1995 ANNUAL ENGINEERING REPORT

FOR

SOLID WASTE CLASS I LANDFILLS
SITES 3 & 4

TONTITOWN, ARKANSAS
SUNRAY SERVICES, INC.

SOLID WASTE DISPOSAL FACILITIES
SITE 3 (PERMIT NO. 123-SR-2) &
SITE 4 (PERMIT NO. 162-SR-2)

PREPARED FOR:

SUNRAY SERVICES, INC.

AND

THE ARKANSAS DEPARTMENT OF POLLUTION CONTROL & ECOLOGY

PREPARED BY:

GENESIS ENVIRONMENTAL CONSULTING, INC.

MARCH 1996

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1. INTRODUCTION

The Sunray Services, Inc. (Sunray) Tontitown Landfill site is located within the Four County (Northwest) Regional Solid Waste Management District approximately three miles southwest of the City of Tontitown in Washington County, Arkansas. The location on a U.S. Geological Survey Quadrangle map is shown on FIGURE 1.

Sunray currently holds two Class I Solid Waste Disposal Permits (Permits) at the Tontitown site (Permit Nos. 162-SR-2 and 123-SR-2). These Permits include Class IV disposal. The Permits together make up a single site at Tontitown that includes a Solid Waste Transfer Station, a Compost facility, and a Waste Tire Processing facility. A layout of the Tontitown facility is shown in FIGURE 2.

On September 20, 1991, the Arkansas Department of Pollution Control and Ecology (ADPC&E) issued Sunray two Permits for Class I Landfills at the Tontitown site. Permit Nos. 162-SR-2 is generally referred to as Site 4 and 123-SR-2 is generally referred to as Site 3. Copies of the permits are contained in APPENDIX A.

The Solid Waste Permits for the Landfill operation contain several conditions that require efficient operation, maintenance, and reporting. In the past, Sunray was required by Condition No. 19, to have a Registered Professional Engineer prepare a report every 4 months to address the design and operation of the Landfill. However, on September 15, 1995 the Solid Waste Division notified all solid waste permitted landfills that reporting is to be performed on an annual basis (see APPENDIX B). The 1995 Class I Landfill Engineering Report is due at the ADPC&E by March 31, 1996.

This document constitutes the 1995 Annual Engineering Report for the Sunray Class I facilities in Tontitown, and addresses the design and operation for the following items:

- The volume remaining in the landfill
- The estimated remaining site life considering the current waste stream
- Compliance of the facility fill progression with the approved permit plans, specifications, and narrative
- Compliance with the operating requirements of Regulation 22 and Permit Conditions
- Changes or proposed changes to the operating plan
- Quantity and characteristics of leachate collected and disposed
- Maintenance of stormwater controls
- Status of capping and closure of completed areas
- Status of remedial or corrective actions taken
- Other items impacting Permit compliance

2. SITE INFORMATION

This section discusses various site specific information including the Landfill personnel, access roads, stormwater and erosion control, and the rainfall received at the site in 1995.

2.1 Site Personnel

The personnel that are required for the operation of the Tontitown facility are normally kept at 10 persons as shown below:

Landfill Manager (1)
Scale House Attendant (1)
Scraper Operator (3)
Class IV Landfill Operator (1)
Class I Landfill Operator (2)
Transfer Station Operator (1)
Laborer (1)

In addition, a Sunray engineer, District Manager, and other personnel frequently visit the Tontitown site to monitor the facility and perform various duties. During the 1995 reporting period, Sunray maintained four certified Class I Landfill Operators and two certified Class II Landfill Operators at the site. Sunray is scheduling personnel for training to obtain Operator Certification whenever classes are available.

2.2 Access Roads

Sunray maintains all weather asphalt and/or gravel access roads at the site and on the landfills. No major additions to the access roads have been made to the site this reporting period. However, minor maintenance is routinely performed to the existing access roads to the site and within the facility property. This includes the placement of rock (chert) generated from the soil screening process described in Section 8. In addition, the main entrance road to the Landfill leads

directly to the newly constructed Transfer Station which provides service to all private vehicles, thereby keeping traffic off the Landfill working area.

2.3 Storm Water and Erosion Control

In the area of stormwater control, minor improvements have been made to improve the existing drainage systems at the site. Construction for expansion of the south sedimentation pond is also taking place. Routine maintenance for the control of erosion on the Landfill cap and drainage pathways is performed on an as-needed basis and includes application of cover material, riprap, seeding, mulching, and fertilizer.

2.4 Weather and Monthly Precipitation

Sunray maintains a rain gage at the site and keeps a daily log of the amount of rainfall received. In addition, the site temperature (high and low), sky conditions, and wind direction is also documented on a daily basis. A monthly summary of the rainfall at the site is shown below in TABLE 1. Information regarding other conditions at the site are kept on file at the Landfill office.

TABLE 1

1995 RAINFALL SUMMARY (Inches)

JANUARY	8.75
FEBRUARY	2.13
MARCH	4.75
APRIL	7.25
MAY	9.75
JUNE	7.38
JULY	5.00
AUGUST	1.00
SEPTEMBER	3.75
OCTOBER	3.38
NOVEMBER	3.63
DECEMBER	3.63
TOTAL RAIN 1995	60.40 INCHES

3. REMAINING VOLUME AND SITE LIFE

3.1 REMAINING VOLUME

During this reporting period the Class I Landfill received waste from the larger cities including Springdale, Fayetteville, Rogers, Harrison, and many smaller cities and towns. TABLE 2 lists the waste placed in the Landfill on a volume basis (cubic yards) and a weight basis (tons). In addition, the approximate soil cover placed on the Landfill, and the air space that was consumed is presented.

TABLE 2

SUMMARY OF WASTE AND SOIL PLACEMENT

	CLASS I FILL			
MONTH	WASTE (C.Y.)	WASTE (TONS)	SOIL PLACE-MENT (C.Y.) *	AIRSPACE CONSUMED (C.Y.)
JANUARY	48,149	10,681	8,880	21,886
FEBRUARY	47,777	10,475	19,366	21,717
MARCH	45,562	10,185	13,667	20,710
APRIL	48,567	11,507	17,088	22,076
MAY	50,034	12,098	11,174	21,619
JUNE	47,708	12,227	11,251	20,885
JULY	48,117	11,606	13,424	22,700
AUGUST	51,508	13,155	14,861	23,500
SEPTEMBER	42,377	9,991	13,158	19,700
OCTOBER	41,139	9,573	23,859	17,500
NOVEMBER	35,088	8,544	14,336	18,600
DECEMBER	27,855	6,734	12,224	15,900
TOTAL	533,881	126,776	173,228	246,793
AVERAGE	44,490	10,565	14,441	20,566

* Daily and Intermediate Soils

As shown in TABLE 2, the Class I volume received during the 1995 reporting period is approximately 533,881 cubic yards (C.Y.) A total of approximately 173,228 C.Y. of (loose) daily and interim soil covers were placed on the waste during the reporting period. The Class I airspace used for placement of waste and cover material during the 1995 reporting period is approximately 246,793 C.Y. This yields a compaction ratio of approximately 2.87 to 1 (gate yards plus soil placed to airspace utilized).

3.2 SITE LIFE

The Tontitown Class I Landfill consist of Site 3 (Permit #123 SR-2) and Site 4 (Permit # 164-SR-2). Site 4 has reached its permitted capacity. Site 3 has almost reached its permitted capacity, however, it has approximately 30,000 C.Y. of remaining air space. Sunray transports varying volumes of solid waste to other landfills located in Oklahoma. Based on an average consumption of approximately 15,000 C.Y. per month, Site 3 has 2 months of capacity remaining.

4. COMPLIANCE WITH PERMIT AND REGULATION 22

Sunray manages the Tontitown Landfill in accordance with the applicable requirements of the Landfill Permits (Permit Nos. 162-SR-2 and 123-SR-2) and Regulation 22 (Solid Waste Management Code). FIGURE 2 presents a layout of the Tontitown site. FIGURE 3 (Site 3) and FIGURE 4 (Site 4) depict the permitted contours and the existing contours based on an aerial survey performed in December of 1995. As shown, both of the Landfills are within the permitted area and vertical height limitations as established by a 1991 Permit Modification.

The landfill is operated using the area fill method with lift heights of no more than 15 feet. Under this method, one cell is built next to the previous day's cell until design elevations are reached. The collection vehicles discharge the waste in the area identified as the working face. The working face is a sloped surface upon which the waste is spread in layers. The compaction equipment then compacts the waste as it is moved from the bottom to the top of the cell. The dozer is used to keep the width of the working face as small as practical. The compactor makes a minimum of three complete passes over the waste, or as many passes as is necessary to consolidated the waste.

According to records obtained from the Central Files at the ADPC&E the Tontitown facility was inspected by the Solid Waste Division a total of 10 times during the 1995 reporting period. Many of these inspections reported no violations. However, minor deficiencies were noted on several inspections.

Sunray responds to each minor deficiencies noted by the ADPC&E Inspections by correcting the noted problem and sending a written response to the Solid Waste Division of the ADPC&E.

The final cap is currently being constructed on Site 4. In order to construct a clay cap in accordance with the Permit requirements, Sunray has purchased equipment to separate the on-site cherty clay soil. The soil screening equipment separates the chert from the clay material and provides a suitable clay for the final cap.

5. OPERATING PLAN CHANGES

Sunray has made various operational changes and improvements at the Landfill during the 1995 reporting period. The major changes and revisions in the operation at the Tontitown site include the following:

- Construction of a Solid Waste Transfer Station
- Construction of an expansion to the South Sedimentation Basin
- New equipment utilized at the site

The construction of the Transfer Station was the largest change that has occurred at the Tontitown site. This has helped the facility better manage and consolidate waste that is destined for transportation to other landfills. Two persons have been added to the site to help operate the Transfer Station.

Construction of an expansion to the South Sedimentation Basin was completed during this reporting period. The South Sedimentation Basin collects stormwater that drains from mainly the east and south portions of Site 4. This site improvement should allow the facility to hold a larger volume of stormwater longer and allow more manageable NPDES discharges.

During the 1995 reporting period the major equipment utilized by Sunray at the site included a Caterpillar 816B Compactor, Caterpillar D7 and D6D dozer, and three elevating scrapers. In addition, Sunray has added a screening operation to segregate the rock (chert) and the suitable cap material. The chert material is utilized for maintaining roads at the Landfill. The screened cover material has resulted in providing a quality clay material for use in construction of the clay cap on Site 4.

6. LEACHATE DATA

6.1 LEACHATE REMOVED AND DISPOSED

The leachate collection capability at the Tontitown facility include; Site 3, Site 4 Class IV, and the Transfer Station. TABLE 3 provides a summary of the approximate amount of leachate removed from the leachate collection tanks at the facility during the 1995 reporting period.

TABLE 3
SUMMARY OF LEACHATE GENERATED

MONTH	LEACHATE GENERATED & DISPOSED (Gallons)
January	22,050
February	25,200
March	21,800
April	15,750
May	37,800
June	25,200
July	6,300
August	9,450
September	3,150
October	12,600
November	0
December	12,350
TOTAL	191,650
MONTHLY AVERAGE	15,971

Note: Includes leachate generated from Class I Landfills, Class IV Landfills, and the Transfer Station Tank.

All of the leachate that was generated at the Tontitown site is transported by truck to the City of Fayetteville Wastewater Lift Station #6 on Washington County Road #877, and pumped to the Fayetteville Sewage Treatment Plant located at 1500 N. Fox Road in Fayetteville, Arkansas.

6.2 Leachate Characteristics

Sunray samples and performs laboratory analyses on the leachate that is generated in the Class I Landfills (Site 3 and Site 4) prior to transporting to the Fayetteville sewer system. A summary of the laboratory results are presented in TABLE 4.

TABLE 4

SUMMARY OF LEACHATE ANALYSIS

PARAMETER	SITE 3			SITE 4			
	3/31/95	6/29/95	12/5/95	3/31/95	6/29/95	12/5/95	AVERAGE
BOD	1643	239	67	15	2	67	225.89
COD	3170	884	637	74	213	637	623.89
CHLORIDE	296	515	125	100	190	125	150.11
pH	7.74	7.5	6.89	6.33	6.3	6.89	4.63
TDS	2252	1370	1976	616	420	1976	956.67
CHROMIUM	0.06	0.06	0.06	0.06	0.06	0.06	0.04
COPPER	0.05	0.05	0.022	0.05	0.1235	0.02	0.04
LEAD	0.1	0.1	0.1	0.1	0.1	0.1	0.07
NICKEL	0.1109	0.213	0.217	0.06	0.141	0.105	0.09
ZINC	2.82	0.559	0.452	0.269	1.62	0.143	0.65
CADMIUM	0.01	0.01	0.01	0.01	0.01	0.005	0.01

Laboratory results in ppm

7. STORMWATER CONTROLS

The site has a total of three sedimentation basins located at the west, south, and east portions of the facility to control stormwater at the site. Stormwater run-off from the Class I Landfills, Class 4 Landfills, and other areas within the Permitted Landfill are directed to these sedimentation basins. During the 1995 reporting period Sunray has performed maintenance activities on the stormwater systems at the Tontitown site to properly control stormwater run-off and prevent stormwater run-on at the site.

Maintenance activities include removal of silt from the drainage pathways, placement of hay bales in strategic locations, placement of riprap, and installation of perimeter silt fences. In addition, the East Sedimentation Basin was drained, the sediments were removed, and the basin was put back into service. Sunray also enlarged the South Sedimentation Basin to increase stormwater retention and improve settling of the suspended solids in the stormwater.

During the 1995 reporting period, Sunray released stormwater from the three sedimentation basin outfalls in accordance with NPDES Permit ARG160003. A summary of the discharges are recorded on Discharge Monitoring Reports (DMR) that are submitted monthly to the ADPC&E.

8. LANDFILL CLOSURE ACTIVITIES

The Site 4 Class I Landfill at Tontitown has reached its final permit contours. Sunray began closure activities during the 1995 reporting period in accordance with Permit Condition 8. See APPENDIX A; Permit No. 162-SR-2 for more information. Correspondence from Sunray to the ADPC&E Solid Waste Division, dated September 1, 1995, provides notification for closure of Site 4 (see APPENDIX B). The activities associated with closure of Site 4 are described below.

8.1 Final Cap Construction

Closure of Site 4 began in the 1995 reporting period in areas of Site 4 in which Sunray applied intermediate seeding and fertilization. The capping procedures began in September 1995, and the construction is in accordance with the Permit requirements. In addition, the ADPC&E requested that Sunray prepare a final closure plan for Site 4. On October 20, 1995 Sunray submitted the "Site 4 Final Closure Plan for Class I Landfill (Permit 162-SR-2)" to the ADPC&E. A summary of the cap requirements, from top to bottom, are as follows:

- 6 inches of vegetated topsoil;
- 1 foot of cherty-soil drainage layer;
- 2 feet of compacted clay, and
- 6 inches of daily cover.

In order to achieve an adequate material for the 2 foot thick compacted clay cap, borrow area soils are being screened to remove cherty material. Laboratory classification tests have been performed on the screened material for the following:

- Atterberg Limits
- Moisture-Density
- Seive Analysis

- Unified Soil Classification
- Permeability

Construction and testing of the clay cap began at the northeast portion of landfill Site 4. FIGURE 4 indicates the areas in which a final clay cap has been applied. APPENDIX C contains the results of laboratory testing for the screened material and the clay cap for this reporting period. The Site 3 Class I Landfill (Permit 123-SR-2) is nearing the final Permit contours and will also begin closure activities in the near future.

8.2 Revegetation of Completed Areas

During the 1995 reporting period Sunray revegetated various areas of the Class I Landfills, Site 3 and Site 4. Planting occurred during the months of March 15 to May 1, 1995 and in August of 1995. The following Areas within Site 3 and Site 4 were revegetated during this time period:

Site 3	Site 4
North one-half	Entire area
South one-third	

During revegetation of Site 3 and Site 4 the following materials were utilized:

- Lime applied at approximately 500 lb./acre
- Fertilizer (13-13-13)
- Seed applied at approximately 100 lb/acre (wheat, rye grass, rye mixture)

As indicated, a final cap will be constructed on Site 4 during the next reporting period. Interim seeding has occurred on the completed area to prevent erosion. As soon as the final cap is completed in various areas of the Landfill, additional lime, fertilizer, and seed will be applied to protect the soil from erosion and provide an adequate vegetative cover.

9. REMEDIAL, CORRECTIVE ACTIONS, AND PERMIT COMPLIANCE

The Tontitown Landfill is in compliance with all Solid Waste Permits, groundwater monitoring requirements, and NPDES Permits at the facility during the reporting period. The site has consistently received inspection ratings of satisfactory from the Solid Waste Division at the ADPC&E. In addition, all violations noted during an inspection have been responded to in an efficient and timely manner.

Sunray is currently operating an approved groundwater monitoring system under the "Assessment Monitoring Program" provisions of 40 CFR 258.55. Sunray began their Assessment Monitoring Program based upon the results of the Third Quarter 1994 Groundwater Report dated January 11, 1995. The provisions of the assessment program are defined in 40 CFR 258.55. A February 13, 1995 letter from GEC on behalf of Sunray to the ADPC&E, and a response letter from ADPC&E to Sunray dated February 27, 1995 outline the details of the program. This required the Landfill to begin an assessment monitoring program during the 1995 reporting period for 5 of the 10 groundwater monitoring wells at the site. A total of four quarters of sampling and laboratory analysis data, for the required assessment monitoring parameters, were performed.

Even though the Assessment Monitoring Program is to be complete during the first half of 1996, recent developments from the Technical Section of the ADPC&E could delay the schedule time frames.

10. CONCLUSIONS

The solid waste landfills at Sunray's Tontitown, Arkansas locations were inspected on numerous occasions throughout the 1995 Reporting year to observe operational compliance with permit conditions, permit plans, and specifications. As indicated in this 1995 Annual Engineering Report, the Class I Site 3 and Site 4 solid waste disposal facilities are being operated in accordance with their Solid Waste Permits (0123-SR-2 and 0162-SR-2) and Regulation 22 requirements.

The 1995 Annual Engineering Report for the Site 3 and Site 4 Solid Waste Class I Landfills was prepared by or under the direction of Kenneth E. Bown, a Professional Engineer licensed in the State of Arkansas.

Kenneth E. Bown, P.E.

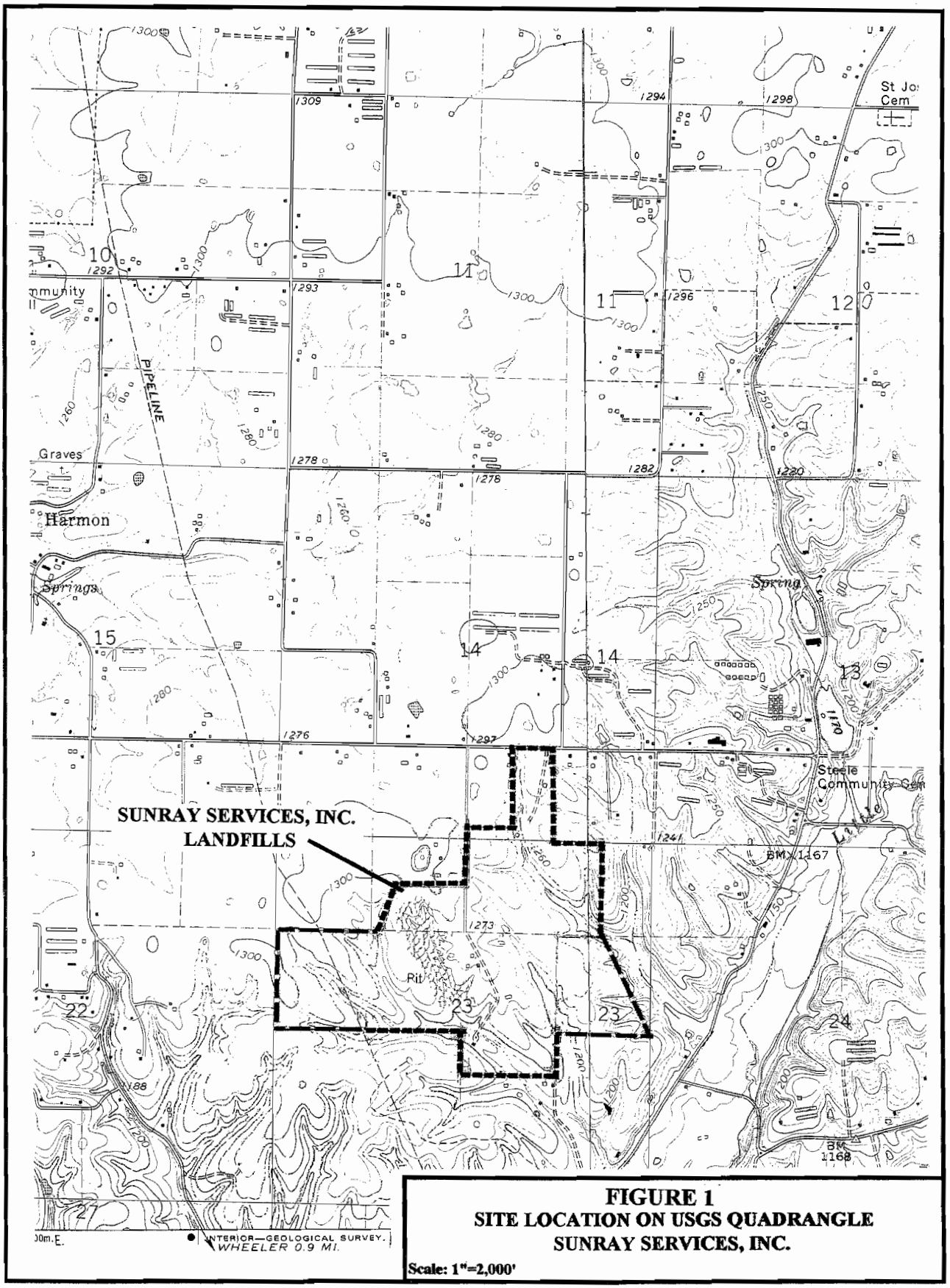


FIGURE 1
SITE LOCATION ON USGS QUADRANGLE
SUNRAY SERVICES, INC.

Scale: 1"=2,000'

LEACHATE TRANSFER LINE.

LEACHATE COLLECTION LINE.

WEST SEDIMENTATION BASIN

TRANSFER STATION

MW-7 1243.70

MW-4 1211.73

MW-8 1226.35

25-YEAR, 24-HOUR 100 STORM SPILLWAY.

CONCRETE PAD AND RISER

SITE 4 EAST BASIN

+/- 5:1 SLOPE

LANDFILL OFFICE

SCALE HOUSE

FINAL PERMIT CONTOURS

BENCH (TYP)

LET-DOWN DITCH

1200 1225 1230 1235.7 1238.2 1247.3 1246.5 1249.0 1250 1250.1 1252.6 1258.6 1260 1270 1191.0 1202.1 1253.6 1258.9 1275 1342.8 1280 1290 1300 1310 1320 1330 1340 1337.1 1340.6 1325 1272.5 1270.8 1271 1274.7 1297.1 1291.5 1308.1 1319.5 1306.9 1222.4 1196.4 1200 1212.5 1224.2 1212.7 1206.7 1258.2

LEGEND

- PL = OLD PROPERTY LINE
- = NEW PROPERTY LINE
- 1300 = DEC. 1995 AERIAL SURVEY CONTOURS
- 1280 = PERMIT CONTOURS
- = STORMWATER SHEETFLOW
- = DRAINAGE PATHWAY
- = AREA WITH 2' OF COMPACTED CLAY DENSITY TEST PERFORMED
- = MONITORING WELL
- = RIP-RAP AREA

STATE OF ARKANSAS *** REGISTERED PROFESSIONAL ENGINEER KENNETH E. BOWN No.7139

Design by:	KEB
Checked by:	BE
Drawn by:	JFH
Project No.:	9541
Date:	MAR 1996
Scale:	1"=100'

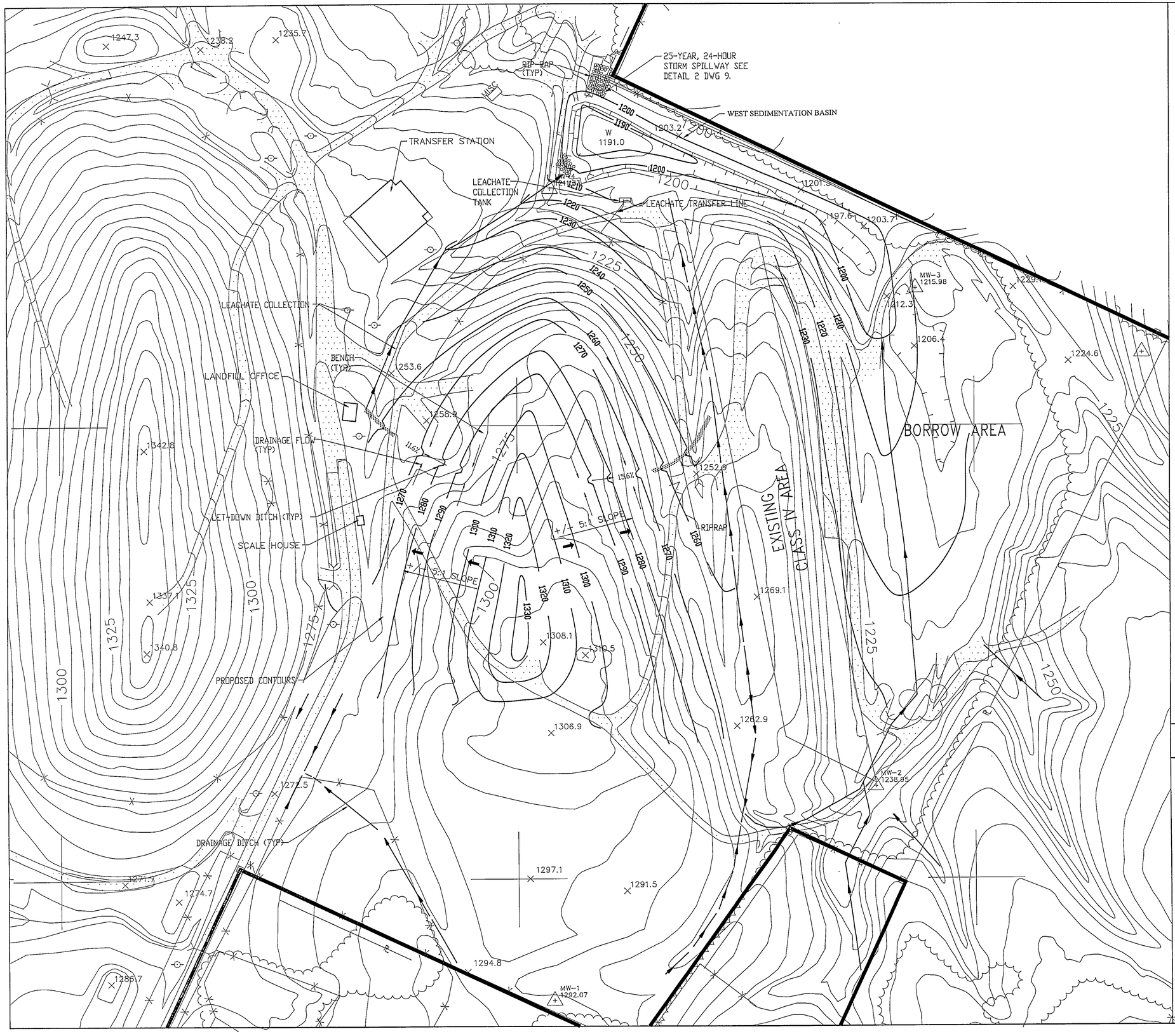
FIGURE 4

1995 ENGINERRING REPORT SITE 4

PERMIT CONTOURS, AS-BUILT CONTOURS, AND DETAILS

SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

GEC
GENESIS
ENVIRONMENTAL CONSULTING, INC.
8211 Geyer Springs Road
Little Rock, AR 72209



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
KENNETH E. BRADEN
No. 7139

Design by:	KEB
Checked by:	BE
Drawn by:	JFH
Project No.:	9541
Date:	MAR 1996
Scale:	1"=100'

FIGURE 3
1995 ENGINEERING REPORT SITE 3
PERMIT CONTOURS, AS-BUILT CONTOURS, AND DETAILS

SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

LEGEND

- = OLD PROPERTY LINE
- = NEW PROPERTY LINE
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- = RIP-RAP AREA

GEC
GENESIS
ENVIRONMENTAL CONSULTING, INC.
8211 Geyer Springs Road
Little Rock, AR 72209

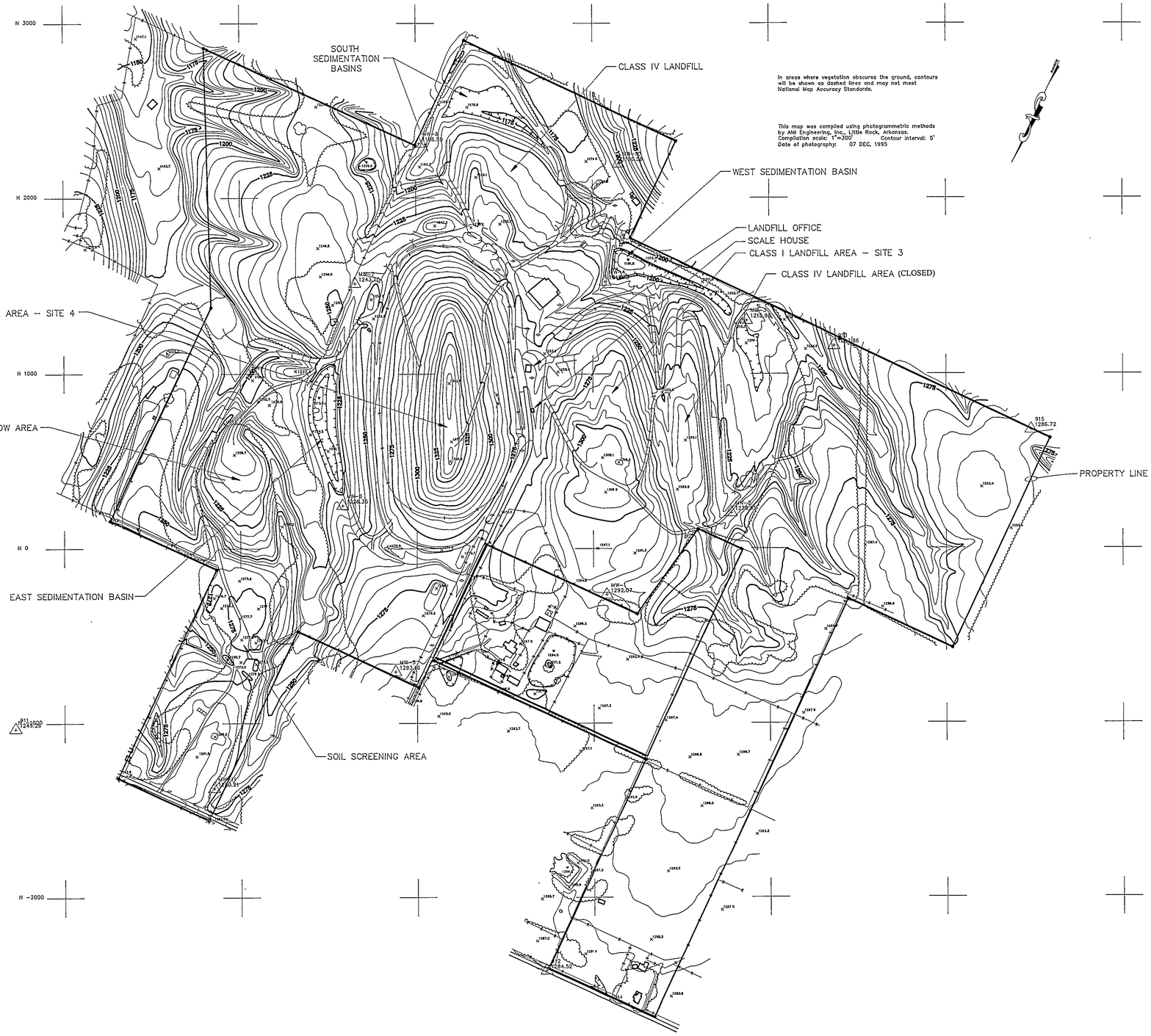


FIGURE 2

1995 ENGINEERING REPORT
SITE LAYOUT

SUNRAY SERVICES, INC.
TONTITOWN LANDFILL

Design by: KEB	GEC GENESIS ENVIRONMENTAL CONSULTING, INC.	Project No.: 9541
Checked by: BE	8211 Geyer Springs Road Little Rock, AR 72209	Date: MAR 1996
Drawn by: JFH		Scale: AS SHOWN

C:\WORK\GEC\9541\TSK9\1995ENGR\FIG2

APPENDIX A

SOLID WASTE DISPOSAL PERMITS

ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
8001 National Drive
Little Rock, Arkansas 72209

PERMIT
FOR THE CONSTRUCTION AND/OR OPERATION OF A SOLID WASTE DISPOSAL FACILITY

CLASS I

Permit No. 0123-SR-2 EFFECTIVE DATE September 20, 1991

Sunray Services, Inc.
105 Old Missouri Rd.
Springdale, Arkansas 72765

Engineering: SCS Engineers
10401 Holmes Road
Suite 400
Kansas City, Missouri 64131

This permit is your authority to construct and/or operate the Solid Waste Disposal Facility set forth in your application dated February 18, 1991 . This permit is issued pursuant to the provisions of the Arkansas Solid Waste Management Act (Act 237 of 1971; Sec. 82-2701 et seq., Ark. Stats.), hereinafter called the "Act", the Arkansas Solid Waste Management Code, hereinafter called the "Code", and all other applicable rules and regulations of the Department of Pollution Control and Ecology, hereinafter called "Department", and the following terms and conditions:

1. The disposal facility shall be constructed, maintained, and operated in accordance with the final plans and specifications as approved by the Department and in compliance with all applicable provisions of the Act, the Code, and all other applicable rules and regulations.

2. This permit shall automatically terminate unless construction of the disposal facility has been commenced within N/A day(s) of the date hereof and completed with all reasonable diligence. The Department shall be notified in writing when the disposal facility has been completed in order that it may be inspected.

3. The disposal facility shall be operated by qualified personnel and maintained in good operating condition at all times.

4. This permit may be revoked or modified whenever, in the opinion of the Department, the facilities are no longer in compliance with the Act, the Code, and applicable rules and regulations. This permit shall not relieve the permittee, its agents or employees, from compliance with all provisions of the Act and the Code.

5. Nothing herein contained shall be construed as releasing the permittee from any liability for damage to persons or property by reason of the installation, maintenance, or operation of the disposal facility.

6. This permit is issued in reliance upon the statements and representations made in the application and the plans and specifications and the Department has no responsibility for the adequacy or proper functioning of the disposal facility.

PLEASE SEE ATTACHED SHEET FOR ADDITIONAL CONDITIONS.

Approved:

DEPARTMENT OF POLLUTION CONTROL & ECOLOGY

By _____
for Director

23 Sept 91
Date

7. Backhoe test pits or borings shall be installed at 200 feet centers in the proposed 16 acre borrow area. The material encountered must be logged by a registered Engineer or Geologist. Final grades must be adjusted downward based upon the quality and quantity of material available. Upon completion of the geotechnical work a summary report must be submitted to the Department. The report shall contain a revised soil budget for the proposed modification.

8. A 4 foot thick cap shall be incorporated into the final grade design. The cap design shall consist of the following from top to bottom:

   - 6 inches of vegetated topsoil.

   - 1 foot chert-soil drainage layer.

   - 2 feet of compacted clay. The clay cap material must have greater than 35% passing the No. 200 sieve or if all chert over 1 inch in diameter is excluded, 30% passing the No. 200 sieve. Clay cap material is to be segregated and stockpiled in a designated location. Prior to placement on completed portions of the fill. A minimum of 10 representative samples shall be collected from the stockpile. Sieve analyses shall be conducted on each sample to insure conformance with the compliance standard. Material containing an excessive chert content must not be utilized in the compacted clay layer. The clay must be compacted to 95% of standard proctor density and wet of optimum moisture content in 8 inch lifts. Density test shall be performed on each lift every 10,000 square feet of surface area. Permeability of the cap shall not be greater than .000001 cm per second.

   - 6 inches of daily cover.

9. A fill sequence must be developed for the closure plan and approved by the Department prior to initiating the operation. The fill sequence must provide for the orderly progression of the closure plan in order to provide for the following minimization of disturbed areas on site, the phased construction of the cap in order to prevent erosion and to prevent excessive closure cost at the termination of fill operations, and finally, to allow fill operations to cease if suitable quality soils are depleted.

10. Sunray Services shall submit a plan for a hydrogeologic study of the landfill complex. The plan must be submitted within 30 days of the approval date of this modification. The plan can be altered by the Solid Waste Division staff prior to approval.

The plan must include the installation of a series of piezometers into the waste mass in order to assess the effectiveness of the existing leachate collection system and the potential for leakage through the bottom liner of the fills. At least three piezometers must be installed in each fill area. The structures shall be constructed in the following manner:

- each hole must extend to the bottom of the waste mass.

- A minimum of 4 inch I.D. slotted screen must be used with a clean, coarse graded, sand filter pack. The slotted screen and filter pack must extend to within 10 feet of the final grade. A bentonite plug shall extend from 10 feet to the surface.

11. The following materials are suitable for disposal within the Class IV fill area:

masonry debris
roofing debris
stumps and rocks
appliances and auto bodies
pallets
tires shredded or chipped

Any other types of waste must have written authorization from the Department to be placed into the Class IV area.

12. Additional erosion control measures can be required by the Department staff. If the staff determines that excessive erosion is occurring the company will be notified. Additional erosion control measures consisting of mulch, sediment traps, erosion control matting or fabric, terraces and run off let down structures may be required. Time frames for the completion of additional erosion control measures will be specified by the staff. All additional measures and deadlines can be appealed to the Director.

13. The Class IV bottom liner design shall consist of one foot of clean washed limestone and two feet of recompacted clay meeting the following specifications:

The bottom 8 inches can be compacted in place. The other 16 inches shall be taken out and recompacted in eight inch lifts.

Each of the 8 inch layers shall be compacted to 95% standard proctor density.

Each of the 8 inch layers shall be tested and certified as to permeability of no more than 0.000001 cm per second. Density test shall be conducted on each 10,000 square feet of liner on each lift.

The soil-aggregate mixture must have more than 30% passing No. 200 or 30% if all chert over one inch is excluded from the bottom liner material.

The leachate collection area shall be constructed to drain by gravity.

The leachate collection trench shall be double lined with three feet of clay and a 40 mil HDPE liner.

14. A revised set of blueprints shall be submitted that shows all changes to the SCS June 1991 first submittal. The revised plans shall include the revised soil budget addressed in condition #1.

15. The modification application dated 2/18/91 and received on 8/1/91 must be signed by a corporate officer.

16. Post Closure maintenance shall be a minimum of ten years. The Post Closure care and maintenance period may be extended to provide adequate leachate treatment if deemed necessary by the Department.

17. Extraction wells shall be installed in 1992 on Sunray 3 and Sunray 4. Preliminary and final plans shall be presented for approval by registered PG & PE.

18. The Director on November 2, 1991 asked the staff to work up a draft ban on landfilling in the Boone formation. Therefore, if the PC&E Commission adopts this ban as policy this landfill may be closed out before reaching final grades if there becomes other adequate landfill capacity within the region.

19. Proper preparation of the site shall be supervised and reported in writing to the Department by a Registered Engineer with reports submitted every four months that address the following components of the design and operation: surface water diversion, access roads on site, proper compaction of waste, amount of waste received, final cap construction, revegetation of completed areas, quantity of leachate removed from trenches, and where the leachate was properly disposed of. In addition compaction density test shall be conducted on every 10,000 square feet of clay liner.

20. Each of the groundwater monitoring wells shall be sampled quarterly unless more frequent monitoring is deemed necessary by the Department.

Results are to be submitted directly to the Department from the contract laboratory and shall include the following parameters: Ammonia (as N), Bicarbonate, Calcium, Chloride, Iron, Magnesium, Manganese, Nitrate, Potassium, Sodium, Sulfate, Chemical Oxygen Demand, Totaled Dissolved Solids, pH, Arsenic, Barium, Cadmium Chromium, Cyanide, Lead, Mercury, Selenium, Silver and, the Volatile Organic Compounds listed in Appendix I of 40 CFR Part 258 - the Solid Waste Disposal Facility Criteria; Proposed Rule. All sampling parameters are subject to revision by Department at any time.

21. A statistical method for evaluating increases (or decrease in the case of pH) in inorganic parameters in groundwater must be selected and approved by the Department prior to the receipt of waste at the facility. In addition a contingency plan outline must be developed and approved by the Department listing the logical sequence of measures to be taken by the permittee in the event of a statistically significant increase in inorganic parameters or a positive detection of organic parameters.

22. This facility is for the disposal of all waste eligible for a Class I sanitary landfill including all special materials (as listed in Appendix "A" of the Arkansas Solid Waste Management Code-March 23, 1984) except small quantities of exempt hazardous waste. All other wastes requiring specified written authorization as identified in the Arkansas Solid Waste Management Code shall obtain this authorization from the Arkansas Department of Pollution Control and Ecology prior to disposal.

23. Any change in ownership or control of the operation of this landfill will be considered a major modification of the permit. Failure to notify the Department of a change in ownership or a change of operators will be cause for revocation of this permit.

24. No wet waste or liquid waste shall be received at the facility. Wet waste is defined as material which will not support equipment and typically contains less than 30% solids.

25. Leachate will be trucked to a sewage treatment plant or disposed of in an alternate manner approved in advance by the Department. The quality and quantity of leachate produced shall be analyzed and measured as long as significant amounts are produced as determined by the Department. Leachate storage capability is subject to Department approval, based on actual leachate flow rate. Department approval must be received prior to any changes in leachate disposal methods. Leachate analysis shall be conducted prior to disposal, or as directed by the Department. Volume measurements shall be made weekly. Results shall be submitted directly from the contract laboratory to the Department after each monitoring period, and shall include the following: Volume produced, Chlorides, Total Dissolved Solids, Chemical Oxygen Demand, Biological Oxygen Demand, pH, Zinc, Copper, Nickel, Lead, Chromium, and Cadmium.

26. Quality control records for the construction of the clay liner and the artificial liner shall be maintained on site for review by regulatory officials.

27. Seeding and soil stabilization shall be conducted in the spring and fall on all exposed surfaces. Futhermore, revegetation shall be accomplished immediately after final elevations are completed. Water for irrigation from the sediment basins may be used.

28. The initial amount of financial assurance required is $61,500.00. The instruments used must be in the exact form set forth in Appendix "B" of the Code and must be filed with the Department before the permit can become effective. A portion or all of the financial assurance may be held by the Department beyond the normal closure dates as set forth in the Code, due to post closure consideration for maintenance of the leachate collection system.

    This financial assurance amount must be maintained at the initial amount at all times in order to cover the provisions of Act 531 of 1989, unless other arrangements are met to cover these provisions. Any other arrangements must be approved in writing by the Department. No waste disposal is to take place until financial arrangements are approved by the Department.

29. The as-built grades/elevations as shown on the approved blueprints shall not be adjusted due to settling/consolidation of the waste mass. Therefore, the actual final grades/elevations after closure/post closure will be lower than as-built grades/elevations as shown on the approved blueprints.

30. All cover vegetation shall be mowed one time each year during the growth season so that proper inspection of the cover can be made.

31. Any ash or sewage treatment plant sludges other than from a strictly domestic source shall be disposed of in a monofill with double liners, impervious cap, leachate collection system and separate monitoring well system.

32. The Department, its employees, agents or any authorized person shall have the right to enter the property at any time for any reason as set out in the Arkansas Solid Waste Code for the purpose including but not limited to taking of samples, inspection, and any other enforcement or engineering action, without interference or delay from the permittee.

33. The operation and closure of this landfill is proposed to continue past the time that which new federal regulations will be in place, therefore the operation, construction, and closure/post closure shall also be subject to the Resource Conservation and Recovery ACT (RCRA) requirements.

*****

ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
8001 National Drive
Little Rock, Arkansas 72209

PERMIT
FOR THE CONSTRUCTION AND/OR OPERATION OF A SOLID WASTE DISPOSAL FACILITY

CLASS I

Permit No. 0162-SR-2 EFFECTIVE DATE September 20, 1991

Sunray Services, Inc.
105 Old Missouri Road
Springdale, Arkansas 72765

Engineering: SCS Engineers
10401 Holmes Road
Suite 400
Kansas City, Missouri 64131

This permit is your authority to construct and/or operate the Solid Waste Disposal Facility set forth in your application dated February 20, 1991. This permit is issued pursuant to the provisions of the Arkansas Solid Waste Management Act (Act 237 of 1971; Sec. 82-2701 et seq., Ark. Stats.), hereinafter called the "Act", the Arkansas Solid Waste Management Code, hereinafter called the "Code", and all other applicable rules and regulations of the Department of Pollution Control and Ecology, hereinafter called "Department", and the following terms and conditions:

1. The disposal facility shall be constructed, maintained, and operated in accordance with the final plans and specifications as approved by the Department and in compliance with all applicable provisions of the Act, the Code, and all other applicable rules and regulations.

2. This permit shall automatically terminate unless construction of the disposal facility has been commenced within N/A day(s) of the date hereof and completed with all reasonable diligence. The Department shall be notified in writing when the disposal facility has been completed in order that it may be inspected.

3. The disposal facility shall be operated by qualified personnel and maintained in good operating condition at all times.

4. This permit may be revoked or modified whenever, in the opinion of the Department, the facilities are no longer in compliance with the Act, the Code, and applicable rules and regulations. This permit shall not relieve the permittee, its agents or employees, from compliance with all provisions of the Act and the Code.

5. Nothing herein contained shall be construed as releasing the permittee from any liability for damage to persons or property by reason of the installation, maintenance, or operation of the disposal facility.

6. This permit is issued in reliance upon the statements and representations made in the application and the plans and specifications and the Department has no responsibili for the adequacy or proper functioning of the disposal facility.

PLEASE SEE ATTACHED SHEET FOR ADDITIONAL CONDITIONS.

Approved:

DEPARTMENT OF POLLUTION CONTROL & ECOLOGY

By _____ Director
for

20 Sept 91
Date

7. Backhoe test pits or borings shall be installed at 200 feet centers in the proposed 16 acre borrow area. The material encountered must be logged by a registered Engineer or Geologist. Final grades must be adjusted downward based upon the quality and quantity of material available. Upon completion of the geotechnical work a summary report must be submitted to the Department. The report shall contain a revised soil budget for the proposed modification.

8. A 4 foot thick cap shall be incorporated into the final grade design. The cap design shall consist of the following from top to bottom:

   - 6 inches of vegetated topsoil.

   - 1 foot chert-soil drainage layer.

   - 2 feet of compacted clay. The clay cap material must have greater than 35% passing the No. 200 sieve or if all chert over 1 inch in diameter is excluded, 30% passing the No. 200 sieve. Clay cap material is to be segregated and stockpiled in a designated location. Prior to placement on completed portions of the fill. A minimum of 10 representative samples shall be collected from the stockpile. Sieve analyses shall be conducted on each sample to insure conformance with the compliance standard. Material containing an excessive chert content must not be utilized in the compacted clay layer. The clay must be compacted to 95% of standard proctor density and wet of optimum moisture content in 8 inch lifts. Density test shall be performed on each lift every 10,000 square feet of surface area. Permeability of the cap shall not be greater than .000001 cm per second.

   - 6 inches of daily cover.

9. A fill sequence must be developed for the closure plan and approved by the Department prior to initiating the operation. The fill sequence must provide for the orderly progression of the closure plan in order to provide for the following minimization of disturbed areas on site, the phased construction of the cap in order to prevent erosion and to prevent excessive closure cost at the termination of fill operations, and finally, to allow fill operations to cease if suitable quality soils are depleted.

10. Sunray Services shall submit a plan for a hydrogeologic study of the landfill complex. The plan must be submitted within 30 days of the approval date of this modification. The plan can be altered by the Solid Waste Division staff prior to approval.

The plan must include the installation of a series of piezometers into the waste mass in order to assess the effectiveness of the existing leachate collection system and the potential for leakage through the bottom liner of the fills. At least three piezometers must be installed in each fill area. The structures shall be constructed in the following manner:

- each hole must extend to the bottom of the waste mass.

- A minimum of 4 inch I.D. slotted screen must be used with a clean, coarse graded, sand filter pack. The slotted screen and filter pack must extend to within 10 feet of the final grade. A bentonite plug shall extend from 10 feet to the surface.

11. The following materials are suitable for disposal within the Class IV fill area:

masonry debris
roofing debris
stumps and rocks
appliances and auto bodies
pallets
tires shredded or chipped

Any other types of waste must have written authorization from the Department to be placed into the Class IV area.

12. Additional erosion control measures can be required by the Department staff. If the staff determines that excessive erosion is occurring the company will be notified. Additional erosion control measures consisting of mulch, sediment traps, erosion control matting or fabric, terraces and run off let down structures may be required. Time frames for the completion of additional erosion control measures will be specified by the staff. All additional measures and deadlines can be appealed to the Director.

13. The Class IV bottom liner design shall consist of one foot of clean washed limestone and two feet of recompacted clay meeting the following specifications:

The bottom 8 inches can be compacted in place. The other 16 inches shall be taken out and recompacted in eight inch lifts.

Each of the 8 inch layers shall be compacted to 95% standard proctor density.

Each of the 8 inch layers shall be tested and certified as to permeability of no more than 0.000001 cm per second. Density test shall be conducted on each 10,000 square feet of liner on each lift.

The soil-aggregate mixture must have more than 30% passing No. 200 or 30% if all chert over one inch is excluded from the bottom liner material.

The leachate collection area shall be constructed to drain by gravity.

The leachate collection trench shall be double lined with three feet of clay and a 40 mil HDPE liner.

14. A revised set of blueprints shall be submitted that shows all changes to the SCS June 1991 first submittal. The revised plans shall include the revised soil budget addressed in condition #1.

15. The modification application dated 2/18/91 and received on 8/1/91 must be signed by a corporate officer.

16. Post Closure maintenance shall be a minimum of ten years. The Post Closure care and maintenance period may be extended to provide adequate leachate treatment if deemed necessary by the Department.

17. Extraction wells shall be installed in 1992 on Sunray 3 and Sunray 4. Preliminary and final plans shall be presented for approval by registered PG & PE.

18. The Director on November 2, 1991 asked the staff to work up a draft ban on landfilling in the Boone formation. Therefore, if the PC&E Commission adopts this ban as policy this landfill may be closed out before reaching final grades if there becomes other adequate landfill capacity within the region.

19. Proper preparation of the site shall be supervised and reported in writing to the Department by a Registered Engineer with reports submitted every four months that address the following components of the design and operation: surface water diversion, access roads on site, proper compaction of waste, amount of waste received, final cap construction, revegetation of completed areas, quantity of leachate removed from trenches, and where the leachate was properly disposed of. In addition compaction density test shall be conducted on every 10,000 square feet of clay liner.

20. Each of the groundwater monitoring wells shall be sampled quarterly unless more frequent monitoring is deemed necessary by the Department.

Results are to be submitted directly to the Department from the contract laboratory and shall include the following parameters: Ammonia (as N), Bicarbonate, Calcium, Chloride, Iron, Magnesium, Manganese, Nitrate, Potassium, Sodium, Sulfate, Chemical Oxygen Demand, Totaled Dissolved Solids, pH, Arsenic, Barium, Cadmium Chromium, Cyanide, Lead, Mercury, Selenium, Silver and, the Volatile Organic Compounds listed in Appendix I of 40 CFR Part 258 - the Solid Waste Disposal Facility Criteria; Proposed Rule. All sampling parameters are subject to revision by Department at any time.

21. A statistical method for evaluating increases (or decrease in the case of pH) in inorganic parameters in groundwater must be selected and approved by the Department prior to the receipt of waste at the facility. In addition a contingency plan outline must be developed and approved by the Department listing the logical sequence of measures to be taken by the permittee in the event of a statistically significant increase in inorganic parameters or a positive detection of organic parameters.

22. This facility is for the disposal of all waste eligible for a Class I sanitary landfill including all special materials (as listed in Appendix "A" of the Arkansas Solid Waste Management Code-March 23, 1984) except small quantities of exempt hazardous waste. All other wastes requiring specified written authorization as identified in the Arkansas Solid Waste Management Code shall obtain this authorization from the Arkansas Department of Pollution Control and Ecology prior to disposal.

23. Any change in ownership or control of the operation of this landfill will be considered a major modification of the permit. Failure to notify the Department of a change in ownership or a change of operators will be cause for revocation of this permit.

24. No wet waste or liquid waste shall be received at the facility. Wet waste is defined as material which will not support equipment and typically contains less than 30% solids.

25. Leachate will be trucked to a sewage treatment plant or disposed of in an alternate manner approved in advance by the Department. The quality and quantity of leachate produced shall be analyzed and measured as long as significant amounts are produced as determined by the Department. Leachate storage capability is subject to Department approval, based on actual leachate flow rate. Department approval must be received prior to any changes in leachate disposal methods. Leachate analysis shall be conducted prior to disposal, or as directed by the Department. Volume measurements shall be made weekly. Results shall be submitted directly from the contract laboratory to the Department after each monitoring period, and shall include the following: Volume produced, Chlorides, Total Dissolved Solids, Chemical Oxygen Demand, Biological Oxygen Demand, pH, Zinc, Copper, Nickel, Lead, Chromium, and Cadmium.

26. Quality control records for the construction of the clay liner and the artificial liner shall be maintained on site for review by regulatory officials.

27. Seeding and soil stabilization shall be conducted in the spring and fall on all exposed surfaces. Futhermore, revegetation shall be accomplished immediately after final elevations are completed. Water for irrigation from the sediment basins may be used.

28. The initial amount of financial assurance required is $76,500.00. The instruments used must be in the exact form set forth in Appendix "B" of the Code and must be filed with the Department before the permit can become effective. A portion or all of the financial assurance may be held by the Department beyond the normal closure dates as set forth in the Code, due to post closure consideration for maintenance of the leachate collection system.

    This financial assurance amount must be maintained at the initial amount at all times in order to cover the provisions of Act 531 of 1989, unless other arrangements are met to cover these provisions. Any other arrangements must be approved in writing by the Department. No waste disposal is to take place until financial arrangements are approved by the Department.

29. The as-built grades/elevations as shown on the approved blueprints shall not be adjusted due to settling/consolidation of the waste mass. Therefore, the actual final grades/elevations after closure/post closure will be lower than as-built grades/elevations as shown on the approved blueprints.

30. All cover vegetation shall be mowed one time each year during the growth season so that proper inspection of the cover can be made.

31. Any ash or sewage treatment plant sludges other than from a strictly domestic source shall be disposed of in a monofill with double liners, impervious cap, leachate collection system and separate monitoring well system.

32. The Department, its employees, agents or any authorized person shall have the right to enter the property at any time for any reason as set out in the Arkansas Solid Waste Code for the purpose including but not limited to taking of samples, inspection, and any other enforcement or engineering action, without interference or delay from the permittee.

33. The operation and closure of this landfill is proposed to continue past the time that which new federal regulations will be in place, therefore the operation, construction, and closure/post closure shall also be subject to the Resource Conservation and Recovery Act (RCRA) requirement.

*****

APPENDIX B

CORRESPONDENCE

STATE OF ARKANSAS
DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
SOLID WASTE MANAGEMENT DIVISION
8017 I-30, P.O. BOX 8913
LITTLE ROCK, ARKANSAS 72219-8913
PHONE: (501) 682-0580
FAX: (501) 682-0611

MEMORANDUM

TO: All Solid Waste Permit Holders
All Solid Waste Division Personnel

FROM: Mike Hood, Technical Manager
Solid Waste Division

DATE: September 15, 1995

SUBJECT: Annual Reporting Under Regulation Number 22

Amendments to Regulation Number 22 became effective on May 7, 1995. The regulation requires all solid waste management facilities to submit annual reports. By copy of this memorandum, all permit holders are hereby notified that annual reports will be due, **BEGINNING IN 1996,** in accordance with the following schedule and special instructions below.

FACILITY TYPE	END OF REPORTING PERIOD	REPORT DUE DATE
Class 1 Landfill	December 31	March 31
Class 3 Landfill	March 31	June 30
Class 4 Landfill	June 30	September 30
Transfer Stations	September 30	December 31
Composting Facilities	September 30	December 31
Material Recovery Facilities	September 30	December 31

The requirements of the amended Regulation Number 22 including this annual operation reporting requirement will supersede any permit condition in conflict with this requirement. Unless in conflict with the requirements of Regulation Number 22, quarterly, tri-annual, and bi-annual operation reporting that may be required by permit conditions can be discontinued.

THIS REQUIREMENT PERTAINS ONLY TO ANNUAL OPERATION REPORTS. IT DOES NOT APPLY TO GROUNDWATER REPORTING REQUIREMENTS. Owners or operators should continue to follow the reporting frequencies identified in your permit or in Regulation Number 22 as applicable.

SUNRAY

SUNRAY SERVICES, INC.

September 1, 1995

Mr. Mike Hood, P.E.
Technical Manager, Solid Waste Division
Arkansas Department of Pollution Control & Ecology
P.O. Box 8913
Little Rock, AR 72219-8913

Dear Mr. Hood:

Per Regulation 22, Section 22.1301 (e), please be advised that the Sunray Services, Inc. Site 4, permit number 162-SR-2, has reached capacity and stopped receiving waste for disposal on August 21, 1995. This letter constitutes notification to the Director for the intent to close the unit.

The closure of the unit which consists of the application of the final cover configuration of a four foot thick cap as described by permit condition 8 has already begun. It should be noted that the closure of this unit comes at the end of the construction season and that the process for screening the clay for the compacted barrier, application, and in-situ compaction of the cap require favorable weather conditions. Therefore, bearing these variables in mind, it is possible our projection for the completed closure activities of the unit will surpass 180 days. A good faith effort will be put forth to cap the unit within 180 days, but in all reality, it will probably take longer.

I thank you for your time, if you have any questions or comments, please feel free to contact me at (501) 751-7024.

Sincerely,

Kevin E. Hodges, P.E.
Project Engineer

pc G.R. Holcomb, Sunray
Hon. Charles A. Johnson, Washington County Judge
Drew Holt, Director, Four County (NW) RSWMD

APPENDIX C

CAP DENSITIES AND SCREENING MATERIAL DATA

CAP DENSITIES

FIELD DENSITY TESTS

PROJECT: Sunray Services - Tontitown Landfill - Landfill Cap JOB NO. 94-506

LABORATORY COMPACTION PROCEDURES: ASTM D-698 TESTED BY: RH

TEST NO.	DATE	METHOD	LOCATION	APPROX-IMATE DEPTH BELOW GRADE, FT	WATER CONTENT PERCENT		DRY DENSITY LBS/CU FT		PERCENT COMPAC-TION	MINIMUM REQUIRED PERCENT COMPACTION	COMMENTS
					FIELD	OPT.	FIELD	MAX.			
1	4-3-95	ASTM D-2922	Landfill Cap: 4+50 N and 150' W	1ST Lift	26.1	26.6	86.8	88.8	97.8	95.0	

FIELD DENSITY TESTS

PROJECT: Tontitown Landfill Sunray - Cap - Tontitown, Arkansas JOB NO. 94-506

LABORATORY COMPACTION PROCEDURES: ASTM D-698 TESTED BY: MWB

TEST NO.	DATE	METHOD	LOCATION	APPROX-IMATE DEPTH BELOW GRADE, FT	WATER CONTENT PERCENT		DRY DENSITY LBS/CU FT		PERCENT COMPAC-TION	MINIMUM REQUIRED PERCENT COMPACTION	COMMENTS
					FIELD	OPT.	FIELD	MAX.			
2	4-14-95	ASTM D-2922	4+50 N - 50' E	1st Lift	23.9	24.0	83.9	85.6	98.0	95.0	

NOTE: Water Content Check at 22.0% and 25.0% in 5ft area of Test No. 2

FIELD DENSITY TESTS

PROJECT: Sunray Services - Tontitown Landfill - Springdale, Arkansas JOB NO. 94-506

LABORATORY COMPACTION PROCEDURES: ASTM D-698 TESTED BY: RH

TEST NO.	DATE	METHOD	LOCATION	APPROX-IMATE DEPTH BELOW GRADE, FT	WATER CONTENT PERCENT		DRY DENSITY LBS/CU FT		PERCENT COMPAC-TION	MINIMUM REQUIRED PERCENT COMPACTION	COMMENTS
					FIELD	OPT.	FIELD	MAX.			
4	7-18-95	ASTM D-2922	Landfill Cap: STA 4+50 North and 50' West	1st Lift	27.1	26.6	84.3	88.8	95.0	95.0	
5	"	"	STA 4+50 North and 150' East	"	28.0	"	86.0	"	96.8	"	
6	"	"	STA 5+50 North and 150' East	"	29.7	"	87.4	"	98.4	"	
7	"	"	STA 5+50 North and 50' East	"	25.9	24.0	85.2	85.6	99.5	"	
8	"	"	STA 6+50 North and 50' East	"	33.1	30.8	81.5	85.4	95.4	"	
9	"	"	STA 6+50 North and 150' East	"	25.5	24.0	87.2	85.6	100+	"	

GRUBBS, GARNER & HOSKYN, INC.
CONSULTING ENGINEERS

PLATE 1

SCREENING MATERIAL

SUMMARY OF LABORATORY CLASSIFICATION TESTS

PROJECT: Sunray Services - Tontitown Landfill JOB NO. 94-506

LABORATORY COMPACTION PROCEDURE: ASTM D-698 (Standard Proctor)

SAMPLE	ATTERBERG LIMITS			MOISTURE-DENSITY		SIEVE ANALYSIS							UNIFIED SOIL CLASSIFICATION
	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTICITY INDEX %	MAXIMUM DENSITY LBS./CU.FT.	OPTIMUM MOISTURE PERCENT	PERCENT PASSING							
						3 IN.	3/4 IN.	3/8 IN.	NO.4	NO.10	NO.40	NO.200	
1				89.0	23.2								
Sample 1 = Red Clay and Chert (Submitted 9-23-94) - Falling Head Permeability = 2.9×10^{-7} cm per sec													
2				81.1	33.0								
Sample 2 = Reddish Brown Clay with Occasional Chert (Submitted 9-23-94) - Falling Head Permeability = 4.2×10^{-7} cm per sec													
3				86.0	28.5								
Sample 3 = Red with Light Gray Clay with Chert (Submitted 9-23-94) Falling Head Permeability = 1.4×10^{-7} cm per sec													

SUMMARY OF LABORATORY CLASSIFICATION TESTS

PROJECT: Sunray Services - Tontitown Landfill JOB NO. 94-506

LABORATORY COMPACTION PROCEDURE: ASTM D-698 (Standard Proctor)

SAMPLE	ATTERBERG LIMITS			MOISTURE-DENSITY		SIEVE ANALYSIS PERCENT PASSING							UNIFIED SOIL CLASSIFICATION
	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTICITY INDEX %	MAXIMUM DENSITY LBS./CU.FT.	OPTIMUM MOISTURE PERCENT	3 IN.	3/4 IN.	3/8 IN.	NO.4	NO.10	NO.40	NO.200	
4				85.6	24.0	100	97	79	65	55	49	46	GC
Sample 4 = Tan Silty Clay and Chert-Screened Material For Cap-Submitted 9/28/94 - Falling-Head Permeability = 5.7×10^{-8} cm per sec (Proctor Point on Wet Side)													

Job No. 94-506 Project: SUNRAY SERVICES - TONTITOWN

Date: Submitted 9/28/94 Material Description: Tan SI. CLAY w/ chert

Type Effort: STANDARD

Method: ASTM D-698 (D) Sample No. 4

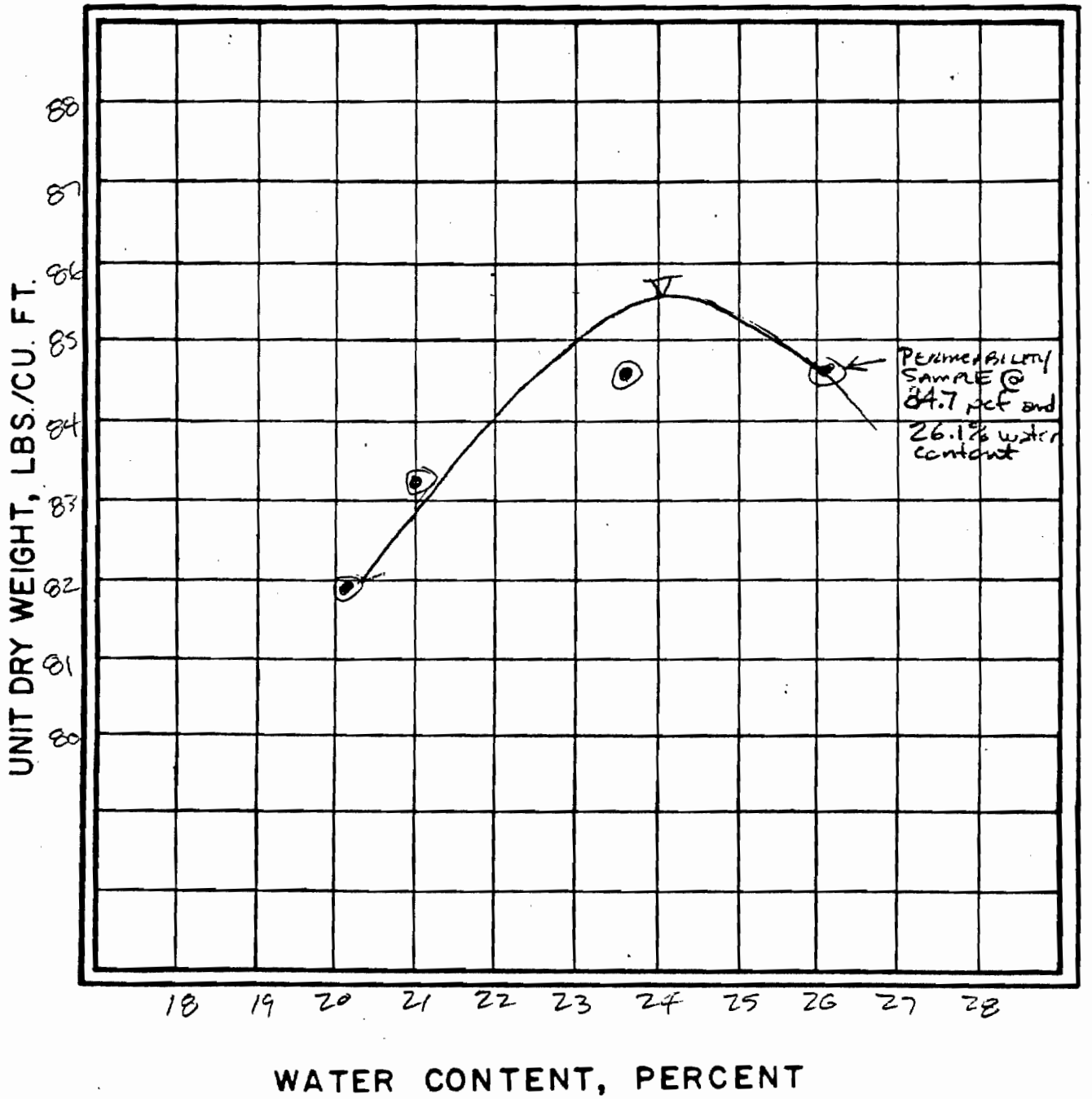
Max Unit Dry Wt. 85.6 pcf

Optimum Water Content: 24.0 %

Liquid Limit :

Tested By: RMC Plastic Limit:

Checked By: MWB Plasticity Index :



Grubbs, Garner & Hoskyn, Inc.
Consulting Engineers

PLATE 2

SUMMARY OF LABORATORY CLASSIFICATION TESTS

PROJECT: Sunray Services - Tontitown Landfill JOB NO. 94-506

LABORATORY COMPACTION PROCEDURE: ASTM D-698 (Standard Proctor)

SAMPLE	ATTERBERG LIMITS			MOISTURE-DENSITY		SIEVE ANALYSIS PERCENT PASSING							UNIFIED SOIL CLASSIFICATION
	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTICITY INDEX %	MAXIMUM DENSITY LBS./CU.FT.	OPTIMUM MOISTURE PERCENT	3 IN.	3/4 IN.	3/8 IN.	NO.4	NO.10	NO.40	NO.200	
5	54	28	26	88.8	26.6		100	81	65	58	51	38	GC
Sample 5 = Reddish Tan Silty Clay & Chert, Screened for cap - Submitted 1/4/95 Falling Head Permeability = 3.2×10^{-7} cm per sec (Proctor Point on Wet Side)													

GRUBBS, GARNER & HOSKYN, INC.
CONSULTING ENGINEERS

PLATE 1

Job No. 94-506

Project: Tenttown Landfill

Date: Submitted 1/4/95

Material Description: Reddish tan silty clay and CHERT (screened material)

Type Effort: ASTM D-698

Method: Standard

Sample No. 5

Max Unit Dry Wt. 88.8 pcf

Optimum Water Content: 26.6 %

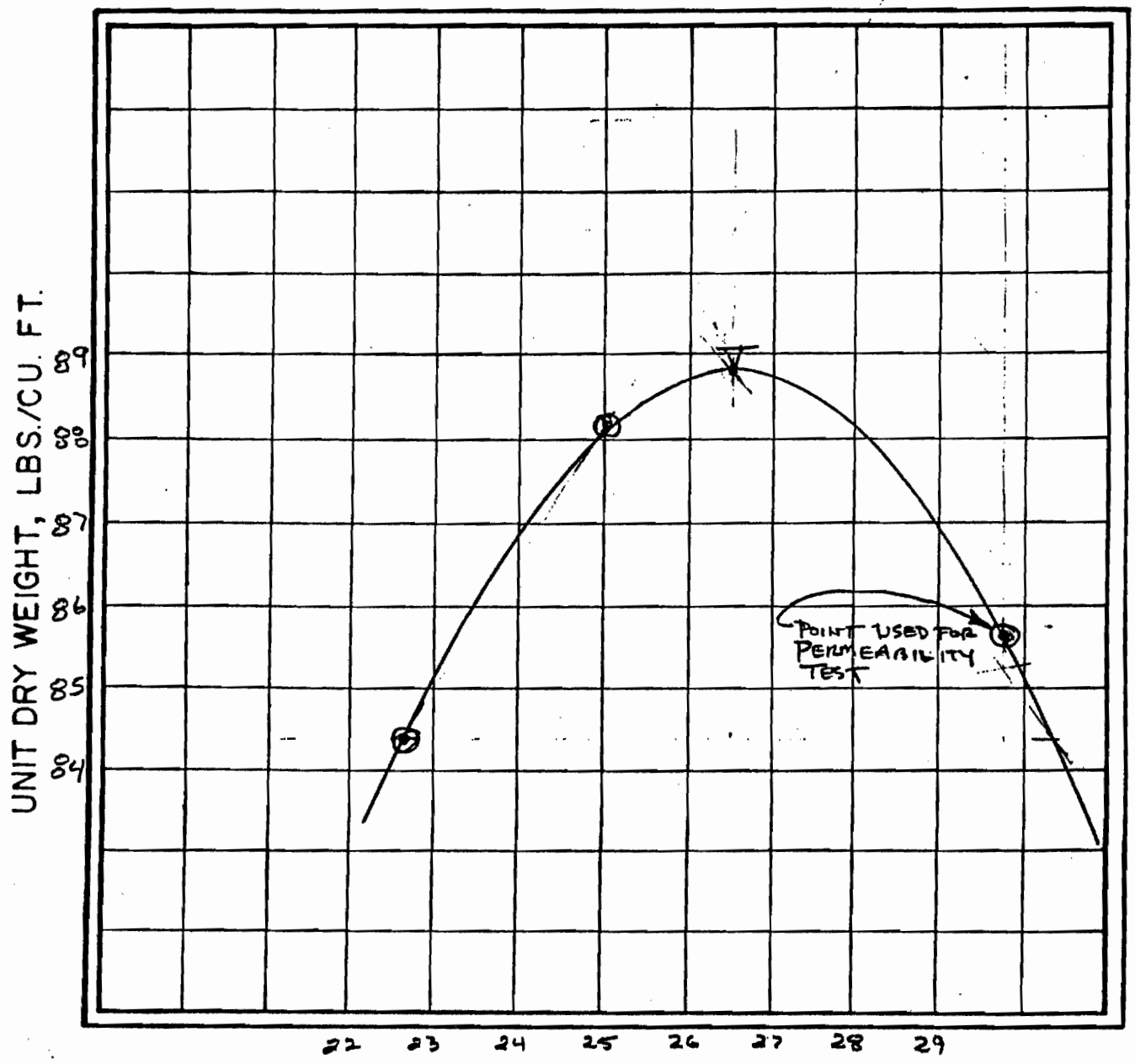
Liquid Limit: 54

Plastic Limit: 28

Plasticity Index: 26

Tested By: BH

Checked By: MWB



Grubbs, Garner & Hoskyn, Inc.
Consulting Engineers

PLATE 2

SUMMARY OF LABORATORY CLASSIFICATION TESTS

PROJECT: Sunray Services - Tontitown Landfill - Tontitown, Arkansas JOB NO. 94-506

LABORATORY COMPACTION PROCEDURE: ASTM D-698

SAMPLE	ATTERBERG LIMITS			MOISTURE-DENSITY		SIEVE ANALYSIS							UNIFIED SOIL CLASSIFICATION
						PERCENT PASSING							
	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTICITY INDEX %	MAXIMUM DENSITY LBS./CU.FT.	OPTIMUM MOISTURE PERCENT	3 IN.	3/4 IN.	3/8 IN.	NO.4	NO.10	NO.40	NO.200	
6	44	23	21				100	94	86	76	63	37	SC
Sample 6 = Reddish Tan Silty Clay and Chert, Screened for Cap - Submitted 4-19-95 (Falling Head Permeability = 1.8×10^{-7})													

GRUBBS, GARNER & HOSKYN, INC.
CONSULTING ENGINEERS

PLATE 1

Job No. 94-506

Project: SUNRAY — Tanytown Landfill

Date: Submitted 4-19-95

Material Description: Reddish tan silty clay & chert

Type Effort: Standard

Method: ASTM D-698 (C)

Sample No. 6

Max Unit Dry Wt. 88.6 pcf

Optimum Water Content: 27.3 %

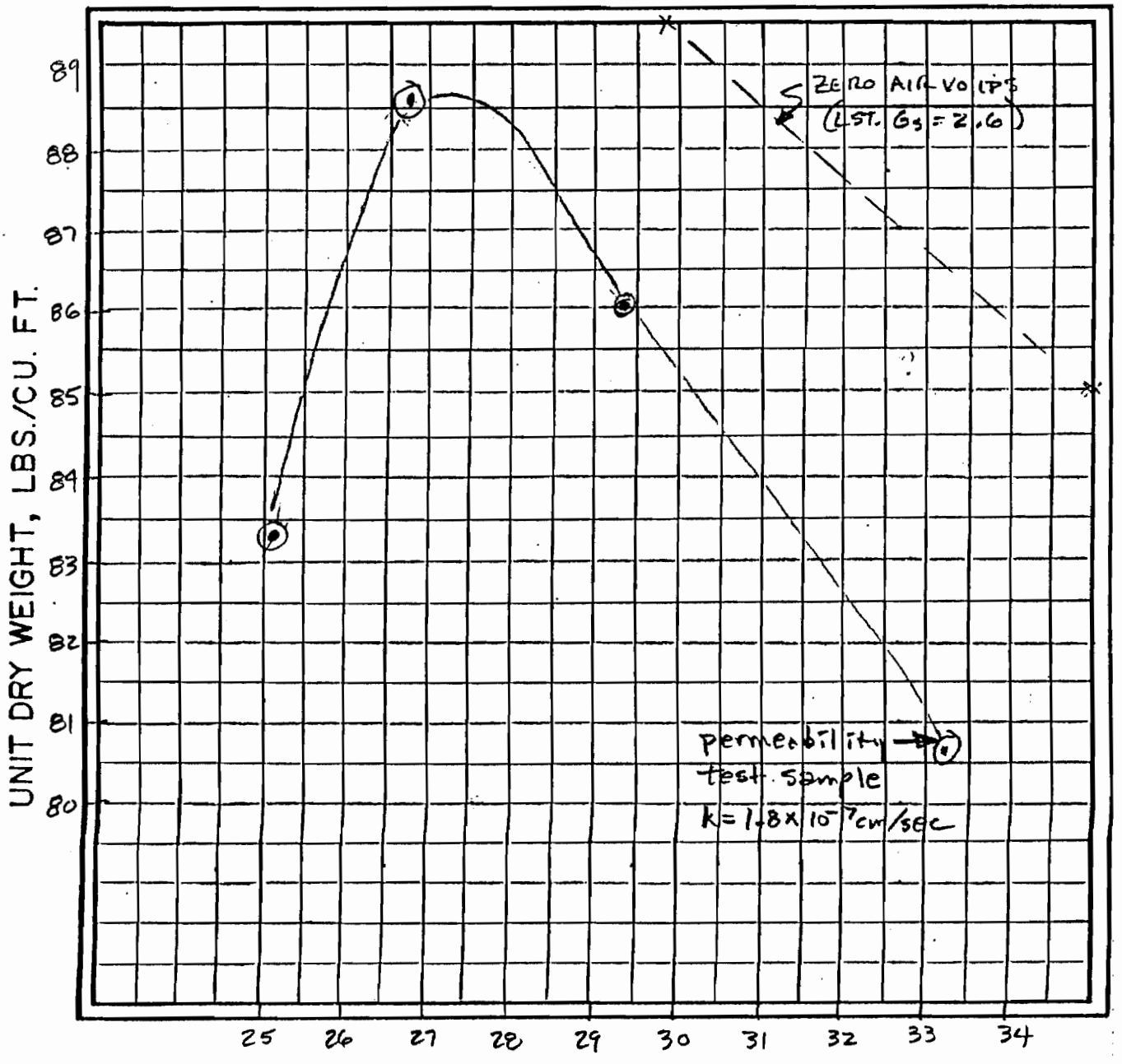
Liquid Limit: 44

Plastic Limit: 23

Plasticity Index: 21

Tested By: CJ

Checked By: MWB



SUMMARY OF LABORATORY CLASSIFICATION TESTS

PROJECT: Sunray Services - Tontitown Landfill - Tontitown, Arkansas JOB NO. 94-506

LABORATORY COMPACTION PROCEDURE: ASTM D-698

SAMPLE	ATTERBERG LIMITS			MOISTURE-DENSITY		SIEVE ANALYSIS PERCENT PASSING							UNIFIED SOIL CLASSIFICATION
	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTICITY INDEX %	MAXIMUM DENSITY LBS./CU.FT.	OPTIMUM MOISTURE PERCENT	3 IN.	3/4 IN.	3/8 IN.	NO.4	NO.10	NO.40	NO.200	
7	55	31	24	85.4	30.8		100	98	87	75	59	41	SC
Sample 7 = Reddish Tan Clay with Chert, Screened for Cap (Falling Head Permeability = 5.0×10^{-7} cm per sec, See Plate 2)													

Job No. 94-576

Date: 5-30-95

Type Effort: Standard

Method: ASTM D-698

Max Unit Dry Wt. 85.4 pcf

Optimum Water Content: 30.8 %

Tested By: CF

Checked By: RN

Liquid Limit: 55

Plastic Limit: 31

Plasticity Index: 24

Initial water content (As Submitted) = 29.1%

Project: SUNRAY LANDFILL

Material Description: Reddish tan clay with chert (Screened for CAP)

Sample No. 7

GRADATION	
SIEVE NO.	PERCENT PASSING
1-1/2"	
1"	
3/4"	
3/8"	
4	
10	
40	
200	41

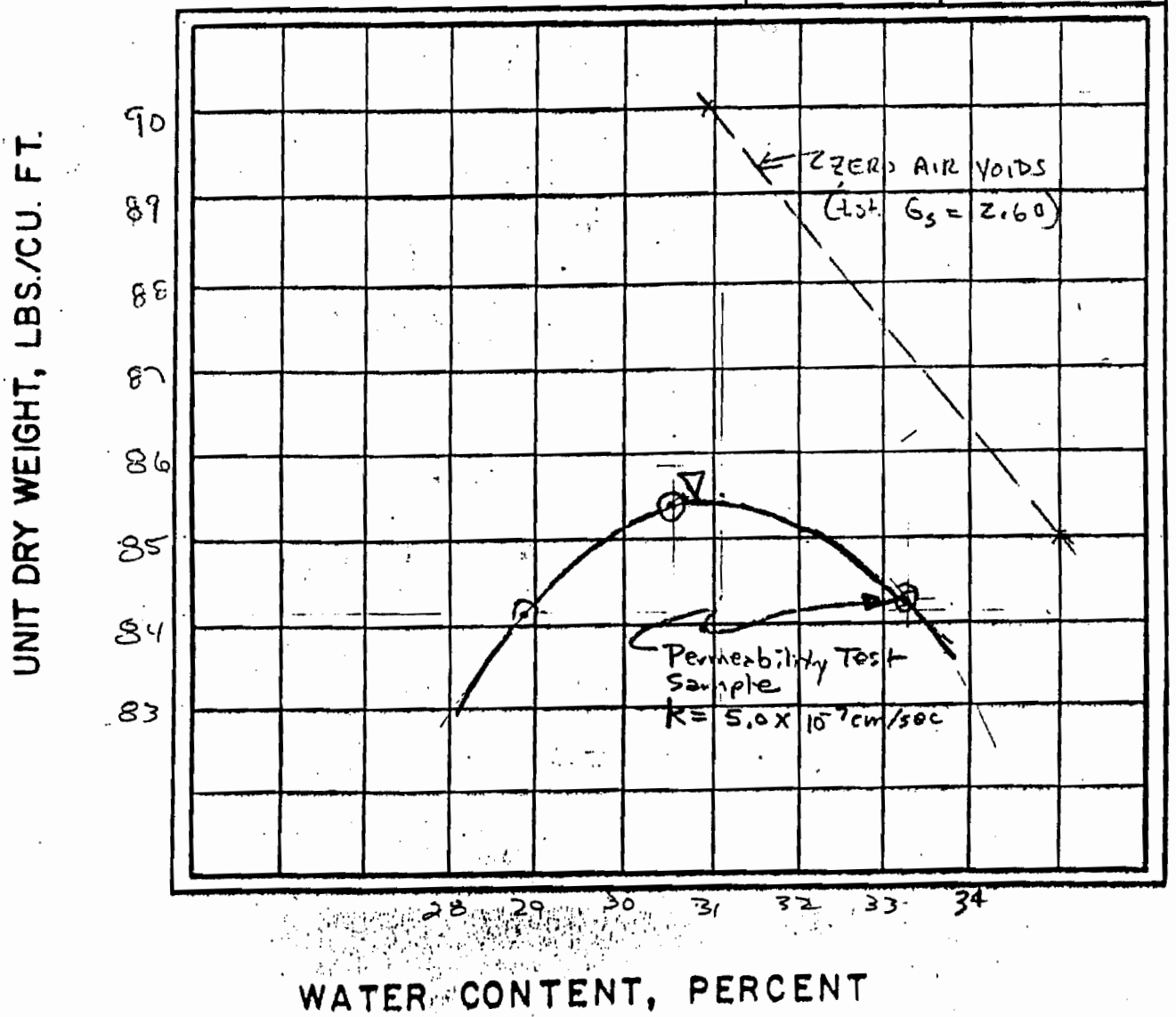


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PLATE 2

SUMMARY OF LABORATORY CLASSIFICATION TESTS

PROJECT: Sunray Services - Tontitown Landfill - Tontitown, Arkansas JOB NO. 94-506

LABORATORY COMPACTION PROCEDURE: ASTM D-698

SAMPLE	ATTERBERG LIMITS			MOISTURE-DENSITY		SIEVE ANALYSIS PERCENT PASSING							UNIFIED SOIL CLASSIFICATION
	LIQUID LIMIT %	PLASTIC LIMIT %	PLASTICITY INDEX %	MAXIMUM DENSITY LBS./CU.FT.	OPTIMUM MOISTURE PERCENT	3 IN.	3/4 IN.	3/8 IN.	NO.4	NO.10	NO.40	NO.200	
8	44	26	18	88.1	27.8							49.5	SC
Sample 8 = Reddish Tan Cherty Clay, Screened for Cap (Falling Head Permeability = 1.4×10^{-7} cm per sec See Plate 2)													

GRUBBS, GARNER & HOSKYN, INC.
CONSULTING ENGINEERS

Job No. 95-506

Date: Submitted 6-28-95

Type Effort: ASTM D-698

Method: STANDARD

Max Unit Dry Wt. 88.1 pcf

Optimum Water Content: 27.8 %

Tested By: CJ

Checked By: MWB

Liquid Limit: 44

Plastic Limit: 26

Plasticity Index: 18

Project: SUNRAY - TONITOWN LANDFILL

Material Description: (Screened Material) RED CHERTY CLAY

Sample No: B

GRADATION	
SIEVE NO.	PERCENT PASSING
1-1/2"	
1"	
3/4"	
3/8"	
4	
10	
40	
200	49.5

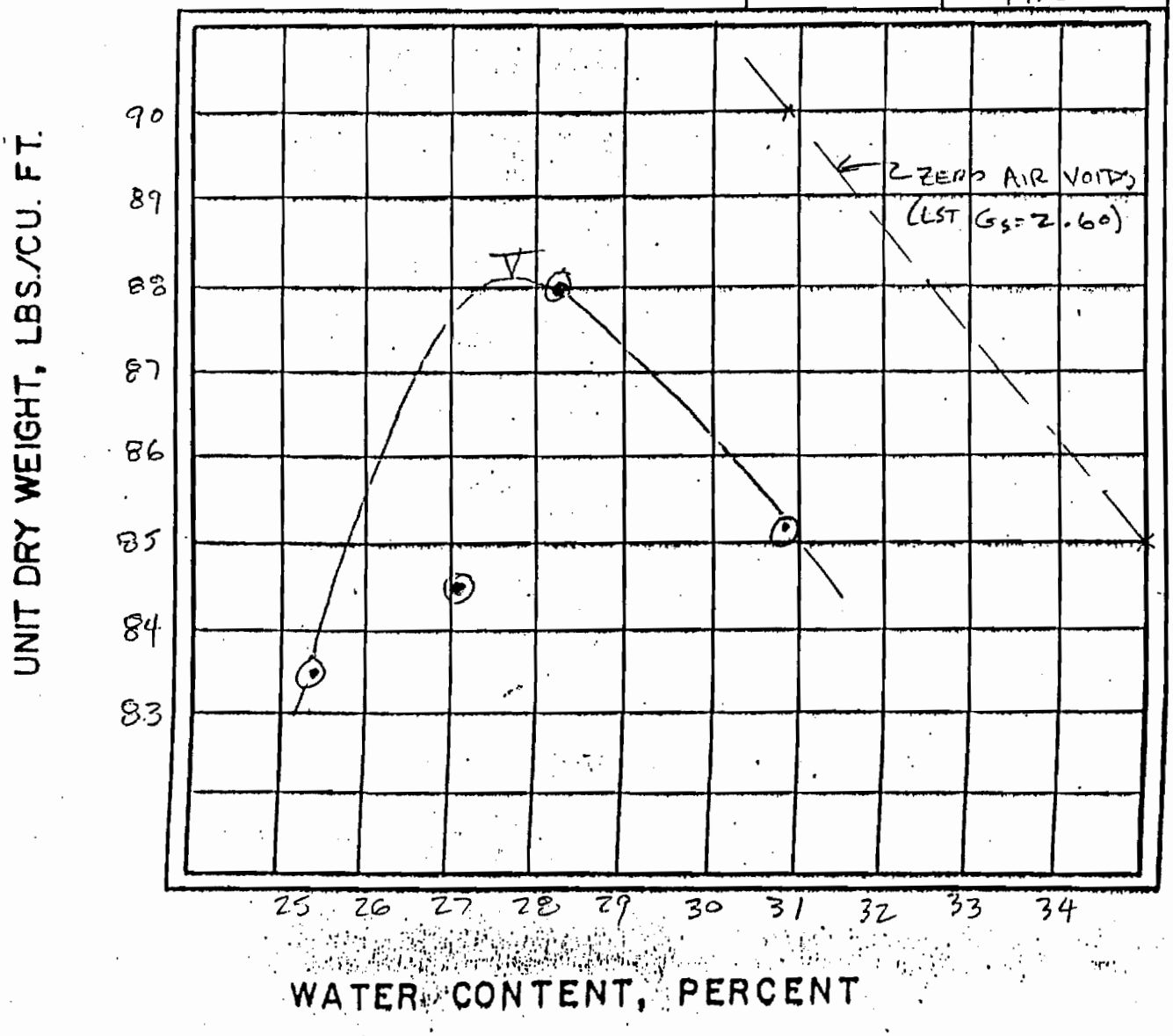

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PLATE 2