TRAIL RIDGE Permit Renewal ~~Sept 02 Oct 03~~ July 19, 2003 (DOC 5) + other DOCS
August 8, 2003 (DOC 6)

MISC INFORMATION

England-Thims & Miller, Inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS

July 11, 2003

RECEIVED
JUL 10 2003
STATE OF FLORIDA
DEPT. OF ENV. PROTECTION
NORTHEAST DISTRICT-JAX

Ms. Mary C. Nogas, P.E.
Waste Management Section
Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256

RE: Trail Ridge Landfill – Second Permit Renewal
FDEP Permit Numbers 0013493-001 and 0013493-002
FDEP File Numbers 13493-010 and 13493-011
Fourth Request for Additional Information
ETM No. 02-025-3

Dear Ms. Nogas:

We have received your letter dated June 9, 2003 regarding the referenced project. On behalf of Trail Ridge Landfill, Inc., please find the following response to your request for additional information. Please note that only the items for which the Department requested a response are included.

Attachment No. 1 – Memorandum Prepared by Julia Boesch Dated June 9, 2003

19. ***The 1992 approach for ensuring that the geonet is not flooded was updated in 1997. Please readdress this issue with the updated approach and provide all supporting calculations. Please note that an action trigger rate five times the determined rate appears excessive.***

    Please see the attached calculations, which have been revised to include the 1997 approach, as requested. Further, the action trigger rate has been revised to four times the determine rate. It is our understanding that the action trigger rate will only be used as a threshold for the facility to evaluate the cause of the elevated level. As you are well aware, levels above the action threshold rate may in most cases be attributable to equipment malfunction and other site-specific conditions.

I sincerely hope this response will provide the Department all the necessary information. Please feel free to give me a call if you have any questions or require any additional information.

Sincerely,

ENGLAND, THIMS & MILLER, INC.

Juanitta Bader Clem, P.E.
Vice President

Attachment

cc: Greg Mathes
Achaya Kelpenda
Chris Pearson

14775 ST. AUGUSTINE RD. • JACKSONVILLE, FL 32258 • TEL: (904) 642-8990 • FAX: (904) 646-9485

Trail Ridge Landfill
Primary Liner Leakage

Although geomembranes have very low permeability, they still allow some leakage. Leakage through geomembranes can occur due to pinholes and larger holes (holes larger than the geomembrane thickness). The leakage due to pinholes is negligible compared to the larger holes and is therefore ignored. The leakage due to large holes can be calculated by Bernoulli's equation for flow through an aperture, as follows:

$$Q = 0.6\ a\ \sqrt{2gh}$$

Where:
- Q = Leakage rate through one geomembrane hole
- a = Area of geomembrane hole
- g = Acceleration of gravity = 9.81 m/s^2
- h = Head of liquid on top of geomembrane

Say:

a = 1 cm^2 (per acre) = 1 x 10^{-4} m^2

h = 5.6 mil* = 0.0056 in = 1.42 x 10^{-4} m

* The maximum head on the liner as determined in the First Permit Renewal, Appendix E, October 28, 1996.

Therefore:

$$Q = (0.6)\ (1 \times 10^{-4}\ m^2)\sqrt{2\ (9.81\ m/s^2)\ (1.42 \times 10^{-4}\ m)}$$

$$Q = 3.17 \times 10^{-6}\ m^3/sec\ \text{(per acre)}$$

$$Q = 72.51\ \frac{\text{gallons}}{\text{day}}\ \text{(per acre)}$$

Check to make sure the geonet can handle the leakage.

$$t_{LCL} = (Q / k)^{1/2} \qquad \text{(J.P. Giroud, 1997)}$$

Where:
- k = θ/t
- t_{LCL} = Minimum Thickness of Secondary Geonet
- Q = Maximum Flow Rate for Secondary Geonet
- k = Hydraulic Conductivity of Secondary Geonet
- θ = Hydraulic Transmissivity of the Secondary Geonet (m^2/sec)
- t = Thickness of Secondary Geonet

Say:

θ	=	2.26×10^{-3} m^2/sec
t	=	200 mil = 0.2 inches = 7.9×10^{-4} m
Q	=	3.17×10^{-6} m^3/sec

Therefore:

k	=	$(2.26 \times 10^{-3}$ m^2/sec) / $(7.9 \times 10^{-4}$ m) = 2.86 m/sec
t_{LCL}	=	$(3.17 \times 10^{-6}$ m^3/sec / 2.86 m/sec)$^{1/2}$ = 1.05×10^{-3} m
	=	41.4 mil

Since the geonet has a thickness of 200 mil, the geonet can handle the flow.

The smallest cell is 17.7 acres, so the flow per cell is:

$$Q_{Total} = 72.51 \frac{\text{gallons}}{\text{day} * \text{ac}} * 17.7 \text{ ac}$$

$$\Rightarrow 1{,}283.4 \frac{\text{gallons}}{\text{day}} \text{ per cell}$$

Assume the flow is at a failure rate at 4 times this rate.

$$Q_{Max} = 5{,}134 \frac{\text{gallons}}{\text{day}} \text{ per cell}$$

Aquilla Bodeau 7/11/03

England-Thims & Miller, Inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS

Principals
James E. England, P.E., CEO
Douglas C. Miller, P.E., President
N. Hugh Mathews, P.E., Exec., V.P.
Joseph A. Tarver, Exec., V.P.
Juanitta Bader Clem, P.E., V.P.
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Samuel R. Crissinger, CPA, V.P
Robert A. Mizell, Jr., P.E., V.P.
Bryan R. Stewart, V.P.

August 7, 2003

Ms. Julia Boesch
Waste Management Section
Department of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256

RE: Trail Ridge Landfill – Second Permit Renewal
FDEP Permit Numbers 0013493-001 and 0013493-002
FDEP File Numbers 13493-010 and 13493-011
ETM No. 02-025-3

Dear Ms. Boesch:

Please find herewith the revised Primary Liner Leakage calculations for the referenced project. I apologize for the conversion error in the previous calculations.

Please feel free to give me a call if you have any questions or require any additional information.

Sincerely,

ENGLAND, THIMS & MILLER, INC.

Juanitta Bader Clem, P.E.
Vice President

Attachment

cc: Greg Mathes
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Trail Ridge Landfill
Primary Liner Leakage

Although geomembranes have very low permeability, they still allow some leakage. Leakage through geomembranes can occur due to pinholes and larger holes (holes larger than the geomembrane thickness). The leakage due to pinholes is negligible compared to the larger holes and is therefore ignored. The leakage due to large holes can be calculated by Bernoulli's equation for flow through an aperture, as follows:

$$Q = 0.6\ a\ \sqrt{2gh}$$

Where:
- Q = Leakage rate through one geomembrane hole
- a = Area of geomembrane hole
- g = Acceleration of gravity = 9.81 m/s^2
- h = Head of liquid on top of geomembrane

Say:

a = 1 cm^2 (per acre) = 1 x 10^{-4} m^2

h = 5.6 mil* = 0.0056 in = 1.42 x 10^{-4} m

* The maximum head on the liner as determined in the First Permit Renewal, Appendix E, October 28, 1996.

Therefore:

$$Q = (0.6)\ (1 \times 10^{-4}\ m^2) \sqrt{\ 2\ (9.81\ m/s^2)\ (1.42 \times 10^{-4}\ m)}$$

$$Q = 3.17 \times 10^{-6}\ m^3/sec\ \text{(per acre)}$$

$$Q = 72.51\ \frac{\text{gallons}}{\text{day}}\ \text{(per acre)}$$

Assume a trigger rate at 3.5 times this rate.

$$Q_{Max} = 253.8\ \frac{\text{gallons}}{\text{day}}\ \text{(per acre)} = 1.11 \times 10^{-5}\ m^3/sec\ \text{(per acre)}$$

Check to make sure the geonet can handle the trigger rate leakage.

$t_{LCL} = (Q / k)^{1/2}$ (J.P. Giroud, 1997)

Where:

k	=	θ/t
t_{LCL}	=	Minimum Thickness of Secondary Geonet
Q	=	Maximum Flow Rate for Secondary Geonet
k	=	Hydraulic Conductivity of Secondary Geonet
θ	=	Hydraulic Transmissivity of the Secondary Geonet (m^2/sec)
t	=	Thickness of Secondary Geonet

Say:

θ	=	2.26×10^{-3} m^2/sec
t	=	200 mil = 0.2 inches = 5.1×10^{-3} m
Q	=	1.11×10^{-5} m^3/sec

Therefore:

$k = (2.26 \times 10^{-3} \text{ m}^2/\text{sec}) / (5.1 \times 10^{-3} \text{ m}) = 0.44$ m/sec

$t_{LCL} = (1.11 \times 10^{-5} \text{ m}^3/\text{sec} / 0.44 \text{ m/sec})^{1/2} = 5.02 \times 10^{-3}$ m

$= 197.7$ mil

Since the geonet has a minimum thickness of 200 mil, the geonet can handle the flow.

The smallest cell is 17.7 acres, so the flow per cell is:

$$Q_{Total} = 253.8 \frac{\text{gallons}}{\text{day} * \text{ac}} * 17.7 \text{ ac}$$

$$\Rightarrow 4{,}492.3 \frac{\text{gallons}}{\text{day}} \text{ per cell}$$

Jacqueline Bader Cann
8/7/03

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT

TO: Julia Boesch
Mary Nogas, P.E.
Solid Waste Section

THROUGH: Brian Cheary, Ph.D.
Manager - Waste Cleanup Section

FROM: Richard S. Rachal, P. G.
Professional Geologist - Waste Cleanup Section

Date: October 11, 2002

Subject: Trail Ridge Landfill
Jacksonville, Duval County
Review of groundwater monitoring portion of the permit application

I have completed the review of the groundwater-monitoring portion of the solid waste permit renewal application for the Trail Ridge Landfill in west Jacksonville, Duval County (received September 26, 2002). The information provided, in conjunction with historical information, is sufficient to develop specific conditions for the groundwater-monitoring portion of the permit.

I concur with the replacement of monitor well MW-11 by MW-11(R) and beginning well redevelopment with monitor wells MW-13I, MW-32I and MW-34. Other wells with elevated turbidities may be required in the future.

c.c. file

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT

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I concur with the replacement of monitor well MW-11 by MW-11(R) and beginning well redevelopment with monitor wells MW-13I, MW-32I and MW-34. Other wells with elevated turbidities may be required in the future.

c.c. file

Memorandum

Florida Department of Environmental Protection

From:
Michael Eaton, Environmental Manager
Submerged Lands and
Environmental Resources Program
Northeast District

September 23, 2003

To: Mary Nogas
Solid Waste

RE: Trail Ridge Wetlands Monitoring Requirements

Based on a review of the submitted information and past monitoring reports SLERP has no objections to the removal of Specific Conditions 50, 51and 52. The adjacent wetlands appear to be stable and no further monitoring is necessary. However, the requirements for the irrigation system should remain in affect. This determination has not been field verified.

Incerpt from Document I Appendix E

TRAIL RIDGE LANDFILL

SUMMARY REPORT OF WETLANDS MONIT(ADJACENT TO A CLASS I STORMWATER P

I. INTRODUCTION

The Florida Department of Environmental Protection (DEP) has required that the wetlands adjacent to the Class I stormwater pond at Trail Ridge Landfill be monitored in order to determine if there are any detrimental changes to the wetland vegetation or hydrology due to construction and operation of the pond. The Trail Ridge Landfill is primarily located west of Highway 301 in Township 3 S, Range 23 E, Sections 18 and 19 of Duval County, FL (Figure 1). The monitoring work is required pursuant to conditions 50-52 in permit number 0013493-002-SC; I.D. number GMS3116P02787 (renewal of permit number SC 16-184444; I.D. number GMS3116P03090). A copy of these permit conditions is included as Attachment A.

On 3 January 1992 a baseline study was completed to establish the site conditions prior to pond construction (data collected during December, 1991). Construction of the stormwater pond occurred between January and October 1992. The following report provides a comparison of the wetland vegetation monitoring from the most recent monitoring event, conducted on December 20, 1999, to the baseline study. This report also addressed hydrology monitoring from the baseline study through 1999. Vegetation monitoring was also conducted in 1992 and 1994; however, data from these years are not included in this report because, based on preliminary evaluation, annual variation caused by variable climatic conditions tended to obscure long-term trends. This report includes a description of the stormwater pond, wetland irrigation system, the adjacent wetlands, and the monitoring transects with vegetative sampling plots and piezometers.

II. STORMWATER POND AND WETLAND IRRIGATION SYSTEM

The Class I stormwater pond was constructed east of the Class I landfill within the Trail Ridge Landfill Property(Figure 2). Construction of the pond commenced in January 1992 and was completed in September/October 1992. An irrigation system for wetlands adjacent to the pond berm was installed to mitigate any potential effects to the natural hydroperiod of the adjacent wetland as a result of hydrologic draw down caused by the stormwater pond. The irrigation system extends along the southern and eastern most edges of the pond berm and along a portion of the northern edge of the pond berm (Figure 3).

Figure 4 represents a typical cross-sectional view through the edge of the pond. The pond bottom was excavated to elevation +80.0 feet. There is a 62 foot-wide berm surrounding portions of the pond. The top of the berm was constructed at

elevation +112.0 feet. The normal water level is designed to be at elevation +104.0 feet. Following certain storm events the main pond discharges to the south into a smaller dispersion pond. For a detailed description of the design and operation of the Class I stormwater pond, please refer to the engineering plans for the landfill.

There is an 8-inch diameter PVC force main pipe extending along the outer edge of the basin of the main pond (Figure 4). Sections of 2-inch diameter PVC pipe extend at right angles from the force main at intervals, as indicated on the plan. A valve was installed near the connection of the 8-inch and 2-inch PVC pipes to control the flow of water. At the opposite end, the 2-inch PVC pipes connect with 20-foot lengths of perforated 2-inch diameter PVC pipe (spreader pipes). Water discharges from the spreader pipes through 3/8-inch diameter holes. There are two holes per ring with each ring spaced three inches on center. The spreader pipes were installed approximately five (5) feet landward of the wetland jurisdiction line. No portion of the wetland irrigation system extends directly into the wetlands. The flow of water from the spreader pipes has been adjusted to prevent erosion downstream. Based on the results of the interim monitoring reports, the rate of discharge was modified further in order to provide irrigation where it is most needed.

III. ADJACENT WETLANDS

A. Drainage Pattern

Wetlands border the stormwater pond to the south (wetland A), east (wetland B), and north (wetland C), and the wetlands drain off-site to the east (Figure 2). Some of the water eventually flows to the north into Deep Creek, a tributary of St. Mary's River. Some of the water eventually flows to the south into Long Branch, a tributary of the North Fork of Black Creek.

The primary source of water for the wetlands on-site is ground water seepage. A portion of the rain that falls on the uplands along Trail Ridge enters the surficial water table and begins to flow down slope. The wetlands occur where the ground surface intercepts the seasonal high water table. Over time some of the wetlands have eroded uphill into Trail Ridge and formed relatively broad, linear drainageways, oriented east/west and perpendicular to the centerline of the ridge. Part way downslope the wetland drainages broaden and connect with each other, forming a large wetland complex (Hell's Bay).

The wetlands located to the south and east of the Class I stormwater pond (wetlands A and B) are an example of this type of drainage pattern. The upstream drainage basin for this wetland is relatively large (700± acres).

Considering the size of the Class I stormwater pond, any potential draw down effect should be relatively minor to those wetlands.

Other wetlands occur as essentially isolated pockets on the side of the slope. These wetlands may have formed where less permeable layers are located close to the surface. Such layers may consist of silt, loam, clay or a cemented spodic horizon (hardpan). These layers can create a perched water table during the rainy season, but otherwise the water table may occur far below the surface during drier seasons. Other isolated wetlands may occur in shallow depressional areas that naturally formed on the side of the slope. The wetland located north of the stormwater pond (wetland C) may have formed as a result of a combination of slightly lower topography and an underlying, impermeable layer.

B. Elevations and Hydrology

The topography in the project area slopes down from west to east from elevation +120 feet to +100 feet (Figure 5). The deepest portions of the wetlands are approximately 2 to 3 feet lower than the adjacent uplands. The wetlands are roughly concave in cross section except where wetland A connects with wetland B. At this point the wetland floor slopes gradually down from south to north from elevation +112 feet to +108 feet. Wetland B slopes down from south to north from elevation +108 feet to +100 feet.

Through the deeper, central portions of wetlands A and B, there are a number of small drainage channels. These flow ways are generally 5 to 10 feet across and 1 to 2 feet deep and contains some water at almost all times. The surrounding hardwood swamp appears to be saturated at or near the surface for prolonged periods of time and is periodically inundated when the flow ways overflow during the rainy season. Upslope from the hardwood swamp are broad, fringing areas of seepage slope wetlands. These areas appear to be periodically saturated at or near the surface during the rainy season. During much of the year the water table is within 1 to 2 feet of the surface. However, during prolonged droughts the water table recedes to a greater depth. The seepage slopes do not appear to be inundated from the flow ways during most storm events.

The western two thirds of wetland C has a seasonal high water table but is rarely, if ever, inundated. There are small pockets (<0.1 acre) scattered throughout this portion of the wetland that periodically contain shallow puddled water. During much of the year, the water table is more than 12 to 18 inches below the surface. Following prolonged droughts, the water table is 3 or more feet below the surface.

The eastern one third of wetland C (3.0± acres) consists of a deeper pocket of swamp and shrubby/grassy wetlands. Based on stain lines on the trees and past visual observations, this swamp periodically contains 12 to 18 inches of standing water. The water drains east through a narrow, incised channel into wetland B. During much of the year, this portion of wetland C is saturated at or near the surface. However, during drought conditions, the water table may recede at least 2 feet below the surface.

C. Soils

The Soil Survey of City of Jacksonville, Duval County, Florida (U.S. Department of Agriculture, Soil Conservation Service 1978) indicates three soil types in the study area (Figure 6).

(1) Wesconnett fine sand

The main wetland drainage system to the south and east of the pond is mapped as containing Wesconnett fine sand. This soil is nearly level, very poorly drained and was formed in thick deposits of marine sands. It occurs in shallow depressions and large drainageways. Slopes are smooth to concave and range from 0 to 2 percent. Under natural conditions, the water table is at a depth of 0 to 10 inches, or the soil is covered by water for 6 to 12 months during most years.

There is a weakly cemented spodic or hardpan layer typically between 2 and 32 inches below the surface and a second layer usually from 44 inches to at least 80 inches below the surface. Permeability is moderate to moderately rapid (0.6 to 6.0 inches/hour) in the spodic horizons and rapid (6.0 to 20.0 inches/hour) in all other layers. Included with this soil in mapping may be small areas of other soil types such as Maurepas muck and Pamlico muck.

(2) Ridgeland fine sand

Most of the wetland north of the stormwater pond is mapped as containing Ridgeland fine sand. This is a nearly level, poorly drained, acid soil that formed in marine sands. It occurs in broad flatwood areas. Slopes are smooth to convex and range from 0 to 2 percent. Under natural conditions, the water table is at a depth of less than 10 inches for brief periods of 2 to 4 weeks, at a depth of 10 to 20 inches for 2 to 4 months, and at a depth of 20 to 40 inches for most of the remainder of the year. A few small areas of this soil are covered with water for periods of 1 to 2 weeks.

There are two weakly cemented spodic horizons, one between 6 and 16 inches of the surface and the second from 31 to at least 80 inches from the surface. The permeability is moderate to moderately rapid (0.6 to 6.0 inches/hour) in the spodic horizons and rapid (6.0 to 20 inches/hour) in all other layers.

(3) Lynn Haven fine sand

A small portion of wetland C and the upland area where the pond was constructed are mapped as containing Lynn Haven fine sand. This is a nearly level, poorly drained soil that was formed in thick beds of marine sand. It occurs in broad flatwood areas. Slopes are smooth to convex and range from 0 to 2 percent. Under natural conditions, the water table is at a depth of less than 10 inches for 2 to 4 months and at a depth of 10 to 30 inches for 2 to 8 months during most years.

There is a weakly cemented spodic horizon from 21 to at least 80 inches below the surface. Permeability is moderate to moderately rapid (0.6 to 6.0 inches/hour) in the spodic horizon and permeability is rapid (6.0 to 20.0 inches/hour) in the surface horizon.

D. Vegetation

There are five distinct types of wetlands in the study area (Figure 7). Most of the wetlands have been significantly impacted in the past due to the silvicultural practices of the former landowner (Gilman Paper Company).

(1) Mature hardwood swamp

The central portion of wetland A consists of relatively mature hardwood swamp. The canopy is dominated primarily by tupelo (*Nyssa sylvatica var. biflora*) with lesser amounts of sweet bay (*Magnolia virginiana*), swamp bay (*Persea palustris*), red maple (*Acer rubrum*), pond pine (*Pinus serotina*), and slash pine (*Pinus elliottii*). The shrub layer consists of dense patches of sweet gallberry (*Ilex coriacea*) mixed with lesser amounts of fetterbush (*Lyonia lucida*), bitter gallberry (*Ilex glabra*), dog hobble (*Leucothoe axillaris*), opossum haw (*Viburnum nudum*), Virginia willow (*Itea virginica*) and wax myrtle (*Myrica cerifera* and *M. heterophylla*). Ground cover species included dog hobble, fetterbush, cinnamon fern (*Osmunda cinnamomea*), sphagnum moss (*Sphagnum* sp.) and netted chain fern (*Woodwardia areolata*).

(2) Cut-over hardwood swamp

Most of wetland B and portions of wetlands A and C consist of hardwood swamp that was cut in the past by Gilman Paper Company. The trees appear to be approximately 30 years old. The canopy is dominated by a mixture of tupelo and sweet bay with lesser amounts of swamp bay and loblolly bay (*Gordonia lasianthus*). The shrub layer consists of tupelo and bays mixed with wax myrtle, dahoon holly (*Ilex cassine*), fetterbush, and sweet gallberry. Ground cover species include those listed above as well as large mats of sphagnum moss and patches of sedges (*Carex* sp. and *Cyperus* sp.) and grasses (*Andropogon* sp., *Erianthus* sp., *Panicum* sp. and *Aristida* sp.). The swamp within wetland C has a canopy consisting of tupelo and cypress (*Taxodium distichum* and *Taxodium ascendens*).

In general the cut-over swamps have no pines but have more sweet bay and less tupelo in the canopy and shrub layer, more wax myrtle and dahoon holly in the shrub layer, and more sphagnum moss and grasses and sedges in the ground cover as compared with the mature swamp. Over time as the trees mature, the tupelo may gradually increase in dominance. As the canopy closes, the shrub layer and ground cover will thin out and look more like that in the mature swamp.

(3) Pond pine seepage slope

Bordering wetland A on the north and south are broad fringing areas of pond pine seepage slope. The canopy is dominated by pond pine with lesser amounts of slash pine, loblolly pine (*Pinus taeda*), long leaf pine (*Pinus palustris*), swamp bay, sweet bay, and tupelo. The subcanopy consists primarily of swamp bay, sweet bay and tupelo. The shrub layer is relatively dense and consists of a mixture of sweet gallberry and bitter gallberry mixed with scattered wax myrtle, high bush blueberry (*Vaccinium corymbosum*), and Virginia willow. The ground cover consists of the same species listed above as well as scattered cinnamon fern.

(4) Pine/gallberry wetlands

This wetland type occurs as a narrow band around almost all of the wetlands. The band widens into a relatively broad fringe south of wetlands A and B and also comprises most of wetland C. The vegetation in wetland C consists of rows of planted slash pine with a dense shrub layer of bitter gallberry. Sweet bay, swamp bay, loblolly bay and tupelo saplings are widely scattered among the

pines. Other shrubs include scattered high bush blueberry, sweet gallberry and choke berry (*Aronia arbutifolia*). Bamboo briar (*Smilax lauifolia*) and cat briar (*Smilax glauca*) are common vines. Widely scattered under the gallberry are bog button (*Eriocaulon* sp.), club moss (*Lycopodium* sp.), hooded pitcher plant (*Sarracenia minor*), meadow beauty (*Rhexia* sp.), sphagnum moss, red root (*Lachnanthes caroliniana*), blue maidencane (*Amphicarpum muhlenbergianum*), wire grass (*Aristida* sp.), yellow-eyed grass (*Xyris* sp.), cinnamon fern, netted chain fern, and St. Johns wort (*Hypericum fasciculatum*). This area has a seasonal high water table at or near the surface during parts of the rainy season as evidenced by the presence of crayfish borrows.

The area south of wetlands A and B consists of pine plantation with widely scattered clusters of bitter gallberry and an open ground cover of wire grass mixed with bog buttons and other herbaceous species listed above. This area has been bedded and planted with rows of slash pine.

Within the pine/gallberry portion of wetland C, there are a number of small (<0.1 acre) open patches vegetated with a mixture of listed and nonlisted species such as red root, St. Johns wort, and blue maidencane. Some of these pockets have enough listed species to be considered jurisdictional wetlands pursuant to Section 40C-4 F.A.C., Management and Storage of Surface Waters (MSSW) permit. All of wetland C is mapped as being jurisdictional in the landfill's MSSW permit. However, most of the pine/gallberry portion of the wetland is dominated by nonlisted vegetation and, therefore, does not truly function as a "water of the State."

Historically the areas of pine/gallberry wetlands may have consisted of open savannahs of wiregrass pine flatwoods. The vegetation was kept open by regular summer wildfires. After the property was converted into pine plantation, the fire regime was altered and summer wildfires were controlled or completely suppressed. As a result of the fire suppression, bitter gallberry may have gradually become the dominant shrub and ground cover plant in most areas. The ground cover vegetation has also been degraded somewhat due to intensive silvicultural practices such as bedding.

During the life span of the landfill, there should continue to be some changes in the vegetation in the pine/gallberry wetlands. The pines will continue to grow to maturity. Hardwoods, such as bays and tupelo, may gradually increase in numbers. Bitter gallberry and vines will continue to dominate and become taller and denser

in the shrub and ground cover layers.

(5) Pine/St. John's wort wetlands

Portions of wetlands A, B and C consist of pine/St. John's wort wetlands. This wetland type appears to be a transitional zone between the pine/gallberry wetland and the hardwood swamp. The canopy and subcanopy consist of planted rows of slash pine with scattered swamp bay, sweet bay and tupelo. Due to the wetter condition of this area, the pines are more widely scattered and are smaller and stunted as compared with the pines in the pine/gallberry wetlands. The shrub layer consists primarily of St. John's wort (*Hypericum fasciculatum*) mixed with lesser amounts of bitter gallberry, sweet gallberry, wax myrtle, and titi (*Cyrilla racemiflora*). Ground cover vegetation consists of such species as sphagnum moss, grasses (*Dicanthelium* spp., *Aristida* sp., and *Erianthus* sp.), bog buttons, sedges (*Carex* sp. and *Cyperus* sp.), red root, and Asiatic coinwort (*Centella asiatica*).

Over time some succession may occur in this wetland type. Trees and shrubs may become more dominant and eventually shade out much of the ground cover species. The area may succeed into a transitional edge of bays, fetterbush and sweet gallberry.

IV. METHODS

A. Establishment of Monitoring Transects

Monitoring transects were established in the wetlands adjacent to the proposed stormwater pond (Figure 8). The number and specific locations of the transects were determined in the field by Environmental Services, Inc., (ESI) and the Florida Department of Environmental Regulation on 11 December 1991. The transects extend through all five of the vegetative community types and cover representative areas of each of the main wetlands. Sunshine State Surveyors, Inc., surveyed the location of each transect and cut a line approximate 5 to 10 feet wide for access. Surface elevations were surveyed at intervals approximately 100 feet apart and marked with iron pins and PVC pipe.

(1) Vegetation Monitoring

Sampling stations were established every 100 feet at the survey points, starting on the wetland jurisdiction line, and extending for a minimum length of 200 feet into or through deeper portions of the wetlands. A one square meter sampling plot was established at each sampling station. Square meter sampling plots were

permanently marked with short sections of PVC pipe. Each station was established away from the centerline of the transect, in a representative area where the vegetation had not been disturbed. Species and percent cover for all ground cover vegetation within each plot was recorded. When necessary, the herbaceous coverage was estimated separately from the shruby/woody coverage. Combining herbaceous and woody coverages may result in total coverage exceeding 100 percent at times. General notes were made regarding the composition of the canopy, subcanopy and shrub layer in the immediate area and the presence or absence of surface water such as flow channels.

(2) Hydrology Monitoring

A piezometer was installed at each sampling station on each transect. The piezometers consisted of perforated PVC pipe installed from 4 to 6 feet below the surface, depending on the location in the wetland. The initial water table readings from the baseline study were taken several days after the piezometers were installed. Each piezometer was capped after installation to prevent rainwater and debris from entering.

(3) Reference Transects

In order to analyze trends in vegetative cover and hydrology, reference transects were established in non-irrigated portions of the wetlands beyond the calculated potential drawdown influence. Project engineers had calculated the maximum extent of potential drawdown influence to be 200 feet from the edge of the stormwater pond. Transects 2, 6, and 7 are the reference transects. Additionally, sampling stations 4 and 5 along Transect 1 were established beyond the 200-foot extent of potential drawdown influence.

B. Transect Descriptions

(1) Transect 1

Transect 1 is approximately 435 feet long. It extends through a section of pine/gallberry wetland and a St. Johns wort/grass pocket in the western half of Wetland C.

(2) Transect .

Transect 2 is approximately 850 feet long. It extends through sections of pine/St. John's wort, tupelo/cypress, and bay wetlands

in the eastern half of Wetland C. Transect 2 is a non-irrigated reference transect, though, because it is in close proximity to and generally down slope of Transect 1, probably receives some influence from the irrigation system at Transect 1.

(3) Transect 3

Transect 3 is 536 feet long. It extends through sections of pine/St. John's wort wetland and cut-over hardwood swamp.

(4) Transect 4

Transect 4 is 400 feet long, beginning in a planted pine/St John's wort community then extending through portions of both cut over and uncut hardwood swamp.

(5) Transect 5

Transect 5 is 400 feet long. This transect is located entirely along a pond pine seepage slope.

(6) Transect 6

Transect 6 is a 400 foot, non-irrigated reference transect. This transect begins along a pond pine seepage slope and extends into uncut hardwood swamp.

(7) Transect 7

Transect 7 is a 400 foot, non-irrigated reference transect. Transect 7 begins in a planted pine/gallberry community, runs down a pond pine seepage slope and terminates in uncut hardwood swamp.

C. Rainfall Data

Daily rainfall measurements were collected on-site at Trail Ridge Landfill for the duration of the study. Values were summarized on a monthly bases and used to calculate annual rainfall values and average monthly and annual values.

D. Quantitative Methods

In-situ data was collected in terms of areal percent cover by species. Because vegetative strata often overlap, estimated areal percent cover for an individual plot often exceeds 100%. Similarly, because natural vegetation is not uniformly distributed within a plot, areas of bare ground

(or open water in inundated plots) can exist and result in total areal vegetative cover values less than 100%. Because of these situations, only intra-plot evaluations can be made using areal percent cover estimates. In order to make inter-year, inter-plot, and inter-transect comparisons, data must be normalized to a standard unit. For the purposes of this report, relative percent cover is used for these comparisons. Relative percent cover is defined as the areal percent cover of a given species divided by the sum of the areal percent cover of all species in that plot. The relative percent cover calculation yields an estimate of each species contribution to the total vegetative cover in each plot that is comparable across years, plots, and transects.

Each species was coded as upland (U), transitional (T), or submerged (S) following the indicator status listed in Chapter 62-301.400 F.A.C. To calculate the relative percent wetland vegetation within a plot, the relative percent covers of all transitional and submerged species within that plot were summed. The mean of the relative percent wetland vegetation of all plots on a given transect is reported as the transect's relative percent cover.

V. RESULTS

A. Overall (All Plots Combined)

Relative percent wetland vegetation for all plots combined remained essentially unchanged on Transects 1 and 4, while Transect 6 decreased from 75.0% to 64.7% and Transect 7 decreased from 68.3% to 51.3% between 1991 and 1999 (Figure 9). Transects 2, 3, and 5 demonstrated considerable increases in relative percent wetland vegetation from the baseline to 1999.

B. Transect 1

Relative percent wetland vegetation increased at the 200 ft distance on Transect 1, however at 100 ft relative percent wetland vegetation decreased from 47.4% to 37.5% and at 300 ft decreased from 60.0% to 15.8% (Figure 10). Vegetative data was not collected at the 0 ft plot in 1999 nor at the 400 ft plot in the baseline study so comparisons for these plots could not be generated. At all plots except the 0 ft plot, the water table was above the baseline for all years except 1995 (Figure 11). During 1995, the water table was roughly 2 feet lower than the baseline at the 0 ft and 100 ft plot, though it was nearly the same or higher at other plot distances in that year.

C. Transect 2

Transect 2 demonstrated increases in relative percent wetland vegetation at all plots except the 400 ft plot between the baseline study and 1999 (Figure 12). For all years at all plot distances, the water table was nearly equal to or higher than values recorded in the baseline study (Figure 13).

D. Transect 3

The 0 ft, 300 ft, and 500 ft plots on Transect 3 all showed considerable increases in relative percent wetland vegetation between the baseline study and 1999 (Figure 14). The 100 ft and 400 ft plots both declined in relative percent wetland vegetation. The 200 ft plot on Transect 3 showed little change between monitoring events. During all years except 1999, the water table at Transect 3 was generally higher than or equal to elevations recorded during the baseline study (Figure 15). In 1999, the water table was approximately 2 feet lower than the baseline study at plots from 200 ft and beyond. The water table was similar to the baseline at the 100 ft plot and slightly higher than the baseline at the beginning of the transect in 1999.

E. Transect 4

On Transect 4, the 100 ft and 200 ft plots both increased slightly in relative percent wetland vegetation while the 0 ft plot decreased from 65.0% to 46.2% (Figure 16). Similar to Transect 3, the water table elevations for Transect 4 were generally higher than the baseline for all years except 1999 (Figure 17). In 1999, the water table was approximately 1 foot lower at the 100 ft plot and 2 feet lower than the baseline at the 200 ft plot.

F. Transect 5

Relative percent wetland vegetation increased to 50% from 0% between 1991 and 1999 at the 0 ft plot of Transect 5 (Figure 18). Relative percent wetland vegetation also increased, though to a lesser extent, at the 100 ft plot and decreased from 74.1% to 58.3% at the 200 ft plot. Ground water elevations were approximately 4 feet lower in 1995 and 1999 than in the baseline study for Transect 5 (Figure 19). Water table elevation was approximately 1 foot lower than the baseline at the 0 ft and 100 ft plots in 1996 but was slightly higher than the baseline at the 200 ft plot.

G. Transect 6

Relative percent wetland vegetation decreased from 25.0% to 0% at the 0 ft plot and from 100% to 94.1% at the 100 ft plot on Transect 6 from 1991

to 1999 (Figure 20). The 200 ft plot was 100% wetland vegetation in both the baseline and 1999 study. With the exception of the 0 ft plot in 1999, ground water elevations were equal to or higher than the baseline study at all plots in all years on Transect 6 (Figure 21).

H. Transect 7

Relative percent wetland vegetation decreased from 100% to 58.8% at the 100 ft plot and from 100% to 90.0% at the 200 ft plot between the baseline study and 1999, though it did not change at the 0 ft plot (Figure 22). Similar to Transect 6, ground water elevations were equal to or higher than the baseline study at all plots in all years on Transect 7 except at the 0 ft plot in 1999 (Figure 23).

G. Rainfall

Rainfall data for the entire study period are presented in Table I. Annual rainfall was lowest in 1999 (41.45 inches) and highest in 1991 (79.63 inches) (Figure 24). A downward trend from 70.2 inches in 1995 to the 41.14 inches in 1999 was observed.

VI. DISCUSSION AND CONCLUSIONS

Analysis of the individual transect relative percent wetland vegetation data shows that of the four study transects (1, 3, 4, and 5), two showed overall increases in wetland vegetation (3 and 5) while the other two showed only slight decreases in overall relative percent wetland vegetation. Vegetative cover estimation is an inherently non-precise method of quantification, and slight variances between years are often the result more of inconsistency between observers rather than real differences in vegetative cover. Of the three non-irrigated reference transects (2, 6, and 7), two transects (6 and 7) showed considerable declines in relative percent wetland vegetation. Reference Transect 2 showed an increase in relative percent wetland vegetation.

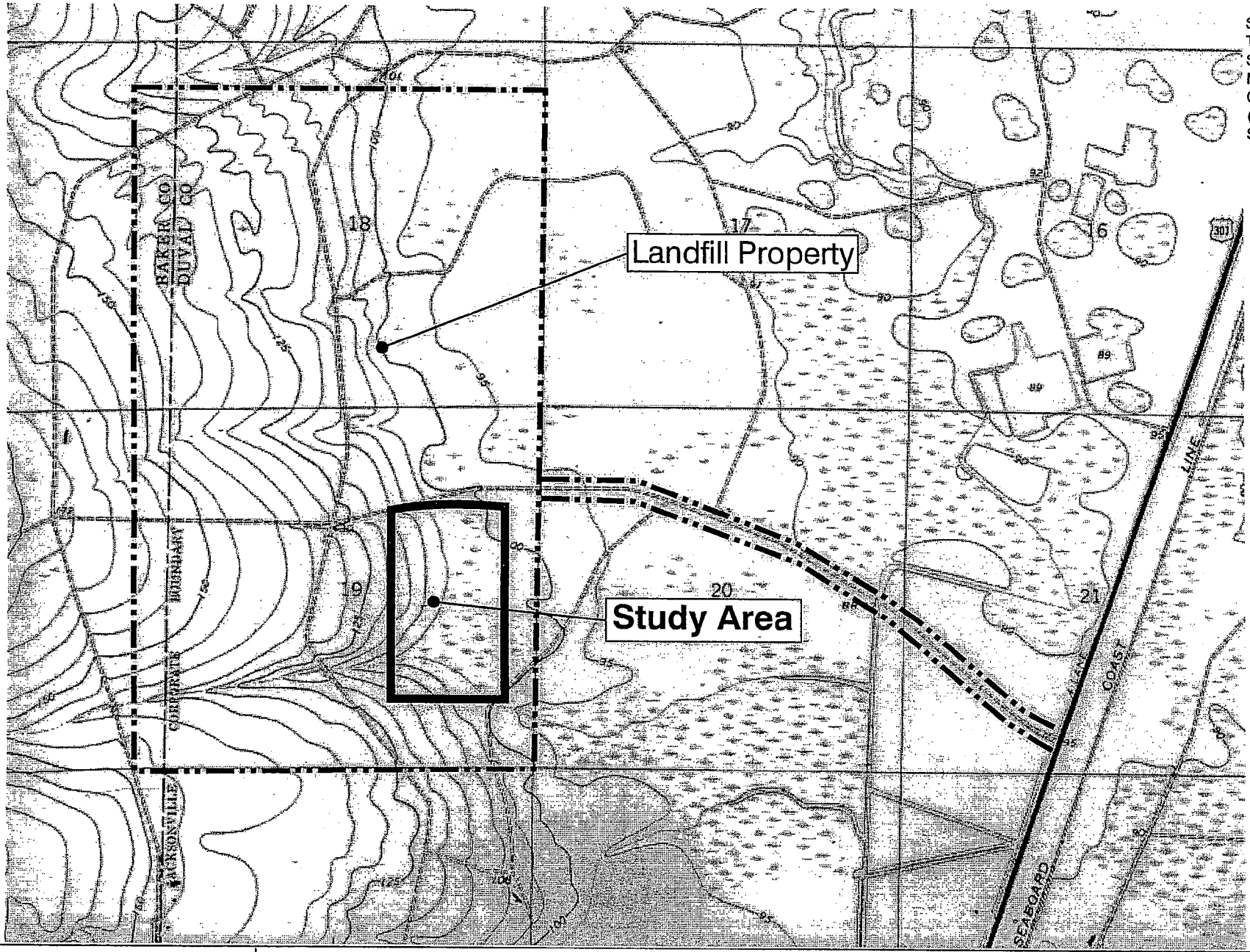
Rainfall data for the study period indicates a strong trend towards drought conditions from 1994 to 1999, and generally lower ground water elevations in 1999 further reflect this trend. Decreases in wetland vegetation observed at the non-irrigated reference Transects 6 and 7 are likely a response to the drought conditions. Irrigation of the study transects during this period appears to have been sufficient in not only offsetting any potential drawdown effects of the stormwater pond, but also prevented the encroachment of upland vegetation during the drier than normal conditions. Transect 2 was also a non-irrigated transect, though it showed an increase in relative percent wetland vegetation despite the drought conditions. Transect 2 was located adjacent to and down-slope of Transect 1, and, though it was not directly irrigated, probably received

inputs of water as seepage from the irrigation of Transect 1, thus offsetting the drought effects.

Ground water elevation data for Transect 5 provides the only evidence of a potential drawdown effect as most values for the 0 ft and 100 ft plots on this transect are below the baseline study elevations. Relative percent cover by wetland vegetation actually increased at the 0 ft and 100 ft plots on transect 5, suggesting that though there may be some drawdown of the ground water on this transect, the irrigation system has sufficiently maintained soil moisture to prevent the encroachment of upland vegetation into this portion of the wetland.

Transects 3, 4, 5, 6, and 7 all reflect drought conditions in 1999 with ground water levels typically at or near the lowest values recorded during the study period. Groundwater elevation data for Transects 1 and 2 do not, however, reflect this same trend with both transects demonstrating higher than average ground water elevations in 1999. Transects 1 and 2 are located in close proximity on the north side of the stormwater pond, while the other transect are either to the east or the south of the pond. The lack of an observed drought effect in the hydrological data for Transects 1 and 2 may be a result of differing geo-physical soil characteristics between the areas to the north of the stormwater pond and those to the east and south.

In conclusion, it appears that vegetative and hydrologic variations observed in the wetlands around the stormwater pond at Trail Ridge Landfill are the result of natural climatic variation and are not attributable to hydrologic drawdown caused by construction of the stormwater pond. While some drawdown may have occurred, the wetland irrigation system has been efficient in mitigating those effects, leaving no discernable trends in the vegetation or hydrology monitoring data collected from the baseline study to 1999. The evidence for the stormwater pond having no long term negative effects on the adjacent wetlands is strengthened by the fact that the baseline vegetative data were gathered during one of the wettest years of the past decade, while the 1999 data were collected during the driest year, at the height of the drought. In addition, vegetative monitoring has been conducted during months (typically December) in which ground cover vegetation is at a minimum. The relative percentages of wetland vegetation would likely be higher if monitored in the summer months, when herbaceous wetland species are more prevalent. With continued operation of the wetland irrigation system, further monitoring of these transects would appear unnecessary, so we recommend that all permit conditions related to monitoring be removed from future permit renewals.



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Trail Ridge Landfill

Jacksonville, Florida

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Figure No.	1

DEP003729

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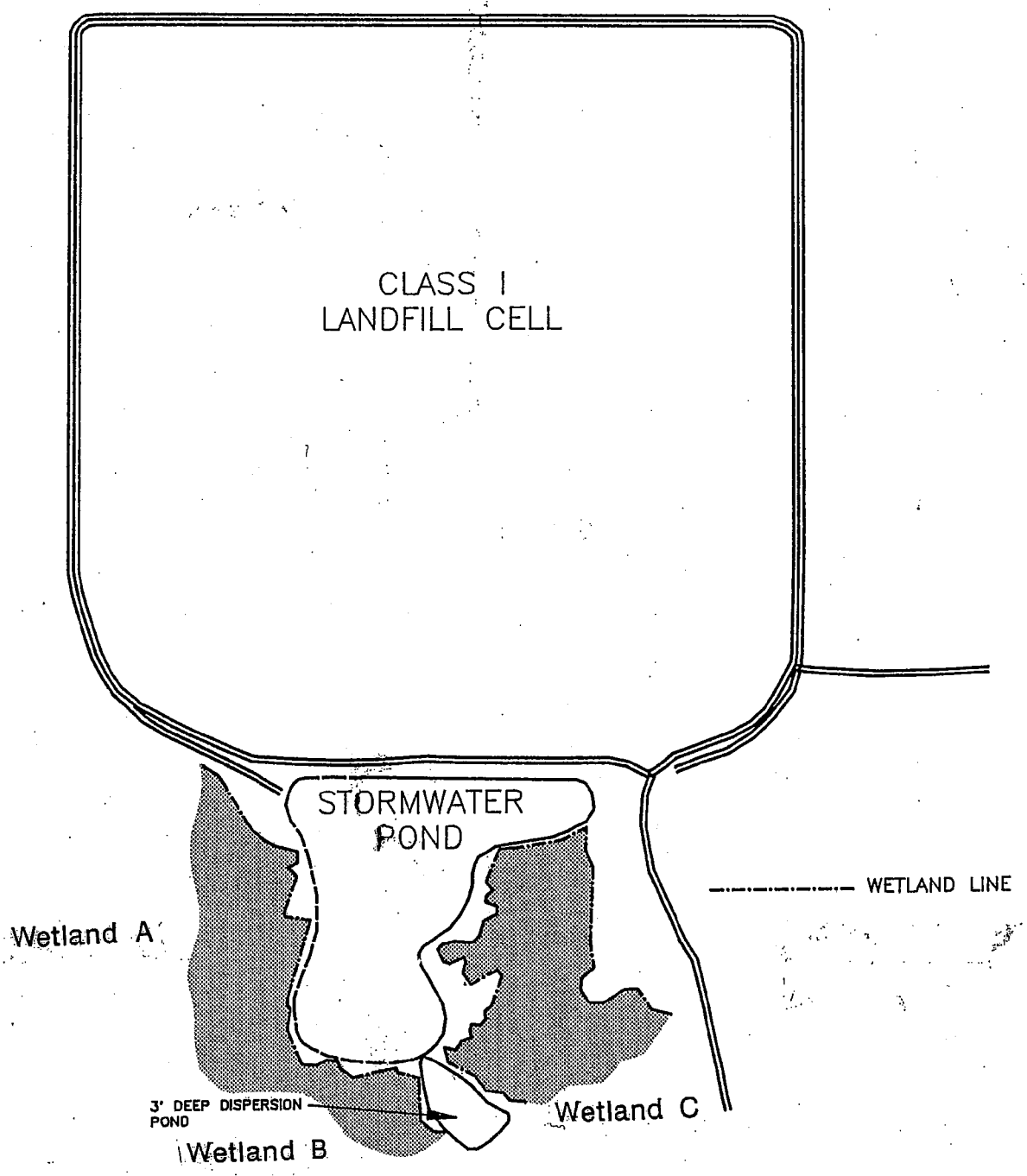

Project No.	EJ02131.00
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Figure No. 2	

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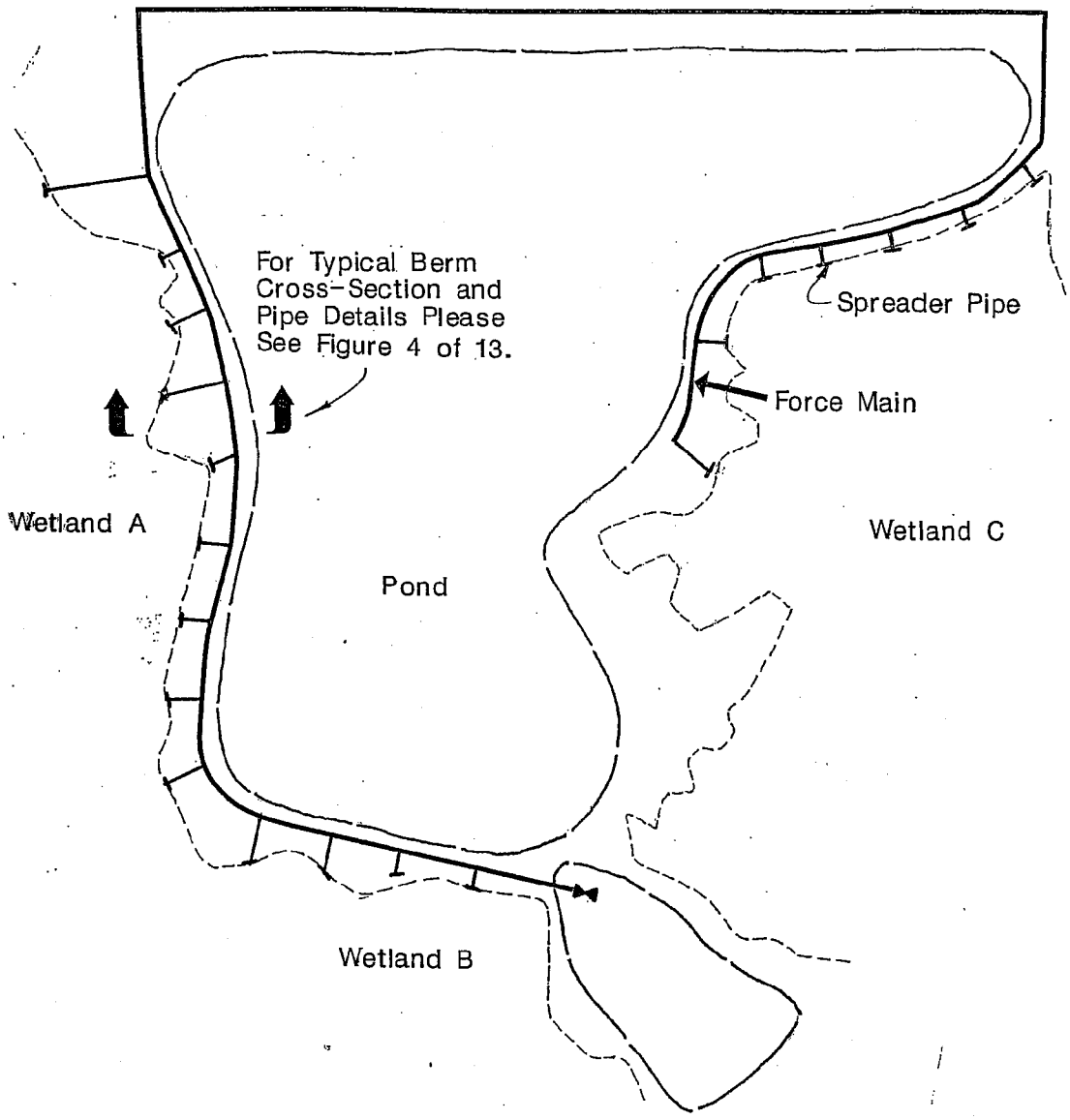

Detailed Plan View of Wetland Irrigation System

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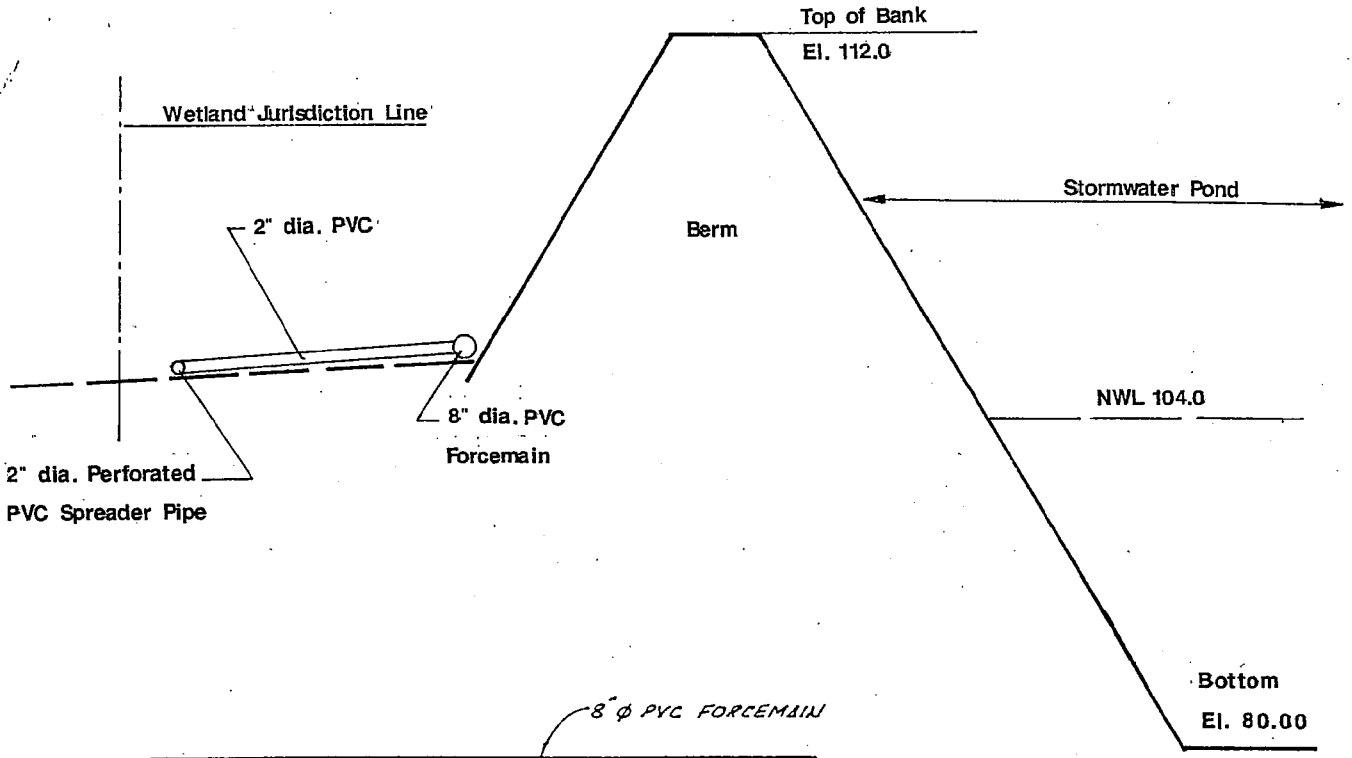
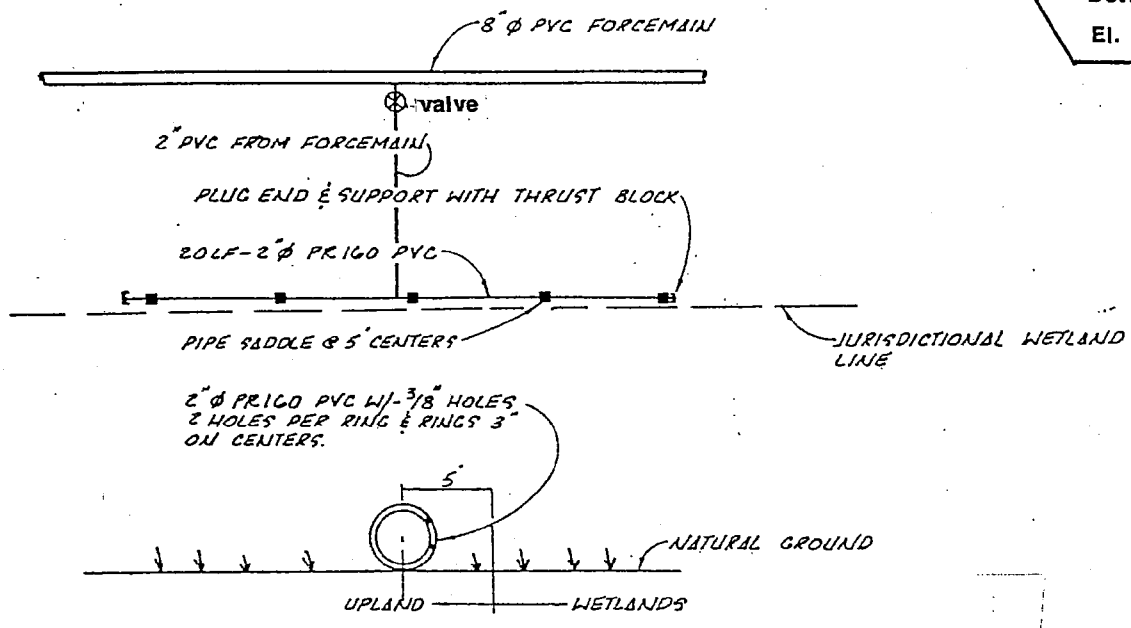
Figure No. 3	

DEP003731

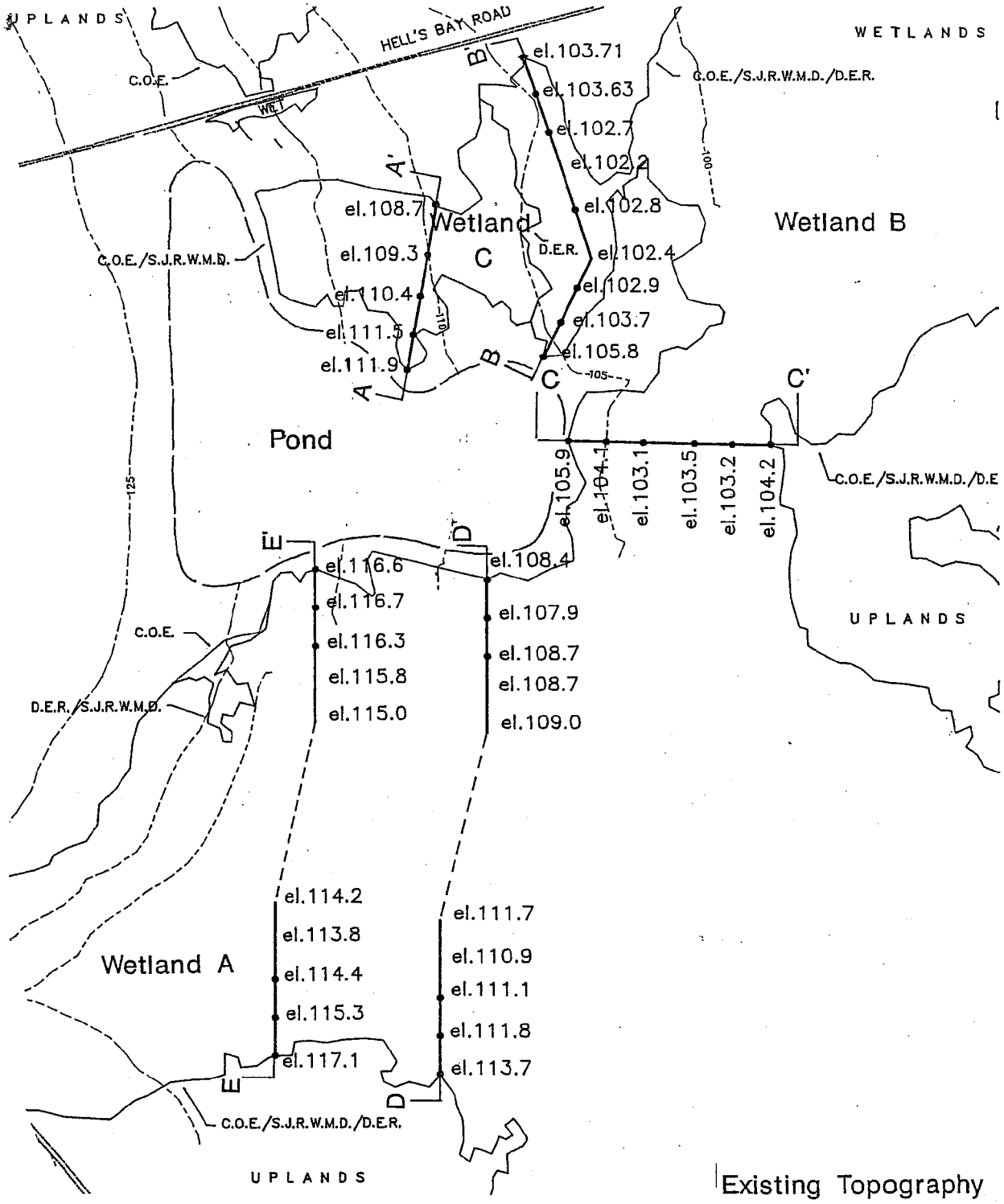




Plans for Wetland Irrigation System

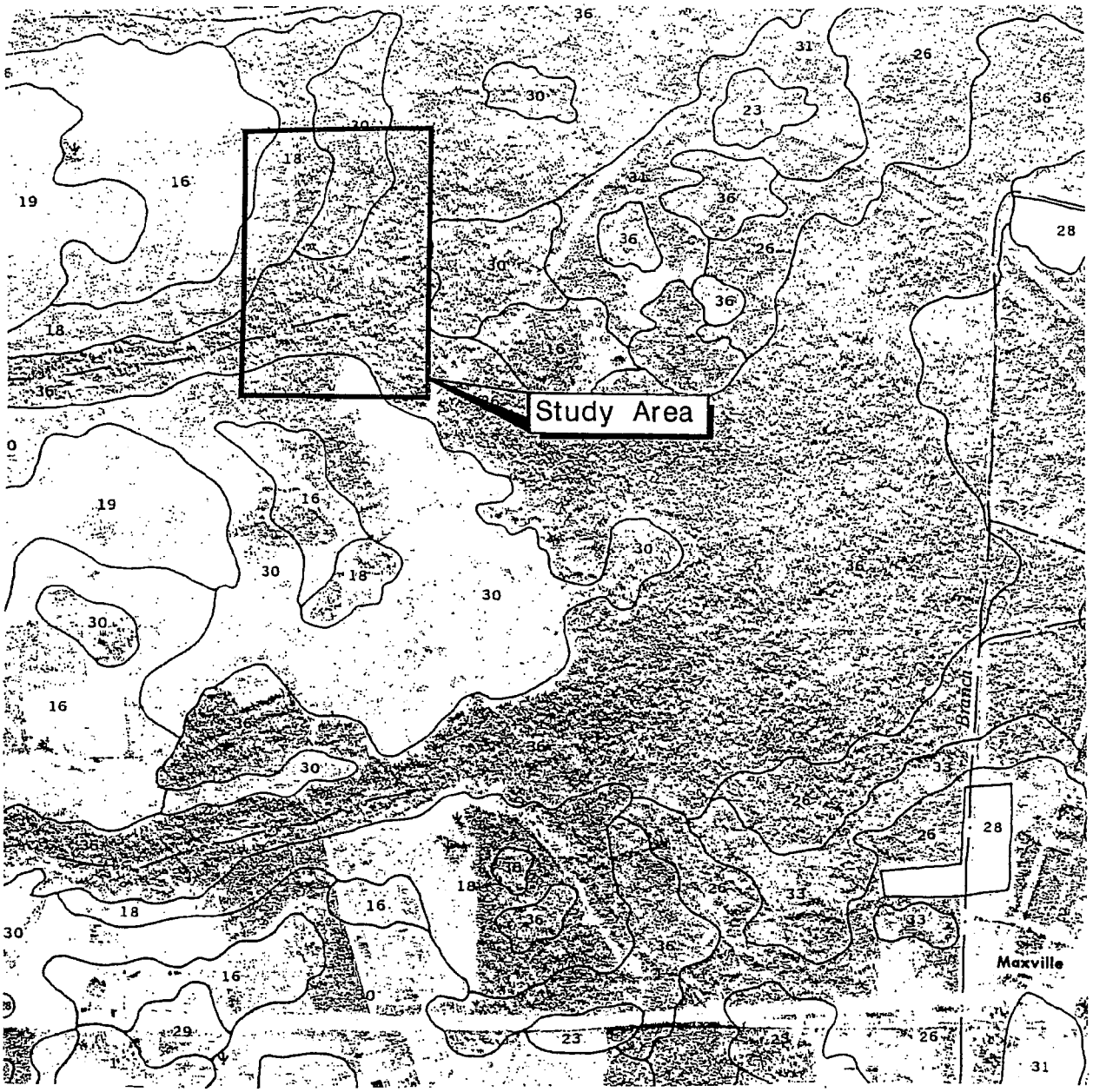
ENVIRONMENTAL SERVICES, INC.	Trail Ridge Landfill Jacksonville, Florida	Project No. EJ02131.00 Date September 2002 Figure No. 4

DEP003732



Existing Topography

ENVIRONMENTAL SERVICES, INC.	Trail Ridge Landfill Jacksonville, Florida	Project No. EJ02131.00 Date September 2002 Figure No. 5



Soil Legend:

18 – Lynn Haven fine sand

30 – Ridgeland fine sand

36 – Wesconnett fine sand

Source:U.S.D.A. Soils Survey for Duval County, Fla. (1978)

Soils Map

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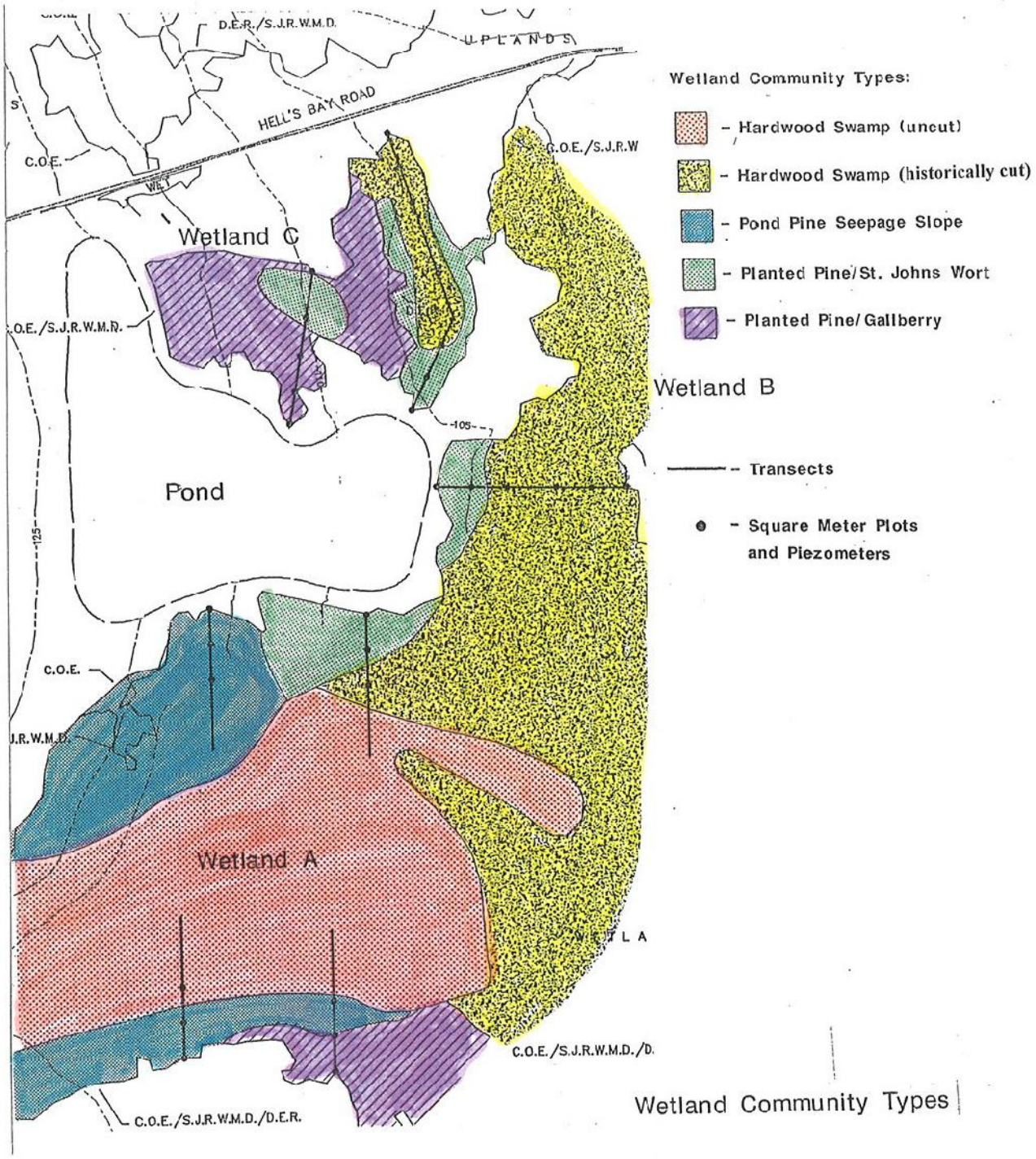
Figure No.	6



Wetland Community Types

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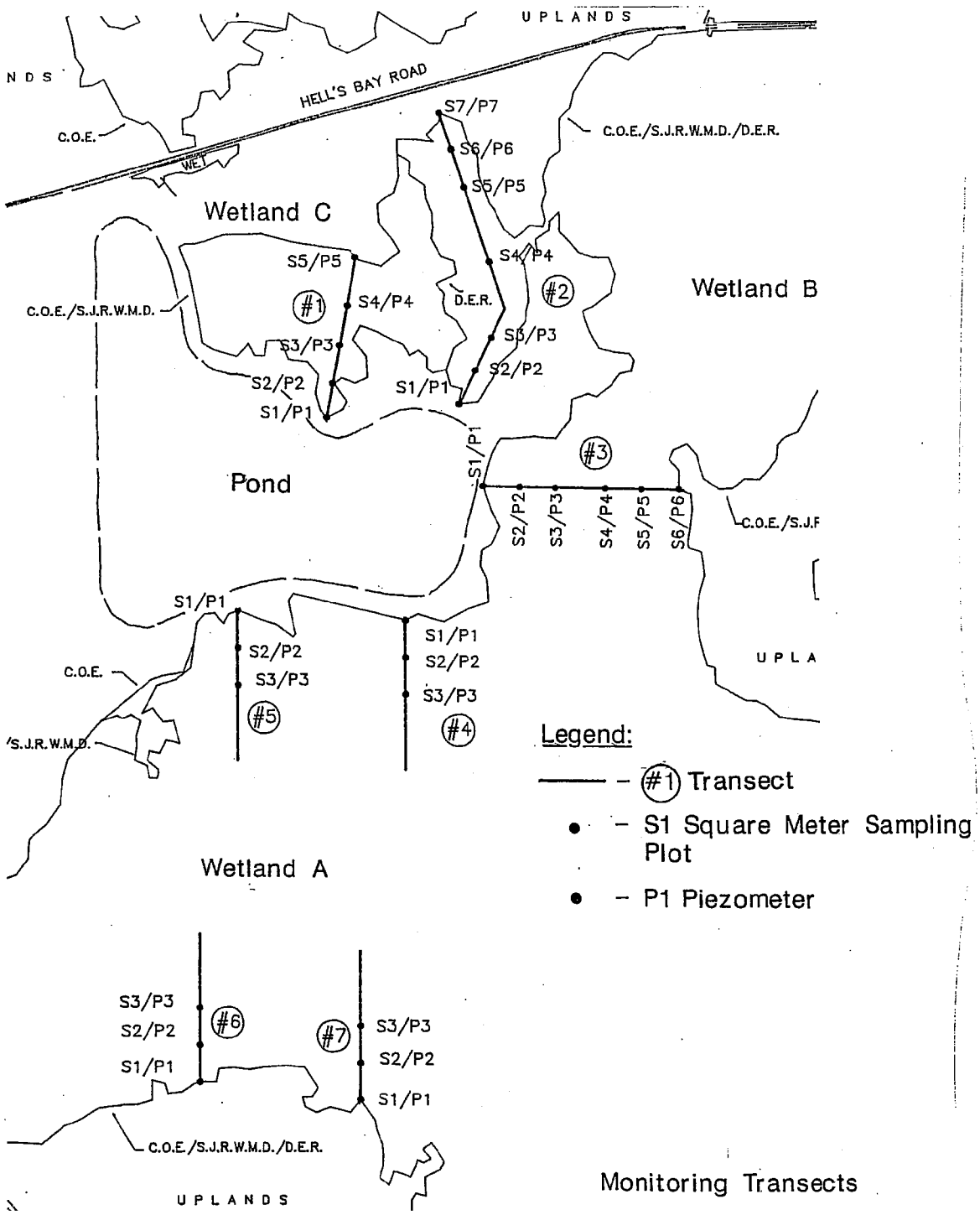
Figure No.	7

DEP003735



Monitoring Transects

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Figure No.	8

DEP003736

Relative % Wetland Vegetation

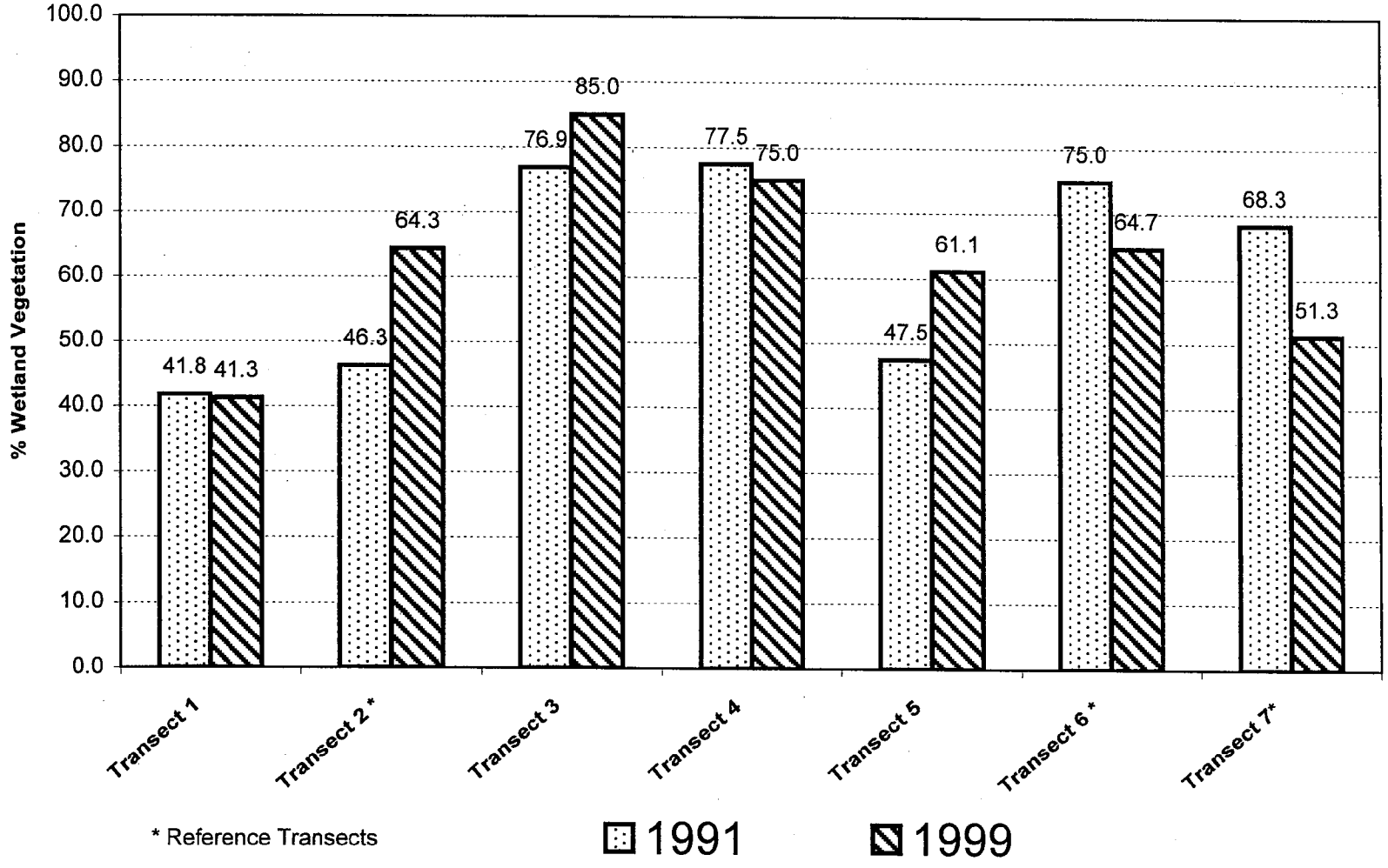

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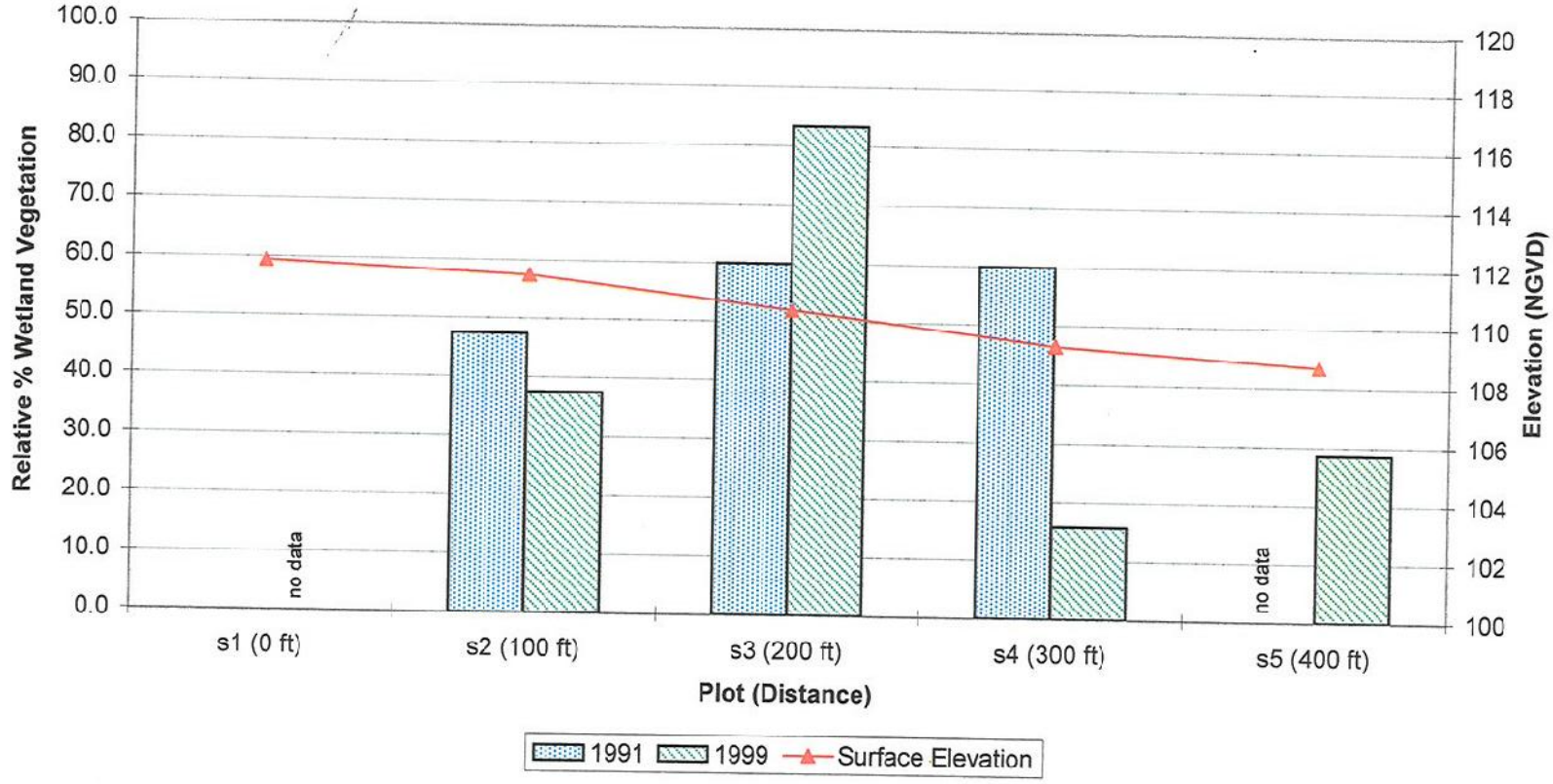
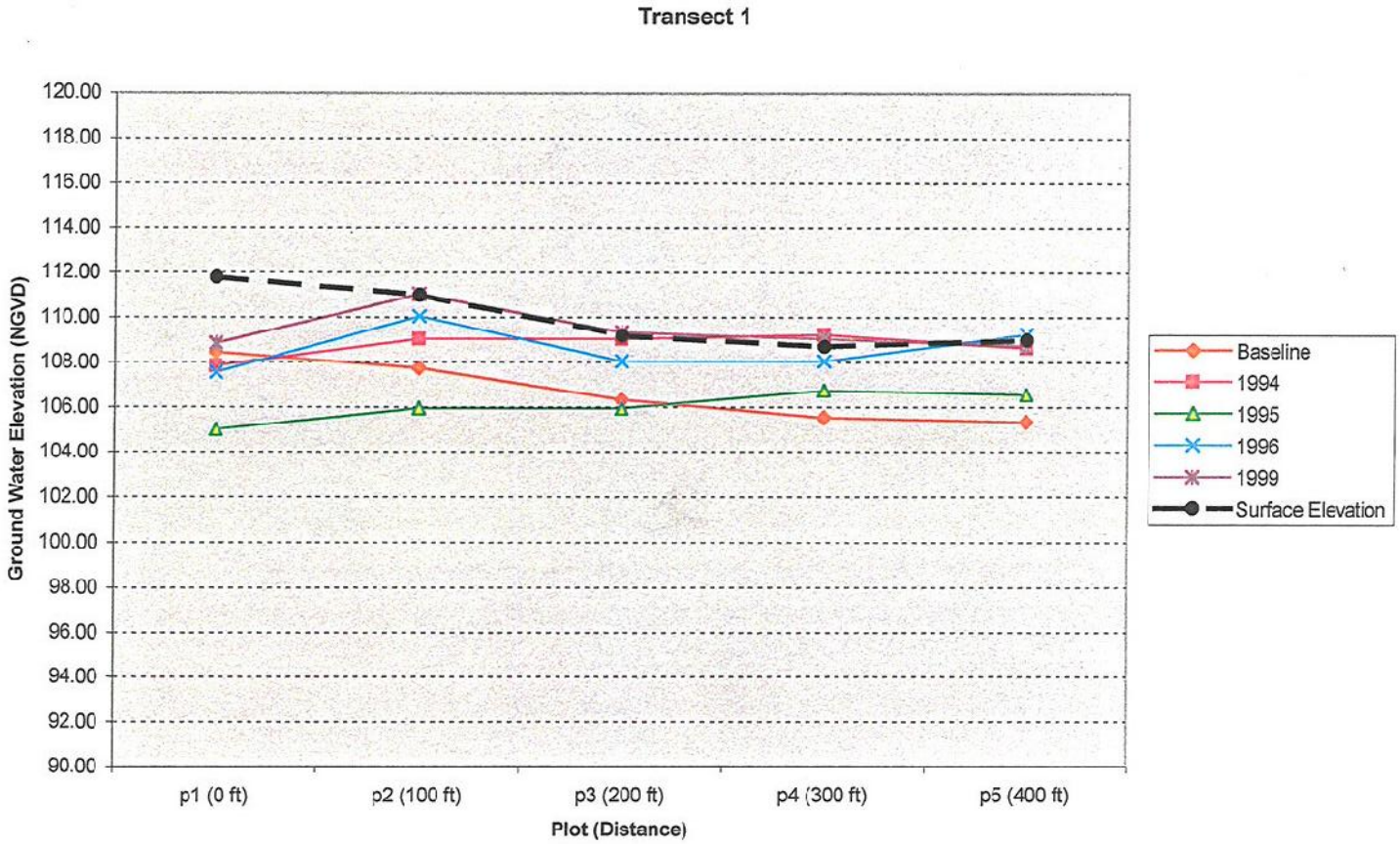
Figure No.	9

Transect 1



ENVIRONMENTAL SERVICES, INC.	Trail Ridge Landfill Jacksonville, Florida	Project No. EJ02131.00 Date September 2002 Figure No. 10



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Project No.	EJ02131.00
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Figure No.	11

Transect 2

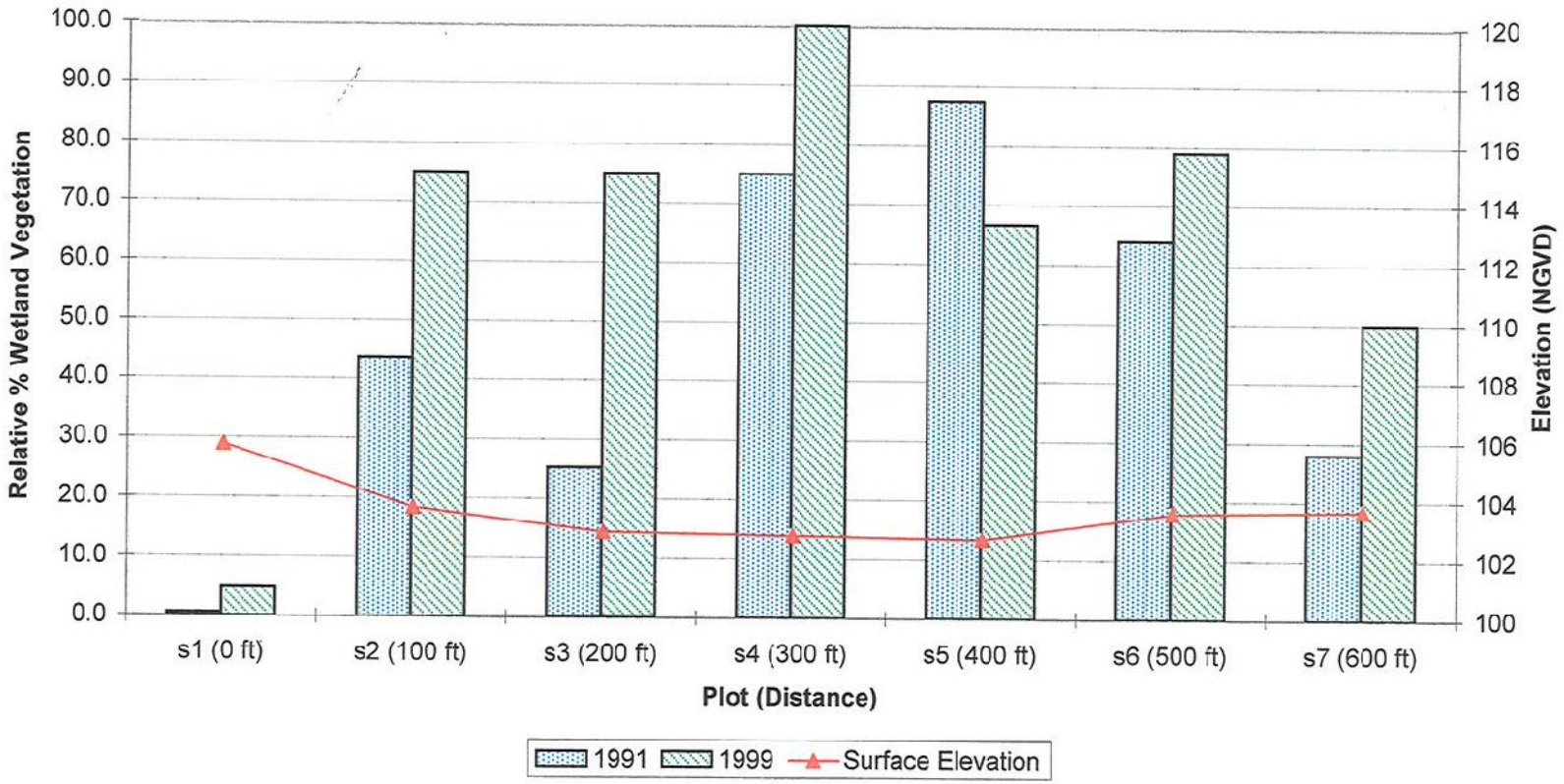

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Figure No.	12

DEP003740

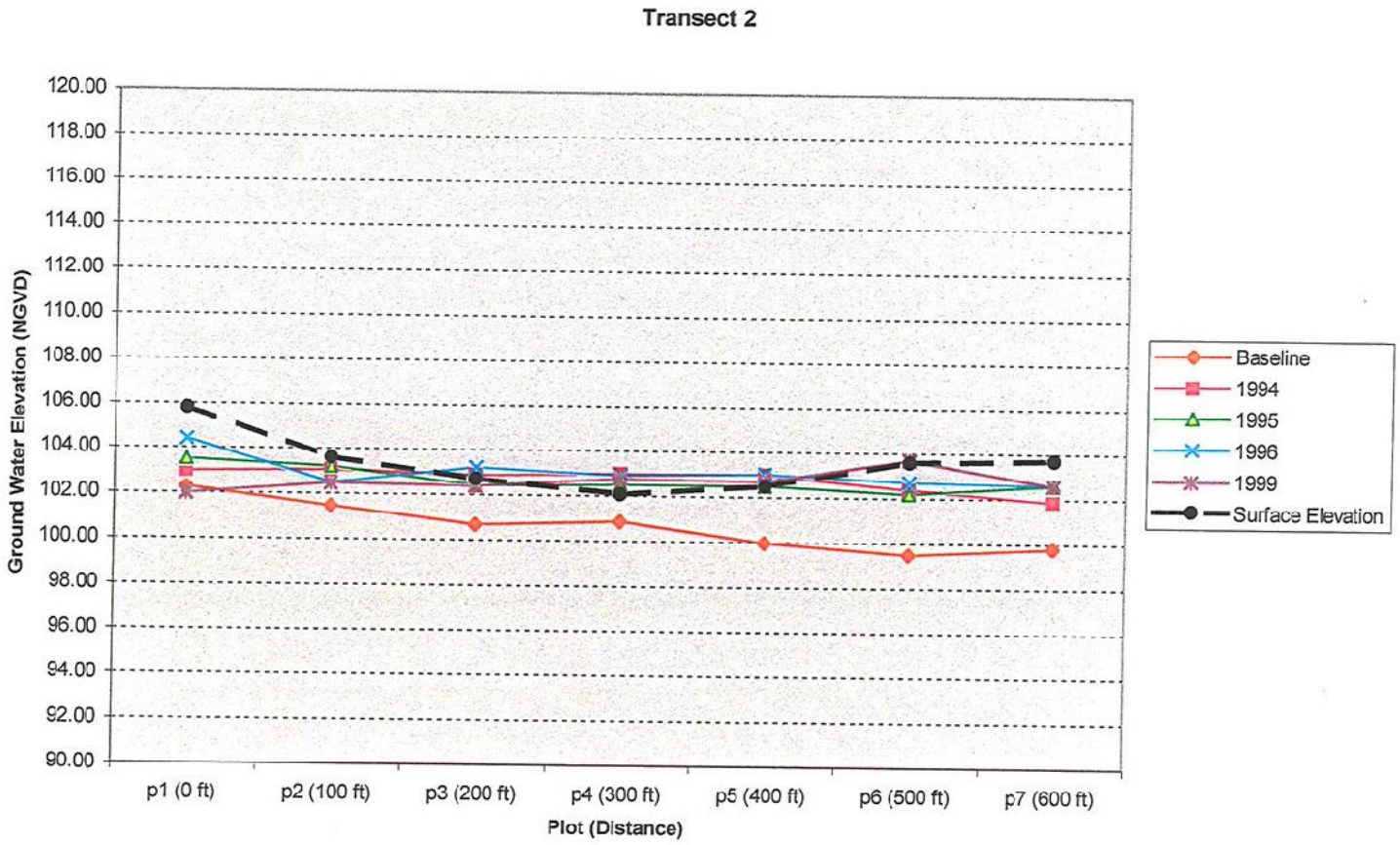

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Figure No.	13

DEP003741

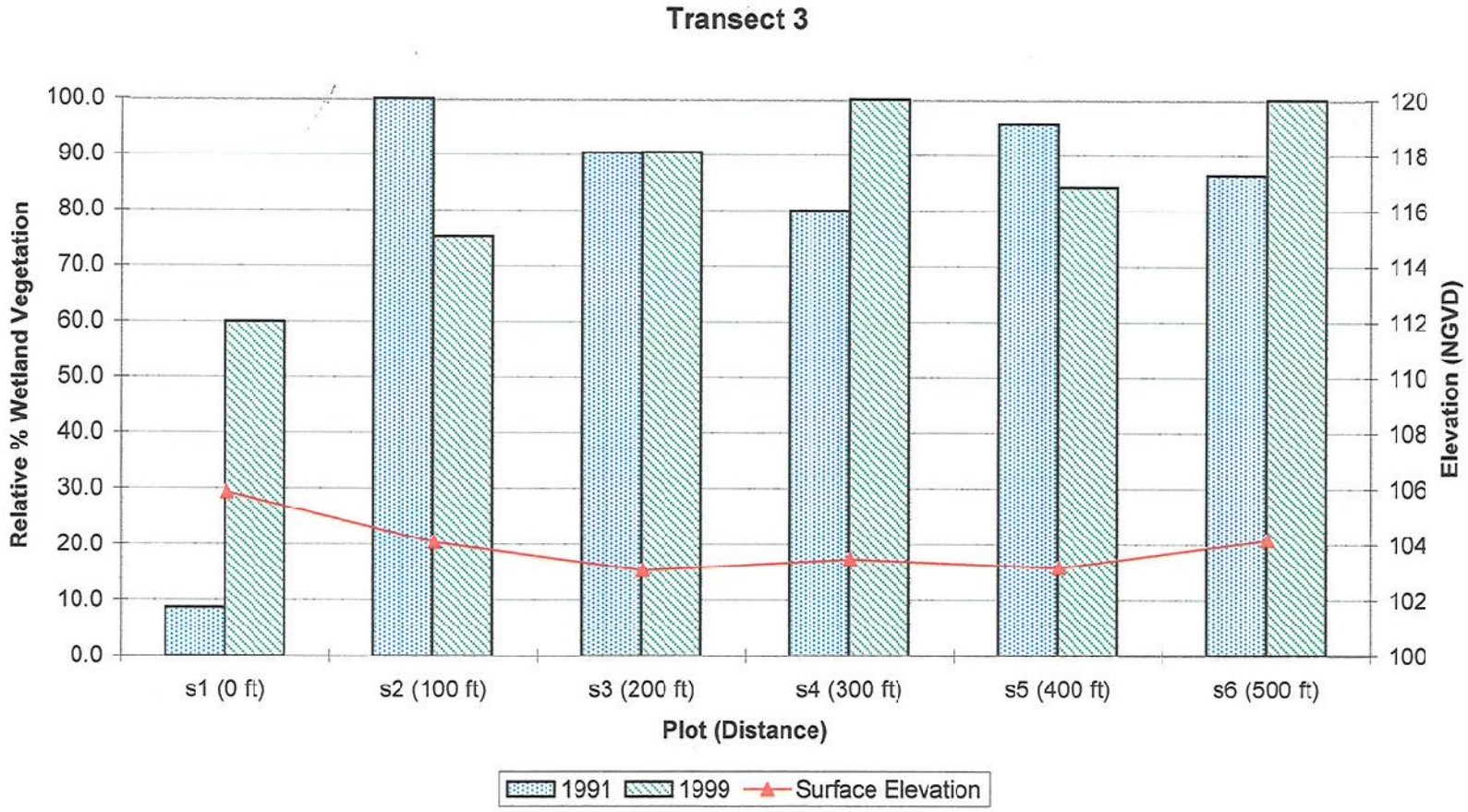

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Figure No.	14

DEP003742

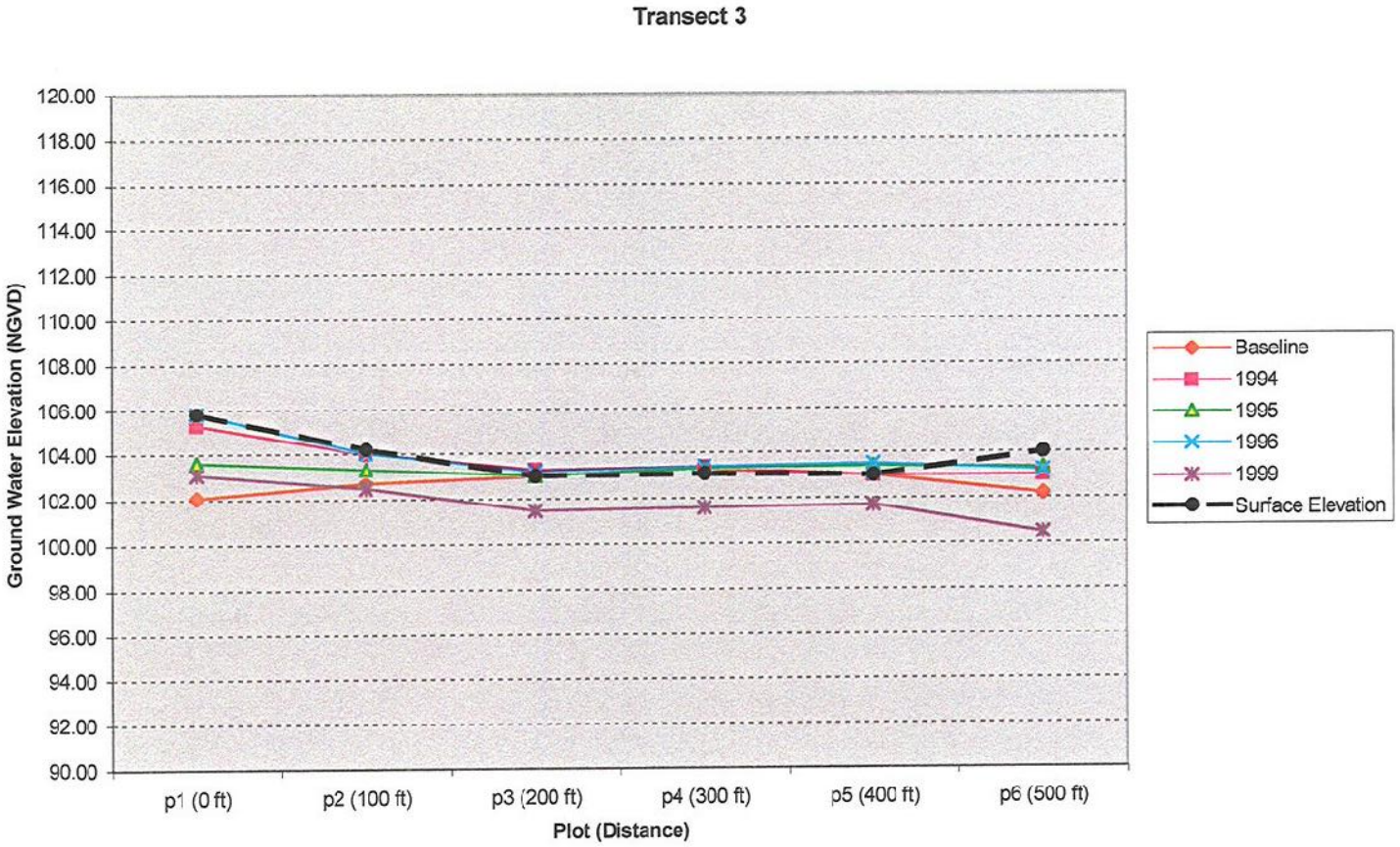

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Figure No.	15

DEP003743

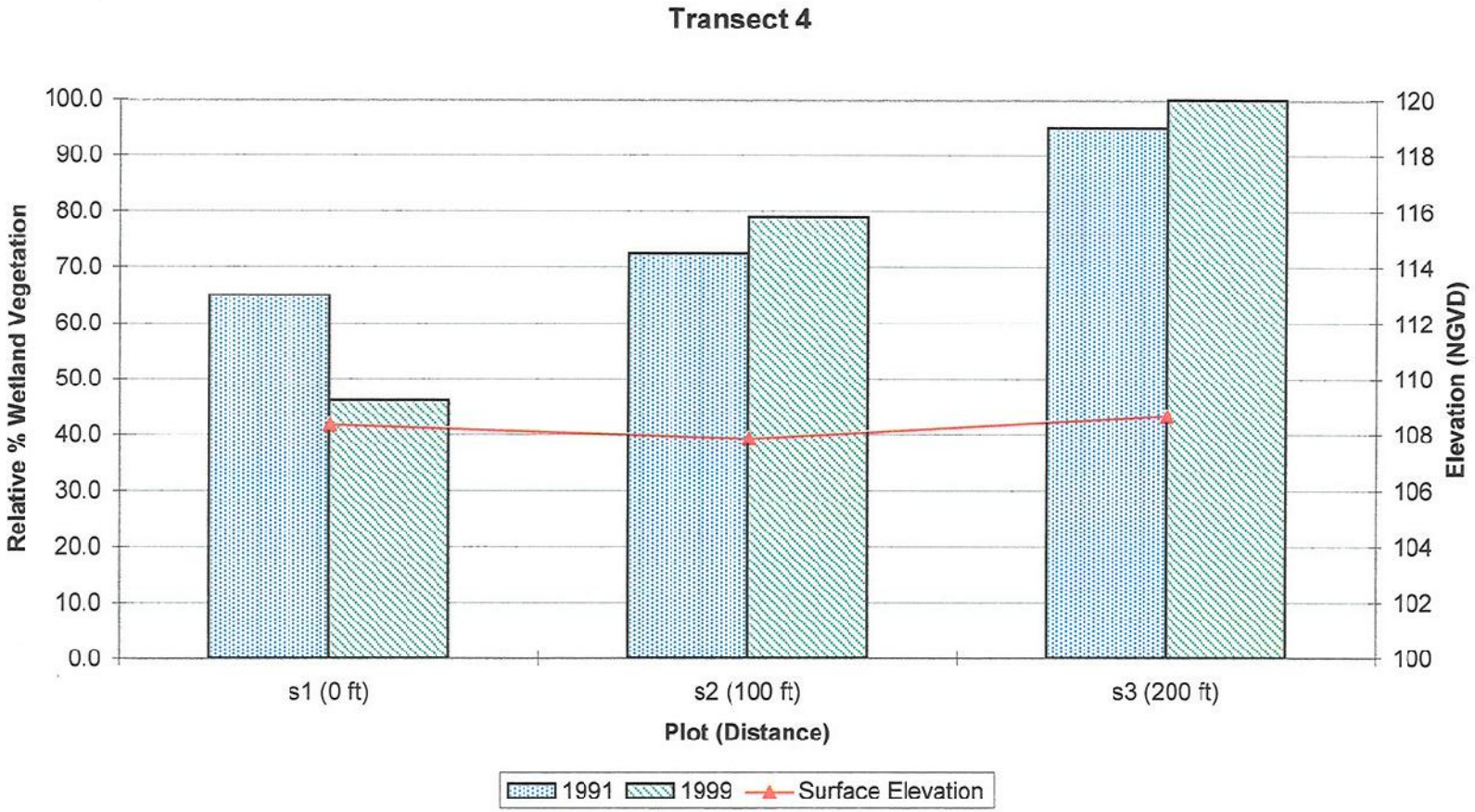

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Figure No.	16

DEP003744

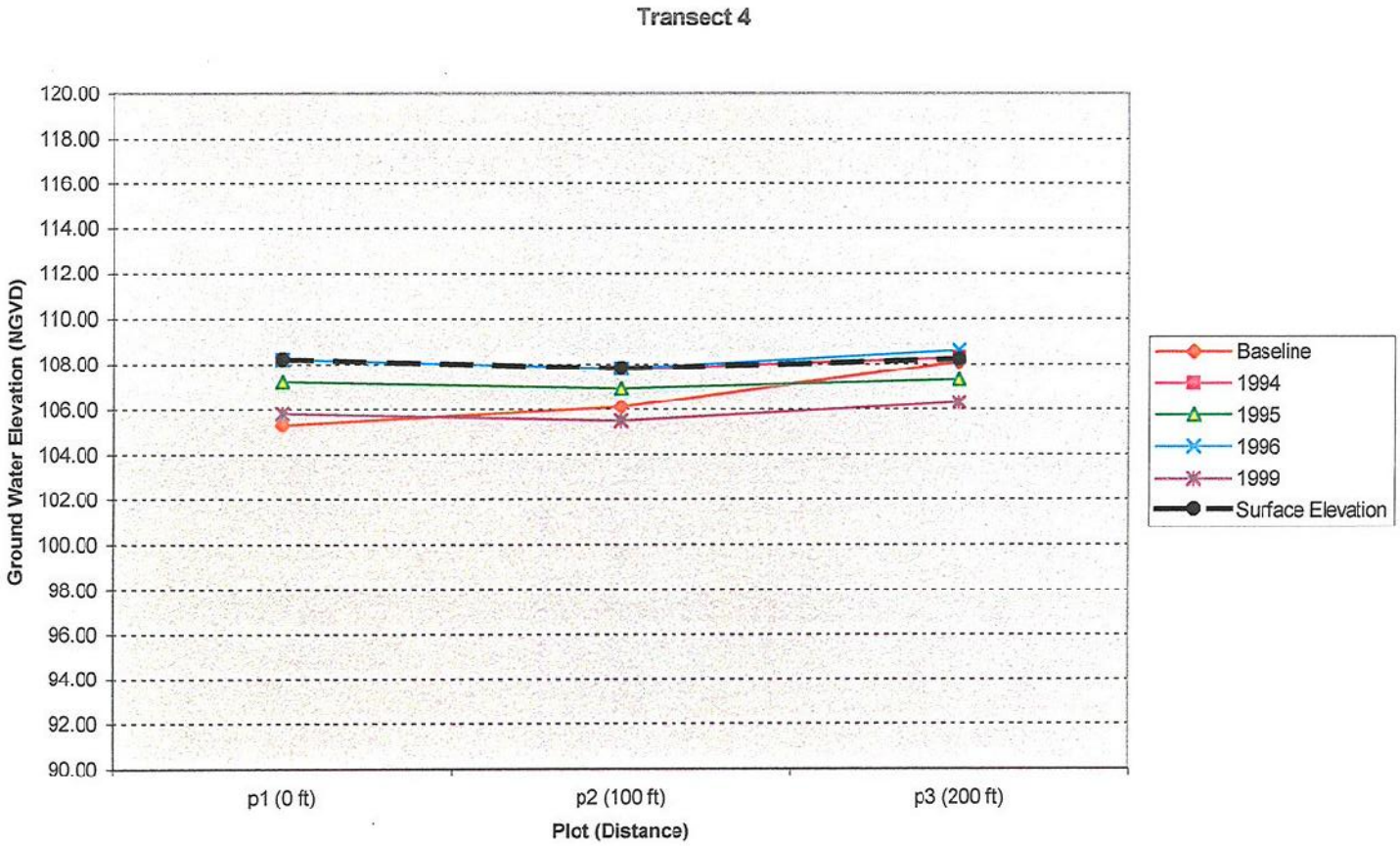

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Figure No. 17	

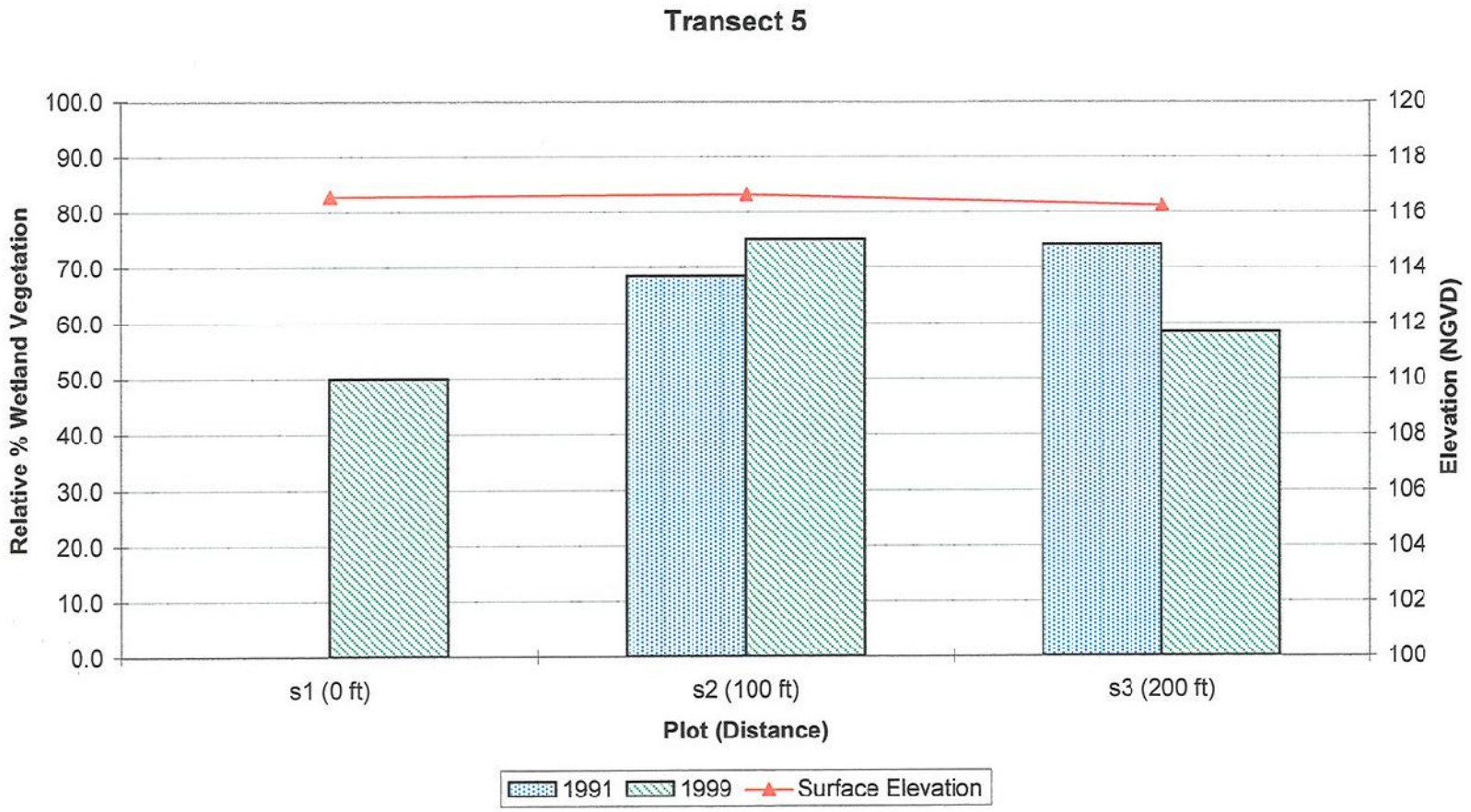

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Figure No.	18

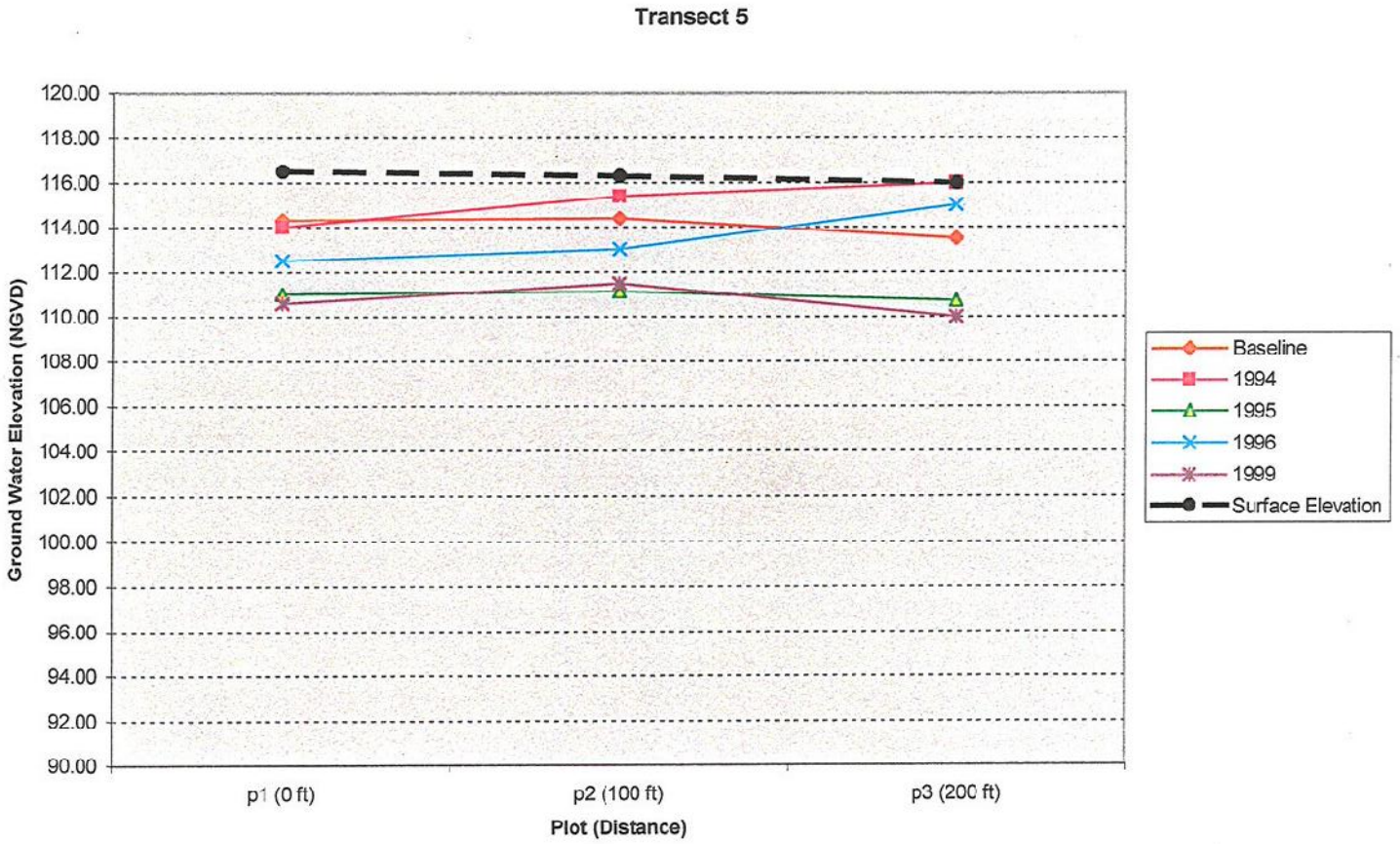

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Figure No.	19

DEP003747

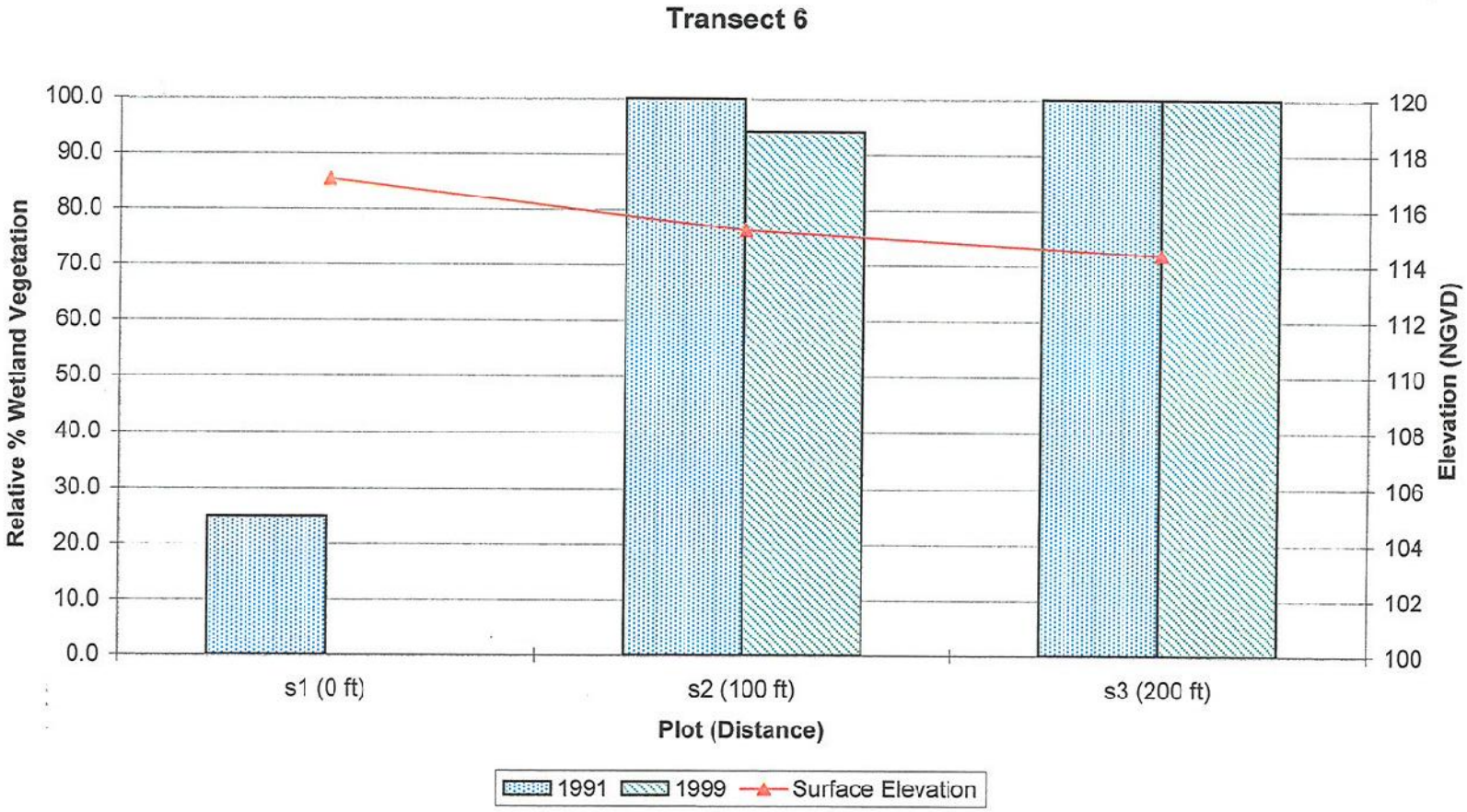

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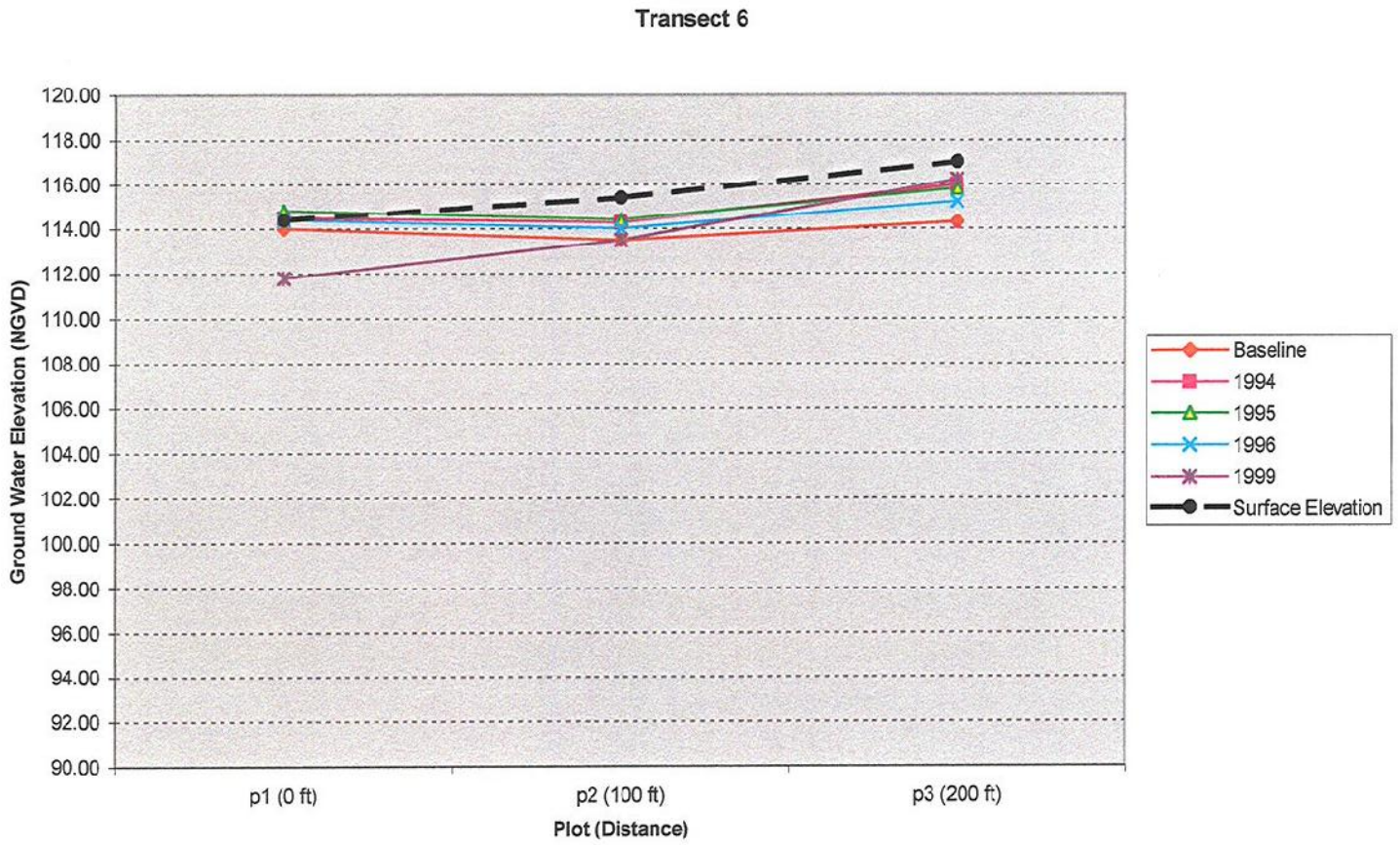
Figure No.	20

DEP003748



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Trail Ridge Landfill

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Figure No.	21

DEP003749

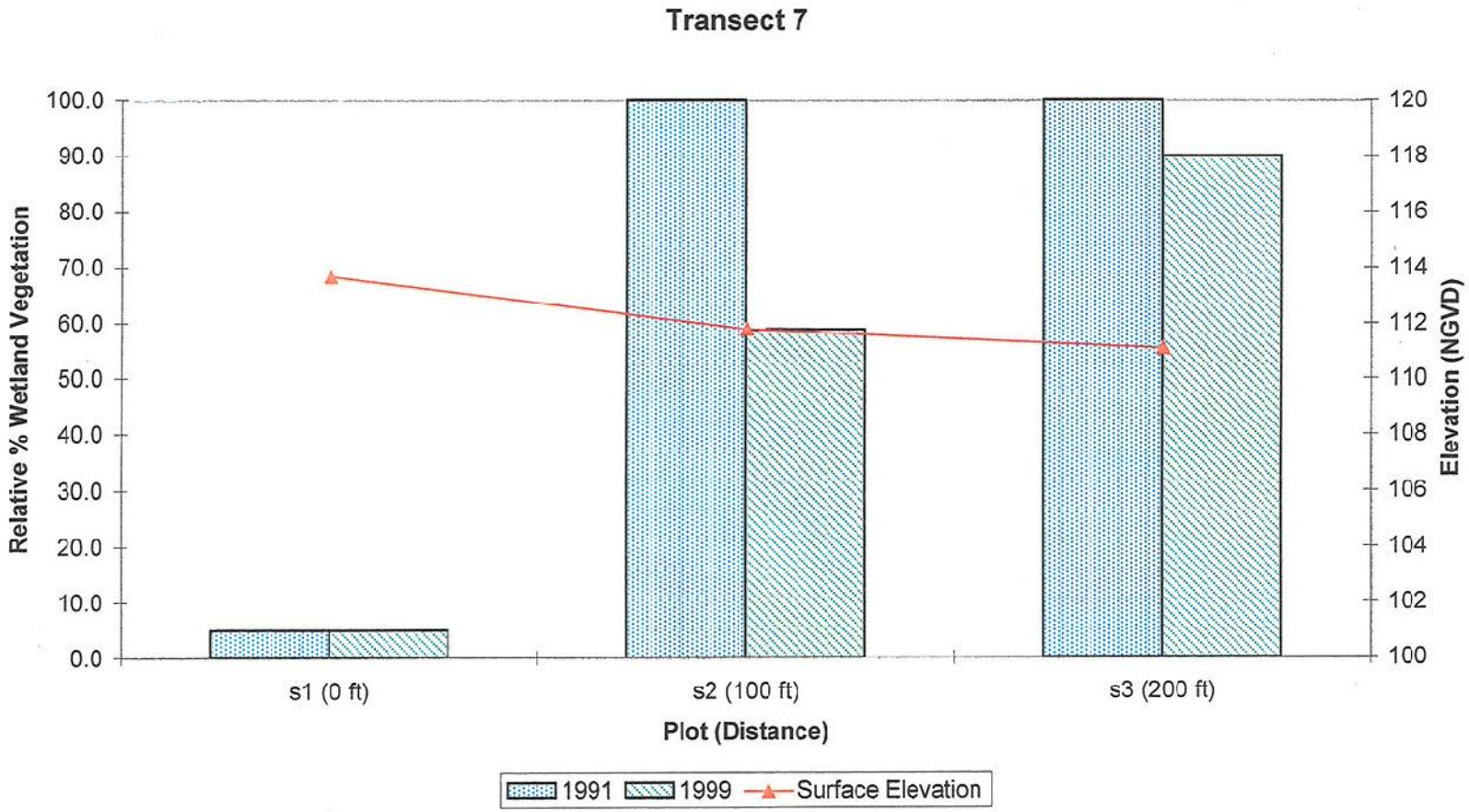

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Figure No.	22

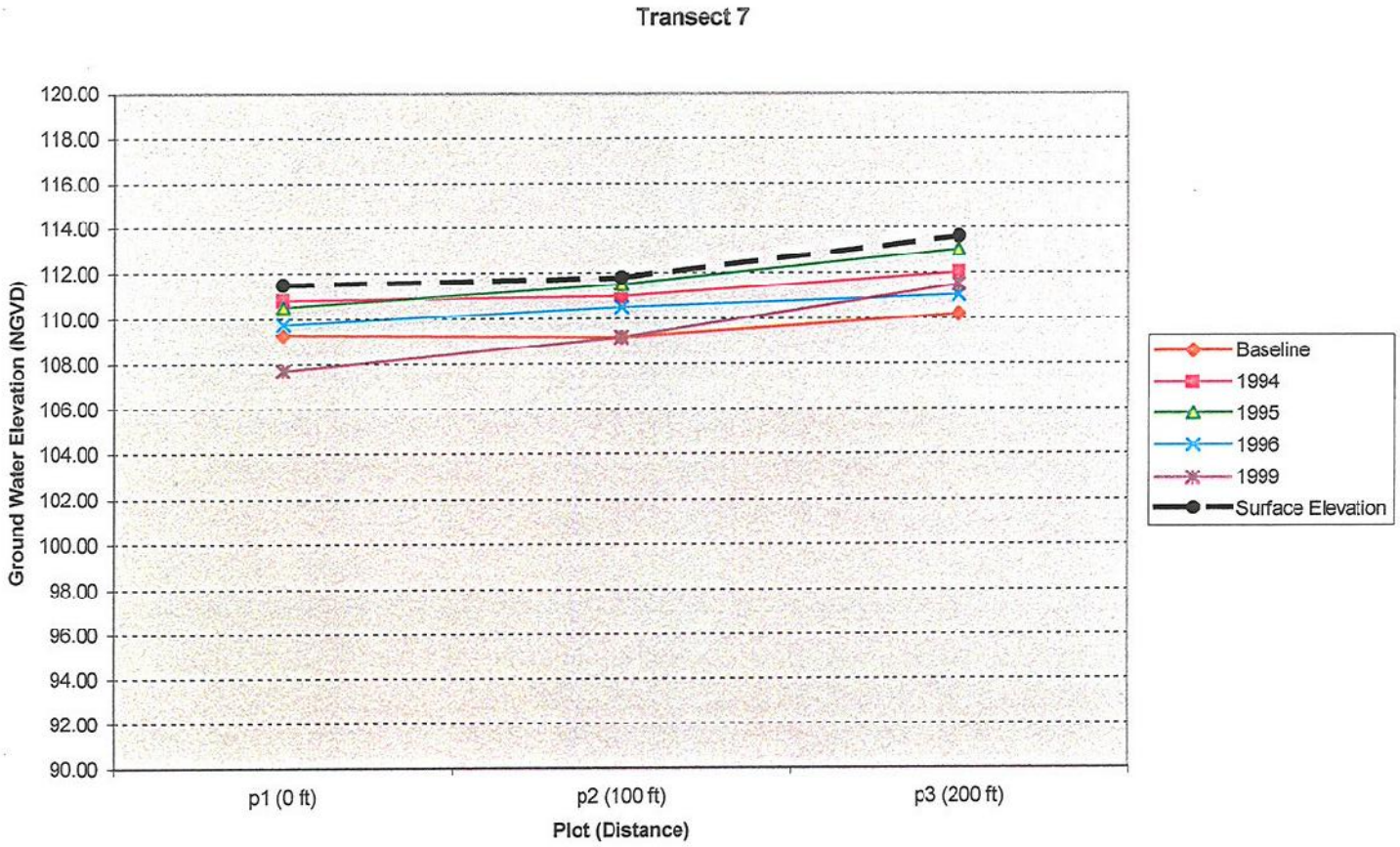

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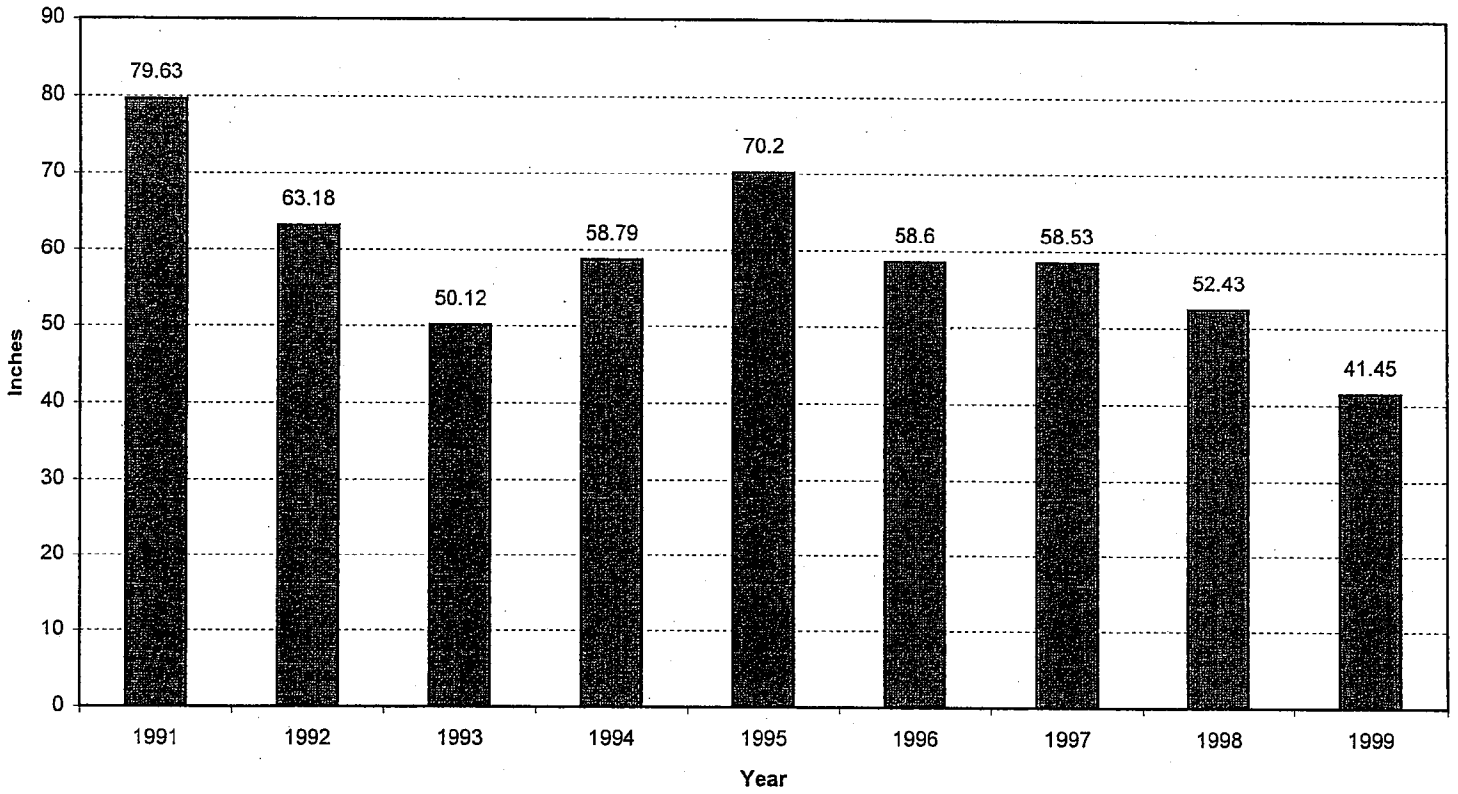
Figure No.	23

Annual Rainfall



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Trail Ridge Landfill

Jacksonville, Florida

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Date	September 2002
Figure No.	24

ATTACHMENT A

Permit Conditions for Monitoring Wetlands At Trail Ridge Landfill

SPECIFIC CONDITIONS:

construction and every year thereafter. A registered Florida Professional Engineer must sign and seal the report certifying the system is functioning as designed.

b. The reports shall be submitted to the Department's Stormwater Engineer at 7825 Baymeadows Way, Suite B-200, Jacksonville, Florida 32256-7590.

C MS C. If the stormwater management system is not functioning as designed and permitted, operational maintenance must be performed immediately to restore the system. If operational maintenance measures are insufficient to enable the system to meet the design standards, the Permittee must either replace the system or construct an alternative design. In such a case, the Permittee must submit a permit modification application within sixty (60) days of the date the system was determined to be design deficient.

CMS 50. **Hydrology Monitoring Requirement.** All piezometers (installed as part of the requirements of Specific Condition No. 48I(a) of Permit Number SC16-184444) at the wetland/upland boundary and at existing groundwater monitoring locations, installed to determine groundwater elevations in the wetland discharge areas, shall be monitored at 6 month intervals commencing 6 months from the permit receipt date. The hydrology monitoring reports shall be submitted to the Department's Northeast District's Environmental Resource Permitting Section within 45 days from the monitoring event.

C MS 51. **Wetland Vegetation Monitoring.** The vegetation in the wetland areas of discharge shall be monitored every 2 years commencing from the permit receipt date. These vegetation monitoring reports shall utilize the transects established in the Base Line Study (required in Specific Condition Number 48I(a) of Permit Number SC16-184444) and shall include all the required information in this Base Line Study. These vegetation monitoring reports shall be submitted to the Department's Northeast District's Environmental Resource Permitting Section no later than 30 days after each monitoring event.

CMS 52. **Monitoring report.** Each vegetative monitoring report shall document any quantitative changes in vegetational composition which indicates any significant changes in the hydroperiod of the wetlands. Monitoring data shall be collected from all previously established quadrants along the existing transects. Each vegetative monitoring report shall contain an explanation of short term trends caused by, but not limited to, rainfall, fire, flooding and or other natural events and an explanation of any potential long term trends based on past reports which indicate potential changes in the hydroperiod of the wetland. The Department shall review the vegetative monitoring reports and the Permittee shall take whatever corrective remedial actions required by the Department in the event of significant indications of changes or potential changes in the hydroperiod of the wetland.

- MS 53. **Erosion control.** The Permittee shall take all appropriate measures to insure that the wetland stormwater discharge system does not cause erosion into any wetland area during construction and operation.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256-7590

Interoffice Memorandum

TO: Julia Boesch
Solid Waste

THROUGH: Ken Kohn
Industrial Wastewater

FROM: Dean Setiono
Industrial Wastewater DS

DATE: January 10, 2003

SUBJECT: Duval County – Stormwater Review
Trail Ridge Landfill – First RAI Response

My stormwater review of the First RAI Response for Trail Ridge Landfill is complete, based upon the information provided on December 16, 2002. Based on my review, comments number 12 in the First RAI Response adequately addressed the capacity, flow rate and velocity for the terrace swales. Therefore additional stormwater RAI regarding the terrace swales will not be necessary.

If you have any questions concerning this matter, please feel free to contact me.

n:\iw\dean\memos\trailridgelandfill-internal.doc

Department of Environmental Protection

Lawton Chiles
Governor

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Virginia B. Wetherell
Secretary

May 17, 1996

Mr. Robert E. Hice
Environmental Coordinator
Ameristeel
Jacksonville Steel Mill Division
Post Office Box 518
Baldwin, Florida 32234

Dear Mr. Hice:

Ameristeel Slag Disposal
Duval County - Solid Waste

The Department has reviewed your May 16 submittal of the results of the slag column leaching test designed to demonstrate whether or not your mill's processed slag meets the requirements of Section 403.7045(1)(g)(2), Florida Statutes.

These results, in combination with previous results and your confirmation that slag that is collected during furnace maintenance or Melt Shop clean-up or might otherwise be contaminated will continue to be transported to a properly permitted TSDF, provide adequate assurance for the Department to reach the determination that your processed slag may be considered an industrial byproduct under Florida Statutes, and therefore not regulated as solid waste, provided that:

a majority of the processed slag is demonstrated to be sold, used, or reused within one year;

the slag is not utilized in such a manner that it is placed in the environment in a greater than six-foot thickness; and

neither the slag nor your processing operation is found to be a source of pollution.

Thank you very much for your cooperation in this matter. The Department appreciates the responsible and professional manner in which you approached this issue. If you have any questions

concerning the Department's determination, please do not hesitate to contact me at (904)448-4320, extension 355.

Sincerely,

Michael J. Fitzsimmons

Michael J. Fitzsimmons
Waste Program Administrator

MJF:mn

cc: Chris McGuire, Office of General Counsel, DEP

Department of
Environmental Protection

Lawton Chiles
Governor

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

Virginia B. Wetherell
Secretary

January 28, 1998

Mr. Greg Maths
General Manager & Division President
Trail Ridge Landfill, Inc.
5110 U.S. Highway 301
Baldwin, Florida 32234

Duval County - Stormwater
Modification of the Stormwater System
Permit No. MS16-296691 to Solid Waste
Permit No. SC16-184444

Dear Mr. Maths:

On January 26, 1998, the Department conducted an inspection of the stormwater system located adjacent to the Trail Ridge Landfill. After reviewing the as-built plan submitted to the Department along with the review of the permit and associated construction plans and calculations, the Department finds that the constructed modification of the stormwater system is in compliance with Chapter 373, Florida Statutes, Chapters 40C-4 and 40C-42, F.A.C.

It is the Department's understanding that the permit will now move into the operational phase with Trail Ridge Landfill, Inc. being the responsible entity for the operation and maintenance of the stormwater system. It is the responsibility of Trail Ridge Landfill, Inc. to meet all conditions of the permit and provide information on monitoring to the Department as required by the permit. This information is to be submitted to the stormwater engineer.

If you have any questions, please feel free to call me at (904) 448-4340, extension 345.

Sincerely,

R. Shayan

Reza Shayan, E.I.
Stormwater Compliance Engineer

RS/lgb

cc: Juanita Bader-Clem, P.E.
Jeremy Tyler
David Apple
Mary Nogas

Department of
Environmental Protection

Lawton Chiles
Governor

Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

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May 17, 1996

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Sincerely,

Michael J. Fitzsimmons
Waste Program Administrator

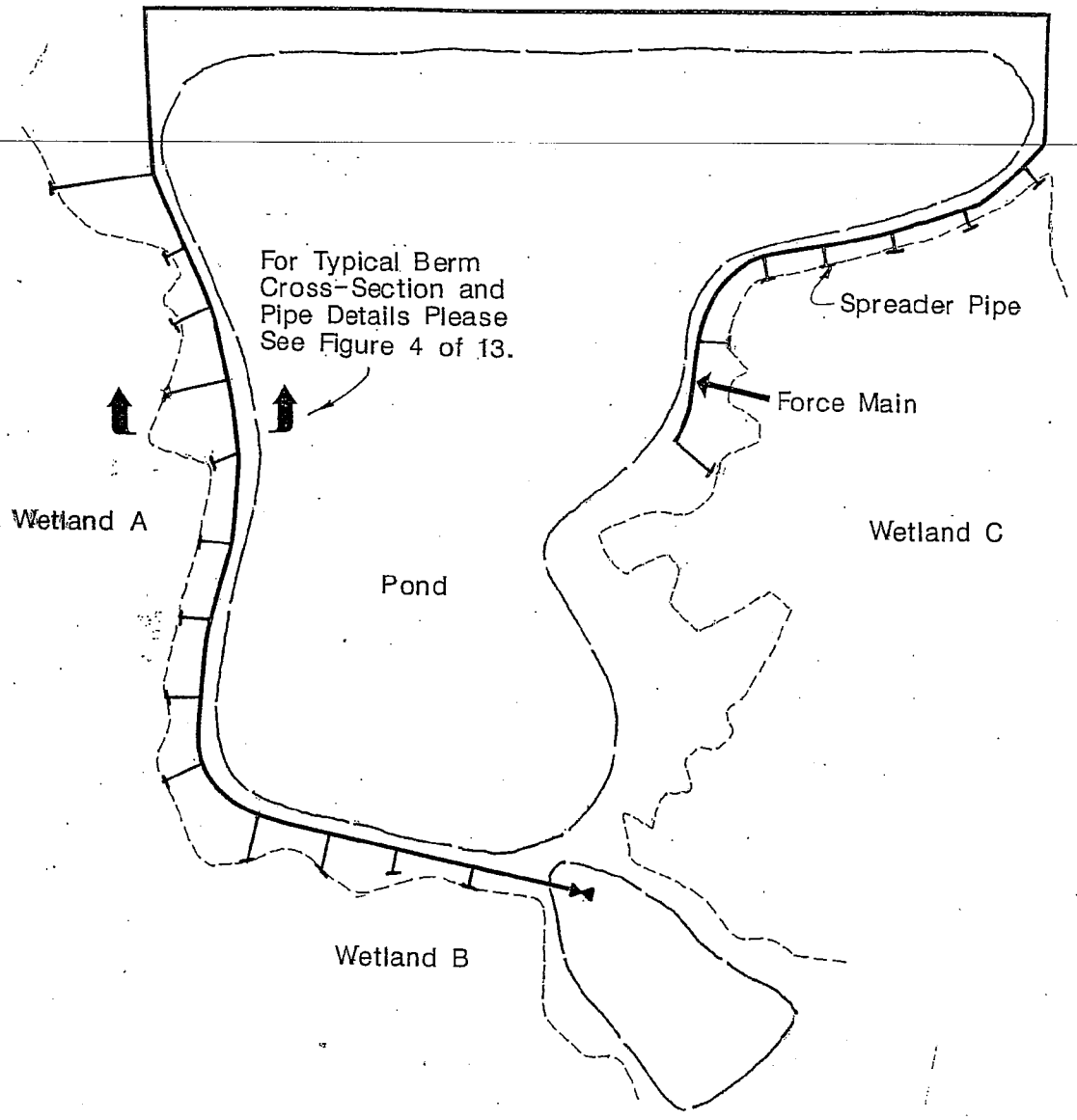
MJF:mn

cc: Chris McGuire, Office of General Counsel, DEP

ENVIRONMENTAL SERVICES, INC.

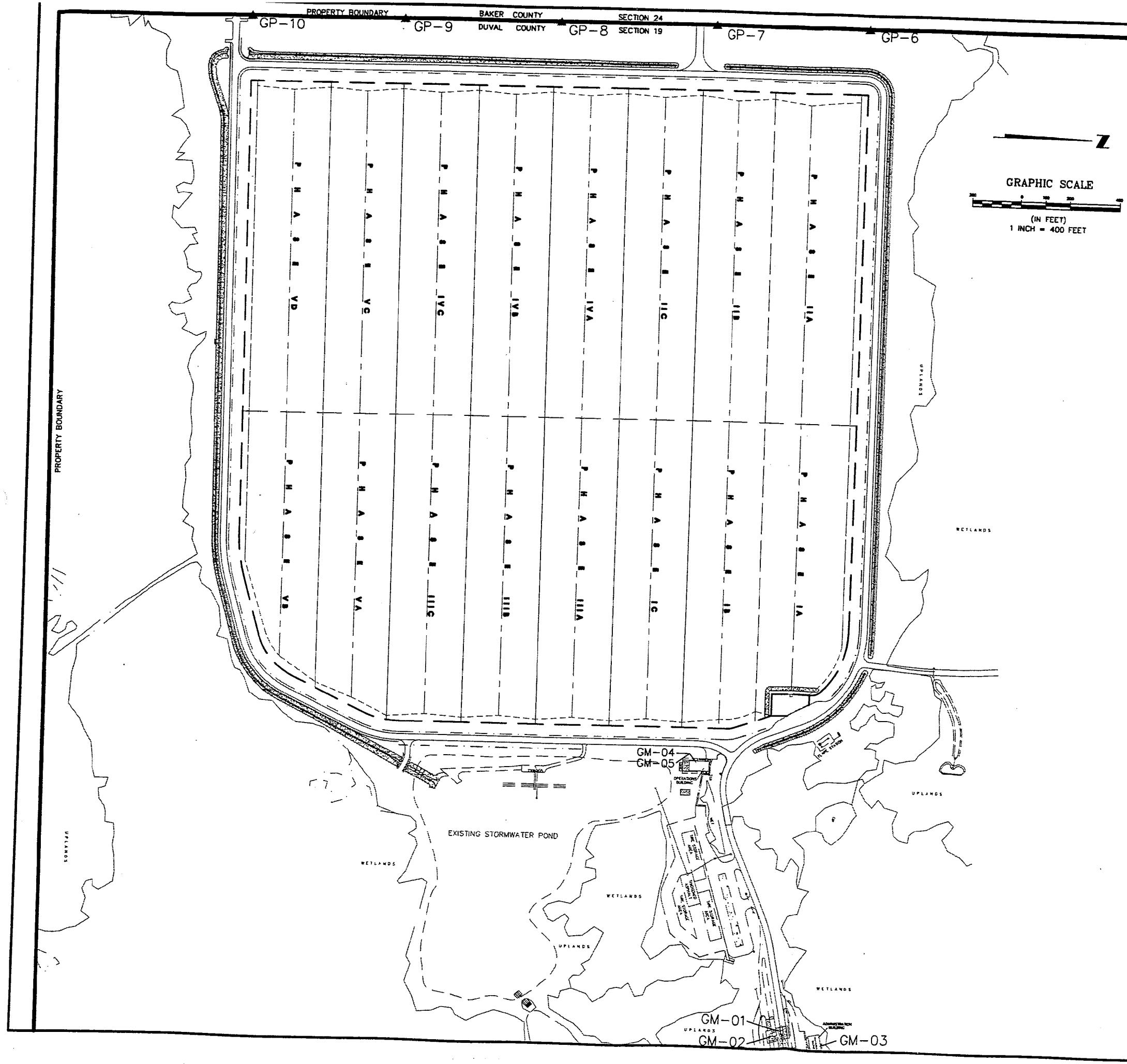
Trail Ridge Landfill

Jacksonville, Florida



Detailed Plan View of Wetland Irrigation System

Project No.	EJ02131.00
Date	September 2002
Figure No. 3	



DEP003762

REVISIONS:

ETM NO. 02-025
DRAWN BY: S.J.L.
DESIGNED BY: J.B.C.
CHECKED BY: J.B.C.
DATE: SEPTEMBER 23, 2002

GAS PROBE PLAN

TRAIL RIDGE LANDFILL PERMIT RENEWAL
FOR
TRAIL RIDGE LANDFILL, INC.

England-Thims & Miller, Inc.
ENGINEERS - PLANNERS - SURVEYORS - LANDSCAPE ARCHITECTS
14775 ST. AUGUSTINE ROAD JACKSONVILLE, FLORIDA 32258
CERTIFICATE OF AUTHORIZATION NUMBER: 2584
PHONE NUMBER (904) 642-8990 FAX NUMBER (904) 646-9485

DRAWING NO.

APPENDIX F

England-Thims & Miller, Inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS

Principals
James E England, P E , CEO
Douglas C Miller, P E , President
N Hugh Mathews, P E , Exec V P
Joseph A Tarver, Exec., V P
Juanitta Bader Clem, P.E., V.P.
Scott A. Wild, P.E., P.S.M., V.P.

Fax Transmission

To:	Julia Boesch	**Date:**	October 23, 2003
From:	Juanitta Bader Clem	**Pages:**	8, including this cover sheet.
Reference:	Trail Ridge Landfill Permit Renewal		
ETM No.:	02-025		

If you do not receive all pages or have difficulty reading this document, please contact Juanitta Clem at (904) 642-8990.

Dear Julia:

Please see the attached letter and technical memorandum regarding the draft permit for the referenced project. We would like to meet with you next week to review these comments.

If you have any questions, please feel free to give me a call.

Sincerely,

Juanitta Clem

Attachment

England-Thims & Miller, Inc.
ENGINEERS • PLANNERS • SURVEYORS • GIS • LANDSCAPE ARCHITECTS

Principals
Douglas C. Miller, P.E., CEO
N. Hugh Mathews, P.E., President
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Scott A. Wild, P.E., PSM, V.P.
Samuel R. Crissinger, CPA, V.P.
Robert A. Mizell, Jr., P.E., V.P.
Bryan R. Stewart, V.P.

Emeritus
James E. England, P.E.
Robert E. Thims

October 24, 2003

Ms. Mary Nogas, P. E.
Department of Environmental Protection
7825 Baymeadows Way, Suite B-200
Jacksonville, Florida 32256

Reference: Trail Ridge Landfill
FDEP File Numbers 13493-010 and 13493-011
ET&M Project No. 02-025-03

Dear Ms. Nogas:

In conjunction with Trail Ridge Landfill, Inc., we have reviewed the draft permit for the referenced project and have the following comments that we would like to discuss with the Department:

1. Page 1 – The location of the geosynthetic clay layer is below the secondary liner in Phases IA, IB, IC, IIA, IIB, and IIC.

2. Page 6, Specific Condition No. 3, Other Applicable Permits – This condition requires the applicant to obtain all necessary permits including the Suwannee Water Management District, which should be changed to the St. Johns River Water Management District.

3. Page 7, Specific Condition No. 6, Permit Renewal – The May 24, 2011 deadline for renewing the permit is not consistent with the permit expiration date.

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12. Page 15, Specific Condition No. 27, Subsection c., the Permittee is limited to an eight foot high pile of processed tires, whereas Rule 62-711.540(4), FAC allows for a ten foot high pile.

    In Subsection e., the Department referenced FAC Rule 62-701.711(530)(5) which should be Rule 62-711.530(5).

13. Page 17, Specific Condition 32A – It is requested that the words "as initial cover" be added to the end of the last sentence of the first paragraph of this condition. Further, under the section called "Records," it is requested that the word "material" in the first two sentences be changed to "contaminated soil" for clarity.

14. Pages 18-19, Specific Condition No. 33, Wet Weather Area – It may not be possible to always locate the wet weather area on an interior slope and why is that an issue? Further, why is the Department so concerned with the leachate ponding in the wet weather area? The fifth sentence should be split into two sentences. (The wet weather area shall have either initial or intermediate cover. The facility shall apply either initial cover or tarp approved by specific condition number 30 of this permit to the wet weather area at the end of the workday.)

    Also, the last sentence should be stricken because the word heavy is not defined. The facility in the past has shown it can operate during rain events.

15. Page 19, Specific Condition No. 34, Inspection – This condition requires that the active areas be inspected on a weekly basis and the closed areas at a minimum on a monthly basis. It was agreed during the permitting process to conduct inspections on a monthly basis and after major storm events.

16. Pages 19-20, Specific Condition No. 35, Gas Monitoring Probes – Subsection a. references Attachment 8 which is the same as Attachment 6.

17. Page 20, Specific Condition No. 36, Gas Monitoring Well Maintenance – This condition also references Attachment 8, which is the same as Attachment 6. The proposed condition requires that the repair or replacement of a gas monitoring well/probe have a construction completion report from the "professional engineer or professional geologist in charge of installation". Why does it warrant a professional engineer or professional geologist?

18. Page 21, Specific Condition No. 37, Contingency Operations – First, there are two Subsections "b". The second Subsection b. requires that the facility cease accepting waste in the event of a fire at the working face and not recommence waste acceptance activities until the fire is extinguished or the Permittee obtains authorization from the Department. This is not acceptable since the operations can be moved to the wet weather area during such a situation.

19. Page 21, Specific Condition No. 38b, Action Leachate Leakage Rate - This condition requires that the quantity of leachate collected be recorded Monday through Friday at a minimum and "any other day the facility is operating, at a minimum". Please clarify whether the Permittee is required to record the flow on Saturdays.

    Also in the third sentence, after the word "manometer," the words "or equivalent device" should be added.

20. Page 22, Specific Condition No. 38d, Pump Station and flow meter maintenance – Please note that the flow in the leachate collection system is from west to east.

21. Pages 23-25, Specific Condition No. 39, Leachate Monitoring - The first sentence indicates that the leachate monitoring schedule shall be conducted in conjunction with the groundwater monitoring schedule specified in Specific Condition No. 41o. The reference condition appears to be a typographical error and should be Specific Condition 48o. Rule 62-701.510(6)(c)1., FAC requires leachate sampling and analysis annually. We hereby request that the semi-annual requirement for sampling leachate be deleted and the facility be required to monitor leachate for the list of parameters on an annual basis only. Further, why does the sampling require "Those parameter listed in 40CFR Part 258, Appendix I" which is not in the listed parameters in Rule 62-701.510(8)(e), FAC? Further, on page 24, second paragraph, please explain the reference to "Biological evaluations."

22. Pages 25-27, Specific Condition No. 41, Closure Phasing Plan and Final Cover Application – In Subsection a., the last sentence references Specific Condition No. 15 which should be Specific Condition No. 19.

In Subsection b., it is stated that "All earthen materials shall be uncontaminated". Please clarify whether an analysis must be conducted on all earthen materials used in closures. Further, for the final cover system design, the Department indicated "**minimum** 40 mil geomembrane." We hererby request that the word "minimum" be changed to "average thickness" per F.A.C. Rule 60-701.600(5)(f)4.

23. Page 27, Specific Condition No. 42, Non-authorized, Subsection b - Should include reuse of processed waste tires for initial cover.

24. Page 29, Specific Condition No. 46 - This condition references obtaining a Title V Air Operating Permit. The facility has a Title V permit. Further, the proposed condition indicates that a landfill is subject to Subpart WWW if the design capacity is equal to or greater than 2.5 million Megagrams or 2.5 million cubic meters. In Subpart WWW rules, it states 2 5 Megagrams **and** 2.5 million cubic meters (i.e., it has to meet both conditions).

25. Page 33, Specific Condition No. 48j, Groundwater Monitoring Requirements, the initial sampling of the wells has been completed so this condition is no longer relevant and should be deleted.

26. Page 33. Specific Condition No. 48l – Since the report submittal deadline is more clearly stated in Specific Condition No. 48m, we hereby request the following be removed from the condition, "The Permittee shall submit to the Department the results of the groundwater monitoring well water quality analysis no later than the fifteenth (15) day of the month following the end of the sampling period."

27. In addition to the above comments, please see the attached Technical Memorandum from Steve Clarke with Waste Management.

We would greatly appreciate if we can discuss the aforementioned comments with you at your earliest convenience. If you have any questions, please feel free to give me a call.

Sincerely,
ENGLAND, THIMS & MILLER, INC.

Juanitta Bader Clem, P.E.
Vice President

cc: Greg Mathes
Achaya Kelapanda
Mark Behel
Steve Clarke
Chris Pearson

WASTE MANAGEMENT

TECHNICAL MEMORANDUM

TO: MARK BEHEL, WASTE MANAGEMENT; JUANITTA BADDER-CLEM, ETM

FROM: STEVE CLARKE, DIRECTOR - WASTE MANAGEMENT GROUNDWATER PROGRAMS

SUBJECT: TRAIL RIDGE LANDFILL – GROUNDWATER RELATED PERMIT ISSUES

DATE: 10/23/03

CC: GREG MATHES, WASTE MANAGEMENT

PROPOSED TRAIL RIDGE LANDFILL PERMIT GROUNDWATER RELATED ISSUES

There are several groundwater and leachate related permit conditions that are no longer required regulatorily. The specific conditions in the Trail Ridge permit should be modified to reflect the most current regulatory requirements. Following are comments specific to the groundwater and leachate related permit conditions:

Specific Condition 39, Issue 1: Semi-Annual Leachate Monitoring

Permit Condition

- Page 23, last paragraph: Leachate Monitoring. Leachate shall be sampled semi-annually in conjunction with the groundwater monitoring schedule ... A composite sample will be take from the drain valve of each of the five (5) leachate collection system storage tanks and one (1) sample shall be taken from the leachate detection system storage tanks ..

Regulatory Requirement:

- FAC 62-701 510(6)(c) Routine leachate sampling 1. Leachate shall be sampled and analyzed annually for the parameters listed in paragraphs (8)(c) and (q) of this section.

Comment/Recommended Change:

- The 5/27/2001 update to the Solid Waste Regulations recognized that annual leachate monitoring is sufficient for evaluating leachate quality. Accordingly, we request that the semi-annual requirement be deleted and the facility be required to monitor leachate for listed parameters on an *annual basis* only.

Specific Condition 39, Issue 2: Detection Levels

Permit Condition:

- Page 24, 3rd paragraph: Detection levels shall be at or below groundwater standards and/or criteria. Leachate sampling results shall be reported on the attached Groundwater Monitoring Report Form ...

Regulatory Requirement:

- FAC 62-701 200 Definitions. (79) "Method detection limit" means the smallest concentration of an analyte of interest that can be measured and reported with 99 percent confidence that the concentration is greater than zero. The method detection limit shall be determined pursuant to procedures outlined in Chapter 62-160, F A C., which is hereby incorporated by reference.

Comment:

- There is no state regulatory requirement that detection levels be set at or below water quality criteria. In fact, for many analytes, there are analytical methods that can meet published FDEP water quality criteria. The 1994 Groundwater Guidance Criteria booklet recognizes this by setting the water quality criteria at the practical quantitation limit, where the health-based guidance concentration is lower than what can reasonably be measured in a laboratory. Further, proposed changes to Chapters 62-770 (petroleum), 62-782 (dry-cleaning solvents) and 62-785 (brown fields), developed through workshops, recognize the problems of reporting and quantifying analytical data at low levels by defining the Best achievable detection limit (BADL) as the practical quantitation limit.

  We request that the text be changed to the following *Reporting levels shall be at or below groundwater standards and/or criteria, unless dilution of the sample is necessary due to interferences or the method detection limit, as defined by FAC 62-160, is higher than a specific criteria.*

England · Thims & Miller, Inc.
ENGINEERS • PLANNERS • SURVEYORS • GIS • LANDSCAPE ARCHITECTS
14775 St. Augustine Road, Jacksonville, FL. 32258
(904) 642-8990 Fax: (904) 646-9485 http://www.etminc.com

LETTER OF TRANSMITTAL

To: Department of Environmental Protection
ATTN: Mary Nogas
Address: 7825 Baymeadows Way
Suite B-200
Jacksonville, Florida 32256

Date: October 23, 2003
Job No: 02-025-03
Reference: Trail Ridge Landfill

VIA: **COURIER**

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Draft Permit with attached Comments

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
2003 OCT 24 A 10:49
NORTHEAST DISTRICT JACKSONVILLE, FL

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ for corrected prints
☐ Review and comment ☐ _____
☐ FOR BIDS DUE _____, 2003 ☐ PRINTS RETURNED AFTER LOAN TO US

Remarks If you have any quuestions, please contact us.

COPY TO: Achaya Kelapanda, Mark Behel, Greg Mathes, Steve Clarke, Chris Pearson, File

SIGNED: Beth Ann Dutton
Beth Ann Dutton for Juanitta Clem

G:\LANDFILL\TRAIL\permit\transmit.DEP.MN.doc

England-Thims & Miller, Inc.
ENGINEERS • PLANNERS • SURVEYORS • GIS • LANDSCAPE ARCHITECTS

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Emeritus
James E. England, P.E.
Robert E. Thims

October 24, 2003

Ms. Mary Nogas, P. E.
Department of Environmental Protection
7825 Baymeadows Way, Suite B-200
Jacksonville, Florida 32256

Reference: Trail Ridge Landfill
FDEP File Numbers 13493-010 and 13493-011
ET&M Project No. 02-025-03

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27. In addition to the above comments, please see the attached Technical Memorandum from Steve Clarke with Waste Management.

We would greatly appreciate if we can discuss the aforementioned comments with you at your earliest convenience. If you have any questions, please feel free to give me a call.

Sincerely,
ENGLAND, THIMS & MILLER, INC.

Juanitta Bader Clem, P.E.
Vice President

cc: Greg Mathes
Achaya Kelapanda
Mark Behel
Steve Clarke
Chris Pearson

WASTE MANAGEMENT

TECHNICAL MEMORANDUM

TO: MARK BEHEL, WASTE MANAGEMENT, JUANTITA BADDER-CLEM, ETM

FROM: STEVE CLARKE, DIRECTOR - WASTE MANAGEMENT GROUNDWATER PROGRAMS

SUBJECT: TRAIL RIDGE LANDFILL – GROUNDWATER RELATED PERMIT ISSUES

DATE: 10/23/03

CC: GREG MATHES, WASTE MANAGEMENT

PROPOSED TRAIL RIDGE LANDFILL PERMIT GROUNDWATER RELATED ISSUES

There are several groundwater and leachate related permit conditions that are no longer required regulatorily. The specific conditions in the Trail Ridge permit should be modified to reflect the most current regulatory requirements. Following are comments specific to the groundwater and leachate related permit conditions:

Specific Condition 39, Issue 1: Semi-Annual Leachate Monitoring

Permit Condition

- Page 23, last paragraph: Leachate Monitoring. Leachate shall be sampled semi-annually in conjunction with the groundwater monitoring schedule ... A composite sample will be take from the drain valve of each of the five (5) leachate collection system storage tanks and one (1) sample shall be taken from the leachate detection system storage tanks ...

Regulatory Requirement:

- FAC 62-701.510(6)(c) Routine leachate sampling 1. Leachate shall be sampled and analyzed annually for the parameters listed in paragraphs (8)(c) and (d) of this section.

Comment/Recommended Change:

- The 5/27/2001 update to the Solid Waste Regulations recognized that annual leachate monitoring is sufficient for evaluating leachate quality. Accordingly, we request that the semi-annual requirement be deleted and the facility be required to monitor leachate for listed parameters on an *annual basis* only.

Specific Condition 39, Issue 2: Detection Levels

Permit Condition:

- Page 24, 3rd paragraph: Detection levels shall be at or below groundwater standards and/or criteria. Leachate sampling results shall be reported on the attached Groundwater Monitoring Report Form ...

Regulatory Requirement:

- FAC 62-701.200 Definitions: (79) "Method detection limit" means the smallest concentration of an analyte of interest that can be measured and reported with 99 percent confidence that the concentration is greater than zero. The method detection limit shall be determined pursuant to procedures outlined in Chapter 62-160, F.A.C., which is hereby incorporated by reference.

Comment:

- There is no state regulatory requirement that detection levels be set at or below water quality criteria. In fact, for many analytes, there are analytical methods that can meet published FDEP water quality criteria. The 1994 Groundwater Guidance Criteria booklet recognizes this by setting the water quality criteria at the practical quantitation limit, where the health-based guidance concentration is lower than what can reasonably be measured in a laboratory. Further, proposed changes to Chapters 62-770 (petroleum), 62-782 (dry-cleaning solvents) and 62-785 (brown fields), developed through workshops, recognize the problems of reporting and quantifying analytical data at low levels by defining the Best achievable detection limit (BADL) as the practical quantitation limit.

  We request that the text be changed to the following: *Reporting levels shall be at or below groundwater standards and/or criteria, unless dilution of the sample is necessary due to interferences or the method detection limit, as defined by FAC 62-160, is higher than a specific criteria.*

PROPOSED TRAIL RIDGE LANDFILL PERMIT
GROUNDWATER RELATED ISSUES (CONTINUED)

Specific Condition 39, Issue 3: Leachate Reporting

Permit Condition:

- Page 24, 3rd paragraph: Detection levels shall be at or below groundwater standards and/or criteria. Leachate sampling results shall be reported on the attached Groundwater Monitoring Report Form ...

Comment:

- Reporting of data in electronic format, as an alternative, should be allowed. See comments, below, for recommended changes.

Specific Condition 48, Issue 2: Groundwater Sampling Results Reporting

Permit Condition:

- Page 32, Condition 48 l.: Groundwater sampling reports shall be reported on the attached Parameter Monitoring Report Form ... In order to facilitate entry ...

Regulatory Requirement:

- F.A.C. 62-701.510(9) Water quality monitoring reporting. (a) The landfill owner or operator shall report all water quality and leachate monitoring results to the Department semi-annually ... Water quality data contained in the report may be submitted to the Department electronically, and may be used in place of written copies of the data, if approved by the Department in the permit....

Comment:

- We request that the permit be modified to allow for reporting of analytical data in an electronic format. This will facilitate reporting of the data, reduce paper work, and will eliminate potential data entry errors when transferring data from the state forms.

  We request that the following sentence be added to this section and to the above referenced paragraph in Specific Condition 39 (Leachate Reporting): *Upon Department approval, groundwater and leachate analytical data may be submitted to the Department electronically, in lieu of the state forms.*

Specific Condition 48, Issue 3: Groundwater Resampling and Reporting

Permit Condition:

- Page 35, Condition 48 p.: If, at any time, groundwater standards and/or criteria are exceeded, or if parameter concentrations are significantly above unaffected background water quality, the Permittee shall notify the Department within seventy-two (72) hours of the discovery and resample the monitor well(s) to verify the contamination analysis within fourteen (14) days from the date the Permittee receives the results...

Regulatory requirement

- FAC 62-701.510(7)(a) Evaluation monitoring. If monitoring parameters are detected in detection wells in concentrations which are significantly above background water quality ...the Permittee may resample the wells within 30 days after the sampling data is received, to confirm the data.... Should the Permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. If the data is confirmed, or if the Permittee chooses not to resample, the Permittee shall notify the Department in writing within 14 days of this finding.

Comment

- We would request that FDEP change the language to *require Department notification within 14 days after verification and to allow a resample within 30 days of receipt of results*, consistent with the FDEP solid waste regulations. As the condition currently stands, 72-hour notification is often trigged by laboratory contamination issues (false positives). In addition, FDEP agreed in the 5/27/2001 update to the SW regulations, that 30 days is appropriate.

Specific Condition 41, Issue 4: Assessment Monitoring

Permit Condition:

1. Page 35, Condition 48 p., 3rd paragraph: *If the groundwater standards and/or criteria are exceeded in a detection well ... the Permittee shall implement the Assessment Monitoring and Corrective Action requirements of F.A.C. Rule 62-701.510*

Comment:

The language in FAC 62-701.510(7)(b) has been changed to the effect that, under FAC 62-701.510(7)(b)(1), "Evaluation Monitoring" replaces "Assessment Monitoring. In addition, exceedances in detection wells require "Preventative Action" if the water quality criteria are exceeded beyond the ZOD. Similarly, Corrective action is requirements are specified for compliance wells under FAC 62-701.510(7)(b)(2). The permit should changed to be consistent with the language in the regulation.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST DISTRICT
7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256-7590

Interoffice Memorandum

TO: Julia Boesch
Solid Waste

THROUGH: Ken Kohn
Industrial Wastewater

FROM: Dean Setiono
Industrial Wastewater

DATE: January 10, 2003

SUBJECT: Duval County – Stormwater Review
Trail Ridge Landfill – First RAI Response

My stormwater review of the First RAI Response for Trail Ridge Landfill is complete, based upon the information provided on December 16, 2002. Based on my review, comments number 12 in the First RAI Response adequately addressed the capacity, flow rate and velocity for the terrace swales. Therefore additional stormwater RAI regarding the terrace swales will not be necessary.

If you have any questions concerning this matter, please feel free to contact me.

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TRAIL RIDGE LANDFILL, INC.
A WASTE MANAGEMENT COMPANY

5110 U.S. Highway 301 South
Baldwin, FL 32234-3608
(904) 289-9100
(904) 289-9013 Fax

June 11, 2002

Mr. Richard Robinson
Air Pollution Permitting Section
Regulatory and Environmental Services Department
117 West Duval Street, Suite 225
Jacksonville, Florida 32202

Re: Submittal of 2002 Annual NSPS Report
Landfill Gas Management System
Trail Ridge Landfill, Inc.
Title V Permit No.: 0310358-002-AV

Dear Mr. Robinson:

Enclosed, please find two (2) copies of the annual report of information required by 40 CFR 60.757(f)(1) through (f)(6) as listed on page 18 of the Trail Ridge Landfill Final Title V Air Operations Permit. This annual report submittal contains information for the annual period of June 2001 through May 2002. Trail Ridge Landfill, Inc. contracted with Waste Energy Technology, LLC (WET) to prepare this report.

If you have any questions or comments, please call me at (904) 289-9100.

Sincerely,

Greg Mathes
Director of Landfill Operations

GM:lh
Enclosures

cc: Ms. Mary Nogas, PE, w/o encl.
Mr. L. Chris Pearson, w/encl.
Ms. Carolyn McCreedy, w/o encl.
Mr. Achaya Kelapanda, w/o encl.

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14775 St. Augustine Road, Jacksonville, FL. 32258
(904) 642-8990 Fax: (904) 646-9485 http://www.etminc.com

LETTER OF TRANSMITTAL

To:	Department of Environmental Protection	**Date:**	October 23, 2003
ATTN:	Mary Nogas	**Job No:**	02-025-03
Address:	7825 Baymeadows Way	**Reference:**	Trail Ridge Landfill
	Suite B-200		
	Jacksonville, Florida 32256		
		VIA:	**COURIER**

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of Letter ☐ Change Order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Draft Permit with attached Comments

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
2003 OCT 24 A 10:49
NORTHEAST DISTRICT JACKSONVILLE, FL

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ for corrected prints

☐ Review and comment ☐ _____

☐ FOR BIDS DUE _____, 2003 ☐ PRINTS RETURNED AFTER LOAN TO US

Remarks If you have any quuestions, please contact us.

COPY TO: Achaya Kelapanda, Mark Behel, Greg Mathes, Steve Clarke, Chris Pearson, File

SIGNED: Beth Ann Dutton
Beth Ann Dutton for Juanitta Clem

G:\LANDFILL\TRAIL\permit\transmit.DEP.MN.doc

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Douglas C. Miller, P.E., CEO
N. Hugh Mathews, P.E., President
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Juanitta Bader Clem, P.E., V.P.
Scott A. Wild, P.E., PSM, V.P.
Samuel R. Crissinger, CPA, V.P.
Robert A. Mizell, Jr., P.E., V.P.
Bryan R. Stewart, V.P.

Emeritus
James E. England, P.E.
Robert E. Thims

October 24, 2003

Ms. Mary Nogas, P. E.
Department of Environmental Protection
7825 Baymeadows Way, Suite B-200
Jacksonville, Florida 32256

Reference: Trail Ridge Landfill
FDEP File Numbers 13493-010 and 13493-011
ET&M Project No. 02-025-03

Dear Ms. Nogas:

In conjunction with Trail Ridge Landfill, Inc., we have reviewed the draft permit for the referenced project and have the following comments that we would like to discuss with the Department:

1. Page 1 – The location of the geosynthetic clay layer is below the secondary liner in Phases IA, IB, IC, IIA, IIB, and IIC.

2. Page 6, Specific Condition No. 3, Other Applicable Permits – This condition requires the applicant to obtain all necessary permits including the Suwannee Water Management District, which should be changed to the St. Johns River Water Management District.

3. Page 7, Specific Condition No. 6, Permit Renewal – The May 24, 2011 deadline for renewing the permit is not consistent with the permit expiration date.

4. Page 7. Specific Condition No. 9, Design Elevations and Annual Survey - The Permittee must submit the annual survey within 30 days of conducting the survey. The previous permit required 60 days. Thirty days is not sufficient time. Further, the condition requires that the survey include "all points designed for terraces and the location of the toes of the sideslopes". Will the contours be sufficient? Further, Specific Condition No. 11 on Page 8 requires the remaining site life and capacity to be submitted between July 1 and September 1 of each year. These data are determined from the annual aerial survey as well. We propose to have the elevations, remaining site life, and capacity submitted all together between July 1 and September 1.

5. Page 7, Specific Condition No. 10, Financial Assurance – Per this condition, the deadline for submittal of the annual audit is "December 31 of each year, unless a Single Audit accounting system is utilized, then the audit shall be submitted by March 31 of the following year". However, Rule 62-701.630(5)(c), FAC, requires filing "no later than March 31 of the following year."

6. Pages 8-9, Specific Condition No. 14a, Active Gas Collection System, Authorization and Permits – The reference to passive flares in the last sentence of this condition could be deleted since the facility has an operating active gas collection system.

14775 ST. AUGUSTINE RD. • JACKSONVILLE, FL 32258 • TEL: (904) 642-8990 • FAX: (904) 646-9485
CA – 00002584 • www.etminc.com • LC – 0000316

7. Page 10, Specific Condition No. 14g - This condition requires that a temporary header that is inoperable be severed and abandoned. The permit should allow for rehabilitation of the header should it be feasible.

8. Page 11, Specific Condition No. 16, Operating Personnel - The following sentence "Also for the same amount of waste during the peak hours of 10:00 a.m. to 3:00 p.m. the same minimum personnel shall be provided." is confusing. The phrase "same minimum" requirement must be clarified because in one case there are six persons required and in the other case, five persons are required.

9. Page 12, Specific Condition No. 18, Maximum Daily Tonnage - The maximum tonnage has been set at 5000 tons (except during emergency situations) with a minimum of 9 people (2 spotters, 3 laborers and 4 equipment operators). However, based upon the "matrix", 9 people are required during the peak hours only (6:00 AM - 7:00 AM and 10:00 AM – 3:00 PM).

10. Page 12, Specific Condition No. 19, Fill Phasing Plan - The third sentence should be revised as follows: "The facility shall place waste ~~in~~ and conduct operations in a manner to prevent the ponding of ~~leachate~~ stormwater in waste, the mixing of leachate with stormwater, and the running off of leachate into the stormwater system."

11. Page 13, Specific Condition No. 21, Waste Inspection at the Working Face – This requires that the solid waste be "completely inspected", prior to compaction. This is not consistent with landfill operations (waste is spread and compacted at the same time).

12. Page 15, Specific Condition No. 27, Subsection c., the Permittee is limited to an eight foot high pile of processed tires, whereas Rule 62-711.540(4), FAC allows for a ten foot high pile.

    In Subsection e., the Department referenced FAC Rule 62-701.711(530)(5) which should be Rule 62-711.530(5).

13. Page 17, Specific Condition 32A – It is requested that the words "as initial cover" be added to the end of the last sentence of the first paragraph of this condition. Further, under the section called "Records," it is requested that the word "material" in the first two sentences be changed to "contaminated soil" for clarity.

14. Pages 18-19, Specific Condition No. 33, Wet Weather Area – It may not be possible to always locate the wet weather area on an interior slope and why is that an issue? Further, why is the Department so concerned with the leachate ponding in the wet weather area? The fifth sentence should be split into two sentences. (The wet weather area shall have either initial or intermediate cover. The facility shall apply either initial cover or tarp approved by specific condition number 30 of this permit to the wet weather area at the end of the workday.)

    Also, the last sentence should be stricken because the word heavy is not defined. The facility in the past has shown it can operate during rain events.

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Sincerely,
ENGLAND, THIMS & MILLER, INC.

Juanitta Bader Clem, P.E.
Vice President

cc: Greg Mathes
Achaya Kelapanda
Mark Behel
Steve Clarke
Chris Pearson

WASTE MANAGEMENT

TECHNICAL MEMORANDUM

TO: MARK BEHEL, WASTE MANAGEMENT, JUANTITA BADDER-CLEM, ETM

FROM: STEVE CLARKE, DIRECTOR - WASTE MANAGEMENT GROUNDWATER PROGRAMS

SUBJECT: TRAIL RIDGE LANDFILL – GROUNDWATER RELATED PERMIT ISSUES

DATE: 10/23/03

CC: GREG MATHES, WASTE MANAGEMENT

PROPOSED TRAIL RIDGE LANDFILL PERMIT GROUNDWATER RELATED ISSUES

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Permit Condition

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Regulatory Requirement:

- FAC 62-701.510(6)(c) Routine leachate sampling 1. Leachate shall be sampled and analyzed annually for the parameters listed in paragraphs (8)(c) and (d) of this section.

Comment/Recommended Change:

- The 5/27/2001 update to the Solid Waste Regulations recognized that annual leachate monitoring is sufficient for evaluating leachate quality. Accordingly, we request that the semi-annual requirement be deleted and the facility be required to monitor leachate for listed parameters on an *annual basis* only.

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Regulatory Requirement:

- FAC 62-701.200 Definitions: (79) "Method detection limit" means the smallest concentration of an analyte of interest that can be measured and reported with 99 percent confidence that the concentration is greater than zero. The method detection limit shall be determined pursuant to procedures outlined in Chapter 62-160, F.A.C., which is hereby incorporated by reference.

Comment:

- There is no state regulatory requirement that detection levels be set at or below water quality criteria. In fact, for many analytes, there are analytical methods that can meet published FDEP water quality criteria. The 1994 Groundwater Guidance Criteria booklet recognizes this by setting the water quality criteria at the practical quantitation limit, where the health-based guidance concentration is lower than what can reasonably be measured in a laboratory. Further, proposed changes to Chapters 62-770 (petroleum), 62-782 (dry-cleaning solvents) and 62-785 (brown fields), developed through workshops, recognize the problems of reporting and quantifying analytical data at low levels by defining the Best achievable detection limit (BADL) as the practical quantitation limit.

  We request that the text be changed to the following: *Reporting levels shall be at or below groundwater standards and/or criteria, unless dilution of the sample is necessary due to interferences or the method detection limit, as defined by FAC 62-160, is higher than a specific criteria.*

WASTE MANAGEMENT

PROPOSED TRAIL RIDGE LANDFILL PERMIT
GROUNDWATER RELATED ISSUES (CONTINUED)

Specific Condition 39, Issue 3: Leachate Reporting

Permit Condition:

- Page 24, 3rd paragraph: Detection levels shall be at or below groundwater standards and/or criteria. Leachate sampling results shall be reported on the attached Groundwater Monitoring Report Form ...

Comment:

- Reporting of data in electronic format, as an alternative, should be allowed. See comments, below, for recommended changes.

Specific Condition 48, Issue 2: Groundwater Sampling Results Reporting

Permit Condition:

- Page 32, Condition 48 l.: Groundwater sampling reports shall be reported on the attached Parameter Monitoring Report Form ... In order to facilitate entry ...

Regulatory Requirement:

- F.A.C. 62-701.510(9) Water quality monitoring reporting. (a) The landfill owner or operator shall report all water quality and leachate monitoring results to the Department semi-annually ... Water quality data contained in the report may be submitted to the Department electronically, and may be used in place of written copies of the data, if approved by the Department in the permit....

Comment:

- We request that the permit be modified to allow for reporting of analytical data in an electronic format. This will facilitate reporting of the data, reduce paper work, and will eliminate potential data entry errors when transferring data from the state forms.

  We request that the following sentence be added to this section and to the above referenced paragraph in Specific Condition 39 (Leachate Reporting): *Upon Department approval, groundwater and leachate analytical data may be submitted to the Department electronically, in lieu of the state forms.*

Specific Condition 48, Issue 3: Groundwater Resampling and Reporting

Permit Condition:

- Page 35, Condition 48 p.: If, at any time, groundwater standards and/or criteria are exceeded, or if parameter concentrations are significantly above unaffected background water quality, the Permittee shall notify the Department within seventy-two (72) hours of the discovery and resample the monitor well(s) to verify the contamination analysis within fourteen (14) days from the date the Permittee receives the results...

Regulatory requirement

- FAC 62-701.510(7)(a) Evaluation monitoring. If monitoring parameters are detected in detection wells in concentrations which are significantly above background water quality ...the Permittee may resample the wells within 30 days after the sampling data is received, to confirm the data.... Should the Permittee choose not to resample, the Department will consider the water quality analysis as representative of current ground water conditions at the facility. If the data is confirmed, or if the Permittee chooses not to resample, the Permittee shall notify the Department in writing within 14 days of this finding.

Comment

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Specific Condition 41, Issue 4: Assessment Monitoring

Permit Condition:

1. Page 35, Condition 48 p., 3rd paragraph: *If the groundwater standards and/or criteria are exceeded in a detection well ... the Permittee shall implement the Assessment Monitoring and Corrective Action requirements of F.A.C. Rule 62-701.510*

Comment:

The language in FAC 62-701.510(7)(b) has been changed to the effect that, under FAC 62-701.510(7)(b)(1), "Evaluation Monitoring" replaces "Assessment Monitoring. In addition, exceedances in detection wells require "Preventative Action" if the water quality criteria are exceeded beyond the ZOD. Similarly, Corrective action is requirements are specified for compliance wells under FAC 62-701.510(7)(b)(2). The permit should changed to be consistent with the language in the regulation.

Boesch, Julia

From: Juanitta Clem [ClemJ@etminc.com]
Sent: Thursday, August 07, 2003 4:09 PM
To: Boesch, Julia
Cc: Achaya Kelapanda (E-mail); Greg Mathes (E-mail); Mark Behel (E-mail)
Subject: Trail Ridge Landfill

LeakageRevised2.doc

Dear Julia:

Please find herewith the revised Primary Liner Leakage calculations for the referenced project. I apologize for the conversion error in the previous calculations. I will have original copies delivered to you tomorrow morning.

Juanitta Clem
ENGLAND, THIMS & MILLER, INC.

<<LeakageRevised2.doc>>

Trail Ridge Landfill
Primary Liner Leakage

Although geomembranes have very low permeability, they still allow some leakage. Leakage through geomembranes can occur due to pinholes and larger holes (holes larger than the geomembrane thickness). The leakage due to pinholes is negligible compared to the larger holes and is therefore ignored. The leakage due to large holes can be calculated by Bernoulli's equation for flow through an aperture, as follows:

$$Q = 0.6\ a\ \sqrt{2gh}$$

Where:
- Q = Leakage rate through one geomembrane hole
- a = Area of geomembrane hole
- g = Acceleration of gravity = 9.81 m/s^2
- h = Head of liquid on top of geomembrane

Say:

a = 1 cm^2 (per acre) = 1 x 10^{-4} m^2

h = 5.6 mil* = 0.0056 in = 1.42 x 10^{-4} m

* The maximum head on the liner as determined in the First Permit Renewal, Appendix E, October 28, 1996.

Therefore:

$$Q = (0.6)\ (1 \times 10^{-4}\ m^2) \sqrt{\ 2\ (9.81\ m/s^2)\ (1.42 \times 10^{-4}\ m)}$$

$$Q = 3.17 \times 10^{-6}\ m^3/sec\ \text{(per acre)}$$

$$Q = 72.51\ \frac{\text{gallons}}{\text{day}}\ \text{(per acre)}$$

Assume a trigger rate at 3.5 times this rate.

$$Q_{Max} = 253.8\ \frac{\text{gallons}}{\text{day}}\ \text{(per acre)} = 1.11 \times 10^{-5}\ m^3/sec\ \text{(per acre)}$$

Check to make sure the geonet can handle the trigger rate leakage.

$t_{LCL} = (Q / k)^{1/2}$ (J.P. Giroud, 1997)

Where:

k	=	θ/t
t_{LCL}	=	Minimum Thickness of Secondary Geonet
Q	=	Maximum Flow Rate for Secondary Geonet
k	=	Hydraulic Conductivity of Secondary Geonet
θ	=	Hydraulic Transmissivity of the Secondary Geonet (m^2/sec)
t	=	Thickness of Secondary Geonet

Say:

θ	=	2.26×10^{-3} m^2/sec
t	=	200 mil = 0.2 inches = 5.1×10^{-3} m
Q	=	1.11×10^{-5} m^3/sec

Therefore:

$k = (2.26 \times 10^{-3} \text{ m}^2/\text{sec}) / (5.1 \times 10^{-3} \text{ m}) = 0.44$ m/sec

$t_{LCL} = (1.11 \times 10^{-5} \text{ m}^3/\text{sec} / 0.44 \text{ m/sec})^{1/2} = 5.02 \times 10^{-3}$ m

$= 197.7$ mil

Since the geonet has a minimum thickness of 200 mil, the geonet can handle the flow.

The smallest cell is 17.7 acres, so the flow per cell is:

$$Q_{Total} = 253.8 \frac{\text{gallons}}{\text{day} * \text{ac}} * 17.7 \text{ ac}$$

$$\Rightarrow 4{,}492.3 \frac{\text{gallons}}{\text{day}} \text{ per cell}$$