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FINAL CLOSURE PLAN FOR LANDFILLS 4 AND 5 NAS FORT WORTH TX  
5/1/2000  
EMCON/OWT



**NAVAL AIR STATION  
FORT WORTH JRB  
CARSWELL FIELD  
TEXAS**

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**ADMINISTRATIVE RECORD  
COVER SHEET**

AR File Number 522

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P.W. 17A-65

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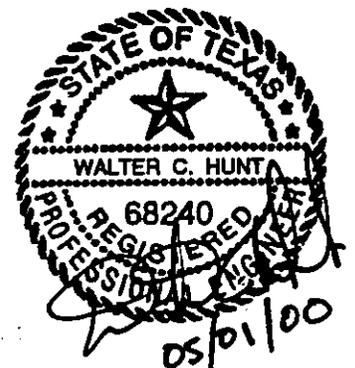
**NAVAL AIR STATION (NAS)  
FORT WORTH JOINT RESERVE BASE (JRB), TEXAS**

**FINAL CLOSURE PLAN  
FOR  
LANDFILLS NO. 4 AND NO. 5**

Prepared by

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Fort Worth, Texas 76119  
817/478-8254

Project 773015



## CONTENTS

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<b>1</b>	<b>INTRODUCTION</b>	<b>1-1</b>
<b>2</b>	<b>BACKGROUND</b>	<b>2-1</b>
	2.1 Historical	2-1
	2.2 Current Investigation	2-1
<b>3</b>	<b>FINAL COVER SYSTEM</b>	<b>3-1</b>
	3.1 Introduction	3-1
	3.2 Cover System Design	3-1
	3.3 Installation Methods and Procedures	3-1
	3.3.1 Construction Procedures	3-1
	3.3.2 Final Cover Testing Procedures	3-2
<b>4</b>	<b>CLOSING SEQUENCE</b>	<b>4-1</b>

### APPENDIX A

Drawing 1	Cover
Drawing 2	Site Map
Drawing 3	Landfill No. 4 Final Cover System
Drawing 4	Landfill No. 5 Final Cover System
Drawing 5	Final Cover System Details

## 1 INTRODUCTION

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This Final Closure Plan has been prepared to obtain Texas Natural Resource Conservation Commission (TNRCC) approval of the proposed cover system for Landfills No. 4 and No. 5 (also referred to as Solid Waste Management Unit [SWMU] No. 22 and No. 23) at Naval Air Station (NAS), Fort Worth Joint Reserve Base (JRB), Texas. Information regarding work performed at the NAS, Fort Worth JRB, including LF No. 4 and No. 5 can also be located by contacting the TNRCC Remediation Division, Carswell Air Force Base, Fort Worth, TX, TNRCC Solid Waste Registration Number 65004, Hazardous Waste Permit Number HW-50289. This final closure plan describes the steps necessary to close Landfills No. 4 and No. 5 in accordance with TNRCC regulations. The two areas are inactive and covered with soil. The existing cover soil, which ranges from 6 inches to 6 feet over the waste areas, currently represents the only type of cover for both landfills.

In order to close the landfill area, an approved Municipal Solid Waste (MSW) final cover system will be constructed for each landfill. The proposed final cover system will consist of an infiltration layer and an erosion layer. The following Final Closure Plan has been prepared in accordance with 30 Texas Administrative Code (TAC) §330.251. This plan will provide the design and specifications for the closure of these two landfills.

## 2 BACKGROUND

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### 2.1 Historical

Carswell Air Force Base (CAFB) was located on 2,555 acres of land in Tarrant County, Texas, eight miles west of downtown Fort Worth. It consisted of the main Base and two noncontiguous parcels located west of the town of White Settlement. The main Base comprised 2,264 acres and was bordered by Lake Worth to the north, the West Fork of the Trinity River, River Oaks, and Westworth Village to the east, other urban areas of Fort Worth to the northeast and southeast, White Settlement to the west and southwest, and AF Plant 4 to the west. The two MSW landfills described in the following paragraphs are within the main Base of CAFB (see Drawing 2).

Landfill No. 4 (LF-04) includes approximately nine acres of land located east of the south end of Taxiway 197. It was the main landfill during much of the history of CAFB. While in active use, at least six large pits, approximately twelve feet deep, were filled with refuse that was burned and buried. It was reported that various potentially hazardous wastes including drums of waste liquids, partially full paint cans, and cadmium batteries were reported disposed of at this site. Waste materials actually found at LF-04 are further described in Section 2.2.

Landfill No. 5 (LF-05) includes approximately three acres of land located northwest of LF-04 between Fire Training Areas 1 and 2. LF-05 is adjacent to a small tributary to Farmers Branch Creek and was constructed by building a clay berm next to the creek and filling the area behind the berm. The landfill reportedly received all types of flightline waste and refuse, which was routinely burned prior to covering. Further description of waste materials actually found at LF-05 are also described below in Section 2.2

### 2.2 Investigation For Closure

As part of the RCRA Facility Investigation (RFI) for the overall base conversion several investigations have been conducted at LF-04 and LF-05. The investigations have included installing and sampling soil borings, monitoring wells and excavating trenches, in order to identify landfill materials and limits, as well as to identify and delineate landfill-related contaminants. During the trench excavations significant amounts of medical wastes were encountered including syringes, surgical garments and gloves, IV bags and tubing, specimen bottles, test tubes, and sealed bags of medical waste. Other

waste identified at both LF-04 and LF-05 include general industrial wastes and construction debris such as metal, wood, concrete rubble, asphalt, glass, and cans. Analytical findings at LF-04 and LF-05 have included TNRCC Risk Reduction Standard No. 2 (RRS2) concentrations of volatile organic compounds (VOCs) semi-volatile organic compounds (SVOCs), inorganics, and isolated pesticides in soils. Analytical results for landfill groundwater monitoring wells have shown TNRCC Risk Reduction Standard No. 3 (RRS3) and RRS2 concentrations of VOCs in both the upgradient and downgradient directions; however, these VOCs are associated with the regional trichloroethene groundwater plume. The SVOC, bis(2-ethylhexyl)phthalate, has been sporadically detected at RRS3 concentrations in some of the downgradient landfill monitoring wells; these detections have been infrequent with a bipolar concentration range of either non-detect or RRS3 just above its practical quantitation limit.

Although the investigations noted above, did encounter various waste materials, contaminant concentrations are below the TNRCC RRS3 threshold levels. Therefore, AFCEE is pursuing attainment of closure under TNRCC Remediation Division RRS2. However, because of the discovery of the medical waste materials, an MSW final cover system will also be installed at both landfills. Since these landfills stopped receiving waste prior to October 1991, the landfills will be closed in accordance with §330.251, of the MSW regulations.

## 3 FINAL COVER SYSTEM

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### 3.1 Introduction

The final cover system for LF-04 and LF-05 was developed to incorporate the requirements of §330.251. The rules state that the closure will include installation of a multi-layer cover system.

### 3.2 Cover System Design

The final cover system for the disposal area has been designed in accordance with §330.251 and will consist of an infiltration layer of at least 18 inches of earthen material of the SC or CL classification as defined in the "United Soil Classification System." The infiltration layer will be covered with an erosion layer that consists of at least 6 inches of topsoil capable of sustaining plant growth.

The existing and proposed final contours for the landfills are shown on Drawings 3 and 4 in Appendix A. The final cover slope is at least 2 percent. Details of the final cover including a transition zone to tie-in the final cover to the surrounding topography are shown on Drawing 5.

### 3.3 Installation Methods and Procedures

#### 3.3.1 Construction Procedures

The final cover system will be constructed consistent with §330.251. The infiltration layer will be a relatively homogeneous clayey soil, placed and compacted under controlled moisture-density conditions with appropriate compaction equipment. The lift thickness will be controlled to no more than six inches to minimize the potential for water infiltration. The finished surface of the infiltration layer will be a hard and uniform surface.

The erosion layer will be placed directly over the infiltration layer. The surface of the erosion layer will be seeded, mulched, and watered as necessary to establish a vegetative

cover. Vegetation will be established to provide at least 95 percent coverage of native and introduced grasses.

### **3.3.2 Testing Procedures Prior to Cover Placement**

Testing and evaluation of the final cover system during construction and reporting of results will be performed. Prior to construction of the infiltration layer, representative samples of the material to be used for construction of the infiltration layer (i.e. the borrow source) should be tested in a geotechnical laboratory to ensure that the soils meet the requirements set forth in this closure plan.

Borrow soil will be tested to qualify each borrow source using Atterberg Limits (ASTM D 4318), Sieve Analysis (ASTM D 422 or D 1140), Moisture/Density Testing (ASTM D 698) and Coefficient of Permeability (ASTM D 5084).

In addition to soil pre-qualification procedures, surveying will also be performed in the areas of the landfills and along the perimeters to document elevations prior to cover placement. These elevations will be obtained by a registered surveyor and will be documented in the Final Closure Report to be prepared by a registered professional engineer. The surveying will typically be performed at a frequency of one survey point per 10,000 square feet of area.

### **3.3.3 Quality Assurance and Testing Frequency During Construction**

Testing of the infiltration layer will be conducted during construction to verify that the final cover meets the requirements stated in this closure plan. This testing will include Atterberg Limits (ASTM D 4318), Sieve Analysis (ASTM D 422 or D 1140) and Coefficient of Permeability (ASTM D 5084 or Corps of Engineers EM1110-2-1906 Appendix 7). This testing will be performed at a frequency of at least one test per 100,000 square feet of surface area. Additionally, field density and moisture testing will be performed as the cover is constructed. This testing will be performed at a frequency of at least one test per 10,000 square feet of surface area for each lift, with a minimum of one test per 6-inch lift.

At the completion of the installation of both the infiltration layer and erosion layer, thickness verification will be performed to ensure that the total thickness is at least 2 feet. This surveying will typically be performed at a frequency of one survey point per 10,000 square feet of area.

## 4 CLOSING SEQUENCE

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The final cover for LF-04 and LF-05 will be constructed and tested consistent with this final closure plan (see Section 3.3). The plan allows for closure of fill areas by placement of final cover, erosion control features, and establishment of vegetative cover. The procedures to complete the closure of the disposal areas are to be completed as follows:

- No later than 60 days prior to initiation of final closure activities (i.e., construction of the cover system) for the MSW landfill unit, the design and specifications will be submitted to the Executive Director for review and approval. Since this closure plan also represents the design/specification information for LF-04 and LF-05, the submittal of this plan is considered to satisfy this requirement.
- Final closure activities of the MSW landfill unit will be completed in accordance with this Final Closure Plan within 180 days following the beginning of closure. The beginning of closure is considered the time at which construction of the cover system begins.
- The final cover system layers will be constructed and testing of the various components of the final cover system will be performed in accordance with this closure plan (see Section 3.3).
- A final cover certification report, complete with an as-built survey, will be prepared by an independent registered professional engineer and submitted to the TNRCC.
- After completion of the final cover system, deed certification for LF-04 and LF-05 will be recorded in accordance with RRS2 requirements.

**APPENDIX A**

Drawing 1	Cover
Drawing 2	Site Map
Drawing 3	Landfill No. 4 Final Cover System
Drawing 4	Landfill No. 5 Final Cover System
Drawing 5	Final Cover System Details

# FINAL COVER SYSTEM DESIGN LANDFILL NO. 4 AND NO. 5

## NAVAL AIR STATION

### FORT WORTH JOINT RESERVE BASE, TEXAS

PROJECT NO. 773015

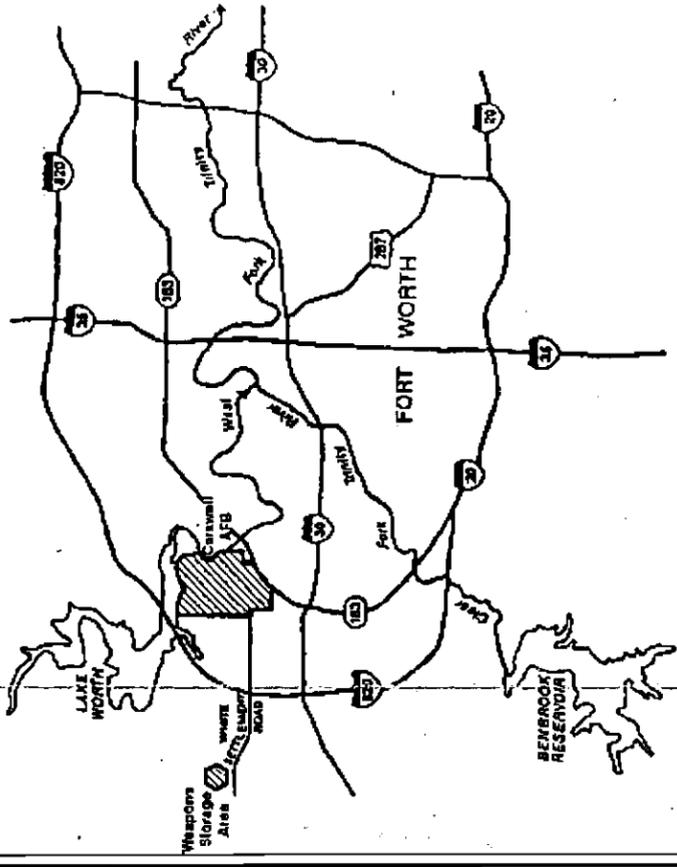
MAY 2000  
REVISED JUNE 2000

PREPARED BY:



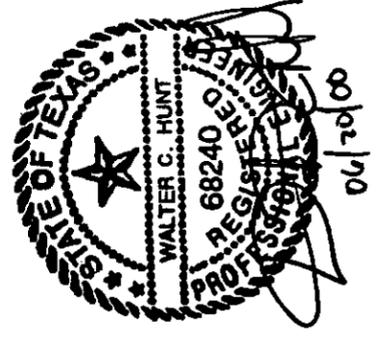
EMCON

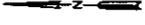
5701 E. LOOP 820 SOUTH  
FORT WORTH, TEXAS 76118-7051  
(817) 478-8264



#### INDEX

DRAWING NO.	TITLE
1	COVER SHEET
2	SITE MAP
3	LANDFILL NO. 4 - FINAL COVER SYSTEM
4	LANDFILL NO. 5 - FINAL COVER SYSTEM
5	FINAL COVER SYSTEM DETAILS





PROPERTY BOUNDARY OF AF PLANT 4

PROPERTY BOUNDARY OF CARSWELL AFB

LAKE WORTH, TEX.

SW/4 HALTOM CITY 15' QUADRANGEL  
N3245-29722.5/7.5

1955

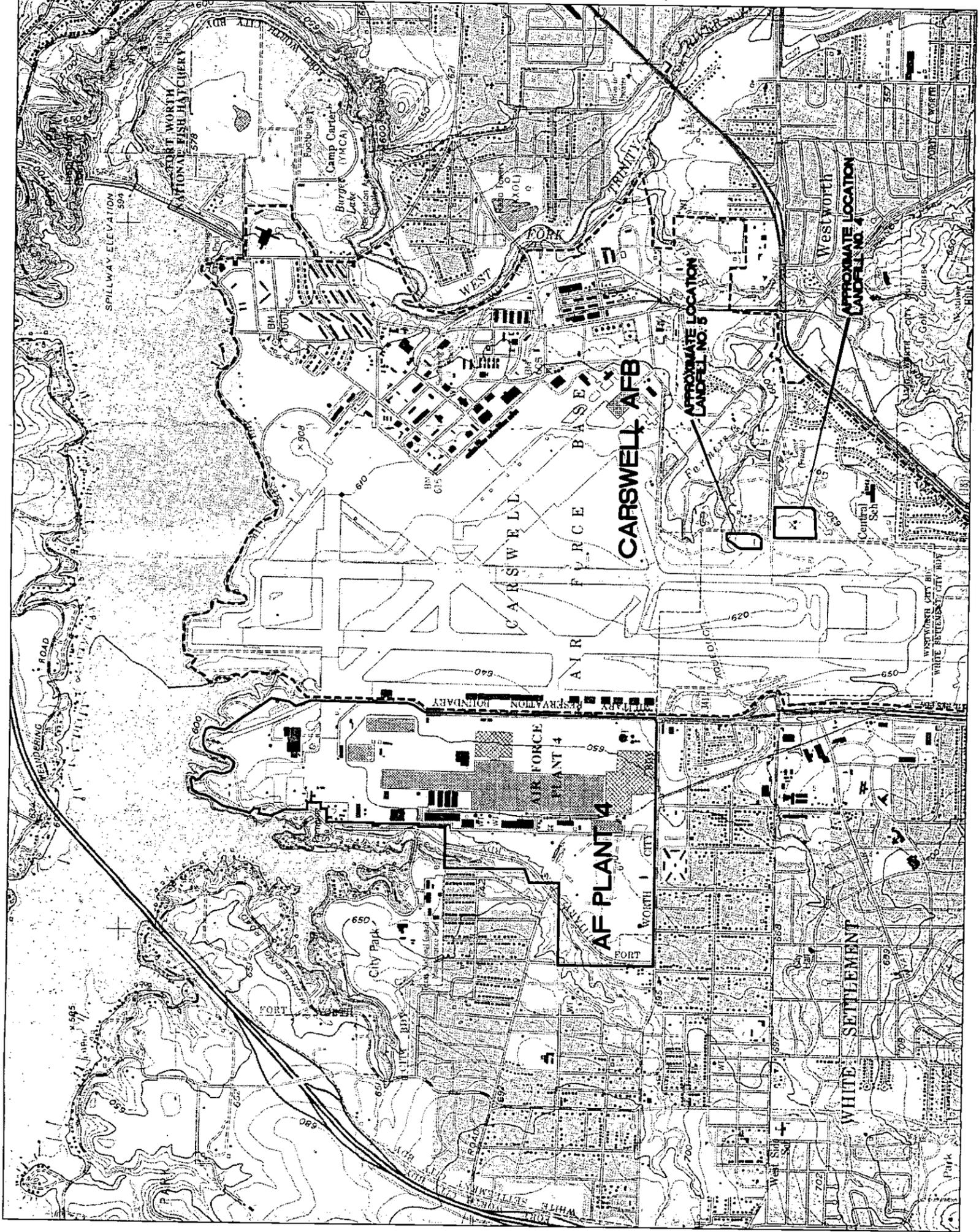
PHOTOREVISED 1982  
DMA 6549 IV SW-SERIES V882

ROAD CLASSIFICATION

Primary highway, all weather, hard surface  
Secondary highway, all weather, hard surface

Light-duty road, all weather, improved surface  
Unimproved road, fair or dry weather

Interstate Route U. S. Route State Route



REV	DATE	DESCRIPTION	CRH	CRH	CRH	WCH	WCH
01	06-00	MODIFY LANDFILL NAMES	CRH	CRH	CRH	WCH	WCH
DATE OF SCALE			DATE BY				
02	02-00	DATE OF SCALE	DATE BY				

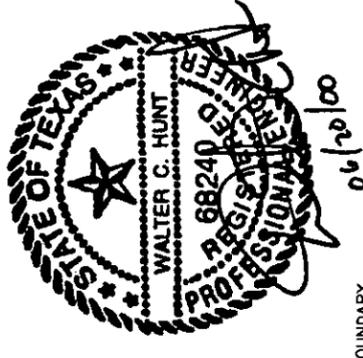


NAVAL AIR STATION  
FORT WORTH JOINT RESERVE BASE, TEXAS  
FINAL COVER SYSTEM LANDFILLS NO. 4 AND NO. 5  
SITE MAP



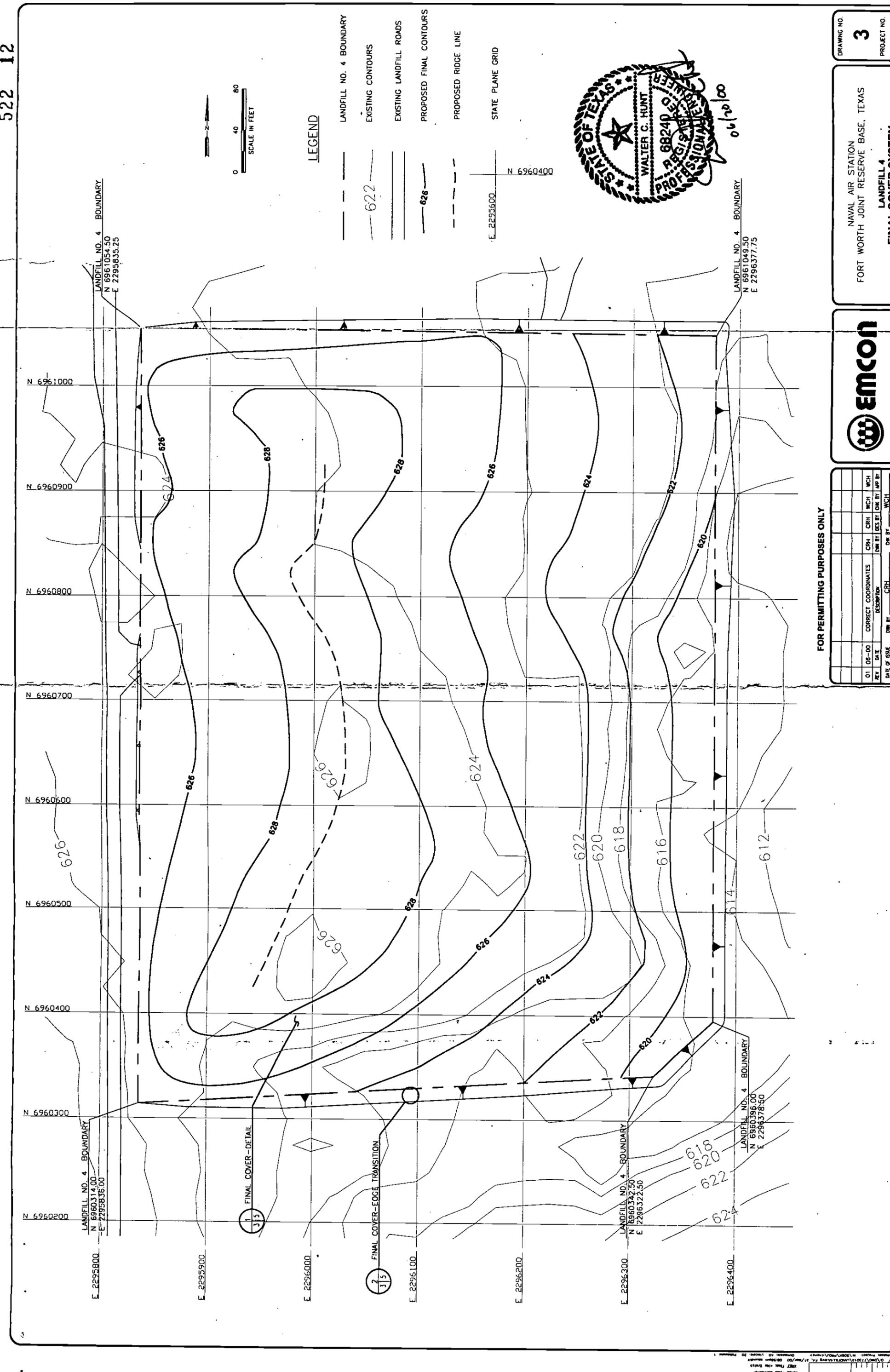
FOR PERMITTING PURPOSES ONLY

REV	DATE	DESCRIPTION	CRH	CRH	CRH	WCH	WCH
DATE OF ISSUE	DATE	DESCRIPTION	CRH	CRH	CRH	WCH	WCH
01	06-00	CORRECT COORDINATES	CRH	CRH	CRH	WCH	WCH
DATE OF ISSUE	DATE	DESCRIPTION	CRH	CRH	CRH	WCH	WCH
06/20/00			CRH	CRH	CRH	WCH	WCH



**LEGEND**

- LANDFILL NO. 4 BOUNDARY
- EXISTING CONTOURS
- EXISTING LANDFILL ROADS
- PROPOSED FINAL CONTOURS
- PROPOSED RIDGE LINE
- STATE PLANE GRID



LANDFILL NO. 4 BOUNDARY  
N 6961054.50  
E 2295835.25

LANDFILL NO. 4 BOUNDARY  
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E 2296377.75

LANDFILL NO. 4 BOUNDARY  
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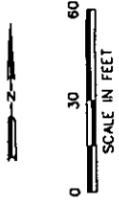
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LANDFILL NO. 4 BOUNDARY  
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E 2296372.50

1 FINAL COVER-DETAIL  
3/5

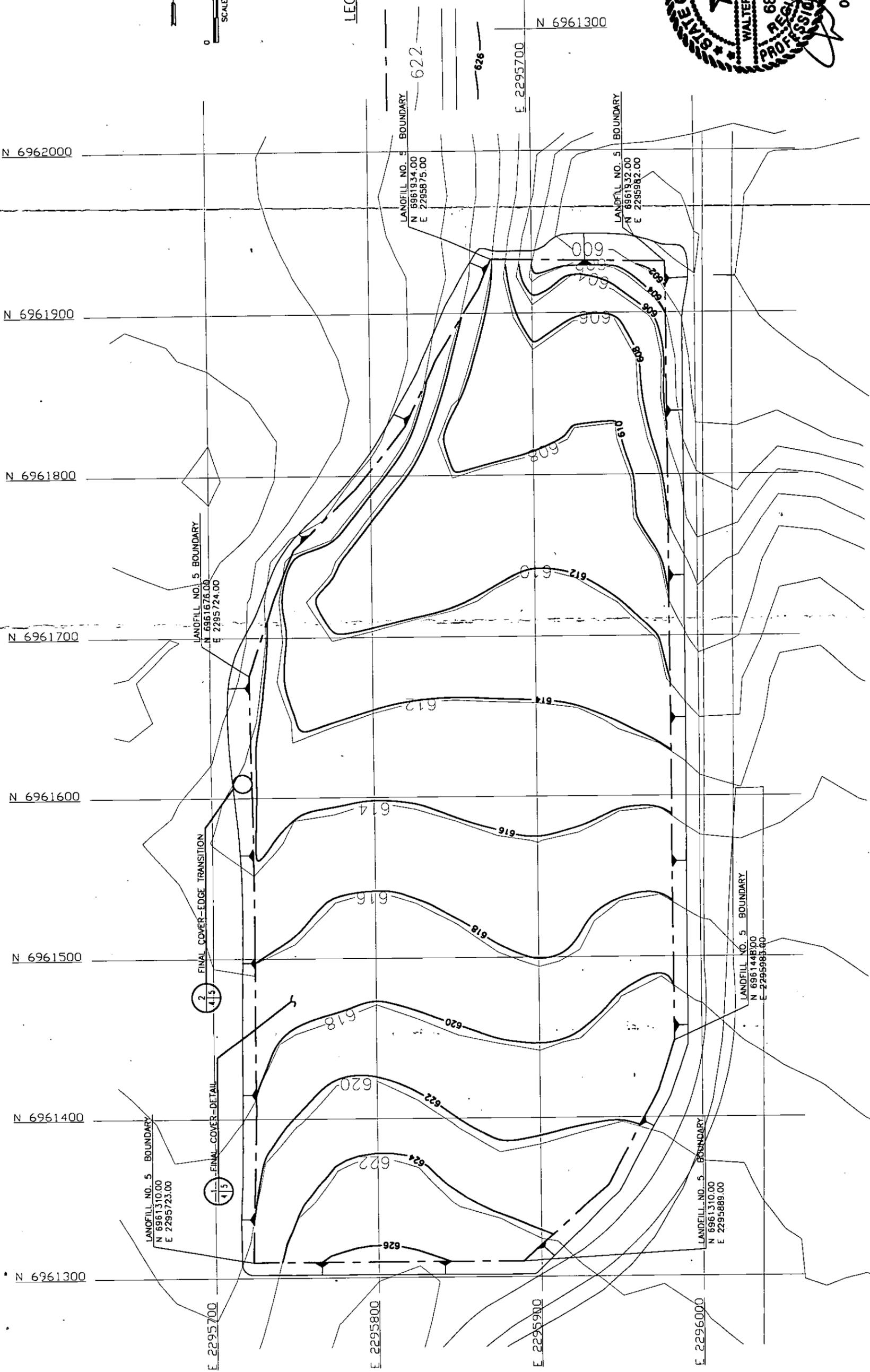
2 FINAL COVER-EDGE TRANSITION  
3/5

MADE FROM CAD FILE  
DATE: 06/20/00  
DRAWN BY: WCH  
CHECKED BY: WCH  
DATE: 06/20/00



LEGEND

- LANDFILL NO. 5 BOUNDARY
- EXISTING CONTOURS
- EXISTING LANDFILL ROADS
- PROPOSED FINAL CONTOURS
- STATE PLANE GRID



NAVAL AIR STATION  
FORT WORTH JOINT RESERVE BASE, TEXAS  
LANDFILL 5  
FINAL COVER SYSTEM

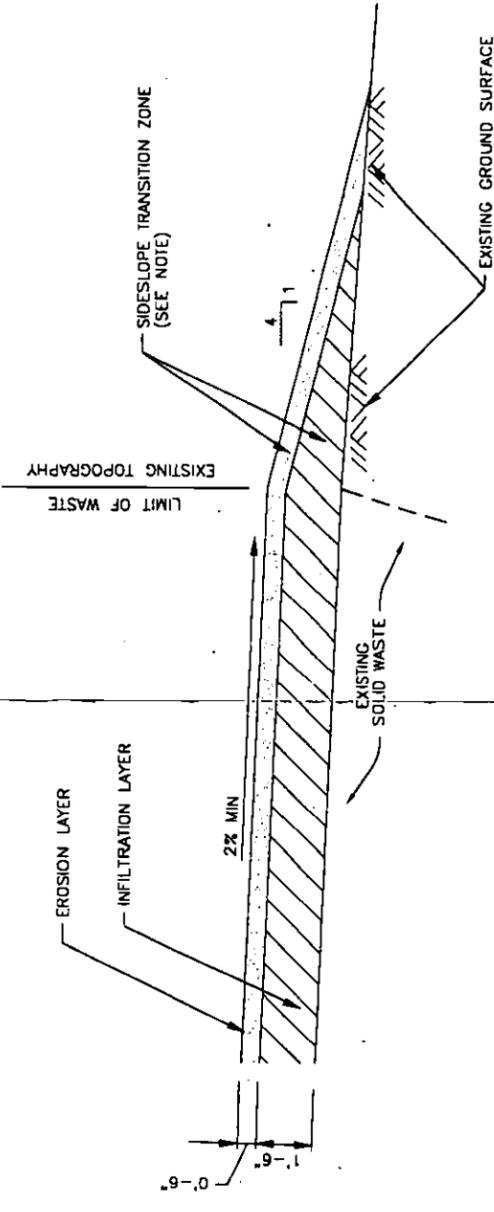


FOR PERMITTING PURPOSES ONLY

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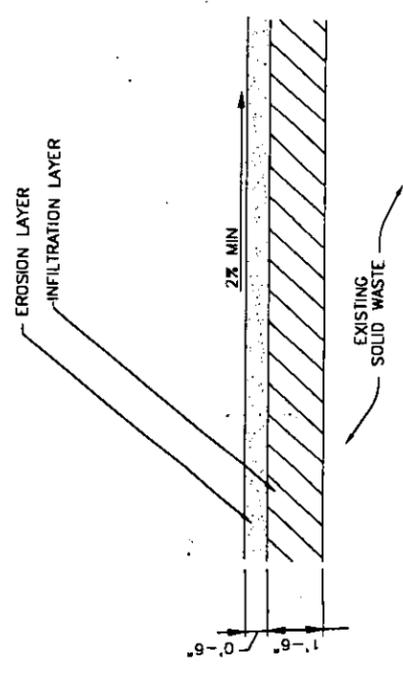
DATE OF ISSUE: 08-00  
 DRAWN BY: CRH  
 CHECKED BY: WCH  
 APP. BY: WCH

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FINAL COVER - EDGE TRANSITION 2 3/15

NOTE:  
TRANSITION ZONE WILL VARY AS NECESSARY TO TIE-IN TO THE EXISTING GRADES.



FINAL COVER - DETAIL 1 3/15

FOR PERMITTING PURPOSES ONLY

REV.	DATE	DESCRIPTION	DES. BY	CHK. BY	APP. BY



NAVAL AIR STATION  
FORT WORTH JOINT RESERVE BASE, TEXAS  
LANDFILLS NO. 4 AND NO. 6  
FINAL COVER SYSTEM DETAILS

**FINAL PAGE**

**ADMINISTRATIVE RECORD**

**FINAL PAGE**