

New Mexico Environment Department
September 2003

Navajo Refining Company
RCRA Permit No. NMD048918817

ATTACHMENT 2

RCRA PART B POST-CLOSURE PERMIT APPLICATION
NAVAJO REFINING COMPANY ARTESIA REFINERY
RCRA PART B POST-CLOSURE PERMIT APPLICATION
SECTIONS 13.0, 15.0, 16.0, ATTACHMENTS B-4 THROUGH B-6 AND B-8

13.0 CLOSURE / POST-CLOSURE PLAN
[40 CFR 270.14 (b)(13)]

13.1 North Colony Landfarm

13.1.1 Closure Plan

13.1.1.1 Closure Plan Implementation

A Closure Plan for the North Colony Landfarm was submitted with Navajo's original RCRA Permit application. The NCL Closure / Post-Closure Plan was approved by NMEID and incorporated into the facility RCRA Operating Permit (Permit Number NMD048918817-1), issued to Navajo effective August 21, 1989. A copy of the permit notice and relevant pages from the permit directing Navajo to implement the Closure / Post-Closure Plan (paragraphs L.1 & O.1) is included with this application in Attachment B-4. The approved plan follows the requirements of §264.280 for land treatment units, including placement of a vegetative cover after degradation, transformation or immobilization of hazardous constituents is substantially complete. An updated closure plan that reflects actions already taken is provided in Attachment B-4. Updates to estimated closure costs and financial assurance are addressed in Tab-B, Section 15.2 of this application.

The last application of waste was made to the NCL in September 1990, when the groundwater detection monitoring system detected hazardous constituents in the groundwater and the land treatment demonstration phase of the permit was terminated by NMEID. According to the permit conditions, the NCL reverted to interim status and the operating phase of the permit was never approved. In compliance with the permit, and the requirements of §§ 264.98-.99, Navajo implemented quarterly groundwater compliance monitoring which continues as of the date of this application. Under a schedule negotiated and approved by NMEID, Navajo also implemented a Corrective Action Program (CAP) to comply with §264.100. The RFI Phase II Report required by the CAP was submitted to NMEID in November 1997. Additional discussion of the CAP can be found in Tab C, Section 1.8.

Completion of the approved Closure Plan has been delayed pending results of the Corrective Action Program to ensure compatibility with any corrective measures, if necessary. However, certain elements of the closure plan were implemented or have been effectively completed, including:

- submittal, to the Eddy County Clerk, of the certified survey plat required by §264.116 (April, 1989; a copy of the Notice is provided in Attachment B-5);
- operation of the landfarm to the extent necessary to maximize degradation, transformation and immobilization of the final applications of hazardous waste constituents (1990-1991; tilling continued approximately six months after last application);

- removal and decontamination of the drum storage pad (1991);
- maintenance of run-on and run-off control systems (on-going);
- control of wind dispersion of hazardous wastes (on-going);
- unsaturated zone monitoring (except soil-pore liquid monitoring) as part of RFI activities (1990, 1994, 1997); and,
- groundwater compliance monitoring (quarterly since 1991).

The most recent soil and groundwater analytical summaries are provided in Appendices 4 and 5.

The only major closure tasks which remain are those necessary for placement of the vegetative cover and certification of closure .

13.1.1.2 Schedule

Navajo will proceed with implementing the remaining activities for the approved Closure Plan on a schedule to be identified by NMED in the permit. The original schedule and activities in the closure plan will be modified as necessary to reflect actions that have already taken place and the time that has elapsed. Expected actions to complete closure are outlined below:

- Provide notice to NMED, as required in §264.112(d), that Navajo intends to begin final closure of the NCL. Navajo will begin closure upon approval from NMED. For purposes of compliance with §264.113(b) regarding time allowed for closure, the 180 day period within which closure must be completed will start on day 60 following the notice to NMED.
- Conduct soil core monitoring per the Closure Plan. Additional soil pore liquid monitoring will not be conducted since almost 10 years have elapsed since the last application of waste and the soil lysimeters are no longer in operation. Conduct soil analysis for evaluation of placement of vegetative cover (pH; nitrogen, phosphorous, potassium and organic levels)
- Incorporate soil amendments as necessary for placement of final cover and commence placement of final vegetative cover, allowing as necessary for the proper time of year conducive to establishing initial growth of the cover.

- Notify NMED if closure will not be completed within 180 days from date NMED provides approval to begin final closure and submit a permit modification requesting an extension to the closure period as required in §264.113(b) and (c).
- Complete closure by final placement of vegetative cover (within 180 days of initiating closure as required in §264.113(b)). Initiate Post-Closure Care Plan.
- Submit final closure certification to NMED in compliance with §264.115 (within 60 days of completion of closure).
- Submit certification to NMED that a notation has been placed on the deed to the facility property in compliance with §264.119 (within 60 days of certification of closure).

If an unexpected event occurs during closure which necessitates a change in the closure plan, Navajo will submit to NMED an amended closure plan and request for permit modification, within 60 days of the unexpected event in compliance with §264.112(c)(3). If it is necessary to submit an amended closure plan during the final closure period, Navajo will also submit a permit modification requesting an extension to the closure period in compliance with §264.113(b).

13.1.2 Post-Closure Plan

A Post-Closure Plan for the North Colony Landfarm was submitted with Navajo's original RCRA Permit application. The NCL Post-Closure Plan was approved by NMEID and incorporated into the facility RCRA Operating Permit (Permit Number NMD048918817-1), issued to Navajo effective August 21, 1989. A copy of the permit notice and relevant pages from the permit directing Navajo to implement the Closure / Post-Closure Plan (paragraphs L.1 & O.1) is included with this application in Attachment B-4. A revised post-closure plan reflecting actions already undertaken or completed is also provided in Attachment B-4.

The last application of waste was made to the NCL in September 1990, when the groundwater detection monitoring system detected hazardous constituents in the groundwater and the land treatment demonstration phase of the permit was terminated by NMEID. According to the permit conditions, the NCL reverted to interim status and the operating phase of the permit was never approved. In compliance with the permit, the Post-Closure Plan and the requirements of §§ 264.98-.99, Navajo implemented quarterly groundwater compliance monitoring which continues as of the date of this application. Under a schedule negotiated and approved by NMEID, Navajo also implemented a Corrective Action Program (CAP) to comply with §264.100. The RFI Phase II Report required by the CAP was submitted to NMED in November 1997. Additional discussion of the CAP can be found in Tab C, Section 1.8.

Although not specifically directed to begin post-closure care activities, implementation of the approved Post-Closure Plan effectively began the year after the last application of waste to the landfarm, following completion of essentially all closure activities except placing the final cover. Most elements of the Post-Closure Plan are being implemented or have been effectively completed, including:

- submittal, to the Eddy County Clerk, of the certified survey plat required by §264.119 (a copy of the Notice is provided in Attachment B-5);
- inspection and maintenance of access restrictions (fence, gate, warning signs);
- inspection and maintenance of run-on and run-off control systems (dikes);
- control of wind dispersion of hazardous wastes;
- unsaturated zone monitoring (except soil-pore liquid monitoring) as part of RFI activities; and,
- quarterly groundwater compliance monitoring and reporting.

Given the delay in placing a final cover which is the only task necessary to complete closure, and that post-closure activities effectively began following the last application of waste, Navajo requests that NMED stipulate that the post-closure care period for NCL began in September 1991, one year following the last application of waste. Post-Closure activities will continue for 30 years from that date..

Navajo also requests that the soil core monitoring schedule and groundwater monitoring schedule reflect the activities that have occurred over the past 10 years and be in congruence with NMOCD requirements

Updates to estimated post-closure care costs and financial assurance are addressed in Section 16.2 of this application and are based on a 20-year post-closure period reflecting the previous ten years of activities.

13.2 TEL Site

13.2.1 Closure Plan

Closure of the TEL Site, in accordance with a closure plan approved by NMEID (see next subsection), was completed in 1989 and approved by NMEID in a letter from Richard Mitzelfelt, Director - New Mexico Health and Environment Department, on June 20, 1989. Copies of the closure certification, NMEID approval letter and the notice-in-deed are provided in Attachment B-5. The cap used for TEL closure was designed and constructed according to EPA guidance for cap and cover systems. The cap effectiveness was modeled as part of the closure plan and can be found in Attachment B-6 of this application (Appendix D of original closure plan – June 17, 1988).

13.2.2 Post-Closure Plan

Navajo submitted a TEL Closure / Post-Closure Plan to NMEID in April 1988. The TEL Closure Plan was approved by NMEID in a letter from Jack Ellvinger, Chief - NMEID Hazardous Waste Bureau, on June 17, 1988. The original TEL Post-Closure Plan and the NMEID approval letter is included with this application as Attachment B-6. The June 20, 1989, letter from NMED which approved the TEL closure (Attachment B-5) instructed Navajo to “implement your post-closure care plan until the EID issues a post-closure permit”.

Navajo has been implementing provisions of the April 1988 TEL Post-Closure Plan since June 1989. The unit is fenced, has its own irrigation system, is covered with grass and is mowed as necessary. At the time of closure, compliance monitoring had been ordered for the TEL Site and continues quarterly at the time of this application as a condition of Post-Closure care. Groundwater monitoring requirements are presented in Tab C, Section 2.0. Monitoring results are provided in Appendix 5.

In the last 8 years, the product level in the monitor wells around this unit has dropped from 2 feet to a sheen. This is attributed to an aggressive product recovery system in place throughout the refinery, but most specifically to a recovery trench just east of the TEL. The source of the free product is believed to be two diesel storage tanks that were at one time located just west of the TEL and that had been identified as leaking when they were removed. Laboratory analysis has shown the recovered product to be diesel. Given the characteristics of wastes placed on the TEL, it is most likely the source of the free product was the diesel tanks, not the TEL.

Updates to estimated post-closure care costs and financial assurance are addressed in Section 16.3 of this application. Post-Closure care has been implemented for 12 years, since closure in June 1989, so financial assurance is calculated based on 18 years of remaining post-closure care.

13.3 Evaporation Ponds

13.3.1 Closure Plan

As regulated units defined in 40 CFR 264.90 (a)(2), Evaporation Ponds 2-6 are subject to the corrective action requirements of § 264. 100 as presented in Tab C, Section 3.0 (page C-13). Accordingly, a closure plan (corrective measure plan) addressing surface soils for Ponds 2-6 was developed and submitted to EPA and NMED in 1996 and is discussed in Tab C, Section 3.8 (page C-16) of this application. Information can also be located in Appendix 1 of this application (*Executive Summary*, Section V, page 68). EPA approved this closure plan and in April, 1997, EPA Region VI (Samuel Coleman, Director – Compliance Assurance and Enforcement Division) wrote a letter to NMED recommending acceptance of the plan. A copy of the letter is included in Attachment B-7.

Navajo will submit a workplan for additional investigation of Evaporation Ponds 2-6 and a revised closure/post-closure plan on a schedule to be identified in the post-closure permit. The revised closure plan may contain a provision for incorporating a Corrective Action Management Unit with the Evaporation Ponds 2-6 unit.

Requirements for Post-Closure Care (Part 264, Subpart G), and Releases From Solid Waste Management Units (Part 264, Subpart F), are addressed in the following Section 13.3.2 and Tab-C, Section 3.0 respectively.

13.3.2 Post-Closure Plan

The permitting requirements of 40 CFR 270.1(c) require that owners or operators of closed surface impoundments that received hazardous waste after July 26, 1982, must have a post -closure permit that addresses applicable Part 264 Groundwater Monitoring (264.91-.99), Corrective Action (264.100) and Post-Closure Care (264.117-120) requirements. 40 CFR 264.90, Subpart F - Releases from Solid Waste Management Units, identifies surface impoundments that received hazardous waste after July 26, 1982, as a special type of solid waste management unit, referred to as a "regulated unit", subject to the groundwater monitoring and corrective action program provisions of §264.91 through 264.100, in lieu of Corrective Action for Solid Waste Management Units in §264.101 The post-closure requirements of 264.117 also encompass the provisions of 264.91-.100 for groundwater monitoring and corrective action.

Evaporation Ponds 2-6 received hazardous waste after July 26, 1982, and are therefore "regulated units" subject to post-closure requirements including a post closure plan. As part of corrective action and other enforcement activities, Navajo has prepared a Post-Closure Plan included as Attachment B-7 to this application. This Post-Closure Plan will be updated on a schedule to be identified by NMED in the post-closure permit.

**15.0 COST ESTIMATE AND FINANCIAL ASSURANCE
FOR CLOSURE**
[40 CFR 270.14 (b)(15)]

15.1 General

The North Colony Landfarm is the only hazardous waste management unit remaining to be closed subject to the permitting requirement of 40 CFR 270.14(b)(15), which requires a cost estimate for closing the facility in accordance with the requirements of §§264.111 through 264.115 and a demonstration of financial assurance in accordance with §264.142-.143. The cost estimate and financial assurance for closure of the North Colony Landfarm is discussed in Sections 15.2 and 15.3 below.

As regulated units defined in §264.90, Evaporation Ponds 2-6 are being addressed under a §264.100 Corrective Action Program (corrective action for regulated units). That section has no specific financial responsibility requirements, however, according to §264.90(a)(2), the financial responsibility requirements of §264.101 apply to regulated units. Cost estimates and financial assurance for potential corrective measures for Ponds 2-6 were prepared as part of the 1996 Closure Plan for Ponds 2-6 discussed in Tab C, Section 3.8 (also Appendix 1, page 69). These estimates have been updated and are included in Table B-8-6 of Attachment B-8, Financial Assurance for Closure, Post-Closure and Corrective Action.

Three Mile Ditch and Evaporation Pond 1 are considered to be a solid waste management unit (SWMU). This unit is being addressed under a §264.101 Corrective Action Plan (corrective action for solid waste management units) and the applicable financial requirements of §264.101(b) and (c). Potential corrective measures for Three Mile Ditch and Evaporation Pond 1 are therefore presented in Tab-D, Information Requirements for Solid Waste Management Units, Section 3.0 and 4.0. Corrective measure costs for Three Mile Ditch have been updated and are included in Table B-8-5 of Attachment B-8, Financial Assurance for Closure, Post-Closure and Corrective Action. Because Evaporation Pond 1 is co-located with Evaporation Ponds 2-6 and will undergo similar corrective actions, corrective measure costs for these units have been combined and are presented in Table B-8-6 of Attachment B-8.

15.2 Cost Estimate for Closure of North Colony Landfarm

The cost estimate for closure of the North Colony Landfarm is provided in Table B-1 on page B-47. The cost can also be found in Section 2.4 of the Closure and Post-Closure Plan for North Colony Landfarm (Attachment B-4, Table 1).

The remaining closure costs for the NCL are estimated at \$22,256 based on hiring a third party to close the facility. This estimate will be updated annually for inflation, within 30 days after the close of Navajo's fiscal year, by either recalculating the cost estimate in current dollars or using an inflation factor as specified in §264.142(b). Navajo's fiscal year currently ends July 31. Closure costs will be updated in August of each year unless the fiscal year ending date changes in which case the update will be made within 30 days of the next fiscal year end close.

15.3 Financial Assurance for Closure of North Colony Landfarm

Financial assurance for closure requirements is provided through a corporate guarantee in accordance with 40 CFR Part 264 Subpart H by Holly Corporation on behalf of its subsidiary, Navajo Refining Company. The most recent Financial Assurance certification for the Navajo facility is provided in Attachment B-8. The corporate guarantee will be updated annually and submitted to NMED within 90 days after the close of the fiscal year. Navajo's fiscal year currently ends July 31. Updated financial assurance certification will be submitted by the end of October of each year unless the fiscal year ending date changes in which case the update will be made within 90 days of the next fiscal year end close.

TABLE B-1

ESTIMATED CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost

Establish Vegetative Cover				
Obtain Soil Samples (technician, includes travel time)	Hrs	12	\$50/hr	\$600
Test Soil (pH, nutrients, organic matter)	Samples	8	\$150/sample	\$1,200
Establish grade	SY	17818	\$0.19/SY	\$3,385
Fertilize (3 times, 800 lbs/acre)	Acres	3.68	\$78.45/acre	\$870
Apply lime (3 times, 800 lbs/acre)	Acres	3.68	\$95.14/acre	\$1,050
Initial seeding (mechanical seeding, seed, mulch and water)	Acres	3.68	\$2,033/acre	\$7,481
Water (5 times, by truck)	Acres	3.68	\$54.19/acre	\$997
Survey (2-person crew)	Day	1	\$650	\$650
Subtotal Task				\$16,233

Project Management and Reporting				
Certify closure	hrs	8	\$125/hr	\$1,000
Notice in deed	hrs	8	\$125/hr	\$1,000
Travel Time (2 trips)	hrs	8	\$125/hr	\$1,000
Travel cost	Trip	2	\$500	\$1,000
Project management and subcontractor markup	10% of total cost			\$2,023
Subtotal Task				\$6,023

PROJECT TOTAL COST	\$22,256
---------------------------	-----------------

NOTES:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

**16.0 COST ESTIMATE AND FINANCIAL ASSURANCE
FOR POST-CLOSURE
[40 CFR 270.14 (b)(16)]**

16.1 General

Three units (North Colony Landfarm , TEL Site and Evaporation Ponds 2-6) are subject to the permitting requirement of 40 CFR 270.14(b)(16), which requires a cost estimate for facilities subject to the post-closure requirements of §§264.117 through 264.120, and a demonstration of financial assurance in accordance with §264.144 -.145.

Post-Closure requirements for the North Colony Landfarm (NCL), TEL Site (TEL) and Evaporation Ponds 2-6 are found in Tab-B, Section 13.0. Post-closure cost estimates for these units are provided in Sections 16.2 – 16.5 below.

Three Mile Ditch and Evaporation Pond 1 are considered to be a single solid waste management unit (SWMU). This unit is being addressed under a §264.101 Corrective Action Plan (corrective action for solid waste management units) and the applicable financial requirements of §264.101(b) and (c). Potential corrective measures for Three Mile Ditch and Evaporation Pond 1 are presented in Tab-D, Information Requirements for Solid Waste Management Units, Section 3.0 and 4.0. Corrective measure costs for Three Mile Ditch include five years of groundwater monitoring as presented in Table B-8-5 of Attachment B-8, Financial Assurance for Closure, Post-Closure and Corrective Action. Because Evaporation Pond 1 is co-located with Evaporation Ponds 2-6 and will undergo similar corrective actions, on-going groundwater monitoring requirements for these units have been combined.

Cost estimates for post-closure will be updated annually for inflation, within 30 days after the close of Navajo's fiscal year, by either recalculating the cost estimate in current dollars or using an inflation factor as specified in §264.144(b). Navajo's fiscal year currently ends July 31. Post -closure costs will be updated in August of each year unless the fiscal year ending date changes in which case the update will be made within 30 days of the next fiscal year end close.

16.2 Cost Estimates for Post-Closure Care of North Colony Landfarm

Anticipated post-closure activities for the NCL are presented in Tab B, Section 13.1.2 of this application. The post-closure cost estimate for the North Colony Landfarm, is based on activities in the Post-Closure Plan provided in Attachment B-4 and is presented in Table B-2 on page B-50.

At the time this estimate was prepared in 2001, post-closure care had been implemented for ten years, beginning one year after final application of waste in September 1990 (since September 1991). At that time, compliance monitoring had been ordered for the NCL area and continues at the time of this application as a condition of post-closure care.

Navajo requests that the initial post-closure care period be set at 20 years to reflect the last ten years of post-closure activities. Post-closure cost and financial assurance is calculated based on 20 years of remaining post-closure care, including semi-annual groundwater monitoring. The post-closure costs for the NCL are estimated at \$673,560 for a 20 year post-closure period, based on hiring a third party to execute the tasks.

16.3 Cost Estimates for Post-Closure Care of TEL Site

Post-Closure activities for the TEL are presented in Tab B, Section 13.2.2 and Attachment B-6 of this application. The post-closure cost estimate for the TEL Surface Impoundment has been updated in May 2001 and is presented in Table B-3 on page B-51.

Post-Closure care has been implemented for twelve (12) years, since closure in June 1989, so financial assurance is calculated based on 18 years of remaining post-closure care. At the time of closure, compliance monitoring had been ordered for the TEL Site and continues at the time of this application as a condition of post-closure care.

Total post-closure costs, including semiannual sampling for the remaining 18 years, are estimated at \$295,956 based on hiring a third party to execute the tasks.

16.4 Cost Estimates for Post-Closure Care of Evaporation Ponds 2-6

Proposed post-closure activities for Evaporation Ponds 2-6 are presented in Tab B, Section 13.3.2 of this application. Because Evaporation Pond 1 is co-located with Evaporation Ponds 2-6, post closure activities for Evaporation Ponds 2-6 will encompass Evaporation Pond 1. The post-closure cost estimate for Evaporation Ponds 2-6 is provided in the Evaporation Ponds 2-6 Post-Closure Plan (Attachment B-7, Section 8.0) and in Table B-4 on page B-52.

Post-closure costs for the Evaporation Ponds are estimated at \$1,003,076 for the entire 30 year post-closure period based on hiring a third party to execute the tasks.

16.5 Financial Assurance

Financial assurance for post-closure is provided through a corporate guarantee in accordance with 40 CFR Part 264 Subpart H by Holly Corporation on behalf of its subsidiary, Navajo Refining Company. The most recent Financial Assurance certification for the Navajo facility is provided in Attachment B-8. The corporate guarantee will be updated annually and submitted to NMED within 90 days after the close of the fiscal year. Navajo's fiscal year currently ends July 31. Updated financial assurance certification will be submitted by the end of October of each year unless the fiscal year ending date changes in which case the update will be made within 90 days of the next fiscal year end close.

TABLE B-2

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Semiannual inspection (2/yr)	hours	4 hrs/insp	\$50/hr	\$400/yea
Security maintenance	annual	1	\$250/yr	\$250/year
Dike maintenance	annual	1	\$250/yr	\$250/year
Monitoring well mtce	wells	8 wells/yr	\$150/well	\$1,200/year
Mowing (2/yr)	Acre	3.68 acre	\$27.04/acre	\$200/year
Fertilize (annually)	Acre	3.68 acre	\$78.44/acre	\$288/year
Semiannual groundwater Sampling; (8 wells)	hours	1 tech+1 geologist 16 hours/event 2 events/yr	\$45/hr-tech \$85/hr-geologist	\$4,160/year
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	9 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$14,850/ year
Travel time (2/yr)	Hours	2 people 8 hrs/event	\$65/hr avg	\$2,080/year
Travel costs	Trip	2/yr	\$500/trip	\$1,000/year
Reporting(2/yr)	hours	16 hrs/report	\$85/hr	\$2,720/year
Project management and subcontractor markup		10% of total cost		\$2,740/year
TOTAL ANNUAL COST				\$30,138
20 YEARS ANNUAL COST				\$602,760

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	8 wells	\$3,500	\$28,000
Replace fence once during 30 years	Linear foot (LF)	1600 LF 7' chain link	\$26.80/LF	\$42,880
TOTAL ONE TIME COSTS				\$70,880

TOTAL 20 YEAR COST:	\$673,560
----------------------------	------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

TABLE B-3

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR TEL SITE				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Semiannual inspection (2/yr)	hours	2 hrs/insp	\$50/hr	\$200/yea
Security maintenance	annual	1	\$250/yr	\$250/year
Dike/Cap maintenance	annual	1	\$250/yr	\$250/year
Monitoring well mtce	wells	4 wells/yr	\$150/well	\$600/year
Mowing (2/yr)	Acre	0.9 acre	\$27.04/acre	\$50/year
Fertilize (annually)	Acre	0.9 acre	\$78.44/acre	\$70/year
Semiannual groundwater Sampling; (4wells)	hours	1 tech+1geologist 8 hours/event 2 events/yr	\$45/hr-tech \$85/hr-geologist	\$2,080/year\$
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	5 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$8,250/ year
Travel time (2/yr)	Hours	Included with NCL	\$65/hr avg	
Travel costs	Trip	Included with NCL	\$360/trip	
Reporting(2/yr)	hours	8 hrs/report	\$85/hr	\$1,360/year
Project management and subcontractor markup		10% of total cost		\$1,311/year
TOTAL ANNUAL COST				\$14,421
18 YEARS ANNUAL COST				\$259,578

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR TEL SITE				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	4 wells	\$3,500	\$14,000
Replace fence once during 30 years	Linear foot (LF)	835 LF 7' chain link	\$26.80/LF	\$22,378
TOTAL ONE TIME COSTS				\$36,378

TOTAL 18 YEAR COST:	\$295,956
----------------------------	------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

TABLE B-4

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR EVAPORATION PONDS				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Monthly inspection (12/yr)	hours	4 hrs/insp	\$50/hr	\$2,400/year
Security maintenance	annual	1	\$500/yr	\$500/year
Dike maintenance	annual	1	\$1000/yr	\$1000/year
Monitoring well mtce	wells	15 wells/yr	\$150/well	\$2,250/year
Semiannual groundwater Sampling; (15 wells yr 1-3, then 7-8 wells)	hours	1 tech+1geologist 24 hours/event(1-3) 12 hrs/event (4-30) 2 events/yr	\$45/hr-tech \$85/hr-geologist	\$6,240/year (1-3) \$3,120/year(4-30)
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	17 samples/event (includes QA) yr 1-3 9 samples/event (includes QA) yr 4-30	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$28,050/year(1-3) \$14,850/year (4- 30)
Travel time (2/yr)	Hours	Included with NCL	\$65/hr avg	
Travel costs	Trip	Included with NCL	\$360/trip	
Reporting(2/yr)	hours	16 hrs/report	\$85/hr	\$2,720
Project management and subcontractor markup		10% of total cost		\$4,316/year(1-3) \$2,684/yr(4-30)
TOTAL ANNUAL COST				\$47,476(1-3) \$9,524(4-30)
30 YEARS ANNUAL COST				\$939,576

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	15 wells	\$3,500	\$52,500
Replace fence once during 30 years	Linear foot (LF)	8,800 LF 4-strand barbed wire	\$1.25/LF	\$11,000
TOTAL ONE TIME COSTS				\$63,500

TOTAL 30 YEAR COST:	\$1,003,076
----------------------------	--------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

**NAVAJO REFINING COMPANY
ARTESIA, NEW MEXICO REFINERY**

PART B APPLICATION

ATTACHMENT B-4

**NORTH COLONY LANDFARM
CLOSURE / POST-CLOSURE PLAN**

- >> Revised NCL Closure and Post-Closure Plan (March 2001)**
- >> Original NCL Closure & Post-Closure Plan**
- >> Authorization for 1989 Hazardous Waste Facility Permit with pages documenting that Navajo was to implement closure/post-closure according to the plan submitted with the application and included in the permit**

June 2001

NAVAJO REFINING COMPANY
NORTH COLONY LANDFARM
CLOSURE & POST CLOSURE PLAN

March 2001

Table of Contents	Page
1.0 INTRODUCTION	1
1.1 Maximum Inventory of Waste	1
2.0 CLOSURE PLAN	1
2.1 Completed Phases of Closure Plan	1
2.1.1 Decontamination	1
2.1.2 In-Place Treatment of Wastes	2
2.1.3 Control of Release of Contaminated Run-Off	2
2.1.4 Control of Airborne Particles	3
2.1.5 Compliance of Food-Chain Crop Restrictions	3
2.1.6 Soil Core Monitoring	3
2.2 Closure Plan Actions to be Completed	3
2.2.1 Placement of Final Cover	3
2.2.2 Certification of Closure	5
2.2.3 Survey and Notice	5
2.3 Schedule for Remaining Closure Actions	6
2.4 Closure Cost Estimate	6
3.0 POST-CLOSURE PLAN	7
3.1 Requirements for Post-Closure Activities	7
3.1.1 Groundwater Monitoring	7
3.1.2 Maintenance of Access Restrictions	7
3.1.3 Inspection and Maintenance	7
3.2 Post-Closure Property Use	9
3.3 Length of Post-Closure Period	9
3.4 Post-Closure Contact	10
3.5 Amendment of Post-Closure Plan	10
3.6 Certification of Post-Closure	10
3.7 Post-Closure Cost Estimate	10
3.8 Revision of Post-Closure Cost Estimate	10

NAVAJO REFINING COMPANY
NORTH COLONY LANDFARM
CLOSURE & POST CLOSURE PLAN

(cont.)

March 2001

<u>Table of Contents</u>	<u>Page</u>
TABLES	
Table 1: Estimated Closure Costs for North Colony Landfarm	11
Table 2: Estimated Post-Closure Costs for North Colony Landfarm.....	12
FIGURES	
Figure 1: Inspection Log for North Colony Landfarm.....	13
ATTACHMENTS	
Attachment A: 1988 NCL Closure/Post-Closure Plan	

NORTH COLONY LANDFARM CLOSURE & POST-CLOSURE PLAN

1.0 INTRODUCTION

This Closure Plan for the North Colony Landfarm, hereafter known as NCL, satisfies the requirements of New Mexico's Hazardous Waste Regulations. A Closure/Post-Closure Plan for the NCL was originally prepared and incorporated into Navajo's 1989 RCRA Landfarm Treatment Demonstration permit. That original closure/post-closure plan is attached at the end of this revised plan.

Portions of this closure plan have been completed as described. Uncompleted portions of this closure plan have been delayed due to an order to cease landfarm operations issued by the NMED (then NMEID) in 1990 as a result of groundwater contamination discovered during routine detection monitoring. This closure plan incorporates applicable portions of the original closure plan and details modifications necessary due to the manner in which the facility ceased operations that caused certain procedures of the original closure plan to be irrelevant.

2.0 CLOSURE PLAN

The closure plan consists of three phases:

- Decontamination of the general facility and drum storage area
- In-place treatment of final waste application
- Establishment of a vegetative cover

To date, all phases but establishment of the vegetative cover have been completed.

2.1 Completed Phases of the Closure Plan

2.1.1 Decontamination and Removal of the Drum Storage Pad

All equipment used in conjunction with operation of the landfarm was drained, washed with a suitable detergent, and triple rinsed. The rinsate volume was contained and transported to the NCL for application. Once all loads of the hazardous wastes had been applied to the landfarm, the application equipment and any other equipment used on the NCL was steam cleaned over the surface of the NCL and allowed to drain over the surface of the NCL.

The drum storage area was located within the fenced boundaries of the North Colony Landfarm. It consisted of approximately 11,300 square feet of concrete pad and was constructed in 1980. The drum storage area was used for the accumulation of empty drums generated at the refinery prior to being shipped off-site within 90 days for cleaning and reclamation.

Although not a hazardous waste management unit, the disposition of the storage area was included in the original closure plan for North Colony Landfarm and has been implemented. When landfarm operations were discontinued in September 1990, use of the Drum Storage Area was discontinued shortly thereafter. All drums were removed, the concrete pad steam cleaned and the concrete removed. There are no remaining actions to be taken regarding the Drum Storage Area.

2.1.2 In-Place Treatment of Wastes

Final waste volume was applied in September 1990. In-place treatment of the wastes was conducted by tilling and application of any required soil amendments for a period of 90 to 150 days. However, installation of the final cover was delayed indefinitely as a result of the multiple phase RCRA Facility Investigation conducted at the facility.

Procedures were employed to prevent and/or monitor the migration of hazardous constituents from the NCL to adjacent soils and groundwater. As during the operating life of the facility, groundwater monitoring has continually been conducted throughout the closure implementation. During the closure process, the groundwater has been monitored on a quarterly basis and at the request of the NMED, the results of groundwater monitoring have been reported at least annually.

2.1.3 Control of Release of Contaminated Run-Off

A dike constructed surrounding the NCL was installed to control the release of contaminated runoff from the NCL. The dike was designed to contain potentially contaminated water that periodically accumulated at the surface of the NCL from flowing into contiguous areas, preventing the potential eventual migration to groundwater. Topographic maps showing surface contour elevations and dike cross sections can be found in Figures B-9 and B-10 of the Navajo Post-Closure Permit Application.

During the course of the closure since 1990, potentially contaminated surface run-off has continued to be controlled by the existing dike around the perimeter of the NCL. The dike was constructed to a minimum height of 3.5 feet above the surface of the NCL and is capable of containing approximately 3.5 times the annual rainfall for the area (13 inches) in volume assuming an average dike height of 3.5 feet and approximately 4 acres of surface area based on an estimated 13-inch rainfall accumulation total over the facility produced by a 24-hour, 25-year storm event. The integrity of the dike is routinely inspected by the closure coordinator and any eroded areas are promptly repaired in order to maintain the capacity of the impounded area.

2.1.4 Control of Airborne Particulates

To minimize soil desiccation and consequently suppress dust production during the closure period, soil moisture is maintained by irrigation. The closure coordinator inspects the NCL on a weekly basis to detect any soil desiccation. Whenever the soil appears overly dry, such that dusting could be a problem, the soil is irrigated.

2.1.5 Compliance With Food-Chain Crop Restrictions

Navajo has not allowed the cultivation of food chain crops on the during the closure period. A notice of such restriction of use of the property will be filed with the Title Deed maintained in the official land owner records of the county when final closure is certified.

2.1.6 Soil Core Monitoring

Soil core monitoring was part of the original closure plan; however, due to termination of the landfarm treatment demonstration, soil core monitoring was conducted as a part of the RFI at the facility and was eliminated from this closure plan revision. Results of soil core monitoring conducted in 1990-1994 can be found in Appendix 4 of the Navajo Post-Closure Permit Application.

2.2 Closure Actions To Be Completed

2.2.1 Placement of Final Cover

The final phase of the closure plan is the establishment of a vegetative cover. Soil samples will be submitted to an agriculture lab for analysis of nutrients and soil pH. A specialist in the field of agriculture (county agent or professional agronomist or soil scientist) should be consulted to determine what, if any, soil amendments are necessary to promote the establishment of vegetation over the surface of the NCL and appropriate grasses to be used for the cover.

When it is determined that no further in-place treatment will occur in the zone of incorporation, the surface of the NCL should be prepared for a vegetative cover. The surface of the NCL should be graded to a final slope of between 1% and 1.5% in an eastern direction. The final grade should be a smooth, planar expanse having no more than a 0.5 feet variance in the surface level at any point on its final slope, minimizing the potential for localized depressions and elevation variations caused by the effects of erosion. Once a uniformly graded surface is constructed, an evaluation of soil suitability should be performed. Soil characterizations were performed for the NCL as part of the original Part B Permit Application (Appendix II-1-3 of Part B Permit Application, Volume II; Land Treatment Facilities, March 1986.) A general evaluation made in consultation with an agricultural specialist should consider the following points:

pH Level: The pH buffering capacity (tons/acre of lime) should be determined to adjust the pH to around 6.5, \pm 0.5.

Nitrogen and Organic Matter: Since the nitrogen fertilizer requirements are directly proportional to the amount of organic matter present and dependent upon the sandiness of the soil, these two factors need to be evaluated in the soil characterization at the time of closure.

Phosphorus and Potassium Levels: Phosphorus levels are pH-dependent. At optimum pH (values of 2.6 to 6.8), amounts of 50 lbs/acre are needed, more if pH is closer to 7.5. Adequate potassium levels can be established for several growing seasons with the initial application of 26 lbs/acre.

Species Selection: A mixture of perennial grasses as suggested by documents in the original permit application and closure plan should be considered (These included alkali sacaton, side oats grama, buffalograss, bermudagrass, crested wheatgrass and salt grass, or a mixture thereof). These grasses are known to thrive locally. Characteristics of any grass species that should be considered include, rapid germination, depth of root system to prevent erosion, vegetative thickness to minimize percolation and low maintenance. Navajo can draw from experience with the vegetative cover maintained on the closed TEL unit as well.

After first considering the appropriate seeding time, and once the evaluations are made, seed bed preparations should commence. The appropriate pH and nutrient levels should be established. The NCL surface should be plowed to destroy any existing vegetation that might detrimentally compete with the grasses and to create a favorable soil density. If seeding can not proceed shortly after preparation, straw mulch (approximately 1.5 tons/acre) should be used to protect the surface against wind or rain erosion and preserve moisture. The appropriate time for seeding plays a key role in the development of a healthy, thick vegetative cover. Ideally, seeding will be conducted in the fall or spring.

Seeding will be accomplished using one of three methods – conventional planter, broadcasting, or hydroseeding. Selection of the method should consider not only the cost effectiveness of the method but also the application rate and optimum depth of seed placement.

Conventional Planter – Seeds are planted using a agricultural implement pulled by a farm tractor. The seeds are dropped from a hopper mounted over a dispensing mechanism that individually dispenses a calibrated volume of seed into a narrow, shallow trench (seed bed) cut into the soil by a narrow v-shaped, vertically-mounted blade that gouges a trench into the soil and is covered by trailing rolling wheel that pushes the disturbed soil into the trench.

Broadcast Planting – Seeds are placed in a broadcast spreader pulled by a tractor or bull dozer and distributed at a calibrated rate over the area to be seeded. This action is followed by pulling an implement over the soil using a disc or harrow pulled by a tractor or bulldozer to disturb the soil and incorporate the seed. However, the potential for dust production may limit the utility of this method.

Hydroseeding – Hydroseeding or hydromulching utilizes a truck-mounted pressure sprayer to apply a slurry of seed, fertilizer, mulch, lime, and water to area to be seeded.

Conventional planting or broadcasting followed by incorporation of the seeds into the soil would provide the best soil-seed contact for establishing the seeds.

A bench-scale test of the selected method is recommended to evaluate the effectiveness of the selected method prior to seeding the entire surface of the NCL.

The best method for establishing soil-seed contact is preferable and will likely be one of the methods that employs an agricultural implement to plant the seed. The suggested seeding rate is approximately 12 pounds per acre planted at a depth of 0.25 or 0.50 inches, but seeding rates and depths may vary depending on the seed variety, soil conditions, and season at the time of seeding.

2.2.2 Certification of Closure

Navajo will submit certification of closure to the NMED within 60 days of completion of all activities necessary to close the North Colony Landfarm (i.e. – the vegetative cover has been planted). The certification will state that the NCL has been closed in accordance with the approved closure plan. The certification must be sent by registered mail and signed by an independent registered professional engineer or an independent qualified soil scientist.

2.2.3 Survey and Notice to Local Land Authority

A survey plat performed by a professional land surveyor will indicate the location and dimensions of the NCL with respect to permanently surveyed benchmarks. The survey plat will contain a note, prominently displayed, stating that disturbance of the closed hazardous waste facility is restricted.

Navajo will record a notation in the deed to the North Colony Landfarm property that:

- The land has been used to manage hazardous waste;
- Its use is restricted under 206.D.2.g.(3); and,
- The survey plat and record of waste disposal has been filed with the local land use authority and the NMED.

Navajo will submit to the NMED a signed certification specifying that the notation in the deed has been recorded, together with a copy of the document in which the notation has been placed.

2.3 Schedule

The NMED will identify a schedule for completion of the remaining closure actions in the Post-Closure Permit.

2.4 Closure Cost Estimate

An estimate of the costs to perform the remaining closure activities is provided in Table 1 at the end of the plan.

3.0 *POST-CLOSURE PLAN*

3.1 **Requirements for Post Closure Activities**

3.1.1 **Groundwater Monitoring**

A compliance monitoring program was initiated for NCL in 1989-1990 following detection of hazardous constituents in the groundwater. The Compliance Monitoring Program, which meets the requirements of 40 CFR 264.99, is a part of the Groundwater Monitoring Plan of the RCRA Permit issued in 1989 and can be found in the Post-Closure Permit Application (Section 3 of Attachment C-1). Quarterly compliance monitoring continues as of the date of this application as part of the Corrective Action Program implemented under 40 CFR 264.100(d). Results of the quarterly monitoring are reported annually to NMED and NMOCD. Reports for calendar years 1999 and 2000 are included in Appendix 5 of the Post-Closure Permit Application.

Based on discussions with NMED regarding future post-closure activities, Navajo will conduct semiannual monitoring on eight (8) wells around NCL (NCL-32, NCL-33, NCL-34, NCL-44, MW-53, MW-54A, MW-55 and MW-56) Samples from these wells will be tested for VOCs(Method 8260B), SVOCs (Method 8270C), diesel range organics (DRO – Method 8015B) and RCRA VIII metals. NMED will identify the schedule such sampling and reporting is to be done.

3.1.2 **Maintenance of Access Restrictions**

To ensure that the surface of the NCL remains undisturbed during post closure, a 7 foot chain link fence will be maintained along with the lockable metal swing gate to restrict access to the NCL. To minimize risk of exposure to humans or livestock, the perimeter fence and lockable gate will be maintained through the post closure care period.

3.1.3 **Inspection and Maintenance Procedures**

During post-closure care duration, the Closure Coordinator will supervise planned inspection and maintenance activities. The inspection frequencies and maintenance procedures for these activities are listed below:

Final cover integrity will be inspected on a semiannual basis during post-closure care. Once a vegetative cover is established it will require only twice-yearly mowing to keep down weed and brush species. Annual fertilizations or liming if necessary, will promote the desirable grasses over those that offer less resistance to surface erosion. Judicious use of herbicides and pesticides may be necessary to protect the vegetative cover from competing vegetation and insects. Bi-monthly irrigation may be necessary to bring soil moisture content up to a minimum of 50% of the available soil water.

An inspection list shall include the following:

- Surface erosion
- Need for fertilization, mowing, or irrigation
- Need for herbicides and pesticides
- Burrowing animals destroying large surface areas of vegetation

Although severe surface erosion is not expected, any surface erosion should immediately be repaired and restored to pre-damaged conditions. If erosional effects are persistent, re-sculpting of the land surface should be conducted to eliminate these effects, including terracing of the area.

The run-on/run-off control system consisting of the NCL perimeter dike shall be inspected semiannually. The frequency of storm events severe enough to cause erosion damage to the dike is less than the bi-annual inspection frequency.

The following items should be inspected:

- Width of the dike base and crown
- Height of dike above exterior ground level
- Back of vegetative growth to secure dike from erosion
- Presence of burrowing animals

Specifically look for indications of severe erosion that would reduce the dike's capacity to control run-on/run-off. If erosion occurs, dirt from the refinery property may be used to restore the dike to specification.

Access control features consisting of a 7 foot chain link fence around the NCL perimeter, lockable 4 foot steel gate and warning signs in English and Spanish will be inspected semiannually.

The following items shall be inspected:

- Integrity of chain link fence and gate
- Integrity of lock on the gate
- Warning signs

Specifically look for indications of storm damage, vandalism, or mechanical failure. Additionally, check that signs are legible and securely fastened.

The NCL groundwater monitoring wells (NCL-32, NCL-33, NCL-34, NCL-44, MW-53, MW-54A, MW-55 and MW-56) will be inspected at scheduled sampling events as outlined in the groundwater monitoring program. This will be frequent enough to affect any maintenance necessary to allow the groundwater monitoring program to fulfill its schedule.

The following items shall be inspected:

- Surface casing and lockable lid
- Concrete pad around surface casing
- Indications of mechanical integrity of tubing
- Indications of standing water on vegetative growth

Specifically look for; severe damage to surface casing that would prevent sampling or compromise security, mechanical function of lock and indications of vandalism, weathering of concrete pad into fragments or subsidence of well structure, subsidence of tubing or indications of physical mechanical failure or elevated levels of PVC constituents in groundwater samples, standing water that can migrate into groundwater by seeping down the outside of the casing or vegetative growth, such as bushes or small trees whose root systems could penetrate the seal around casing in the well bore.

If replacement of a well becomes necessary, applicable regulatory guidelines on RCRA-approved well installation will be consulted. It may also be necessary to apply for a Class I Permit Modification.

An example inspection checklist is provided in Figure 1 at the end of this plan.

3.2 Post-Closure Property Use

Navajo will not allow post-closure use of the NCL that will disturb the integrity of the final cover, run-on/run-off containment system, security system, or the function of the sites monitoring systems unless the Director of the NMED approves of the use.

If such post-closure use becomes necessary, Navajo may request modification of its post-closure plan in accordance with the provisions of 40 CFR 270.42 and 40 CFR 264.117(c) as appropriate, provided that the modification or use meets either of the following conditions:

- It is necessary to the proposed use of the property and will not increase the potential hazard to human health or the environment; or
- It is necessary to reduce a threat to human health or the environment.

3.3 Length of Post-Closure Period

The post-closure period identified in the original RCRA Permit for NCL was 30 years from the date of closure. Navajo essentially commenced post-closure care in 1991 when most closure activities, except placement of the vegetative cover, were completed and the RFI was initiated. Post-closure activities have been underway for 10 years. Navajo requests that the remaining post-closure period be initially set at 20 years. The NMED will identify the remaining post-closure period and schedule in the post-closure permit.

3.4 Post Closure Contact

The individual holding the position of Environmental Coordinator, or its successor title will be the point of contact:

Environmental Coordinator
Navajo Refining
P.O. Drawer 159
501 East Main Street
Artesia, NM 88210
(505) 748-3311

3.5 Amendment of Post-Closure Plan

Navajo will amend the post-closure plan whenever changes in facility design or operating plans effect post-closure plans. This includes events that occur during partial or final closure.

Navajo will amend the post-closure plan at least 60 days prior to the proposed change or no later than 60 days after the unexpected event that affects the post-closure plan.

This includes any changes caused by amendments to the closure plan.

3.6 Certification of Post-Closure

Within 60 days after completion of post-closure care, Navajo will submit a letter of certification by registered mail to the Director.

The letter of certification will state that the post-closure care was performed in accordance with the approved post-closure plan. The signatures of a duly authorized representative of Navajo and an independent certified registered professional engineer will appear on the letter of certification.

3.7 Post-Closure Cost Estimate

The Post-Closure Plan Cost Estimate is presented in Table 2 at the end of this plan. Since post-closure activities have been underway for 10 years, Navajo is providing a cost estimate for 20 years of post-closure care and requests that that the remaining post-closure care period be initially set at 20 years.

3.8 Revision of Post-Closure Cost Estimate

Navajo will revise the post-closure cost estimates within 30 days after the Director has approved the request to modify the post-closure plan, if the change in the post-closure plan results in an increase to the cost of the post-closure care.

TABLE 1

ESTIMATED CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost

Establish Vegetative Cover				
Obtain Soil Samples (technician, includes travel time)	Hrs	12	\$50/hr	\$600
Test Soil (pH, nutrients, organic matter)	Samples	8	\$150/sample	\$1,200
Establish grade	SY	17818	\$0.19/SY	\$3,385
Fertilize (3 times, 800 lbs/acre)	Acres	3.68	\$78.45/acre	\$870
Apply lime (3 times, 800 lbs/acre)	Acres	3.68	\$95.14/acre	\$1,050
Initial seeding (mechanical seeding, seed, mulch and water)	Acres	3.68	\$2,033/acre	\$7,481
Water (5 times, by truck)	Acres	3.68	\$54.19/acre	\$997
Survey (2-person crew)	Day	1	\$650	\$650
Subtotal Task				\$16,233

Project Management and Reporting				
Certify closure	hrs	8	\$125/hr	\$1,000
Notice in deed	hrs	8	\$125/hr	\$1,000
Travel Time (2 trips)	hrs	8	\$125/hr	\$1,000
Travel cost	Trip	2	\$500	\$1,000
Project management and subcontractor markup	10% of total cost			\$2,023
Subtotal Task				\$6,023

PROJECT TOTAL COST	\$22,256
---------------------------	-----------------

NOTES:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

TABLE 2

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Semiannual inspection (2/yr)	hours	4 hrs/insp	\$50/hr	\$400/yea
Security maintenance	annual	1	\$250/yr	\$250/year
Dike maintenance	annual	1	\$250/yr	\$250/year
Monitoring well mtce	wells	8 wells/yr	\$150/well	\$1,200/year
Mowing (2/yr)	Acre	3.68 acre	\$27.04/acre	\$200/year
Fertilize (annually)	Acre	3.68 acre	\$78.44/acre	\$288/year
Semiannual groundwater Sampling; (8 wells)	hours	1 tech+1geologist 16 hours/event 2 events/yr	\$45/hr-tech \$85/hr- geologist	\$4,160/year
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	9 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$14,850/ year
Travel time (2/yr)	Hours	1 tech+1geologist 8 hrs/event	\$65/hr avg	\$2,080/year
Travel costs	Trip	2/yr	\$500/trip	\$1,000/year
Reporting(2/yr)	hours	16 hrs/report	\$85/hr	\$2,720/year
Project management and subcontractor markup		10% of total cost		\$2,740/year
TOTAL ANNUAL COST				\$30,138
20 YEARS ANNUAL COST				\$602,760

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	8 wells	\$3,500	\$28,000
Replace fence once during 30 years	Linear foot (LF)	1600 LF 7' chain link	\$26.80/LF	\$42,880
TOTAL ONE TIME COSTS				\$70,880

TOTAL 20 YEAR POST-CLOSURE COST	\$673,560
--	------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

Last waste placed on NCL in 1990. Under Post-Closure for 10 years, since 1991.

FIGURE 1
INSPECTION LOG: NORTH COLONY LANDFARM

At least semiannually and after major storm events the following should be inspected, observations recorded, and repairs made if necessary

Dikes:

1. Any surface erosion? _____
2. Is the dike height approximately 3 feet all around the exterior? _____
3. Any presence of burrowing animals? _____
4. Any deep rooted vegetation (trees, bushes) that need removed? _____

Security and Control:

1. Is the integrity of the fence and gate intact? _____
2. Is the gate locked and the lock in good condition? _____
3. Are the warning signs in place (any missing) and legible? _____
4. Any signs of vandalism or prohibited trespass _____

Monitor Wells: (also inspect at each monitoring event)

1. Any damage to surface casing that would prevent sampling? _____
2. Any indication of vandalism? _____
3. Any weathering of concrete pad? _____
4. Any evidence of standing water or subsidence of well structure? _____
5. Are wells locked and locks/caps in good condition? _____

Final Vegetative Cover (when placed)

1. Any evidence of standing water? _____
2. Any erosion or evidence of burrowing animals? _____
3. Is vegetation distressed? Any areas that require re-seeding? _____
4. Does grass need mowing, watering, fertilization? _____

General:

1. Any standing water on the landfarm? _____
2. Does the landfarm need to be tilled? _____
3. Does the landfarm need to be watered (evidence of wind erosion extreme dusting? _____
4. Other observations: _____

Work Memo Number: _____

Date Issued: _____ Date Completed: _____

Inspection Date: _____ Inspection Signature: _____

NOTE: this inspection log and any related work orders to be retained for at least three years from inspection date.

**NAVAJO REFINING COMPANY
ARTESIA, NEW MEXICO REFINERY**

PART B APPLICATION

ATTACHMENT B-5

**TETRAETHYLLEAD (TEL) WEATHERING AREA
CLOSURE CERTIFICATION**

- » **TEL Closure Certification** (Navajo, to Richard Mitzelfelt, Director, New Mexico Health and Environment, Feb.13, 1989)
- » **Correspondence Regarding Closure Period Extension**
- » **Results of Permeability Testing on Cap** (Navajo to NMEID, April 19, 1989)
- » **NMEID Approval of the Tetraethyllead Impoundment Closure** (Richard Mitzelfelt, Director, New Mexico Health and Environment, June 20, 1989)
- » **Notice Submitted to Local Land Use Authority Identifying Hazardous Waste Operations at the North Colony Landfarm and the TEL Site**

June 2001



REFINING COMPANY

501 EAST MAIN STREET • P. O. DRAWER 159

ARTESIA, NEW MEXICO 88210

February 13, 1989

Mr. Richard Mitzelfelt, Director
Environmental Improvement Div.
1190 St. Francis Drive
Santa Fe, NM 87503

RE: TEL CLOSURE CERTIFICATION NMD048918817

Dear Mr. Mitzelfelt:

Enclosed you will find two (2) copies of our executed Closure Certification as required by HWMR-4 206.C.2.f. for the TEL site. Please return one (1) copy of the certification with your signature and keep one (1) for your file.

Also, other information required to be submitted with the Closure Certification is enclosed. If I can be of further assistance to you do not hesitate to call me.

Regards,

Zeke Sherman
Environmental Engineer

ZRS/pb

enclosures

copy to C. Kelly Crossman
Environmental Supv.
Hazardous Waste Management Sect.

Post-it® Fax Note	7671	Date	2-23-89	# of pages	▶ 13
To		From	Darrell Moore		
Co./Dept.		Co.	Navajo		
Phone #		Phone #	748-3311		
Fax #		Fax #	505746-5421		

TEL Closure Certification

As required by HWMR-4 206.C.2.f., Navajo Refining Company certifies that the TEL site has been closed in accordance with the specifications in the approved closure plan, dated June 17, 1988 except for the following field changes:

- 1) The thickness of the substratum shown on drawing #102-27-D-2 exceeds design specifications. Additional substratum was mixed with the surface of the waste mass so that the design compaction proctor percentages could be achieved. The required 3% grade was maintained and relative elevations were increased approximately 12 inches.

Additional substratum enhances overall structural integrity of the cap and increases it's ability to minimize movement of fluid through the cap.

- 2) Closure construction was not completed until November 11, 1988, due to weather delays.
- 3) Closure costs exceeded those shown in Section 2.11 of the Closure Plan, due to the reasons stated in item #1 above.
- 4) Soil cores for undisturbed soil and test cap permeabilities were obtained December 21, 1988. Samples are still under evaluation, so data will have to be forwarded to your office when testing is complete.

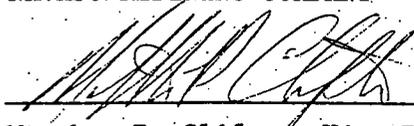
NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION

Date _____

Richard Mitzelfelt, Director
New Mexico Environmental Improvement Division
1190 St. Francis Drive
Santa Fe, New Mexico 87504-0968

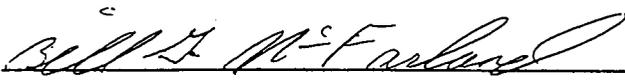
NAVAJO REFINING COMPANY

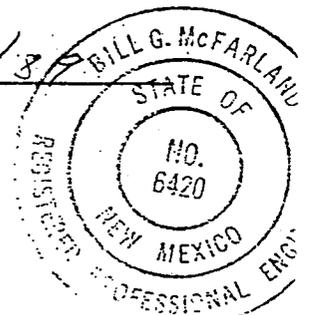
Date 2/16/89


Matthew P. Clifton, Vice President
Navajo Refining Company
P.O. Drawer 159
Artesia, New Mexico 88210

INDEPENDENT REGISTERED ENGINEER

Date 2/16/89


Bill G. McFarland
N.M. Registered Professional Engineer #6420
1609 Sears Avenue
Artesia, New Mexico 88210



TEL Closure Information

The following information is submitted as requested in the revisions to the TEL Closure Plan, Section 2.10.

<u>Well #</u>	<u>Screen Length</u>	<u>Amount of Bentonite</u>	<u>Amount of Fill</u>
21	5 feet	11.4 cu ft	3.15 cu ft
22	4 feet	6.6 cu ft	2.45 cu ft

Based on our experience obtained during the closure of the TEL site, we find no reason to revise the closure cost estimate for the North Colony Landfarm.



REFINING COMPANY

501 EAST MAIN STREET • P. O. DRAWER 159

ARTESIA, NEW MEXICO 88210

March 9, 1989

Mr. Richard Mitzelfelt, Director
Environmental Improvement Division
1190 St. Francis Drive
Santa Fe, NM 87503

RE: TEL Closure Period Extension
NMD048918817

Dear Mr. Mitzelfelt:

As you know Navajo Refining Company completed closure construction at the TEL site on November 11, 1988 and submitted a closure certification to your office, on or about February 13, 1989.

In the closure certification were listed certain field changes to the approved closure plan. Item #4 on the list of changes concerns obtaining permeability data from soil and test cap cores and that the data would not be available until laboratory evaluations are complete.

Due to problems obtaining useable Shelby tube cores from the extremely hard test cap (the tubes buckled under load, creating micro fractures in the test cap material), Navajo must request an extension of the closure period as provided for in Section 2.6, TIME ALLOWED FOR CLOSURE, on the approved TEL closure plan and in HWMR-5 265.113(b)(1)(1).

Since the delay involves obtaining useable test cap cores for the permeability study, the closure activities will, of necessity, take longer than 180 days to complete. Navajo expects to have the permeability study completed no later than April 15, 1989.

Regards,

Zeke Sherman
Environmental Engineer

ZRS/pb

TELEPHONE
(505) 748-3311



REFINING COMPANY

501 EAST MAIN STREET • P. O. DRAWER 159

ARTESIA, NEW MEXICO 88210

MPC

EASYLINK
62905278

April 19, 1989

Mr. Kelly Crossman, Supervisor
Hazardous Waste Section
Environmental Improvement Division
1190 St. Francis Drive
Santa Fe, New Mexico 87503

RE: TEL CLOSURE NMD 048918817

Dear Kelly:

I am enclosing a report on the results of permeability testing performed on soil and test cap samples obtained during the TEL site closure. This submittal should satisfy the requirements of the TEL closure plan and should alleviate the concerns stated in EID's Notice of Violation letters of March 13 and March 22, 1989.

The following is a brief description of the soil core and test cap material sampling program.

On December 21, 1988, four (4) soil borings and two (2) test cap material borings were obtained from the TEL site at locations shown on the attached diagram.

The soil borings were obtained by augering an 8.0" diameter hole to a depth of approximately 10.0'. The borings were cleared of cuttings and a 3.0" O.D. by 30.0" length thin walled Shelby tube was hydraulically pressed into the soil stratum at the bottom of the bore.

The test cap material borings were obtained by pressing the Shelby tubes into the surface of the test cap. In pressing the tubes into the densely compacted material, some slight buckling of the thin walled samplers occurred. When this was observed, the tubes were withdrawn with the recovered samples.

The following table shows the recovery length and description of each Shelby tube sample:

Tube #	Sample Length	Description
1	14 3/4"	compacted tan caliche, vfn snd, clay, occ. 1" aggregate
2	14 3/4"	as above
3	22 1/4"	gy, tn, wt anhy soil, gyp. xtals
4	23 1/2"	as above, tr gravel
5	25"	gy anhy soil
6	11 1/2"	gy anhy soil, tr gravel

The tubes were capped with plastic ends and identified by core # and location. The tubes were then shipped to Geo-Test, Inc. of Santa Fe, New Mexico for permeability testing.

Sometime in early February, 1989, Navajo was informed by Geo-Test that representative permeability data could not be obtained from the test cap samples. Two attempts on each of the two test cap samples yielded results that indicated that the material had been disturbed and forced away from the Shelby tube walls during the sampling.

On February 17, 1989, a bulk sample of test cap material was obtained and shipped to Geo-Test for permeability analysis.

Using information from the attached Atterberg diagram, Geo-Test recompacted the test cap material and was able to obtain representative permeability data.

It can be seen from the bulk test cap material sample results that the test cap, hence the actual closure cap, can demonstrate a permeability of at least 10^{-7} centimeters/second as required by the TEL closure permit.

The arithmetic average permeability of the four (4) soil cores is 5.09×10^{-7} centimeters/second and the standard deviation of the data set is 9.9×10^{-13} centimeters/second.

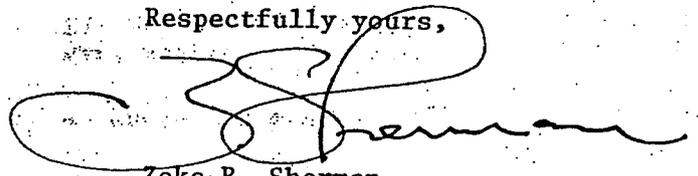
Mr. Kelly Crossman
4/19/89

Page 3

I am also enclosing a copy of the survey plat that is being submitted to the local zoning authority as required by 40 CFR, Part 265.116. It should satisfy the intent of the above mentioned HWMR-5 regulation concerning the closure of the TEL site.

Please review all the enclosed information and if you should have any questions or additional requirements, please contact me as soon as possible so that I may expeditiously address any of your concerns.

Respectfully yours,



Zeke R. Sherman
Environmental Engineer

ZRS/sgp

Enclosures

RECEIVED

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

JUN 26 1989

MARALYN BUOKE
Acting Secretary

CARLA L. MUTH
Deputy Secretary

MICHAEL J. BURKHART
Deputy Secretary

RICHARD MITZELFELT
Director

NAVAJO REFINING CO.

June 20, 1989

Mr. Clovis Evans
Navajo Refining Company
P. O. Box 159
Artesia, NM 88210

RE: NMD048918817
Tetra Ethyl Lead Impoundment Closure

Dear Mr. Evans:

The Environmental Improvement Division has reviewed your correspondence of April 19, 1989, March 9, 1989, February 17, 1989 and February 13, 1989. These letters indicate that the Tetra Ethyl Lead (TEL) surface impoundment has been closed in accordance with the closure plan and the TEL surface impoundment is thereby closed. You should implement your post-closure care plan until the EID issues a post-closure care permit.

In accordance with HWMR-5, Part VI, 40CFR Section 265.143(h), Navajo Refining Company is hereby released from the closure surety requirements of the Hazardous Waste Management Regulations for this unit. Post-Closure surety must be maintained for the post-closure care period. In accordance with HWMR-5, Part VI, 40CFR Section 265.145(e), Navajo Refining Company is hereby released from the liability surety requirements for this unit.

If you have any questions, please call Mr. C. Kelley Crossman of my staff at (505) 827-2923.

Sincerely,



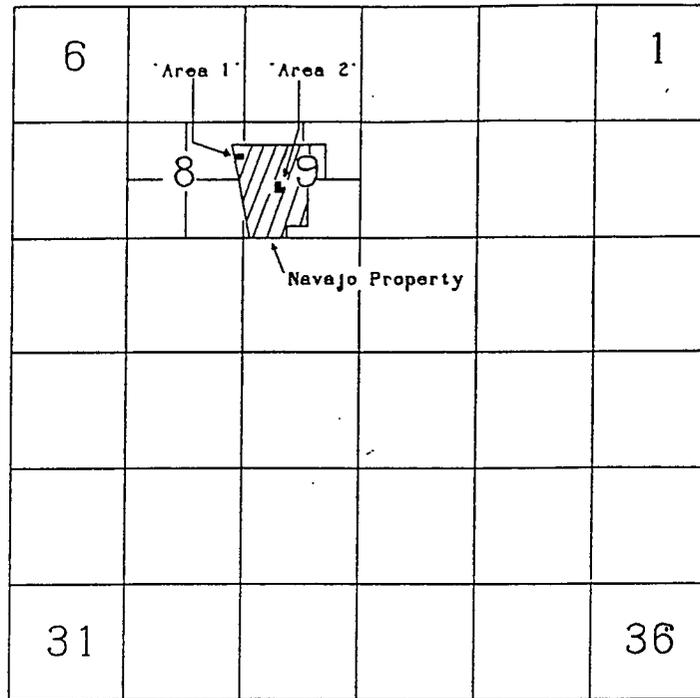
Richard Mitzelfelt
Director

RM:CKC:vga

cc: Lynn Prince, U.S. EPA Region VI (6H-HS)
David Griffin, Navajo Refining Co.
Jack Ellvinger, Chief, Hazardous Waste Bureau

Exhibit A

T 17 S



Approx Scale: 1" = 6125'

R 26 E

NAVAJO REFINING COMPANY HAZARDOUS WASTE DISPOSAL AREAS

BY:

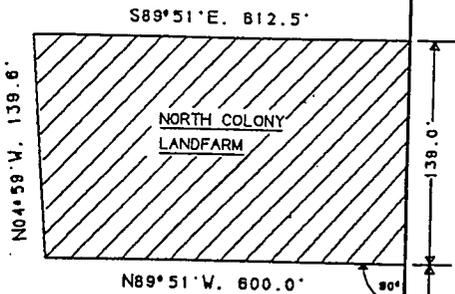
Date:



REFINING COMPANY ENGINEERING DEPARTMENT
ARTESIA, NEW MEXICO



AREA 1



HAZARDOUS WASTE MANAGEMENT FACILITY
 This property has been used to manage hazardous waste and its subsequent use is restricted.

SECTION LINE

N00°09'E. 837.47'

N 28°40.0'

APPROX SCALE: 1" = 245'

NW CORNER of
SW 1/4 SECTION
T 17 S. R 26 E



CERTIFICATE OF SURVEY:

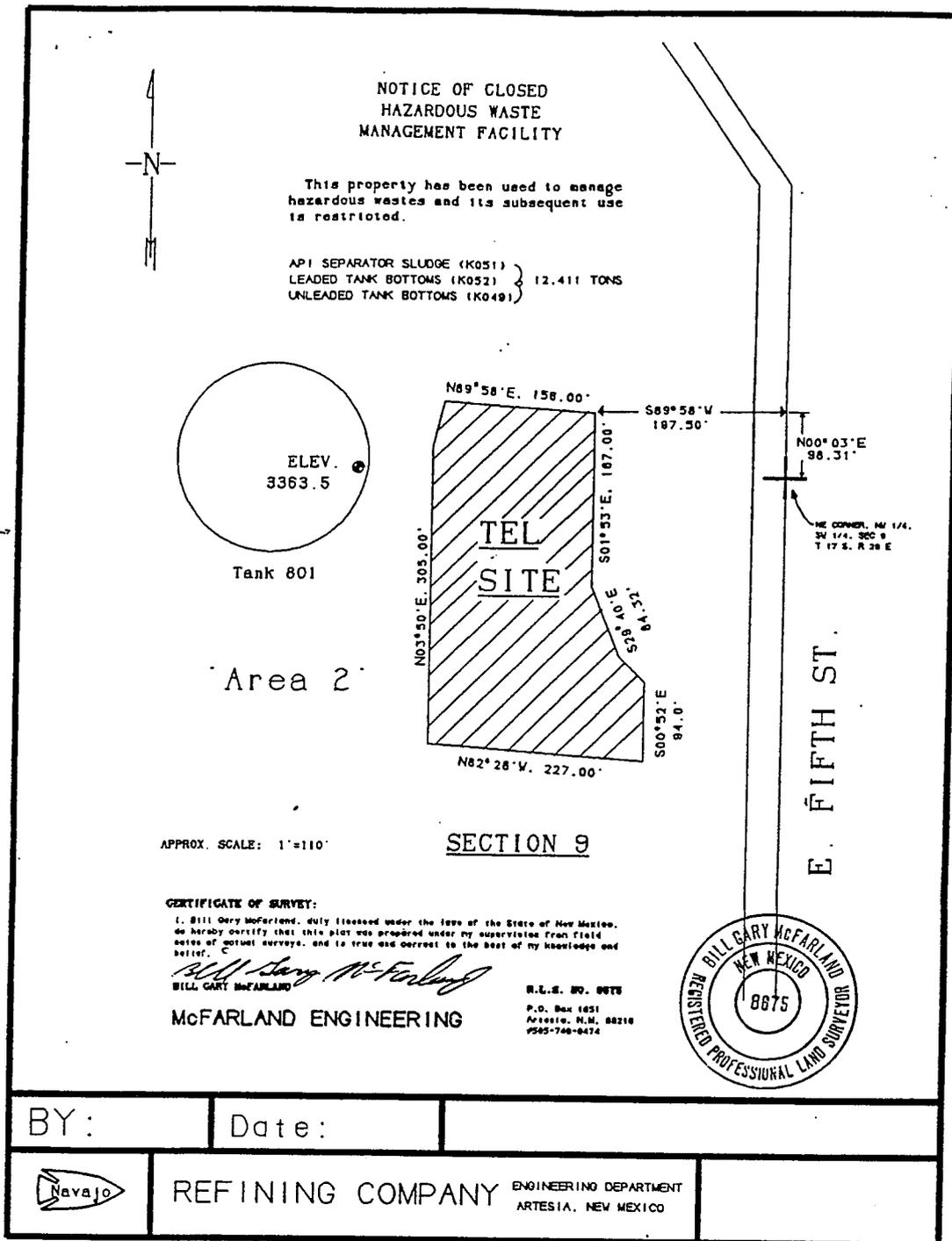
I, Bill Gary McFarland, duly licensed under the laws of the State of New Mexico, do hereby certify that this plat was prepared under my supervision from field notes of actual surveys, and is true and correct to the best of my knowledge and belief.

Bill Gary McFarland
 BILL GARY MCFARLAND

R.L.S. NO. 8875
 P.O. Box 1051
 Artesia, N.M. 88210
 #505-746-4474

MCFARLAND ENGINEERING

BY:	Date:	
	REFINING COMPANY	ENGINEERING DEPARTMENT ARTESIA, NEW MEXICO



BY:	Date:	
	REFINING COMPANY	ENGINEERING DEPARTMENT ARTESIA, NEW MEXICO

STATE OF NEW MEXICO, County of Eddy, ss. I hereby certify that this instrument was filed for record on the 21 day of April, A.D. 19 89 at 11:28 o'clock A. M., and duly recorded in BOOK 43 PAGE 413 of the Eddy County Records.

KAREN DAVIS, County Clerk By Jean E. Stover Deputy
CLERK'S CERTIFICATE

Certified this 1st day of May, 19 98, as a true and correct copy of the original recorded in this office.

KAREN OGULS
Clerk of Eddy County, N. Mex.
Freida Unguider Deputy

**NAVAJO REFINING COMPANY
ARTESIA, NEW MEXICO REFINERY**

PART B APPLICATION

ATTACHMENT B-6

**TETRAETHYLLEAD (TEL) WEATHERING AREA
POST-CLOSURE PLAN**

June 2001

NAVAJO REFINING COMPANY
TETRAETHYLLEAD WEATHERING AREA (TEL)
CLOSURE & POST CLOSURE PLAN

June 2001

<u>Table of Contents</u>		<u>Page</u>
1.0	INTRODUCTION	1
2.0	POST-CLOSURE PLAN	2
2.1	Requirements for Post-Closure Activities.....	2
2.1.2	Groundwater Monitoring	2
2.1.2	Maintenance of Access Restrictions.....	2
2.1.3	Inspection and Maintenance	2
2.2	Post-Closure Property Use	4
2.3	Length of Post-Closure Period	5
2.4	Post-Closure Contact	5
2.5	Amendment of Post-Closure Plan	5
2.6	Certification of Post-Closure	5
2.7	Post-Closure Cost Estimate	5
2.8	Revision of Post-Closure Cost Estimate.....	6
 TABLES		
	Table 1: Estimated Post-Closure Costs for TEL.....	7
 FIGURES		
	Figure 1: Inspection Log for TEL	8
 ATTACHMENTS		
	Attachment A: 1988 TEL Closure/Post-Closure Plan	

TETRAETHYLLEAD WEATHERING AREA (TEL) POST-CLOSURE PLAN

1.0 INTRODUCTION

This Post-Closure Plan for the Tetraethyllead Weathering Area (TEL) satisfies the requirements of New Mexico's Hazardous Waste Regulations. A Closure/Post-Closure Plan for the NCL was originally prepared and incorporated into Navajo's 1989 RCRA Landfarm Treatment Demonstration permit. That original closure/post-closure plan is attached at the end of this revised plan (Attachment A).

Closure of the TEL Site, in accordance with a closure plan approved by NMEID, was completed in 1989 and approved by NMEID in a letter from Richard Mitzelfelt, Director - New Mexico Health and Environment Department, on June 20, 1989. The cap used for TEL closure was designed and constructed according to EPA guidance for cap and cover systems. The cap effectiveness was modeled as part of the original closure plan (Appendix D of the original plan - April, 1988). A hazardous waste disposal notice was placed in the property deed and filed with the local land use authority (Eddy County Clerk) at the time of closure. This notice provided a certified survey of the TEL Site including the type, location, and quantity of hazardous waste disposed of within the TEL Site, identified that the area was used to manage hazardous wastes and that its use is restricted.

Navajo has been implementing provisions of the April 1988 TEL Post-Closure Plan since June 1989. The unit is fenced, has its own irrigation system, is covered with grass and is mowed as necessary. At the time of closure, compliance monitoring had been ordered for the TEL Site and continues quarterly. Monitoring results are provided in Appendix 5 of the Post-Closure Permit Application.

In the last 8 years, the product level in the monitor wells around this unit has dropped from 2 feet to a sheen. This is attributed to an aggressive product recovery system in place throughout the refinery, but most specifically to a recovery trench just east of the TEL. The source of the free product is believed to be two diesel storage tanks that were at one time located just west of the TEL and that had been identified as leaking when they were removed. Laboratory analysis has shown the recovered product to be diesel. Given the characteristics of wastes placed on the TEL, it is most likely the source of the free product was the diesel tanks, not the TEL.

This revised post-closure plan incorporates applicable portions of the original post-closure plan

2.0 *POST-CLOSURE PLAN*

2.1 Requirements for Post Closure Activities

2.1.1 Groundwater Monitoring

A compliance monitoring program was initiated for the TEL in 1989-1990 following detection of hazardous constituents in the groundwater. The Compliance Monitoring Program, which meets the requirements of 40 CFR 264.99, is also part of the groundwater monitoring plan for the North Colony Landfarm and is integrated with monitoring requirements for NMOCD. The groundwater monitoring wells for the TEL consist of RCRA well numbers 35, 36, 37 and 38 and can be located in Figure C-1 of the Post-Closure Permit Application.

Results of quarterly monitoring are reported annually to NMED and NMOCD. Reports for calendar years 1999 and 2000 are included in Appendix 5 of the Post-Closure Permit Application.

Based on discussions with NMED regarding future post-closure activities, Navajo will conduct semiannual monitoring on four (4) wells around the TEL (TEL-1, TEL-2, TEL-3 and TEL-4). Samples from these wells will be tested for VOCs (Method 8260B), SVOCs (Method 8270C), diesel range organics (DRO – Method 8015B) and RCRA VIII metals. NMED will identify the schedule such sampling and reporting is to be done.

2.1.2 Maintenance of Access Restrictions

Access control features consisting of a 7 foot chain link fence around the TEL perimeter, lockable steel gate and warning signs in English and Spanish will be inspected semiannually.

The following items shall be inspected:

- Integrity of chain link fence and gate
- Integrity of lock on the gate
- Warning signs

Specifically look for indications of storm damage, vandalism, or mechanical failure. Additionally, check that signs are legible and securely fastened.

2.1.3 Inspection and Maintenance Procedures

During post-closure care duration, the Closure Coordinator will supervise planned inspection and maintenance activities. The inspection frequencies and maintenance procedures for these activities are listed below.

Final cover integrity will be inspected on a semiannual basis during post-closure care. It shall be inspected once during the summer months and once again during the winter months. This frequency will provide observations of the final cover under varying seasonal conditions. It will also allow major problems to be detected and corrected in a relatively short period of time. An inspection list for the cover shall include the following:

- Need for fertilization, mowing, or irrigation
- Need for herbicides and pesticides
- Surface erosion and settling of the cap
- Burrowing animals destroying large surface areas of vegetation

The vegetative cover is expected to require only twice-yearly mowing to keep down weed and brush species. Annual fertilizations or liming if necessary, will promote the desirable grasses over those that offer less resistance to surface erosion. Judicious use of herbicides and pesticides may be necessary to protect the vegetative cover from competing vegetation and insects. Bi-monthly irrigation may be required to bring soil moisture content up to a minimum of 50% of the available soil water. The vegetative cover will be re-established as soon as possible if partly or completely destroyed.

Although severe surface erosion is not expected, any surface erosion should immediately be repaired and restored to pre-damaged conditions. Look for signs such as small rills or gullies. A thick, healthy vegetative cover should be maintained to minimize erosion. If erosional effects are persistent, re-sculpting of the land surface should be conducted to eliminate these effects, including terracing of the area.

The final cover and specifically, the impermeable soil layer are designed to resist cracking due to shrinkage or cold weather. Look for cracks along the upper elevations of the cover surface. If any cracks are observed, the cause of the problem will be determined before repairs are made. Repairs will be made in such a manner to minimize long term maintenance and retain cap structural integrity.

The entire surface of the final cover will be inspected for animal burrows or holes. If located, such features will be backfilled with soil or clay and compacted such that the cap maintains structural integrity. Appropriate eradication procedures will be taken if the burrows or holes persist.

The cap will be inspected for any signs of differential settling such as slumping surfaces or radiating cracks on any part of the final cover. If differential settling is observed, the cause will be determined before repairs are attempted so that long term maintenance requirements are minimized and so that the waste will not be exposed. The cap can be repaired by backfilling and compacting with a spoil of similar or better characteristics than the original material used to construct the cap. The repair must have at least the same or lower permeability than the rest of the cap and be re-vegetated as quickly as possible. Repair and testing records will be maintained .

The TEL groundwater monitoring wells, TEL-1, TEL-2, TEL-3 and TEL-4, will be inspected at scheduled sampling events as outlined in the groundwater monitoring program. This will be frequent enough to affect any maintenance necessary to allow the groundwater monitoring program to fulfill its schedule. The following items shall be inspected:

- Surface casing and lockable lid
- Concrete pad around surface casing
- Indications of mechanical integrity of tubing
- Indications of standing water

Specifically look for; severe damage to surface casing that would prevent sampling or compromise security, mechanical function of lock and indications of vandalism, weathering of concrete pad into fragments or subsidence of well structure, subsidence of tubing or indications of physical mechanical failure or elevated levels of PVC constituents in groundwater samples, standing water that can migrate into groundwater by seeping down the outside of the casing or vegetative growth, such as bushes or small trees whose root systems could penetrate the seal around casing in the well bore.

If replacement of a well becomes necessary, applicable regulatory guidelines on RCRA-approved well installation will be consulted. It may also be necessary to apply for a Class I Permit Modification.

There is a brass cap survey marker set in a concrete pylon near the TEL site and shown on the survey plot. This marker will be inspected at least annually to determine that it is still present, and that it has not been disturbed or its position disturbed. If necessary, the marker will be replaced. If necessary to move the marker, a new marker will be reestablished and surveyed in relation to another permanent geodetic marker. The new marker location will be documented and the survey plat revised.

An example inspection checklist is provided in Figure 1 at the end of this plan.

2.2 Post-Closure Property Use

Navajo will not allow post-closure use of the TEL that will disturb the integrity of the final cover, security system, or the function of the sites monitoring systems unless the Director of the NMED approves of the use.

If such post-closure use becomes necessary, Navajo may request modification of its post-closure plan in accordance with the provisions of 40 CFR 270.42 and 40 CFR 264.117(c) as appropriate, provided that the modification or use meets either of the following conditions:

- It is necessary to the proposed use of the property and will not increase the potential hazard to human health or the environment; or
- It is necessary to reduce a threat to human health or the environment.

2.3 Length of Post-Closure Period

The post-closure period identified in the original RCRA Permit for TEL was 30 years from the date of closure (1989), until June 2019. Twelve (12) years of the post-closure period have been completed with 18 years remaining, unless approval for an adjustment of the remaining time period is obtained from the NMED.

2.4 Post Closure Contact

The individual holding the position of Environmental Coordinator, or its successor title will be the point of contact:

Environmental Coordinator
Navajo Refining
P.O. Drawer 159
501 East Main Street
Artesia, NM 88210
(505) 748-3311

2.5 Amendment of Post-Closure Plan

Navajo will amend the post-closure plan whenever changes in facility design or operating plans effect post-closure plans. This includes events that occur during partial or final closure.

Navajo will amend the post-closure plan at least 60 days prior to the proposed change or no later than 60 days after the unexpected event that affects the post-closure plan.

2.6 Certification of Post-Closure

Within 60 days after completion of post-closure care, Navajo will submit a letter of certification by registered mail to the Director.

The letter of certification will state that the post-closure care was performed in accordance with the approved post-closure plan. The signatures of a duly authorized representative of Navajo and an independent certified registered professional engineer will appear on the letter of certification.

2.7 Post-Closure Cost Estimate

The Post-Closure Plan Cost Estimate is presented in Table 1 at the end of this plan

2.8 Revision of Post-Closure Cost Estimate

Navajo will revise the post-closure cost estimates within 30 days after the Director has approved the request to modify the post-closure plan, if the change in the post-closure plan results in an increase to the cost of the post-closure care.

TABLE 1

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR TEL SITE				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Semiannual inspection (2/yr)	hours	2 hrs/insp	\$50/hr	\$200/yea
Security maintenance	annual	1	\$250/yr	\$250/year
Dike/Cap maintenance	annual	1	\$250/yr	\$250/year
Monitoring well mtce	wells	4 wells/yr	\$150/well	\$600/year
Mowing (2/yr)	Acre	0.9 acre	\$27.04/acre	\$50/year
Fertilize (annually)	Acre	0.9 acre	\$78.44/acre	\$70/year
Semiannual groundwater Sampling; (4wells)	hours	1 tech+1geologist 8 hours/event 2 events/yr	\$45/hr-tech \$85/hr- geologist	\$2,080/year\$
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	5 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$8,250/ year
Travel time (2/yr)	Hours	Included with NCL	\$65/hr avg	
Travel costs	Trip	Included with NCL	\$360/trip	
Reporting(2/yr)	hours	8 hrs/report	\$85/hr	\$1,360/year
Project management and subcontractor markup		10% of total cost		\$1,311/year
TOTAL ANNUAL COST				\$14,421
18 YEARS ANNUAL COST				\$259,578

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR TEL SITE				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	4 wells	\$3,500	\$14,000
Replace fence once during 30 years	Linear foot (LF)	835 LF 7' chain link	\$26.80/LF	\$22,378
TOTAL ONE TIME COSTS				\$36,378

TOTAL 18 YEAR POST-CLOSURE COST:	\$295,956
---	------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

**FIGURE 1
INSPECTION LOG: TEL SITE**

At least semiannually and after major storm events the following should be inspected, observations recorded, and repairs made if necessary

Security and Control:

1. Is the integrity of the fence and gate intact? _____
2. Is the gate locked and the lock in good condition? _____
3. Are the warning signs in place (any missing) and legible? _____
4. Any signs of vandalism or prohibited trespass _____

Monitor Wells: (also inspect at each monitoring event)

1. Any damage to surface casing that would prevent sampling? _____
2. Any indication of vandalism? _____
3. Any weathering of concrete pad? _____
4. Any evidence of standing water or subsidence of well structure? _____
5. Are wells locked and locks/caps in good condition? _____

Cap/Cover

1. Any evidence of differential settling of cap (standing water, slumping surfaces, radiating cracks)? _____
2. Any cracks ,crevices? _____
3. Any erosion or evidence of burrowing animals? _____
4. Is vegetation distressed? Any areas that require re-seeding? _____
- 5 Does grass need mowing, watering, fertilization? _____

General:

1. Is drainage clear of debris, overgrowth or other obstructions? _____
2. Is the survey marker present and in good condition? _____
3. Other observations: _____

Work Memo Number: _____

Date Issued: _____ Date Completed: _____

Inspection Date: _____ Inspection Signature: _____

NOTE: this inspection log and any related work orders to be retained for at least three years from inspection date.

**NAVAJO REFINING COMPANY
ARTESIA, NEW MEXICO REFINERY**

PART B APPLICATION

ATTACHMENT B-8

**FINANCIAL ASSURANCE
for
CLOSURE, POST-CLOSURE AND CORRECTIVE ACTION**

June 2001

TABLE B-8-1

NAVAJO REFINING COMPANY
Artesia, New Mexico

**SUMMARY OF ESTIMATED CLOSURE, POST-CLOSURE
AND CORRECTIVE MEASURE COSTS**

UNIT	ESTIMATED COST			TOTAL UNIT COST
	CLOSURE	CORRECTIVE MEASURES	POST- CLOSURE	
North Colony Landfarm	\$22,256	NA	\$673,560 ¹	\$695,816
TEL Site	closed	NA	\$295,956 ²	\$295,956
Three-Mile Ditch	NA	\$78,134	NA	\$78,134
Evaporation Ponds	NA	\$687,740	\$1,003,076 ³	\$1,690,816
TOTAL FACILITY	\$22,256	\$765,874	\$1,972,592	\$2,760,722

NOTE:

¹Based on 20 years of Post-Closure. NCL received last waste in 1990; post-closure actions initiated in 1991.

²Based on 18 years of Post-Closure. TEL has been in post-closure since 1989.

³Based on 30 years of Post-Closure.

All costs updated May, 2001.

Costs based on hiring third party.

TABLE B-8-2

ESTIMATED CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Establish Vegetative Cover				
Obtain Soil Samples (technician, includes travel time)	Hrs	12	\$50/hr	\$600
Test Soil (pH, nutrients, organic matter)	Samples	8	\$150/sample	\$1,200
Establish grade	SY	17818	\$0.19/SY	\$3,385
Fertilize (3 times, 800 lbs/acre)	Acres	3.68	\$78.45/acre	\$870
Apply lime (3 times, 800 lbs/acre)	Acres	3.68	\$95.14/acre	\$1,050
Initial seeding (mechanical seeding, seed, mulch and water)	Acres	3.68	\$2,033/acre	\$7,481
Water (5 times, by truck)	Acres	3.68	\$54.19/acre	\$997
Survey (2-person crew)	Day	1	\$650	\$650
Subtotal Task				\$16,233

Project Management and Reporting				
Certify closure	hrs	8	\$125/hr	\$1,000
Notice in deed	hrs	8	\$125/hr	\$1,000
Travel Time (2 trips)	hrs	8	\$125/hr	\$1,000
Travel cost	Trip	2	\$500	\$1,000
Project management and subcontractor markup	10% of total cost			\$2,023
Subtotal Task				\$6,023

PROJECT TOTAL COST	\$22,256
---------------------------	-----------------

NOTES:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

TABLE B-8-3

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Semiannual inspection (2/yr)	hours	4 hrs/insp	\$50/hr	\$400/yea
Security maintenance	annual	1	\$250/yr	\$250/year
Dike maintenance	annual	1	\$250/yr	\$250/year
Monitoring well mtce	wells	8 wells/yr	\$150/well	\$1,200/year
Mowing (2/yr)	Acre	3.68 acre	\$27.04/acre	\$200/year
Fertilize (annually)	Acre	3.68 acre	\$78.44/acre	\$288/year
Semiannual groundwater Sampling; (8 wells)	hours	1 tech+1geologist 16 hours/event 2 events/yr	\$45/hr-tech \$85/hr-geologist	\$4,160/year
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	9 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$14,850/ year
Travel time (2/yr)	Hours	1 tech+1geologist 8 hrs/event	\$65/hr avg	\$2,080/year
Travel costs	Trip	2/yr	\$500/trip	\$1,000/year
Reporting(2/yr)	hours	16 hrs/report	\$85/hr	\$2,720/year
Project management and subcontractor markup		10% of total cost		\$2,740/year
TOTAL ANNUAL COST				\$30,138
20 YEARS ANNUAL COST				\$602,760

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR NORTH COLONY LANDFARM				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	8 wells	\$3,500	\$28,000
Replace fence once during 30 years	Linear foot (LF)	1600 LF 7' chain link	\$26.80/LF	\$42,880
TOTAL ONE TIME COSTS				\$70,800

TOTAL 20 YEAR POST-CLOSURE COST	\$673,560
--	------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

Last waste placed on NCL in 1990. Under Post-Closure for 10 years, since 1991.

TABLE B-8-4

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR TEL SITE				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Semiannual inspection (2/yr)	hours	2 hrs/insp	\$50/hr	\$200/yea
Security maintenance	annual	1	\$250/yr	\$250/year
Dike/Cap maintenance	annual	1	\$250/yr	\$250/year
Monitoring well mtce	wells	4 wells/yr	\$150/well	\$600/year
Mowing (2/yr)	Acre	0.9 acre	\$27.04/acre	\$50/year
Fertilize (annually)	Acre	0.9 acre	\$78.44/acre	\$70/year
Semiannual groundwater Sampling; (4wells)	hours	1 tech+1geologist 8 hours/event 2 events/yr	\$45/hr-tech \$85/hr-geologist	\$2,080/year\$
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	5 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$8,250/ year
Travel time (2/yr)	Hours	Included with NCL	\$65/hr avg	
Travel costs	Trip	Included with NCL	\$360/trip	
Reporting(2/yr)	hours	8 hrs/report	\$85/hr	\$1,360/year
Project management and subcontractor markup		10% of total cost		\$1,311/year
TOTAL ANNUAL COST				\$14,421
18 YEARS ANNUAL COST				\$269,578

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR TEL SITE				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	4 wells	\$3,500	\$14,000
Replace fence once during 30 years	Linear foot (LF)	835 LF 7' chain link	\$26.80/LF	\$22,378
TOTAL ONE TIME COSTS				\$36,378

TOTAL 18 YEAR POST-CLOSURE COST:	\$295,956
---	------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)

TEL has been in Post-Closure 12 years, since 1989.

TABLE B-8-5

ESTIMATED CORRECTIVE MEASURE COSTS FOR THREE-MILE DITCH				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Soil Sampling and Removal				
Labor for sampling and oversight	hours	1 tech+1geologist 80 hrs ea	\$45/hr-tech \$85/hr-geologist	\$10,400
Instrument rental for lead/PID	days	8	\$250/day	\$2,000
Soil removal, transportation & grading	cubic yard hours	200 40	(costed at hrly rate) 78.34/hr-trackloader 63.07/hr-dumptruck	\$5,656
Other misc field exp	Days	8	100	\$800
Travel and living expenses	Days Hours Nights Days	8 8 ea x 2 = 16 8 ea x 2 = 16 8ea x 2 = 16	\$75/day truck rental \$65/hr avg \$75/night lodging \$35/day meals	\$3,400
Analysis - soil	analysis	115 20	Lead -\$25 DRO-\$85	\$4,575
Reporting	hours	40	\$85/hr	\$3,500
Senior Review - certification	Hours	8	\$125	\$1000
Project management & reporting	10% of total costs			\$3,133
Subtotal Soil Sampling and Removal				\$34,464

Groundwater Monitoring				
Monitoring well mtce	wells	5 wells/yr	\$150/well	\$750/year
Groundwater sampling; (5 wells)	hours	1 tech+1geologist 12 hours/event 1 events/yr	\$45/hr-tech \$85/hr-geologist	\$1,560/year\$
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	6 samples/event (includes QA)	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$4,950/ year
Travel time	Hours	Included with NCL	\$65/hr avg	
Travel costs	Trip	Included with NCL	\$500/trip	
Reporting(1/yr)	hours	8 hrs/report	\$85/hr	\$680/year
Project management and subcontractor markup	10% of total cost			\$794/year
Total Annual Cost				\$8,734
Subtotal Cost for 5-Years Groundwater Monitoring				\$43,670

PROJECT TOTAL COST	\$78,134
---------------------------	-----------------

NOTES:

Costs originally estimated in June 1998 (RCRA Permit Application, Post-Closure Plan for Evaporation ponds; preliminary estimates in December 1997, Consolidated RFI/CMS Report).

Costs based on hiring third party for all activities.

Costs last updated: May, 2001

TABLE B-8-6

ESTIMATED CORRECTIVE MEASURE COSTS FOR EVAPORATION PONDS 1-6				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Initial Sampling				
Write workplan/H&S Plan	Hrs	80	\$100/hr	\$8,000
Consultant sampling labor (45 locations – 15 each Pond 1, 2 & 3-6; 2 samples/location)	Hrs	1 tech+1geologist 100 hrs ea including prep	\$45/hr-tech \$85/hr-geologist	\$13,000
Travel and living expenses	Days Hours Nights Days	8 8 ea x 2 = 16 8 ea x 2 = 16 8ea x 2 = 16	\$75/day truck rental \$65/hr avg \$75/night lodging \$35/day meals	\$3,400
Geoprobe and crew (includes living expenses)	Mobe Days	1 8	\$1,000 \$1,500	\$13,000
Miscellaneous sampling expenses (PPP, PID, shipping, water etc)	Days	8	\$250/day	\$2,000
Analysis; soil (VOC, SVOC, DRO, RCRA VIII metals)	samples	100 samples(inc QA) for modified Skinner List	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$82,500
Write Report (data management, risk assessment, draft/final report)	Hrs	180	\$100/hr avg	\$18,000
Project management and subcontractor markup	10% of total cost			\$13,990
Subtotal Initial Sampling Task				\$153,890
Establish Vegetative Cover as Final Closure (107 acres)				
Write workplan/H&S Plan	Hrs	120	\$100/hr	\$12,000
Obtain Soil Samples	Hrs	16	\$50/hr	\$800
Test Soil (pH, nutrients, etc)	Samples	20	\$150/sample	\$3,000
Earthwork, create CAMU	Cubic yds	28,291	\$4.34/cy	\$122,782
Establish grade/till	Acre	107	\$919/acre	\$98,333
Fertilize (3 times, 800 lbs/acre)	Acres	107	\$78.45/acre	\$8,394
Apply lime (3 times, 800 lbs/acre)	Acres	107	\$95.14/acre	\$10,179
Seeding (mechanical seeding, seed, mulch and water)	Acres	107	\$2,033/acre	\$217,531
Survey (2-person crew)	Day	2	\$650/day	\$1,300
Final Closure Certification Report	hrs	80	\$100/hr avg	\$8,000
Notice in deed	hrs	8	\$125/hr	\$1,000
Travel Time (2 trips)	hrs	8	\$125/hr	\$1,000
Travel cost	Trip	2	\$500	\$1,000
Project management and subcontractor markup	10% of total cost			\$48,532
Subtotal Vegetative Cover Task				\$533,850
PROJECT TOTAL COST				\$687,740

NOTES:

Cost for Pond 1 originally estimated at \$82,660 in December 1997 (*Consolidated RFI/CMS Report*)

Cost for Pond 2 originally estimated at \$225,560 in August 1996 (*Evaporation Ponds 2-6 Closure Plan*)

Cost for Ponds 3-6 originally estimated at \$380,165 in August 1996 (*Evaporation Ponds 2-6 Closure Plan*)

Costs last updated: May, 2001. Costs based on hiring third party for all activities. Cost estimates for dirt work, seeding etc. based on data from R.S. Means Environmental Unit Cost Data (2000)

TABLE B-8-7

ESTIMATED RECURRING ANNUAL POST-CLOSURE COSTS FOR EVAPORATION PONDS				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Monthly inspection (12/yr)	hours	4 hrs/insp	\$50/hr	\$2,400/year
Security maintenance	annual	1	\$500/yr	\$500/year
Dike maintenance	annual	1	\$1000/yr	\$1000/year
Monitoring well mtce	wells	15 wells/yr	\$150/well	\$2,250/year
Semiannual groundwater Sampling; (15 wells yr 1-3, then 7-8 wells)	hours	1 tech+1geologist 24 hours/event(1-3) 12 hrs/event (4-30) 2 events/yr	\$45/hr-tech \$85/hr-geologist	\$6,240/year (1-3) \$3,120/year(4-30)
Analysis; ground water (VOC, SVOC, DRO, RCRA VIII metals)	samples	17 samples/event (includes QA) yr 1-3 9 samples/event (includes QA) yr 4-30	VOC-\$205 SVOC-\$380 DRO-\$85 Metals-\$155 Total-\$825	\$28,050/year(1-3) \$14,850/year (4- 30)
Travel time (2/yr)	Hours	Included with NCL	\$65/hr avg	
Travel costs	Trip	Included with NCL	\$360/trip	
Reporting(2/yr)	hours	16 hrs/report	\$85/hr	\$2,720
Project management and subcontractor markup		10% of total cost		\$4,316/year(1-3) \$2,684/yr(4-30)
TOTAL ANNUAL COST				\$47,476(1-3) \$29,524(4-30)
30 YEARS ANNUAL COST				\$939,576

ESTIMATED ONE-TIME POST-CLOSURE COSTS FOR EVAPORATION PONDS				
Activity	Unit	Quantity	Cost/Unit	Total Cost
Replace monitoring wells once during 30 years	Well installation	15 wells	\$3,500	\$52,500
Replace fence once during 30 years	Linear foot (LF)	8,800 LF 4-strand barbed wire	\$1.25/LF	\$11,000
TOTAL ONE TIME COSTS				\$63,500

TOTAL 30 YEAR POST-CLOSURE COST:	\$1,003,076
---	--------------------

NOTE:

Costs last updated: May, 2001

Costs based on hiring third party for all activities.

Cost estimates based on data from R.S. Means Environmental Unit Cost Data (2000)