



KAFB 07

DEPARTMENT OF THE AIR FORCE
 377th Civil Engineer Division (AFMC)
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20 Feb 07

MEMORANDUM FOR MR. WILLIAM C. OLSON, CHIEF
 GROUNDWATER QUALITY BUREAU
 NEW MEXICO ENVIRONMENT DEPARTMENT
 PO BOX 26
 SANTA FE, NM 87502

FROM: 377 MSG/CEVR
 2050 Wyoming Blvd SE, Suite 118
 Kirtland AFB NM 87117-5270

SUBJECT: Operations and Maintenance Plan, Interim Remedial Action Operation, Nitrate Abatement Ponds (Golf Course) Repair at WP-026 and ST-105, Kirtland Air Force Base (AFB), New Mexico

1. The Environmental Management (EM) Branch at Kirtland AFB is submitting two copies of the subject report, including one electronic copy with each document. One copy is being submitted to your office, and one copy is being submitted to Mr. Baird Swanson of your staff.
2. Please contact me at 505-853-6534 or Rob Warder at 505-853-0012 if you have any questions or comments on this matter.



CARL J. LANZ, P.G.
 Chief, Restoration Section



- Attachments:
1. Operations and Maintenance Plan, Interim Remedial Action Operation, Nitrate Abatement Ponds (Golf Course) Repair at WP-026 and ST-105
 2. Electronic copies of Operations and Maintenance Plan, Interim Remedial Action Operation, Nitrate Abatement Ponds (Golf Course) Repair at WP-026 and ST-105

cc:

NMED GWQB, Mr. Swanson w Atchs

NMED HWB, Mr. Kieling wo Atchs

NMED HWB, Mr. McDonald w Atchs

USEPA-Region 6 (6PD-N), Ms. King w Atchs

HQ AFMC/A7CVP, Mr. McCann wo Atchs

USACE, Mr. Martell wo Atchs

Tetra Tech, Ms. Moss wo Atchs

Admin. Record, CNM, Montoya Campus w Atch 2 only

AR/IR w Atch 2 only

File

KIRTLAND AIR FORCE BASE

Operations and Maintenance Plan Interim Remedial Action–Operation Nitrate Abatement Ponds (Golf Course) Repair at WP-026 and ST-105 Kirtland Air Force Base, New Mexico

January 2007



**377 MSG/CEVR
2050 Wyoming Blvd SE
Kirtland AFB, New Mexico 87117-5270**

**KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO**

**OPERATIONS AND MAINTENANCE PLAN
INTERIM REMEDIAL ACTION–OPERATION
NITRATE ABATEMENT PONDS (GOLF COURSE) REPAIR
AT WP-026 AND ST-105
KIRTLAND AIR FORCE BASE, NEW MEXICO**

January 2007

Prepared for

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Project No. MHMV 06-7037
Task Order 0003

Prepared by

Tetra Tech EC, Inc.
143 Union Boulevard, Suite 1010
Lakewood, Colorado 80228

NOTICE

Tetra Tech EC, Inc. prepared this Operations and Maintenance Plan for the U.S. Army Corps of Engineers, Tulsa District, to document operations and maintenance requirements for the Interim Remedial Action–Operation at WP-026 and ST-105 under the Environmental Restoration Program (ERP). As the plan relates to actual or possible releases of potentially hazardous substances, its release prior to an U.S. Air Force (USAF) final decision on remedial action may be in the public’s interest. The limited objectives of this plan and the ongoing nature of the ERP, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this plan, as subsequent facts may become known that may make this report premature or inaccurate.

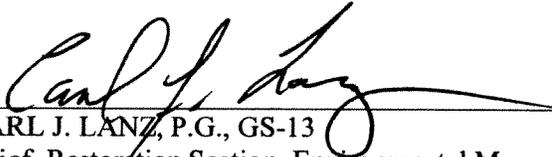
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6. AUTHOR Ms. Jacqueline Arcaris Mr. Ron Versaw, P.E.				
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11. SUPPLEMENTARY NOTES This is a final report.				
12a. DISTRIBUTION/AVAILABILITY STATEMENT			12b. DISTRIBUTION CODE	
13. ABSTRACT The Operations and Maintenance Plan documents the long-term inspection, routine maintenance, and repair activities to ensure all components of the liner systems, inlet/outlet pipes, and riprap structures installed as part of the Golf Course nitrate abatement pond repair project are in effective condition and function as designed to meet operational objectives.				
14. SUBJECT TERMS <ul style="list-style-type: none"> • Interim Remedial Action–Operation • Golf Course Nitrate Abatement Ponds Repair • WP-026 and ST-105 			15. NUMBER OF PAGES Approximately 48 pages	
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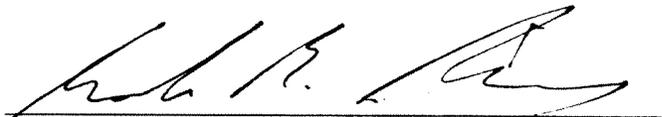
**40 CFR 270.11
DOCUMENT CERTIFICATION
JANUARY 2007**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



CARL J. LANZ, P.G., GS-13
Chief, Restoration Section, Environmental Management Branch

This document has been approved for public release.



SSGT MARKUS MAIER
Public Affairs

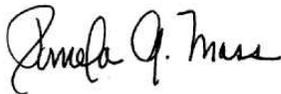
PREFACE

This Operations and Maintenance Plan addresses the inspection, maintenance, and repair activities that will be performed for the Interim Remedial Action–Operation Nitrate Abatement Ponds (Golf Course) Repair at WP-026 and ST-105, Kirtland Air Force Base (AFB), New Mexico. The purpose of this plan is to provide contractors with basic guidance to perform required inspections, routine maintenance, and repairs to ensure the liner systems function as designed and meet operational objectives.

Because the pond liner systems constructed at the Golf Course are similar, a single, comprehensive operations and maintenance plan for all six ponds is appropriate.

This work was performed under the authority of the U.S. Army Corps of Engineers (USACE), Tulsa District, Project Number MHMV 06-7037, Task Order 0003. Mr. Ken Kebbell, USACE, is the Contracting Officer’s Representative (COR) and Mr. Jim Martell, P.G., is the Project Manager for this task order.

This program was conducted under the Kirtland AFB Environmental Restoration Section Chief, Mr. Carl Lanz and the Kirtland AFB Project Manager, Mr. Rob Warder, P.E. Ms. Pamela Moss is the Tetra Tech EC, Inc. (TtEC) Task Order Manager and Mr. Eric J. Snow, TtEC, is the Construction Manager. The Operations and Maintenance Plan was prepared by a team of multidisciplinary engineers, compliance, and quality control professionals.



Pamela J. Moss
Tetra Tech EC, Inc.
Task Order Manager



Eric J. Snow
Tetra Tech EC, Inc.
Construction Manager

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
CFR	Code of Federal Regulations
Chugach	Chugach Alaska Corporation
COR	Contracting Officer's Representative
ft	feet/foot
HDPE	high-density polyethylene
GCMP	Golf Course Main Pond
IRA–O	Interim Remedial Action–Operation
NOT	Notice of Termination
O&M	Operations and Maintenance
TtEC	Tetra Tech EC, Inc.
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force

1. INTRODUCTION

This Operations and Maintenance (O&M) Plan describes the inspection, routine maintenance, and repair activities to be performed for the Interim Remedial Action–Operation (IRA–O) Nitrate Abatement Ponds (Golf Course) Repair at WP-026 and ST-105, Kirtland Air Force Base (AFB), New Mexico. The location of the Tijeras Arroyo Golf Course at Kirtland AFB is shown on the site map, Figure 1-1.

The *Base-Wide Plans for Investigations under the Environmental Restoration Program* (USAF, 2004) and the *Work Plan, Interim Remedial Action–Operation Nitrate Abatement Pond (Golf Course) Repair at WP-026 and ST-105 (IRA–O Work Plan)* (USAF, 2006) serve as the procedural guidance for this plan. The procedures detailed in the Base-Wide Plans will be adhered to for the required inspection, routine maintenance, and repair activities unless specifically modified by this plan. The contractor will oversee all technical and field work. Work conducted by subcontractors will be performed under the contractor's coordination and oversight.

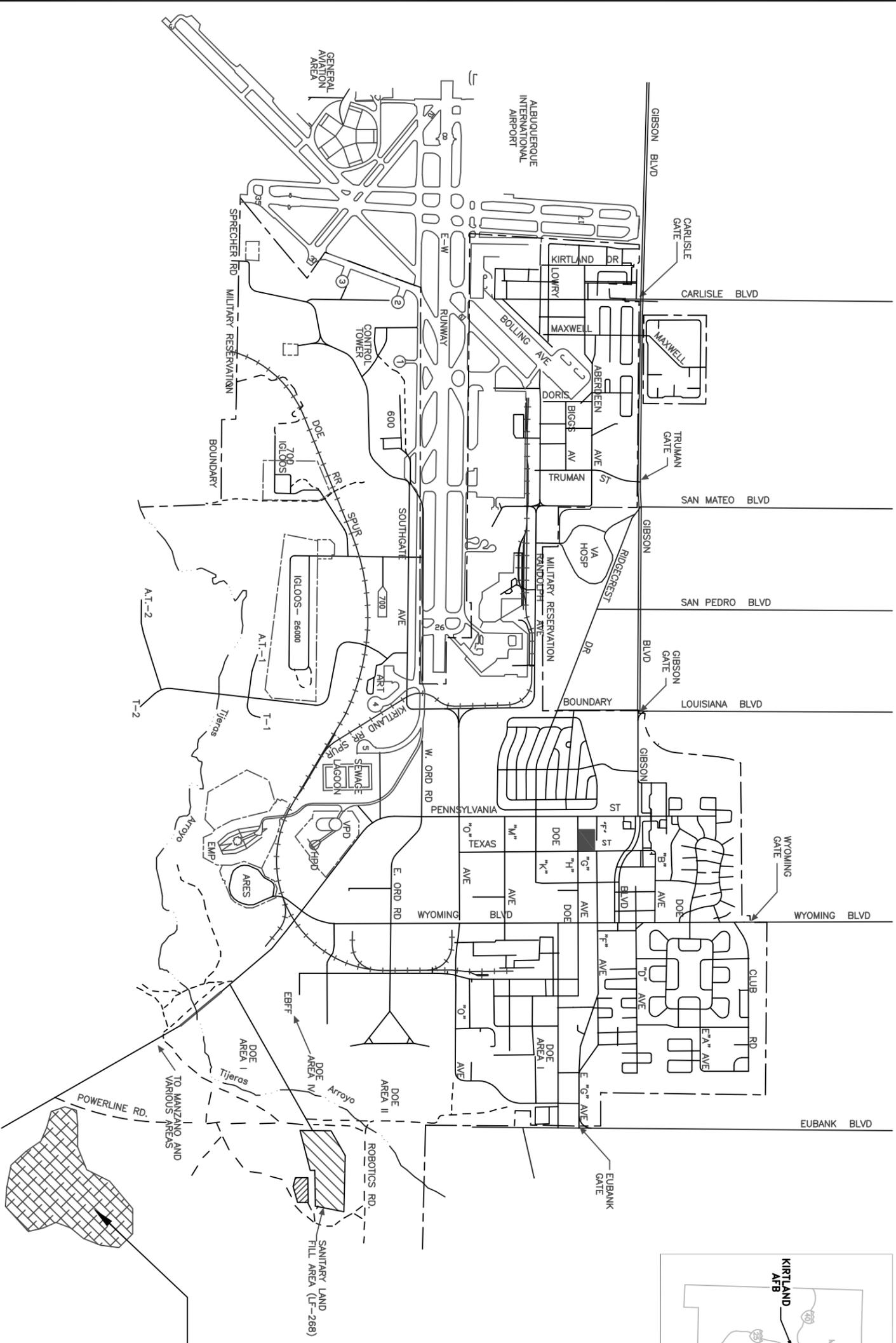
1.1 Purpose and Scope

The purpose of this O&M Plan is to provide the contractor with basic guidance to perform required inspections, routine maintenance, and repair to ensure the Golf Course nitrate abatement pond liner systems, inlet/outlet pipes, and riprap structures function as designed and meet operational objectives. Because the systems constructed at the nitrate abatement ponds are similar, one comprehensive O&M Plan for the Golf Course Main Pond (GMCP) and the five smaller ponds is appropriate.

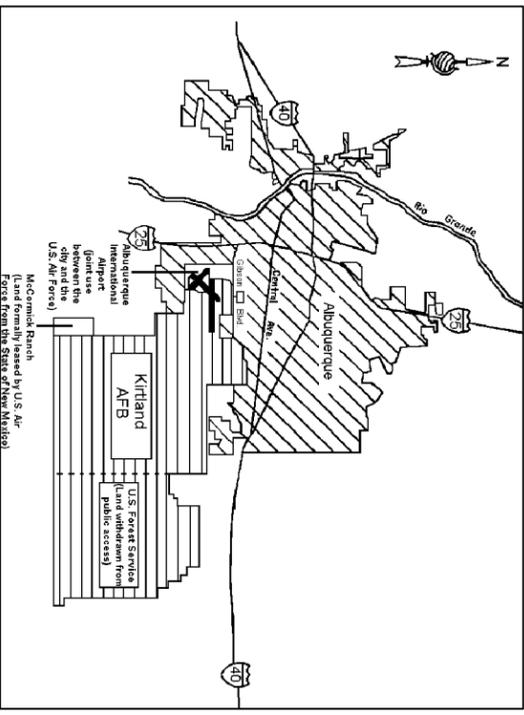
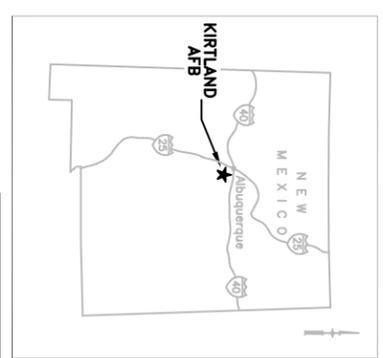
The O&M Plan addresses the following elements:

- Site description and background
- Inspection requirements
- Maintenance and repair procedures
- Monitoring requirements for revegetated areas
- Documentation and reporting requirements

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TIJERAS ARROYO GOLF COURSE



LEGEND

- KIRTLAND AFB PROPERTY
- BOUNDARY
- PROPERTY LEASED BY KIRTLAND AFB OR USED THROUGH OTHER AGREEMENT
- RAILROAD
- ROADS

0 1500 3000
1"=3000'
GRAPHIC SCALE

REVISIONS		DATE	APPROVED
SYMBOL	DESCRIPTIONS		
\$\$ - THINK VALUE ENGINEERING - \$\$			
DESIGNED BY:	AML		
DRAWN BY:	AML		
CHECKED BY:	JEA		
REVIEWED BY:	REV	DATE: 11/14/06	SHEET NUMBER:
SUBMITTED BY:	REV	CONTRACT NO.:	Figure 1-1
			REVISION:

SITE LOCATION MAP

TETRA TECH EC, INC.
ALBUQUERQUE, NM

U.S. ARMY CORPS OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

KIRTLAND AFB, NEW MEXICO

2. BACKGROUND AND HISTORY

The Tijeras Arroyo Golf Course lies 3 miles south of the East Operations Area, northwest of the Manzano Base area and north of the riding stables. The GCMP is located in the northwestern portion of the Golf Course, between fairways three and four, approximately 100 feet (ft) east of the Golf Course maintenance facility. Six nitrate abatement ponds are located at the site (see Figure 2-1). The five smaller ponds receive waters from the GCMP and are located throughout the Golf Course. Ponds one and two lie southeast of the main pond, in the middle and southeastern portion of the course. Ponds three and four are northeast of the GCMP. The fifth and smallest pond is immediately south of the GCMP.

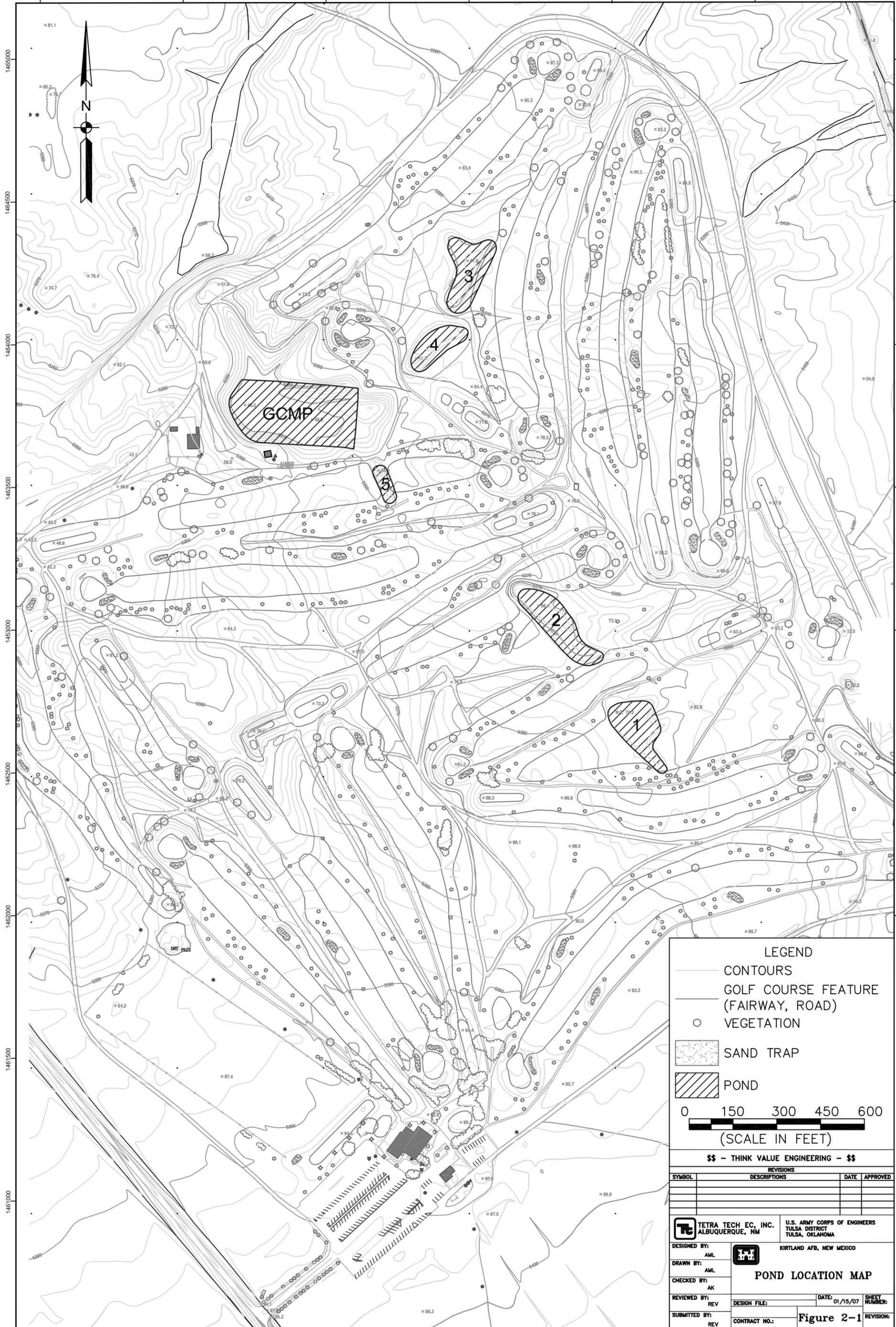
The GCMP and five smaller ancillary ponds are part of the WP-026 and the ST-105 Nitrate Abatement Plan. The ponds are used to store nitrate-contaminated groundwater that is pumped by production well KAFB-7 for use as irrigation water. A new production well for ST-105 will be installed in spring 2007, but will not be connected to the system until later in the year. A pumping rate based on model projections is 140 gallons per minute, but aquifer tests to determine the true pumping rate will be completed in the spring. The concentration of nitrate in groundwater representative of the area (KAFB-0508) measures about 24 milligrams per liter. It is expected the new production well will run almost continuously. A float in the GCMP will turn the well off or on when control elevations are reached. KAFB-7 will also be part of the telemetry system. When water-use demands are high (i.e., high irrigation periods) and the new extraction well cannot supply sufficient water, KAFB-7 will start up and supply additional water.

The ponds circulate in a self-contained, closed-loop system. This reduces vegetation growth and overflow. The GCMP is the lowest point in the system. The five smaller ponds gravity flow into the GCMP. Water stored in the ponds is applied to the Golf Course via the facility's irrigation system. The IRA-O Work Plan (USAF, 2006) was developed for Golf Course pond repairs to eliminate the potential for nitrate-contaminated water to leak from the ponds. The IRA-O Work Plan included clearing vegetation, regrading pond banks, installing and repairing 40-mil high-density polyethylene (HDPE) liners, and installing erosion control measures (piping, riprap).

The O&M Plan specifies the long-term inspection, routine maintenance, and repair activities to ensure all components of the liner systems, inlet/outlet pipes, and riprap structures installed as part of the Golf Course nitrate abatement pond repair project are in effective condition and function as designed to meet operational objectives. The condition of revegetated disturbed areas around the ponds will also be monitored under this plan.

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415500 416000 416500 417000 417500 418000



LEGEND

- CONTOURS
- GOLF COURSE FEATURE (FAIRWAY, ROAD)
- VEGETATION
- ▨ SAND TRAP
- ▩ POND

0 150 300 450 600
(SCALE IN FEET)

\$\$ - THINK VALUE ENGINEERING - \$\$

REVISIONS			
SYMBOL	DESCRIPTIONS	DATE	APPROVED

<p>TETRA TECH EC, INC. ALBUQUERQUE, NM</p> <p>DESIGNED BY: AML DRAWN BY: AML CHECKED BY: AK REVIEWED BY: REV SUBMITTED BY: REV</p>	<p style="text-align: center;">U.S. ARMY CORPS OF ENGINEERS TULSA DISTRICT TULSA, OKLAHOMA</p> <p style="text-align: center;">KIRTLAND AFB, NEW MEXICO</p> <p style="text-align: center;">POND LOCATION MAP</p> <p>DESIGN FILE: _____ DATE: 01/15/07 SHEET NUMBER: _____ CONTRACT NO.: _____ Figure 2-1 REVISION: _____</p>
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3. INSPECTION AND MAINTENANCE

3.1 Frequency

Site inspections and routine maintenance will be performed on a scheduled basis as dictated by this plan (Table 3-1) and requested by Kirtland AFB. Repairs will be performed on an as-needed basis.

3.2 O&M Activities

The O&M contractor will be responsible for performing and documenting the site inspections, routine maintenance, and repairs deemed necessary for the Golf Course nitrate abatement pond systems (liners, inlet/outlet pipes, and riprap structures) and identified in the plan. The required O&M activities are described in the following sections.

3.2.1 Inspections

Inspections shall consist of a review of the current condition of the system for each pond, including associated HDPE liner, riprap, and inlet and outlet piping, to determine whether all components are functioning as designed and integrity is maintained. The general condition of vegetation will be noted and issues shall be brought to the attention of Golf Course maintenance and Kirtland AFB Environmental Restoration staff. A complete photographic record of all system features to be inspected will be obtained during the initial monthly inspection and included with the first inspection report.

Each inspection will be recorded on the O&M Inspection Checklist (Appendix A). Copy of the site maps (Figures 3-1 and 3-2) will accompany the inspection report and be manually updated as necessary during the inspection to reflect any changes to the site condition, maintenance activities performed, and areas requiring repairs. Photographs will be taken during inspections to document site conditions.

Until a Notice of Termination (NOT) is filed, both the O&M Inspection Checklist (Appendix A) and the Stormwater Pollution Prevention Plan form provided in Appendix B of the IRA-O Work Plan (USACE, 2006) will be completed to fulfill all requirements. After the NOT is filed, only the form in Appendix A of this plan is required.

3.2.2 Maintenance

The O&M contractor will perform maintenance as required to ensure all components of the liner system, inlet/outlet pipes, and riprap structures are in effective operating condition. Maintenance activities and description of areas or features requiring maintenance will be noted as part of the inspection as described in Section 3.2.1.

Prior to forecasted major storm events, it is recommended that Golf Course personnel lower the level of the GCMP to compensate for additional runoff. In the event of overflow, a grab sample will be collected from the pond water in accordance with Basewide Plan Standard Operating Procedure B4.3, Surface Water Sampling (USAF, 2004) and analyzed for nitrate nitrogen.

3.2.3 Repair

As needed, the O&M contractor will perform minor repairs within 2 weeks of inspection unless otherwise directed by Kirtland AFB. Minor repairs are those performed to restore conditions at the ponds to the state present immediately after completion of the IRA-O nitrate abatement pond repair work and final

inspection. Examples include repair of damage to riprap, liner, or inlet/outlet piping; removal of blockages in inlet/outlet piping; and restoration of eroded areas. Reseeding to establish cover in sparsely vegetated areas will be the responsibility of Golf Course maintenance personnel.

Repair activities may be scheduled simultaneously at all pond locations to maximize efficiency and minimize the number of required mobilizations. The repair activities will be documented by photographs taken before and after the repairs have been completed. An O&M inspection report will be completed that provides details of the repair action, including a site map that shows the locations of all completed repairs. Descriptions of all repair activities will be summarized in the annual O&M report.

The basic categories of potential minor and major repairs at the nitrate abatement ponds include:

- Repair damaged HDPE liner and replace riprap on exposed areas of liner, especially where the liner is keyed-in along the pond rim.
- Replace displaced riprap.
- Remove excessive silt and debris that diverts intended direction of runoff flows.
- Remove debris from the ponds and blockages in the inlet/outlet pipes.
- Backfill eroded areas to original configuration.
- Remove vegetation from outside perimeter and banks of ponds.

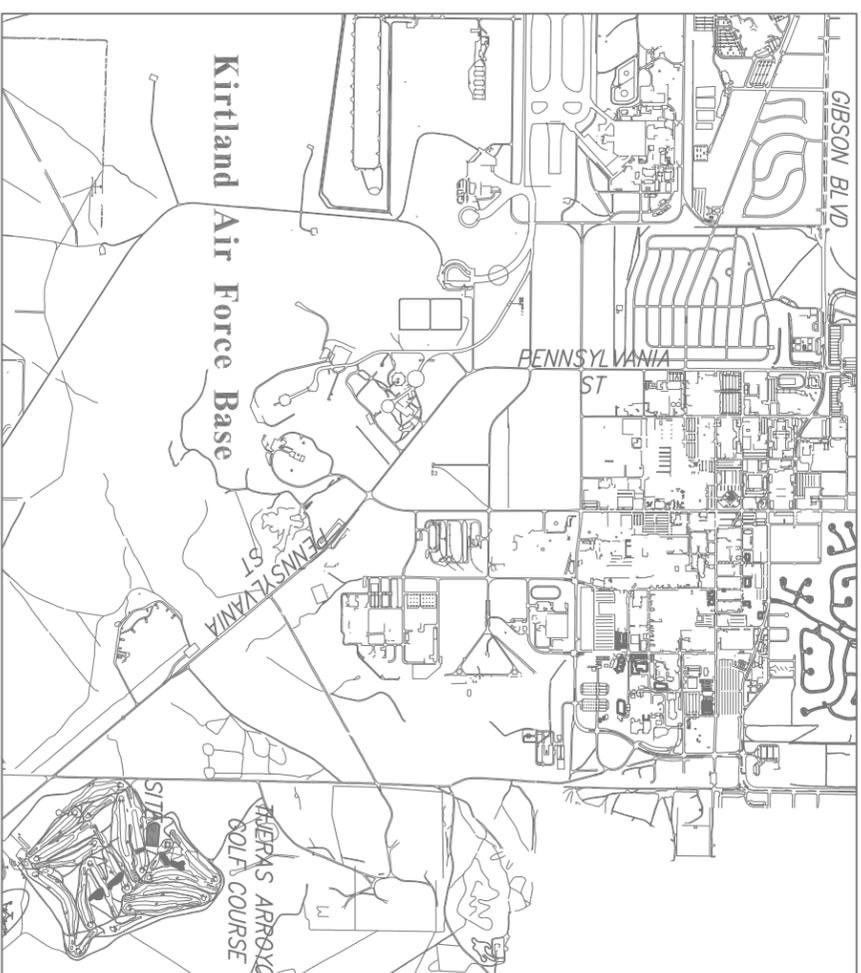
Remove vegetation and sedimentation build-up in interior of ponds. Removal of interior sediment will not be considered routine O&M activity and will require draining of ponds.

- Implement modifications to existing control measures based on changes to pond liner system, inlet/outlet pipes, or riprap structure design.
- Note sparsely vegetated areas and report to Golf Course maintenance personnel.

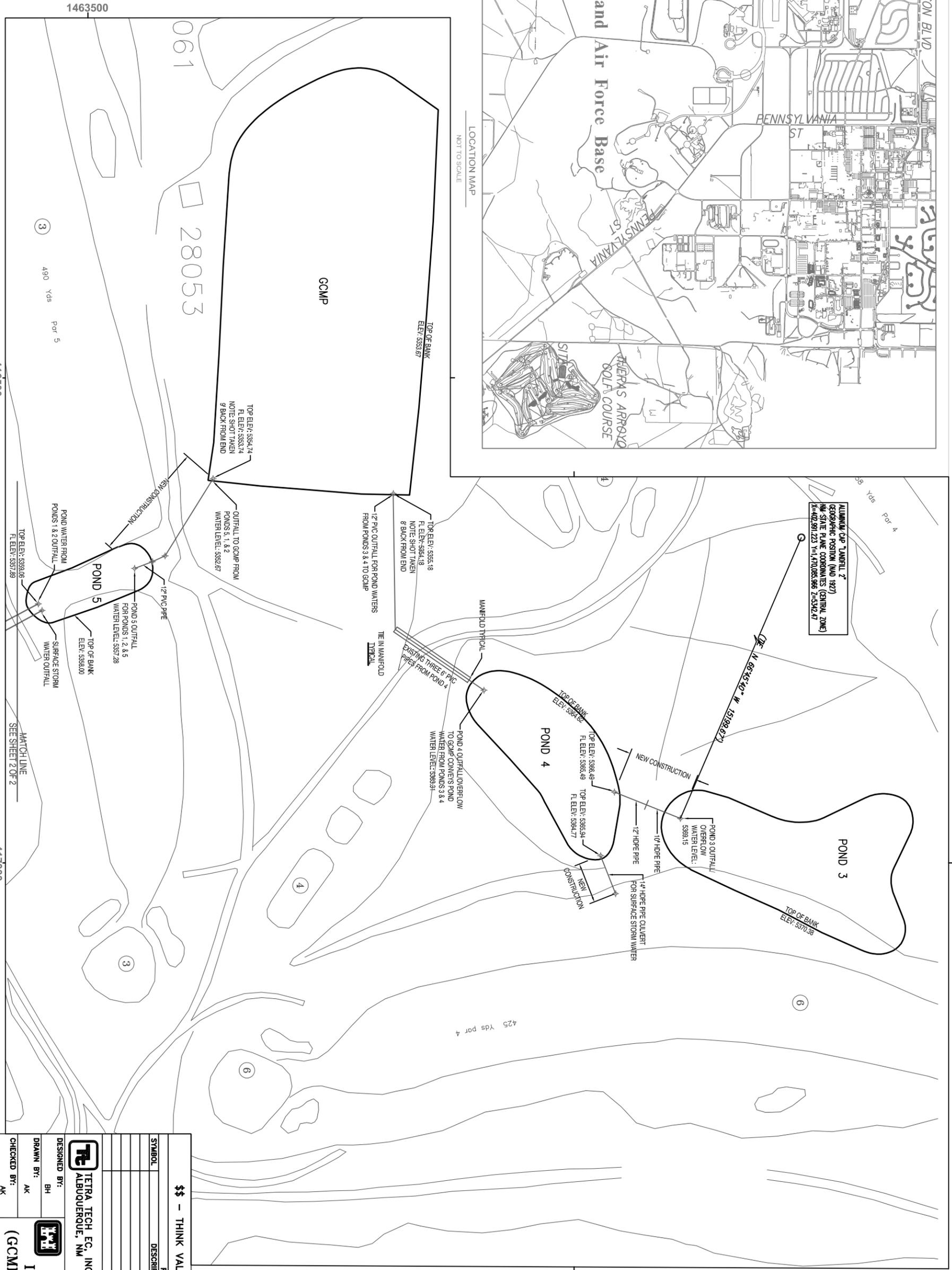
Any repairs that require modification to the existing design, or re-engineering and generation of record drawings, are considered major repairs and are not included under this O&M Plan.

3.2.4 Schedule for O&M Activities

A summary of the inspection and routine maintenance requirements for the Golf Course nitrate abatement pond liner systems, inlet/outlet pipes, and riprap structures is presented in Table 3-1. Any nonhazardous materials removed from the site will be coordinated through Kirtland AFB Environmental Management staff and Chugach Alaska Corporation (Chugach) for disposal at the Kirtland AFB active landfill (LF-268).



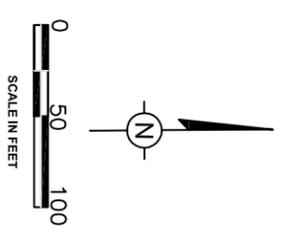
ALUMINUM CAP 1/4" DIA
 GEORGIA POSITION (MAD 1927)
 NEW STATE PLANE COORDINATES (CENTRAL ZONE)
 X=402,991,223 Y=1,470,085,966 Z=5342.47



Bohannan & Huston

ENGINEERING & SPATIAL DATA & ADVANCED TECHNOLOGIES
 NOTE: THE WATER LEVEL SHOWN APPROXIMATELY EQUALS THE OUTFALL ELEVATION

GOLF COURSE
 KIRTLAND AIR FORCE BASE
 ALBUQUERQUE, NEW MEXICO
 DECEMBER, 2008



\$\$\$ - THINK VALUE ENGINEERING - \$\$\$

SYMBOL	REVISIONS	DATE	APPROVED

DESIGNED BY:	TE TETRA TECH EC, INC. ALBUQUERQUE, NM	U.S. ARMY CORPS OF ENGINEERS TULSA DISTRICT TULSA, OKLAHOMA
DRAWN BY:	BH	KIRTLAND AFB, NEW MEXICO
CHECKED BY:	AK	MAINTENANCE INSPECTION MAP (GCMP, PONDS 3, 4 & 5)
REVIEWED BY:	REV	DESIGN FILE:
SUBMITTED BY:	REV	DATE: 01/15/07
		SHEET NUMBER:
		CONTRACT NO.:
		Figure 3-1
		REVISION:

1463000

TOP ELEV. 5393.06
 FL ELEV. 5397.89
 SEE SHEET 1 OF 2
 1/4" HDPE PIPE MATCH LINE
 EXISTING SURFACE
 STORAGE WATER COLLECTOR
 UTILIZED AS CONDUIT FOR 12" PVC POND WATER PRELINE TO CROSS UNDER A/C GOLF CART PATH

488 Yds Par 5
 (7)

NEW CONSTRUCTION
 1/4" PVC PIPE FROM POND 2
 NEW INSTALLATION FOR REVERSE OF POND WATERS TO GOLF

356 Yds Par 4
 (11)

MANHOLE TO TRANSITION
 THREE 8" EXISTING PVC PIPES TO ONE 12" PVC PIPE
 MANHOLE TO TRANSITION
 POND 2, 12" PVC OUTFALL TO EXISTING THREE 8" PVC PIPES

POND 2
 OVERFLOW OUTFALL
 WATER LEVEL: 5387.28

POND 2

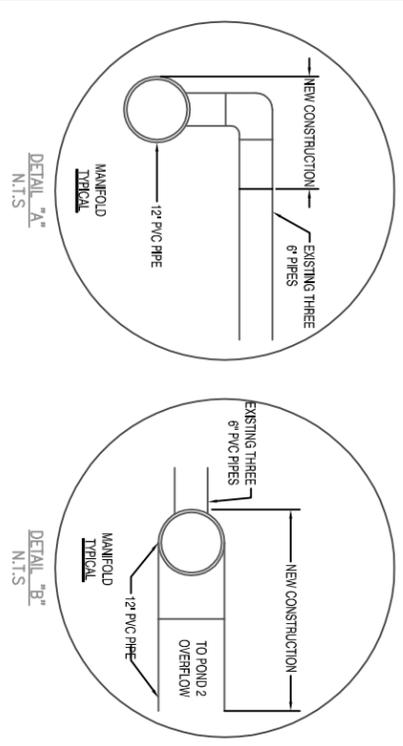
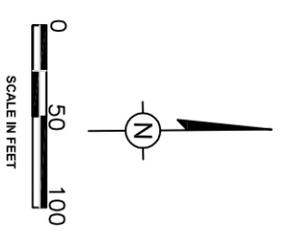
TOP ELEV. 5370.20
 ELEV. 5369.21
 TOP OF BANK
 TOP ELEV. 5370.24
 FL ELEV. 5389.70
 TOP ELEV. 5370.44
 FL ELEV. 5389.94
 TOP ELEV. 5370.24
 FL ELEV. 5389.74
 OVERFLOW INFALLS FROM POND 1

355 Yds Par 4
 (11)

416500

MANHOLE TYPICAL
 THREE EXISTING 8" PVC PRESS OVERFLOWS TO POND 2
 POND 1 OVERFLOW OUTFALL
 WATER LEVEL: 5375.00
 TOP OF BANK
 ELEV. 5375.06
 POND 1

415 Yds Par 4
 (13)



Behanman & Huston
 ENGINEERING • SPATIAL DATA • ADVANCED TECHNOLOGIES

1462500

417000

\$\$ - THINK VALUE ENGINEERING - \$\$

SYMBOL	REVISIONS	DATE	APPROVED
	DESCRIPTIONS		

DESIGNED BY: BH	 TETRA TECH EC, INC. ALBUQUERQUE, NM	 KIRTLAND AFB, NEW MEXICO MAINTENANCE INSPECTION MAP (PONDS 1 & 2)	U.S. ARMY CORPS OF ENGINEERS TULSA DISTRICT TULSA, OKLAHOMA
DRAWN BY: AK			
CHECKED BY: AK			
REVIEWED BY: REV			
DESIGN FILE:	DATE: 01/15/07	SHEET NUMBER:	REVISION:
CONTRACT NO.:	Figure 3-2		

Table 3-1. Summary of Nitrate Abatement Pond Inspection, Maintenance, and Repair Activities

Inspection Frequency	Inspection	Routine Maintenance
Monthly	General condition of each pond and system components—unwanted vegetation, exposed liner, sliding riprap, erosion; condition of revegetated areas	Remove unwanted vegetation, replace sliding riprap to cover any exposed liner material, backfill eroded areas to original configuration. Document condition with site photos.
Quarterly	Excessive silt and debris buildup	Remove excess silt and debris.
Semiannual	Blockages in inlet/outlet pipes and any physical damage	Remove blockage and repair damage, if necessary.

3.3 Site Safety and Health Plan

All activities will be conducted in accordance with the Site Health and Safety Plan, Appendix C of the IRA-O Work Plan (USAF, 2006), and the Base-Wide Health and Safety Plan, Appendix F of the Base-Wide Plans (USAF, 2004).

3.4 Quality Assurance Project Plan

All activities will be conducted in accordance with Contractor Quality Assurance and Quality Control Plan, Appendix A of the IRA-O Work Plan (USAF, 2006), and the Base-wide Quality Assurance Project Plan, Appendix C of the Base-Wide Plans (USAF, 2004).

3.5 Report Preparation

The reports to be prepared for this project and proposed frequency are listed in Table 3-2. The IRA-O was completed on December 6, 2006. The first inspection should be completed within 1 month of completion.

Table 3-2. Proposed Reporting and Schedule

Task	Report Contents	Frequency
Initial Inspection Report	Inspection Report with complete photographic record of all system features to be inspected. Site map noting location of liner features will be attached.	Initial Inspection Report to be completed by January 6, 2007.
Inspection Reports for monthly, quarterly, and semiannual inspections	Inspection Report and description of any routine maintenance or repairs performed. Site map noting features inspected and location of routine maintenance or repairs performed. Photographs showing conditions before and after repairs will be included.	Monthly, quarterly, or semiannual, within 2 weeks of inspection activity
Annual Report	Summary of inspection, maintenance, and repair activities for fiscal year at each of the ponds; conclusions and recommendations for upcoming year. Previously prepared reports and information will be included as appendices. Description and photographic record of the inspection, maintenance, and repair activities.	Annual

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REFERENCES

USAF, 2004. *Base-Wide Plans for Investigations under the Environmental Restoration Program, 2004 Update*. Kirtland Air Force Base, New Mexico. April.

USAF, 2006. *Work Plan, Interim Remedial Action–Operation Nitrate Abatement Pond (Golf Course) Repair at WP-026 and ST-105*. Kirtland Air Force Base, New Mexico. September.

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APPENDIX A
Operations and Maintenance Inspection Checklist

Operations and Maintenance Inspection Checklist
IRA-O Nitrate Abatement Ponds (Golf Course)
Kirtland Air Force Base, Bernalillo County, New Mexico

Inspector Name and Title: _____
 Days since last rainfall: _____
 (Contact Base Weather Service 846-9707)

Date: _____
 Amount of rainfall: _____

Erosion Control Measures

	GCMP		Pond 1		Pond 2		Pond 3		Pond 4		Pond 5	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1. Pond Rim and Banks:												
• Is erosion present on slopes (gullies, depressions, washouts)?												
• Is HDPE liner exposed?												
• Is HDPE liner damaged?												
• Are anchor trenches in good condition?												
• Is riprap displaced?												
• Are liner, anchor trenches, and riprap functioning as designed?												
Problems observed with the pond rim and banks:												
Maintenance or repairs required for the pond rim and banks:												
Maintenance or repairs performed (list Subcontractor name and date):												
	GCMP		Pond 1		Pond 2		Pond 3		Pond 4		Pond 5	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
2. Pond Bottom/Basin:												
• Is silt present in pond basin? Estimated Thickness:												
• Is vegetation growing from pond bottom?												
• Is debris present in pond basin?												
Problems observed with the pond bottom/basin:												
Maintenance or repairs required for the pond bottom/basin:												
Maintenance or repairs performed (list Subcontractor name and date):												

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IRA–O Nitrate Abatement Ponds (Golf Course)
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	GCMP		Pond 1		Pond 2		Pond 3		Pond 4		Pond 5	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
3. Inlet/Outlet Pipes:												
• Is erosion present at inlet/outlet?												
• Is drainage directed so there is no ponding?												
• Is excessive buildup of silt and debris present?												
• Are blockages developing in the pipe?												
• Are the inlet/outlet pipes functioning as designed?												
Problems observed with the inlet/outlet pipes:												
Maintenance or repairs required for the inlet/outlet pipes:												
Maintenance or repairs performed (list Subcontractor name and date):												
	GCMP		Pond 1		Pond 2		Pond 3		Pond 4		Pond 5	
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
4. Vegetation surrounding ponds:												
• Are sparsely vegetated areas present?												
• Is the Golf Course specified grass mixture present?												
• Is undesirable vegetation present?												
Problems observed with vegetation surrounding ponds to report to Golf Course Maintenance:												
Maintenance or repairs recommended for the vegetation surrounding ponds:												
Maintenance or repairs performed (list Subcontractor name and date):												

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IRA–O Nitrate Abatement Ponds (Golf Course)
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5. Changes required to the Operations and Maintenance Plan?

Inspector's Name

Inspector's Signature

Date