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PROJECT COMPLETION REPORT FOR PETROLEUM REMEDIATION AT BOCA CHICA
FLYING CLUB SITE NAS KEY WEST FL
1/1/1999
BECHTEL ENVIRONMENTAL INC

PROJECT COMPLETION REPORT
FOR
DELIVERY ORDER NO. 0094

FLYING CLUB SITE
PETROLEUM REMEDIATION

AT

NAVAL AIR STATION
KEY WEST, FLORIDA

Prepared for
DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Under Contract No. N62467-93-D-0936

Prepared by
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OAK RIDGE, TENNESSEE

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Bechtel Job No. 22567

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ACRONYMS AND ABBREVIATIONS

| | |
|----------|---|
| ABB | ABB Environmental Services, Inc. |
| Bechtel | Bechtel Environmental, Inc. |
| FAC | Florida Administrative Code |
| FDEP | Florida Department of Environmental Protection |
| NAS | Naval Air Station |
| ppm | parts per million |
| ppb | parts per billion |
| RAC | Response Action Contractor |
| RAP | Remedial Action Plan |
| ROICC | Resident Officer in Charge of Construction |
| SOUTHDIV | Naval Facilities Engineering Command, Southern Division |

1. INTRODUCTION

Bechtel Environmental, Inc. (Bechtel) was contracted by the Department of the Navy, Naval Facilities Engineering Command, Southern Division (SOUTHDIR), to provide remedial services as the Navy's Environmental Response Action Contractor (RAC). Under Delivery Order 0094 of Prime Contract N62467-93-D-0936, Bechtel was contracted to prepare a Remedial Work Plan to implement the Remedial Action Plan (RAP) for the remediation of petroleum contamination at the Flying Club Site, Building A-127, at Naval Air Station (NAS) Key West.

The remedial actions conducted at the Flying Club Site included:

- Abandonment of six existing monitoring wells.
- Excavation of petroleum contaminated soils at four locations at the Flying Club Site.
- Treatment of contaminated soils with the Ion Collider Technology as a pilot study.
- Backfill the treated soils into the excavation.
- Site restoration.
- Installation of two new monitoring wells.

In addition to the work performed at the Flying Club Site, part of the pilot study was conducted on petroleum contaminated soils from Trumbo Point Fuel Farm. Approximately 50 cubic yards of soils were excavated and transported to the Flying Club Site for treatment with the Ion Collider Technology.

1.1 SITE DESCRIPTION

NAS Key West is located approximately 150 miles southwest of Miami in Monroe County, Florida (Figure 1). NAS Key West covers 5,000 acres on numerous areas of the Lower Florida Keys. The majority of the NAS Key West is concentrated on Boca Chica Key and Key West. The Flying Club Site is a former parking and refueling area that is located along the northwest boundary of Taxiway "H" approximately 100 feet south of Building A133 at Boca Chica field (Attachment 1, Figure 2).

1.2 SITE HISTORY

Building A-126 was formerly used as a transportation facility and is currently used as an electrical maintenance and repair facility. Building A-133 is part of the former motor pool refueling point and is currently used to store electrical supplies and equipment. The motor pool's underground storage tank(s) have been removed. The Boca Chica Flying Club was in operation until the late 1960s. Four aboveground storage tanks at the Flying Club were removed in 1992. Past practices and possibly leaks from these tank systems were the suspected causes of petroleum contamination at this site.

1.3 REGULATORY SETTING

Remedial actions were implemented following the RAP that was issued by ABB Environmental Services, Inc. in August 1997. The RAP was prepared to meet the requirements of Chapter 62-770, Florida Administrative Code (FAC) (State Underground Petroleum Environmental Response) regulations on petroleum contamination that results from spills or leaking tanks or piping. Major changes to these regulations were promulgated in September 1997. The remedial work at the Flying Club Site was performed in accordance with the latest Florida Department of Environmental Protection (FDEP) regulations.

2. CLEANUP OBJECTIVE

The primary contaminant of concern for this remedial project was petroleum products. The RAP detailed the procedures and the Ion Collider Technology that were to be used in the remediation of the Flying Club Site. Since this site was a pilot study for the technology, the lowest possible Soil Cleanup Target Levels from FDEP's FAC 62-770, "Petroleum Contaminated Site Cleanup Criteria" were used for the cleanup goals for this site. These consisted of the lowest of the Residential Direct Exposure Levels and the Low Yield/Low Quality Leachability Levels. A table of these levels is included in Attachment 2.

2.1 WORK PLAN

Bechtel prepared a work plan detailing the procedures used to implement the RAP. Also included in the work plan were details of the equipment to be used for this scope of work.

3. REGULATORY APPROVAL

The Florida Department of Environmental Protection (FDEP) reviewed and approved the NAS Key West Remedial Action Plan that was prepared by ABB Environmental Services, Inc. on September 8, 1997.

4. SUBCONTRACTING

Several key subcontractors were used to complete the work included in this delivery order.

| Subcontractor | Scope | Prime or Lower Tier |
|--|--------------------------------------|----------------------------|
| DEMCO 238 Lein Road West Seneca, New York | General Contractor | Prime |
| Big Blue, Inc. 12409 Memorial Drive Bixby, Oklahoma | Soil Treatment | Lower Tier |
| F&W Fencing 6620 Maloney Ave #7 Key West, Florida. | Fence Installation | Lower Tier |
| Key West Welding and Fabrication 1 st Avenue Key West, Florida | Equipment and Laborers | Lower Tier |
| PAVEX 99 Callie Uno Key West, Florida | Asphalt Recycling and Paving | Lower Tier |
| Precision Drilling PO Box 1927 Pompano Beach, Florida | Well Installation and Abandonment | Prime |

5. EXECUTION OF WORK

5.1 MOBILIZATION

Bechtel mobilized to the field on September 21, 1998 with a site superintendent and a health and safety officer. The general services subcontractor was also mobilized to the site on this date. Dates and significant events are as follows:

- 21 Sep 98 Mobilized to the site and attended the pre-construction meeting with NAS Key West personnel. Treatment equipment was mobilized to the site.
- 22 Sep 98 Abandoned 6 monitoring wells. Notified of station evacuation for hurricane Georges. Secured equipment on site and evacuated Bechtel and subcontractor personnel from site.
- 12 Oct 98 Remobilized Bechtel and subcontractor personnel to the site after the hurricane.
- 15 Oct 98 Fencing removal work completed. Completed saw cutting of the asphalt paving.
- 20 Oct 98 Completed soil treatment equipment setup and checkout.
- 22 Oct 98 Started excavation of Area II.
- 23 Oct 98 Continued excavation of Area II. Started treatment of excavated soils.
- 27 Oct 98 Completed excavation of Area II. Continued treatment of excavated soils. Started excavation of Area I.
- 28 Oct 98 Completed excavation of Area I. Started excavation of Area III.
- 29 Oct 98 Finished excavation of Area II. Analytical results indicated that the treated soils from Stockpile No. 1 were clean. Backfilling operations began. Continued treatment of excavated soils.
- 02 Nov 98 Excavated contaminated soils at Trumbo Point Fuel Farm. Transported contaminated soils from Trumbo Point Fuel Farm to the Flying Club Site for treatment.
- 03 Nov 98 Processed the contaminated soils from Trumbo Point. Analytical results indicated that the treated soils from Stockpile No. 2 were clean. Started excavation of Area IV.
- 04 Nov 98 Completed excavation and treatment of Area IV soils. Completed backfill of Area I.
- 05 Nov 98 Analytical results indicated that the treated soils from Stockpile No.3 were clean. Tropical Storm Mitch dumped several inches of rain on the site. Continued backfilling operations.
- 10 Nov 98 Analytical results indicated that the treated soils from Trumbo Point did not meet the TRPH cleanup goals. The soils were retreated and resampled. Finished backfilling of all excavations at the Flying Club Site.
- 16 Nov 98 Repaved the two excavated areas next to Building A126. Installed two monitoring wells in Area II. Analytical results indicated that the treated soils from Trumbo Point did not meet the TRPH residential cleanup goals for the second time.
- 17 Nov 98 The Trumbo Point soils were returned to the Trumbo Point Site.
- 19 Nov 98 The two excavated areas next to the taxiway were seeded and covered with erosion blankets. Completed site cleanup and restoration.
- 20 Nov 98 Final site inspection was conducted with the ROICC's office.

5.2 PLANNED VS. ACTUAL WORK ACTIVITIES

5.2.1 Delays and Problems Encountered

5.2.1.1 Hurricane and Tropical Storm

Hurricane Georges forced the evacuation of Key West on the day after initial site mobilization. The equipment that had been mobilized to the site was secured and site personnel demobilized from the site. Georges caused large-scale damage to the Key West area and Bechtel could not remobilize to the site for three weeks.

Tropical storm Mitch also struck Key West during remediation of the Flying Club Site. Fortunately, the damage was far less severe. Several inches of rain fell and flooded the open excavations at the site. Some backfilled material had to be removed, dried and rebackfilled to meet compaction requirements.

5.2.1.2 Trumbo Point Fuel Farm

The pilot study on the petroleum-contaminated soils from the Trumbo Point Fuel Farm was only partially successful. The Ion Collider process was able to reduce the TRPH values to 25% of their original values and did meet the industrial cleanup goals, but was not successful in meeting the FDEP Residential Cleanup Goals. The process did reduce all the other chemicals of concern to non-detections.

5.2.1.3 Changes in Regulatory Requirements

Since the time of the initial site investigations performed in 1993 and 1996, and when the RAP was issued in August 1997, FDEP has revised the regulations regarding investigation and cleanup of petroleum contaminated sites. The regulatory change that had the most impact on the Flying Club Site was the change in the sampling and analytical requirements. The old regulations used a headspace field screening method to determine the extent and levels of soil contamination at a site. Soil samples were not required to be submitted for offsite laboratory analysis. The new regulations still use the headspace field screening method, but also require offsite laboratory analysis with specific cleanup goals for specific chemicals of concern. For the Flying Club Site these goals are included in Attachment 2, and laboratory results are included in Attachment 3.

In reviewing the pretreatment samples collected from the site, it would appear that the contamination levels were below the chemical specific cleanup goals required in the new regulations. The site investigation was performed several years ago and natural attenuation might have reduced these levels. If the site investigation had been performed under the current regulations, the scope of the cleanup may have been reduced.

5.3 SUMMARY OF MATERIALS HANDLED

The following quantities were generated during the implementation of this remedial action:

- Excavation – 983 cubic yards of soils were excavated and backfilled at the Flying Club Site and 47 cubic yards of soils were excavated and backfilled at Trumbo Point Fuel Farm.
- Treatment – 664 cubic yards of petroleum contaminated soils were treated with the Ion Collider process. Three existing piles of contaminated soil were also included in the treated material, two from the bio-treatment boxes adjacent to the Flying Club Site and one from Trumbo Point Fuel Farm.

- Seeding – 12,274 square feet were seeded and covered with erosion control blankets.
- Paving – 2,526 square feet were removed and repaved with asphalt paving.

5.4 SUMMARY OF TREATMENT RESULTS

Prior to start of the Ion Collider treatment process, excavated soil was run through the conveyor system without any chemical treatment. This soil was sampled prior to and after running it through the conveyor system. Analytical data was obtained to determine if there was a change in contamination levels with material handling alone. This data was inconclusive. Copies of the laboratory results are included in Attachment 3.

During the Ion Collider process, pre- and post-treatment samples were collected from each stockpile. Four stockpiles were generated from the excavations at the Flying Club and two stockpiles were generated for the Trumbo Point Fuel Farm material. Copies of the laboratory results are included in Attachment 3.

5.4.1 Treatment of Flying Club Material

The pre- and post-treatment sample results for the four stockpiles of material from the Flying Club are contained in Table 1. All post treatment results met the cleanup criteria.

Table 1. Flying Club Soil Treatment Results

| Contaminant | Cleanup Goal (ppm) | Stockpile 1 | | Stockpile 2 | |
|---------------|--------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | | Before Sample ID KW02941 | After Sample ID KW02944 | Before Sample ID KW02946 | After Sample ID KW02951 |
| TPRH | 350 | 32 | 22 | ND | ND |
| Benzene | 0.07 | ND | ND | ND | ND |
| Ethylbenzene | 3.8 | ND | 0.082 | 0.008 | 0.012 |
| Toluene | 4 | ND | 0.082 | 0.008 | 0.017 |
| Total Xylenes | 2.9 | ND | ND | ND | 0.015 |
| Contaminant | Cleanup Goal (ppm) | Stockpile 3 | | Stockpile 4 | |
| | | Before Sample ID KW02960 | After Sample ID KW02959 | Before Sample ID KW02961 | After Sample ID KW02966 |
| TPRH | 350 | 100 | 32 | 12 | 20 |
| Benzene | 0.07 | ND | ND | 0.002 | ND |
| Ethylbenzene | 3.8 | ND | ND | ND | ND |
| Toluene | 4 | ND | ND | 0.002 | ND |
| Total Xylenes | 2.9 | ND | 0.006 | ND | ND |

Note: All samples were tested for MTBE and PAHs and all were Non-Detects

5.4.2 Trumbo Point Fuel Farm Material

Material from Trumbo was collected from an excavation in the middle of the Bunker C contaminated area and an existing stockpile of Bunker C contaminated soil that was left by at the site by Pensacola Public Works. The excavated soil was labeled Stockpile 1 and the existing stockpile was labeled Stockpile 2. Both stockpiles were transported to the Flying Club Site on Boca Chica for treatment by the Ion Collider Technology. The laboratory results for the both the pre-treatment and post-treatment samples are included in Table 2.

The Ion Collider Technology was able to reduce the contaminant levels. The technology was not able to reduce the TRPH to desired residential goals, however the technology did reduce the levels to well below the industrial cleanup goals, even after being treated twice.

Table 2. Trumbo Point Fuel Farm Soil Treatment Results

| Contaminant | Cleanup Goal (ppm) | Stockpile 1 | | | Stockpile 2 | | |
|---------------|--------------------|---------------------------------|--|--|---------------------------------|--|--|
| | | Pre-Treatment Sample ID KW02956 | 1 ST Post-Treatment Sample ID KW02965 | 2 ND Post-Treatment Sample ID KW02969 | Pre-Treatment Sample ID KW02957 | 1 ST Post-Treatment Sample ID KW02964 | 2 ND Post-Treatment Sample ID KW02968 |
| TRPH* | 350 | 3100 | 470 | 760 | 4900 | 800 | 1100 |
| Benzene | 0.07 | 0.006 | ND | ND | 0.014 | ND | ND |
| Ethylbenzene | 3.8 | 0.150 | ND | ND | 0.066 | 0.067 | ND |
| Toluene | 4 | 0.064 | ND | ND | 0.180 | 0.002 | ND |
| Total Xylenes | 2.9 | 0.41 | ND | ND | 0.475 | 0.009 | ND |

*The Industrial Cleanup Goal for TPRH is 2500 ppm.

Note: All samples were tested for MTBE and PAHs and all were Non-Detects

5.4.3 Surface Water Treatment

During the excavation of Area II at the Flying Club, the bottom of the excavation extended into the water table. Part of the excavation contained up to a foot of water. The field crew had concerns that this water might be contaminated. The technology provider for the Ion Collider Technology suggested that the Ion Collider Technology solution be used to treat this water. This approach has been used successfully at other sites. Bechtel consulted with Mr. Jorge Caspary of FDEP to determine if this approach would be acceptable to the State of Florida. Mr. Caspary agreed with this approach on October 29, 1998.

Surface water samples were taken before and after the solution was sprayed into the excavation. The sample results showed that the water was slightly contaminated before treatment and the treatment did reduce the levels of contamination. The sample results are included in Table 3.

Table 3. Surface Water Sampling Results

| Contaminant | Drinking Water Standard (ppb) | Pre-Treatment Sample ID KW02949 | Post-Treatment Sample ID KW02952 |
|---------------|-------------------------------|---------------------------------|----------------------------------|
| Benzene | 7 | ND | ND |
| Ethylbenzene | 700 | 19 | 8 |
| Toluene | 1000 | 2 | 3 |
| Total Xylenes | 10000 | 9 | 5 |

Note: All samples were tested for TPRH, MTBE and PAHs and all were Non-Detects

5.5 MONITORING WELL ABANDONMENT AND INSTALLATION

Six monitoring wells that were located within the excavation areas were abandoned prior to the start of any excavation work. Two monitoring wells were installed at the site. The well completion reports and the geologic drill logs for these wells are included in Attachment 4. The locations of the new wells are indicated on the As-Built Drawing included in Attachment 1.

5.6 AS-BUILT DRAWING

An As-Built Drawing was prepared for excavations at the Flying Club Site. The drawing also includes the sidewall confirmation sampling locations and results. All sidewall confirmation sample results met the cleanup criteria. A copy of the As-Built Drawing is included in Attachment 1.

5.7 COMPLETION POSTER

The completion poster is included in Attachment 5.

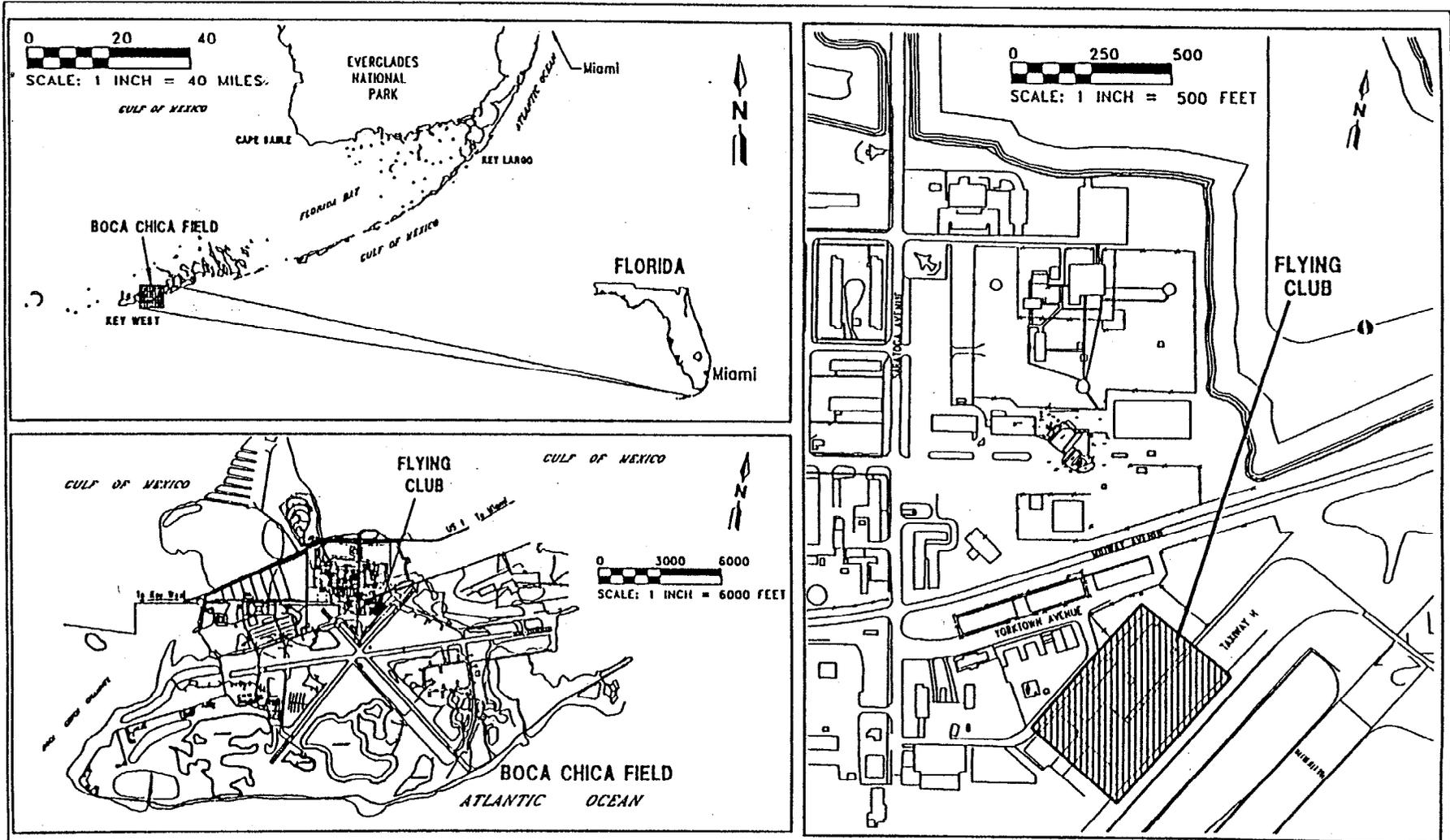


Figure 1.
SITE LOCATION MAP



REMEDIAL ACTION PLAN
FLYING CLUB SITE, BUILDING A-127

NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

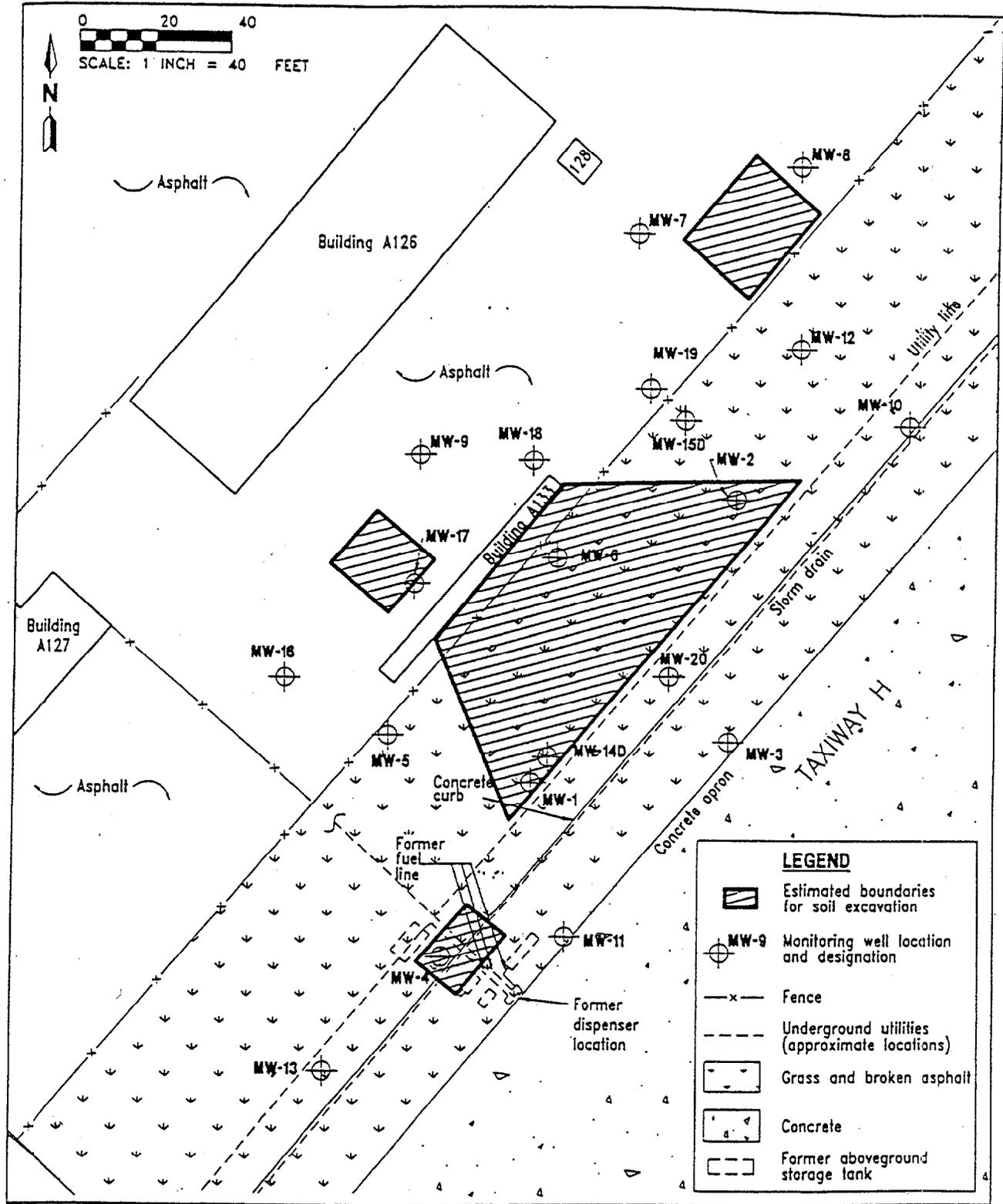


Figure 2.
ESTIMATED BOUNDARIES FOR SOIL
EXCAVATION



REMEDIAL ACTION PLAN
FLYING CLUB SITE, BUILDING A-127

NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

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TABLE IV (Page 1 of 2)
Selected Soil Cleanup Target Levels

| Chemicals of Concern (Organic) | Direct Exposure (mg/kg) | | Table V ^a | Leachability (mg/kg) based on: | | |
|-----------------------------------|-------------------------|--------|----------------------|--------------------------------|------------------------|-------------------------|
| | I # | II ## | | Table VI ^b | Table VII ^c | Table VIII ^d |
| PAHs: | | | | | | |
| Acenaphthene | 2300 | 22000 | 4 | 0.6 | 0.6 | 40 |
| Acenaphthylene | 1100 | 11000 | 22 | 0.003* | 0.003* | 220 |
| Anthracene | 19000 | 290000 | 2000 | 0.3 | 0.3 | 20000 |
| Benzo(a)anthracene | 1.4 | 5.1 | 2.9 | 0.4 | 0.4 | 29 |
| Benzo(a)pyrene | 0.1 | 0.5 | 7.8 | 1.2 | 1.2 | 78 |
| Benzo(b)fluoranthene | 1.4 | 5 | 9.8 | 1.5 | 1.5 | 98 |
| Benzo(g,h,i)perylene | 2300 | 45000 | 13000 | 2 | 2 | 130000 |
| Benzo(k)fluoranthene | 15 | 52 | 25 | 1.5 | 1.5 | 250 |
| Chrysene | 140 | 490 | 80 | 0.5 | 0.5 | 800 |
| Dibenzo(a,h)anthracene | 0.1 | 0.5 | 14 | 2.2 | 2.2 | 140 |
| Fluoranthene | 2800 | 45000 | 550 | 0.4 | 0.4 | 5500 |
| Fluorene | 2100 | 24000 | 87 | 9.4 | 9.4 | 870 |
| Indeno(1,2,3-c,d)pyrene | 1.5 | 5.2 | 28 | 4.3 | 4.3 | 280 |
| Naphthalene | 1000 | 8600 | 1 | 1 | 1.3 | 10 |
| Phenanthrene | 1900 | 29000 | 120 | 0.02* | 0.02* | 1200 |
| Pyrene | 2200 | 40000 | 570 | 0.8 | 0.8 | 5700 |
| VOAs: | | | | | | |
| Benzene | 1.1 | 1.5 | 0.007 | 0.007 | 0.5 | 0.07 |
| Ethylbenzene** | 240 | 240 | 0.4 | 0.4 | 7.7 | 3.8 |
| Toluene | 300 | 2000 | 0.4 | 0.4 | 4.8 | 4 |
| Total Xylenes** | 290 | 290 | 0.3 | 0.3 | 5.3 | 2.9 |
| OTHER: | | | | | | |
| 1,2-dichloroethane | 0.6 | 0.9 | 0.02 | 0.02 | 0.7 | 0.2 |
| MTBE | 350 | 6100 | 0.2 | 0.2 | 150 | 1.6 |
| TRPHs | 350 | 2500 | 340 | 340 | 340 | 3400 |

NOTE:

The Soil Cleanup Target Levels for the treatment of the Flying Club contaminated soils shall be the lower of columns "Direct Exposure I" and "Table VIII".

TABLE IV (Page 2 of 2)

| Chemicals of Concern (Inorganic) | Direct Exposure (mg/kg) | | Leachability (mg/l) based on: | | | |
|-------------------------------------|-------------------------|-------|-------------------------------|-----------------------|------------------------|-------------------------|
| | I # | II ## | Table V ^a | Table VI ^b | Table VII ^c | Table VIII ^d |
| METALS: | | | | | | |
| Arsenic | 0.8 | 3.7 | TCLP | TCLP | TCLP | TCLP |
| Barium | 5200 | 87000 | TCLP | TCLP | TCLP | TCLP |
| Cadmium | 75 | 1300 | TCLP | TCLP | TCLP | TCLP |
| Chromium | 290 | 430 | TCLP | TCLP | TCLP | TCLP |
| Lead*** | 500 | 1000 | TCLP | TCLP | TCLP | TCLP |
| Mercury | 3.7 | 28 | TCLP | TCLP | TCLP | TCLP |
| Selenium | 390 | 10000 | TCLP | TCLP | TCLP | TCLP |
| Silver | 390 | 9100 | TCLP | TCLP | TCLP | TCLP |

Values rounded to two significant figures if greater than 1 and to one significant figure if less than 1.

Values based on residential use assumptions.

Values based on worker industrial exposure assumptions.

* Unless the Method Detection Limit (MDL) using the most sensitive and currently available technology is higher than the specified criterion.

** Direct Exposure values based on Soil Saturation Limit (Csat).

*** Direct Exposure values from USEPA Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, OSWER Directive 9355.4-12 (1994). Residential value is the middle of the USEPA suggested range of 400-600 mg/kg.

TCLP = Toxicity Characteristic Leaching Procedure. The analyses must be performed if the concentrations listed in Table II are exceeded, and need to pass test (see Table II).

^a Table V - Groundwater Cleanup Target Levels for Resource Protection/Recovery.

^b Table VI - Lower of Table V and Freshwater Surface Water Criteria.

^c Table VII - Surface Water Criteria for Resource Protection/Recovery.

^d Table VIII - Low Yield/Poor Quality.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

PA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02941</u> | | | <u>KW02942</u> | | | <u>Units</u> |
|------------------------|----------------|---|----|----------------|---|----|---------------|
| ethyl tert-butyl ether | 2.0 | U | D1 | 2.0 | U | D2 | µg/Kg |
| benzene | 1.5 | U | D1 | 1.0 | U | D2 | µg/Kg |
| toluene | 1.5 | U | D1 | 1.0 | U | D2 | µg/Kg |
| chlorobenzene | 1.5 | U | D1 | 1.0 | U | D2 | µg/Kg |
| styrene | 1.5 | U | D1 | 4.1 | I | D2 | µg/Kg |
| -Xylene & p-Xylene | 2.0 | U | D1 | 2.0 | I | D2 | µg/Kg |
| -Xylene | 1.0 | U | D1 | 1.0 | U | D2 | µg/Kg |
| m,3-Dichlorobenzene | 1.0 | U | D1 | 1.0 | U | D2 | µg/Kg |
| m,4-Dichlorobenzene | 1.0 | U | D1 | 1.0 | U | D2 | µg/Kg |
| m,2-Dichlorobenzene | 1.0 | U | D1 | 1.0 | U | D2 | µg/Kg |
| <u> surrogate:</u> | <u>% RECOV</u> | | | <u>% RECOV</u> | | | <u>LIMITS</u> |
| monofluorobenzene | 95 | | | 108 | | | 40-170 |
| not Analyzed | 10/28/98 | | | 10/28/98 | | | |

- J = Compound was analyzed for but not detected to the level shown.
- I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
- D1 = Analysis is reported on a "dry weight" basis.
- D2 = Analyte value determined from a 1:1.22 dilution.
- D2 = Analyte value determined from a 1:1.02 dilution.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

PA METHOD 8270 -
 PAH Compounds

| | <u>KW02941</u> | <u>KW02942</u> | <u>Units</u> |
|--------------------------|----------------|----------------|---------------|
| aphthalene | 330 U | 330 U | µg/Kg |
| -Methylnaphthalene | 520 | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | 330 U | µg/Kg |
| acenaphthylene | 330 U | 330 U | µg/Kg |
| acenaphthene | 330 U | 330 U | µg/Kg |
| fluorene | 330 U | 330 U | µg/Kg |
| phenanthrene | 330 U | 330 U | µg/Kg |
| anthracene | 330 U | 330 U | µg/Kg |
| fluoranthene | 330 U | 330 U | µg/Kg |
| pyrene | 330 U | 330 U | µg/Kg |
| fluorene | 330 U | 330 U | µg/Kg |
| benzo (a) anthracene | 330 U | 330 U | µg/Kg |
| benzo (b) fluoranthene | 330 U | 330 U | µg/Kg |
| benzo (k) fluoranthene | 330 U | 330 U | µg/Kg |
| benzo (a) pyrene | 330 U | 330 U | µg/Kg |
| indeno (1,2,3-cd) pyrene | 330 U | 330 U | µg/Kg |
| dibenzo (a,h) anthracene | 330 U | 330 U | µg/Kg |
| benzo (g,h,i) perylene | 330 U | 330 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| 2-Fluorobiphenyl | 83 | 74 | 14-146 |
| Date Extracted | 10/27/98 | 10/27/98 | |
| Date Analyzed | 10/28/98 | 10/28/98 | |

J = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

| <u>TEST METHOD</u> | <u>KW02941</u> | <u>KW02942</u> | <u>Units</u> |
|---|----------------|----------------|---------------|
| FLUORENCE METHOD - PETROL. RESIDUAL ORG. | | | |
| Hydrocarbons (C8-C40) | 32 | 8.5 U | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| 1,2,4-Terphenyl | 75 | 65 | 51-148 |
| Date Extracted | 10/27/98 | 10/27/98 | |
| Date Analyzed | 10/28/98 | 10/28/98 | |

| <u>MISCELLANEOUS</u> | <u>METHOD</u> | <u>KW02941</u> | <u>KW02942</u> | <u>Units</u> |
|----------------------|---------------|----------------|----------------|--------------|
| Percent Solids | SM2540G | 82 | 78 | % |
| Date Analyzed | | 10/29/98 | 10/29/98 | |

Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

22567-326-SC-0836-0001-(1)-1

ENCO LABORATORIES

REPORT # : JR3812
 DATE REPORTED: October 29, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

PA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02943</u> | <u>KW02944</u> | <u>Units</u> |
|------------------------|----------------|----------------|---------------|
| ethyl tert-butyl ether | 2.0 U D3 | 2.0 U | µg/Kg |
| benzene | 1.3 U D3 | 1.0 U | µg/Kg |
| toluene | 1.3 U D3 | 1.0 U | µg/Kg |
| chlorobenzene | 1.3 U D3 | 1.0 U | µg/Kg |
| ethylbenzene | 1.3 U D3 | 82 | µg/Kg |
| m-Xylene & p-Xylene | 2.0 U D3 | 82 | µg/Kg |
| o-Xylene | 1.0 U D3 | 1.0 U | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U D3 | 1.0 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U D3 | 1.0 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U D3 | 1.0 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| 1,2-Difluorobenzene | 96 | 120 | 40-170 |
| 1,4-Difluorobenzene | 10/28/98 | 10/28/98 | |

1. Compound was analyzed for but not detected to the level shown.
 2. Analysis is reported on a "dry weight" basis.
 3. = Analyte value determined from a 1:1.11 dilution.

ENCO LABORATORIES

REPORT # : JR3812

DATE REPORTED: October 29, 1998

REFERENCE : 22567-326-MR

PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

IPA METHOD 8270 -

PAH Compounds

| | <u>KW02943</u> | <u>KW02944</u> | <u>Units</u> |
|--------------------------|----------------|----------------|---------------|
| Naphthalene | 330 U | 330 U | µg/Kg |
| 1-Methylnaphthalene | 330 U | 330 U | µg/Kg |
| 2-Methylnaphthalene | 330 U | 330 U | µg/Kg |
| Acenaphthylene | 330 U | 330 U | µg/Kg |
| Acenaphthene | 330 U | 330 U | µg/Kg |
| Fluorene | 330 U | 330 U | µg/Kg |
| Phenanthrene | 330 U | 330 U | µg/Kg |
| Anthracene | 330 U | 330 U | µg/Kg |
| Fluoranthene | 330 U | 330 U | µg/Kg |
| Pyrene | 330 U | 330 U | µg/Kg |
| Chrysene | 330 U | 330 U | µg/Kg |
| Benzo (a) anthracene | 330 U | 330 U | µg/Kg |
| Benzo (b) fluoranthene | 330 U | 330 U | µg/Kg |
| Benzo (k) fluoranthene | 330 U | 330 U | µg/Kg |
| Benzo (a) pyrene | 330 U | 330 U | µg/Kg |
| Indeno (1,2,3-cd) pyrene | 330 U | 330 U | µg/Kg |
| Dibenzo (a,h) anthracene | 330 U | 330 U | µg/Kg |
| Benzo (g,h,i) perylene | 330 U | 330 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| 2-Fluorobiphenyl | 77 | 76 | 14-146 |
| Date Extracted | 10/27/98 | 10/27/98 | |
| Date Analyzed | 10/28/98 | 10/28/98 | |

U = Compound was analyzed for but not detected to the level shown.

22567-326-SC-0836-0001-(1)

ENCO LABORATORIES

REPORT # : JR3812
 DATE REPORTED: October 29, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

FLUORENCE METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02943</u> | <u>KW02944</u> | <u>Units</u> |
|-----------------------|----------------|----------------|---------------|
| Hydrocarbons (C8-C40) | 21 | 22 | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | 68 | 74 | 51-148 |
| Date Extracted | 10/27/98 | 10/27/98 | |
| Date Analyzed | 10/28/98 | 10/28/98 | |

DIFFERENTIAL

| | <u>METHOD</u> | <u>KW02943</u> | <u>KW02944</u> | <u>Units</u> |
|----------------|---------------|----------------|----------------|--------------|
| Percent Solids | SM2540G | 82 | 87 | % |
| Date Analyzed | | 10/29/98 | 10/29/98 | |

U = Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3812
 DATE REPORTED: October 29, 1998
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RESULTS OF ANALYSIS

PA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02945</u> | <u>LAB BLANK</u> | <u>Units</u> |
|------------------------|----------------|------------------|---------------|
| ethyl tert-butyl ether | 2.0 U | 2.0 U | µg/Kg |
| benzene | 1.0 U | 1.0 U | µg/Kg |
| toluene | 1.0 U | 1.0 U | µg/Kg |
| chlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| styrene | 1.0 U | 1.0 U | µg/Kg |
| m-Xylene & p-Xylene | 2.0 U | 2.0 U | µg/Kg |
| o-Xylene | 1.0 U | 1.0 U | µg/Kg |
| m,3-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| p,4-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| o,2-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| <u>Aggregate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| monofluorobenzene | 69 | 88 | 40-170 |
| date Analyzed | 10/28/98 | 10/28/98 | |

Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3812
 DATE REPORTED: October 29, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

| PA METHOD 8270 - AH Compounds | KW02945 | LAB BLANK | Units |
|----------------------------------|----------------|----------------|---------------|
| aphthalene | 330 U | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | 330 U | µg/Kg |
| cenaphthylene | 330 U | 330 U | µg/Kg |
| cenaphthene | 330 U | 330 U | µg/Kg |
| luorene | 330 U | 330 U | µg/Kg |
| henanthrene | 330 U | 330 U | µg/Kg |
| nthracene | 330 U | 330 U | µg/Kg |
| luoranthene/ | 330 U | 330 U | µg/Kg |
| pyrene | 330 U | 330 U | µg/Kg |
| fluorene | 330 U | 330 U | µg/Kg |
| benzo(a) anthracene | 330 U | 330 U | µg/Kg |
| benzo(b) fluoranthene | 330 U | 330 U | µg/Kg |
| benzo(k) fluoranthene | 330 U | 330 U | µg/Kg |
| benzo(a) pyrene | 330 U | 330 U | µg/Kg |
| indeno(1,2,3-cd) pyrene | 330 U | 330 U | µg/Kg |
| benzo(a,h) anthracene | 330 U | 330 U | µg/Kg |
| benzo(g,h,i) perylene | 330 U | 330 U | µg/Kg |
| <u> surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| -Fluorobiphenyl | 71 | 76 | 14-146 |
| Date Extracted | 10/27/98 | 10/27/98 | |
| Date Analyzed | 10/28/98 | 10/28/98 | |

J = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR3812
 DATE REPORTED: October 29, 1998
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 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

| <u>TEST METHOD</u> | <u>RESIDUAL ORG.</u> | <u>KW02945</u> | <u>LAB BLANK</u> | <u>Units</u> |
|-----------------------|----------------------|----------------|------------------|---------------|
| Hydrocarbons (C8-C40) | | 28 | 6.6 U | mg/Kg |
| <u>Surrogate:</u> | | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| -Terphenyl | | 74 | 71 | 51-148 |
| Date Extracted | | 10/27/98 | 10/27/98 | |
| Date Analyzed | | 10/28/98 | 10/28/98 | |

| <u>TEST METHOD</u> | <u>METHOD</u> | <u>KW02945</u> | <u>LAB BLANK</u> | <u>Units</u> |
|--------------------|---------------|----------------|------------------|--------------|
| Percent Solids | SM2540G | 83 | NR | % |
| Date Analyzed | | 10/29/98 | | |

U = Compound was analyzed for but not detected to the level shown.
 N = Analysis not requested for this sample.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3832
 DATE REPORTED: November 10, 1998
 REFERENCE : 22567
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

PA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02946</u> | | | <u>LAB BLANK</u> | <u>Units</u> |
|-------------------------|----------------|---|------|------------------|---------------|
| Methyl tert-butyl ether | 2.0 | U | D1 | 2.0 U | µg/Kg |
| Benzene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| Toluene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| Chlorobenzene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| Ethylbenzene | 8.2 | | D1 | 1.0 U | µg/Kg |
| m-Xylene & p-Xylene | 8.0 | I | D1 J | 2.0 U | µg/Kg |
| o-Xylene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 | U | D1 | 1.0 U | µg/Kg |
| <u>Recovery:</u> | <u>% RECOV</u> | | | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 96 | | | 78 | 40-170 |
| Date Analyzed | 11/02/98 | | | 11/02/98 | |

12/4/98

J = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
 D = Analysis is reported on a "dry weight" basis.
 D1 = Analyte value determined from a 1:1.04 dilution.

ENCO LABORATORIES

REPORT # : JR3832
 DATE REPORTED: November 10, 1998
 REFERENCE : 22567
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

| <u>PAH Compounds</u> | <u>KW02946</u> | <u>LAB BLANK</u> | <u>Units</u> |
|----------------------------|----------------|------------------|--------------|
| naphthalene | 330 U | 330 U | µg/Kg |
| 1-Methylnaphthalene | 330 U | 330 U | µg/Kg |
| 2-Methylnaphthalene | 330 U | 330 U | µg/Kg |
| acenaphthylene | 330 U | 330 U | µg/Kg |
| acenaphthene | 330 U | 330 U | µg/Kg |
| fluorene | 330 U | 330 U | µg/Kg |
| phenanthrene | 330 U | 330 U | µg/Kg |
| anthracene | 330 U | 330 U | µg/Kg |
| fluoranthene | 330 U | 330 U | µg/Kg |
| pyrene | 330 U | 330 U | µg/Kg |
| chrysene | 330 U | 330 U | µg/Kg |
| benzo (a) anthracene | 330 U | 330 U | µg/Kg |
| benzo (b) fluoranthene | 330 U | 330 U | µg/Kg |
| benzo (k) fluoranthene | 330 U | 330 U | µg/Kg |
| benzo (a) pyrene | 330 U | 330 U | µg/Kg |
| indeno (1, 2, 3-cd) pyrene | 330 U | 330 U | µg/Kg |
| dibenzo (a, h) anthracene | 330 U | 330 U | µg/Kg |
| benzo (g, h, i) perylene | 330 U | 330 U | µg/Kg |

| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
|-------------------|----------------|----------------|---------------|
| 2-Fluorobiphenyl | 77 | 77 | 14-146 |
| Date Extracted | 11/04/98 | 11/04/98 | |
| Date Analyzed | 11/04/98 | 11/05/98 | |

RM 12/14/98

| <u>MISCELLANEOUS</u> | <u>METHOD</u> | <u>KW02946</u> | <u>LAB BLANK</u> | <u>Units</u> |
|----------------------|---------------|----------------|------------------|--------------|
| Percent Solids | SM2540G | 84 | NR | % |
| Date Analyzed | | 10/29/98 | | |

U. Compound was analyzed for but not detected to the level shown.
 NK. Analysis not requested for this sample.

ENCO LABORATORIES
REPORT # : JR3832
DATE REPORTED: November 10, 1998
REFERENCE : 22567
PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

| <u>FL METHOD FLPRO -</u> <u>PETROL. RESIDUAL ORG.</u> | <u>KW02946</u> | <u>LAB BLANK</u> | <u>Units</u> |
|--|----------------|------------------|---------------|
| Hydrocarbons (C8-C40) | 7.8 U | 6.6 U | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | 101 | 79 | 51-148 |
| Date Extracted | 11/06/98 | 11/06/98 | |
| Date Analyzed | 11/09/98 | 11/08/98 | |

RH
12/11/98

Compound was analyzed for but not detected to the level shown.
Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3853
 DATE REPORTED: November 4, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

PA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02947</u> | <u>Units</u> |
|-------------------------|----------------|---------------|
| Methyl tert-butyl ether | 3.0 U | µg/Kg |
| Benzene | 1.2 U | µg/Kg |
| Toluene | 2.2 I | µg/Kg |
| Chlorobenzene | 1.2 U | µg/Kg |
| Ethylbenzene | 1.2 U | µg/Kg |
| m-Xylene & p-Xylene | 8.0 I | µg/Kg |
| o-Xylene | 3.3 I | µg/Kg |
| 1,3-Dichlorobenzene | 1.2 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.2 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.2 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 49 | 40-170 |
| Date Analyzed | 11/01/98 | |

U Compound was analyzed for but not detected to the level shown.
 I Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3853
 DATE REPORTED: November 4, 1998
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 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

PA METHOD 8270 -
AH Compounds

KW02947

Units

| | | |
|----------------------------|-------|-------|
| aphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| acenaphthylene | 330 U | µg/Kg |
| acenaphthene | 330 U | µg/Kg |
| fluorene | 330 U | µg/Kg |
| phenanthrene | 330 U | µg/Kg |
| anthracene | 330 U | µg/Kg |
| fluoranthene | 330 U | µg/Kg |
| pyrene | 330 U | µg/Kg |
| fluorene | 330 U | µg/Kg |
| benzo (a) anthracene | 330 U | µg/Kg |
| benzo (b) fluoranthene | 330 U | µg/Kg |
| benzo (k) fluoranthene | 330 U | µg/Kg |
| benzo (a) pyrene | 330 U | µg/Kg |
| Indeno (1, 2, 3-cd) pyrene | 330 U | µg/Kg |
| Dibenzo (a, h) anthracene | 330 U | µg/Kg |
| benzo (g, h, i) perylene | 330 U | µg/Kg |

Surrogate:

2-Fluorobiphenyl
 Date Extracted
 Date Analyzed

% RECOV

61
 10/29/98
 10/30/98

LIMITS

14-146

U = Compound was analyzed for but not detected to the level shown.

22567-326-SC-0836-0002-(17)-1

ENCO LABORATORIES

REPORT # : JR3853
DATE REPORTED: November 4, 1998
REFERENCE : 22567-326-MR
PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

L METHOD FLPRO -
ETROL. RESIDUAL ORG.

hydrocarbons (C8-C40)

surrogate:
-Terphenyl
ate Extracted
ate Analyzed

KW02947

9.0 U

% RECOV

73
10/29/98
10/31/98

Units

mg/Kg

LIMITS

51-148

ISCELLANEOUS

METHOD

percent Solids
ate Analyzed

SM2540G

KW02947

73
10/29/98

Units

%

J - Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.

22567-326-SC-0836-0002-C1)-1

ENCO LABORATORIES

REPORT # : JR3853
 DATE REPORTED: November 4, 1998
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RESULTS OF ANALYSIS

PA METHOD 8021 -
VOLATILE ORGANICS

KW02948

Units

| | | |
|------------------------|-------|-------|
| ethyl tert-butyl ether | 2.0 U | µg/Kg |
| benzene | 1.0 U | µg/Kg |
| toluene | 1.0 U | µg/Kg |
| chlorobenzene | 1.0 U | µg/Kg |
| styrene | 1.0 U | µg/Kg |
| -Xylene & p-Xylene | 2.0 U | µg/Kg |
| -Xylene | 1.0 U | µg/Kg |
| m,3-Dichlorobenzene | 1.0 U | µg/Kg |
| p,4-Dichlorobenzene | 1.0 U | µg/Kg |
| o,2-Dichlorobenzene | 1.0 U | µg/Kg |

Surrogate:

1,2-difluorobenzene
 Date Analyzed

% RECOV

50
 11/01/98

LIMITS

40-170

Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3853
 DATE REPORTED: November 4, 1998
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RESULTS OF ANALYSIS

PA METHOD 8270 -
AH Compounds

KW02948

Units

| | | |
|----------------------------|-------|-------|
| aphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| cenaphthylene | 330 U | µg/Kg |
| cenaphthene | 330 U | µg/Kg |
| luorene | 330 U | µg/Kg |
| henanthrene | 330 U | µg/Kg |
| nthracene | 330 U | µg/Kg |
| luoranthene// | 330 U | µg/Kg |
| pyrene | 330 U | µg/Kg |
| fluorene | 330 U | µg/Kg |
| enzo (a) anthracene | 330 U | µg/Kg |
| enzo (b) fluoranthene | 330 U | µg/Kg |
| enzo (k) fluoranthene | 330 U | µg/Kg |
| enzo (a) pyrene | 330 U | µg/Kg |
| indeno (1, 2, 3-cd) pyrene | 330 U | µg/Kg |
| tribenzo (a, h) anthracene | 330 U | µg/Kg |
| benzo (g, h, i) perylene | 330 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

-Fluorobiphenyl
 Date Extracted
 Date Analyzed

69
 10/29/98
 10/30/98

14-146

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR3853
DATE REPORTED: November 4, 1998
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RESULTS OF ANALYSIS

L METHOD FLPRO -
ETROL. RESIDUAL ORG.

hydrocarbons (C8-C40)

Surrogate:
-Terphenyl
Date Extracted
Date Analyzed

KW02948

8.0 U

% RECOV

108

10/29/98

10/31/98

Units

mg/Kg

LIMITS

51-148

MISCELLANEOUS

METHOD

Percent Solids
Date Analyzed

SM2540G

KW02948

82

10/29/98

Units

%

U = Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3853

DATE REPORTED: November 4, 1998

REFERENCE : 22567-326-MR

PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

PA METHOD 8021 -
VOLATILE ORGANICS

KW02949

Units

| | | |
|-------------------------|-------|------|
| Methyl tert-butyl ether | 2.0 U | µg/L |
| Benzene | 1.0 U | µg/L |
| Toluene | 2.0 | µg/L |
| Chlorobenzene | 1.0 U | µg/L |
| Ethylbenzene | 19 | µg/L |
| m-Xylene & p-Xylene | 7.0 | µg/L |
| o-Xylene | 2.0 | µg/L |
| m,3-Dichlorobenzene | 1.0 U | µg/L |
| m,4-Dichlorobenzene | 1.0 U | µg/L |
| m,2-Dichlorobenzene | 1.0 U | µg/L |

Surrogate:

% RECOV

LIMITS

| | | |
|--------------------|----------|--------|
| Bromofluorobenzene | 90 | 65-129 |
| Date Analyzed | 10/30/98 | |

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR3853

DATE REPORTED: November 4, 1998

REFERENCE : 22567-326-MR

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RESULTS OF ANALYSIS

PA METHOD 8270 -
AH Compounds

| | <u>KW02949</u> | <u>Units</u> |
|---------------------------|----------------|---------------|
| aphthalene | 10 U | µg/L |
| -Methylnaphthalene | 10 U | µg/L |
| -Methylnaphthalene | 10 U | µg/L |
| acenaphthylene | 10 U | µg/L |
| acenaphthene | 10 U | µg/L |
| luorene | 10 U | µg/L |
| nenanthrene | 10 U | µg/L |
| anthracene | 10 U | µg/L |
| luoranthene | 10 U | µg/L |
| pyrene | 10 U | µg/L |
| ene | 10 U | µg/L |
| enzo (a) anthracene | 10 U | µg/L |
| enzo (b) fluoranthene | 10 U | µg/L |
| enzo (k) fluoranthene | 10 U | µg/L |
| enzo (a) pyrene | 10 U | µg/L |
| ndeno (1, 2, 3-cd) pyrene | 10 U | µg/L |
| ibenzo (a, h) anthracene | 10 U | µg/L |
| enzo (g, h, i) perylene | 10 U | µg/L |
| <u>urrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| -Fluorobiphenyl | 85 | 14-146 |
| ate Extracted | 11/03/98 | |
| ate Analyzed | 11/03/98 | |

U = Compound was analyzed for but not detected to the level shown.

22567-326-SC-0836-0002-(C)-

ENCO LABORATORIES

REPORT # : JR3853

DATE REPORTED: November 4, 1998

REFERENCE : 22567-326-MR

PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

L METHOD FLPRO -
ETROL. RESIDUAL ORG.

hydrocarbons (C8-C40)

Surrogate:
-Terphenyl
Date Extracted
Date Analyzed

KW02949

0.20 U

% RECOV

70

11/02/98

11/03/98

Units

mg/L

LIMITS

65-140

MISCELLANEOUS

METHOD

150.1

Date Analyzed

KW02949

8.0

11/03/98

Units

S.U.

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

PA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02950</u> | <u>Units</u> |
|------------------------|----------------|---------------|
| ethyl tert-butyl ether | 2.0 U D1 | µg/Kg |
| benzene | 1.3 U D1 | µg/Kg |
| toluene | 1.3 U D1 | µg/Kg |
| chlorobenzene | 1.3 U D1 | µg/Kg |
| ethylbenzene | 6.9 D1 | µg/Kg |
| m-Xylene & p-Xylene | 41 D1 | µg/Kg |
| o-Xylene | 5.0 I D1 | µg/Kg |
| m,3-Dichlorobenzene | 1.0 U D1 | µg/Kg |
| p,4-Dichlorobenzene | 1.0 U D1 | µg/Kg |
| o-Dichlorobenzene | 1.0 U D1 | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Perfluorobenzene | 52 | 40-170 |
| Sample Analyzed | 11/01/98 | |

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
 DW = Analysis is reported on a "dry weight" basis.
 D1 = Analyte value determined from a 1:1.11 dilution.

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RESULTS OF ANALYSIS

PA METHOD 8270 -

AH Compounds

KW02950

Units

| | | |
|----------------------------|-------|-------|
| aphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| cenaphthylene | 330 U | µg/Kg |
| cenaphthene | 330 U | µg/Kg |
| luorene | 330 U | µg/Kg |
| henanthrene | 330 U | µg/Kg |
| nthracene | 330 U | µg/Kg |
| luoranthene | 330 U | µg/Kg |
| pyrene | 330 U | µg/Kg |
| fluorene | 330 U | µg/Kg |
| benzo (a) anthracene | 330 U | µg/Kg |
| benzo (b) fluoranthene | 330 U | µg/Kg |
| benzo (k) fluoranthene | 330 U | µg/Kg |
| benzo (a) pyrene | 330 U | µg/Kg |
| indeno (1, 2, 3-cd) pyrene | 330 U | µg/Kg |
| tribenzo (a, h) anthracene | 330 U | µg/Kg |
| benzo (g, h, i) perylene | 330 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

2,2-Difluorobiphenyl
 Date Extracted
 Date Analyzed

70
 10/29/98
 10/30/98

14-146

J = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

FLUORENCE METHOD FLPRO -
PETROL. RESIDUAL ORG.

hydrocarbons (C8-C40)

KW02950

Units

7.8 U

mg/Kg

Surrogate:
 -Terphenyl
 Date Extracted
 Date Analyzed

% RECOV

LIMITS

82

51-148

10/29/98

10/31/98

MISCELLANEOUS

METHOD

KW02950

Units

Percent Solids
 Date Analyzed

SM2540G

85

%

10/29/98

U Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

22567-326-SC-0836-0002-(1)-1

ENCO LABORATORIES

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RESULTS OF ANALYSIS

PA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02951</u> | <u>Units</u> |
|------------------------|----------------|---------------|
| ethyl tert-butyl ether | 2.0 U D2 | µg/Kg |
| benzene | 1.0 U D2 | µg/Kg |
| toluene | 4.5 D2 | µg/Kg |
| chlorobenzene | 17 D2 | µg/Kg |
| ethylbenzene | 12 D2 | µg/Kg |
| m-Xylene & p-Xylene | 15 D2 | µg/Kg |
| o-Xylene | 1.0 U D2 | µg/Kg |
| m,3-Dichlorobenzene | 1.0 U D2 | µg/Kg |
| m,4-Dichlorobenzene | 1.0 U D2 | µg/Kg |
| m,2-Dichlorobenzene | 1.0 U D2 | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 139 | 40-170 |
| Date Analyzed | 11/02/98 | |

U = Compound was analyzed for but not detected to the level shown.
 D = Analysis is reported on a "dry weight" basis.
 D2 = Analyte value determined from a 1:1.02 dilution.

ENCO LABORATORIES

REPORT # : JR3853

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RESULTS OF ANALYSIS

PA METHOD 8270 -

PAH Compounds

KW02951

Units

| | | |
|--------------------------|-------|-------|
| aphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| -Methylnaphthalene | 330 U | µg/Kg |
| acenaphthylene | 330 U | µg/Kg |
| acenaphthene | 330 U | µg/Kg |
| fluorene | 330 U | µg/Kg |
| benzanthrene | 330 U | µg/Kg |
| anthracene | 330 U | µg/Kg |
| fluoranthene// | 330 U | µg/Kg |
| pyrene | 330 U | µg/Kg |
| benzofluorene | 330 U | µg/Kg |
| benzo (a) anthracene | 330 U | µg/Kg |
| benzo (b) fluoranthene | 330 U | µg/Kg |
| benzo (k) fluoranthene | 330 U | µg/Kg |
| benzo (a) pyrene | 330 U | µg/Kg |
| indeno (1,2,3-cd) pyrene | 330 U | µg/Kg |
| benzo (a, h) anthracene | 330 U | µg/Kg |
| benzo (g, h, i) perylene | 330 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

-Fluorobiphenyl
 Date Extracted
 Date Analyzed

62
 10/29/98
 10/30/98

14-146

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR3853
 DATE REPORTED: November 4, 1998
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 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

L METHOD FLPRO -
ETROL. RESIDUAL ORG.

KW02951

Units

hydrocarbons (C8-C40)

8.0 U

mg/Kg

Surrogate:

% RECOV

LIMITS

-Terphenyl
 Date Extracted
 Date Analyzed

102
 10/29/98
 10/31/98

51-148

MISCELLANEOUS

METHOD

KW02951

Units

Percent Solids
 Date Analyzed

SM2540G

82
 10/29/98

%

U Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES
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 DATE REPORTED: November 18, 198
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RESULTS OF ANALYSIS

EPA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02952</u> | <u>Units</u> |
|-------------------------|----------------|---------------|
| Methyl tert-butyl ether | 2.0 U | µg/L |
| Benzene | 1.0 U | µg/L |
| Toluene | 3.0 | µg/L |
| Chlorobenzene | 1.0 U | µg/L |
| Ethylbenzene | 8.0 | µg/L |
| m-Xylene & p-Xylene | 5.0 | µg/L |
| o-Xylene | 1.0 U | µg/L |
| m,3-Dichlorobenzene | 1.0 U | µg/L |
| m,4-Dichlorobenzene | 1.0 U | µg/L |
| m,2-Dichlorobenzene | 1.0 U | µg/L |
| <u>rogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| fluorobenzene | 90 | 65-129 |
| Date Analyzed | 10/30/98 | |

24
 12/14/98

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

KW02952

Units

| | | |
|--------------------------|------|------|
| Naphthalene | 10 U | µg/L |
| 2-Methylnaphthalene | 10 U | µg/L |
| 1-Methylnaphthalene | 10 U | µg/L |
| Acenaphthylene | 10 U | µg/L |
| Acenaphthene | 10 U | µg/L |
| Fluorene | 10 U | µg/L |
| Phenanthrene | 10 U | µg/L |
| Anthracene | 10 U | µg/L |
| Fluoranthene | 10 U | µg/L |
| Pyrene | 10 U | µg/L |
| Chrysene | 10 U | µg/L |
| Benzo (a) anthracene | 10 U | µg/L |
| Benzo (b) fluoranthene | 10 U | µg/L |
| Benzo (k) fluoranthene | 10 U | µg/L |
| Benzo (a) pyrene | 10 U | µg/L |
| Indeno (1,2,3-cd) pyrene | 10 U | µg/L |
| Dibenzo (a,h) anthracene | 10 U | µg/L |
| Benzo (g,h,i) perylene | 10 U | µg/L |

Surrogate:

% RECOV

LIMITS

| | | |
|------------------|----------|--------|
| 2-Fluorobiphenyl | 71 | 14-146 |
| Date Extracted | 11/03/98 | |
| Date Analyzed | 11/03/98 | |

24
12/14/98

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

Hydrocarbons (C8-C40)

KW02952

Units

0.20 U

mg/L

Surrogate:

p-Terphenyl
Date Extracted
Date Analyzed

% RECOV

LIMITS

.75

65-140

11/03/98

11/04/98

MISCELLANEOUS

METHOD

KW02952

Units

pH
Analyzed

150.1

7.8
11/01/98

S.U.

R.H.
12/14/98

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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 DATE REPORTED: November 24, 1998
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RESULTS OF ANALYSIS

EPA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02953</u> | <u>Units</u> |
|-------------------------|----------------|---------------|
| Methyl tert-butyl ether | 2.0 U | µg/L |
| Benzene | 1.0 U | µg/L |
| Toluene | 1.0 U | µg/L |
| Chlorobenzene | 1.0 U | µg/L |
| Ethylbenzene | 1.0 U | µg/L |
| n-Xylene & p-Xylene | 1.0 U | µg/L |
| o-Xylene | 1.0 U | µg/L |
| 1,3-Dichlorobenzene | 1.0 U | µg/L |
| 1,4-Dichlorobenzene | 1.0 U | µg/L |
| 1,2-Dichlorobenzene | 1.0 U | µg/L |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 109 | 65-129 |
| Date Analyzed | 11/05/98 | |

*RL
12/14/98*

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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 DATE REPORTED: November 24, 1998
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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

KW02953

Units

| | | |
|----------------------------|------|------|
| Naphthalene | 10 U | µg/L |
| 2-Methylnaphthalene | 10 U | µg/L |
| 1-Methylnaphthalene | 10 U | µg/L |
| Acenaphthylene | 10 U | µg/L |
| Acenaphthene | 10 U | µg/L |
| Fluorene | 10 U | µg/L |
| Phenanthrene | 10 U | µg/L |
| Anthracene | 10 U | µg/L |
| Fluoranthene | 10 U | µg/L |
| Pyrene | 10 U | µg/L |
| Benzo (a) anthracene | 10 U | µg/L |
| Benzo (b) fluoranthene | 10 U | µg/L |
| Benzo (k) fluoranthene | 10 U | µg/L |
| Benzo (a) pyrene | 10 U | µg/L |
| Indeno (1, 2, 3-cd) pyrene | 10 U | µg/L |
| Dibenzo (a, h) anthracene | 10 U | µg/L |
| Benzo (g, h, i) perylene | 10 U | µg/L |

Surrogate:

% RECOV

LIMITS

2-Fluorobiphenyl

76

14-146

Date Extracted

11/06/98

Date Analyzed

11/06/98

RA
12/14/98

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

L METHOD FLPRO -
NETROL. RESIDUAL ORG.

hydrocarbons (C8-C40)

KW02953

Units

0.20 U

mg/L

surrogate:

-Terphenyl
ate Extracted
ate Analyzed

% RECOV

LIMITS

71

65-140

11/06/98

11/08/98

24
12/14/98

J... Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02954</u> | <u>Units</u> |
|-------------------------|----------------|---------------|
| Methyl tert-butyl ether | 2.0 U D1 | µg/Kg |
| Benzene | 1.3 U D1 | µg/Kg |
| Toluene | 1.3 U D1 | µg/Kg |
| Chlorobenzene | 1.3 U D1 | µg/Kg |
| Ethylbenzene | 1.3 U D1 | µg/Kg |
| m-Xylene & p-Xylene | 2.0 U D1 | µg/Kg |
| o-Xylene | 1.0 U D1 | µg/Kg |
| m,3-Dichlorobenzene | 1.0 U D1 | µg/Kg |
| m,4-Dichlorobenzene | 1.0 U D1 | µg/Kg |
| m,2-Dichlorobenzene | 1.0 U D1 | µg/Kg |
| <u>Recovery:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 60 | 40-170 |
| Date Analyzed | 11/02/98 | |

24
 12/14/98

J = Compound was analyzed for but not detected to the level shown.
 J = Analysis is reported on a "dry weight" basis.
 J = Analyte value determined from a 1:1.06 dilution.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

KW02954

Units

| | | |
|------------------------|-------|-------|
| Naphthalene | 390 U | µg/Kg |
| 2-Methylnaphthalene | 390 U | µg/Kg |
| 1-Methylnaphthalene | 390 U | µg/Kg |
| Acenaphthylene | 390 U | µg/Kg |
| Acenaphthene | 390 U | µg/Kg |
| Fluorene | 390 U | µg/Kg |
| Phenanthrene | 390 U | µg/Kg |
| Anthracene | 390 U | µg/Kg |
| Fluoranthene | 390 U | µg/Kg |
| Pyrene | 390 U | µg/Kg |
| Chrysene | 390 U | µg/Kg |
| Benzo(a)anthracene | 390 U | µg/Kg |
| Benzo(b)fluoranthene | 390 U | µg/Kg |
| Benzo(k)fluoranthene | 390 U | µg/Kg |
| Benzo(a)pyrene | 390 U | µg/Kg |
| Indeno(1,2,3-cd)pyrene | 390 U | µg/Kg |
| Dibenzo(a,h)anthracene | 390 U | µg/Kg |
| Benzo(g,h,i)perylene | 390 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

| | | |
|------------------|----------|--------|
| 2-Fluorobiphenyl | 76 | 14-146 |
| Date Extracted | 11/04/98 | |
| Date Analyzed | 11/04/98 | |

RH
12/14/98

U Compound was analyzed for but not detected to the level shown.
 D Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02954</u> | <u>Units</u> |
|-----------------------|----------------|---------------|
| Hydrocarbons (C8-C40) | 100 | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | .79 | 51-148 |
| Date Extracted | 11/12/98 | |
| Date Analyzed | 11/13/98 | |

MISCELLANEOUS

METHOD

| | <u>KW02954</u> | <u>Units</u> |
|----------------|----------------|--------------|
| Percent Solids | 85 | % |
| Date Analyzed | 10/30/98 | |

RW
12/14/98

Compound was analyzed for but not detected to the level shown.
Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES
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RESULTS OF ANALYSIS

EPA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02955</u> | | <u>Units</u> |
|-------------------------|----------------|------|---------------|
| Methyl tert-butyl ether | 2.0 | U D2 | µg/Kg |
| Benzene | 1.3 | U D2 | µg/Kg |
| Toluene | 1.3 | U D2 | µg/Kg |
| Chlorobenzene | 1.3 | U D2 | µg/Kg |
| Ethylbenzene | 12 | D2 | µg/Kg |
| m-Xylene & p-Xylene | 8.0 | I D2 | µg/Kg |
| o-Xylene | 1.0 | U D2 | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 | U D2 | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 | U D2 | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 | U D2 | µg/Kg |
| <u>Srogate:</u> | <u>% RECOV</u> | | <u>LIMITS</u> |
| Bromofluorobenzene | 143 | | 40-170 |
| Date Analyzed | 11/02/98 | | |

J

RW
 12/14/98

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
 D = Analysis is reported on a "dry weight" basis.
 D2 = Analyte value determined from a 1:1.09 dilution.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

KW02955

Units

| | | |
|------------------------|-------|-------|
| Naphthalene | 400 U | µg/Kg |
| 2-Methylnaphthalene | 400 U | µg/Kg |
| 1-Methylnaphthalene | 400 U | µg/Kg |
| Acenaphthylene | 400 U | µg/Kg |
| Acenaphthene | 400 U | µg/Kg |
| Fluorene | 400 U | µg/Kg |
| Phenanthrene | 400 U | µg/Kg |
| Anthracene | 400 U | µg/Kg |
| Fluoranthene | 400 U | µg/Kg |
| Pyrene | 400 U | µg/Kg |
| Chrysene | 400 U | µg/Kg |
| Benzo(a)anthracene | 400 U | µg/Kg |
| Benzo(b)fluoranthene | 400 U | µg/Kg |
| Benzo(k)fluoranthene | 400 U | µg/Kg |
| Benzo(a)pyrene | 400 U | µg/Kg |
| Indeno(1,2,3-cd)pyrene | 400 U | µg/Kg |
| Dibenzo(a,h)anthracene | 400 U | µg/Kg |
| Benzo(g,h,i)perylene | 400 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

| | | |
|------------------|----------|--------|
| 2-Fluorobiphenyl | 77 | 14-146 |
| Date Extracted | 11/04/98 | |
| Date Analyzed | 11/04/98 | |

RH
12/4/98

U = Compound was analyzed for but not detected to the level shown.
Dw = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

L METHOD FLPRO -
ETROL. RESIDUAL ORG.

| | <u>KW02955</u> | <u>Units</u> |
|-----------------------|----------------|---------------|
| hydrocarbons (C8-C40) | 68 | mg/Kg |
| <u> surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| -Terphenyl | .82 | 51-148 |
| ate Extracted | 11/12/98 | |
| ate Analyzed | 11/13/98 | |

ISCELLANEOUS

METHOD

KW02955

Units

percent Solids
 Analyzed

SM2540G

82
 10/30/98

%

RH
12/14/98

Compound was analyzed for but not detected to the level shown.
 Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES
 REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying
 Club/Trumbo Point

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RESULTS OF ANALYSIS

MPA METHOD 8021 -
 VOLATILE ORGANICS

| | KW02956 | | | Units |
|-------------------------|----------------|---|-------|---------------|
| Methyl tert-butyl ether | 2.0 | U | D1 UJ | µg/Kg |
| Benzene | 5.6 | | D1 J | µg/Kg |
| Toluene | .64 | | D1 ↓ | µg/Kg |
| Chlorobenzene | 330 | J | D1 J | µg/Kg |
| Ethylbenzene | 150 | J | D1 ↓ | µg/Kg |
| m-Xylene & p-Xylene | 270 | J | D1 ↓ | µg/Kg |
| o-Xylene | 140 | J | D1 ↓ | µg/Kg |
| 1,3-Dichlorobenzene | 680 | J | D1 ↓ | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 | U | D1 UJ | µg/Kg |
| 1,2-Dichlorobenzene | 260 | J | D1 J | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | | | <u>LIMITS</u> |
| Bromofluorobenzene | * | | | 40-170 |
| Date Analyzed | 11/11/98 | | | |

RU
12/14/98

J = Estimated value; result exceeds linear calibration limit.
 * = Surrogate recovery unavailable due to matrix interference.
 U = Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.
 D1 = Analyte value determined from a 1:1.16 dilution.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8270 -
PAH Compounds

| | <u>KW02956</u> | | | <u>Units</u> |
|------------------------|----------------|---|----|--------------|
| Naphthalene | 21000 | U | D2 | μg/Kg |
| 2-Methylnaphthalene | 21000 | U | D2 | μg/Kg |
| 1-Methylnaphthalene | 21000 | U | D2 | μg/Kg |
| Acenaphthylene | 21000 | U | D2 | μg/Kg |
| Acenaphthene | 21000 | U | D2 | μg/Kg |
| Fluorene | 21000 | U | D2 | μg/Kg |
| Phenanthrene | 21000 | U | D2 | μg/Kg |
| Anthracene | 21000 | U | D2 | μg/Kg |
| Fluoranthene | 21000 | U | D2 | μg/Kg |
| Pyrene | 21000 | U | D2 | μg/Kg |
| Chrysene | 21000 | U | D2 | μg/Kg |
| Benzo(a)anthracene | 21000 | U | D2 | μg/Kg |
| Benzo(b)fluoranthene | 21000 | U | D2 | μg/Kg |
| Benzo(k)fluoranthene | 21000 | U | D2 | μg/Kg |
| Benzo(a)pyrene | 21000 | U | D2 | μg/Kg |
| Indeno(1,2,3-cd)pyrene | 21000 | U | D2 | μg/Kg |
| Dibenzo(a,h)anthracene | 21000 | U | D2 | μg/Kg |
| Benzo(g,h,i)perylene | 21000 | U | D2 | μg/Kg |

UJ
 ↓

| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
|-------------------|----------------|---------------|
| 2-Fluorobiphenyl | * | 14-146 |
| Date Extracted | 11/06/98 | |
| Date Analyzed | 11/07/98 | |

211 12/14/98

* = Surrogate recovery unavailable due to matrix interference.
 U = Compound was analyzed for but not detected to the level shown.
 D = Analysis is reported on a "dry weight" basis.
 D2 = Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02956</u> | <u>Units</u> |
|-----------------------|----------------|---------------|
| Hydrocarbons (C8-C40) | 3100 D2 J | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | * | 51-148 |
| Date Extracted | 11/13/98 | |
| Date Analyzed | 11/16/98 | |

MISCELLANEOUS

| | <u>METHOD</u> | <u>KW02956</u> | <u>Units</u> |
|----------------|---------------|----------------|--------------|
| Percent Solids | SM2540G | 78 | % |
| Date Analyzed | | 11/03/98 | |

RH 12/14/98

* = Surrogate recovery unavailable due to matrix interference.
 U = Compound was analyzed for but not detected to the level shown.
 F = Analysis is reported on a "dry weight" basis.
 D2 = Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
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RESULTS OF ANALYSIS

EPA METHOD 8021 -
 VOLATILE ORGANICS

| | KW02957 | | | Units |
|-------------------------|----------------|---|------|---------------|
| Methyl tert-butyl ether | 3.0 | U | D3 | µg/Kg |
| Benzene | 14 | | D3 | µg/Kg |
| Toluene | 180 | J | D3 J | µg/Kg |
| Chlorobenzene | 1.6 | U | D3 | µg/Kg |
| Ethylbenzene | 66 | | D3 | µg/Kg |
| m-Xylene & p-Xylene | 390 | J | D3 J | µg/Kg |
| o-Xylene | 85 | | D3 | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 | U | D3 | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 | U | D3 | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 | U | D3 | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | | | <u>LIMITS</u> |
| Bromofluorobenzene | 94 | | | 40-170 |
| Date Analyzed | 11/11/98 | | | |

RH
 12/14/98

J = Estimated value; result exceeds linear calibration limit.
 J = Compound was analyzed for but not detected to the level shown.
 D = Analysis is reported on a "dry weight" basis.
 D3 = Analyte value determined from a 1:1.39 dilution.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8270 -
PAH Compounds

| | <u>KW02957</u> | <u>Units</u> |
|------------------------|----------------|---------------|
| Naphthalene | 380 U | µg/Kg |
| 2-Methylnaphthalene | 380 U | µg/Kg |
| 1-Methylnaphthalene | 380 U | µg/Kg |
| Acenaphthylene | 380 U | µg/Kg |
| Acenaphthene | 380 U | µg/Kg |
| Fluorene | 380 U | µg/Kg |
| Phenanthrene | 380 U | µg/Kg |
| Anthracene | 380 U | µg/Kg |
| Fluoranthene | 380 U | µg/Kg |
| Pyrene | 380 U | µg/Kg |
| Benzo(a)anthracene | 380 U | µg/Kg |
| Benzo(b)fluoranthene | 380 U | µg/Kg |
| Benzo(k)fluoranthene | 380 U | µg/Kg |
| Benzo(a)pyrene | 380 U | µg/Kg |
| Indeno(1,2,3-cd)pyrene | 380 U | µg/Kg |
| Dibenzo(a,h)anthracene | 380 U | µg/Kg |
| Benzo(g,h,i)perylene | 380 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| 2-Fluorobiphenyl | 98 | 14-146 |
| Date Extracted | 11/06/98 | |
| Date Analyzed | 11/07/98 | |

R4 12/14/98

U = Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02957</u> | <u>Units</u> |
|-----------------------|----------------|---------------|
| Hydrocarbons (C8-C40) | 4900 D2 J | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| p-Terphenyl | * | 51-148 |
| Date Extracted | 11/13/98 | |
| Date Analyzed | 11/16/98 | |

| <u>MISCELLANEOUS</u> | <u>METHOD</u> | <u>KW02957</u> | <u>Units</u> |
|----------------------|---------------|----------------|--------------|
| Percent Solids | SM2540G | 87 | % |
| Date Analyzed | | 11/03/98 | |

24
12/14/98

* = Surrogate recovery unavailable due to matrix interference.
 U = Compound was analyzed for but not detected to the level shown.
 D = Analysis is reported on a "dry weight" basis.
 D = Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying
 Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02958</u> | <u>Units</u> |
|-------------------------|----------------|---------------|
| Methyl tert-butyl ether | 2.0 U D4 | µg/Kg |
| Benzene | 1.3 U D4 | µg/Kg |
| Toluene | 1.3 U D4 | µg/Kg |
| Chlorobenzene | 1.3 U D4 | µg/Kg |
| Ethylbenzene | 1.3 U D4 | µg/Kg |
| n-Xylene & p-Xylene | 2.0 U D4 | µg/Kg |
| o-Xylene | 1.0 U D4 | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U D4 | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U D4 | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U D4 | µg/Kg |
| <u> surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 78 | 40-170 |
| Date Analyzed | 11/04/98 | |

12/14/98

U = Compound was analyzed for but not detected to the level shown.
 D = Analysis is reported on a "dry weight" basis.
 D = Analyte value determined from a 1:1.14 dilution.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
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 PROJECT NAME : Boca Chica Flying x
 Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8270 -
PAH Compounds

KW02958

Units

| | | |
|------------------------|-------|-------|
| Naphthalene | 400 U | µg/Kg |
| 2-Methylnaphthalene | 400 U | µg/Kg |
| 1-Methylnaphthalene | 400 U | µg/Kg |
| Acenaphthylene | 400 U | µg/Kg |
| Acenaphthene | 400 U | µg/Kg |
| Fluorene | 400 U | µg/Kg |
| Phenanthrene | 400 U | µg/Kg |
| Anthracene | 400 U | µg/Kg |
| Fluoranthene | 400 U | µg/Kg |
| Pyrene | 400 U | µg/Kg |
| Chrysene | 400 U | µg/Kg |
| Benzo(a)anthracene | 400 U | µg/Kg |
| Benzo(b)fluoranthene | 400 U | µg/Kg |
| Benzo(k)fluoranthene | 400 U | µg/Kg |
| Benzo(a)pyrene | 400 U | µg/Kg |
| Indeno(1,2,3-cd)pyrene | 400 U | µg/Kg |
| Dibenzo(a,h)anthracene | 400 U | µg/Kg |
| Benzo(g,h,i)perylene | 400 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

| | |
|------------------|----------|
| 2-Fluorobiphenyl | 72 |
| Date Extracted | 11/04/98 |
| Date Analyzed | 11/05/98 |

24
 12/14/98

U Compound was analyzed for but not detected to the level shown.
 D Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
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 Club/Trumbo Point

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

hydrocarbons (C8-C40)

KW02958

Units

8.0 U

mg/Kg

Surrogate:

o-Terphenyl
 Date Extracted
 Date Analyzed

% RECOV

LIMITS

77

51-148

11/04/98

11/05/98

MISCELLANEOUS

METHOD

KW02958

Units

Percent Solids
 Date Analyzed

SM2540G

83

%

11/03/98

*RH
 12/14/98*

U Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying
 Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02959</u> | <u>Units</u> |
|-------------------------|----------------|---------------|
| Methyl tert-butyl ether | 2.0 U | µg/Kg |
| Benzene | 1.0 U | µg/Kg |
| Toluene | 1.0 U | µg/Kg |
| Chlorobenzene | 1.0 U | µg/Kg |
| Ethylbenzene | 1.0 U | µg/Kg |
| m-Xylene & p-Xylene | 6.0 I | µg/Kg |
| o-Xylene | 1.0 U | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 73 | 40-170 |
| Date Analyzed | 11/04/98 | |

RH
 12/14/98

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 L = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

KW02959

Units

| | | |
|--------------------------|-------|-------|
| naphthalene | 380 U | µg/Kg |
| 1-Methylnaphthalene | 380 U | µg/Kg |
| 2-Methylnaphthalene | 380 U | µg/Kg |
| acenaphthylene | 380 U | µg/Kg |
| acenaphthene | 380 U | µg/Kg |
| fluorene | 380 U | µg/Kg |
| phenanthrene | 380 U | µg/Kg |
| anthracene | 380 U | µg/Kg |
| fluoranthene | 380 U | µg/Kg |
| pyrene | 380 U | µg/Kg |
| benzene | 380 U | µg/Kg |
| benzo (a) anthracene | 380 U | µg/Kg |
| benzo (b) fluoranthene | 380 U | µg/Kg |
| benzo (k) fluoranthene | 380 U | µg/Kg |
| benzo (a) pyrene | 380 U | µg/Kg |
| indeno (1,2,3-cd) pyrene | 380 U | µg/Kg |
| dibenzo (a,h) anthracene | 380 U | µg/Kg |
| benzo (g,h,i) perylene | 380 U | µg/Kg |

Surrogate:

% RECOV

LIMITS

| | | |
|------------------|----------|--------|
| 2-Fluorobiphenyl | 83 | 14-146 |
| Date Extracted | 11/04/98 | |
| Date Analyzed | 11/05/98 | |

12/14/98

U - Compound was analyzed for but not detected to the level shown.
 DW - Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
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 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

KW02959

Units

Hydrocarbons (C8-C40)

32

mg/Kg

Surrogate:

% RECOV

LIMITS

o-Terphenyl

72

51-148

Date Extracted

11/04/98

Date Analyzed

11/05/98

MISCELLANEOUS

METHOD

KW02959

Units

Percent Solids

SM2540G

87

%

Date Analyzed

11/03/98

*RW
12/14/98*

U - Compound was analyzed for but not detected to the level shown.
 DW - Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club/Trumbo Point

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

| | <u>KW02960</u> | <u>Units</u> |
|--------------------------|----------------|--------------|
| Naphthalene | 380 U | µg/Kg |
| 2-Methylnaphthalene | 380 U | µg/Kg |
| 1-Methylnaphthalene | 380 U | µg/Kg |
| Acenaphthylene | 380 U | µg/Kg |
| Acenaphthene | 380 U | µg/Kg |
| Fluorene | 380 U | µg/Kg |
| Phenanthrene | 380 U | µg/Kg |
| Anthracene | 380 U | µg/Kg |
| Fluoranthene | 380 U | µg/Kg |
| Pyrene | 380 U | µg/Kg |
| Chrysene | 380 U | µg/Kg |
| Benzo (a) anthracene | 380 U | µg/Kg |
| Benzo (b) fluoranthene | 380 U | µg/Kg |
| Benzo (k) fluoranthene | 380 U | µg/Kg |
| Benzo (a) pyrene | 380 U | µg/Kg |
| Indeno (1,2,3-cd) pyrene | 380 U | µg/Kg |
| Dibenzo (a,h) anthracene | 380 U | µg/Kg |
| Benzo (g,h,i) perylene | 380 U | µg/Kg |

Surrogate:

| | <u>% RECOV</u> | <u>LIMITS</u> |
|------------------|----------------|---------------|
| 2-Fluorobiphenyl | 87 | 14-146 |
| Date Extracted | 11/06/98 | |
| Date Analyzed | 11/07/98 | |

24
12/14/98

U = Compound was analyzed for but not detected to the level shown.
 D = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3909
 DATE REPORTED: November 24, 1998
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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02960</u> | <u>Units</u> |
|-----------------------|----------------|---------------|
| Hydrocarbons (C8-C40) | 20 * J | mg/L |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | .82 | 65-140 |
| Date Extracted | 11/19/98 | |
| Date Analyzed | 11/24/98 | |

MISCELLANEOUS

| | <u>METHOD</u> | <u>KW02960</u> | <u>Units</u> |
|----------------|---------------|----------------|--------------|
| Percent Solids | SM2540G | 86 | % |
| Date Analyzed | | 11/03/98 | |

K.H.
 12/14/98

* = Sample extracted outside method-specified holding time of 14 days from sampling.

U - Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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 DATE REPORTED: November 17, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

| | <u>KW02961</u> | <i>Rev Qual</i> | <u>KW02962</u> | <i>Rev Qual</i> | <u>Units</u> |
|-------------------------|----------------|-----------------|----------------|-----------------|--------------|
| Dichlorodifluoromethane | 2.0 U | | 2.0 U | | µg/Kg |
| Chloromethane | 1.0 U | | 1.0 U | | µg/Kg |
| Vinyl Chloride | 1.0 U | | 1.0 U | | µg/Kg |
| Bromomethane | 1.0 U | | 1.0 U | | µg/Kg |
| Chloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| Trichlorofluoromethane | 1.0 U | | 1.0 U | | µg/Kg |
| 1,1-Dichloroethene | 1.0 U | | 1.0 U | | µg/Kg |
| Acetone | 25 U | | 26 U | | µg/Kg |
| Methylene Chloride | 23 U | U | 25 U | U | µg/Kg |
| c-1,2-Dichloroethene | 1.0 U | | 1.0 U | | µg/Kg |
| Methyl tert-butyl ether | 7.0 U | | 8.0 U | | µg/Kg |
| 1,2-Dichloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| 2,2-Dichloropropane | 2.0 U | | 2.0 U | | µg/Kg |
| c-1,2-Dichloroethene | 1.0 U | | 1.0 U | | µg/Kg |
| 2-Butanone | 25 U | | 26 U | | µg/Kg |
| Chloroform | 1.0 U | | 1.0 U | | µg/Kg |
| 1,1,1-Trichloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| Carbon tetrachloride | 1.0 U | | 1.0 U | | µg/Kg |
| 1,1-Dichloropropene | 1.0 U | | 1.0 U | | µg/Kg |
| Benzene | 1.7 I | J | 1.0 U | | µg/Kg |
| 1,2-Dichloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| Trichloroethene | 1.0 U | | 1.0 U | | µg/Kg |
| 1,2-Dichloropropane | 1.0 U | | 1.0 U | | µg/Kg |
| Dibromomethane | 1.0 U | | 1.0 U | | µg/Kg |
| Bromodichloromethane | 1.0 U | | 1.0 U | | µg/Kg |

RH 12/11/98

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 D = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
 VOLATILE ORGANICS

| | <u>KW02961</u> | <i>Rev Qual</i> | <u>KW02962</u> | <i>Rev Qual</i> | <u>Units</u> |
|---------------------------|----------------|-----------------|----------------|-----------------|--------------|
| 1-Chloroethyl vinyl ether | 7.0 U | | 8.0 U | | µg/Kg |
| 1,3-Dichloropropene | 1.0 U | | 1.0 U | | µg/Kg |
| 2-Methyl-2-pentanone | 25 U | | 26 U | | µg/Kg |
| Toluene | 2.2 I | J | 1.0 U | | µg/Kg |
| 1,3-Dichloropropene | 1.0 U | | 1.0 U | | µg/Kg |
| 1,1,2-Trichloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| Tetrachloroethene | 4.0 U | | 4.0 U | | µg/Kg |
| 1,3-Dichloropropane | 1.0 U | | 1.0 U | | µg/Kg |
| 2-Hexanone | 25 U | | 26 U | | µg/Kg |
| Dibromochloromethane | 1.0 U | | 1.0 U | | µg/Kg |
| 1,2-Dibromoethane | 1.0 U | | 1.0 U | | µg/Kg |
| Bromobenzene | 1.0 U | | 1.0 U | | µg/Kg |
| 1,1,1,2-Tetrachloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| Ethylbenzene | 1.0 U | | 1.0 U | | µg/Kg |
| m-Xylene & p-Xylene | 2.0 U | | 2.0 U | | µg/Kg |
| o-Xylene | 1.0 U | | 1.0 U | | µg/Kg |
| Styrene | 1.0 U | | 1.0 U | | µg/Kg |
| Bromoform | 1.0 U | | 1.0 U | | µg/Kg |
| Isopropylbenzene | 1.0 U | | 1.0 U | | µg/Kg |
| 1,1,1,2-Tetrachloroethane | 1.0 U | | 1.0 U | | µg/Kg |
| Bromobenzene | 1.0 U | | 1.0 U | | µg/Kg |
| 1,2,3-Trichlorobenzene | 1.0 U | | 1.0 U | | µg/Kg |
| n-Propylbenzene | 1.0 U | | 1.0 U | | µg/Kg |
| 2-Chlorotoluene | 1.0 U | | 1.0 U | | µg/Kg |
| 1,3,5-Trimethylbenzene | 1.0 U | | 1.0 U | | µg/Kg |
| 4-Chlorotoluene | 1.0 U | | 1.0 U | | µg/Kg |

RH 12/11/98

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 D = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3969
 DATE REPORTED: November 17, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

| | <u>KW02961</u> <i>Rev Qual</i> | <u>KW02962</u> <i>Rev Qual</i> | <u>Units</u> |
|-----------------------------|--------------------------------|--------------------------------|---------------|
| tert-Butylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2,4-Trimethylbenzene | 1.0 U | 1.0 U | µg/Kg |
| is-Butylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| p-Isopropyltoluene | 1.0 U | 1.0 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| n-Butylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2-Dibromo-3-chloropropane | 1.0 U | 1.0 U | µg/Kg |
| 1,2,4-Trichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| Hexachlorobutadiene | 1.0 U | 1.0 U | µg/Kg |
| Naphthalene | 2.0 | 1.0 | µg/Kg |
| 1,2,3-Trichloropropane | 1.0 U | 1.0 U | µg/Kg |
| Bromochloromethane | 1.0 U | 1.0 U | µg/Kg |
| Surrogate: | % RECOV | % RECOV | LIMITS |
| Dibromofluoromethane | 92 | 94 | 59-143 |
| D8-Toluene | 90 | 97 | 60-115 |
| Bromofluorobenzene | 75 | 92 | 55-144 |
| Date Analyzed | 11/06/98 | 11/06/98 | |

RH
12/11/98

Compound was analyzed for but not detected to the level shown.
 Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES
 REPORT # : JR3969
 DATE REPORTED: November 17, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

| | <u>KW02961</u> <i>Rev Qual</i> | <u>KW02962</u> <i>Rev Qual</i> | <u>Units</u> |
|----------------------------|--------------------------------|--------------------------------|--------------|
| Naphthalene | 410 U | 430 U | µg/Kg |
| 1-Methylnaphthalene | 410 U | 430 U | µg/Kg |
| 2-Methylnaphthalene | 410 U | 430 U | µg/Kg |
| Acenaphthylene | 410 U | 430 U | µg/Kg |
| Acenaphthene | 410 U | 430 U | µg/Kg |
| Fluorene | 410 U | 430 U | µg/Kg |
| Phenanthrene | 410 U | 430 U | µg/Kg |
| Anthracene | 410 U | 430 U | µg/Kg |
| Fluoranthene | 410 U | 430 U | µg/Kg |
| Pyrene | 410 U | 430 U | µg/Kg |
| Chrysene | 410 U | 430 U | µg/Kg |
| Benzo (a) anthracene | 410 U | 430 U | µg/Kg |
| Benzo (b) fluoranthene | 410 U | 430 U | µg/Kg |
| Benzo (k) fluoranthene | 410 U | 430 U | µg/Kg |
| Benzo (a) pyrene | 410 U | 430 U | µg/Kg |
| Indeno (1, 2, 3-cd) pyrene | 410 U | 430 U | µg/Kg |
| Dibenzo (a, h) anthracene | 410 U | 430 U | µg/Kg |
| Benzo (g, h, i) perylene | 410 U | 430 U | µg/Kg |

Surrogate:

| | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
|------------------|----------------|----------------|---------------|
| 2-Fluorobiphenyl | 73 | 66 | 14-146 |
| Date Extracted | 11/06/98 | 11/06/98 | |
| Date Analyzed | 11/06/98 | 11/06/98 | |

RH 12/11/98

U... Compound was analyzed for but not detected to the level shown.
 D... Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3969
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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02961</u> <i>Rw Anal</i> | <u>KW02962</u> <i>Rw Anal</i> | <u>Units</u> |
|-----------------------|-------------------------------|-------------------------------|---------------|
| Hydrocarbons (C8-C40) | 12 | 8.6 U | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | 81 | 53 | 51-148 |
| Date Extracted | 11/06/98 | 11/06/98 | |
| Date Analyzed | 11/09/98 | 11/09/98 | |

MISCELLANEOUS

| | <u>METHOD</u> | <u>KW02961</u> | <u>KW02962</u> | <u>Units</u> |
|----------------|---------------|----------------|----------------|--------------|
| Percent Solids | SM2540G | 81 | 77 | % |
| Date Analyzed | | 11/04/98 | 11/04/98 | |

RH
12/11/98

U: Compound was analyzed for but not detected to the level shown.
 D: Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3969
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RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

| | <u>KW02963</u> <i>Rev Qual</i> | <u>KW02965</u> <i>Rev Qual</i> | <u>Units</u> |
|-------------------------|--------------------------------|--------------------------------|--------------|
| Dichlorodifluoromethane | 3.0 U | 2.0 U | µg/Kg |
| Chloromethane | 1.0 U | 1.0 U | µg/Kg |
| Vinyl Chloride | 1.0 U | 1.0 U | µg/Kg |
| Bromomethane | 1.0 U | 1.0 U | µg/Kg |
| Chloroethane | 1.0 U | 1.0 U | µg/Kg |
| Trichlorofluoromethane | 1.0 U | 1.0 U | µg/Kg |
| 1,1-Dichloroethene | 1.0 U | 1.0 U | µg/Kg |
| Acetone | 27 U | 25 U | µg/Kg |
| Methylene Chloride | 26 U | 24 U | µg/Kg |
| t-1,2-Dichloroethene | 1.0 U | 1.0 U | µg/Kg |
| Methyl tert-butyl ether | 8.0 U | 8.0 U | µg/Kg |
| 1,1-Dichloroethane | 1.0 U | 1.0 U | µg/Kg |
| 2,2-Dichloropropane | 3.0 U | 2.0 U | µg/Kg |
| c-1,2-Dichloroethene | 1.0 U | 1.0 U | µg/Kg |
| 2-Butanone | 27 U | 25 U | µg/Kg |
| Chloroform | 1.0 U | 1.0 U | µg/Kg |
| 1,1,1-Trichloroethane | 1.0 U | 1.0 U | µg/Kg |
| Carbon tetrachloride | 1.0 U | 1.0 U | µg/Kg |
| 1,1-Dichloropropene | 1.0 U | 1.0 U | µg/Kg |
| Benzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2-Dichloroethane | 1.0 U | 1.0 U | µg/Kg |
| Trichloroethene | 1.0 U | 1.0 U | µg/Kg |
| 1,2-Dichloropropane | 1.0 U | 1.0 U | µg/Kg |
| Dibromomethane | 1.0 U | 1.0 U | µg/Kg |
| Bromodichloromethane | 1.0 U | 1.0 U | µg/Kg |

RH 12/11/98

U = Compound was analyzed for but not detected to the level shown.
 Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3969

DATE REPORTED: November 17, 1998

REFERENCE : 22567-326-MR

PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

| | <u>KW02963</u> <i>Rev Qual</i> | <u>KW02965</u> <i>Rev Qual</i> | <u>Units</u> |
|---------------------------|--------------------------------|--------------------------------|--------------|
| -Chloroethyl vinyl ether | 8.0 U | 8.0 U | µg/Kg |
| -1,3-Dichloropropene | 1.0 U | 1.0 U | µg/Kg |
| -Methyl-2-pentanone | 27 U | 25 U | µg/Kg |
| oluene | 1.0 U | 1.0 U | µg/Kg |
| -1,3-Dichloropropene | 1.0 U | 1.0 U | µg/Kg |
| ,1,2-Trichloroethane | 1.0 U | 1.0 U | µg/Kg |
| tetrachloroethene | 4.0 U | 5.0 I J | µg/Kg |
| ,3-Dichloropropane | 1.0 U | 1.0 U | µg/Kg |
| 2-Hexanone | 27 U | 25 U | µg/Kg |
| ibromochloromethane | 1.0 U | 1.0 U | µg/Kg |
| 2-Dibromoethane | 1.0 U | 1.0 U | µg/Kg |
| robenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,1,1,2-Tetrachloroethane | 1.0 U | 1.0 U | µg/Kg |
| Ethylbenzene | 1.0 U | 1.0 U | µg/Kg |
| n-Xylene & p-Xylene | 3.0 U | 2.0 U | µg/Kg |
| o-Xylene | 1.0 U | 1.0 U | µg/Kg |
| Styrene | 1.0 U | 1.0 U | µg/Kg |
| Bromoform | 1.0 U | 1.0 U | µg/Kg |
| Isopropylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,1,2,2-Tetrachloroethane | 1.0 U | 1.0 U | µg/Kg |
| Bromobenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2,3-Trichlorobenzene | 1.0 U | 7.3 | µg/Kg |
| n-Propylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 2-Chlorotoluene | 1.0 U | 1.0 U | µg/Kg |
| 1,3,5-Trimethylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 4-Chlorotoluene | 1.0 U | 1.0 U | µg/Kg |

RH 12/11/98

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3969
 DATE REPORTED: November 17, 1998
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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

| | <u>KW02963</u> <i>Rev Qual</i> | <u>KW02965</u> <i>Rev Qual</i> | <u>Units</u> |
|-----------------------------|--------------------------------|--------------------------------|---------------|
| tert-Butylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2,4-Trimethylbenzene | 1.0 U | 1.0 U | µg/Kg |
| s-Butylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| p-Isopropyltoluene | 1.0 U | 1.9 I J | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| n-Butylbenzene | 1.0 U | 2.2 I J | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2-Dibromo-3-chloropropane | 1.0 U | 1.0 U | µg/Kg |
| 1,2,4-Trichlorobenzene | 1.0 U | 3.2 | µg/Kg |
| Hexachlorobutadiene | 1.0 U | 1.0 U | µg/Kg |
| Naphthalene | 1.0 U | 2.0 | µg/Kg |
| 1,3-Trichloropropane | 1.0 U | 1.0 U | µg/Kg |
| Bromochloromethane | 1.0 U | 1.0 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Dibromofluoromethane | 91 | 91 | 59-143 |
| D8-Toluene | 93 | 88 | 60-115 |
| Bromofluorobenzene | 88 | 82 | 55-144 |
| Date Analyzed | 11/06/98 | 11/06/98 | |

*R4
12/11/98*

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 L = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

PA METHOD 8270 -

AH Compounds

| | <u>KW02963</u> | <i>Rev Qual</i> | <u>KW02965</u> | <i>Rev Qual</i> | <u>Units</u> |
|----------------------------|----------------|-----------------|----------------|-----------------|---------------|
| naphthalene | 450 | U | 420 | U | µg/Kg |
| -Methylnaphthalene | 450 | U | 420 | U | µg/Kg |
| -Methylnaphthalene | 450 | U | 420 | U | µg/Kg |
| acenaphthylene | 450 | U | 420 | U | µg/Kg |
| acenaphthene | 450 | U | 420 | U | µg/Kg |
| fluorene | 450 | U | 420 | U | µg/Kg |
| phenanthrene | 450 | U | 420 | U | µg/Kg |
| anthracene | 450 | U | 420 | U | µg/Kg |
| fluoranthene | 450 | U | 420 | U | µg/Kg |
| pyrene | 450 | U | 420 | U | µg/Kg |
| chrysene | 450 | U | 420 | U | µg/Kg |
| benzo (a) anthracene | 450 | U | 420 | U | µg/Kg |
| benzo (b) fluoranthene | 450 | U | 420 | U | µg/Kg |
| benzo (k) fluoranthene | 450 | U | 420 | U | µg/Kg |
| benzo (a) pyrene | 450 | U | 420 | U | µg/Kg |
| indeno (1, 2, 3-cd) pyrene | 450 | U | 420 | U | µg/Kg |
| dibenzo (a, h) anthracene | 450 | U | 420 | U | µg/Kg |
| benzo (g, h, i) perylene | 450 | U | 420 | U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | | <u>% RECOV</u> | | <u>LIMITS</u> |
| 2-Fluorobiphenyl | 69 | | 64 | | 14-146 |
| Date Extracted | 11/06/98 | | 11/06/98 | | |
| Date Analyzed | 11/06/98 | | 11/09/98 | | |

U. Compound was analyzed for but not detected to the level shown.
 D. Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02963</u> <i>Rev Qual</i> | <u>KW02965</u> <i>Rev Qual</i> | <u>Units</u> |
|-----------------------|--------------------------------|--------------------------------|---------------|
| Hydrocarbons (C8-C40) | 8.9 U | 470 | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | 56 | 72 | 51-148 |
| Date Extracted | 11/06/98 | 11/06/98 | |
| Date Analyzed | 11/09/98 | 11/09/98 | |

MISCELLANEOUS

| | <u>METHOD</u> | <u>KW02963</u> | <u>KW02965</u> | <u>Units</u> |
|----------------|---------------|----------------|----------------|--------------|
| Percent Solids | SM2540G | 74 | 79 | % |
| Date Analyzed | | 11/04/98 | 11/04/98 | |

RU
12/11/98

Compound was analyzed for but not detected to the level shown.
 U = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

| | KW02964 | Rev | Qual | KW02966 | Rev | Qual | Units |
|-------------------------|---------|-----|------|---------|-----|------|-------|
| Dichlorodifluoromethane | 2.0 | | U | 2.0 | | U | µg/Kg |
| Chloromethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Vinyl Chloride | 1.0 | | U | 1.0 | | U | µg/Kg |
| Bromomethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Chloroethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Trichlorofluoromethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| 1,1-Dichloroethene | 1.0 | | U | 1.0 | | U | µg/Kg |
| Acetone | 25 | | U | 24 | | U | µg/Kg |
| Methylene Chloride | 25 | | U | 25 | | U | µg/Kg |
| t-1,2-Dichloroethene | 1.0 | | U | 1.0 | | U | µg/Kg |
| Methyl tert-butyl ether | 7.0 | | U | 7.0 | | U | µg/Kg |
| Dichloroethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| 2,2-Dichloropropane | 2.0 | | U | 2.0 | | U | µg/Kg |
| c-1,2-Dichloroethene | 1.0 | | U | 1.0 | | U | µg/Kg |
| 2-Butanone | 25 | | U | 24 | | U | µg/Kg |
| Chloroform | 1.0 | | U | 1.0 | | U | µg/Kg |
| 1,1,1-Trichloroethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Carbon tetrachloride | 1.0 | | U | 1.0 | | U | µg/Kg |
| 1,1-Dichloropropene | 1.0 | | U | 1.0 | | U | µg/Kg |
| Benzene | 1.0 | | U | 1.0 | | U | µg/Kg |
| 1,2-Dichloroethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Trichloroethene | 1.0 | | U | 1.0 | | U | µg/Kg |
| 1,2-Dichloropropane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Dibromomethane | 1.0 | | U | 1.0 | | U | µg/Kg |
| Bromodichloromethane | 1.0 | | U | 1.0 | | U | µg/Kg |

R4
12/11/98

Compound was analyzed for but not detected to the level shown.
Dw = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

| | <u>KW02964</u> | <i>Rev Qual</i> | <u>KW02966</u> | <i>Rev Qual</i> | Units |
|---------------------------|----------------|-----------------|----------------|-----------------|-------|
| 2-Chloroethyl vinyl ether | 7.0 | U | 7.0 | U | µg/Kg |
| c-1,3-Dichloropropene | 1.0 | U | 1.0 | U | µg/Kg |
| 4-Methyl-2-pentanone | 25 | U | 24 | U | µg/Kg |
| Toluene | 1.6 | I | 1.0 | U | µg/Kg |
| t-1,3-Dichloropropene | 1.0 | U | 1.0 | U | µg/Kg |
| 1,1,2-Trichloroethane | 1.0 | U | 1.0 | U | µg/Kg |
| Tetrachloroethene | 4.0 | U | 6.0 | I | µg/Kg |
| 1,3-Dichloropropane | 1.0 | U | 1.0 | U | µg/Kg |
| 2-Hexanone | 25 | U | 24 | U | µg/Kg |
| Dibromochloromethane | 1.0 | U | 1.0 | U | µg/Kg |
| 1,1-Dibromoethane | 1.0 | U | 1.0 | U | µg/Kg |
| Chlorobenzene | 1.0 | U | 1.0 | U | µg/Kg |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 1.0 | U | µg/Kg |
| Ethylbenzene | 6.7 | | 1.0 | U | µg/Kg |
| m-Xylene & p-Xylene | 5.1 | | 2.0 | U | µg/Kg |
| o-Xylene | 4.0 | | 1.0 | U | µg/Kg |
| Styrene | 1.0 | U | 1.0 | U | µg/Kg |
| Bromoform | 1.0 | U | 1.0 | U | µg/Kg |
| Isopropylbenzene | 3.2 | I | 1.0 | U | µg/Kg |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 1.0 | U | µg/Kg |
| Bromobenzene | 1.0 | U | 1.0 | U | µg/Kg |
| 1,2,3-Trichlorobenzene | 1.0 | U | 1.0 | U | µg/Kg |
| n-Propylbenzene | 15 | | 1.0 | U | µg/Kg |
| 2-Chlorotoluene | 1.0 | U | 1.0 | U | µg/Kg |
| 1,3,5-Trimethylbenzene | 3.2 | | 1.0 | U | µg/Kg |
| 4-Chlorotoluene | 1.0 | U | 1.0 | U | µg/Kg |

R4 12/11/98

U = Compound was analyzed for but not detected to the level shown.
 I - Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

| | <u>KW02964</u> <i>Rev Qual</i> | <u>KW02966</u> <i>Rev Qual</i> | <u>Units</u> |
|-----------------------------|--------------------------------|--------------------------------|---------------|
| tert-Butylbenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2,4-Trimethylbenzene | 6.9 | 1.0 U | µg/Kg |
| n-Butylbenzene | 4.4 | 1.0 U | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| p-Isopropyltoluene | 3.4 | 1.0 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| n-Butylbenzene | 17 | 1.0 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| 1,2-Dibromo-3-chloropropane | 1.0 U | 1.0 U | µg/Kg |
| 1,2,4-Trichlorobenzene | 1.0 U | 1.0 U | µg/Kg |
| Hexachlorobutadiene | 1.0 U | 1.0 U | µg/Kg |
| Nonachalene | 6.0 | 1.0 U | µg/Kg |
| 1,2,3-Trichloropropane | 1.0 U | 1.0 U | µg/Kg |
| Bromochloromethane | 1.0 U | 1.0 U | µg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Dibromofluoromethane | 86 | 90 | 59-143 |
| D8-Toluene | 87 | 95 | 60-115 |
| Bromofluorobenzene | 76 | 88 | 55-144 |
| Date Analyzed | 11/06/98 | 11/06/98 | |

*RH
12/11/98*

U = Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

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RESULTS OF ANALYSIS

PA METHOD 8270 -

AH Compounds

| | <u>KW02964</u> | <i>Rev Qual</i> | <u>KW02966</u> | <i>Rev Qual</i> | <u>Units</u> |
|------------------------|----------------|-----------------|----------------|-----------------|--------------|
| aphthalene | 2000 | U | 390 | U | µg/Kg |
| -Methylnaphthalene | 2000 | U | 390 | U | µg/Kg |
| -Methylnaphthalene | 2000 | U | 390 | U | µg/Kg |
| acenaphthylene | 2000 | U | 390 | U | µg/Kg |
| acenaphthene | 2000 | U | 390 | U | µg/Kg |
| fluorene | 2000 | U | 390 | U | µg/Kg |
| phenanthrene | 2000 | U | 390 | U | µg/Kg |
| anthracene | 2000 | U | 390 | U | µg/Kg |
| fluoranthene | 2000 | U | 390 | U | µg/Kg |
| pyrene | 2000 | U | 390 | U | µg/Kg |
| fluorene | 2000 | U | 390 | U | µg/Kg |
| benzo(a)anthracene | 2000 | U | 390 | U | µg/Kg |
| benzo(b)fluoranthene | 2000 | U | 390 | U | µg/Kg |
| benzo(k)fluoranthene | 2000 | U | 390 | U | µg/Kg |
| benzo(a)pyrene | 2000 | U | 390 | U | µg/Kg |
| indeno(1,2,3-cd)pyrene | 2000 | U | 390 | U | µg/Kg |
| dibenzo(a,h)anthracene | 2000 | U | 390 | U | µg/Kg |
| benzo(g,h,i)perylene | 2000 | U | 390 | U | µg/Kg |

Surrogate:

| | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
|------------------|----------------|----------------|---------------|
| 2-Fluorobiphenyl | 79 | 83 | 14-146 |
| Date Extracted | 11/06/98 | 11/06/98 | |
| Date Analyzed | 11/09/98 | 11/06/98 | |

U = Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.

ENCO LABORATORIES

REPORT # : JR3969
 DATE REPORTED: November 17, 1998
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 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

L METHOD FLPRO -
ETROL. RESIDUAL ORG.

| | <u>KW02964</u> | <i>Rev Qual</i> | <u>KW02966</u> | <i>Rev Qual</i> | <u>Units</u> |
|-----------------------|----------------|-----------------|----------------|-----------------|---------------|
| hydrocarbons (C8-C40) | 800 | D1 J | 20 | | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | | <u>% RECOV</u> | | <u>LIMITS</u> |
| -Terphenyl | * | | 84 | | 51-148 |
| Date Extracted | 11/06/98 | | 11/06/98 | | |
| Date Analyzed | 11/09/98 | | 11/09/98 | | |

MISCELLANEOUS

| | <u>METHOD</u> | <u>KW02964</u> | <u>KW02966</u> | <u>Units</u> |
|----------------|---------------|----------------|----------------|--------------|
| Percent Solids | SM2540G | 81 | 84 | % |
| Date Analyzed | | 11/04/98 | 11/04/98 | |

RU
12/11/98

* = Surrogate recovery unavailable due to matrix interference.
 J = Compound was analyzed for but not detected to the level shown.
 D1 = Analysis is reported on a "dry weight" basis.
 D1 = Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES

REPORT # : JR3969
 DATE REPORTED: November 17, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8021 -
 VOLATILE ORGANICS

| | <u>KW02967</u> <i>Rev Qual</i> | <u>LAB BLANK</u> | <u>Units</u> |
|-------------------------|--------------------------------|------------------|---------------|
| Methyl tert-butyl ether | 2.0 U | 2.0 U | µg/L |
| Benzene | 1.0 U | 1.0 U | µg/L |
| Toluene | 1.0 U | 1.0 U | µg/L |
| Chlorobenzene | 1.0 U | 1.0 U | µg/L |
| Ethylbenzene | 1.0 U | 1.0 U | µg/L |
| n-Xylene & p-Xylene | 1.0 U | 1.0 U | µg/L |
| o-Xylene | 1.0 U | 1.0 U | µg/L |
| 1,3-Dichlorobenzene | 1.0 U | 1.0 U | µg/L |
| 1,4-Dichlorobenzene | 1.0 U | 1.0 U | µg/L |
| 1,2-Dichlorobenzene | 1.0 U | 1.0 U | µg/L |
| <u>Spike:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| Bromofluorobenzene | 101 | 104 | 65-129 |
| Date Analyzed | 11/10/98 | 11/10/98 | |

*24
12/11/98*

U - Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR3969
 DATE REPORTED: November 17, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

EPA METHOD 8270 -

PAH Compounds

| | <u>KW02967</u> | <u>LAB BLANK</u> | <u>Units</u> |
|------------------------|----------------|------------------|--------------|
| Naphthalene | 10 U | 10 U | µg/L |
| 2-Methylnaphthalene | 10 U | 10 U | µg/L |
| 1-Methylnaphthalene | 10 U | 10 U | µg/L |
| Acenaphthylene | 10 U | 10 U | µg/L |
| Acenaphthene | 10 U | 10 U | µg/L |
| Fluorene | 10 U | 10 U | µg/L |
| Phenanthrene | 10 U | 10 U | µg/L |
| Anthracene | 10 U | 10 U | µg/L |
| Fluoranthene | 10 U | 10 U | µg/L |
| Pyrene | 10 U | 10 U | µg/L |
| Chrysene | 10 U | 10 U | µg/L |
| Benzo(a)anthracene | 10 U | 10 U | µg/L |
| Benzo(b)fluoranthene | 10 U | 10 U | µg/L |
| Benzo(k)fluoranthene | 10 U | 10 U | µg/L |
| Benzo(a)pyrene | 10 U | 10 U | µg/L |
| Indeno(1,2,3-cd)pyrene | 10 U | 10 U | µg/L |
| Dibenzo(a,h)anthracene | 10 U | 10 U | µg/L |
| Benzo(g,h,i)perylene | 10 U | 10 U | µg/L |

*RH
12/14/98*

Surrogate:

| | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
|------------------|----------------|----------------|---------------|
| 2-Fluorobiphenyl | 76 | 64 | 14-146 |
| Date Extracted | 11/12/98 | 11/12/98 | |
| Date Analyzed | 11/16/98 | 11/16/98 | |

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
 REPORT # : JR3969
 DATE REPORTED: November 17, 1998
 REFERENCE : 22567-326-MR
 PROJECT NAME : Boca Chica Flying Club

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RESULTS OF ANALYSIS

FL METHOD FLPRO -
 PETROL. RESIDUAL ORG.

| | <u>KW02967</u> | <u>LAB BLANK</u> | <u>Units</u> |
|-----------------------|----------------|------------------|---------------|
| Hydrocarbons (C8-C40) | 0.20 U | 0.20 U | mg/L |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | 65 | 60 | 65-140 |
| Date Extracted | 11/11/98 | 11/11/98 | |
| Date Analyzed | 11/12/98 | 11/12/98 | |

*24
12/14/98*

FL METHOD FLPRO -
 PETROL. RESIDUAL ORG.

| | <u>LAB BLANK</u> | <u>Units</u> |
|-----------------------|------------------|---------------|
| Hydrocarbons (C8-C40) | 6.6 U | mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | 79 | 51-148 |
| Date Extracted | 11/06/98 | |
| Date Analyzed | 11/08/98 | |

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR4051
 DATE REPORTED: November 16, 1998
 REFERENCE : 22567
 PROJECT NAME : Boca Chica Flying Club

PAGE 2 OF 8

RESULTS OF ANALYSIS

EPA METHOD 8021 -
VOLATILE ORGANICS

| | <u>KW02968</u> | <u>KW02969</u> | <u>Units</u> |
|-------------------------|----------------|----------------|--------------|
| Methyl tert-butyl ether | 2.0 U D1 | 2.0 U | µg/Kg |
| Benzene | 1.3 U D1 | 1.0 U | µg/Kg |
| Toluene | 1.3 U D1 UJ | 1.0 U UJ | µg/Kg |
| Chlorobenzene | 1.3 U D1 | 1.0 U | µg/Kg |
| Ethylbenzene | 1.3 U D1 UJ | 1.0 U UJ | µg/Kg |
| m-Xylene & p Xylene | 2.0 U D1 | 2.0 U | µg/Kg |
| o-Xylene | 1.0 U D1 UJ | 1.0 U UJ | µg/Kg |
| 1,3-Dichlorobenzene | 1.0 U D1 | 1.0 U | µg/Kg |
| 1,4-Dichlorobenzene | 1.0 U D1 | 1.0 U | µg/Kg |
| 1,2-Dichlorobenzene | 1.0 U D1 | 1.0 U | µg/Kg |

| <u> surrogate:</u> | <u>% RECOV</u> | <u>% RECOV</u> | <u>LIMITS</u> |
|--------------------|----------------|----------------|---------------|
| Bromofluorobenzene | 63 | 75 | 40-170 |
| Date Analyzed | 11/14/98 | 11/14/98 | |

RH 12/11/98

U = Compound was analyzed for but not detected to the level shown.
 DW = Analysis is reported on a "dry weight" basis.
 - Analyte value determined from a 1:1.11 dilution.

ENCO LABORATORIES

REPORT # : JR4051
DATE REPORTED: November 16, 1998
REFERENCE : 22567
PROJECT NAME : Boca Chica Flying Club

RESULTS OF ANALYSIS

FL METHOD FLPRO -
PETROL. RESIDUAL ORG.

| | <u>KW02968</u> | | <u>KW02969</u> | <u>Units</u> |
|-----------------------|----------------|---|----------------|---------------|
| Hydrocarbons (C8-C40) | 1100 | J | 760 | J mg/Kg |
| <u>Surrogate:</u> | <u>% RECOV</u> | | <u>% RECOV</u> | <u>LIMITS</u> |
| o-Terphenyl | * | | * | 51-148 |
| Date Extracted | 11/12/98 | | 11/12/98 | |
| Date Analyzed | 11/16/98 | | 11/16/98 | |

*KH
12/4/98*

* = Surrogate recovery unavailable due to matrix interference.
J = Compound was analyzed for but not detected to the level shown.
J = Analysis is reported on a "dry weight" basis.



| GEOLOGIC DRILL LOG | | | | PROJECT | | JOB NO. | SHEET NO. | HOLE NO. | | |
|---------------------------|----------------------|-----------------------|----------------------------------|----------------------|---------------|------------------------|------------|---|--|---|
| | | | | NAVYRAC-NAS Key West | | 22567 | 1 OF 1 | MW-6 | | |
| SITE | | | COORDINATES | | | ANGLE FROM HORIZ | | BEARING | | |
| Boca Chica Flying Club | | | | | | Vertical | | ----- | | |
| BEGUN | COMPLETED | DRILLER | DRILL MAKE AND MODEL | | SIZE | OVERBURDEN | ROCK (FT.) | TOTAL DEPTH | | |
| 11-16-98 | 11-16-98 | Precision Drilling | CME-75 | | 8" | 16.5 | 0.0 | 16.5 | | |
| CORE RECOVERY (FT./%) | | CORE BOXES | SAMPLES | EL. TOP CASING | GROUND EL. | DEPTH/EL. GROUND WATER | | DEPTH/EL. TOP OF ROCK | | |
| / | | | | | | // | | / | | |
| SAMPLE HAMMER WEIGHT/FALL | | | CASING LEFT IN HOLE: DIA./LENGTH | | | LOGGED BY: | | | | |
| | | | 2"/15.5' | | | N. Ring | | | | |
| SAMP. TYPE AND DIAM. | SAMP. ADV. LEN. CORE | SAMPLE REC. CORE REC. | SAMPL. "N" CORE RECOVERY | WATER PRESSURE TESTS | | ELEV. | DEPTH | GRAPHICS SAMPLE | DESCRIPTION AND CLASSIFICATION | NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC. |
| | | | | LOSS IN G.P.M. | PRESS. P.S.I. | | | | | |
| | | | | | | | | 0 | 0 to 5 ft SAND with GRAVEL, pale red (10R6/2) to pale yellowish brown (10YR6/2), moist, medium-grained, well graded, fill-treated material. 0 to 2 ft pale red (10R6/2) 2 to 4 ft light brownish gray (5YR6/1) | Drilling from 0 to 16.5 ft with hollow stem auger with bottom plug. |
| | | | | | | | 5 | 4 to 5 ft pale yellowish brown (10YR6/2) | | |
| | | | | | | | 10 | 5 to 16.5 ft SILTY SAND AND GRAVEL, medium light gray (N6) to very light gray (N8), moist to wet, medium-grained sand, light petroleum odor. 5 to 12 ft medium light gray (N6) | | |
| | | | | | | | 15 | 10 ft wet 12 to 16.5 ft very light gray (N8) | | |
| | | | | | | | | | Bottom of borehole at 16.5 ft. Borehole completed as a monitoring well screened from 5.5 to 15.5 ft. | |

SS = SPLIT SPOON; ST = SHELBY TUBE; SITE
 D = DENNISON; P = PITCHER; O = OTHER

Boca Chica Flying Club

HOLE NO. **MW-6**



MONITORING WELL

PROJECT

NAVYRAC-NAS Key West

WELL NO.

MW-6

JOB NO.

SITE

COORDINATES

22567

Boca Chica Flying Club

BEGUN

COMPLETED

PREPARED BY

REFERENCE POINT FOR MEASUREMENTS

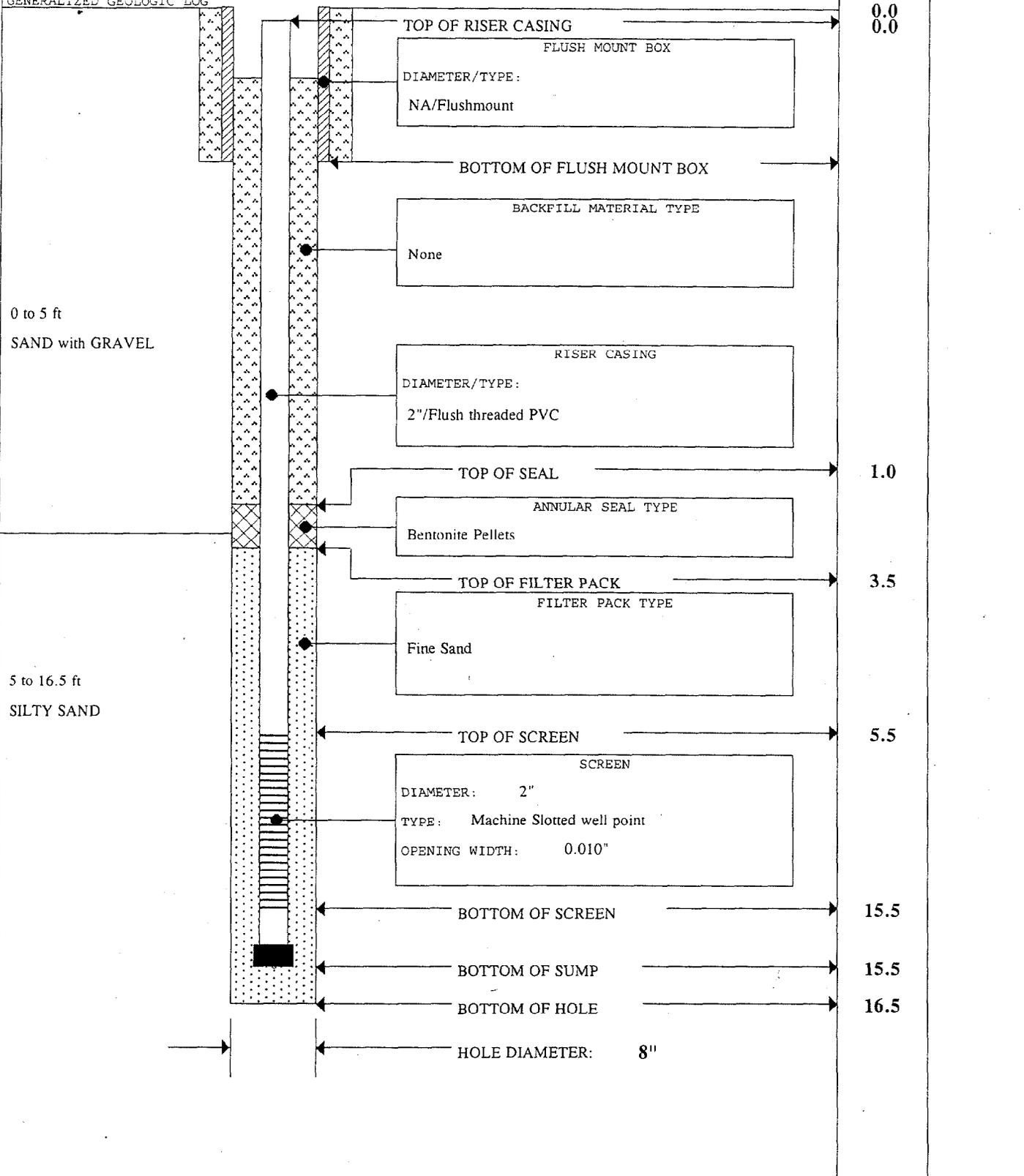
11/16/98

11/16/98

N. Ring

Top of PVC casing

GENERALIZED GEOLOGIC LOG





| | | | | | | | | | | | |
|--|----------------------|----------------------------------|-----------------------------------|----------------------|------------------------|-----------------------|-------------|----------|--------|---|---|
| GEOLOGIC DRILL LOG | | | | PROJECT | JOB NO. | SHEET NO. | HOLE NO. | | | | |
| | | | | NAVYRAC-NAS Key West | 22567 | 1 OF 1 | MW-21 | | | | |
| SITE | | | COORDINATES | | | ANGLE FROM HORIZ | BEARING | | | | |
| Boca Chica Flying Club | | | | | | Vertical | ----- | | | | |
| BEGUN | COMPLETED | DRILLER | DRILL MAKE AND MODEL | SIZE | OVERBURDEN | ROCK (FT.) | TOTAL DEPTH | | | | |
| 11-16-98 | 11-16-98 | Precision Drilling | CME-75 | 8" | 16.0 | 0.0 | 16.0 | | | | |
| CORE RECOVERY (FT./%) | CORE BOXES | SAMPLES | EL. TOP CASING | GROUND EL. | DEPTH/EL. GROUND WATER | DEPTH/EL. TOP OF ROCK | | | | | |
| / | | | | | V / | / | | | | | |
| SAMPLE HAMMER WEIGHT/FALL | | CASING LEFT IN HOLE: DIA./LENGTH | | | LOGGED BY: | | | | | | |
| | | 2"/15.5' | | | N. Ring | | | | | | |
| SAMP. TYPE AND DIAM. | SAMP. ADV. LEN. CORE | SAMPLE REC. CORE REC. | SAMPLE BLONS 1/4" % CORE RECOVERY | LOSS IN G.P.M. | WATER PRESSURE TESTS | ELEV. | DEPTH | GRAPHICS | SAMPLE | DESCRIPTION AND CLASSIFICATION | NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC. |
| | | | | | | | | | | <p>0 to 5 ft SAND with GRAVEL, pale red (10R6/2) to pale yellowish brown (10YR6/2), moist, medium-grained, well sorted, fill-treated material.</p> <p>0 to 2 ft pale red (10R6/2)</p> <p>2 to 4 ft light brownish gray (5YR6/1)</p> <p>4 to 5 ft pale yellowish brown (10YR6/2)</p> <p>5 to 10 ft SILTY SAND, pale yellowish brown (10YR6/2), moist to wet, well graded, medium-grained, some coarse gravel.</p> <p>10 to 16 ft SILTY SAND, very light gray (N8) to white (N9), wet, well graded, medium-grained.</p> <p>Bottom of borehole at 16.0 ft. Borehole completed as a monitoring well screened from 5.5 to 15.5 ft.</p> | Drilling from 0 to 16.0 ft with hollow stem auger with bottom plug. |
| SS = SPLIT SPOON; ST = SHELBY TUBE; D = DENNISON; P = PITCHER; O = OTHER | | | | | | | | | | | |
| SITE Boca Chica Flying Club | | | | | | | | | | HOLE NO. MW-21 | |



MONITORING WELL

PROJECT

NAVYRAC-NAS Key West

WELL NO.

MW-21

JOB NO.

SITE

COORDINATES

22567

Boca Chica Flying Club

BEGUN

COMPLETED

PREPARED BY

REFERENCE POINT FOR MEASUREMENTS

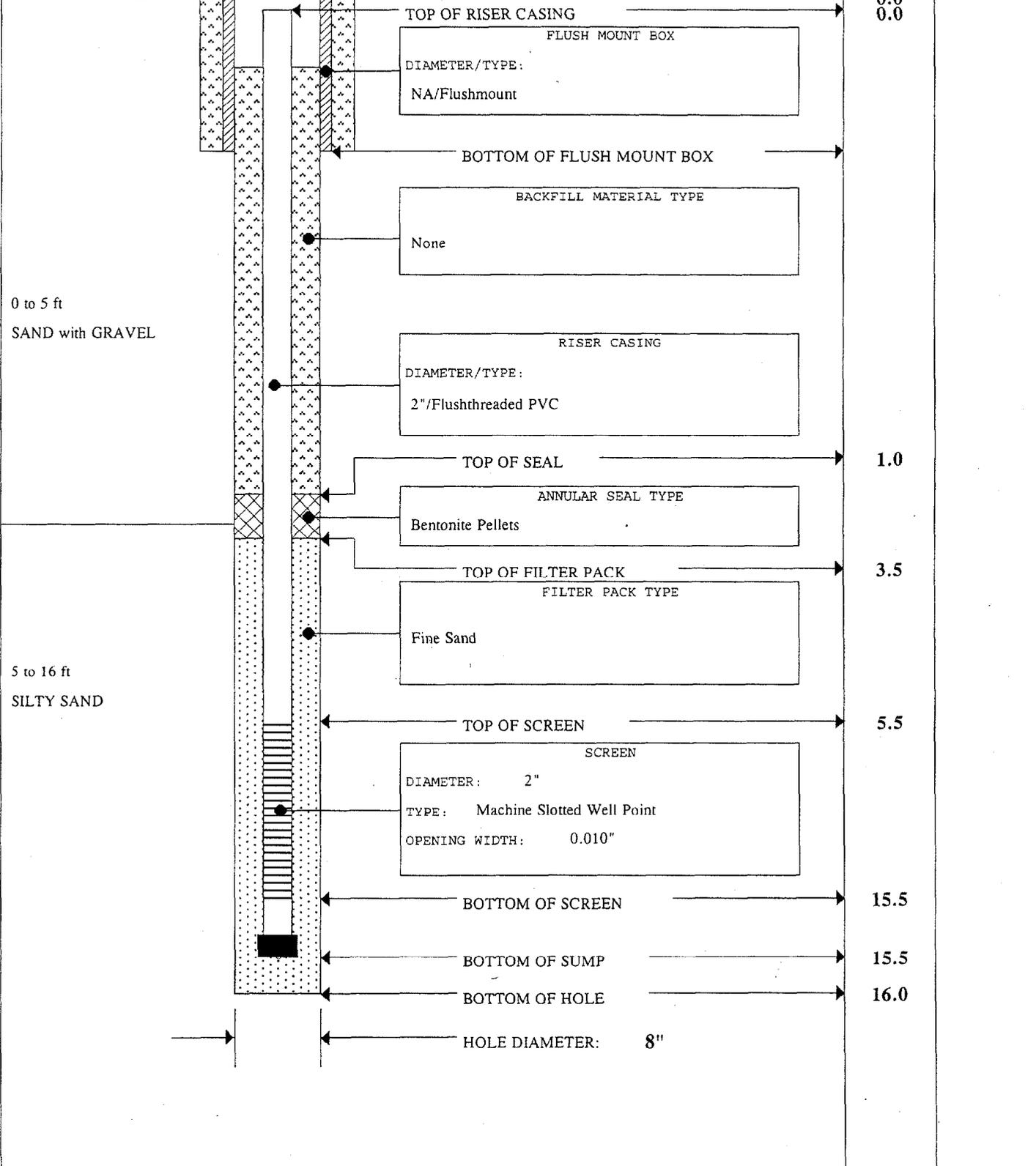
11/16/98

11/16/98

N. Ring

Top of PVC casing

GENERALIZED GEOLOGIC LOG



NAS Key West

Naval Facilities Engineering Command, Southern Division

At Naval Air Station (NAS) Key West, Florida, a Remedial Action has been completed at the Flying Club Site on Boca Chica. This Remedial Action is part of the Navy's Petroleum/UST program. An innovative technology, the Ion Collider Process, was used to treat petroleum-contaminated soils at this site.

Description of the Problem

The Flying Club site is adjacent to the Taxiway "H" at the Boca Chica airfield. The Boca Chica Flying Club was in operation until the late 1960s. The Flying Club had 4 ASTs that were removed in 1992. The site was also a motor pool refueling point. The motor pool had USTs that have been removed. Past practices and possibly leaks from these tank systems were the suspected causes of petroleum contamination at this site.

How the Problem was Addressed

The contaminated soils from each of the four contaminated areas were excavated and stockpiled.

The contaminated soils were treated with the Ion Collider Technology. The soils were run through a series of conveyors

and sprayed with mixture of ionized water and potassium permanganate (KMNO₄).

The treated soils were stockpiled and tested after a 48 hour waiting period.

Once the confirmation sampling results indicated that the contaminated soils met the cleanup goals, the soils were placed back into the excavation. The results from confirmation samples indicated that all the soils excavated and treated at the Flying Club site met the required cleanup goals.

After the excavations were filled, the disturbed areas were paved or seeded.

Pilot Study

The Flying Club site was used as a pilot study to test the Ion Collider Technology on

contaminated soils from Trumbo Point Fuel Farm. Two truckloads (47 cubic yards) of Bunker C contaminated soil were transported to the Flying Club for treatment.

The Ion Collider Technology was able to reduce the levels of total petroleum in these soils by 75%.

Saving Realized

The remedial action plan included the abandonment and replacement of six monitoring wells. Actually, only one well was replaced saving \$6,000.

The depth of the excavation was reduced from 6 feet to the top of the water table saving \$16,500.

Field screening methods were used to segregate clean from contaminated soils during excavation activities saving \$15,400.

Use of reduced air fares and the BOQ Facilities saving more than \$4,000.



Participants (Bechtel Environmental, Inc.; Florida Department of Environmental Protection; Harding, Lawson and Associates; Naval Facilities Engineering Command, Southern Division)

