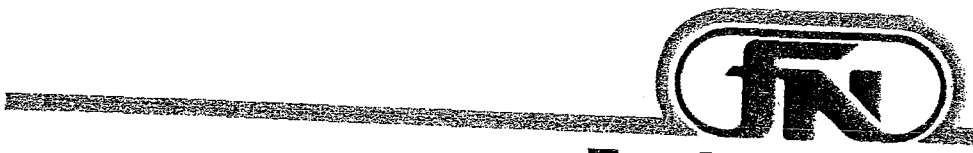

Fenley & Nicol Environmental Inc.

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445 Brook Avenue, Deer Park, NY 11729 (631) 586-4900 • NYC (718) 204-4993 FAX (631) 586-4920

Spill Investigation Report
NYSDEC Spill # 02-08119
129-01 Jamaica Avenue
Richmond Hill, New York

Prepared For	Mr. Luis Zarate Uniforms for Industry 129-01 Jamaica Avenue Richmond Hill, NY
Prepared By	Fenley & Nicol Environmental 445 Brook Avenue Deer Park, New York 11729
Date	March 18, 2003
Job #	0211007

TABLE OF CONTENTS

Fenley & Nicol Environmental Inc®

1.0 INTRODUCTION

Fenley & Nicol Environmental (F&N) has been retained by Mr. Luis Zarate of Uniforms for Industry (UFI) to sample and investigate a specific subsurface area at the property known as 129-01 Jamaica Avenue in Richmond Hill (herein after referred as "the site"). This report summarizes the field activities and laboratory results for the western portion of the site.

Figure 1 Provides a Site Plan

1.1 Site Description

The western portion of the site, where the described activities took place, consists of an asphalt driveway and concrete parking area. A building is present on the central and northern portions of the site. Jamaica Avenue, which runs east/west, is located to the south of the site. Railroad tracks are located to the east and adjacent to the subject site. Depth to water in this area is approximately 50 feet.

1.2 Regional Geology and Hydrogeologic Characteristics

The site is located in the central portion of Queens County on western Long Island. The site ground surface is generally flat, with an average on-site surface elevation of approximately 60 feet above mean sea level (U.S.G.S. Jamaica, NY Quadrangle, 1979). The regional groundwater flow, as determined by the USGS, is to the south-southeast.

Long Island consists of a wedge-shaped mass of unconsolidated deposits, which overlie ancient basement rock. The thickness of these deposits ranges from approximately 100 feet on the Island's north shore, to approximately 2,000 feet in some portions of the south shore.

The major landforms of Long Island of importance to the hydrologic system are the moraines and outwash plains, which originated from glacial activity. The moraines, which represent the farthest extent of the glacial advances, consist of till, a poorly sorted mixture of sand, silt, clay, gravel, and boulders. The till deposits are poorly to moderately permeable in most areas. The outwash plains lie to the south of the moraines. The plains were formed by the action of meltwater streams, which eroded the headland material of the moraines, and laid down deposits of well-sorted sands, silts, and gravels. These deposits are moderately too highly permeable.

On-site lithology consists of Recent, Pleistocene, and Upper Cretaceous glacial deposits. The uppermost hydrogeologic unit is termed the Upper Glacial Aquifer. This aquifer encompasses the moraine and outwash deposits, in addition to some localized lacustrine, marine and reworked materials. The outwash plain portion of this unit is characterized by high horizontal hydraulic conductivity, however vertical hydraulic conductivity tends to be considerably less. Because the water table is located in the Upper Glacial deposits, this aquifer has been subjected to the degradation of water quality in many areas due to industrial activity.

Below the Upper Glacial aquifer lies the Raritan Formation. This formation consists of an upper unit and a lower unit. The upper unit, the Raritan Confining Unit, consists of layers of solid to silty clays with few lenses and layers of sands. The deposits are typically poorly to very poorly permeable.

2.0 FIELDWORK PERFORMED

A concrete sump/pit, located adjacent to the main building on the site, contains a portion of the tank piping that runs from the tanks located beneath the western parking area, into the building. At some point, product was found to be present in this pit. A tank tightness test was performed, and it was determined that the lines, not the tanks were the source of the problem. F&N was retained to replace the lines from the two (2) tanks. One tank is utilized for storage of heating oil; the second is used for mop oil storage. The NYSDEC was notified of the product release, spill # 0208119 was issued and Mr. Jeffrey Vought was assigned as the NYSDEC Spill Case Manager.

Upon commencement of excavation/trenching activities associated with the line replacement, impacted soils were discovered. The source of impact was not known at the time of discovery, based on the properties identified in the field. Excavation activities continued in an attempt to remove all impacted soil.

The final excavation was irregular in shape, with a maximum depth of approximately 20 feet below grade. The soil in the excavation included sand, cobbles and old household/commercial debris. A total of 134.53 tons of soil was removed.

Appendix A provides copies of the waste manifests

A sediment sample was obtained from the bottom of the excavation. The sample consisted of medium grained tan/brown sand. A slight sweet odor was detected. The sample was obtained utilizing the bucket of the excavator.

Following the collection of the soil sample, it was placed in the proper container and transported to Long Island Analytical Labs, Inc. (Holbrook, NY). The sample was designated EX 201. The sample was analyzed for Volatile

Organic Compounds (VOCs) according to EPA Method 8021 and Semi Volatile Organic Compounds (SVOCs) by EPA Method 8270.

3.0 DISCUSSION OF RESULTS

Tables 1 and 2 tabulate the analytical results of the soil sample obtained from the excavation. The results of the analyses were compared to the NYSDEC TAGM 4046 Soil Cleanup Objectives.

The results of the Analysis for Volatile Organic Compounds (VOCs) are provided as Table 1 (all compounds analyzed by this method and found to be non-detect are excluded from this table). A review of Table 1 indicates that, of the 61 compounds analyzed, nine (9) compounds were present at detectable concentrations. These compounds include sec-Butylbenzene, Isopropylbenzene, p-Isopropyltoluene, Naphthalene, n-Propylbenzene, Trimethylbenzenes and Xylenes. None of the detected compounds exceeded the Cleanup Objective.

Table 1
Results of Excavation Sample, EPA Method 8021
129-01 Jamaica Avenue, Richmond Hill, NY

Compound	*Sample*	*CLEANUP OBJECTIVE*
Sec-Butylbenzene	24	NS
Isopropylbenzene	13	2,600
p-Isopropyltoluene	13	3,900
Naphthalene	17	10,000
n-Propylbenzene	9	300
1,3,5-Trimethylbenzene	32	2,600
1,2,4-Trimethylbenzene	90	2,400
o-xylene	29	1,200
M,p-xylene	29	2,400

All clean up criteria are from Appendix A of NYSDEC TAGM #4046
All concentrations are in Microgram per Kilogram or ppb NS no standard

The results of the Analysis for Semi-Volatile Organic Compounds (SVOCs) are provided as Table 2 (all compounds analyzed by this method and found to be non-detect are excluded from this table). A review of Table 2 indicates that the excavation sample did not contain any compounds at levels above the recommended soil cleanup objectives.

Table 2

Results of Excavation Sample Analysis, EPA Method 8270
129-01 Jamaica Avenue, Richmond Hill, NY

Compound	*Sample*	*CLEANUP OBJECTIVE*
Naphthalene	135	13,000
2-Methylnaphthalene	620	36,400
Di-n-Butylphthalate	291	8,100
Flouranthene	232	1,900,000
Pyrene	207	665,000
Butylbenzylphthalate	500	122,000
Benzo-a-anthracene	102	3,000
Chrysene	164	400
Bis(2-Ethylexyl)phtalate	2,413	435,000
Benzo-b-Flouroanthene	148	1,100
Benzo-k-Flouroanthene	123	1,100
Benzo-a-Pyrene	143	11,000
Indeno(1,2,3-c,d)Pyrene	92	3,200
Benzo-g,h,I-Perylene	78	800,000

All clean up criteria are from Appendix A of NYSDEC TAGM #4046
All concentrations are in Microgram per Kilogram or ppb

Copies of the Laboratory Results are provided in Appendix B

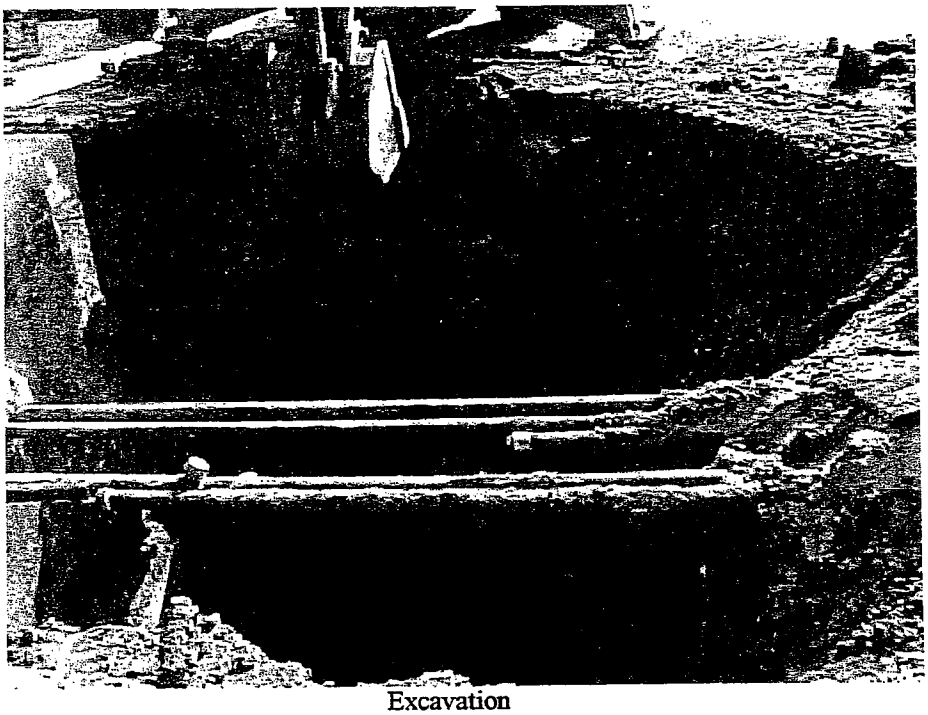
4.0 CONCLUSIONS

Based on the work performed, F&N provides the following conclusions:

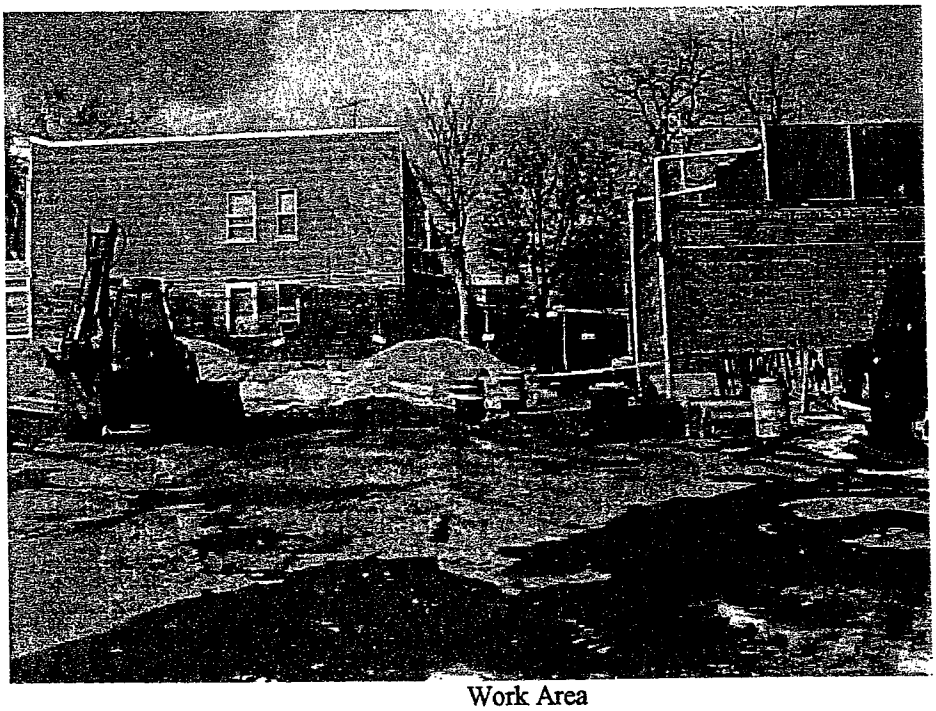
- The tank mat located on the asphalt parking area to the west of the main building contains two (2) tanks, one utilized for heating oil, the other utilized for mop oil.
- Upon determination that piping lines where the cause of a tank test failure, the lines were replaced.
- During excavation/replacement activities, impacted soils were discovered.
- A soil sample was obtained and analyzed.
- Based on the analytical results, in which no compounds were detected above their respective cleanup objective level, it was determined that the source of the impact was the mop oil tank piping.
- After the replacement of the tank piping lines as well as excavation, removal and disposal of impacted soil, the area was backfilled.
- F&N has made numerous attempts to discuss the status of the spill with the NYSDEC Case Manager, as of the date of this report, no communications have been returned.

5.0 RECOMMENDATIONS

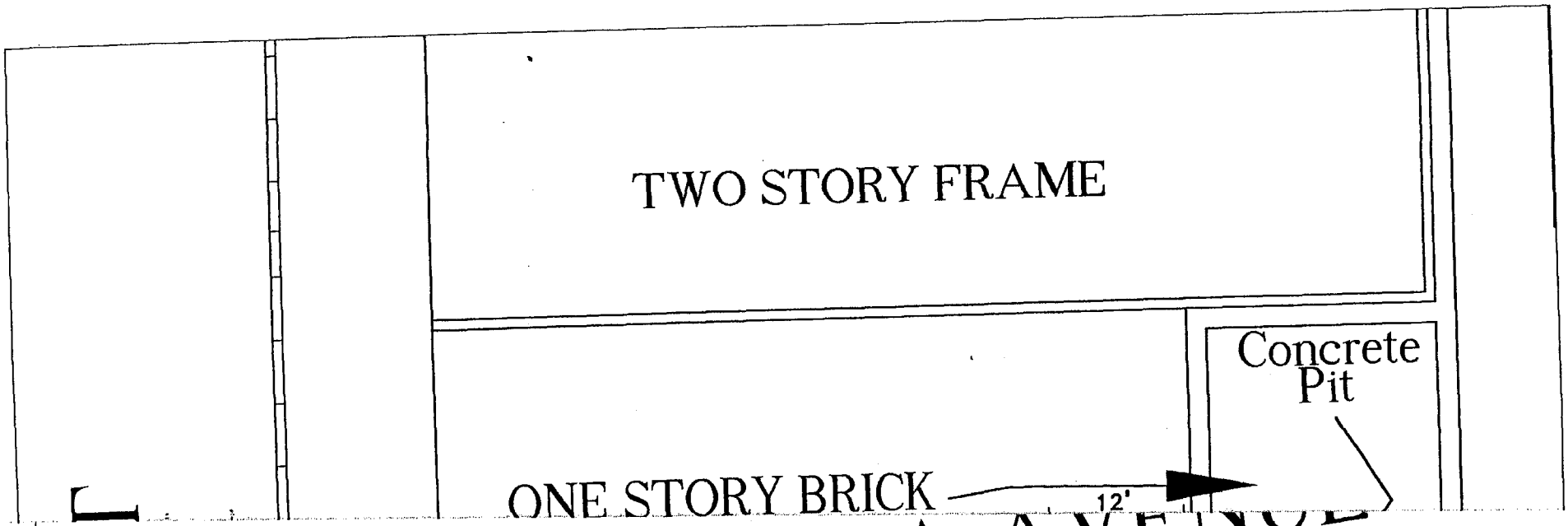
Based upon the conclusions put forth in this report and the results from the sample analysis, F&N is recommending that spill number 0208119, associated with the tank/line test failure at 129-01 Jamaica Avenue, be issued a closure letter.



Excavation



Work Area



Fenley & Nicol Environmental, Inc.® Professional Services Division 445 BROOK AVENUE. DEER PARK. NEW YORK 11729 (631)586-4900		
SCALE:	GEOLOGIST: SS	JOB #: 0211007
DATE: 4/03	DRAWN BY: SS	FILE NAME: SP.DWG

– FIGURE 1 – SITE PLAN EXCAVATION

129-01 JAMAICA AVENUE
RICHMOND HILL, N. Y.

Excavation

ALLIED WASTE SERVICES, INC.

2163 MERRICK AVE., MERRICK, NY 11566 • TEL: 1-800-969-DIRT • FAX: 516-867-6480

1

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name [illegible] Shipping Location SAME

Address 192.01 SMALTA AVE Address TIME IN = 8.00 AM

RICHMOND HILL ON NO HAZARDOUS ATTIRE JOB

Phone No. _____ Phone No. TIME OUT = 9.45

Approval Number	Description of Material	Codes	Gross Weight	Tare Weight	Net Weight	Net Weight (Tons)
203/97	[illegible]					

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

AGENT FOR MIKE SAS M. SAS 3/19/03

Generator Authorized Agent Name | Signature | Shipment Date

TRANSPORTER

Transporter Name [illegible] Driver Name (Print) MARIO A

Address [illegible] Vehicle License No./State AF 61417

[illegible] Truck Number NAQ F 1

State Permit # [illegible]

I hereby certify that the above named material was picked up at the generator site listed above.

[signature] 3/19/03

Driver Signature | Shipment Date

I hereby certify that the above named material was delivered without incident to the destination listed below.

[signature] 3/19/03

Driver Signature | Delivery Date

DESTINATION

Site Name [illegible] Phone No. _____

Address 24 MIDDLESEX AVE (NORTH YORK) State Permit # _____

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

[signature] 3-19-03

Name of Authorized Agent | Signature | Receipt Date

CONTRACTOR

Log Number

ALLIED WASTE SERVICES, INC.

2163 MERRICK AVE., MERRICK, NY 11566 • TEL: 1-800-969-DIRT • FAX: 516-867-6480

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name UNIFORMS FOR INDUSTRY Shipping Location SAME

Address 129-01 JAMAICA AVE Address

RICHMOND HILL, NY

Phone No. Phone No.

Approval Number	Description of Material	Codes	Gross Weight	Tare Weight	Net Weight	Net Weight (Tons)
	NON HAZ PETROLEUM CONTAMINATED SOIL DESTINED FOR RECYCLING					

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

MIKE SAKE M. Cay 3/20/03

Generator Authorized Agent Name Signature Shipment Date

TRANSPORTER

Transporter Name THE TOP SOIL DEPOT, INC Driver Name (Print) MARCO A

Address 190 POMPTON PLAINS CROSSROADS Vehicle License No./State AE-614 9

WAYNE, NJ 07470 (973) 835-9434 Truck Number HAD #1

State Permit # NJ-561

I hereby certify that the above named material was picked up at the generator site listed above.

Marco A Rosado 3/20/03

Driver Signature Shipment Date

I hereby certify that the above named material was delivered without incident to the destination listed below.

Marco A Rosado 3/20/03

Driver Signature Delivery Date

DESTINATION

Site Name CLEAN EARTH OF CARTERET Phone No.

Address 24 MIDDLESEX AVE CARTERET NJ State Permit #

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent Signature Receipt Date

GENERATOR

Log Number

ALLIED WASTE SERVICES, INC.

2163 MERRICK AVE., MERRICK, NY 11566 • TEL: 1-800-969-DIRT • FAX: 516-867-6480

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name UNIFORMS FOR INDUSTRY Shipping Location SAME

Address 129-01 JAMAICA AVE Address TIME IN = 8:00 AM

RICHMOND HILL NY NO WASHING AT THE JOB

Phone No. _____ Phone No. TIME OUT = 9:45

Approval Number	Description of Material	Codes	Gross Weight	Tare Weight	Net Weight	Net Weight (Tons)
	NON HAZ PETROLEUM CONTAMINATED SOIL DESTINED FOR RECYCLING					

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

AGENT FOR MIKE SEA M. Sea 3/19/03

Generator Authorized Agent Name Signature Shipment Date

TRANSPORTER

Transporter Name THE TOP SOIL DEPOT, INC (TSD) Driver Name (Print) MARCO A

Address 100 POMPTON PLAINS CROSSROADS Vehicle License No./State AE-614T

WAYNE, NJ 07470 (973) 835-9434 Truck Number MAQ FF 1

State Permit # NJ561

I hereby certify that the above named material was picked up at the generator site listed above.

Marco Vargas 3/19/03

Driver Signature Shipment Date

I hereby certify that the above named material was delivered without incident to the destination listed below.

Marco Vargas 3/19/03

Driver Signature Delivery Date

DESTINATION

Site Name CLEAN EARTH OF CARTERET Phone No. _____

Address 24 MIDDLESEX AVE CARTERET NJ State Permit # _____

I hereby certify that the above named material has been accepted and to the best of my knowledge, the foregoing is true and accurate.

Name of Authorized Agent Signature Receipt Date

LONG ISLAND ANALYTICAL LABORATORIES INC.
"TOMORROWS ANALYTICAL SOLUTIONS TODAY"

NYSDOH ELAP# 11693
USEPA# NY01273
CTDOH# PH-0284

February 20, 2003

Stephanie Salvenini
Fenley & Nicol
445 Brook Avenue
Deer Park, NY, 11729

Re: [redacted] UFI Jamaica Avenue [redacted]

Dear Ms. Salvenini:

Enclosed please find the Laboratory Analysis Report(s) for sample(s) received February 18, 2003. Long Island Analytical Laboratories, Inc. analyzed the samples February 20, 2003 for the following:

CLIENT ID	ANALYSIS
Ex 201	EPA 8021, EPA 8270

If you have any questions or require further information, please call at your convenience. Long Island Analytical Laboratories would like to thank you for the opportunity to be of service to you.

Best Regards,

Long Island Analytical Laboratories, Inc.

Client: Fenley & Nicol	Client ID: UFI, Jamaica Avenue Ex 201
Date received: 2/18/03	Laboratory ID: 0301736
Date extracted: 2/20/03	Matrix: Soil
Date analyzed: 2/20/03	ELAP #: 11693

EPA METHOD 8021

PARAMETER	CAS No.	RESULTS ug/kg
MTBE	1634-04-4	<5
BENZENE	71-43-2	<5
BROMOBENZENE	108-86-1	<5
BROMOCHLOROMETHANE	74-97-5	<5
BROMODICHLOROMETHANE	75-27-4	<5
BROMOFORM	75-25-4	<5
BROMOMETHANE	74-83-9	<5
n-BUTYLBENZENE	104-51-8	<5
sec-BUTYLBENZENE	135-98-8	24
tert-BUTYLBENZENE	98-06-6	<5
CARBON TETRACHLORIDE	56-23-5	<5
CHLOROBENZENE	108-90-7	<5
CHLORODIBROMOMETHANE	124-48-1	<5
CHLOROETHANE	75-00-3	<5
CHLOROFORM	67-66-3	<5
CHLOROMETHANE	74-87-3	<5
2-CHLOROTOLUENE	95-49-8	<5
4-CHLOROTOLUENE	106-43-4	<5
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	<5
DIBROMOCHLOROMETHANE	124-48-1	<5
1,2-DIBROMOETHANE	106-93-4	<5
DIBROMOMETHANE	74-95-3	<5
1,2-DICHLOROBENZENE	95-50-1	<5
1,3-DICHLOROBENZENE	541-73-1	<5
1,4-DICHLOROBENZENE	106-46-7	<5
DICHLORODIFLUOROMETHANE	75-71-8	<5
1,1-DICHLOROETHANE	75-34-3	<5
1,2-DICHLOROETHANE	107-06-2	<5
1,1-DICHLOROETHENE	75-35-4	<5
cis-1,2-DICHLOROETHENE	156-59-2	<5
trans-1,2-DICHLOROETHENE	156-60-5	<5

Client: Fenley & Nicol	Client ID: UFI, Jamaica Avenue Ex 201
Date received: 2/18/03	Laboratory ID: 0301736
Date extracted: 2/20/03	Matrix: Soil
Date analyzed: 2/20/03	ELAP #: 11693

EPA METHOD 8021

PARAMETER	CAS No.	RESULTS ug/kg
1,2-DICHLOROPROPANE	78-87-5	<5
1,3-DICHLOROPROPANE	142-28-9	<5
2,2-DICHLOROPROPANE	594-20-7	<5
1,1-DICHLOROPROPENE	563-58-6	<5
cis-1,3-DICHLOROPROPENE	10061-01-5	<5
trans-1,3-DICHLOROPROPENE	10061-02-6	<5
ETHYLBENZENE	100-41-4	<5
HEXACHLOROBUTADIENE	87-68-3	<5
ISOPROPYLBENZENE	98-82-8	13
p-ISOPROPYLTOLUENE	99-87-6	13
METHYLENE CHLORIDE	75-09-2	<5
NAPHTHALENE	91-20-3	17
n-PROPYLBENZENE	103-65-1	9
STYRENE	100-42-5	<5
1,1,1,2-TETRACHLOROETHANE	630-20-6	<5
1,1,2,2-TETRACHLOROETHANE	79-34-5	<5
TETRACHLOROETHENE	127-18-4	<5
TOLUENE	108-88-3	<5
1,2,3-TRICHLOROBENZENE	87-61-6	<5
1,2,4-TRICHLOROBENZENE	120-82-1	<5
1,1,1-TRICHLOROETHANE	71-55-6	<5
1,1,2-TRICHLOROETHANE	79-00-5	<5
TRICHLOROETHENE	79-01-6	<5
TRICHLOROFLUOROMETHANE	75-69-4	<5
1,2,3-TRICHLOROPROPANE	96-18-4	<5
1,2,4-TRIMETHYLBENZENE	95-63-6	90
1,3,5-TRIMETHYLBENZENE	108-67-8	32
VINYL CHLORIDE	75-01-4	<5
p & m-XYLENES	1330-20-7	29
o-XYLENE	1330-20-7	29

Michael Veraldi-Laboratory Director

Client: Fenley & Nicol	Client ID: UFI, Jamaica Avenue Ex 201
Date received: 2/18/03	Laboratory ID: 0301736
Date extracted: 2/19/03	Matrix: Soil
Date analyzed: 2/19/03	ELAP #: 11693

EPA METHOD 8270

Parameter	CAS No.	Results ug/kg
Bis(2-CHLOROETHYL)ETHER	111-44-4	<40
PHENOL	108-95-1	<40
2-CHLOROPHENOL	95-57-8	<40
1,3-DICHLOROBENZENE	541-73-1	<40
1,4-DICHLOROBENZENE	106-46-7	<40
1,2-DICHLOROBENZENE	95-50-1	<40
Bis(2-CHLOROISOPROPYL)ETHER	108-60-1	<40
2-METHYLPHENOL	95-48-7	<40
HEXACHLOROETHANE	67-72-1	<40
N-NITROSODI-n-PROPYL AMINE	621-64-7	<40
4-METHYLPHENOL	106-44-5	<40
NITROBENZENE	98-95-3	<40
ISOPHORONE	78-59-1	<40
2-NITROPHENOL	88-75-5	<40
2,4-DIMETHYLPHENOL	105-67-9	<40
Bis(2-CHLOROETHOXY)METHANE	111-91-1	<40
2,4-DICHLOROPHENOL	102-83-2	<40
1,2,4-TRICHLOROBENZENE	120-82-1	<40
NAPHTHALENE	91-20-3	135
4-CHLOROANILINE	106-47-8	<40
HEXACHLOROBUTADIENE	87-68-3	<40
4-CHLORO-3-METHYLPHENOL	59-50-7	<40
2-METHYLNAPHTHALENE	91-57-6	620
HEXACHLOROCYCLOPENTADIENE	77-47-4	<66
2,4,6-TRICHLOROPHENOL	88-06-2	<40
2,4,5-TRICHLOROPHENOL	95-95-4	<40
2-CHLORONAPHTHALENE	91-58-7	<40
2-NITROANILINE	88-74-4	<40
ACENAPHTHYLENE	208-96-8	<40
DIMETHYLPHTHALATE	131-11-3	<40
2,6-DINITROTOLUENE	606-20-2	<40
ACENAPHTHENE	83-32-9	<40

Client: Fenley & Nicol	Client ID: UFI, Jamaica Avenue Ex 201
Date received: 2/18/03	Laboratory ID: 0301736
Date extracted: 2/19/03	Matrix: Soil
Date analyzed: 2/19/03	ELAP #: 11693

EPA METHOD 8270

Parameter	CAS No.	Results ug/kg
3-NITROANILINE	99-09-2	<40
2,4-DINITROPHENOL	51-28-5	<40
DIBENZOFURAN	132-64-9	<40
2,4-DINTROTOLUENE	121-14-2	<40
4-NITROPHENOL	100-02-7	<40
FLUORENE	86-73-7	<40
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	<40
DIETHYLPHTHALATE	84-66-2	<40
4-NITROANILINE	100-01-6	<40
4,6-DINITRO-2-METHYLPHENOL	534-52-1	<40
N-NITROSODIPHENYLAMINE	86-30-6	<40
4-BROMOPHENYL-PHENYL ETHER	101-55-3	<40
HEXACHLOROBENZENE	118-74-1	<40
PENTACHLORPHENOL	87-86-5	<40
PHENANTHRENE	85-01-8	<40
ANTHRACENE	120-12-7	<40
Di-n-BUTYLPHTHALATE	84-74-2	291
FLUORANTHENE	206-44-0	232
PYRENE	129-00-0	207
BUTYLBENZYLPHTHALATE	85-68-7	500
3,3-DICHLOROBENZIDINE	91-94-1	<40
BENZO-a-ANTHRACENE	56-55-3	102
CHRYSENE	218-01-9	164
Bis(2-ETHYLEXYL)PHTALATE	117-81-7	2,413
DI-n-OCTYLPHTHALATE	117-84-0	<40
BENZO-b-FLUOROANTHENE	205-99-2	148
BENZO-k- FLUOROANTHENE	207-08-9	123
BENZO-a-PYRENE	50-32-8	143
INDENO(1,2,3-c,d)PYRENE	193-39-5	92
DIBENZO-a,h-ANTHRACENE	53-70-3	<40
BENZO-g,h,i-PERYLENE	191-24-2	78

Michael Veraldi-Laboratory Director

LONG ISLAND ANALYTICAL LABORATORIES INC.
"TOMORROWS ANALYTICAL SOLUTIONS TODAY"
101-4 Colin Drive • Holbrook, New York 11741
Phone (631) 472-3400 • Fax (631) 472-8505 • Email: LIAL@lialinc.com

MOF OILS

Typical Properties of Shellflex Oils
Naphthenic Oils

	(Manufactured at Martinez, California)					(Manufactured at Deer Park, Texas)					
Shellflex Number	132	212	371	412	3131	3211	3271	3311	3681	3371	4132
Product Code	86068	86010	86039	86045	86081	86082	86083	86084	86085	86086	86092
ASTM Rubber Extending Oil Type	104A	104A	104A	103	104A	103	103	103	103	103	104A
Viscosity											
SSU/100°F	58	106	410	490	60	98	200	275	800	425	60
SSU/210°F	34	36	52	54	34	39	45	49	72	55	34
cSt/40°C	9	19	78	90	9	20	41	58	147	80	9
cSt/100°C	2	4	8	8	2	4	6	7	12	9	2
Specific Gravity/60°F	.868	.892	.898	.910	.871	.884	.896	.897	.909	.899	.883
Pounds/Gallon	7.39	7.43	7.48	7.58	7.28	7.36	7.45	7.47	7.57	7.48	7.36
Color, ASTM	L0.5	L0.5	L0.5	0.5	L0.5	0.5	1.0	1.0	2.0	1.0	L0.5
Flash Point, c.o.c. °F	300	350	420	420	320	335	400	405	440	440	310
Pour Point, °F	-60	-40	-25	-25	-40	-10	0	0	10	0	-60
Volatility, 22 hrs/225°F % wt	22	5.5	0.5	0.5	23	10	3.6	2.6	0.9	1.3	26
Neutralization No., mg. KOH/g	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Aniline Point, °F	165	172	216	195	171	182	185	187	207	202	167
UV Absorptivity at 280 mu	0.45	2.3	0.1	0.3	.85	1.56	1.75	1.83	2.0	2.0	.68
Viscosity — Gravity Constant	.857	.860	.835	.850	.841	.841	.850	.840	.842	.836	.849
Refractive Index/20°C	1.481	1.490	1.489	1.498	1.482	1.487	1.492	1.494	1.500	1.494	1.481
Refractivity Intercept	1.040	1.040	1.043	1.041	1.043	1.046	1.044	1.046	1.046	1.047	1.041
Molecular Analysis, Clay-Gel, % wt											
Asphaltenes	0	0	0	0	0	0	0	0	0	0	0
Polar Compounds	0.6	0.6	0.3	1.3	0.2	1.3	1.9	1.6	1.6	1.2	0.9
Aromatics	23.9	29.4	10.0	34.6	28.0	32.1	33.0	32.0	37.4	32.2	23.1
Saturates	75.5	70.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	66.4	61.0	66.6	76.0
[illegible] Analysis, %											
Aromatics Carbon Atoms, C_A	3	4	1	4	8	9	8	8	9	5	4
Naphthenic Carbon Atoms, C_N	55	53	46	52	39	36	40	37	34	38	47
Paraffinic Carbon Atoms, C_P	42	43	53	44	53	55	52	55	57	57	49
Molecular Weight, (Est)	270	325	400	350	280	310	330	360	430	400	270
Locations Where Available	MS	M	HSMLP	MPL	HWSR	HWSR	HWSR	WSR	HWSR	HWSR	HWS

H = Houston, Texas; M = Martinez, California; S = Sewaren, New Jersey; W = Wood River, Illinois; L = Los Angeles; P = Portland, Oregon; R = Pittsburgh, Pennsylvania

2000 gal. virgin
1500 gal - used
Small sludge

MOT OIL

MATERIAL SAFETY DATA SHEE

Shell

MSDS NUMBER ▶ 10.051-1

17367 M-85

24 HOUR EMERGENCY ASSISTANCE	GENERAL MSDS ASSISTANCE
SHELL: 713-473-9481 CHEMTREC: 800-424-9300	SHELL: 713-241-4819

ACUTE HEALTH*	FIRE	REACTIVITY	HAZARD RATING ▶	LEAST - 0	SLIGHT - 1	MODERATE - 2
1	1	0		HIGH - 3	EXTREME - 4	

*For acute and chronic health effects refer to the discussion in Section III

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION AND PACKET OIL

SECTION I NAME

PRODUCT ▶	SHELLFLEX(R) 3131
CHEMICAL NAME ▶	SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE
CHEMICAL FAMILY ▶	PETROLEUM HYDROCARBON: PROCESS/EXTENDER OIL
SHELL CODE ▶	86081

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	SHELLFLEX 3131	64742-53-6	100

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NOT AVAILABLE		

SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT
LUBRICATING BASE OILS ARE GENERALLY CONSIDERED NO MORE THAN MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT
LUBRICATING BASE OILS ARE GENERALLY CONSIDERED NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT MAY LEAD TO VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, OIL ACNE OR FOLLICULITIS.

INHALATION
INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST FROM THIS PRODUCT MAY CAUSE MILD IRRITATION OF THE UPPER RESPIRATORY TRACT.

INGESTION
INGESTION OF PRODUCT MAY RESULT IN VOMITING; ASPIRATION (BREATHING OF VOMITUS INTO THE LUNGS) MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY RESULT IN ASPIRATION PNEUMONITIS.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING, LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

ID.	OSHA PEL/TWA	PEL/CEILING	ACGIH TLV/TWA	TLV/STEL	OTHER
	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	NONE

OIL MIST, MINERAL

SECTION V EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING AND WIPE EXCESS OFF. WASH WITH SOAP AND WATER OR A WATERLESS HAND CLEANER FOLLOWED BY SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION
DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN
IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS. GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SECTION VII PHYSICAL DATA

BOILING POINT (DEG F) >550

SPECIFIC GRAVITY: 0.8730 (H2O=1)

VAPOR PRESSURE: NOT AVAILABLE (MM HG)

MELTING POINT (DEG F) -40 (POUR POINT)

SOLUBILITY IN: NEGLIGIBLE (WATER)

VAPOR DENSITY: NOT AVAILABLE (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1) NOT AVAILABLE

VIS.CS(40 DEG C): 8

APPEARANCE AND ODOR: WHITE LIQUID. SLIGHT HYDROCARBON ODOR.

PRODUCT NAME SHELLFLEX(R) 3

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
320 DEG F (COC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV HIGHER: N/AV

EXTINGUISHING MEDIA
USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER

SECTION IX REACTIVITY

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SECTION IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS AND PARTICULATES.

PROTECTIVE CLOTHING
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. WEAR SAFETY GOGGLES TO AVOID EYE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE GLOVES.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ADSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

WASTE DISPOSAL
PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

ENVIRONMENTAL HAZARDS
THIS PRODUCT IS CLASSIFIED AS AN OIL UNDER SECTION 311 OF THE CLEAN WATER ACT. SPILLS ENTERING (A) SURFACE WATERS OR (B) ANY WATER COURSES OR SEWERS ENTERING/LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER. (800-424-8802.

PRODUCT NAME SHELLFLEX(R) 3131 [redacted] ISSUE 10,08 -1
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SECTION XII - SPECIAL PRECAUTIONS

MINIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILLATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION: NOT HAZARDOUS BY D.O.T. REGULATIONS

SECTION XIV OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: AUGUST 23, 1985

ORIGINAL SIGNED BY:

JOHN P. SEPESI

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210