Park
Environmental

January 10, 1993

Ms. Jennifer Eberle
Alameda County
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

1137J1

RE: VAPOR TREATABILITY WORK
CARNATION COMPANY
1310 14TH STREET
OAKLAND, CALIFORNIA

Dear Ms. Eberle:

Nestle, USA (Nestle) retained **Park Environmental Corporation (Park)** to perform vapor treatability testing at their Oakland, California facility. The objective of the testing was to evaluate whether vapor extraction was a viable technology to remove the volatile Total Petroleum Hydrocarbon (TPH) compounds at their Carnation Company site in Oakland, California. A second objective was to evaluate whether there were heavier and less volatile compounds present in the subsurface.

Figure 1 shows the portion of the facility where the testing was conducted. A total of four wells were selected for testing. These wells were selected by location and general well construction. **Park** desired to obtain representative air flow and vapor TPH concentrations from the areas where TPH had been identified during earlier site assessment programs. The wells tested had four inch casings and appeared to be perforated from near the ground surface to below the water table.

Specific tasks completed for this investigative testing included the following:

- Measured the volume of air removable from the selected wells;
- Measured the vacuum necessary to withdraw vapors from each respective test well.
- Monitored relative vapor concentration during the testing using a Century 128 Organic Vapor Analyzer (OVA);

2140 Professional Drive ⁂ Suite 130 ⁂ Roseville, CA 95661 **TEL:916-782-8980** 1-800-753-7401 FAX 916-784-7496

- o Monitored the vacuum in nearby monitoring wells during the testing using manometers;

- o Collected vapor samples in Tedlar bags for chemical analysis;

- o Analyzed vapor samples for TPH and benzene, toluene, ethylbenzene and xylenes (BTEX) using Methods 8015 and 8020 or equivalent; and

- o Prepared documentation of work performed and test results generated.

FIELD PROCEDURES AND DISCUSSION OF RESULTS

A brief reconnaissance of the site was performed upon arrival to the site. A number of general areas were selected for possible testing. Well covers were removed from wells in the proposed test areas to examine the size of the casing, whether the perforation extended above the water table, and whether the vapor extraction connections could be made to the wells.

A 92 cfm regenerative blower was used to provide the vacuum to the wells. Vacuums created in each respective well and nearby monitoring wells were measured using manometers to evaluate the continuity of the subsurface soils in the vicinity of the test wells.

The vacuum system was connected to the well to be tested and a vacuum was applied. Flow volumes and vacuums were monitored with time in the vapor well. Vacuums were measured in wells near the extraction well. Due to the large number of wells present on the site, the manometers were moved from well to well to measure the radii of influence.

Four wells were vapor tested during this assessment. Figure 1 shows the test locations, numbered Test 1 through Test 4. Because of the number of wells present on site and the lack of numbering, it was difficult to know conclusively which well was being tested. **Park** believes that the wells tested were V-90, MW-91, MW-25, and MW-4, in the order tested.

Each well tested was pumped for approximately thirty minutes. During this time the air flow was monitored. Vapor samples were collected for field screening using a Century 128 OVA. Manometers were moved from well to well to measure the effect the pumped well was having on surrounding wells. When continuity was measured, the distance to the monitored well from the test well was measured. Continuity between wells was obtained in excess of fifty feet from the tested wells. Representative airflow and vacuum information are provided in Table 1. Vapors removed from the wells were treated through activated carbon prior to discharge to the atmosphere.

TABLE 1
VAPOR FLOW INFORMATION
JULY 22, 1992

WELL NUMBER	AIR FLOW (cfm)	WELL VACUUM (IN. H2O)
Test #1 (V-90)	36	45
Test #2 (MW-91)	33	44
Test #3 (MW-25)	32	42
Test #4 (MW-4)	34	44

Vapor samples were collected in Tedlar bags, refrigerated, and transported to Sierra Laboratories, Inc. under appropriate Chain of Custody. Laboratory analytical test results of vapor samples collected during this assessment are provided in Table 2. Vapor samples were analyzed for TPH and BTEX using Methods 8015M and 8020, or equivalent. Copies of the laboratory reports are provided as an attachment.

TABLE 2
VAPOR CONCENTRATIONS
JULY 22, 1992

WELL NUMBER	TPH (PPMV)	BENZENE (PPMV)	TOLUENE (PPMV)	ETHYL-BENZENE (PPMV)	XYLENE (PPMV)
Test 1 (V-90)	42,000	1,500	2,100	250	1,200
Test 2 (MW-91)	29,000	880	560	180	880
Test 3 (MW-25)	10,000	72	160	16	97
Test 4 (MW-4)	13,000	110	74	16	69

PPMV - Parts per Million by Volume
Analyses by EPA Methods 8015M and 8020.

The vapor analytical test results demonstrate that TPH vapors are present in the vadose in elevated concentrations ranging from 10,000 to 42,000 ppmv as gasoline. Benzene vapor concentrations ranged from 72 to 1,500 ppmv. The gas chromatograms indicate that the gasoline is older and weathered.

The flow rates and vapor concentrations indicate that significant amounts of TPH can be removed from the vadose zone. The presence of so many wells in the vicinity of the TPH release will allow for a very flexible vapor extraction remediation program to be implemented at the Carnation Company facility.

Please contact our Roseville office at (916) 784-7400 if you have any questions regarding this submittal.

Sincerely,

PARK ENVIRONMENTAL CORPORATION

Peter Frank
Project Geologist

Richard J. Zipp, R.G., C.E.G.
Principal Hydrogeologist

RJZ:mjm

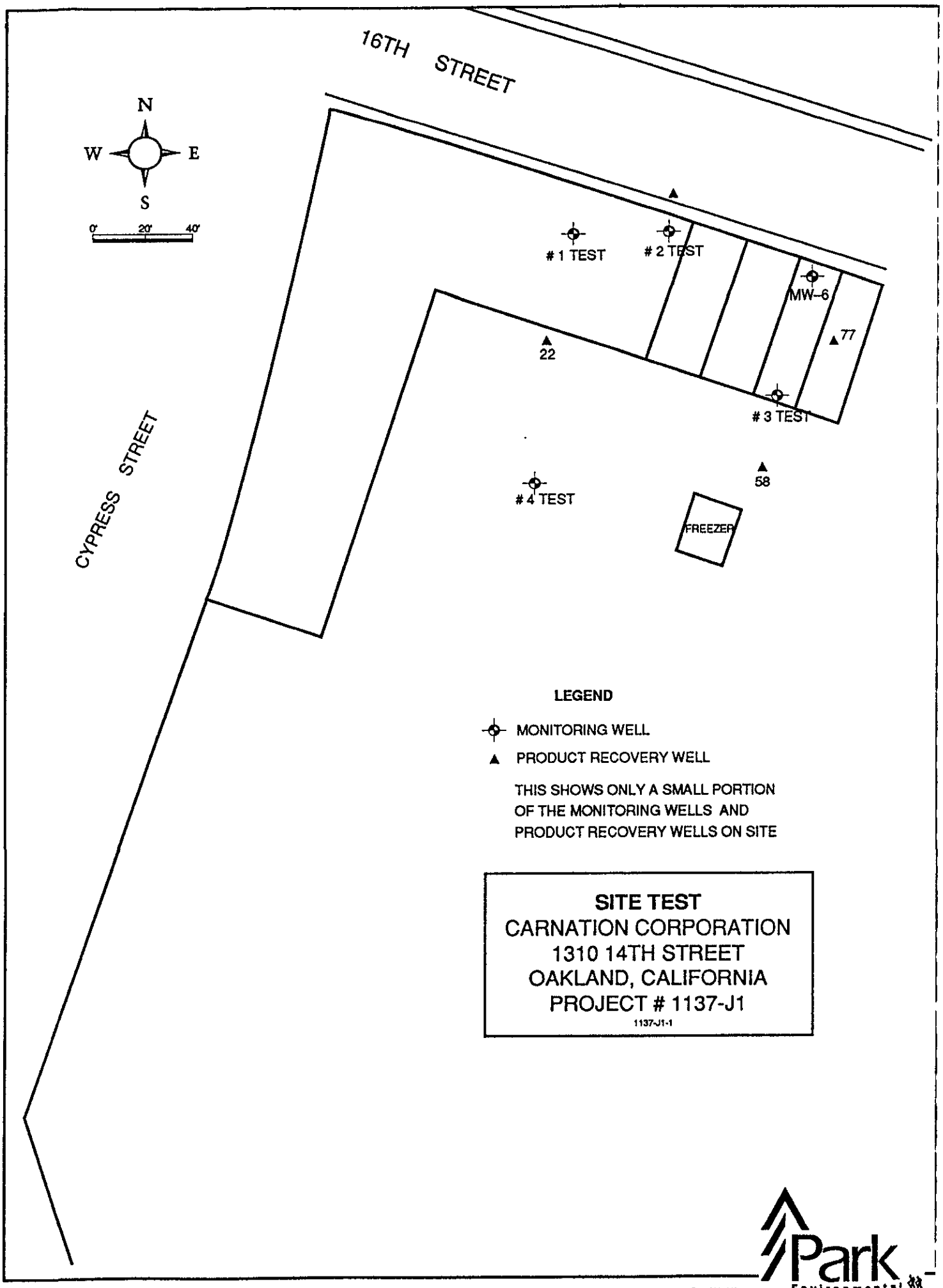

FIGURE 1

Park Environmental

SIERRA
LABORATORIES

Date: July 29,1992

Park Environmental Corporation
5100 East Hunter Avenue
Anaheim, California 92807
Attention: Mr. Richard Zipp

Client Project Number:	1137-J2
Client Project Name:	Carnation
Date Sampled:	July-22-92
Date Samples Received:	July-23-92
Sierra Project Number:	SP-249-92

Enclosed with this letter is the report on the chemo-physical analysis of samples from the project references shown above.

The samples were received by Sierra in a chilled state, intact, and with the chain of custody record attached.

Note that N.D. means not detected at the appropriate reporting limit. The reporting limit is adjusted to reflect the dilution factor of the sample. The reporting limit is expressed in such cases in parentheses to the right of reported value. The detection limit for values without such a designation appears to the right of or at the bottom of the same page.

Preliminary Data was provided on July 24 and July 30, 1992.

High contamination levels required repeated re-analysis of sample MW-25. The result reported for 8015-Modified (TPH as Gasoline-CADHS LUFT) exhibited the highest concentration, although it was analyzed outside of holding time. EPA 8020 (BTEX) analysis for this sample was performed within holding time.

Reviewed

Approved

1525 ENDEAVOR PLACE
SUITE D
ANAHEIM, CA 92801

TEL: 714.758.9988
FAX: 714.758.9692

Park Environmental Corporation	**Sierra Client No.**	**10000-92**	**Date Sampled:** .07/22/92
5100 East Hunter Avenue	**Sierra Project No.**	**SP-249-92**	**Date Received:** .07/23/92
Anaheim, California 92807	**Client Project No.**	1137-J2	**Date Prepared:** .07/23/92
	Client Project: Carnation		**Date Analyzed:** .07/23/92
Sample Preparation:	EPA Method 5030		**Report Date:** .07/29/92
Sample Analysis:	8015-Modified (TPH as Gasoline-CADHS LUFT) and EPA 8020 (BTEX) in series		

Sample Type: Vapor

Client Sample I.D.	TPH		Benzene		Toluene		Ethylbenzene		Xylenes, Total	
	µg/l	ppm (v/v)	µg/l	ppm (v/v)	µg/l	ppm (v/v)	µg/l	ppm (v/v)	µg/l	ppm (v/v)
V 90	170000	42000	4700	1500	7900	2100	1100	250	5200	1200
MW-91	120000	29000	2800	880	2100	560	770	180	3800	880
MW-25 *	41000	10000	1300	410	1500	400	290	67	1400	320
# 4	53000	13000	340	110	280	74	69	16	300	69

* Sample was re-analyzed for TPH on July 28, 1992. The result reported exhibited the highest concentration, although it was analyzed outside of holding time.

	TPH		Benzene		Toluene		Ethylbenzene		Xylenes, Total	
	µg/l	ppm (v/v)	µg/l	ppm (v/v)	µg/l	ppm (v/v)	µg/l	ppm (v/v)	µg/l	ppm (v/v)
Detection Limit:	100	24	1	0.31	1	0.27	1	0.23	1	0.23

Park Environmental Corporation	Sierra Client No.	10000-92	Date Sampled:	.07/22/92
5100 East Hunter Avenue	Sierra Project No.	SP-249-92	Date Received:	.07/23/92
Anaheim, California 92807	Client Project No.	1137-J2	Date Prepared:	.07/23/92
	Client Project: Carnation		Date Analyzed:	.07/23/92
Sample Preparation: EPA Method 5030				
Sample Analysis: 8015-M as Gasoline			Report Date:	.07/29/92

Matrix/Spike Duplicate Report

Sample Type: Vapor

	TPH-Gasoline	(Range)
Matrix Spike Recovery (%)	127	(50-150)
Matrix Spike Duplicate Recovery (%)	123	(50-150)
Relative Per-cent Difference	3	(0-30)

Quality Control Reference Number: G001-072392(V)g1b0005-173-174

Park Environmental Corporation	**Sierra Client No.**	**10000-92**	**Date Sampled:**	.07/22/92
5100 East Hunter Avenue	**Sierra Project No.**	**SP-249-92**	**Date Received:**	.07/23/92
Anaheim, California 92807	**Client Project No.**	1137-J2	**Date Prepared:**	.07/23/92
	Client Project:		**Date Analyzed:**	.07/23/92
	Carnation			
Sample Preparation: EPA Method 5030				
Sample Analysis: EPA 8020 (BTEX)			**Report Date:**	.07/29/92

Matrix/Spike Duplicate Report

Sample Type: Vapor

	Benzene (Range)	Toluene (Range)	Ethylbenzene (Range)	Xylenes, Total (Range)
Matrix Spike Recovery (%)	141 (39-150)	151* (46-148)	153 (32-160)	161* (37-154)
Matrix Spike Duplicate Recovery (%)	131 (39-150)	135 (46-148)	127 (32-160)	137 (37-154)
Relative Per-cent Difference	7 (0-30)	11 (0-30)	18 (0-30)	16 (0-30)

Quality Control Reference Number: G001-072392(V)g1b0005-173-174

* Values outside of control limits. Analytical batch was validated by individual sample surrogate recovery and Laboratory Control Sample (LCS).

Park Environmental Corporation
5100 East Hunter Avenue
Anaheim, California 92807

Sierra Client No.	**10000-92**	**Date Sampled:**	.07/22/92
Sierra Project No.	**SP-249-92**	**Date Received:**	.07/23/92
Client Project No.	1137-J2	**Date Prepared:**	.07/23/92
Client Project: Carnation		**Date Analyzed:**	.07/23/92
		Report Date:	**.07/29/92**

Surrogate Summary Report

Client Sample I.D.	Analysis Type	Per-cent Recovery S1	(Range)
V 90	8015-M (TPH as Gasoline-CADHS-LUFT)/EPA 8020 (BTEX)	**93**	**(50-130)**
MW-9t	8015-M (TPH as Gasoline-CADHS-LUFT)/EPA 8020 (BTEX)	**92**	**(50-130)**
MW-25	8015-M (TPH as Gasoline-CADHS-LUFT)/EPA 8020 (BTEX)	**86**	**(50-130)**
#4	8015-M (TPH as Gasoline-CADHS-LUFT)/EPA 8020 (BTEX)	**123**	**(50-130)**

Park Environmental Corporation
5100 East Hunter Avenue
Anaheim, California 92807

Sierra Client No.	**10000-92**	**Date Sampled:**	.07/22/92
Sierra Project No.	**SP-249-92**	**Date Received:**	.07/23/92
Client Project No.	1137-J2	**Date Prepared:**	.07/23/92
Client Project:		**Date Analyzed:**	.07/23/92
Carnation			
		Report Date:	.07/29/92

Laboratory Control Sample Report

Parameter	Analysis Type	Per-cent Recovery %	Range
TPH as Gasoline	EPA 8015-M	114	(50-150)
	Quality Control Reference Number:	G001-072392(V)g1b0005-179	

Compound	Analysis Type	Per-cent Recovery %	Range
Benzene	EPA 8020 (BTEX)	110	(28-167)
Toluene	EPA 8020 (BTEX)	114	(41-138)
Ethylbenzene	EPA 8020 (BTEX)	102	(38-150)
Xylenes (Total)	EPA 8020 (BTEX)	107	(35-146)
	Quality Control Reference Number:	G001-072392(V)g1b0005-179	

SP-249-92

SIERRA LABORATORIES
Sierra Laboratories, Inc.
1525 Endeavor Place
Suite D
Anaheim, CA 92801

714 - 758-9988
FAX: 714 - 758-9692

CHAIN OF CUSTODY RECORD

Date: 7-22-92 Page 1 of 1

Client: Park Environmental
Address: 5700 E. Hunter Ave.
Anaheim, CA 92807
Client Tel. No.: 714-772-1001
Client Proj. Mgr.: Dick Zipp

Client Proj. Name: Carnation
Client Proj. No.: 1137-J2

For Client Use:
Turn around requested:
- ___ Immediate Attention
- ✓ Rush 24-48 hours
- ✓ Rush 72-96 hours
- ___ Mobile Lab
- ___ Normal

Analyses Requested

Client Sample No.	Date	Time	Sample Matrix: ~~Liquid~~ Vapor	Sample Matrix: Solid	Preservatives: Yes	Preservatives: No	Container: Type	No. of Containers	TPH	BTEX	Remarks
V 90	7-22		X			X	1Lt Bag	1	X	X	
MW-91	7-22		X			X	X	2	X	X	
MW-25	7-22		X			X	X	1	X	X	
#4	7-22		X			X	X	1	X	X	

Sampler's Signature:

Received by: — Date: 7/22/92 Time: 9:48

Relinquished by: — Date: 7-23-92 Time: 9:48

Received by: — Date: ___ Time: ___

Relinquished by: — Date: ___ Time: ___

Received at Laboratory by: — Date: 7/23/92 Time: 0948

5 Total No. of Containers

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analysis specified above under Sierra's Terms and Conditions, unless otherwise agreed upon in writing between Sierra and Client.

Total No. of Containers Recd.: 5

Special Instructions:

FOR LABORATORY USE ONLY — Condition samples received:
- ✓ Chilled
- ✓ Intact
- ___ Appropriate Preservatives
- ✓ Appropriate Sample Container
- ✓ Properly Labeled
- ___ Other