Weiss Associates *Environmental and Geologic Services*

5500 Shellmound Street, Emeryville, CA 94608-2411 *Fax: 510-547-5043* *Phone:* ***510-450-6000***

November 22, 1994

Ms. eva chu
Alameda County Department of
Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway, Suite 250
Oakland, CA 94502-6577

Re: STID #3014
WIC # 204-0072-0403
Shell Service Station
1601 Webster Street
Alameda, California
WA Job #81-434-80

Dear Ms. chu:

Weiss Associates (WA) on behalf of Shell Oil Company (Shell), responds to your October 25, 1994 letter to Shell Engineer Dan Kirk, regarding the proposed ground water oxygenation (GWO) system for the above mentioned site (Figure 1). Our recommendations for further work are presented below.

ADDITIONAL MONITORING WELL

In your letter, you requested Shell to install an additional monitoring well near well MW-2 to monitor the radius of GWO influence and to assess the extent of hydrocarbons in ground water beneath the eastern portion of the site. We do not believe an additional well is necessary because:

- We believe that installing a well near well MW-2 onsite will not delineate the extent of hydrocarbons in ground water because it is too close to well MW-2. Also, there are no safe and accessible locations on Webster Street as we discussed in our September 26, 1994 workplan;
- Shell does not agree that installing a cross-gradient well is necessary, since hydrocarbons above the MCLs have only been detected once in eight sampling events, in downgradient well MW-3. Therefore, downgradient and cross-gradient migration of the plume appears limited. Furthermore, installing a well to delineate the contaminant plume is not beneficial because the well would have to be installed in the middle of Webster Street and more importantly, would endanger personnel who would install and sample the well due to the large volume of traffic on this street; and
- An additional well is not necessary to monitor the effectiveness of the GWO. Instead, WA proposes to collect a ground water sample from wells MW-2 and MW-3 and analyze it for background levels of DO, bacterial nutrients and hydrocarbon utilizing bacteria prior to starting the GWO system. Once the system is operating, we will continue quarterly monitoring of well MW-2 and will turn off the GWO system two to five days before ground water sampling so that hydrocarbon, oxygen, and bacteria concentrations in the GWO well and other monitoring wells are more representative of the site's ground water. The effectiveness of the system will also be evaluated through continued sampling of TPH-G, BETX and DO monitoring, which will be reported to you in

our quarterly monitoring reports. During the first quarter of GWO system operation, wells MW-2 and MW-3 will also be analyzed for hydrocarbon utilizing bacteria.

SAMPLING FREQUENCY MODIFICATIONS

As we discussed in our workplan, WA's recommends sampling well MW-1 annually. In Ms. Shin's letter dated August 1, 1994 she said ,"due to the fact that ground water samples collected from well MW-1 have identified levels of cis-1,2-dichloroethene (1,2-DCE) exceeding CAL-EPA's Maximum Contaminant Levels in the past, quarterly sampling for chlorinated hydrocarbons must continue for well MW-1". Based on a review of the ground water analytic data, VOCs and hydrocarbon concentrations in ground water have been stable and have not exceeded DTSC MCLs for the last three years. We must all acknowledge that current analytic trends are generally more meaningful than historical data. Therefore, please reconsider our request to sample this well annually.

Once we obtain your authorization to proceed and we have obtained the permits, we will proceed with installing the GWO system. Once the system is on for approximately six months, Shell may consider installing an additional well if it is necessary to monitor the effectiveness of the GWO system. We also look forward to sampling well MW-1 annually beginning the first quarter 1995. We trusts that this submittal meets your needs. Please call Joyce Adams at (510) 450-6000 if you have any questions regarding this site or this letter.

Sincerely,
Weiss Associates

Joyce E. Adams

Joyce E. Adams
Senior Staff Geologist

James W. Carmody, CEG
Senior Project Geologist

JEA/JWC:jea

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cc: Dan Kirk, Shell Oil Company, P.O. Box 4023, Concord, California 94524
Kevin Graves, Regional Water Quality Control Board - San Francisco Bay, 2101 Webster Street, Suite 500, Oakland, California 94612

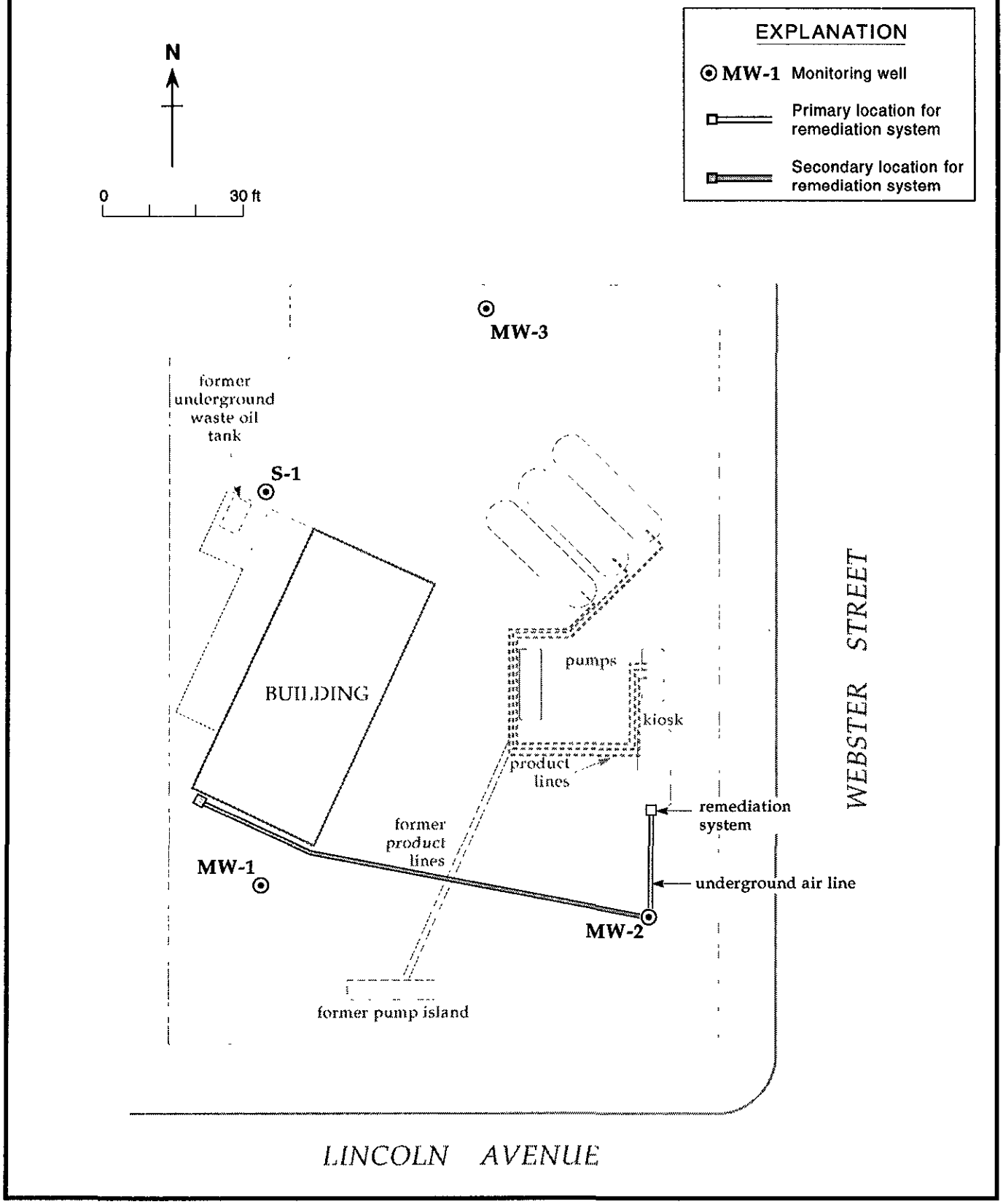

Figure 1. Monitoring Well Locations - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

Analytic Results for ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street Alameda, California

Sample ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	c-1,2-DCE	1,2-DCA	TOG
			<----------parts per billion (ug/L)---------->								
	07-02-92	8.19	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-02-92	9.95	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	01-05-93	7.64	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-08-93	6.10	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	07-20-93	7.18	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-15-93	8.39	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---
	01-07-94	8.19	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-13-94	7.22	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	07-26-94	7.82	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-06-94	**9.01**	**<50**	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---
Trip Blank	07-18-90		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-18-90		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	01-25-91		<50	---	<0.5	<0.5	<0.5	0.8	---	---	---
	04-11-91		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	07-18-91		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-17-91		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	01-24-92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-23-92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	07-02-92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-02-92		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	01-05-93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-08-93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	07-20-93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-15-93		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	01-07-94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-13-94		<50	---	<0.5	<0.5	<0.5[i]	<0.5	---	---	---
	07-26-94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-06-94		<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
DTSC MCLs			NE	NE	1	**680**	**100j**	**1,750**	**6.0**	**0.5**	NE

Analytic Results for ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street Alameda, California

Sample ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	c-1,2-DCE	1,2-DCA	TOG
			<----------parts per billion (ug/L)---------->								
	04-08-93[dup]	5.40	13,000	---	830	1,100	740	3,700	0.64	<0.5	---
	07-20-93	6.05	10,000	---	1,200	1,100	630	4,000	0.87	<0.5	---
	07-20-93[dup]	6.05	12,000	---	1,200	1,100	600	3,800	0.80	<0.5	---
	10-15-93	7.04	24,000	---	1,400	1,200	3,400	5,200	<0.5	<0.5	---
	10-15-93[dup]	7.04	19,000	---	1,200	1,000	2,800	4,400	<0.5	<0.5	---
	01-07-94	6.99	27,000	---	1,300	1,900	2,700	7,900	<10	<10	---
	01-07-94[dup]	6.99	33,000	---	1,100	1,700	2,300	6,900	<10	<10	---
	04-13-94	6.20	16,000	---	460	820	93	2,700	<25	<25	---
	04-13-94[dup]	6.20	18,000	---	500	880	100	3,000	<25	<25	---
	07-26-94	6.63	25,000	---	1,600	1,500	1,500	6,800	<0.4	<0.4	---
	07-26-94[dup]	6.63	28,000	---	1,700	1,600	1,600	7,300	<0.4	<0.4	---
	10-06-94	**7.75**	**15,000**	**---**	**850**	**1,000**	**650**	**4,000**	**<0.4**	**<0.4**	**---**
	10-06-94[dup]	**7.75**	**17,000**	**---**	**1000**	**1,200**	**630**	**4,500**	**<0.4**	**<0.4**	**---**
MW-3	02-25-93	5.37	58	140	<0.5	2.5	<0.5	6.4	<0.5	1.5	<5,000
	04-08-93	5.48	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---
	07-20-93[d]	6.38	<50	---	1.2	<0.5	<0.5	<0.5	<0.5	2.8	---
	10-15-93[e]	7.53	60	---	<0.5	<0.5	<0.5	<0.5	<0.5	0.55	---
	01-07-94	7.38	74	---	<0.5	<0.5	<0.5	0.76	<0.5	0.91	---
	04-13-94	6.50	<50	---	<0.5	<0.5	<0.5	<0.5	<1.3	<1.3	---
	07-26-94	7.00	750[f]	---	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	---
	10-06-94	**8.10**	**1,900**	**---**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.4**	**<0.4**	**---**
S-1	09-04-87[g]		---	---	<5	<5	<5	<5	<0.5	<0.5	---
	09-11-89[h]	9.82	<50	<100	<0.5	<1	<1	<3	<0.5	<0.5	<1,000
	04-11-90	8.41	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10,000
	07-18-90	9.31	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5,000
	10-18-90	10.43	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5,000
	01-25-91	10.49	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-11-91	7.68	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	07-18-91	8.95	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	10-17-91	10.62	<50	---	<0.5	<0.5	<0.5	<5	---	---	---
	01-24-92	9.32	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---
	04-23-92	7.27	<50	---	<0.5	<0.5	<0.5	<0.5	---	---	---

Analytic Results for ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street Alameda, California

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
TPH-D = Total petroleum hydrocarbons as diesel by Modified EPA Method 8015
B = Benzene by EPA Method 602, 624, or 8020
E = Ethylbenzene by EPA Method 602, 624, or 8020
T = Toluene by EPA Method 602, 624, or 8020
X = Xylenes by EPA Method 602, 624, or 8020
c-1,2-DCE = cis-1,2-dichloroethene by EPA Method 601 or 624
1,2-DCA = 1,2-dichloroethane by EPA Method 601 or 624
TOG = Total non-polar oil and grease by American Public Health Association Standard Method 503E
<n = Not detected at detection limit of n ppb
DTSC MCL = California Department of Toxic Substances Control maximum contaminant level for drinking water
NE = Not established
--- = Not analyzed
dup = Duplicate sample

Notes:

a = Chloroform detected at 0.0071 ppm by EPA Method 8010
b = Chloroform detected at 1.1 ppb by EPA Method 8010
d = Chloroform detected at 1.5 ppb by EPA Method 8010
c = Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline
e = Chloroform detected at 3.6 ppb by Method 8010
f = The result for Gasoline in and unknown hydrocarbon which consists of a single peak.
g = 0.12 ppm acetone detected by EPA Method 624; no other volatile organic compounds detected
h = Metals detected by EPA Method 6010; 0.020 ppm chromium, 0.060 ppm lead and 0.030 ppm zinc; no cadmium detected above detection limit of 0.010 ppm; no PCBs or semi-volatile compounds detected by EPA Method 625
i =0.54 ppb Toluene detected in equipment blank
j = DTSC recommended action level for drinking water; MCL not established