



July 9, 2015

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Subject: Proposed Addendum to the Soil Cleanup Goals
Defense Fuel Support Point Norwalk
15306 Norwalk Boulevard, Norwalk, California
(SCP NO. 0286A, Site ID NO. 16638)

Dear Mr. Cho:

On July 12, 2012, the LARWQCB approved soil cleanup goals for the former Defense Fuel Support Point (DFSP) Norwalk facility, located at 15306 Norwalk Boulevard, Norwalk, California. The approved cleanup goals included three ranges of total petroleum hydrocarbons (TPH), specifically C4-C12, C8-C17, and C5-C25 (where C represents carbon and the following number represents the number of carbons present in the hydrocarbon molecule).

However, longer chain hydrocarbons (C25 and greater) were not included in the list of approved site cleanup goals. To address the full range of hydrocarbons present in site soils, the Department of Logistics Agency - Energy (DLA Energy) and The Source Group, Inc. (SGI) reviewed the protocol used to develop the cleanup goals for soil.

The cleanup goals were based on the application of the LARWQCB's 1996 Interim Site Assessment and Cleanup guidebook (Guidebook). The Guidebook specifies that the soil cleanup goals should be calculated by the same general formula used by the United States Environmental Protection Agency (EPA) to calculate Soil Screening Levels (SSLs), as follows:

Soil cleanup goal = total attenuation factor x water quality standard

Table 4-1 of the Guidebook (Attachment A) includes maximum soil screening levels (SSL) for hydrocarbon compounds based on carbon range and depth to the underlying groundwater. As an example, at sites where the depth of the contamination is between 20

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to 150 feet, the C13-C22 hydrocarbons is 1,000 milligrams per kilogram (mg/kg), whereas the longer chain hydrocarbons in the C23-C32 range, a SLS of 10,000 mg/kg is derived based on the greater attenuation rate for longer chain hydrocarbons. As the length of the hydrocarbon chains increases, the corresponding SSL also increases. Conversely, for a given hydrocarbon range, as the depth to groundwater decreases so does the SSL (e.g., for the C13-C22 carbon range, the SSL for depth to groundwater between 20 and 150 feet is 1,000 mg/kg whereas the SLS decreases to 100 mg/kg when the depth to groundwater is less than 20 feet.

You will recall that the cleanup level approved for the Norwalk site with the longest-chain TPH values (C5-C25) is comparable to the SSL values provided for carbon range C13-C22 in the Guidebook Table 4-1. However, no cleanup goals were provided for longer chain hydrocarbon ranges in the July 12, 2012 correspondence. Below is a summary of the cleanup goals provided in the July 12, 2012, correspondence:

July 12, 2012 Approved Soil Cleanup Goals Depth Below Ground Surface	(feet below ground surface)					
	0.5	5	10	15	20	25
Depth to Groundwater	25.5	21	16	11	6	1
Constituent	Proposed Soil Cleanup TPH Goal (mg/kg)					
TPH as Gasoline (C4-C12)	500	500	100	100	100	100
TPH as JP-5 (C8-C17)	500	500	100	100	100	100
TPH as Diesel (C5-C25)	1,000	1,000	100	100	100	100

The July 12, 2012, LARWQCB Soil Cleanup goal table for TPH concentrations is proposed to reflect those levels provided in Table 4-1 of the RWQCB guidance as presented below.

Proposed Revised Soil Cleanup Goals Depth Below Ground Surface	(feet below ground surface)					
	0.5	5	10	15	20	25
Depth to Groundwater	25.5	21	16	11	6	1
Constituent	Proposed Soil Cleanup TPH Goal (mg/kg)					
Carbon Range C4-12	500	500	100	100	100	100
Carbon Range C13-C22	1,000	1,000	100	100	100	100
Carbon Range C23-C44	10,000	10,000	1,000	1,000	1,000	1,000

Carbon Ranges C4 to C12 concentrations will be determined with EPA Method 8260 analysis; Carbon Ranges C13 to C44 will be determined with EPA Method analysis.

The 2012 approved cleanup goals for volatile organic compounds (VOCs) will remain applicable to the site. For some VOCs, highlighted in red on the table included in Appendix B, laboratory techniques limit the achievable method detection limits, and therefore SGI/DLA propose that for these compounds the method detection limits values be considered acceptable as confirmation criteria.

DLA and SGI believe that this proposed cleanup goal addendum is consistent with site cleanup directives and the Guidebook, and we appreciate RWQCB's concurrence with this proposed addendum to allow for implementation of the soil remediation program underway

Attachment A

Table 4-1: Maximum Soil Screening Levels (mg/kg) for TPH, BTEX and MTBE above Drinking Water Aquifers

T P H	Distance Above Groundwater	Carbon Range			
		C4-C12	C13-C22	C23-C32	
	>150 feet	1,000	10,000	50,000	
	20-150 feet	500	1,000	10,000	
<20 feet	100	100	1,000		

B T E X & M T B E	Distance Above Groundwater	Lithology			
		Gravel	Sand	Silt	Clay
	150 feet	B=0.044 T=2 E=8 X=23 MTBE = 0.039	B=0.077 T=4 E=17 X=48 MTBE = 0.078	B=0.165 T=9 E=34 X=93 MTBE = 0.156	B=0.8 T=43 E=170 X=465 MTBE = 0.78
	120 feet	B=0.035 T=1.57 E=6.3 X=17.9 MTBE = 0.028	B=0.058 T=3.1 E=12.7 X=36 MTBE = 0.061	B=0.123 T=7 E=25.9 X=70.3 MTBE = 0.117	B=0.603 T=32 E=128 X=351 MTBE = 0.591
	100 feet	B=0.028 T=1.3 E=5.1 X=14.4 MTBE = 0.020	B=0.046 T=2.57 E=9.86 X=28 MTBE = 0.05	B=0.094 T=5.4 E=20.4 X=55.1 MTBE = 0.091	B=0.471 T=25 E=101 X=276 MTBE = 0.464
	80 feet	B=0.022 T=1 E=4 X=11 MTBE = 0.013	B=0.033 T=2 E=7 X=20 MTBE = 0.039	B=0.066 T=4 E=15 X=40 MTBE = 0.065	B=0.34 T=18 E=73 X=200 MTBE = 0.338
	60 feet	B=0.018 T=0.72 E=2.9 X=7.9 MTBE = 0.013	B=0.026 T=1.4 E=4.9 X=13.9 MTBE = 0.03	B=0.048 T=2.8 E=10.7 X=28.4 MTBE = 0.048	B=0.241 T=13 E=52 X=141.5 MTBE = 0.247
	40 feet	B=0.015 T=0.43 E=1.8 X=4.8 MTBE = 0.013	B=0.018 T=0.87 E=2.8 X=7.8 MTBE = 0.022	B=0.029 T=1.6 E=6.3 X=16.9 MTBE = 0.03	B=0.143 T=7.5 E=30 X=83 MTBE = 0.156
20 feet	B=0.011 T=0.15 E=0.7 X=1.75 MTBE = 0.013	B=0.011 T=0.3 E=0.7 X=1.75 MTBE = 0.013	B=0.011 T=0.45 E=2 X=5.3 MTBE = 0.013	B=0.044 T=2.3 E=9 X=24.5 MTBE = 0.065	

- TPH = Total petroleum hydrocarbons.
- BTEX = benzene, toluene, ethylbenzene, and xylenes, respectively. MTBE = methyl tertiary butyl ether.
- Respective MCLs (ppm): B=0.001, T=0.15, E=0.7, X=1.75, MTBE=0.013.
- BTEX screening concentrations determined per the attenuation factor method as described in RWQCB Guidance for VOC Impacted Sites (March 1996), with a natural degradation factor of 11 for BTEX and of 3 for MTBE. Table

- values can be linearly interpolated between distance above groundwater and are proportional to fraction of each lithological thickness.
- Values in Table 4-1 are for soils above drinking water aquifers. All groundwaters are considered as drinking water resources unless exempted by one of the criteria as defined under SWRCB Resolution 88-63 (TDS>3000 mg/L, or deliverability <200 gal/day, or existing contamination that cannot be reasonably treated). Regional Board staff will make a determination of potential water use at a particular site considering water quality objectives and beneficial uses. For non-drinking water aquifers, regardless of depth, TPH for ">150 feet" category in the table should be used.
 - Distance above groundwater must be measured from the highest anticipated water level. Lithology is based on the USCS scale.
 - In areas of naturally-occurring hydrocarbons, Regional Board staff will make determinations on TPH levels.

(revised 1/7/05)

ATTACHMENT B

TABLE 1
COMPARISON OF LABORATORY DETECTION LIMITS TO SOIL CLEANUP GOALS
DFSP Norwalk
15306 Norwalk Boulevard, Norwalk, California

	Acetone (mg/kg)	tert-Amyl Methyl Ether (TAME) (mg/kg)	Benzene (mg/kg)	Bromobenzene (mg/kg)	Bromochloromethane (mg/kg)	Bromodichloromethane (mg/kg)	Bromoform (mg/kg)	Bromomethane (mg/kg)	2-Butanone (MEK) (mg/kg)	tert-Butyl alcohol (TBA) (mg/kg)	sec-Butylbenzene (mg/kg)	tert-Butylbenzene (mg/kg)	n-Butylbenzene (mg/kg)	Carbon Disulfide (mg/kg)	Carbon Tetrachloride (mg/kg)	Chlorobenzene (mg/kg)	Chloroethane (mg/kg)	Chloroform (mg/kg)	Chloromethane (mg/kg)	2-Chlorotoluene (mg/kg)	4-Chlorotoluene (mg/kg)	1,2-Dibromo-3-chloropropane (mg/kg)	Dibromochloromethane (mg/kg)	1,2-Dibromoethane (EDB) (mg/kg)
STD Lab D/L	<0.050	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050
July 12, 2012 CGs (DTW = 25.5 ft bgs)	0.994	NE	0.015	NE	NE	NE	NE	0.0015	0.557	0.001	2.59	2.07	2.18	0.049	NE	0.119	2.23	0.0000738	NE	0.558	0.547	0.00025	NE	0.0000305
July 12, 2012 CGs (DTW = 1.0 ft bgs)	1.60	NE	0.012	NE	NE	NE	NE	0.0010	0.661	0.0016	0.129	0.110	0.114	0.023	NE	0.013	2.83	0.0000	NE	0.039	0.038	0.0000352	NE	0.0000096

	Dibromomethane (mg/kg)	1,2-Dichlorobenzene (mg/kg)	1,3-Dichlorobenzene (mg/kg)	1,4-Dichlorobenzene (mg/kg)	Dichlorodifluoromethane (R12) (mg/kg)	1,1-Dichloroethane (mg/kg)	1,2-Dichloroethane (EDC) (mg/kg)	trans-1,2-Dichloroethylene (mg/kg)	cis-1,2-Dichloroethylene (mg/kg)	1,1-Dichloroethylene (mg/kg)	1,2-Dichloropropane (mg/kg)	1,3-Dichloropropane (mg/kg)	2,2-Dichloropropane (mg/kg)	1,1-Dichloropropylene (mg/kg)	trans-1,3-Dichloropropylene (mg/kg)	cis-1,3-Dichloropropylene (mg/kg)	Diisopropyl ether (DIPE) (mg/kg)	Ethylbenzene (mg/kg)	Ethyl-tert-Butyl Ether (ETBE) (mg/kg)	Hexachlorobutadiene (mg/kg)	2-Hexanone (MBK) (mg/kg)	Isopropylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
STD Lab D/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0050	<0.010	<0.050	<0.0050	<0.0050
July 12, 2012 CGs (DTW = 25.5 ft bgs)	NE	NE	NE	NE	0.984	NE	0.000106	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.449	2.07	NE	NE	0.0073	5.56	2.82
July 12, 2012 CGs (DTW = 1.0 ft bgs)	NE	NE	NE	NE	0.167	NE	0.0000692	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.212	1.10	NE	NE	0.0047	0.303	0.154

	4-Methyl-2-pentanone (MIBK) (mg/kg)	Methylene Chloride (mg/kg)	Methyl-tert-Butyl Ether (MTBE) (mg/kg)	Naphthalene (mg/kg)	n-Propylbenzene (mg/kg)	Styrene (mg/kg)	1,1,1,2-Tetrachloroethane (mg/kg)	1,1,2,2-Tetrachloroethane (mg/kg)	Tetrachloroethylene (PCE) (mg/kg)	Toluene (mg/kg)	1,1,2-Trichloro-1,2,2-trifluoroethane (R113) (mg/kg)	1,2,3-Trichlorobenzene (mg/kg)	1,2,4-Trichlorobenzene (mg/kg)	1,1,1-Trichloroethane (mg/kg)	1,1,2-Trichloroethane (mg/kg)	Trichloroethylene (TCE) (mg/kg)	Trichlorofluoromethane (R11) (mg/kg)	1,2,3-Trichloropropane (mg/kg)	1,2,4-Trimethylbenzene (mg/kg)	1,3,5-Trimethylbenzene (mg/kg)	Vinyl chloride (mg/kg)	o-Xylene (mg/kg)	m,p-Xylenes (mg/kg)
STD Lab D/L	<0.050	<0.050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020
July 12, 2012 CGs (DTW = 25.5 ft bgs)	NE	0.000778	0.000907	0.270	2.18	0.463	NE	0.0023	NE	0.614	NE	0.0740	NE	NE	0.0032	0.0070	NE	0.000000874	2.10	2.06	NE	5.55	5.55
July 12, 2012 CGs (DTW = 1.0 ft bgs)	NE	0.000682	0.000686	0.012	0.114	0.030	NE	0.0002	NE	0.367	NE	0.0034	NE	NE	0.0008	0.0009	NE	0.000000123	0.120	0.118	NE	2.84	2.84

Notes:
 STD Lab D/L = standard laboratory detection limit.
 July 12, 2012 CGs (DTW = 25.5 ft bgs) = cleanup goals approved by RWQCB; DTW = 25.2 ft bgs.
 DTW = depth to water.
 ft bgs = feet below ground surface.
 mg/kg = milligrams per kilogram.
 RWQCB = Regional Water Quality Control Board.
 NE = cleanup goal not established.
 Red Font = STD Lab D/L is greater than the approved RWQCB Cleanup Goal.