UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

March 11, 2010

Mr. Joseph Kelly
Montrose Chemical Corporation
600 Ericksen Avenue, NE
Suite 380
Bainbridge Island, WA 98110

Subject: February 23, 2010 Request for Clarification of Comments for the Draft DNAPL Feasibility Study, Montrose Superfund Site, prepared by AECOM; Addendum to EPA comment letter dated January 27, 2010

Dear Mr. Kelly:

In follow up to EPA's January 27, 2010 letter transmitting our comments on Montrose's April 21, 2009 Feasibility Study for remediating Dense Non-Aqueous Phase Liquid (DNAPL) from beneath the Montrose Chemical Corporation Property, located at 20201 South Normandie Avenue, in Los Angeles California, we are submitting the following information as an addendum to our January 27, 2010 comments. This is in response to Montrose's request for clarification of EPA's comments, received on February 23, 2010 from Brian Dean of AECOM, as addressed in the responses provided below. Additional response to your request is provided in the attached Technical Memorandum (TM) and Excel workbook from Dr. Huntley which detail the technical basis for his revised estimates of chlorobenzene mass. We are also attaching a revised figure of chlorobenzene concentrations in the Bellflower Sand which pertains to EPA's General Comment No. 4 from our January 27, 2010 letter.

Clarification of EPA Comments:

1. General Comment No. 10: EPA indicated that Alternative 5a (steam injection over focused treatment area) "will remove 144,000 to 230,000 lbs of MCB (50 to 79 percent of the entire MCB mass)." Please provide calculations to support this estimated range of MCB mass removal by steam injection.

Response: The complete calculations are provided in the attached technical memorandum and associated workbook. In all cases, the focused treatment area is assumed to (1) be the same as the area defined by Montrose (in their worksheets), and (2) have peak dense nonaqueous phase liquid (DNAPL) concentrations of greater than 50,000 milligrams per kilogram (mg/kg). As explained in the attached TM and workbook, the estimate of monochlorobenzene (MCB) mass removed can be calculated by comparing the estimated initial mass of MCB in the focused treatment area of 244,922 pounds (lb) (see Table 2 of TM) to the estimated mass of MCB after the range of steam remediation results of 14,610 lb (see Table 5 of TM) to 100,909 lb (see Table 4 of TM). This results in an estimated removed mass of MCB of 144,000 lb to 230,000 lb. Given the initial mass of MCB over the entire area of 291,000 lb (see estimate of sum over all

areas in Table 2 of TM), the removal of 144,000 lb to 230,000 lb equates to a range of 50 to 79 percent removal of the entire MCB mass.

2. Specific Comment No. 4: EPA has estimated a DNAPL mass of 582,000 pounds using an alternate approach, including 80,000 pounds of mobile DNAPL. The comment indicates that "EPA will provide Montrose with the basis for the calculations." Please provide the calculations so that we may better understand EPA's development of these alternate mass estimates.

Response: A complete set of calculations is provided in the attached TM and associated workbook. Table 2 of the TM shows an estimate of 291,000 lb of MCB over the entire area. MCB is assumed in all cases to be 50 percent of the DNAPL mass, so the DNAPL mass is estimated to be 582,000 lb. The mobile mass is considered to be the mass that would be removed with a Hydraulic Displacement (HD) remedy. Comparison of the mass estimates from Table 2 of the TM (initial condition) and Table 3 of the TM (HD Remedy) indicates that 40,000 lb (i.e., 291,000 lb minus 251,000 lb) of MCB would be removed with HD, a-assuming that MCB is 50 percent of DNAPL; 40,000 lb of MCB is equivalent to 80,000 lb of DNAPL.

3. Specific Comment No. 9: EPA has estimated an MCB mass of 245,000 pounds in the focused treatment area (presumably 490,000 pounds of DNAPL). Please provide the calculations supporting the mass estimate within the focused treatment area. Please also confirm whether the focused treatment area assumed by EPA in these calculations differs in any respect from the 26,000 square foot area shown in Figure 5.11 of the draft DNAPL FS.

Response: As noted above, complete calculations are provided in the attached TM and associated workbook. The estimate of MCB mass of 245,000 lb in the focused treatment area is presented in Table 2 of the TM. This mass is estimated for the area of peak DNAPL concentrations greater than 50,000 mg/kg, which is assumed to be the focused treatment area (see Response to General Comment 1).

4. Specific Comment No. 9: EPA indicated an MCB mass removal efficiency up to 94% by steam injection based on an assumed residual MCB saturation of 0.5%. Please provide the basis and supporting calculation for the 0.5% residual MCB saturation.

Response: For the purposes of understanding the degree to which steam remediation might be effective, a wide range of post-remediation maximum DNAPL saturations was assumed. The 0.5 percent saturation is a value that was achieved at the Guadalupe Refinery steam pilot test within 15 feet of the steam injection wells. The nonaqueous phase liquid (NAPL) at that site was a diluent hydrocarbon admixture with a boiling point higher than that of the DNAPL at Montrose, so the 0.5 percent was taken to be a reasonable low end-member in the spectrum of possibilities.

5. Specific Comment No. 81: EPA indicated that "there may be 10,000 lbs of MCB already in the Bellflower Sand." Please provide calculations to support this MCB mass estimate.

Response: The estimate of 10,000 lb of dissolved phase chlorobenzene in the Bellflower Sand is a "back of the envelope" calculation based on an area to be treated of 160,000 square feet, an estimated thickness of the Bellflower Sands of 25 feet, an assumed porosity of the sand of 0.33, and an assumed dissolved-phase concentration of 100,000 micrograms per liter (μg/L). Based on these numbers, the calculated dissolved-phase mass would be 8,240 lb of chlorobenzene. This mass estimate should be considered very conservative, as it does not take into account adsorbed-

phase chlorobenzene or the very likely presence of DNAPL.

6. Specific Comment No. 131: EPA indicated that steam injection over the entire DNAPL impacted area would remove 143,000 to 262,000 pounds of MCB, representing 49 to 90 percent of the MCB mass. Please provide the calculations supporting these mass removal estimates.

Response: As noted above, complete calculations are provided in the attached TM and associated workbook. The estimate of MCB mass removed can be calculated by comparing the total estimated initial mass of MCB of 291,000 lb (see Table 2 of the TM) to the estimated mass after the range of steam remediation results of 29,000 lb (see Table 5 of TM) to 147,700 lb (see Table 4 of the TM). This results in an estimated removed mass of MCB of 143,000 lb to 262,000 lb (i.e., 49 to 90 percent of the estimated initial mass).

If you have any further questions, please feel free to call me at (415) 972-3150.

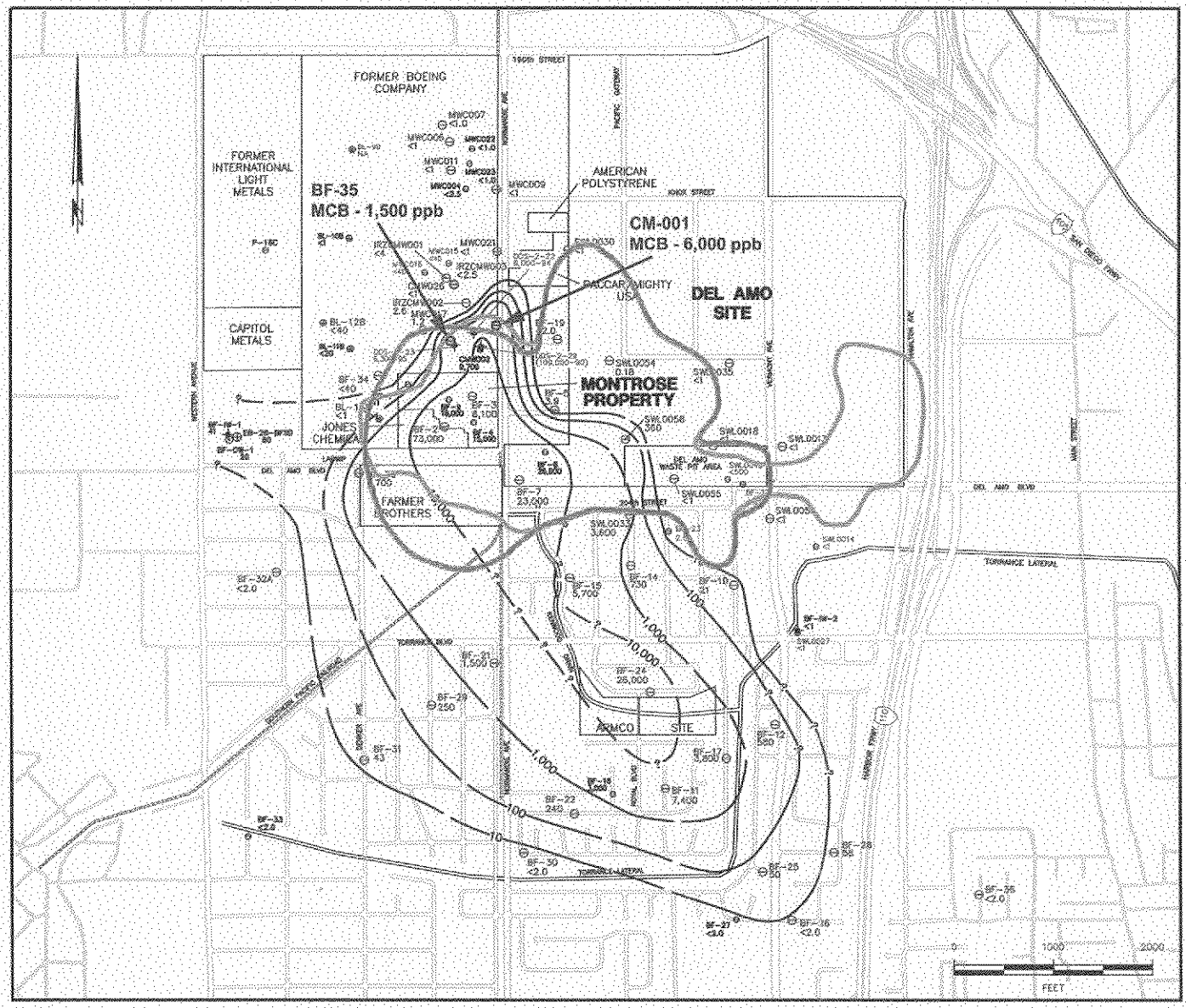
Sincerely,

Carolyn d'Almeida
Remedial Project Manager

Enclosures

cc: Mike Palmer, deMaximus
Paul Sundberg
Brian Dean, AECOM
Mark Schultheis, Geosyntec
Karl Lytz, Latham & Watkins
Kelly Richardson Latham & Watkins
Safouh Sayed, DTSC-Cypress
Natasha Raykhman, CH2MHill

BOE-C6-0060300



EXPLANATION

BF-28	BELLFLOWER SAND MONITOR WELL
58	CONCENTRATION IN MICROGRAMS PER LITER, SAMPLED SEPTEMBER – NOVEMBER 2006
BF-15	BELLFLOWER SAND MONITOR WELL
8,300	CONCENTRATION IN MICROGRAMS PER LITER, COLLECTED BETWEEN SEPTEMBER 2006 AND 2004
BF-23	BELLFLOWER SAND MONITOR WELL
2.9	COLLECTED PRIOR TO 2004
BF-EW-1	BELLFLOWER SAND EXTRACTION WELL
BF-IW-1	BELLFLOWER SAND INJECTION WELL
BF-OW-3	BELLFLOWER SAND OBSERVATION WELL
DGS-2-22	BOEING HYDROPUNCH SAMPLE LOCATION
6,000-94	CONCENTRATION IN MICROGRAMS PER LITER SAMPLE COLLECTION DEPTH SAMPLED PRIOR TO SEPTEMBER 2006
BL-12B	CLUSTER WELL
EB-26-BFSD	EXPLORATORY BORING AND TEMPORARY BELLFLOWER SAND MONITORING WELL
NA	NOT ANALYZED
(100,000)	CONCENTRATION NOT CONTOURED

?——100——?

CONTOUR LINE OF EQUAL CONCENTRATION OF CHLOROBENZENE IN MICROGRAMS PER LITER DASHED WHERE APPROXIMATE, QUERIED WHERE INFERRED BASED ON MOST RECENT SAMPLING RESULTS.

< = LESS THAN; NUMERICAL VALUE IS THE LIMIT OF DETECTION FOR THIS ANALYSIS.

WELL IDENTIFIER NOTES:
BF = MONTROSE MONITOR WELLS
SWL = DEL AMO MONITOR WELLS
WCC, MWC, CMW = BOEING MONITOR WELLS
IRZCMW = BOEING BIOREMEDIATION WELLS
BL = INDUSTRIAL LIGHT METAL MONITOR WELLS

TI WAIVER ZONE EXTENT
MBFB = MIDDLE BELLFLOWER B-SAND

TI WAIVER ZONE EXTENT
MBFC = MIDDLE BELLFLOWER C-SAND

MONTROSE CHEMICAL CORPORATION OF CALIFORNIA
TORRANCE, CALIFORNIA

CHLOROBENZENE
BELLFLOWER SAND

HARGIS + ASSOCIATES, INC
Hydrogeology/Engineering

08/07

PREP BY GLW REV BY MAP RPT NO.857.50e 210-3073 H

BOE-C6-0060302