RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
General Comments:		
1.	For a reader who lacks familiarity with this site, the Executive Summary is hard to follow. Please add headings. Possible headings might be "Purpose of SGI" located between first and second paragraphs; "Investigation" located at the top of ES-2; "Findings of SGI" located on ES-2 between fifth and sixth paragraphs; and "Conclusions" on page ES-7, to include the last two paragraphs. Possible sub headings might include "IRP Site 9" on page ES-3, before the first complete paragraph and "IRP Sites 12 and 13" on page ES-7 before sentence starting "Based on the."	The review comment is acknowledged; however, established report formatting guidelines for this program does not encourage the use of headings within the Executive Summary. Therefore, no such headings will be included in the text.
2.	Throughout the report, data on figures and tables are labeled "This Investigation". Since these figures or tables may be reproduced for use in oral presentations or in other reports, please change the phrase to "SGI" or "Supplemental Groundwater Investigation."	The title block on each of the report figures and the footer on the report tables indicate that they are from the Supplemental Groundwater Investigation (SGI) Report. Therefore, this change is not necessary. It is the responsibility of the person(s) and/or organization(s) using the SGI Report figures and tables to correctly and clearly reference them. Therefore, this recommended change to the SGI report will not be incorporated.
3.	The report is difficult to follow because some of the findings of this investigation were included in Chapter 3 and some were discussed in Chapter 5. Please make it clear at the beginning of Chapter 3 that recent findings related to the geology and hydrogeology are included in this chapter. Also, consider changing the title of Chapter 5 to indicate that this section includes findings related to a photo analysis and chemical data related to the contaminants of concern. The	We concur with this review comment. A review of the report structure indicates that the findings associated with the geology and hydrogeology needs to be defined before discussing contaminant distribution in groundwater in the various hydrogeologic intervals. Likewise, the geologic and hydrogeologic findings must be discussed so that appropriate screening criteria can be selected. A statement will be added to the beginning of Section 3 indicating that this section includes findings from the SGI on the geology

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
	data quality objectives section should be moved to follow Chapter 2.	and hydrogeology encountered at Installation Restoration Program (IRP) Sites 9, 12, and 13 of the Long Beach Naval Shipyard (LBNSY).
4.	The boundaries of IRP Site 9 are inconsistent on the figures (i.e. Figures 1-2 and 1-3). Please check the site boundaries on the figures throughout the report to ensure consistency.	We agree with this review comment. All figures will be reviewed to assure that the correct IRP Site 9 boundaries are being depicted.
5.	The major shortcomings of the tidal study were that water levels in wells completed in the lower intervals were not monitored simultaneously and the water level measurements were not made for a minimum period of 72 hours.	A review of the tidal study (both method and monitoring data) indicates that although the mechanics of the study were less than ideal, the outcome of the study is virtually unaffected. In a worst case scenario, the maximum anticipated variation between the existing calculated groundwater surface and a groundwater surface calculated from ideal data is less than a few hundredths of a foot.
6.	The specific methods used to measure water levels for the tidal study are not included in the report. The specific methods used should be included in either Appendix A or B. Please specifically discuss how transducer measurements were converted to water level elevations.	Section A5.1 details how water level measurements were made during the tidal study. However, to reduce any further possible confusion, a new section will be added to Appendix B detailing what field methodologies were used during only the tidal study.
7.	The document appears to be advocating a "natural attenuation" approach to many of the units. If this is the intent, EPA guidance documents on requirements for documenting natural attenuation should be reviewed to determine the level and types of data required to propose as a viable alternative for the site. As it stands, the report has a large number of speculations without providing supporting data or explanations.	The review comment is acknowledged. The SGI does not provide recommended remedial alternatives. A complete assessment of remedial alternatives that might be used at the LBNSY will be performed as part of the Feasibility Study (FS). If during the FS additional data are required to support the selected remedial alternative(s) being proposed, then the data will be collected (either during the FS (or during the pilot test stage) to justify the use of the selected alternative.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
Specific Comments:		
1.	Page ES-2 paragraph 2. Several paragraphs in the Executive Summary appear to be out of order. Please consider ending the second paragraph on p. ES-1 after the reference to BNI 1997a and starting the next paragraph with "The Final RI Report (BNI 1997a) defined the hydrogeology beneath the LBNSY as consisting of two major water-bear intervals in the near surface (upper approximately 100 feet). The hydrogeologic characteristics of the deeper of these zones, the lower coarser-grained, water-bearing interval (lower interval), were not assessed as part of the RI. During the RI six groundwater areas of potential concern (GWAOPCs) were identified in these two intervals beneath IRP sites 9, 12 and 13." Please delete the sentence in the second paragraph starting with "However" and the second paragraph on page ES-2.	We concur with this review comment. The order of the paragraphs in the Executive Summary will be reviewed and modified as necessary to improve overall flow of the text. Likewise the need for the second paragraph on page ES-2 will be reviewed. If the review indicates that this paragraph can be eliminated, then it will be eliminated.
2.	Page ES-1, bullets. These GWAOPC descriptions should be accompanied by figures that show the locations of these AOPCs.	We do not agree with this review comment. The Executive Summary is intended to provide a short, concise overview of the report. Typically, figures are not placed in the Executive Summary. Two (2) figures have been already placed into the Executive Summary to aid the reader in understanding the complex nature of the subsurface conditions. The addition of four more figures into the Executive Summary will further weaken its summary role. Therefore, this change will not be incorporated into the text.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
3.	Page ES-1, first bullet. Please add "water-bearing" between "upper" and "interval."	We concur with this review comment. The phrase will be modified to read: "upper coarse-grained, water-bearing interval (upper interval)".
4.	Page ES-1, third bullet. Please add "water-bearing" between "lower" and "interval."	We agree with this review comment. The phrase will be modified to read: "lower coarse-grained, water-bearing interval (lower interval)".
5.	Page ES-2, paragraph 3, third line. In place of "existing subsurface conditions" please add a phrase like "complications resulting from artesian conditions in the interval." This would be much clearer for the reader, because the phrase "existing subsurface conditions" does not explain what the problem was.	We concur with the reviewers statement that the use of "existing subsurface conditions" may be a little too vague to describe what was really encountered in the field while trying to install the groundwater monitoring wells into the lower interval. This sentence will be re-written to describe the heaving sands and the artesian-like conditions encountered when drilling was advanced into the lower interval.
6.	Page ES-2, paragraph 5. Please add a sentence at the beginning of this paragraph stating the dates during which the field activities were conducted.	We agree with this review comment. A sentence will be added to the fifth paragraph on page ES-2 which summarizes the start and stop dates for field activities of the SGI.
7.	Please add the following to the list of Acronyms: ARCH, DTSC, IAS, NFES, POLB, RCB.	We concur with this review comment. A global search of the document will be performed to assure that all acronyms have been defined in the text and included in the Acronym List at the beginning of the report.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
8.	Section 1.1.2, last paragraph. This paragraph does not make sense. Please clearly state why the source of groundwater contamination could not be characterized. Then explain the changes that were made and how they impact the SGI report.	We concur with the review comment. The last paragraph of Subsection 1.1.2 will be modified to include discussion on why the sources of contamination could not be fully characterized using the Remedial Investigation (RI) Work Plan and how changes were made to the technical approach so that contaminant plumes could be delineated in groundwater.
9.	Section 1.2.1, p. 1-9, first sentence. Please add "and the surrounding area as shown in Figure 1-2" at the end of the sentence because IR-Site 9 extends beyond Building 129 as described in Section 1.2.1.	We concur with this review comment. Section 1.2.1 (page 1-9) first sentence will be modified to include the text "and the surrounding area as shown in Figure 1-2," at the end of the sentence.
10.	Section 1.2.2, p. 1-11. This section should also introduce Site 13. Please add a reference to IRP Site 13 and its historical use as a tank farm.	We concur with this review comment. Section 1.2.2 (page 1-11) will be modified to include IRP Site 13 and provide a brief discussion of its historic use as a tank farm.
11.	Section 1.2.2.1, p. 1-11, first paragraph, line 7. Please change "borders the site on the" to "borders Site 12 on the," to help the reader more easily understand the relationship between the sites.	We concur with this review comment. Section 1.2.2.1 (page 1-11), first paragraph, fourth sentence (line 7) will be modified to read: "IRP Site 13 borders IRP Site 12 on the south".
12.	Section 1.3.5.1, p. 1-16, paragraph 2. Please add "from the RI" after "analytical results," so the reader clearly understands that the SGI data is not discussed in this section.	We concur with this review comment. Section 1.3.5.1 (page 1-16), paragraph 2 will be modified to read: "The following sections present a summary of the VOC analytical results from the RI (BNI 1997a) for groundwater of the upper and lower intervals."

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
13.	Table 2-3, p. 2-26. This table appears to have been copied verbatim from a Work Plan. Please change "Requested Analyses" to "Performed Analysis" (see Table 2-7).	We concur with this review comment. The title of Table 2-3 (page 2-26) will be modified to read as follows: "Summary of Subsurface Soil Sample Locations and Performed Analyses".
14.	Section 3.1, p. 3-1, paragraph 1, line 5. Please clarify that the modifications and updates were based upon results of the SGI field investigations. Refer above to General Comment number 3.	We concur with this review comment. As indicated in the response to General Comments Number 3, the introductory part of Section 3 will be modified to explain that the findings for geology and hydrogeology during the SGI are included in this section. The geologic and hydrogeologic findings need to be presented in Section 3 so that appropriate screening criteria can be selected for the lower interval, and the distribution of contaminants in groundwater can be discussed. A statement will be added to the beginning of Section 3 indicating that this section includes the SGI findings for the geology and hydrogeology at Installation Restoration Program (IRP) Sites 9, 12, and 13 of the Long Beach Naval Shipyard (LBNSY).
15.	Figure 3-1. This figure lacks a scale and north arrow.	We concur with this review comment. A north arrow and a scale will be added to Figure 3-1.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
16.	Section 3.2.2.1, last paragraph. Please add the range for the depth of the Lynwood Aquifer under Terminal Island.	Based on the data quality objectives (DQOs), the depth at which the Lynwood Aquifer exists beneath the Terminal Island area was not required knowledge. Based on Figure 3-9, the Lynwood Aquifer is present at a depth of approximately 450 feet below ground surface. However, for the sake of completeness, under the heading entitled "Lower Pleistocene Deposits – San Pedro Formation" (page 3-29), a reference depth to the top Lynnwood Aquifer will be included.
17.	Section 3.2.2.3, p. 3-4. To help correlate the groundwater withdrawal and injection programs with the regional hydrogeology and local flow patterns, please add a table listing all of the parties injecting or withdrawing water, oil or waste water, what they are injecting or withdrawing; the purpose of the injections; the water-bearing unit or aquifer affected; approximate depth range, and dates injection began and ended.	Based upon our review of the DQOs for this investigation, the objective of this investigation was to determine if past LBNSY activities were the source of the benzene plume detected in the lower interval. The DQOs did not indicate that if the Navy was determined not to be the source of the benzene in the lower interval, then the investigation would identify the party (or parties) responsible for the release of the benzene (and other associated compounds) somewhere to the north of the facility. Substantial time and effort would be needed to gather this type of information for inclusion into the report. For this reason, we do not agree with the reviewer's comment that this information should be included in the SGI Report.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
18.	Section 3.3.2.1, p. 3-75, last paragraph. The term "dampened" is used to compare tidal fluctuations between the first and second weeks of the survey. Replace the term "dampened" because it is not the most inappropriate term to describe the observed phenomena. Provide the tidal range for the second week.	We concur with this review comment. Section 3.3.2.2 (page 3-75), third paragraph, first sentence will be modified to read as follows: "According to the NAVSTA RI Report and the LBNSY RI Report (BNI 1996a; 1997a), tides in the harbor fluctuated between 0 and 7 feet MLLW during the first week of the survey, and decreased to between .5 and 5 feet MLLW during the second week of the survey."
19.	Section 3.3.2.1, p. 3-79, paragraph 2. Another contributing factor to the absence of tidal fluctuations in the upper interval is that water in the upper interval is under unconfined conditions.	We concur with this review comment. Section 3.3.2.1 (page 3-79), paragraph 2 (second sentence) will be modified to include the observation that the upper interval is under unconfined conditions and that it is anticipated that the lateral extent of the area being influenced by tidal fluctuations would be less than that observed under confined conditions.
20.	Section 3.3.2.1, p. 3-79, paragraph 3. Define the term "strong" when describing groundwater fluctuations. It is better to use specific water level fluctuations or tidal efficiency rather than using the term strong, significant or lesser degree.	We concur with the spirit of the review comment; however, the term strong is used in general terms in this paragraph to reflect the observed similarities in responses between monitoring well MW-5-01 and the stilling well. It does not single out a specific moment in time for actual comparison. Identical wording has been used in the Long Beach Naval Station (NAVSTA) and LBNSY RIs without modification. The use of the word "strong" will continued to be used in this document for the sake of consistency.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
21.	Section 3.3.2.1, p. 3-79, last paragraph. Specify the number of groundwater monitoring wells that were completed in the upper and lower intervals. According to Appendix B, five shallow monitoring wells were installed, but the total number of wells completed in each interval is unclear.	Table 3-4 (page 3-83) provides a complete summary of the monitoring wells used during the groundwater monitoring portion of the investigation at the LBNSY. Table 3-4 also summarizes when individual groundwater monitoring wells were monitored during the investigation. As can be seen from Table 3-4, a total of 16 groundwater monitoring wells were installed during the SGI. Monitoring wells installed during the SGI have SGI as-part of their identification number for ease of reference. Of the 16 groundwater wells installed during the SGI, a total of ten (10) groundwater monitoring wells were completed in the upper interval and six (6) deep, temporary monitoring well points were completed in the lower interval, as indicated on Table 3-4. The five (5) shallow monitoring wells referred to in Appendix B are the five (5) shallow monitoring wells associated with five (5) monitoring well clusters originally called for by the SGI Work Plan. Of these five (5) shallow groundwater monitoring wells, only three (3) monitoring wells were installed during the SGI. The other two (2) groundwater monitoring wells were installed during the RI. The text of Appendix B is very carefully written to indicate that the five (5) shallow monitoring wells were sounded (not installed as the reviewer has indicated) as part of the assessment of the water levels and hydraulic gradient of the lower interval.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		Based on our experience, Table 3-4 seems to be the best way to present which wells were installed during this investigation, monitored during the course of this study, and the time periods during which each well was sounded. A similar approach was used in the NAVSTA and LBNSY RI Reports and found to be adequate by the agencies at that time.
22.	Section 3.3.2.1, p. 3-88, paragraph 1. The water level adjustment factor of 0.24 is not consistent with the discussion in Appendix B where it is stated to be 0.16 foot. Please describe the purpose of the water level adjustment and discuss whether omitting this factor would influence the understanding of the groundwater flow system at the site.	We concur with the reviewer's comment. The water level adjustment of 0.16 shown in Appendix B is the correct value and the text of Section 3 will be modified to match Appendix B. As indicated in the SGI Report, groundwater monitoring of the lower interval was performed during two different time period (August 12-14 and August 25-28, 1997) using two different sets of deep, temporary monitoring well points. To account for mean sea level changes between the two monitoring events, a correction was applied to points monitored during the August 12-14, 1997 event. Omitting this correction factor would mean that data from the two separate monitoring events would have to be used individually. This would limit the data sets to a maximum of three deep, temporary monitoring well points at a time rather than the entire data set (five [5] deep, temporary monitoring well points excluding MW-SGI-04). The reduction in the number of data points may impact how the groundwater elevation surface for the lower interval is contoured.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
23.	Section 3.3.2.1, p. 3-88, paragraph 2. Speculate on the anomalous water levels in MW-SGI-04. Are the water levels lower and higher than expected? It is appropriate to omit MW-SGI-04 in constructing the groundwater elevation contour map, but the discussion should be more specific.	We do not concur with review comment. Based on our experience, including speculation in a report is usually a nonproductive use of resources. The reasons for the exclusion of the water level from MW-SGI-04 in preparing the groundwater elevation contour map for the lower interval were presented in the text of Section 3 and in Appendix B. In our opinion, no further comment is warranted in the report.
24.	Section 3.3.2.1, p. 3-88, last paragraph. Substitute the term "flat" for "horizontal."	We concur with reviewers comment. Section 3.3.2.1 (page 3-88), last paragraph will be modified. The term "flat" will be substituted for "horizontal".
25.	Section 3.3.2.1, p. 3-97, paragraph 2. Include the dates when the water level measurements were taken.	We concur with this review comment. Section 3.3.2.1 (page 3-97), paragraph 2, first sentence will be modified to read as follows: "Figure 3-29 shows the groundwater surface elevation contours in the upper interval on the same day as above (29 October 1998) except between 12:30 and 15:00 or during low tide."

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
26.	Section 3.3.2.1, p. 3-97, paragraph 3. Substitute the term "velocity" for "flow rates" to avoid confusion with flow volume.	We concur with this review comment. Section 3.3.2.1 (page 3-97) paragraph 3, first sentence will be modified to read as follows: "According to the LBNSY RI Report (BNI 1997a), using Darcy's Law, a range of groundwater velocities (with the Darcy flux [gradient] ranging from 0.002 to 0.013 ft/ft per above) is estimated to be approximately 0.02 to 6 inches per day, or 1 to 180 ft/yr for the upper interval."
	It is unclear how effective porosity was determined from slug and/or pumping recovery tests. It s likely that the effective porosity was an assumed parameter.	We concur with this review comment. Section 3.3.2.1, (page 3-97, third paragraph, last sentence) will be modified to read as follows: "The hydraulic conductivity values were developed from slug and/or pumping recovery tests performed in wells screened in the upper interval during the RI with an assumed effective porosity of 0.3 (BNI 1997a)."
27.	Section 3.3.2.1, p. 3-102, paragraph 1. Please include the calculated vertical gradients for comparison with horizontal gradient.	The calculation of the vertical groundwater gradient is not necessary. Pore pressure dissipation testing, measured groundwater levels, and the artesian-like conditions encountered in the field during monitoring well installation in the lower interval indicate an upward vertical gradient. Based on this compelling evidence, an upward vertical gradient exists in the lower interval. This satisfies one of the inputs to decisions required in Step 3 (see Section 4.1.2.3, entitled "Identify Inputs to Decisions" of the SGI

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		Work Plan) of the seven-step DQO process. The calculation of a vertical gradient for the lower interval beneath the western portion of the shipyard does not add to the decision making process; therefore, the calculation is not necessary.
28.	Figure 3-6. It is difficult to see the pertinent information with all of the background information on this figure. Perhaps the background could be slightly screened so that the relevant information can be found. There is no scale. Please add "FIGURE 3-9" after "LOCATION OF CROSS SECTION A-A'."	The review comment is acknowledged. Figure 3-6 is from the RI Report and very little can be done to improve its overall quality. However, the note "FIGURE 3-9" will be added to the figure as requested.
29.	Figures 3-17 through 3-22. On each of these figures, please reference Figure 3-16 for cross section locations.	A review of Figures 3-17 through 3-23 indicates that the reference to the base map showing cross section locations and alignments (Figure 3-16) is on Figure 3-23 under the notes column. A reference to Figure 3-23 is present on the bottom of Figures 3-17 through 3-22. Therefore, a note referring to Figure 3-16 at the bottom of each cross section is not necessary.
30.	Table 3-8, p. 3-111, Note j. Please change "question" to "questionable".	We concur with this review comment. The text of Note j on Table 3-8 (page 3-11) will modified as requested.
31.	Table 3-10. ORP and eH are used interchangeably in the text in later sections. Include a footnote explaining the conversion required to corrected ORP measurements (based on silver/silver chloride reference) to eH (based on platinum/hydrogen reference).	We concur with this review comment. Note "g" on Table 3-10 will be modified to include the conversion formula that will allow the ORP values shown on the table to be converted to eH values used elsewhere in the report.
32.	Table 5-1, p. 5-5, 1958, line 3. Please clarify if the word "spilled" should be inserted before "liquid," or if a pool of liquid is visible on the photograph.	Comment acknowledged. Text will be reworded to imply the dark area appears to be pooled liquid.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
33.	Section 5.1.2.1, p. 5-8, bullets. Please include a figure for each of the significant source areas indicated on the figure.	The general locations, applicable GWAOPC, and references pertaining to potential source areas are tabulated in Tables 5-2 and 5-4. These areas were investigated during the SGI and/or previous investigations. Analytical data obtained from these areas are shown on numerous figures throughout Section 5.
34.	Section 5.2.1.2, p. 5-27. This first paragraph is almost a direct quote from page 2-5, except in Section 5 the dates are 1997 and in Section 2 1998 is used. Please resolve this discrepancy. There are other examples of redundancies in Chapters 2 and 5. This makes the document longer and is confusing to the reader. Perhaps the purpose of each of these two chapters should be re-evaluated and the material reorganized.	The correct date is 1997. The text in Section 2 will be revised as appropriate. Sections 2 and 5 will also be evaluated for redundancies and revised as appropriate.
35.	Section 6.2.1.2, p. 6-5, paragraph 4. The text states "Based on the VOC data collected from this area, releases occurring near MW-SGI-14 are apparently the source...." Expand the discussion to describe how the data lead to this conclusion.	Review Comment is acknowledged. Section 6.2.1.2 (page 6-5) paragraph 4, sixth sentence will be rewritten as follows: Based on the VOC data collected from this area, releases occurring near MW-SGI-14 are apparently the source for the PCE plume in the groundwater under Building 128. Key supporting evidence for this conclusion are: 1) The northeast trending groundwater flow direction beneath this Building 128; 2) soil gas data (including the results for PCE) which have higher detected concentrations for PCE to the southwest of IRP Site 9; and 3) the typical degradation pathway for chlorinated-VOCs which indicates that PCE is a typical parent product rather than breakdown product.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
36.	Section 6.2.1.2, p. 6-6, paragraph 1. The last sentence of this paragraph implies that the VOCs detected in soil are a result of partitioning from groundwater to soil vapor and then to soil. This is highly unlikely given the Henry's law constants and K_{oc}s for PCE and TCE. Provide calculations to estimate soil partitioning from vapor phase transport of PCE in the vadose zone to support this speculation.	We concur with this response comment. Section 6.2.1.2 (page 6-6) paragraph 1, will be modified to read as follows: "Other soil AOPCs identified in Tech Memo No. 2 (BNI 1998), including AOPCs N-2 through N-8, do not appear to be major source areas (Figure 5-16). AOPCs N-2 through N-8 are located down gradient of the groundwater plume originating from AOPC N-1. Significant VOC concentrations were not found during the soil sampling conducted at these AOPCs. Chlorinated-VOCs were not detected in any of the soil samples collected from AOPCs N-2 through N-8. Low levels concentrations of non-chlorinated VOCs were reported in the soil samples collected from AOPC N-5 that is located down-gradient from AOPC N-1." Calculations for estimating soil partitioning coefficients are not necessary due to the modification of the statement.
37.	Section 6.2.1.2, p. 6-6, paragraph 3. It is stated that "..., the migration of the COPCs in the upper interval appears to have been significantly attenuated by degradation." Other explanations which should be discussed in the text include (1) While some degradation has occurred, the degradation products are more mobile than the parent PCE and TCE and, thus, the parent compound concentrations fall off faster from the source and (2) In addition to degradation, dilution has reduced contaminant concentrations in groundwater as migration downgradient from the source occurs.	We agree with this review comment. We will modify Section 6.2.1.2 (page 6-6) paragraph 3 as follows: "Based on the COPC concentrations presented in Figure 5-4, the migration of the COPCs in the upper interval appears to have been affected by: 1) attenuation by degradation; 2) the fact that the mobility of some breakdown by-products are greater than that for the parent products (PCE and TCE); and, therefore the parent compound concentration fall faster from the source; and 3) dilution has reduced contaminant concentrations in groundwater as migration down-gradient from the source occurs."

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
38.	Section 6.2.1.2, p. 6-6, paragraph 4. Provide information in the text regarding carbon disulfide concentrations detected so a reader can determine if the amounts are significant or not. Expand the text to include a discussion of the potential mass of other VOCs (aromatics and acetone) available for cometabolism by microorganisms which may degrade PCE and TCE to determine if this is a viable process at this location.	We will include the maximum detected value for carbon disulfide in GWAOPC 1 during the SGI. Section 6.2.1.2 (page 6-6) paragraph 4, third line will be modified as follows: "The detection of carbon disulfide at several locations within GWAOPC 1, at a maximum concentration of 1.6 µg/L, suggests that the biodegradation of organics in the subsurface is active." The calculation of the potential mass of other VOCs (aromatics and acetone) is not necessary at this time. The selection of remedial alternatives to be used in the clean-up of the site is performed as part of the feasibility study (FS). If during the FS, the selected remedial alternative requires this supporting data, then it will be calculated.
39.	Section 6.2.1.2, p. 6-6, last sentence and top of p. 6-7. Expand the text to include a discussion of degradation rates so the time required for remediation can be assessed.	Calculation of degradation rates were not a DQO, nor was it a required input to the decision making process for achieving the DQOs. Similar to the later half of the response to review comment number 38, the calculation of degradation rates may be performed as part of the evaluation of the remedial alternatives during the FS, if determined necessary.
40.	Section 6.2.1.2, p. 6-7, paragraph 2, last sentence. It is stated that "The SGI has delineated the extent of this plume; however, a source could not be identified." This statement indicates that the plume has not been delineated since the upgradient portion has not been well defined.	We disagree with this review comment. Beneath the northern portion of Building 128 the groundwater flow direction is towards the east-northeast. This means that the up-gradient portion of the tetrachloroethene (PCE) and vinyl chloride (VC) plume is within Building 128 and to northwest of Building 128. Within these areas the maximum limits of the plume have been defined by sample points HP-SGI-07,

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		HP-SGI-08, HP-SGI-32, and HP-SGI-36 (see Figures 5-6, 5-7, and 5-8). Because the detected concentrations of PCE and VC were just above the criteria used to define the plume, the actual limits of the plume were thought to be slightly less than the maximum as is shown in the Draft SGI Report. As part of the SGI, potential vadose zone sources within Building 128 (including the northern portion of the building) were investigated. A vadose zone source for the detected chlorinated-VOCs in the groundwater to the north of Building 128 could not be identified. Based on these facts, and as indicated in the Draft SGI Report, the SGI has delineated the extent of the plume but could not identify the source of the plume.
41.	Section 6.2.2.2, p. 6-9, paragraph 2. Provide information in the text regarding carbon disulfide concentrations detected so a technical reader can evaluate if the amounts are significant enough to support alkyl chloride degradation.	We will include the maximum detected value for carbon disulfide in GWAOPC 2 during the SGI. Section 6.2.2.2 (page 6-9) paragraph 2, sixth sentence will be modified as follows: "In addition to the presence of degradation compounds, the reporting of carbon disulfide at a maximum concentration of 0.8 µg/L in some of the samples collected from within the GWAOPC 2 plume supports the conclusion that the geochemical conditions in the subsurface environment are favorable for the degradation of organics in the subsurface."
42.	Section 6.2.2.2, p. 6-10, paragraphs 1 and 2. It is stated that vinyl chloride can be readily oxidized in the vadose zone. While vinyl chloride can undergo aerobic oxidation, the rate is generally slow.	The review comment is acknowledged. The text of Section 6.2.2.2 (page 6-10) paragraphs 1 and 2 will be revised to indicate that vinyl chloride is not rapidly oxidized.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
43.	Section 6.2.3.1, p. 6-11, paragraph 1. The absence of MTBE may also be a result of higher detection limits typically obtained for this compound. Discuss MTBE reporting limits compared to those achieved for the BTEX compounds.	We concur with review comment. A review of the method detection limits for the MTBE and BTEX compounds indicates that MTBE has a method detection limit (typically 0.5 ppb) that is one order of magnitude greater than that for the BTEX compounds (typically, 0.05 ppb or greater). The use of the phrase "The absence of MTBE in the lower interval" is relative to the method detection limit for that specific compound. It is possible for a compound to be present in a matrix at a concentration less than the method detection, while the result indicated non-detect for that particular compound. Section 6.2.3.1 (page 6-11), paragraph 1, second sentence will be modified to read as follows: "The absence of detectable concentrations of MTBE in the lower interval suggest that the sources, may have originated before the 1980s." The key item of importance is that the method detection limit for MTBE is 0.5 ppb, whereas the drinking water action level is 35 ppb.
44.	Section 6.2.3.2, p. 6-11. Include the normal range of groundwater sulfate for the facility. Indicate if reduced sulfur species such as sulfite or sulfide were analyzed.	We concur with this review comment. We will expand the discussion to include the sulfate range and the analysis of other sulfur species.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
45.	Section 6.2.3.2, p. 6-12, paragraph 2. Provide TOC concentrations and show results of calculations (using TOC and groundwater flow conditions) to estimate predicted benzene/BTEX ratios and compare them with the ratios actually found. It should be noted that ratios should also be expected to vary based strictly on solubility differences among the aromatic compounds.	This request for calculations is outside the scope of the SGI. The concentrations of BTEX are below their respective solubilities, thus no difference in ratios should be seen due to differences in solubility.
46.	Section 6.2.3.2, p. 6-12, paragraph 3. Based on the discussion of benzene/BTEX ratios in the text and the contours presented for IRP Site 10 in Figure 6-2, it appears that the source of contamination at IRP 10 is on site since ratios increase toward the north. Please explain.	We do not concur with the review comment that the B/BTEX ratios indicate that IRP Site 10 is the source of the contamination. As indicated in Section 6.2.3.2 (page 6-12), paragraph 3, ninth sentence "the benzene (B)/benzene-toluene-ethylbenzene and xylenes (BTEX) ratios also suggest that there might have been more than a one-time release." The B/BTEX ratios depicted in the IRP Site 10 area on Figure 6-2 are indicative of the multiple release scenario (to the north of the LBNSY) at different points in time. This over-printing of the plumes (and subsequently the B/BTEX ratios) can be seen on Figure 6-2 near HP-SGI-78 and is conceptually depicted on Figure 6-3. The text of Section 6.2.3.2 (page 6-12), third paragraph, tenth sentence will be modified as follows to improve the overall clarity of the section: "The B/BTEX ratios suggest that the arrival of new plumes may have caused the B/BTEX ration to show some high values near MW-SGI-01 and HP-SGI-78."

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		In addition, Figure 6-2 will be modified to include the .40 B/BTEX contour in the area of IRP Site 10, and Figure 6-3 will be modified as discussed in response to review comment number 48 (below).
47.	Figure 6-2. Please delete or screen back all data points that are not in the lower interval. Label all data points used by alphanumeric designation and include data for the lower interval even when the ratio is 0.	We concur with this comment. Figure 6-2 will be modified so that all data points without any pertinent B/BTEX information will either be screened or removed completely from the drawing.
48.	Figure 6-3. Please explain why both blue and green contour lines were used for time steps 4 and 5.	The blue and green lines on Figure 6-3 represent conceptual leading edges for benzene plumes originating from two separate release events. The blue line represents the leading edge of the benzene plume as a result of an initial release event. The green line represents the leading edge of a benzene plume as a result of a second release event. Figure 6-3 presented in the Draft SGI Report is an older version of the figure. Figure 6-3 in the Draft SGI Report will be replaced with the current version of the drawing which shows the latest B/BTEX ratio contours for Time-Step 5 (Present Day) that match present day conditions depicted in Figure 6-2. In addition, an explanation will be added to the figure which explanations the different colored benzene plume leading edges.
49.	Section 6.2.3.2, p. 6-17, paragraph 3. Expand the text to clarify how SGI data indicate chlorinated VOCs are presumed to be from the same sources as those of BTEX. Chlorinated VOCs (except 1,2-DCA) and chlorobenzenes are generally not associated with gasoline.	We concur with this review comment. Chlorinated VOCs (except 1,2-DCA) and chlorobenzenes are generally not associated with gasoline.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
50.	Section 6.2.4, p. 6-18. It is not apparent that chlorinated VOCs originate with the BTEX compounds. Chlorinated VOCs (except 1,2-DCA) are generally not associated with gasoline. Also, the mobility of chlorinated VOCs is different than the mobility of BTEX compounds.	See the response to review item number 49.
51.	Section 6.3.1.2, p. 6-22, paragraph 3. Indicate if soil manganese data or XRF (mineralogy) data are available to support the presence of manganese oxide minerals. Expand the discussion to describe the "same natural geochemical processes that are observed today...".	Supporting data for the present statement in the text will be provided as part of the Final SGI Report.
52.	Section 6.3.1.2, p. 6-22, paragraph 4. Include a discussion of groundwater ORP measurements, TOC, and dissolved iron and manganese concentrations at this location to support the postulated dissolution of iron and manganese minerals.	Supporting data for the present statement in the text will be provided as part of the Final SGI Report.
53.	Section 6.3.1.3, p. 6-22. Expand the discussion to explicitly present and explain the SGI data to support dissolution of iron and manganese oxides.	Supporting data for the present statement in the text will be provided as part of the Final SGI Report.
54.	Figure 6-6, p. 6-23. Elevated arsenic concentrations appear to be at the bottom of the most recent fill. Discuss the source and composition of fill material.	Figure 6-6 (page 6-23) indicates that the fill with elevated arsenic concentrations is in the top of the fill placed before the mid to late 1950s (approximately 15 to 20 feet below the current ground surface on Pier Echo). This would place the elevated arsenic concentrations at the top of the fill placed before the mid-1950's.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		According to the aerial photos, the source of the fill material prior to the mid- to late-1950 appears to be largely composed of hydraulic fill materials placed in big fill cells defined by a combination of man-made jetties and/or breakwaters. The jetties/breakwaters appear to have been constructed with a combination shore based materials including rock, soil, and man-made materials (e.g. wood and metal). The source of the fill materials placed after the mid- to late-1950s is less certain. Once again the aerial photos of the Pier Echo area indicate that a significant amount of the fill material was derived from dredging activities conducted in the nearby harbor and channel areas. However, some of the fill material may have had a shore and/or more distal dredging source. According to SB-SGI-04, the composition of the fill material consists predominantly of fine to very fine grained sands and silty sands with lesser amounts of sandy silt, and, silt and clay with isolated zones containing broken sea shells. Other items noted within the fill at SB-SGI-04 (and at other locations), drilled on Pier Echo during the SGI, included gravel, fragments of metal and painted wood, twigs, concrete, a black tar-like substance [possibly an asphalt or an oil treated surface], and sand blast grit.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
55.	Section 6.3.1.3, p. 6-24, paragraph 1. Clarify the text to indicate how the 40-year transport time estimate was obtained. Consider and discuss whether it is possible that releases were more recent and, thus, arsenic has not migrated as far.	The 40-year transport time mentioned in the text was based on our knowledge of the site history. Because the elevated metal concentrations appear to be related to the fill materials, the time period during which the fill materials were placed will bracket the maximum transport time. With construction of the bulk of the Pier Echo area during the 1950s, a rough time estimate of 40 years can be deduced. The absence of evidence indicating that the arsenic was introduced into the subsurface from the surface further supports the estimated 40-year transport time made in the Draft SGI Report. Additional discussions on how this time estimate was derived and whether the contaminants could have been introduced at a later point in time will be added to Section 6.3.1.3 (page 6-24) paragraph 1.
56.	Section 6.3.1.3, p. 6-24, paragraph 3. Analysis of both As(III) and As(V)could be performed to accurately determine the redox potential; however, the trend should be similar to field measurements.	Review comment is acknowledged.
57.	Section 6.3.1.3, p. 6-25, last paragraph. Based on redox potentials and pH listed in Table 3-10 and Figure 6-4, it appears that a significant part of the arsenic would be present as H,AsO_3, i.e., As(III) not As(V). A speciation model such as MINTEQ could be used to estimate the relative concentration of arsenic in each form.	Review comment is acknowledged. Remembering that ORP + 200 mV = Eh, it is feasible that As(III) is significant, but it is not likely that it is the major arsenic species outside of the reduced conditions of the hydrocarbon plume.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
	Explain why arsenic is observed in groundwater since the solubility products for the calcium, barium, and magnesium are on the order of 10^{-19} or 10^{-20}. If any of these cations were present in groundwater, dissolved arsenic concentrations would most likely be less than the detected limit.	The minor As(III) (arsenite) component (above) forms more soluble species (and thus is more mobile, even as an alkaline earth salt) in GW than As(V) (arsenate) and alkaline earth salts thereof. (J. L. Schnoor, Environmental Modeling, Wiley, NY, 1996, p. 440)
58.	Section 6.3.2.1, p. 6-26. Indicate that manganese (IV) is found only under strongly oxidizing conditions.	This is correct and will be mentioned.
59.	Section 7. We generally agree with recommendations regarding the need for further action or no further action at each of these GWAOPCs, however, the Section 6 comments need to be resolved in order to support the conclusions. Where the need for further action is recommended, please explain what further actions will be considered and when additional documents (i.e., work plans) will be submitted.	Recommendations for further action are difficult at this time because the final clean-up criteria and source area responsibilities have not been established. However, the issue will be further discussed in the Feasibility Study (FS) for the shipyard.
Appendix B		
1.	Section B.3, p. B-5. Explain how graphical matches were used to calculate tidal efficiency and time lag in greater detail (if this was the method used). According to Table B-2 tidal efficiency was calculated using the ration of standard deviation of 15-minute readings. Please clarify. In the discussion, include a statement that the calculated tidal efficiencies and time lags represent average values.	The footnote in Table B-2 correctly explains that tidal efficiency was calculated using the ratio of standard deviation of sea level readings and piezometer readings, and that the time lag was determined by graphically matching the piezometer peaks and the sea level peaks. The text in Section B.3 will be revised to be consistent with Table B-2. The text will also be revised to indicate that the calculated tidal efficiencies and time lags represent average values. The first sentence in the second paragraph in Section B.3 will be replaced with the following:

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		"Tidal efficiencies for each piezometer are determined from the ratio of the standard deviation of piezometer water levels and sea levels. Time lags for each piezometer are determined by graphically adjusting the sea level hydrographs to obtain the best match of peak tides with each piezometer hydrograph. The calculated tidal efficiencies and time lags represent average values." Graphical matching to determine the time lag involves the use of an EXCEL spreadsheet in the following steps: 1) Plot the sea level hydrograph; 2) Multiply the sea level measurements by the tidal efficiency for a selected piezometer and re-plot; 3) Add the selected piezometer hydrograph to the same plot as the adjusted sea level hydrograph; 4) Make an initial visual estimate of the time lag between the high and low peaks of the two hydrographs; 5) Use the initial time lag estimate to adjust the piezometer measurement times and use these adjusted times to plot the adjusted sea level measurements (alternatively, the time lag estimate can be used to adjust the sea level measurement times directly); 6) Estimate the elevation difference between the sea level and hydrograph peaks and add this elevation difference to the sea level measurements; and

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Martin Hausladen (EPA)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		7) Finally, slightly adjust the initial time lag value, if necessary, to improve the match between adjusted sea level peaks and the piezometer hydrograph peaks.
2.	Figure B-3. This figure is confusing because of the mixed scales used to plot sea level and monitoring well water levels. Include the second Y-axis or include a statement to describe how the sea level scale was determined.	The review comment is acknowledged. A footnote will be added to the figure.
3.	Figure B-4. The water levels in this figure do not match the water levels presented in Table B-2. Please explain or correct as necessary.	The water level elevations presented on Figure B-4 are correct. The water level elevations presented on Figure B-4 have been "normalized" as indicated on Table B-2. All water level elevations have also been rounded to the nearest tenth of a foot. Water level elevations for monitoring wells MW-SGI-01 and MW-SGI-02, as shown on Figure B-4, will be corrected to show positive elevations (i.e. the negative sign will be removed).
4.	Section B.5, p. B-19. There is an inconsistency between the value used to adjust the water level to account for the change in sea level between the two monitoring periods. A value of 0.16 is quoted in the Appendix B but 0.24 is cited in the main body of the report.	Review comment is acknowledged. The correct value is 0.16. Section B.5 (page B-19) will be modified to reflect the correct value.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Hugh Marley (LARWQCB)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
General Comments:		
1.	Figures 5-6, 5-8, and 5-9 indicate that Dry Docks 2 and 3 appear to be influencing both the shallow groundwater flow direction and VOC plume migration. Please discuss this further or identify it as requiring additional work.	Groundwater in the upper zone generally flows to the north-northwest away from Drydock Nos. 2 and 3, with local variations to the north of Drydock No. 2. Groundwater flow conditions in the upper interval are presented in detail in Section 3. Vinyl chloride was the only VOC detected above site screening criteria, and was only detected in one groundwater sample to the northwest of Drydock No. 2. In addition, the soil gas analytical data do not indicate VOCs are present in the subsurface near Drydock Nos. 2 and 3. Vinyl chloride was not detected in any samples collected from the lower interval. This response will be included in the Final SGI Report.
2.	In general, Subsections titled "Delineation of Groundwater Plumes", in Section 7, contain comments that are editorial in nature and include expectations and assumptions not associated with plume delineation. Examples include the final sentences of the last bullet on page 7-6, and the first bullet on page 7-7 and page 7-9. Please move the statements, with supporting data, to the appropriate section.	The hydrogeologic and chemical data support the conclusions referred to in Section 7 of the Draft SGI Report. The conclusions are based on the known degradation pathway for chlorinated-VOCs in groundwater, the time it takes for this degradation to occur, and the hydrogeology for the shipyard. The chlorinated-VOC degradation pathway typically has tetrachloroethene (PCE) breaking down over time into trichloroethene (TCE), then the dichloroethenes (DCEs), and then vinyl chloride (VC). A comparison of the distribution of these individual chlorinated VOC compounds detected in groundwater to the groundwater flow direction in the upper interval indicates

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Hugh Marley (LARWQCB)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
		that greater concentrations of the degradation by-products are present in the down-gradient direction. An excellent example of this would be the groundwater plumes associated with GWAOPC 2. The chlorinated VOC plumes north of Buildings 130 and 131 are composed largely of DCEs and VC (typical degradation by-products) with only minor concentrations (below screening criteria) of TCE being detected in the up-gradient direction. The accumulation of these by-product compounds indicate that natural attenuation of the chlorinated VOCs is occurring in the upper interval.
3.	The MTBE detected at GWAOPC 1, while related to another site, is within the boundaries of the study area. Please clearly identify how and when it will be addressed.	MTBE was only detected in upper interval groundwater samples at six (6) isolated locations. Only one (1) groundwater sample, collected in GWAOPC 1, was above DHS criteria. All detects of MTBE were orders of magnitude below the calculated risk-based concentration (RBC) for a maintenance worker scenario. Furthermore, hydrogeological and chemical data indicate that the MTBE is likely associated with the confirmed petroleum UST released west of Building 210 currently being remediated. The MTBE plume will be investigated by another subcontractor starting in December 1998.
4.	The report states, on page 7-14, that "Manganese oxides became concentrated at or near the ground surface." Please elaborate on the above reference, including why it would be limited to this site.	We acknowledge this review comment. Elaboration on topic will be made in the Final SGI Report as appropriate.

RESPONSE TO COMMENTS ON
DRAFT
SUPPLEMENTAL GROUNDWATER INVESTIGATION REPORT FOR
LONG BEACH NAVAL SHIPYARD
LONG BEACH, CALIFORNIA

CTO-123

October 22, 1998

Comments by: Hugh Marley (LARWQCB)

Response by: Aklile Gessesse (CTOL) and Steve Draper

Number	Comment	Response
	COMMENTS	
5.	The VOCs detected along the northern portions of Building 128 are being deferred to a separate investigation. However, the Building 128 UST investigation is also proposing no further action based on low concentrations in the immediate vicinity of the former USTs. Please reconcile the above differences and provide a revised recommendation.	Based on the risk-based concentration (RBC) values (assuming an acceptable level of risk of 10^{-5}) provided for groundwater from Battelle (Table 2-14, Battelle 1998), the highest detected concentration of contaminants (e.g. 4.5 µg/L for vinyl chloride) are below the calculated RBC values (e.g. 23 µg/L for vinyl chloride). Therefore, the extent of the chlorinated plume in groundwater to the northwest of Building 128 has been defined.
6.	Please update the recommendations for the Site 9 deep benzene plume and reference the additional investigation and remedial action currently proposed.	As part of the follow-up to the meeting held at the RWQCB office on 3 August 1998 to address the detected benzene plume in the lower interval along the northern portion of Drydock No. 1, a plan will be developed and implemented as part of a separate project.
7.	Please update the groundwater screening criteria using the attached 1997 California Ocean Plan. Also update the groundwater plume maps, conclusions and recommendations as appropriate.	The SGI was conducted using guidelines established in the Work Plan and Technical Memos 1 and 2. Changes to site screening levels will be addressed in the Feasibility Study.
8.	Note that should natural attenuation of VOCs be considered at these sites, we will require complete delineation of the groundwater plumes with monitoring data supporting the Navy's recommendation. Downgradient "sentry" wells may also be required to confirmation of the above.	We do not concur with this review comment. Pursuant to the SGI Workplan, we believe that all groundwater plumes pertaining to GWAOPC's 1-4 have been fully delineated.

Bechtel

1230 Columbia Square
Suite 400
San Diego, CA 92101

CLEAN II Program
Bechtel Job No. 22214
Contract No. N68711-92-D-4670
File Code: 02181

IN REPLY REFERENCE: CTO-0123/0218

October 22, 1998

Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 57CS1.RS
Building 127, Room 112
1220 Pacific Highway
San Diego, CA 92132-5187

Subject: Response to Comments on the Draft Supplemental Groundwater Investigation Report for Long Beach Naval Shipyard, Long Beach, California

Attention: M. Orpilla (56SD.MO)

Enclosed for your information and use, please find the Response to Comments on the Draft Supplemental Groundwater Investigation Report for Long Beach Naval Shipyard, Long Beach, California. We have incorporated the Navy's comments and by copy of this letter are transmitting the Response to Comments to the Agencies for their review.

If you have any questions, please call Aklile Gessesse at (562) 807-2454.

Very truly yours,

Krish K. Kapur
Operations Manager

KKK:lm

Enclosure

BECHTEL NATIONAL INC.

CLEAN II TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N-68711-92-D-4670 **Document Control No.** CTO-0123/0218

File Code: 02181

TO Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 57CS1.RS
Building 127, Room 112
1220 Pacific Highway
San Diego, CA 92132-5187

DATE: October 22, 1998
CTO #: 0123
LOCATION: Long Beach Naval Shipyard

FROM: _____ Program / Project Manager

_____ Operations Manager

DESCRIPTION: Response to Comments on the Draft Supplemental Groundwater Investigation Report for , Long Beach Naval Shipyard, Long Beach, CA dated October 22, 1998

TYPE: Contract Deliverable (Cost) _____ CTO Deliverable (Technical) X Other: _____

VERSION: Draft (e.g., Draft, Draft Final, Final, etc.) REVISION No: N/A

ADMIN RECORD: (PM to Identify) Yes [X] No [ ] U.S. EPA Category _____ Confidential _____

SCHEDULED DELIVERY DATE: 10/22/98 ACTUAL DELIVERY DATE: 10/26/98

NUMBER OF COPIES SUBMITTED: O/4C/4E

COPIES TO (Include Name, Navy Mail Code, and No. of Copies):

SWDIV:	BECHTEL:	OTHER (Distribution done by Bechtel):
M. Orpilla, 56SD.MO (O)	K. Kapur (1C/1E)	A. Gutierrez, DTSC (1C/1E)
T. Macchiarella, 56LB.TM (1C/1E)	E. Morelan (1C/1E)	M. Hausladen, EPA (1C/1E)
C. Leadon, 5721.CL (1C/1E)	A. Gessesse (1C/1E)	K. Brasaemle, Weston-EPA (1C/1E)
L. Holloway, 03EN.LH (1C/1E)	Norwalk Office (1C/1E)	H. Marley, RWQCB (1C/1E)
D. Rollefson, 56LB.DR (1C/1E)	PDCC Files (1C/1E)	C. Houston, POLB (1C/1E)
	C. Phillips (AR) (2C/2E)	

Date/Time Received