

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

TO: Bruce H. Wolfe  
Executive Officer

FROM: Mary Rose Cassa  
Engineering Geologist

DATE: February 6, 2004

SIGNATURE: \_\_\_\_\_

SUBJECT: Response to Comments - Tentative Order to Amend Site Cleanup Requirements, Napa County Flood Control and Water Conservation District, Chevron Products Company, Bay Cities Oil Marketers, Inc., Dillingham Construction N.A., Inc., Texaco, Inc., Phillips Petroleum Company, ExxonMobil Oil Corporation, Exxon Mobil Corporation, Atlantic Richfield Company, Napa, Napa County

CONCUR: \_\_\_\_\_

Chuck Headlee  
Toxics Cleanup Division Section Leader

Stephen A. Hill  
Toxics Cleanup Division Chief

Board staff circulated the subject Tentative Order among interested parties in December 2003, requesting any written comments by January 21, 2004. We received comments from the three proposed additional dischargers (Exxon, Mobil, and Arco), who are past owners/operators.

### Summary

Significant comments fall into the following categories: the Board previously issued No Further Action letters for these properties, and the facts remain largely unchanged; the data do not support the existence of significant contamination in surface soil or shallow subsurface (unsaturated zone) soil; observed contamination was not uniquely associated with ExxonMobil's use of the properties. In response to these comments, we have revised the Tentative Order (Appendix B1) to correct the discrepancy between reported concentrations of total petroleum hydrocarbons as diesel (TPHd) and as total TPH. However, we do not recommend further changes to the Tentative Order. In particular, we stand by the Tentative Order's findings that reasonable and credible evidence exists to support amending the existing site cleanup requirements to add ExxonMobil Corporation, ExxonMobil Oil Corporation, and Atlantic Richfield Company as named dischargers.

The commenters have offered several critiques of individual elements to undermine the overall results. However, we can rebut each of the several critiques. Furthermore, even if the Board is unconvinced on one or two individual rebuttals, there is still substantial evidence to name the additional dischargers, since the new information obtained by the District during flood channel construction is so compelling.

Following is a more detailed description of the key points raised in these comments and our responses:

**Exxon/Mobil (letter from Heather L. Hoecherl of Bingham McCutchen, L.L.P., dated January 20, 2004)**

1. **Comment:** No Further Action letters were issued; Exxon and Mobil were not included in the original order.

**Response:** The Board's actions, in issuing NFA letters and omitting Exxon and Mobil from the 2001 order were appropriate, based on the information then available to the Board. However, as explained in the Tentative Order (Appendix B1, page 5), when the Board staff issued the NFA letter to Mobil in March 2000, the Board was aware of the District's planned acquisition of the property, and its planned excavation activities associated with the Napa Flood Control Project. In fact, the NFA letter specifically referred to the Project, and included the following: "... should new evidence be uncovered that a major discharge did occur as a result of Mobil's past operations, particularly during the course of construction work related to the future Napa Flood Control Project at this site, the Board will reopen this case and will hold Mobil Oil Company responsible for any additional investigation and cleanup that may be required as a result of that discharge." When we issued the NFA to Mobil, it was based on the technical conclusion that TPH releases on their site had not impacted groundwater. We had developed a conceptual site model that TPH impacts to groundwater and saturated soils at their site were entirely attributable to releases on the up-gradient North Bay Oil site. We were silent on the question of whether elevated concentrations of TPH in unsaturated soil would need remediation if soil were removed from the site. The new data and technical principles clearly indicate that historic petroleum releases to surface and subsurface soils occurred as a result of Mobil's past operations.

With regard to the Exxon property, at the time that Board staff issued the No Further Action letter in October 1996, Board staff did not have sufficient information to hold Exxon responsible for groundwater impact on the property. The NFA was also based on the technical conclusion that apparently minor TPH releases on their site had not impacted groundwater and a conceptual site model that TPH impacts to groundwater and saturated soils at their site were entirely attributable to releases on the up-gradient North Bay Oil site. As explained in the Tentative Order (Appendix B1, page 7), the new data and technical principles clearly indicate that historic petroleum releases to surface and subsurface soils occurred as a result of Exxon's activities at the site.

Additionally, as explained in the Tentative Order (Appendix B1, page 4), Board staff's earlier conclusions and decision not to include Exxon and Mobil in Order No. 01-066 were based on fairly extensive soil and groundwater investigations and the data available in 2001 for the former Exxon and Mobil properties. These data indicated that a *significant number* of soil samples from above the zone of groundwater fluctuation *did not exceed* certain threshold concentrations (Table 2 of the Tentative Order (Appendix B1)). Most importantly, Board staff *did not see a connection* between what at that time appeared to be minor vadose zone petroleum residuals and the extensive petroleum pollution encountered in the underlying saturated "smear" zone, other than being caused by pollution migrating from an offsite source. The new data provide credible and reasonable new evidence that Exxon and Mobil were responsible for discharges at their properties. Sufficient data now exist to support amending Order No. 01-066 to include

Exxon Mobil Corporation (formerly “Exxon”) and ExxonMobil Oil Corporation (formerly “Mobil”) as additional dischargers.

We conclude that groundwater contamination at these two properties is due to a combination of off-site migration and on-site releases, and the relative contribution from each is irrelevant when naming parties to the cleanup order. The relative contribution from unsaturated soil to the total amount of contamination in the groundwater cannot be determined. Spilled petroleum would be expected to follow pathways of higher porosity and permeability, thus focusing migration in zones of limited lateral extent over time. Similarly, percolating water with dissolved petroleum would be expected to follow these same zones, eventually contributing dissolved-phase hydrocarbons to the groundwater. At the subject facilities, precise locations of all historic fuel storage and handling structures are not fully known; the exact locations were never surveyed. Finding the release “path” downward is further exacerbated where groundwater is shallow because of the short path length. The fact that some of the subject releases could be several decades old also complicates matters. Finally, the grid sampling and compositing imparts gross-scale averaging of impacts, particularly in the unsaturated zone.

2. **Comment:** The new data are not reliable and do not provide substantial evidence to support the addition of ExxonMobil as a named party.
- The TPH fractions are inconsistent between the old data and the new data.
  - The Flood Control District used silica-gel cleanup inconsistently, which could result in false positives.
  - The subjective observations of field personnel appear incongruent with laboratory and field monitoring data.

**Response:** We disagree. As explained in the Tentative Order (Appendix B1), the new data provide a more complete picture of TPH releases and contamination at the two properties. The new data provide a basis to conclude that TPH found in soil above the water table was discharged during the time Mobil (or one of its predecessor companies) owned or used NR-20 for bulk fuel handling and posed a threat to groundwater quality. Contamination may have already been in place from bulk fuel handling before Exxon owned NR-37, but Exxon is responsible for discharges that occurred from contamination in place during the period Exxon owned the property. The new data provide a basis to conclude that TPH in soil above the water table on property owned by Exxon posed a threat to groundwater quality.

Since the history of activities and structures over the decades of use on the properties were not specifically documented (i.e., detailed historic drawings and reports of where and how chemicals were stored and handled), the effectiveness of the investigations targeted at specific facilities was somewhat limited. In contrast, the pre-excavation investigations were conducted on grids across the properties after the structures were demolished. Therefore, the grid sampling, unhampered by obstacles, gives a better picture of the overall distribution of TPH as averaged by the composite sampling methodology.

### *TPH Fraction*

There is no difference between the TPH ranges that were used in the old data and the new data. The industry standard for TPH fractions is as follows:

TPH as gasoline (TPH-g)	C7 to C12
TPH as diesel (TPH-d)	C10 to C23
TPH as motor oil (TPH-mo)	C23 to C36

For the purposes of the Flood Control Project, the overlap of TPH-d and TPH-mo was eliminated by using a project-specific fraction:

TPH as diesel – Napa Flood (TPH-nfd)	C12 to C23
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For the purposes of the Project, TPH-nfd is reported as TPH-d.

Combining the TPH ranges helped simplify the data, and has no significant effect on the results.

“Total TPH” was calculated by summing these ranges, using the following standards:

If TPH-g does not equal "ND" (non-detect), then Total TPH = (TPH-g + TPH-nfd + TPH-mo) or [(C7 to C12) + (C12 to C23) + (C23 to C36)]

If TPH-g = ND, then Total TPH = (TPH-g + TPH-d + TPH-mo) or [(ND) + (C10 to C23) + (C23 to C36)]

We have revised the staff report to correctly report total TPH (not TPH-d) in the new data. The summing of TPH fractions is not expected to skew the results inappropriately, because there are only rare instances where all three petroleum fractions were present in significant proportions. In most cases, one fraction is dominant, with the result that the calculated “TPH” value in reality largely represents one fraction. Whether the fraction is dominantly gasoline, diesel, or motor oil has little bearing on determining whether a significant discharge occurred. The dominant fraction is generally expected to reflect the composition of the source fuel; however, biodegradation (in this case, 30 years or longer) tends to minimize TPH-g, with concurrent relative increase in the TPH-d and TPH-mo fractions.

It should be noted that the “old” data that was used in the Tentative Order (as reported in the Remedial Action Plan) used the same hydrocarbon chain-length fractions as the “new” data. Consequently, this argument has no merit. Further, it should be noted that few of the samples reported in the RAP had results for TPH-mo; consequently, total TPH for these samples is the sum of TPH-d and TPH-g. Further, only nine samples with TPH-d concentration over 10 mg/kg had greater than 50% TPH-g.

### *Silica-gel Sample Cleanup*

Silica-gel cleanup is commonly done prior to TPH sample analysis, to avoid “overestimating” the true value due to naturally-occurring constituents that mimic TPH in

the analysis. As explained in the Tentative Order (Appendix B1 – Attachment 1), the Flood Control District investigated the effects of performing silica-gel cleanup on sample results. The results of the study showed that when initial sample results (before silica-gel cleanup) ranged from the project action limit (93 mg/kg) to two times the project action limit, two-thirds of the sample results were reduced to less than the project action limit after reanalysis using the cleanup procedure. No samples with initial results (before cleanup) greater than two times the project action limit were reduced to less than the project action limit after reanalysis using the cleanup procedure. For samples containing higher initial concentrations of TPH (e.g., 200 mg/kg and greater), it would not be expected that silica-gel cleanup would reduce the concentrations to insignificant levels. Attributing elevated results to not using silica-gel cleanup is speculative and not sufficiently compelling to not name ExxonMobil to the order.

### *Visual Observations*

It is reasonable and customary to use field observations in lieu of sampling and analysis for soils that are grossly contaminated with TPH. Visual observation of apparent contamination is a common field practice that yields credible information. The heavier (longer-chain) petroleum constituents do not contain sufficient volatile components to create a noticeable odor or register above background on field instruments. To expedite cleanup and minimize unnecessary analytical costs, it is common practice for experienced field personnel to use professional judgment and selectively segregate soil. During the pre-excavation soil screening, it would have been appropriate for field personnel to flag grids containing soil suspected of gross contamination for no further analysis. The volume of affected soil would have been minimal compared to the cost savings for analyses that in all likelihood would have confirmed the subjective judgment.

ExxonMobil uses information from a report that was never submitted to the Board to argue that visual observation was not consistent with laboratory results. It is quite possible that direct comparison of results from specific sample locations may not be consistent; however, without the data, we cannot evaluate the assertion. It is important in reviewing the data to step back from individual cell-by-cell comparisons and look at the relationship between historical structures and activities and the distribution of TPH. The areas of significant contamination are concentrated in locations where historical structures are known to have existed.

3. **Comment:** Mobil Property (NR-20): Data are consistent with a release migrating from the Chevron property, as the Regional Board concluded in previous orders.
- The data fail to show any connection between surface releases and groundwater contamination.
  - Capillarity and vapors from the underlying liquid hydrocarbon phase could impact layer 2A in the absence of a local surface release.

**Response:** The new data clearly show that on-site TPH releases have contributed to groundwater contamination. The variable concentrations detected in the cells may reflect both the irregular pathway that such releases follow to the water table and the nature of data from composite samples. The apparent absence of a pathway from the ground surface to the groundwater is due, to a large extent, to the difficulty of obtaining

representative subsurface samples and graphically displaying the results. The figures used in the staff report were prepared to represent the conditions of the three-dimensional volume of soil in the unsaturated and saturated zones beneath the project area. Further, the concentrations reported on the figures represent composite samples, not discrete samples. As explained in the Tentative Order (Appendix B1 – Attachment 1), the use of composite samples tends to minimize high concentrations, but also gives a sense of “average” concentration over a large area. It is impossible to graphically represent the continuum of TPH concentrations in three dimensions to show specific linkages between surface or shallow subsurface releases and measurable concentrations of dissolved or liquid-phase petroleum in the groundwater. In contrast to the old data, which was biased toward locations of suspect releases and did not give a good indication of the distribution of TPH in the vadose zone, the new data provide the surface-to-groundwater link that was not available when Order 01-066 was issued.

The concentrations of TPH in cells AO11/AO12, Layers 1A, 1B, and 2A are entirely consistent with a surface/shallow subsurface release occurring from activities or structures that were concentrated in the area. The variable concentrations detected in the cells may reflect both the irregular pathway that such releases follow to the water table and the nature of data from composite samples. The concentration of 1530 mg/kg TPH in AO11-Layer 1A is certainly indicative of a release. It is unlikely that such a concentration would result from “capillarity and vapors” from the underlying liquid-phase hydrocarbon pool. If such a mechanism were the cause of TPH concentrations in Layer 1A, then one would expect to see similarly elevated concentrations over a more widespread area. This is not the case. Instead, elevated concentrations are observed along the southern boundary of the former Mobil property, consistent with the observed historic structures that were part of the operations on that parcel for several decades.

4. **Comment:** The data are more consistent with activities of subsequent site owners/operators.

**Response:** The successor owner of NR-20 handled paving materials and tennis-court resurfacing material. It is unlikely that these activities contributed substantially to the pervasive soil contamination that has been documented at the site, compared to the previous five decades of bulk fuel storage and handling by Mobil. Questions about specific samples that might have contained constituents uniquely related to successor activities address only a limited number of samples, and do not obviate the larger picture of widespread contamination. Stained soil that was noted during a site visit in 1992 was not necessarily exclusively related to activities of the owner/operator at the time. The staining could have happened at any prior time. There is no evidence that the release associated with the stain specifically occurred after Mobil used the property. Further, such staining accounts for only a minor amount of surface soil that appears to have been impacted at the site. The question here is not how much of the impacted soil is ExxonMobil’s responsibility, but rather whether ExxonMobil has any responsibility for discharges at the site.

5. **Comment:** Exxon Property (NR-37): Humble Oil, predecessor to Exxon, owned the property for only six years, 1967-1973, and did not have any relevant activities at the site. As in the Matter of the Petition of Wenwest, Inc., SWRCB Order No. WQ 92-13,

Exxon's ownership was brief and had nothing to do with the activity that caused the contamination. The data are more consistent with activities of the successor owner operator (roofing company).

**Response:** We disagree. ExxonMobil has consistently asserted its brief ownership of the property and absence of activities related to handling petroleum products. However, ExxonMobil's predecessor's ownership was not brief (six years) and there is no evidence to suggest that its predecessor did not operate the property as a bulk fuel terminal during that time. No information is available that indicates ExxonMobil's predecessor company made a business decision to own property for six years and not engage in any activity at the site that could have contributed to existing contamination. No information is available, such as work orders for pier demolition or other activities, that indicate ExxonMobil's predecessor company actively engaged in decommissioning the site from its previous use. Further, no information is available to indicate ExxonMobil or its predecessor company engaged in activities to ensure any discharges caused by the previous owner did not continue. It is evident from the site history depicted in aerial photos that three vertical fuel tanks were present during the time that Humble owned the property, with no evidence to indicate that the tanks were not being used.

Although ExxonMobil attempts to link observed surface disposal of asphalt emulsions from the roofing company to observations of asphalt in samples, the locations are not consistent. The 1992 site assessment noted asphalt emulsions on the ground in the vicinity of grid cell AG-09; asphalt was noted in a sample from cell AH-03. Further, contributions from pieces of asphalt in a sample would be minimized by the compositing method.

The Wenwest argument is not valid here, because, unlike that case, Exxon and its predecessor company did not own the property for a brief amount of time (certainly, six years is not brief) merely to facilitate a real estate transfer. No information has been provided that, when Humble acquired the bulk fuel terminal, it did not intend to operate it as a bulk fuel terminal. Arguments that Humble is not mentioned in Polk city directories of the period are not conclusive; the directories could be incomplete or incorrect.

6. **Comment:** Exxon Property (NR-37): The data relied upon by the Regional Board to indicate some connection between ExxonMobil and releases on the site are riddled with problems, including false positives, levels of TPH-mo below ambient background concentrations, and lack of connection between soil contamination at the surface and the groundwater.

**Response:** None of the alleged data-reliability problems is valid. As explained in the response to Comment 2, for samples containing higher initial concentrations of TPH (e.g., 200 mg/kg and greater), it would not be expected that silica-gel cleanup would reduce the concentrations to insignificant levels. Therefore, the argument that the data contain false positives is not valid.

The argument that samples with TPH-mo concentrations below ambient concentrations is without merit. The identification of "ambient" concentrations of pollutants is related to selecting cleanup levels and disposal options, not determining if a site is impacted.

Ambient concentrations of petroleum, metals, and other organic compounds were determined for the Flood Control Project to help set cleanup levels for the sediment and soil at the final terrace elevations and help determine disposal options for excavated soil. Even concentrations that might be at or below ambient concentrations need to be considered as part of the site evaluation to determine if discharges occurred at the site in question. The Flood Control District derived an ambient concentration for TPH-mo of 650 mg/kg. Due to the uncertainty of the effects of using silica-gel cleanup, the Flood Control District used the ambient concentration for TPH-d (93 mg/kg) as a surrogate. Using this benchmark, many grid cells on the former Exxon property exceed background.

ExxonMobil specifically refers to a sample from grid AH13-Layer 2A with a total TPH of 470 mg/kg, asserting this is actually below the Napa River ambient for TPH-mo. But ExxonMobil failed to note that gasoline constituents, benzene, toluene, ethylbenzene, and xylene were detected, indicating that this is not a biogenic TPH issue that would be minimized by using silica-gel cleanup.

ExxonMobil only alleges a lack of continuity in TPH contamination from surface to groundwater in a few specific locations shown in the figures in the Tentative Order (Appendix B1), and at those locations, presents an arguments for lack of continuity that are without merit. For example, ExxonMobil specifically refers to a sample from grid AG14-Layer 2B, asserting that gasoline fraction hydrocarbons reported in Layer 2 are not consistent with the heavier fractions present in the overlying layers. The concentrations of different TPH ranges are not material to understanding the evidence for a release in this area that has impacted groundwater. The facts indicate elevated concentrations of TPH in the two shallowest layers and in Layer 2B, in the vicinity of where structures were historically located. The types of product originally released and exact migration pathways from the surface and shallow subsurface to the water table are not known, and uncertainties in the data could have been introduced by the locations of samples, compositing, and laboratory analyses. However, these uncertainties do not overcome the convincing correlation between historic structures and contamination.

It is important in reviewing the data to step back from individual cell-by-cell comparisons and look at the relationship between historical structures and activities and the distribution of TPH. The historical structures and activities on the property were concentrated along the eastern section of the southern property boundary, the areas of significant contamination.

7. **Comment:** The work under the order has been completed; thus, the addition of new parties, even if it were properly justified, is moot.

**Response:** We disagree. As explained in the Tentative Order (Appendix B1, page 11), the work under the order is not complete; Order No. 01-066 requires ongoing monitoring. If adequate cleanup is not demonstrated by monitoring, additional cleanup may be required. Should specific responses be required to problems identified as a result of residual contamination causing or threatening adverse effects on beneficial uses in the project area, the responses will have to be identified and implemented quickly to abate the problem and minimize impacts to the completed project. If the Regional Board were required to go through the process of naming additional dischargers at that time, the



problems could continue to exist until the issue was resolved. Further delays in implementing corrective measures would have a negative impact on the habitat and on the public who will be using the area for recreation.

**Atlantic Richfield Company (letter from Ralph Moran, dated January 21, 2004)**

8. **Comment:** Facts relating to the existence and source of hydrocarbon impact in the capillary fringe and saturated zones ... have remained effectively unchanged since the Board issued a No Further Action letter to Atlantic Richfield Company in a letter dated October 30, 2000.

**Response:** We disagree. The new data do change how we view the source of groundwater contamination. As explained in the Tentative Order (Appendix B1, pages 6-7), a series of earlier soil and groundwater investigations demonstrated that groundwater was significantly impacted on the Arco property, but discharges to surface and subsurface soils appeared to be very low, and were not considered to be at levels consistent with being the cause of the high levels of groundwater pollution found there. Further, Arco's consultant provided data showing preferential migrations pathways in the subsurface, suggesting the groundwater pollution source was located at 477 Oil Company Road. Given this information, Board staff issued a No Further Action letter on October 12, 2000.

When the Board staff issued the NFA letter to Arco, the Board was aware of the District's planned acquisition of the property, and its planned excavation activities associated with the Napa Flood Control Project. In fact, the NFA letters specifically referred to the Project, and included the following: "... should new evidence be uncovered that a major discharge did occur as a result of ARCO's past operations, particularly during the course of construction work related to the future Napa Flood Control Project at this site, the Board will reopen this case and will hold ARCO Oil Company responsible for any additional investigation and cleanup that may be required as a result of that discharge." When we issued the NFA to Arco, it was based on the technical conclusion that TPH releases on their site had not impacted groundwater. We made a technical conclusion that TPH impacts to groundwater and saturated soils at their site were entirely attributable to releases on the up-gradient North Bay Oil site. We were silent on the question of whether elevated concentrations of TPH in unsaturated soil would need remediation if soil were removed from the site.

We disagree that facts relating to the existence and source of hydrocarbon impact in the capillary fringe and saturated zones have remained effectively unchanged since we issued the NFA letter. The new data and technical principles clearly indicate that historic petroleum releases to surface and subsurface soils occurred as a result of result of Arco's past operations.

9. **Comment:** The recent data are not conclusive.

**Response:** We disagree. We have substantial evidence to support naming Arco; "conclusive data" is not our standard. The discrepancy between total TPH and TPH-d has been corrected, and there is still reasonable and credible evidence that discharges to

the soil occurred while Arco owned and operated a bulk fuel terminal on the property. As explained above, the variable concentrations detected in the cells may reflect both the irregular pathway that such releases follow to the water table and the nature of data from composite samples. The apparent absence of a pathway from the ground surface to the groundwater is due, to a large extent, to the difficulty of obtaining representative subsurface samples and graphically displaying the results. The use of composite samples tends to minimize high concentrations, but also gives a sense of “average” concentration over a large area. In contrast to the old data, which was biased toward locations of suspect releases and did not give a good indication of the distribution of TPH in the vadose zone, the new data provide the surface-to-groundwater link that was not available when Order 01-066 was issued. The new data convincingly show the relationship between historical structures and activities and the distribution of TPH.