This is a responsiveness summary, responding to comments that the public has made regarding the U.S. Environmental Protection Agency's (EPA) proposed plan for the cleanup of hazardous substance contamination at the Highway 71/72 Refinery Superfund Site (the "Site").

A responsiveness summary serves two vital functions: first, it provides the decision maker with information about the views of the public, government agencies, the support agency and potentially responsible parties (PRPs) regarding the proposed remedial action and other alternatives. Second, it documents the way in which public comments have been considered during the decision-making process and provides answers to all significant comments.

Under EPA policy, responsiveness summaries are divided into two parts. The first part is generally a summary of commenters' major issues and concerns, and generally it will expressly acknowledge and respond to those issues and concerns raised by major stakeholders. In this situation the stakeholders are the local community, the Louisiana Department of Environmental Quality (LDEQ), Bossier City officials, the PRP CanadianOxy Offshore Production Co. and Glenn Springs Holdings Inc (GSHI), a related company. "Local community" here means those individuals who have identified themselves as living in the immediate vicinity of a Superfund site, and who are threatened from a health or environmental standpoint. These may include local homeowners, businesses, the municipality, and, not infrequently, PRP. Under EPA policy, the first part of a responsiveness summary is presented by subject in nontechnical terms that are intended for the lay person.

Under the policy, the second part of a responsiveness summary is a comprehensive response to all significant comments. It will be comprised mostly of specific legal and technical questions and, if necessary, will elaborate with technical detail on answers covered in the first part of the responsiveness summary.

Rather than divide the Site responsiveness summary into two parts, however, EPA decided that, in this case, it made more sense, and provided a more cohesive discussion, if each comment was dealt with completely in one unified responsiveness summary. We decided that the most technical comments were made by the PRP, and, since the PRP has very sophisticated agents assisting in its interpretation of the Site remedy, there was no reason to give a simple answer in one part of the responsiveness summary, followed by a more technical answer in another part. Moreover, for the more technical questions raised by the PRP, there is no simple answer. Therefore, to save resources, and to give a cohesive picture of the remedy, we decided to respond just once to each question.

For more information regarding EPA's policy regarding responsiveness summaries, please see *Superfund Responsiveness Summaries (Superfund Management Review: Recommendation Number 43E)* (OSWER 9230.0-06, June 1990) which is a part of the Administrative Record for the Site. Documents referenced in this responsiveness summary as part of the Administrative Record for the Site may be viewed at the Bossier City Library, History Building, 2206 Beckett, Bossier City. The library's telephone number is (318) 746-1693.

Community Members' Comments

1. Comment: A better idea to reduce pollution is to reduce gasoline consumption. The pollution coming off of Interstate 20 is getting worse.

Response: Comment noted.

2. Comment: A preference for a permanent remedy should have been pursued in order to provide the people who own and live on the Site property a safe and final conclusion to this process.

Response: Under the Superfund law, there is a preference that EPA select remedial actions that employ treatment technologies that permanently and significantly reduce the toxicity, mobility or volume of the hazardous substances as a principal element. The Selected Remedy, which was Alternative 5 in the Proposed Plan, satisfies the preference for treatment and permanence as a principal element for the light nonaqueous phase liquid (LNAPL) and for co-extracted ground water and vapor. For the soil contaminated with either lead, or with lead and hydrocarbons, the preference for treatment will not be satisfied because soil contaminated with lead, in general, is not amenable to treatment. Though the remedy for soil lead may not be permanent in a way that meets the statutory preference for permanence through treatment; nonetheless, the soil remedy is permanent with respect to the Site in that the contamination will be taken away from the Site.

3. Comment: The second remedial action objective for ground water should also include the removal of subsurface hydrocarbon contaminated refinery sludges and soils in order to reduce and/or eliminate the potential for ground water to be impacted by chemicals of concern present in refinery waste.

Response: This comment has been incorporated into the Record of Decision (ROD.)

4. Comment: The EPA has limited the parties that can request the extensive sampling to only on-site community members. This sampling should also be available to off-site individuals who have an interest in site property.

Response: Under the Selected Remedy, those who own Site property, but who live off-site, will be able to have their property sampled under LDEQ oversight. Those who lease Site property, those who own or operate Site businesses, and those who own Site property (regardless of where they may live) may all request soil or indoor air sampling under the Selected Remedy.

5. Comment: Excavation will only be down to a maximum depth of two feet. The contaminated soil and sludge should be excavated until the remedial goals are achieved.

Response: Lead adheres to soil, and, consequently, lead at depth does not generally migrate. EPA has found that certain vegetable garden plants will uptake lead from depth, and, if those plants are eaten, the lead may pose a threat to human health. However, EPA has found that the roots of the garden plants in question do not extend past two feet below ground surface (bgs). Accordingly, EPA has decided that soil lead that exceeds the remediation goal (510 parts lead per million parts soil (ppm)) need not be cleaned up at depths that exceed two feet bgs.

Buried hydrocarbons may volatilize and travel to the surface through cracks in the soil, or they may migrate into ground water. In this way, buried hydrocarbons can serve as a source of indoor air contamination or ground water contamination. Consequently, the Selected Remedy calls for hydrocarbon-contaminated material found at any depth (even depths greater than two feet bgs) to be cleaned up to meet remediation goals.

6. Comment: The City of Bossier should be required to initiate a system of notification for all building permits for new construction and renovation on the Site. The notification should include a warning of potential contamination and the process available to have the soil tested for contaminants.

Response: EPA and Bossier City officials discussed the possibility of notifying all those who request a building permit, and it was decided that it would be more efficient, and more complete, to notify all property owners or lessees, property managers, business owners, public agencies, and utility companies as called for in the ROD. Anyone asking for a building permit should surely fall into one of these categories. Moreover, the notification process described in the ROD will likely reach any party who is likely to build (or participate in construction) on the Site before the point at which a building permit is considered, thereby enabling that party to make contingency plans in case contamination is encountered.

7. Comment: EPA must require that the PRP notify all present and future site landowners, renters, and lessees of the contamination issues associated with the site and the technical impracticability of remediating contaminated ground water. A deed notification process should also be required.

Response: The Selected Remedy calls for notification of all members of the on-Site community on a quarterly basis. Under the Selected Remedy, notices will be sent to property owners or lessees, property managers, business owners, public agencies, and utility companies. LDEQ's agent will send quarterly notices to those parties through utility bills or direct mailings. Notification will not be completely discontinued until an EPA five-year review of the remedy reveals that no hazardous substances, pollutants, or contaminants remain in soil, ground water, or indoor air at the Site at concentrations that allow for unlimited use and unrestricted exposure. The direct mail notification approach should reach many individuals (such as lessees) who generally never see a deed.

8. Comment: Of the five non-invasive alternatives, the preferred alternative, #5, is the most appropriate. The remedy will serve to provide a mechanism to address a portion of the site contamination concerns. A total remedy of waste at the site still needs to be made available when it becomes necessary.

Response: Support for the Selected Remedy (alternative #5) is noted. The National Contingency Plan, 40 CFR Part 300, under which this ROD is written provides that EPA may change the ROD if conditions change and it necessary to do so.

As explained in Volume I, Section 1 of the Remedial Investigation Report (Mission Research Corporation, 1999), community leaders at the Site requested that EPA take a nonintrusive approach to Site investigation and remediation, including soil remediation. Accordingly, the remedy selected in the ROD provides that, whenever a member of the Site community believes that contaminated soil (including sludge-contaminated soil) has been uncovered (e.g., during gardening), that community member may request soil sampling. If contamination is found, the soil will be cleaned up. Consistent with the wishes of community leaders and due to the technical impracticability of excavating under the numerous on-site buildings without razing the buildings, EPA's Selected Remedy does not call for immediate large scale excavation of hydrocarbon contamination. The removal of the LNAPL, as called for in the ROD, will help the ground water and soil in the vadose zone, but the primary intention for the LNAPL removal is the remediation of indoor air pollution. In order to ensure continued protection of the public, however, EPA has made arrangements with the City to ban the use of ground water from the contaminated aquifer in the vicinity of the Site. This ban on ground water use is an institutional control that will ensure that the potential exposure pathway via ground water is not completed. Since ground water is not presently used on the Site, no one should be inconvenienced.

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9. Comment: EPA sampled our soil 2 or 3 months ago. We have not received any notification of the findings. Will we receive notification, and, if so, when?

Response: After that sampling event was completed, EPA analyzed the data and determined that all the contaminant concentration levels were low, and all concentration levels found were safe. All the tap water samples, all the indoor dust samples and all the soil samples were found to have contaminant concentrations that were below the concentrations that we consider to be a problem. At the time this was written we were in the process of organizing the data into individual packets for each property owner. We hope to mail formal letters containing sampling results to all those whose homes were sampled by the end of the year.

10. Comment: I feel that this has been detrimental to property values, particularly in our area, and I wonder if there will be any recourse to remedy that situation?

Response: The best way to address property value issues is to implement an effective remedy to address the contamination. Under the remedy, any Site property owner will be able to call a special "hotline" and request sampling of soil or indoor air. Once you have sampling results that show that your house and yard are safe, it should help you sell your home. Moreover, new residents will have the assurance of knowing that if they encounter any problems, they can call the hotline for assistance.

11. Comment: When will the remedy be started?

Response: Several steps in the Superfund process must be taken prior to implementation of the remedy. These steps are as follows: The EPA will issue this ROD. The EPA will send a letter to the PRP requesting that the PRP provide a good faith offer within 60 days stating the PRP's intent to perform the cleanup. Providing that this good faith offer is received, EPA and the PRP will enter into 60 days of negotiations. Once an agreement is reached, a legal document called a Consent Decree (CD) will be signed by the parties and lodged with the court. After a 30-day public comment period, the Department of Justice will request the court to enter the CD. If the court enters the CD it becomes final. Once the CD is final, the PRP will begin the design of the remedy. The Remedial Action (remedy implementation) will start after EPA approves the Remedial Design. The entire process in this paragraph is expected to take a minimum of one year. These procedures are specified in CERCLA. It is generally EPA policy to find PRPs to perform cleanups whenever possible, in order to conserve Superfund money.

Prior to the official start of the Remedial Action, the EPA hopes to have informal procedures in place for handling citizen sampling requests.

12. Comment: Alexis Park is not safe. Why are people still being allowed to rent there?

Response: Throughout the 215-acre Site, the EPA has generally been concerned about two media–soil and air. With respect to Alexis Park, the soil was addressed during the soil removal action, and any lead-contaminated soil up to two feet below ground surface (bgs) that was found to have elevated concentrations of lead was cleaned up. Hydrocarbon contamination in Alexis Park soil (and in soil found elsewhere on-site) is buried, and dermal contact or incidental ingestion is thereby prevented. If future earthmoving activity at Alexis Park uncovers concentrations of hydrocarbons above concentrations which pose an unacceptable risk to human health, the Selected Remedy provides that the soil will be excavated until remediation goals are met. Any excavated areas will be backfilled with clean soil.

Indoor air at Alexis Park has been thoroughly investigated, and any residential units that were found to have benzene concentrations that exceeded the remediation goal were addressed and the air was made safe. To make the indoor air safe, cracks in the foundations and around plumbing portals were sealed, or the heating, ventilation and air conditioning (HVAC) system was modified (or both). Under the Selected Remedy, any Site resident, including residents of Alexis Park, who believes that indoor air is contaminated, may have it sampled. If concentrations of

contaminants of concern above concentrations which pose an unacceptable risk to human health are found, then corrective measures will be taken as called for in the Selected Remedy. It is hoped that dual-phase extraction of underground LNAPL contamination, as provided in the Selected Remedy, will eventually eliminate any threat to indoor air.

The Louisiana Office of Public Health (LOPH) has also been concerned with the indoor air in one building in Alexis Park, due to the presence of benzene and methane gas found in the building in 1990. To make the indoor air safe in this building, cracks in the foundations and around plumbing portals were sealed, or the HVAC system was modified (or both). GSHI has cooperated with LOPH, and is currently in the process of monitoring to show that the building, Building 5, is safe. This monitoring is expected to be completed prior to the release of this ROD. (See August 25, 2000, letter from LOPH in the Administrative Record.)

In short, at Alexis park, soil lead contamination has been remediated, and hydrocarbon soil contamination will be remediated if uncovered, all known indoor air contamination has been mitigated, and any resident can have his or her air sampled if the resident believes that it may be polluted with contaminants of concern.

13. Comment: On behalf of Bossier City Chamber of Commerce, the Greater Bossier Economic Development Foundation and more than 1,100 businesses that belong to them, we would like to applaud the process that we've been through so far. We are very pleased with the performance of OXY and their representatives in being responsible corporate citizens in working diligently with the State and with the EPA. We are very interested in moving forward with the Record of Decision, completing the process and securing this 215-acre site and certifying that the structures there do not pose any threat to human health

Response: The EPA agrees. We hope to reach an agreement whereby the responsible parties fund this action, and we are looking forward to working cooperatively toward that end. In order to facilitate real estate sales or development, the EPA will provide letters explaining that cleanup has been successfully completed at a given property.

14. Comment: Can EPA guarantee citizens that the past remediation done is protecting them from being exposed to all contamination that has been identified on the refinery site, especially the explosive levels of methane and cancer-causing benzene that was found?

Response: Since the ground water that underlies the Site is not used, the only media that could pose a threat at the Site are indoor air and soil. Wherever EPA has found contaminated indoor air, it has been mitigated. If any Site resident believes that an indoor area is contaminated, he or she can have it sampled as called for in the Selected Remedy. Any contaminated indoor air will be remediated. EPA believes that the dual-phase extraction of the LNAPL will eliminate any Site-related threat to indoor air. The EPA has sampled all residential soil and found that there is no lead contamination of concern in the top two inches of soil, though there could be contamination below that level. If any Site resident believes that he or she has uncovered

contaminated soil while gardening or performing other earth-moving activities, the resident can request that the soil be sampled. Contaminated soil will be remediated as called for in the Selected Remedy. The EPA believes that through the various mechanisms described in the selected Site remedy, any health threat will be identified and eliminated. As far as the explosion threat from methane is concerned, EPA believes that the threat has been mitigated. The final determination on the effectiveness of the methane mitigation measures will be made by LOPH.

15. Comment: Has EPA followed Superfund law and procedure in every action that the Agency took concerning the 215-acre refinery site?

Response: Yes.

16. Comment: The EPA is monitoring the air quality eight hours a day to measure the ozone levels in Bossier and Shreveport. Why aren't they monitoring the indoor air quality in Alexis Park the same way?

Response: Louisiana has an EPA-approved State Implementation Plan (SIP) under which it monitors the ambient (outdoor) air in certain parishes, including Bossier and Caddo, as part of the requirements of the Clean Air Act (CAA). The SIP requires that a certain type of outdoor monitoring be performed for certain contaminants, such as ground level ozone, so that compliance with the CAA may be ascertained. The response action at the Site is being conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund. Under CERCLA, the EPA is concerned about Site-related contaminants, which are not the same contaminants as those regulated under the CAA. The sampling and statistical methods used to monitor the Site-related contaminants, particularly those found in indoor air, are different than the methods used to monitor outdoor air for compliance with the CAA. The EPA has, under its Superfund authority, taken extensive samples of outdoor and indoor air at the Site using its Trace Atmospheric Gas Analyzer (TAGA), which is an appropriate method through which to measure concentrations of the types of chemicals found at the Site. The EPA also took some indoor air samples using 4-hour Summa canisters or carbon sorbent tubes. Two other methods appropriate to the media being investigated.

17. Comment: Did this site ever qualify as a Brownfields?

Response: The Site is not a Brownfield. Brownfields are abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. EPA has selected a remedy that will help make sure that the Site remains a vital commercial and residential area. Specifically, EPA has selected a nonintrusive remedy that complements the fully-developed nature of the Site, enabling the Site community to go on with its work and residential living without unnecessary interruptions.

18. Comment: Has EPA conducted studies that show that exposure to contaminants over a 70-year period is safe?

Response: Section 8, the Summary of Site Risks, in the ROD explains EPA's risk assessment process. The Selected Remedy targets the cleanup to reach certain contaminant concentrations, known as remediation goals, in each medium (e.g., soil, indoor air). These concentrations are selected using very conservative assumptions including an assumption that on-Site residents will be exposed for 70 years. To answer your question, once remediation goals are reached in the contaminated media on the Site, a 70-year exposure to those media will pose a health risk that falls within acceptable ranges. These risk ranges are described in the section of the ROD that is referenced earlier in this paragraph.

19. Comment: I don't believe the water here is safe.

Response: All homes and businesses on the Site receive their water from Bossier City. Bossier City water has been treated to meet Federal drinking water standards under the Safe Drinking Water Act. Of course, the safety of plumbing can vary from home to home. For example, some older plumbing was installed with lead solder that can leach into tap water. The EPA sampled tap water in two separate sampling events at the Site; in February -March 2000, and in June - July 2000. The results of this sampling showed that the drinking water in each dwelling unit sampled is safe. (See June 2000 and September 2000, reports by EPA on recent sampling included in the Administrative Record.)

20. Comment: My family and I have health problems that I think were caused by site contaminants.

Response: If you believe your health has been harmed you should consult a physician. On June 16, 2000, the Agency for Toxic Substances and Disease Registry (ATSDR), a Federal agency, published a Public Health Assessment for the Site. The Public Health Assessment was prepared by the Louisiana Department of Health and Hospitals, Office of Public Health, a State agency. The Public Health Assessment generally describes the health threat posed by the Site. The Public Health Assessment, and the Public Health Assessment Addendum that describes EPA's response to the health threatening conditions is part of the Administrative Record for the Site and can be viewed at the Bossier City Library, 2206 Beckett, Bossier City. The library's telephone number is (318) 746-1693. Copies of the report can also be obtained by calling the National Technical Information Service, Springfield, Virginia at (703) 605-6000. Ask for the Public Health Assessment for the Highway 71/72 Refinery, Bossier City, Bossier Parish, Louisiana CERCLIS No. LAD981054075 (June 16, 2000).

21. Comment: Is it safe to eat produce grown at the site?

Response: Certain garden plants can leach contaminants out of the soil including lead–a contaminant that is found at the Site, and consuming certain vegetables that have become contaminated in this manner could be unhealthy. EPA has determined that the type of garden plants that will leach contaminants out of soil do not have roots that extend to depths greater than

two feet bgs, and that the background levels of lead that occur naturally in the soil do not pose a risk to humans through consumption of homegrown vegetables. If you have a garden and you believe that soil within two feet of the surface in the garden area may be contaminated, you can have the soil sampled under the Selected Remedy. Of course, it will take some time to write and finalize the sampling and analysis plan, and to hire a contractor to respond to the sampling requests and perform the work. When the response mechanism is in place, the entire on-site community will be notified via direct mail.

22. Comment: How do I know if I should have the air in my home sampled?

Response: If there is a gasoline or diesel smell at your residence or workplace, and there is no obvious source for the odor, such as an attached garage or gasoline-soaked rags, you should have the indoor air sampled. Please note, however, that indoor air contamination may be present even if no odor exists. You will receive a notice in the mail, perhaps in a utility bill, when sampling services become available.

23. Comment: Buildings in Alexis Park are built on a slab. How do you intend to clean the ground that's under the slab?

Response: During the excavation associated with the soil lead removal action, the EPA observed dark stained soil underlying certain on-site structures. The EPA decided that, as long as this material remained where it is, it posed no threat to human health via dermal contact or incidental ingestion. If the dark stained soil contains benzene or other hazardous volatile chemicals, it could be contributing to indoor air contamination. As explained in the Feasibility Study (FS), the Proposed Plan, and the ROD, the EPA believes that the most likely source of indoor air contamination on the Site is the LNAPL that is floating on the ground water in the areas identified as LNAPL plumes A, B, and C, and in Zone 1 shown in Figure 7 in the ROD. (Please note that Zone 1 is referred to as the LNAPL Plume D area in the ROD). The EPA believes that, in the long term, removing the LNAPL plumes should eliminate the threat to indoor air. Nonetheless, under the Selected Remedy, indoor air sampling and mitigation (e.g., foundation crack sealing, and HVAC system modification) is available to on-site community members upon request. This mitigation will stop any indoor air health hazard that is found whether it comes from LNAPL or soil contamination that underlies a slab. In short, we believe that LNAPL is the real indoor air problem, and we are cleaning it up, but we have provided sampling and mitigation that will address all Site-related indoor air contamination whatever its source.

24. Comment: Why can't EPA conduct indoor air monitoring at Alexis Park 24-hours a day for at least six to eight months?

Response: As described in response to comment number 16, the EPA has conducted indoor air monitoring using appropriate equipment and sampling methods for Site conditions. Monitoring for 24-hours a day is not the correct methodology to use to check for the types of contaminants found at the Site in indoor air. At present, EPA believes that it has identified any

Alexis Park apartments with indoor air problems, and that the PRP has addressed those problems (though it is possible other apartments could develop problems as conditions change (e.g., as cracks develop in foundations). To address the source of the problem, and to provide a long-term solution to on-site indoor air contamination, the Selected Remedy calls for removal of the LNAPL. Once the LNAPL is removed, EPA believes that the indoor air problems will be eliminated. To address any short-term risks that there might be, EPA's Selected Remedy provides for sampling on request and for mitigation (e.g., foundation crack sealing, and HVAC system modification) if indoor air contamination is found.

25. Comment: Indoor air mitigation measures are not truly effective.

Response: The EPA has reviewed the analysis of samples taken in indoor units where mitigation has been performed, and EPA has found that the mitigation measures have lowered the indoor air contamination concentrations to concentrations that fall within acceptable risk ranges in every case.

26. Comment: I am requesting that EPA set up a monitoring system in Building 5 and the other buildings that had high levels of benzene, toluene and other hydrocarbons.

Response: As explained in our response to comment 24, EPA does not believe that wide scale indoor air sampling is appropriate. Indoor air sampling will be available to the occupant of any on-site indoor unit upon request.

27. Comment: Are incidences of cancer "clusters" occurring among area residents?

Response: The EPA does not tabulate statistics on the incidence of cancer. Data regarding increased incidences of cancer in a certain part of Louisiana may be obtained by submitting a written request to the Louisiana Department of Health and Hospitals, Office of Public Health, Section of Environmental Epidemiology and Toxicology, 234 Loyola Avenue, Suite 620, New Orleans, LA 70112, (504) 568-7034.

28. Comment: I have taken samples of my water. Can you inspect them for contamination?

Response: The EPA's Remedial Investigation (RI), including sampling of tap water this year, found no reason to believe that there is Site-related contamination of tap water. (See response to comment number 19.) However, if special circumstances cause you to believe that your tap water is contaminated with chemicals related to the Site, please call EPA at (800) 533-3508 and ask to speak to the Remedial Project Manager for the Highway 71/72 Site. As far as your samples are concerned, they cannot be reliably analyzed because water samples must be taken and analyzed following a rigid protocol that utilizes special containers containing preservatives that are maintained at certain temperatures. Therefore, storing water samples renders the samples useless for most analyses under the protocol.

29. Comment: Once EPA begins the remediation process will you continue to monitor over a period of time?

Response: Yes. The EPA, the LDEQ, or the PRPs (with oversight by these agencies) will continue regular monitoring of indoor air in units that were previously found to be contaminated, and EPA will continue regular monitoring of ground water. Monitoring of air and ground water will continue until EPA determines that concentrations of Site-related contaminants are low enough to allow unlimited use and unrestricted exposure to those media.

30. Comment: The environmental group Earth Alert rejects the efforts of EPA on this refinery site and we feel that they're incomplete, that you have not done the best that you could do, and we want you to do better.

Response: Comment noted.

Potentially Responsible Party's Comments

31. Comment: GSHI appreciates the acknowledgment in the Proposed Plan of Action that we have completed, through our removal actions, the work necessary to address environmental issues at the site and to minimize potential exposure to refinery-related constituents.

Response: Comment noted.

32. Comment: GSHI and OXY USA recognizes and appreciates the cooperative efforts of EPA, Louisiana Department of Environmental Quality (LDEQ), and Bossier City officials over the past decade to address environmental issues at the site.

Response: Comment noted.

33. Comment: EPA selected a non-intrusive remedy which we believe can, with only a few significant revisions, be finalized in a Record of Decision and implemented.

Response: Comment noted.

34. Comment: EPA's assumptions and interpretations underlying the Proposed Plan are arbitrary and capricious and not in accordance with law, and that, if not corrected in the Record of Decision, would either prevent or seriously interfere with the timely performance of any necessary remedial action at the site.

Response: The EPA disagrees with this broad comment. The EPA has addressed below, the specific comments made by this commenter.

35. Comment: EPA failed to acknowledge that it has not found a correlation between

subsurface soil and water conditions and indoor air quality despite costly and extensive TAGA sampling and consultant efforts to support this key assumption.

Response: Soil gas generated by LNAPL that floats on top of subsurface water (i.e., ground water) is a significant source of indoor air contamination on the Site. There are, however, many variables that determine whether and to what extent soil gas enters Site residences or businesses to become a source of indoor air pollution. Among these variables are soil condition and foundation integrity. Site soil is not homogenous, it varies from place to place. In some parts of the Site the soil may have voids that act as an efficient conduit for LNAPL-generated soil gas. In other parts of the Site, soil may be compacted to an extent that inhibits soil gas movement. Similarly, building foundation conditions also vary throughout the Site. In some cases, for example, plumbing portals (i.e., the holes in the foundations where water pipes, and electrical conduits enter) make it easy for soil gas to enter a structure, but in other cases, these portals have been sealed. Likewise, some foundations (most on-site foundations are slabs) are cracked and let soil gas through, while others form a barrier to soil gas.

Due to variables like soil condition and foundation integrity, there can be no perfect correlation between subsurface conditions and the amount of soil gas that enters a given structure. Other variables also make correlation between concentrations of contaminants in soil gas and concentrations of contaminants in indoor air impossible to establish. These variables include physical parameters such as barometric pressure, soil moisture content, ground water elevation, and ambient temperature. However, the potential for continued migration of contaminants into indoor air is highly probable as long as source material is present at the Site. In reaching this conclusion, EPA has evaluated Site-specific information, and considered Agency experience in attempting to establish a correlation for radon in indoor air. Studies of radon have found no simple correlation between radon in the subsurface and indoor radon concentrations, but it is undisputed that subsurface radon gas can enter indoor air.

In a significant number of cases, investigations have eliminated all household sources of indoor air contamination from homes, and have documented that contaminated soil gas is entering indoor air on the Site. Specifically, the EPA has used surveys to determine whether the lifestyle of building occupants could have contributed to benzene concentrations (certain activities such as cigarette-smoking can lead to increased indoor benzene concentrations), and EPA found that the detection of benzene at plumbing portals was independent of any lifestyle factors in a significant number of cases. That is, EPA found that it was very likely that the benzene was entering the business and residential units that were sampled from the subsurface, and that the benzene was not due to lifestyle factors. With the household sources eliminated, indoor air contaminants were found to be elevated above outside ambient air levels. Trace atmospheric gas analyzer (TAGA) data show that indoor air concentrations of contaminants were highest at points where soil gas would likely enter structures (e.g., foundation cracks, holes along pipes).

In addition, our knowledge of the historic refinery waste disposal practices that took place in the parts of the Site where indoor air contamination was found, and our knowledge of the

subsurface, based on monitoring wells and soil gas measurements, lends credence to our finding that there are plumes of LNAPL underlying the parts of the Site that exhibit indoor air contamination, and that these plumes are volatilizing benzene-contaminated soil gas that is making its way into certain indoor air spaces on the Site. We know the way that LNAPL behaves in the subsurface. That is, we know that LNAPL will follow the easiest route to the surface when it volatilizes. Sometimes that route is into an indoor space and sometimes it is not.

In short, it is well known that LNAPL plumes produce soil gas. As explained above, due to the many variables affecting soil gas concentrations and indoor air quality measurements, a direct correlation between soil gas concentrations and indoor air concentrations cannot be established (EPA acknowledged this in its Remedial Investigation Report). However, it is clear that, where the conditions are right, contaminated soil gas has entered indoor air in several Site areas at concentrations that are above concentrations which pose an unacceptable risk to human health, and it may continue to do so until the LNAPL plumes are addressed.

36. Comment: The proposed indoor air remediation goal of 3 ppbv [parts per billion by volume] benzene is unsupportable from a health risk standpoint even assuming EPA found a correlation with subsurface refinery-related conditions and the goal is technically impracticable.

Response: Based on an evaluation of scientific information presented by this commenter, and based on an analysis by EPA's toxicologist, Dr. Jon Rauscher, PhD, EPA has raised the indoor air remediation goal to 10 ppbv (the level that was used during the removal action) which corresponds to an excess lifetime cancer risk of 1×10^{-4} to 3×10^{-5} which is consistent with the NCP. An explanation of EPA's decision to raise the remediation goal can be found in the part of Section 14 of the ROD entitled "Documentation of Significant Changes".

37. Comment: The term "Indoor Air Quality Impairment Zone" is unfounded.

Response: In the ROD, the name of Indoor Air Quality Impairment Zone 1 has been changed to "Plume D" to more accurately reflect its similarity to Plumes A, B, and C. The area called Indoor Air Quality Impairment Zone 2 (or "Zone 2") in the Proposed Plan is not shown on Figure 7 in the ROD because it is a very small zone in the vicinity of monitoring well MW-2 in the north central portion of the Site. Only a slight sheen of LNAPL has been found under the area that has been referred to as Zone 2, and, consequently, since it is not expected to have an impact on indoor air, it is not addressed by the Selected Remedy.

38. Comment: The decision to set aside EPA's contractual obligations in the Agreement in Principle (AIP) dated September 10, 1995 is unjustified. This AIP established a specific health-based standard for indoor air quality at the site.

Response: The EPA has stuck with its agreement to, subject to NCP processes and procedures, work toward the items listed in the AIP. During EPA's review of the Site data, in

preparation for the Proposed Plan, the EPA decided that the indoor air standard listed in the AIP should be revised. After considering data and scientific information submitted during the comment period, the EPA has, in the Selected Remedy, returned to the indoor air quality standard contemplated in the AIP (as stated in the AIP, the selection of that standard was subject to NCP procedures). The remediation goal selected for benzene, 10 ppbv, is the same as the action level/cleanup level that was utilized in the removal action that addressed indoor air contamination. This is further explained in the ROD.

39. Comment: EPA failure to acknowledge that, in the absence of the AIP and a demonstrated correlation between concentrations of benzene in indoor air and those in LNAPL and subsurface soil, EPA has no authority to regulate indoor air quality at Bossier City.

Response: As explained in the response to comment number 35, above, EPA has developed evidence other than a statistical correlation to demonstrate that soil gas from LNAPL is entering indoor air spaces on the Site. Since the source of the LNAPL is the release of hazardous substances during past refinery operations, EPA has clear authority under CERCLA Section 104 and 106, 42 U.S.C. §§ 9604 and 9606, to address indoor air quality on the Site.

40. Comment: EPA failed to address the operations of Texas Eastern Pipeline Products Company and its affiliates and predecessors (collectively, TEPPCO) on and off the site, including, but not limited to, the 48,300-gallon jet fuel spill in 1988 at TEPPCO's bulk fuel storage facility next to the Alexis Park Apartments (EPA's Zone 1) and a former pipeline pumping station located at the Residence Inn (EPA's Plume C), which are believed to be the predominant sources of LNAPL fuel hydrocarbons on the water table in the vicinity of these locations, and a major source in the vicinity of the Days Inn (EPA's Plume A).

Response: The EPA examined various materials, including reports and presentations made by Glenn Springs Holdings, Inc. and TE Products Pipeline Company, Limited Partnership, and based upon information that EPA presently has in its possession, EPA does not intend to take any CERCLA action against TE Products Pipeline Company, Limited Partnership, or its affiliated or related entities and predecessors in interest with respect to the Site. The EPA found that the statements made by the commenter regarding TE Products Pipeline Company, Limited Partnership's (or its related entities') contribution to the LNAPL plumes are not supported by the evidence.

41. Comment: EPA used or restated outmoded data, such as the claim that 15 feet of LNAPL currently exists at the site. The Proposed Plan implies more than 15 feet of LNAPL is present in some monitoring wells on the site. The thickest LNAPL accumulation recently measured in any well is approximately 2 feet.

Response: The RI at p. 3-33 says

The LNAPL thickness in Site wells is manually gauged monthly and varies from a sheen (< 0.1 in.) to more than 15 ft. LNAPL thickness in wells varies over time.

The EPA agrees that recent measurements in existing wells show varying amounts of LNAPL in the wells and LNAPL thicknesses of less than 15 feet; however, the number of ground water wells currently monitored and the placement of these wells is insufficient to characterize the nature and extent (including the thickness) of all LNAPL plumes which underlie the Site. Due to the lack of sufficient wells, it is unclear how much LNAPL actually underlies the Site.

Since much is unknown about the thickness of the LNAPL plume, the EPA used 15 feet as a conservative estimate of its average thickness for costing purposes in the FS. That is, in making its projections regarding the length of time that it would take to extract the LNAPL, and in making cost projections, EPA decided to use a conservative (high end) estimate, and, therefore, the largest measured LNAPL thickness (i.e., 15 feet) was used.

The original 15 feet estimate came from a document, supplied by the PRP, prepared by G&E Engineering: *Letter Report of Findings, Additional Site Activities (June 1997 - January 1998), Design Demonstration Project for Free Product Identification and Recovery, Highway 71/72 Former Refinery Site, Bossier City, Louisiana*. (Prepared for Glenn Springs Holdings, Inc., Tulsa, Oklahoma. February 1998.) Further work to define the thickness of the LNAPL plume will be performed during the Remedial Design.

42. Comment: EPA relied on the Draft PHA without recognition of its numerous errors and its failure to follow ATSDR guidance.

Response: Concerns regarding indoor air quality which ATSDR raised in its Draft Public Health Assessment were verified by EPA with its TAGA. The TAGA data was then used to make decisions on the remediation goals and remedial objectives for the Site. Comments on the Draft Public Health Assessment itself should be addressed to the agency responsible for the document, the Louisiana Department of Health and Hospitals, Office of Public Health, Section of Environmental Epidemiology and Toxicology, 234 Loyola Avenue, Suite 620, New Orleans, LA 70112, (504) 568-7034.

43. Comment: EPA used a frequency and type of public notification that is unwarranted, unduly burdensome and inconsistent with notification by EPA at sites where it conducts remedial actions.

Response: The EPA believes that uninformed earth-moving activity on the Site could expose residents and workers to contaminants of concern (COCs). Moreover, the EPA also believes that, since soil gas takes new routes through the soil as these routes arise, indoor air spaces on the Site other than those that are currently being mitigated could be impacted by COCs in the future. Finally, the EPA has found that, because of the numerous rental properties on-site, the population in parts of the Site is relatively transient, with new people moving in and out all the

time. Given these circumstances, a substantial risk of exposure for those that are uninformed, and a transient population, it is appropriate to notify newcomers and remind current Site residents and businesses frequently. A quarterly notification by an individualized attention-grabbing medium (in this case we selected direct mail because it can be targeted to the Site) is warranted by the circumstances at the Site. Although the notification procedures used may be different from notification procedures used at other Superfund Sites, we are unaware of any Superfund site with circumstances like those at the Site.

44. Comment: GSHI believes that EPA can and should select an appropriate indoor air remedial goal for benzene of between 10 and 32 ppbv (for units without evidence of other benzene sources), a straightforward notification process and other aspects of the proposed remedial alternative that would be implementable (technically and administratively), cost effective and fully protective of public health.

Response: Notification requirements were addressed in the preceding response. As explained in EPA's response to comment number 36 above, the remediation goal for benzene has been changed to 10 ppbv based on an analysis of scientific information submitted by this commenter.

45. Comment: GSHI is prepared to work cooperatively with EPA, LDEQ and the City to provide any additional assistance that we can to achieve a ROD that meets CERCLA requirements.

Response: GSHI has performed work on behalf of COPCO at the Site, and EPA hopes that work will continue under a settlement between the United States and COPCO.

46. Comment: GSHI generally supports the remedial alternative selected and proposed by EPA (Alternative 5) and believes this is the most appropriate and applicable technology for this site.

Response: Comment noted.

47. Comment: The proposed action level for benzene in indoor air is unwarranted, unjustified, and technically infeasible, and therefore Alternative 5 must be amended to reflect a more realistic and attainable remedial goal for benzene in indoor air.

Response: As explained in EPA's response to comment number 36 above, the remediation goal for benzene has been changed to 10 ppbv based on an analysis of scientific information submitted by this commenter. This remediation goal is technically feasible, as evidenced by the successful air removal action.

48. Comment: EPA's calculated Site risks which are based on data generated prior to any

removal actions conducted at the Site and does not take into account the results of the surface Soil Removal Action or the Indoor Air Removal Action. If the interim removal actions are considered, risks from exposure to refinery-related constituents do not exceed U.S. EPA acceptable levels, without any further action.

Response: The indoor air removal action mitigated indoor air contaminated with benzene at concentrations that exceeded action levels where indoor air contamination was known to exist, but it did not address the LNAPL which is the primary source of the contamination. Since the source of indoor air contamination remains, there is a probability that other indoor air spaces could become contaminated in the future as soil gas (i.e., volatilized LNAPL) makes its way to the surface through new foundation cracks or new interstitial soil spaces that did not exist when EPA was determining which indoor air units needed to be addressed. In short, the source of contaminated soil gas is still under the Site, and that soil gas could find its way into homes and businesses that were not addressed by the removal. With that assumption in mind, EPA developed remediation goals for indoor air. Since the indoor air removal action did not address the source of the contamination, it does not matter whether EPA based its risk assessment on data gathered before or after the indoor air removal. If soil gas makes its way into a new indoor air space, it will pose a risk that is unaffected by past indoor air removal actions.

Likewise, the soil lead removal addressed only known areas of lead contamination. Based on expert analysis of aerial photographs, based on oil refinery company documents, and based on soil sampling data gathered during the soil removal action, EPA determined that it is possible that lead-contaminated soil remains on the Site, generally at depths greater than two inches below ground surface (bgs). Accordingly, EPA decided that it had to develop a remediation goal for lead, so that if earthmoving activity uncovers the lead, we will know what concentration is safe. After considering other alternative methods for calculating a remediation goal for lead, the EPA toxicologist decided that the Integrated Exposure Uptake Biokinetic (IEUBK) computer model was the most appropriate method. The EPA gathered the various Site data necessary to run the model (e.g., concentrations of lead in Site tap water, concentrations of lead in indoor dust, and concentrations of lead in the top two inches of residential yard soil). Using this data, EPA ran the model and calculated that 510 parts lead per million parts soil (ppm) was a valid remediation goal. That is, the model determined that, based on the amount of lead that was found in background sources such as tap water in residential areas on the Site, it would generally be safe for residential yard soil to contain up to 510 ppm lead. It should be noted that the lead remediation goal was calculated using data that was collected after the soil lead removal action was completed.

To summarize, since the indoor air removal action did not address the source of indoor air contamination, and since the soil lead removal action may not have addressed all the sources of soil lead contamination, EPA had to determine the risk posed by any remaining contamination sources. Moreover, since the indoor air removal action did not address the source of indoor air contamination, and since the soil lead removal action may not have addressed all the sources of soil lead contamination, it did not matter whether EPA used data gathered before the removals or after the removals in determining its risk levels and its remediation goals. Finally, under the NCP,

40 CFR §300.430, the role of the Baseline Risk Assessment is to address the risk associated with a site in the absence of any remedial action or control, including institutional controls. The baseline assessment is essentially an evaluation of the no-action alternative (see 55 Fed. Reg. 8666, 8710-8711, March 8, 1990); accordingly, in developing its Baseline Risk Assessment, it is appropriate for EPA to disregard the effect of the removal actions in any case.

49. Comment: EPA's selection of a Remediation Goal for indoor air of 3 ppbv is technically flawed and inconsistent with the requirements of the NCP.

50. Comment: The Remediation Goal for benzene in indoor air should be established in the range of 10 to 32 ppbv.

51. Comment: Background levels of benzene in ambient air at the Highway 71/72 Former Refinery Site have been described by EPA as ranging from 1 to 3 ppbv. This range is presumably based on ambient air data collected by the TAGA in 1996 and 1997 and the upper bound of this range (3 ppbv) was used to set the indoor air remediation goal.

52. Comment: The 1996 and 1997 background ambient air benzene data from the TAGA range as high as 7.7 ppbv with about 25% of the individual measurements exceeding 3.0 ppbv. Bossier City and other national studies and databases document that background benzene concentrations in air can range up to 20 ppbv.

53. Comment: None of the data justify use of 3 ppbv as the appropriate value for ambient concentrations of benzene.

54. Comment: EPA's own data indicate that outdoor concentrations of benzene exceed 3 ppbv at least 25% of the time. The selected remedial alternatives will be ineffective at reducing indoor air concentrations below this level because indoor air is constantly renewed with outdoor air.

Response to comments 49 through 54: As explained in EPA’s response to comment number 36 above, the remediation goal for benzene has been changed to 10 ppbv based on scientific information submitted by this commenter, and based on an analysis by EPA’s toxicologist.

55. Comment: In establishing a Remediation Goal for indoor benzene concentrations, EPA has failed to account for indoor sources of benzene, including cigarette smoke and gasoline stored in attached garages. These activities and conditions would make achievement of the proposed action level not feasible and technically impracticable.

Response: EPA toxicologist, Dr. Jon Rauscher, PhD, has examined the information presented by this commenter, and based on the range in the background concentrations of benzene that can be found in indoor air on the Site, Dr. Rauscher has recommended that EPA

raise the remediation goal for indoor air to 10 ppbv (from the 3 ppbv proposed in the Proposed Plan). Based on Dr. Rauscher's recommendation, which is part of the Administrative Record for this ROD, EPA has revised the remediation goal for indoor air to 10 ppbv benzene. An explanation of EPA's decision to raise the remediation goal can be found in the Section 14 of the ROD entitled "Documentation of Significant Changes."

56. Comment: If a remediation goal is established based solely on outside air concentrations of benzene, indoor benzene concentrations will almost certainly exceed this level even though no refinery-related constituents are present. EPA must recognize and include some value reflecting indoor sources of benzene unrelated to the site and their expected effect on indoor air concentrations in calculating background concentrations of benzene.

57. Comment: An appropriate indoor background concentration that would reflect a reasonable high end value at the site should be at least 11.55 ppbv (7.7 + (.5)(7.7)).

Response to comments 56 and 57: The remediation goal for indoor air established in the ROD takes into account the fact that spikes in background concentrations of benzene may make excursions to a high end concentration in the vicinity of 11.5 ppbv (based the above method of calculation of a high end background concentration and based on one range of Site-related background concentrations in the vicinity of 7-8 ppbv.) This range of background concentrations was due to random unpredictable events such as occasional cigarette smoke, open gasoline cans in attached garages, and the use of household products that contain benzene. The revised remediation goal is, however, also based on our experience with mitigation during the indoor air removal action. During the removal action we found that cleanup levels of 10 ppbv benzene were attainable in indoor units located on the Site. Consequently, the revised remediation goal was not set at 11.5 ppbv, but at the more protective, and achievable10 ppbv.

58. Comment: EPA has failed to properly include appropriate site specific data in performing its risk calculations. The Baseline Risk Assessment performed by Gradient demonstrated that the 90th percentile exposure duration for residents of single family homes is 18 years. The residential duration of apartment residents and hotel guests is substantially less.

Response: In determining future health risks for a certain population, EPA uses certain default assumptions. EPA makes the default assumption that 9 years is the 50th percentile. That is, EPA assumes that only 50 percent of a certain population will live at given residence for more than 50 years. Likewise, EPA makes the default assumption that 30 years is the 90th percentile. That is, EPA assumes that only 10 percent of the population will live at a given residence for longer than 30 years. These default assumptions are based upon U.S. Bureau of Census data (1993) which shows that the 50th and 90th percentile values for years spent living in current homes were 9.1 years and 32.7 years, respectively, throughout the U.S.

The commenter compares EPA's default assumptions to the findings of the Gradient Corporation ("Gradient") study that was conducted on the Site. The comparison is invalid for the

reasons described in this paragraph. First, the Gradient study measured past residence time for a very small population (relative to the U.S.), and that population may have been affected by various abnormal events that will not occur in the future; therefore, the Gradient study is not a good predictor of future residence time. Second, by basing EPA's default assumptions for future residence time on a larger population (the entire U.S.), EPA eliminates the effect of abnormal events, and achieves an assumption that is more in line with the sort of residence time which most people experience. Finally, the Gradient study is flawed as a predictor of future residence time because the construction of the housing which was used as a basis for the Gradient study was not begun until about 1969. Accordingly, residents of that housing could have only spent a maximum of 24 years in that housing at the time that Gradient conducted the study. That is, the people who were the subjects of the Gradient study did not have the opportunity to live in the study housing for more than 24 years. However, people may have the opportunity to live in Site housing for much longer than 24 years in the future, and EPA's assumptions accounts for this possibility. In addition, the transient population could stabilize as the neighborhood matures. As the age of housing increases on the Site, the 90th percentile residence time will in all likelihood approach (and might exceed) the 30 years found throughout the U.S. by the U.S. Bureau of Census. In short the commenter compares EPA's prediction of the future with Gradient's record of the truncated past--an invalid comparison.

59. Comment: Under Alternative 5, sources of hydrocarbons in the ground water (the site-related source of benzene) will be remediated within 10 years. Thus, the appropriate duration of alleged indoor exposure to site-related benzene is ten years.

Response: The ten-year estimate used for determining the cost of the LNAPL recovery is not an appropriate estimate for determining exposure periods. (The converse is also true.) In establishing remediation goals, EPA uses conservative exposure assumptions (in this case 30 years) intended to ensure protectiveness. While we are confident that the LNAPL is the primary source of indoor air contamination, we cannot be absolutely certain that LNAPL extraction will remove all sources of indoor air contamination, and other sources could remain. Consequently, we have based our remediation goal on the assumption that exposure to contaminated air could continue up to 30 years.

60. Comment: Since benzene does not interact directly with DNA to cause point mutations (ATSDR, Toxicological Profile for Benzene), a nonlinear dose response for benzene at low doses is plausible. Consideration of this factor would yield even lower risk values.

Response: Much uncertainty exists in the understanding of the mechanisms through which benzene and its metabolites exert their toxic and carcinogenic effects. Recent data (From the Integrated Risk Information System: Hayes, RB; Yin, SN: Dosemeci, M; et al. 1996. Mortality among benzene-exposed workers in China. Environ. Health Perspect. 104 (suppl. 6): 1349-1352), suggests that genetic abnormalities appear at low exposure levels in humans, indicating that benzene may interact with DNA. It is likely that more than one mechanistic pathway is responsible for the contributions of benzene to the leukemogenic process. Until there is a better

understanding of the biological mechanisms of benzene-induced leukemia, a nonlinear dose-response curve cannot be used. In addition, the shape of the dose-response curve is not known at the low doses typical of an environmental exposure, so there is no sound scientific basis to choose any particular non-linear extrapolation model to estimate human cancer risk. Given these facts, EPA has chosen to use a linear extrapolation model in its risk assessments. This conservative approach is appropriate, and it is in accordance with the Risk Assessment Guidance for Superfund (RAGS.)

Uncertainty is inherent in any human health risk assessment. A discussion of uncertainty in the Baseline Risk Assessment for this Site is included in Section 9 of Volume III of the RI.

61. Comment: EPA concluded that it was "fairly confident" that exposure to benzene increases the risk of leukemia at the level of 40 ppm-years of cumulative exposure. Other investigators concluded that it is not until exposures exceed 200 ppm-years that risk increases. Therefore 40 ppm-years is a conservative point of departure - the level at or above which effects could occur. This corresponds to a point of departure for lifetime (76 years) environmental exposure of 120 ppb. Hence, 120 ppb is a conservative point of departure. An exposure of 76 years to 120 ppb is equivalent to over 300 ppb based on a 30-year exposure, which EPA has assumed for Bossier City residents.

Response: Conestoga-Rovers & Associates (CRA) misrepresents information presented in the Integrated Risk Information System (IRIS) and in the studies presented in the IRIS file. The Rinsky et al. (1987) study analyses found significantly elevated risks of leukemia at cumulative exposures less than the then equivalent current standard for occupational exposure, which was 5 to 10 ppm over a 40-year working lifetime (200 to 400 ppm-years). This study assumed that exposure occurred for only 8 hours each workday, which is significantly less than a residential exposure time period that would be used at a Superfund Site for calculating baseline risk. Rinsky et al.'s data suggest that a risk in the standardized mortality ratio (SMR) may begin at levels under 40 ppm-years, although the trend does not attain statistical significance until a dose of 200 to 400 ppm-years is reached. The inability to find elevated risk as significant below 40 ppm-years may be attributed to lack of statistical power (i.e., the small sample size). CRA used an unconventional approach and misrepresented facts in order to estimate an exposure concentration for the general population. The current scientifically acceptable approach is to use the range of benzene inhalation unit risk factors (2.2×10^{-6} to 7.8×10^{-6} per $\mu g/m^3$) to estimate an acceptable exposure concentration. (See also response to comments numbered 65 and 66 which describes the benzene risk calculation.)

62. Comment: Selection of a Remediation Goal for indoor air at a 10^{-4} risk level would fully protect human health and the environment and satisfy the objectives of the NCP.

Response: Where remediation goals are not determined by applicable or relevant and appropriate requirements (ARARs), EPA uses 1×10^{-6} lifetime risk (a risk of one in a million) as

the point of departure in determining remediation goals. This means that a cumulative risk level of 1×10^{-6} is used as the starting point (or initial "protectiveness" goal) for determining the most appropriate risk level that cleanup alternatives should be designed to attain. The use of 1×10^{-6} expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range, but this does not reflect a presumption that the final remedial action should attain such a risk level. Factors related to exposure, uncertainty, and technical limitations may justify modification of initial cleanup levels that are based on the1×10^{-6} risk level. The ultimate decision on what level of protection will be appropriate depends on the selected remedy, which is based on the criteria described at 40 CFR § 300.430(e)(9)(iii).

63. Comment: The EPA, the federal Agency for Toxic Substances and Disease Registry, and the Louisiana Department of Health and Hospitals all agree that an indoor air quality goal of no more than 10 ppbv is appropriate to protect human health. EPA has adopted this goal for passive and active abatement action at the Site.

64. Comment: The EPA examined the levels of benzene against a health risk calculation and found that a 10 ppb increase in benzene breathed over an entire lifetime could increase the likelihood of developing cancer by one chance in 10,000. Superfund regulations require EPA to set goals for carcinogens at least this protective. In consideration of outdoor air benzene levels and EPA guidelines for selecting remediation goals, the 10 ppbv goal is acceptable for human health.

Response to comments 63 and 64: As explained in EPA's response to comment number 36 above, the remediation goal for benzene has been changed to 10 ppbv based on an analysis of scientific information submitted by this commenter. This revised remediation goal corresponds to an excess lifetime cancer risk of 3×10^{-5} to 1×10^{-4}. (Note that 1×10^{-4} is a one in 10,000 excess risk. See also the Toxicity Assessment section of the ROD.) The EPA agrees that the 10 ppbv goal is acceptable for human health. These comments are further addressed in response to comments numbered 65 and 66.

65. Comment: Conservatively assuming 30 years exposure (6 years as a child and 24 years as an adult) to a mean indoor air benzene concentration of 19.6 g/m^3 (about 6 ppbv), EPA calculated an excess cancer risk of 4.56×10^{-5}. Using the same exposure scenario as in the BRA, the indoor air concentration corresponding to a 1×10^{-4} excess cancer risk is about 13 ppbv.

66. Comment: Assuming a 30 years exposure, an indoor air concentration as high as 32 ppbv is justified under the NCP. This indoor air concentration corresponds to a 1×10^{-4} risk level. The actual risk will be lower if the exposure duration is less than 30 years. A Remediation Goal of 3 ppbv is unwarranted and EPA would be justified in selecting a goal as high as 32 ppbv. At a minimum, any Remediation Goal must fall within the range of 10 to 32 ppbv.

Response comments 65 and 66: The purpose of these comments seems to be to suggest that the remediation goal for benzene be raised higher than the 10 ppbv which is included as part

of the ROD. Calculation of the remediation goal and the justification for not raising the remediation goal higher than 10 ppbv is described in the remainder of this response.

The inhalation unit risk factor for benzene was changed from a single value of 8.3×10^{-6} per $\mu g/m^3$ to a range of 2.2×10^{-6} to 7.8×10^{-6} per $\mu g/m^3$ on October 16, 1998 (Benzene (01/19/2000) from the IRIS database and Carcinogenic Effects of Benzene: An Update (EPA/600/P-97/001F)). The inhalation unit risk factor is the upper-bound excess lifetime cancer risk estimated to result from continuous exposure to a chemical at a concentration of 1 $\mu g/m^3$ in air. Each end of the range of inhalation unit risk factors for benzene is used to calculate an upper-bound excess lifetime cancer risk from benzene inhalation exposures. The upper-bound excess lifetime cancer risk is then expressed as a range. For example, an interpretation of inhalation unit risk factor would be as follows: if unit risk factor is 8×10^{-6} per $\mu g/m^3$, 8 excess tumors are expected to develop per 1,000,000 people if exposed daily for a lifetime to 1 µg of the chemical in 1 cubic meter of air.

In this case, the upper-bound lifetime cancer risk represents the additional site-related probability that an individual will develop cancer over a lifetime because of exposure to benzene in indoor air (i.e., greater than the general nationwide lifetime risk of cancer). To protect human health, EPA has set the acceptable risk range for carcinogens at Superfund Sites from 1 in 10,000 to 1 in 1,000,000 (expressed as 1×10^{-4} to 1×10^{-6}), though EPA uses the lower end of the range, 1×10^{-6} as an initial protectiveness goal. A risk of 1 in 1,000,000 (1×10^{-6}) means that one person out of one million people could be expected to develop cancer as a result of a lifetime exposure to the site contaminants.

As detailed in the response to comment number 62 and in the Toxicity Assessment Section of the ROD, factors related to exposure, uncertainty and technical limitations may justify modification of initial remediation goals that are based on the initial protectiveness goal of $1x10^{-6}$ risk level. As discussed in Section 14 of the ROD and in the August 30, 2000, memorandum written by Dr. Jon Rauscher, the uncertainty in the background concentration of benzene due to non-site-related excursions has led EPA to select a remediation goal that has an upper-bound lifetime cancer risk higher than 1×10^{-6}. (See response to comments numbered 57 and 63.) The remediation goal of 10 ppbv for benzene in indoor air corresponds to an excess lifetime cancer risk of 3×10^{-5} to $1x10^{-4}$, which is within EPA's acceptable risk range under the NCP.

The risk range corresponding to 13 ppbv is also within EPA's acceptable risk range, at 4×10^{-5} to $1x10^{-4}$, however, the more protective 10 ppbv was selected as the remediation goal. In addition 13 ppbv is higher than the Site background concentration of benzene, even considering excursions. (See response to comment number 57.) Finally, it was found, during the indoor air removal action, that a 10 ppbv remediation goal is achievable. The risk range corresponding to 32 ppbv is not within EPA's acceptable risk range, at 1×10^{-4} to $3x10^{-4}$.

67. Comment: The proposed plan states that GSHI is an indemnitor of COPCO. This is not true.

Response: The text of the ROD describes GSHI as a company that "performs work on behalf of COPCO."

68. Comment: The proposed plan does not discuss the fact that two of the eight units subject to the Indoor Air Removal Action had obvious indoor sources of benzene that were ignored by EPA and not reported by EPA to GSHI.

Response: Benzene at concentrations higher than background concentrations and at concentrations higher than the action level of 10 ppbv was detected in several on-site dwelling units. This contamination was not attributable to household sources, and, in many cases appeared to be coming from foundation cracks and other penetrations of the slabs like plumbing portals. The number of dwelling units sampled was limited. Therefore, EPA set a remediation goal for benzene in indoor air, and included measures to address the source of the indoor air contamination and the indoor air contamination itself as part of the Selected Remedy. The EPA is aware that there could be other household sources of benzene in indoor air, such as cigarette smoke and attached garages. A mechanism for identifying non-site-related sources of benzene in indoor air will be included as part of the Remedial Design. See response to comment number 73.

69. Comment: The proposed plan contains virtually no information on the historic and current operations of TEPPCO and its predecessor companies, both on and adjacent to the Site, including its bulk fuel storage facilities, pipelines and spill. The primary product identified is JP-4, which contains benzene. TEPPCO released JP-4 on or immediately adjacent to the Highway 71/72 Refinery Site and the former refinery did not produce, store of handle JP-4.

Response: Please see response to comment number 40.

70. Comment: The railroad tank car repair yard label in the proposed plan is based on the deposition of a retired TEPPCO employee. The actual refinery historical drawings previously provided to EPA have this area identified as the "Loading Rack Area". No mention of the railroad tank car repair yard is shown on these drawings or other historical documentation regarding the refinery. The Proposed plan text and figures should be changed.

Response: The testimony of the former refinery employee regarding the location of the railroad tank car repair yard has been corroborated by expert analysis of historic aerial photographs of the Site. The analysis, and the testimony are part of the Administrative Record for the ROD.

71. Comment: The comment in the proposed plan that hydrocarbon stained soil "may be serving as a source of ground water or indoor air contamination" is entirely speculative.

Response: Based on information gathered during the RI, it is clear that waste disposal practices during refinery operations were sloppy. For example, process waste water was allowed to flow into unlined pits where sludges were formed (i.e., RCRA listed waste F037), and tank

bottoms (K052) and water drained from storage tanks (another sludge-forming process waste water) were disposed of in the diked areas that surrounded the tanks. Analysis of historic aerial photographs shows that these contaminated sludges and bottoms were spread in certain areas of the Site and buried. It is reasonable to assume that the hydrocarbon-stained soil that has been observed on the Site (see e.g., the photographs taken during the soil lead removal and the October 1999 water main break) is contaminated with material from these sludges and bottoms. Based on EPA's knowledge of the types of contaminants contained in F037 and K052 wastes (e.g., volatile and semi-volatile hydrocarbons, and polynuclear aromatic hydrocarbons (PAHs)), it is reasonable to assume that the hydrocarbon-stained soil could be a source of indoor air and ground water pollution on the Site.

72. Comment: The Summary of Previous Investigations section of the proposed plan should summarize the total number of soil borings, monitor wells, surface soil samples, and indoor air/ambient air samples obtained throughout the site over the past 10 years.

Response: The Summary of Previous Investigations subsection is part of the Site Background section of the Proposed Plan. The purpose of the Site Background section is to provide a foundation for the subsequent sections of the Proposed Plan (see A Guide to Preparing Superfund Proposed Plans, Records of Decision, and other Remedy Selection Decision Documents, OSWER Directive9200.1-23P (July 1999) at p. 3-2 (this directive is part of the Administrative Record for the Site). Among the questions that the Site Background section should answer is "Who has investigated site contamination, and with what results?" The answer to this question should include a history of Federal, State, and local site investigations. Details, such as the "total number of borings," are included in the documents which appear in the Administrative Record, and typically are not appropriate for inclusion in the Site Background section of the Proposed Plan.

73. Comment: The discussion related to the findings of Summa canister sample analyses in the proposed plan should more accurately reflect the fact that, in most samples, benzene levels were not found above levels of potential health effects. This section should also reflect EPA's knowledge that at least one location where benzene in indoor air samples was determined to exceed 10 ppbv was observed to contain a gasoline-soaked rag hidden within a closet.

Response: We presume that the commenters intent is to show that text is needed to show that the extent of known indoor contamination on the Site has been limited to a limited number of apartment units and hotel rooms. The Proposed Plan, at page 2-15, says that

> "EPA selected 10 ppbv benzene as the action level and cleanup level for the Indoor Air Removal Action based on site-specific data that was available at the time. A total of 32 dwelling units (e.g., homes, apartments or hotel rooms) were sampled resulting in eight dwelling units which required corrective action because they contained concentrations of benzene in indoor air that exceeded the action level."

This part of the Proposed Plan shows that the known extent of indoor air contamination found prior to the indoor air removal action was limited. It should be noted, however, that the number of structures sampled was also limited. (The EPA estimates that there are approximately 600 dwelling units on-site.) As far as the indoor unit that had the gasoline-soaked rag is concerned, we presume that the commenter's intent is to make it known to the public that gasoline can raise the concentration of benzene in indoor air. This is discussed somewhat in the Section 14 of the ROD. (See also response to comment number 77.) It is also EPA's intent to include such information in the various quarterly notices that will be distributed under the Selected Remedy.

74. Comment: GSHI previously provided detailed comments on the June 4, 1996 draft Proposed Plan. These comments were not used in the plan.

Response: Under the NCP, EPA is not required to respond to comments submitted prior to the public comment period, though EPA is encouraged to respond to significant early comments as appropriate (see 40 CFR § 300.815(b).) Since the June 4, 1996 draft Proposed Plan was so very different from the Proposed Plan which EPA issued on May 12, 2000, the comments which the commenter submitted regarding the draft were not considered relevant.

75. Comment: A broader discussion of the 1997 EPA TAGA indoor air sampling event and results should be provided in the proposed plan.

Response: In the Proposed Plan EPA explains that

> In the response to these [ATSDR] recommendations, in June 1996, EPA conducted sampling of indoor air at 92 on-site locations, where access was granted, using the EPA Trace Atmospheric Gas Analyzer (TAGA). Additionally, Summa canister samples of indoor air were collected in 31 on-site location in order to determine time-weighted exposure to contaminants of concern (COCs) (Weston, 1996). Locations of Summa canisters were determined based on TAGA results. . . .

The Proposed Plan goes on to say:

> . . .On January 6, 1997, LOPH and ATSDR released a Health Consultation for the Site based on the results of EPA's June 1996 TAGA sampling of indoor air (Louisiana Office of Public Health, 1997). . . .

Proposed Plan at 2-12. The Proposed Plan also describes the use of the TAGA at p 2-15 where it says

> . . .In December 1996, EPA ordered COPCO to conduct a removal action to address indoor air contamination at the Site. An indoor air removal action was conducted by GSHI on COPCO's behalf. The removal action addressed indoor air contamination at eight private residences and motel rooms in order to alleviate confirmed indoor air hazards at the Site (Conestoga-Rovers, 1997b). In early 1997, EPA used the TAGA to screen additional on-site residences for indoor air contaminants.

Finally, on page 3-8 of the Proposed Plan, EPA explains that

> In June 1996, EPA conducted an indoor air sampling study on the Site using EPA's Trace Atmospheric Gas Analyzer (TAGA). The TAGA is an air sampling instrument which detects very low concentrations of organic chemicals simultaneously in both indoor and outdoor air. The results of the TAGA indoor air screening showed contaminant concentration levels above the ambient (or background) outdoor concentration level. The concentrations of contaminants in indoor air were three times outdoor background concentrations for benzene, toluene, and/or xylenes in 48 of the 92 dwelling units tested (Weston, 1996). Additional monitoring and analysis was conducted at 32 dwelling units based on the results of the TAGA screening. Five of these units showed benzene levels above 10 ppbv. The results of a second TAGA indoor air screening conducted in January through March 1997, indicated elevated levels of benzene, toluene, and/or xylenes in nine of the 72 dwelling units tested.

With these sections of the Proposed Plan, it is clear that EPA has provided the public with a good general description of the role that the TAGA played at the Site, including the 1997 sampling. The description of the role that the TAGA played at the Site is consistent with NCP requirements for a Proposed Plan which are as follows:

> (2) The proposed plan. In the first step in the remedy selection process, the lead agency shall identify the alternative that best meets the requirements in §300.430(f)(1), above, and shall present that alternative to the public in a proposed plan. The lead agency, in conjunction with the support agency and consistent with § 300.515(e), shall prepare a proposed plan that briefly describes the remedial alternatives analyzed by the lead agency, proposes a preferred remedial action alternative, and summarizes the information relied upon to select the preferred alternative. The selection of remedy process for an operable unit may be initiated at any time during the remedial action process. The purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration, and to participate in the selection of remedial action at a

site. At a minimum, the proposed plan shall:

(i) Provide a brief summary description of the remedial alternatives evaluated in the detailed analysis established under paragraph (e)(9) of this section;

(ii) Identify and provide a discussion of the rationale that supports the preferred alternative;

(iii) Provide a summary of any formal comments received from the support agency; and

(iv) Provide a summary explanation of any proposed waiver identified under paragraph (f)(1)(ii)(C) of this section from an ARAR.

(40 CFR § 300.430(f)(2).) The description of the role of the TAGA is consistent with 40 CFR § 300.430(f)(2)(ii) in that it helps to identify and provide a discussion of the rationale that supports the preferred alternative. In that the "the purpose of the proposed plan is to supplement the RI/FS," a set of documents which contain extensive discussions of and references to technical studies (including the TAGA studies), it is not appropriate for EPA to go into extensive detail regarding a study that is already dealt with extensively in the RI/FS (see e.g., appendices D, F, and H to the RI).

76. Comment: The Proposed Plan acknowledges that the Air and Soil Removal Actions were completed. GSHI has completed the work under the Indoor Air UAO, Soil Removal UAO, and complied fully with the terms of UAOs. EPA should acknowledge this compliance in the Proposed Plan and the Record of Decision.

Response: In the Proposed Plan at p. 2-13, EPA says (emphasis added)

. . . On July 31, 1996, EPA ordered COPCO to conduct a removal action to address lead-contaminated surface soils. Under the order, lead-contaminated surface soil characterization, excavation and off-site disposal were conducted initially by OXY and then by GSHI, both on COPCO's behalf . . . .

The Proposed Plan goes on to say (emphasis added)

. . . In December 1996, EPA ordered COPCO to conduct a removal action to address indoor air contamination at the Site. An indoor air removal action was conducted by GSHI on COPCO's behalf. . . .

(Proposed Plan at p. 2-15.) The ROD, at subsection, Summary of Previous Response Actions, explains that COPCO complied with the soil lead UAO, and is in compliance with the indoor air UAO.

77. Comment: Section 3 of the Proposed Plan should present a more complete description of the EPA's hypotheses regarding correlations between LNAPL on the water table, soil vapor and indoor air quality, EPA's extensive TAGA efforts to test and prove those hypotheses, and the results of that testing. An explanation is also warranted for why EPA now appears to be repudiating the September 10, 1995 Agreement in Principle for the site among EPA, LDEQ, Bossier City and OXY USA.

Response: For EPA's discussion of the relationship between LNAPL contamination, soil vapor and indoor air contamination, please see EPA's response to comment number 35. The EPA's actions have been consistent with the AIP, as discussed in its responses to comments numbered 38 and 39.

78. Comment: The Proposed Plan ignores the risk level selected by EPA in the AIP and instead purports to apply a 1×10^{-6} risk level. The EPA's decision not to comply with its obligations under the AIP is troubling, given that other parties have relied on EPA's commitments under the AIP and have performed work at the site in accordance with the AIP.

Response: The EPA's actions have been consistent with the AIP, as discussed in its responses to comments 38 and 39. (See also the response to comment number 62 which describes procedures for selecting remediation goals.)

79. Comment: The level of effort undertaken over the past 10 years by GSHI, EPA, and LDEQ to investigate this site is substantial and more details of the scope of the investigation should be summarized in the Proposed Plans Site Contamination - Results of Sampling section.

Response: The Proposed Plan's description of past investigation efforts is consistent with the NCP requirements for the Proposed Plan, which are as follows:

> (2) The proposed plan. In the first step in the remedy selection process, the lead agency shall identify the alternative that best meets the requirements in § 300.430(f)(1), above, and shall present that alternative to the public in a proposed plan. The lead agency, in conjunction with the support agency and consistent with § 300.515(e), shall prepare a proposed plan that briefly describes the remedial alternatives analyzed by the lead agency, proposes a preferred remedial action alternative, and summarizes the information relied upon to select the preferred alternative. The selection of remedy process for an operable unit may be initiated at any time during the remedial action process. The purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration, and to participate in the selection of remedial action at a site. At a minimum, the proposed plan shall:

(i) Provide a brief summary description of the remedial alternatives evaluated in the detailed analysis established under paragraph (e)(9) of this section;

(ii) Identify and provide a discussion of the rationale that supports the preferred alternative;

(iii) Provide a summary of any formal comments received from the support agency; and

(iv) Provide a summary explanation of any proposed waiver identified under paragraph (f)(1)(ii)(C) of this section from an ARAR.

(40 CFR § 300.430(f)(2).) Specifically the EPA's description of the past sampling efforts are consistent with 40 CFR § 300.430(f)(2)(ii) in that it helps to identify and provide a discussion of the rationale that supports the preferred alternative. In that the "the purpose of the proposed plan is to supplement the RI/FS," a set of documents which contain extensive discussions of and references to past technical studies, it is not appropriate for EPA to go into extensive detail regarding studies that are already extensively addressed in the RI.

80. Comment: The "Indoor Air Quality Impairment Zones" are without justification and should be deleted from the Proposed Plan.

Response: Please see response to comment number 37.

81. Comment: Table 4 of the Proposed Plan, the Total Cancer and Non-Cancer Risk Estimates table, is misleading and presents a gross overestimation of current risks at the site. GSHI strongly recommends that this table be removed or that risks be separated into current and hypothetical future risks.

Response: It is appropriate for EPA to calculate the total risk to a receptor which includes both site-related and non-site-related risk as in Table 4 in the Proposed Plan, and it is also appropriate for EPA to present this information to the public in a Proposed Plan. The EPA's risk assessment methods are explained in the Baseline Risk Assessment which is part of the Administrative Record. Generally the risk assessment is based on the methods described in the various volumes of the Risk Assessment Guidance for Superfund (RAGS). The various volumes of RAGS are also part of the Administrative Record. The RAGS takes a conservative approach

to risk assessment that is consistent with the NCP. Table 4, however, is not included in the ROD, which instead focuses on the Site-related risk from the contaminants of concern.

82. Comment: GSHI strongly objects to, and can find no scientific or regulatory basis for, the EPA's remedial action objective (Section 5 of the Proposed Plan) for indoor air.

Response: Remedial action objectives are aimed at protecting human health and the

environment and should specify: (1) The contaminants of concern, (2) exposure routes and receptors, and (3) an acceptable contaminant level or range of levels for each exposure medium (i.e., a remediation goal). Remedial action objectives include both a contaminant level and an exposure route recognizing that protectiveness may be achieved by reducing exposure as well as reducing contaminant levels. See 55 Fed. Reg. 8666, 8712-8713. So, in developing our remedial action objectives for the indoor air, EPA has identified the contaminant of concern–benzene, the exposure route–inhalation, and an acceptable contaminant concentration–10 ppbv. A more detailed explanation of the factors that support our indoor air remedial action objective follows.

As explained in the RI at p. 6-5, investigations have shown that, at residences that have indoor air concentrations of benzene that exceed 10 ppbv, when all background sources, including household sources, of indoor air contamination are discounted, it can be shown that there is benzene entering indoor air. That is, with the household sources eliminated, indoor air contaminants were found to be elevated above outside ambient air concentrations; and, TAGA data shows that indoor air concentrations of contaminants were highest at points where soil gas would likely enter (e.g., foundation cracks, holes along pipes). Due to the many variables affecting soil gas concentrations and indoor air quality measurements, a direct correlation between soil gas concentrations and indoor air concentrations cannot be established. However, as explained above in the response to comment number 35, it is clear that where the conditions are right, benzene-contaminated soil gas is entering indoor air on the Site. Moreover, due to the changing nature of the soil and the changing condition of foundations, over time, indoor air in residences and businesses which is not now contaminated could become contaminated in the future.

Finally, as also explained in our response to comment number 35, based on our knowledge of the historic refinery waste disposal practices that took place in the parts of the Site where indoor air contamination was found, and based on our knowledge of the subsurface gathered from monitoring well and soil gas measurements, it is clear that there are plumes of LNAPL underlying the parts of the Site that exhibit indoor air contamination, and that these plumes are volatilizing benzene-contaminated soil gas that is making its way into certain indoor air spaces on the Site. We know the way that LNAPL behaves in the subsurface. That is, we know that LNAPL follows the easiest route to the surface when it volatilizes. Sometimes that route is into an indoor space and sometimes it is not. Since the contaminant of concern, benzene, is driving the indoor air risk, it is appropriate that we address this benzene in a remedial action objective.

It should be noted that a Public Health Assessment prepared by the Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology under a cooperative agreement with the Agency for Toxic Substances and Disease Registry dated June 16, 2000, concluded (at p. 28) that

> The Highway 71/72 Refinery site has been classified as a public heath threat because there are. . . benzene levels reported in the indoor air, that if representative of long term exposures, would pose an unacceptable cancer risk for long term

residents. . . .

The Public Heath Assessment is consistent with EPA determinations regarding the health threat associated with Site-related benzene in indoor air.

As explained in the NCP, remediation goals establish acceptable exposure levels that are protective of human health and the environment and are developed by considering a series of factors, including ARARs (see 40 CFR § 300.430(e)(2)(i)). Since ARARs are not available for benzene in indoor air, and since the primary risk from benzene in indoor air is the risk due to benzene's health threat as a carcinogen, EPA established a remediation goal for benzene based primarily on 40 CFR § 300.430(e)(2)(i)(A)(2), (3), (4) and (5) (although benzene is a systemic toxicant 300.430(e)(2)(i)(A)(1) was not used because benzene's risk as a carcinogen occurs at concentrations that are much lower than the concentrations that pose a risk as a systemic toxicant). As explained above, in response to comments 65 and 66, the remediation goal for indoor air established in the ROD takes into account the fact that background concentration levels of benzene may make excursions to a high end concentration in the vicinity of 11.5 ppbv due to random unpredictable events such as occasional cigarette smoke, open gasoline cans in attached garages, and the use of household products that contain benzene. The revised remediation goal is, however, also based on our experience with mitigation during the indoor air removal action. During the removal action we found that cleanup levels of 10 ppbv benzene were attainable in indoor units located on the Site. Consequently, the revised remediation goal was not set at 11.5 ppbv, but at the more protective, and achievable 10 ppbv.

Consistent with the NCP, and based on the factors described in the preceding paragraphs, EPA has selected, and documented in the ROD, the following remedial action objective for indoor air:

> 1. Prevent human inhalation of concentrations of benzene in indoor air that exceed 10 ppbv benzene.

See ROD at Section 9, Remedial Action Objectives and Goals. Since, as explained above, the subsurface LNAPL is the source of the indoor air contamination, a remedial action objective to address LNAPL and to complement the first indoor air remedial action objective was selected and documented in the ROD:

> 2. Reduce and/or eliminate the potential for indoor air to be impacted by COCs present in refinery waste materials located in the subsurface by removing LNAPL from ground water until the performance standard (a threshold thickness of 0.1 foot of LNAPL, measured using an interface probe in monitoring or extraction wells) is attained.

Since LNAPL floats on top of ground water and flows through the interstitial areas in soil,

it would not be meaningful to identify an LNAPL concentration as a remediation goal. So, instead, the performance standard "a threshold thickness of 0.1 foot of LNAPL, measured using an interface probe in monitoring or extraction wells" was selected. As explained in the Proposed Plan at p. 5-5, this performance standard was based on EPA guidance and common engineering practice during hydrocarbon recovery operations at underground storage tank locations. See U.S. Environmental Protection Agency, 1996b. *How to Effectively Recover Free Product at Leaking Underground Storage Tank Sites, A Guide for State Regulators.* Office of Underground Storage Tanks, OSWER National Risk Management Research Laboratory, ORD. EPA/510/R-96/001. September 1996 (this document is part of the Administrative Record for the Site).

83. Comment: All of EPA's remedial alternatives outlined in the Proposed Plan assume a quarterly notification to the on-site community for a five-year period, either through utility bills or direct mailing. GSHI strongly objects to the frequency and extent of the notification process.

Response: Please see response to comment number 43.

84. Comment: The appropriate information regarding soil and indoor air sampling and soil excavation services, and information about the ground water restrictions should be provided in an initial distribution to all property owners and residents living on the site, upon sale to a new owner, annually thereafter through the local news paper, and with information sheets disseminated with construction permit requests.

Response: Please see response to comments numbered 6 and 43.

Responses to PRP comments made in previous letters to EPA

The PRPs incorporated by reference several letters which were previously submitted to EPA regarding documents in the Administrative Record. Many of these comments were in reference to the Baseline Risk Assessment. The answers to the majority of the questions in the letters were addressed in correspondence from EPA, or they have been addressed in this responsiveness summary. Most of the comments are not relevant anymore because of changes to the FS since the comments were submitted, or because they were addressed through issuance of the Proposed Plan. The letters referenced in the June 12, 2000, comment letter submitted by Conestoga-Rovers & Associates (CRA) for the PRPs include:

! Comments on the Public Health Assessment for Highway 71/72 Refinery Site, Draft, issued June 4, 1996 - August 1, 1996 (See response to comment number 42.)

! Initial Comments on the MRC Remedial Investigation and Baseline Risk Assessment, February 24, 1998 (See July 29, 1998, response letter from EPA to GSHI in the Administrative Record, all the previous comments in this responsiveness summary relating to the risk assessment and remediation goals, and also the comments that immediately follow this section.)

! Review of EPA Remedial Investigation and Baseline Risk Assessment Reports, May 26, 1999 (See July 29, 1998, response letter from EPA to GSHI in the Administrative Record, all the previous comments in this responsiveness summary relating to the risk assessment and remediation goals, and also the comments that immediately follow this section.)

! Comments on the Bossier City Feasibility Study, October 21, 1999 (See November 11 1999, response letter from EPA in the Administrative Record.)

The following section provides further clarification of previous EPA responses and addresses the comments in the February 1998, and the May 1999, letters incorporated by reference into the PRP's comments on the Proposed Plan:

a. Responses to comments made in letter from Dr. James Beckett of Glenn Springs Holdings Inc. dated February 24, 1998

The EPA provided a detailed response to these comments in a July 29, 1998, letter.

85. Comment: Both EPA and GSHI have demonstrated that there is no correlation between soil gas and indoor air compositions.

Response: See EPA's response to comments numbered 35 and 82.

86. Comment: Based on chemical ratio analyses, automotive emissions and non-refinery related gasoline sources are the likely sources of benzene detected in indoor air. Chemical ratio analyses indicate that benzene concentrations at only two locations (Residence Inn Building 2 and Alexis Park Building 5) may be attributed to a source other than non-refinery related gasoline sources.

Response: As explained in EPA's response to comment number 35, at the residences and hotel rooms that EPA has identified as contaminated with Site-related benzene, EPA has, through a process of elimination, ruled out household sources of benzene contamination and outside sources of benzene. Moreover, using TAGA probes which simultaneously measure outdoor benzene contamination concentrations and indoor benzene contamination in real time, EPA has observed elevated concentrations of benzene at foundation openings which are the most likely entry points for benzene-contaminated soil gas to enter indoor air space. These techniques used by EPA–simultaneous real time analysis of both indoor and outdoor air measured at specific points by probes which take readings many times each second, at a certain point in time give an accurate picture as to the actual entry location of the chemicals in question. That is, the TAGA essentially observed where the benzene was coming from (the probes were pointed at plumbing portals) and simultaneously verified that the source could not be outside air automotive emissions (because there was simultaneously a probe outside that was taking measurements), and since the TAGA probes did not find household sources (because EPA pointed the probe into crevices

throughout the indoor spaces in question and found no elevated levels), they were ruled out as well.

87. Comment: Methane does not act as a carrier gas for benzene or other constituents detected in indoor air. Methane was detected in only 1 of 93 samples collected by EPA in June 1996 and is inversely correlated with benzene levels in indoor air. Methane is the single largest component of soil gas (>90%).

Response: Although this statement may be true, it is irrelevant to a discussion of benzene which is a contaminant of concern (COC) at the Site. Methane is not a COC in this ROD because it does not pose an environmental risk. Methane does pose other types of risks (like explosive risk) and, therefore, has been addressed by the PRP with oversight from the responsible agency, LOPH. As discussed in the RI, the ROD, and in this responsiveness summary, benzene as an individual chemical has been found at concentrations on-site that pose an unacceptable risk in indoor air, so a remediation goal for benzene in indoor air has been set.

88. Comment: Soil gas is diluted by a factor of about 1,000 after mixing with indoor air and could not account for the levels of benzene in indoor air.

Response: As explained in EPA's responses to comments numbered 35 and 86, EPA has directly observed elevated concentrations of benzene at foundation penetrations in indoor air spaces with elevated concentrations of benzene. As we have also explained, the TAGA probes did not find other household sources in those indoor air spaces with elevated benzene concentrations, and outdoor TAGA probes that simultaneously measured outdoor benzene concentrations showed no elevated concentrations outdoors. Based on this evidence, it is reasonable to conclude that benzene is entering though foundation penetrations, like plumbing portals, and concentrating in indoor spaces. The commenter's assertion is unsupported by observations.

89. Comment: The chlorinated compounds that have been detected in indoor air and that EPA has determined make up 80% of the cancer risk from inhalation of indoor air have not been detected in, *[sic]* shallow soils, ground water or surface water; therefore, their source <u>could not have been refinery related</u>.

Response: No chlorinated compounds were included as COCs at the Site, and, therefore, no remediation goal was set for any chlorinated compounds. This comment is not relevant to the Selected Remedy which only addresses COCs. Should additional contaminants be discovered during remediation activities at concentrations that may present an unacceptable risk to human health, EPA shall determine whether or not they are Site-related. If these contaminants are Site-related, a remediation goal shall be set. (See soil media remedial action objective number 3 in Section 9 of the ROD.)

90. Comment: EPA has set an ultraconservative benzene level of 10 parts per billion (ppbv) in

the indoor air UAO [Unilateral Administrative Order] that does not consider background concentrations, has not considered average Site population residence times and has not considered the most recent relevant literature. We have not been able to locate another site in the entire United States where EPA has attempted to regulate benzene in indoor air. However, we do know the following: [The commenter goes on to describe various data sources and standards that the commenter presumably believes should convince EPA to raise its remediation goal for benzene in indoor air]

Response: The comment concerns the 10 ppbv action level/cleanup level for benzene that EPA selected in its December 20, 1996, action memorandum which addresses indoor air contamination on the Site. Since the time that this letter was written, the PRP has successfully mitigated indoor air contamination at various indoor air spaces on the Site, attaining the action level/cleanup level of 10 ppbv in each case. Accordingly, it is clear that the 10 ppbv remediation goal that was selected in the ROD is attainable.

The commenter indicates that he is unaware of any other site in the United States where EPA has attempted to regulate benzene in indoor air. While it is true that EPA has not, as far as we know, addressed benzene contamination in indoor air at other Superfund sites, EPA's actions at the Site are consistent with the NCP and CERCLA. On June 16, 2000, the Agency for Toxic Substances and Disease Registry (ATSDR), a Federal agency, published a Public Health Assessment for the Site. The Public Health Assessment was prepared by the Louisiana Department of Health and Hospitals (LDHH), a State agency. That Public Health Assessment states

> [t]he Highway 71/72 Refinery site has been classified as a public health hazard because there are. . . benzene levels reported in the indoor air, that if representative of long term exposures, would pose an unacceptable cancer risk for long term residents. . . .

Public Heath Assessment at p. 28. Moreover, EPA's Baseline Risk Assessment, which is part of the RI, has identified a risk to human health posed by site-related benzene. Consistent with the NCP, EPA has selected a remedy that addresses this indoor air benzene contamination.

As explained in EPA's response to comments numbered 73, 74, and 75, EPA has selected 10 ppbv as the remediation goal for benzene in indoor air. EPA's reasons for selecting 10 ppbv are described in a memorandum prepared by EPA Toxicologist Dr. John Rauscher (August 30, 2000) which is part of the Administrative Record. During the indoor air removal action at the Site, it has been shown that mitigation measures (i.e., sealing foundation cracks and modifying HVAC systems) can attain a 10 ppbv remediation goal for benzene in indoor air spaces that have been impacted by soil gas contaminated with benzene. The following report, which is part of the Administrative Record for the Site, shows that a 10 ppbv benzene remediation goal can be attained: Conestoga-Rovers & Associates, *Indoor Air Removal Action; Final Report, Highway 71/72 Former Refinery Site, Bossier City, Louisiana*. Prepared for Glenn Springs Holdings, Inc.,

June 26, 1997; Conestoga-Rovers & Associates, *Indoor Air Removal Action-Post Corrective Measure Inspection Program Report.* Prepared for Glenn Springs Holdings, Inc., June 7, 1997.

In the text which immediately follows, EPA addresses the various facts that the commenter presents as bulleted items to support his contention that a 10 ppbv remediation goal is inappropriate.

! The benzene geometric mean concentration (3.1 ppbv) for 136 indoor air samples collected from the site is right in the middle of the range (0.7 ppbv to 4.2 ppbv) of 6 other cities across the US (EPA TEM Study).

Response: Comment noted.

! As documented in ATSDR's 1995 Draft Toxicological Profile for benzene, outdoor air concentrations can exceed 10 ppbv (see data for Houston, TX; St. Louis, MO; Denver, CO; Philadelphia, PA; Chicago, IL, Staten Island, NY; Manhattan, NY; Elizabeth, NJ; and Bayonne, NJ) and have reached 112 ppbv.

Response: From June 4 to June 28, 1996, EPA's Environmental Response team used the Trace Atmospheric Gas Analyzer (TAGA) to perform screening for contamination in indoor and outdoor air, and in soil gas at the Site. The TAGA is a mobile laboratory that contains highly accurate and sophisticated equipment for collecting and analyzing air samples. Approximately 30 on-Site single family residences, four multi-family apartment complexes, three hotels, and one office building--a total of 92 units (hereinafter "dwelling units")--were tested during that three-week period. In those dwelling units that contained target contaminant (i.e., benzene, toluene, xylene, ethylbenzene) concentrations greater than three times the concentrations found in outside ambient air, EPA either took indoor air samples using 4-hour Summa canisters or carbon sorbent tubes. EPA used the TO-14 method to analyze the Summa canister samples.

EPA completed the final analytical TAGA Report on December 2, 1996. At no dwelling unit tested did EPA find an ambient outdoor concentration level of benzene which exceeded 10 ppbv. This Site-specific data gathered by EPA is more accurate and more pertinent than the data that the commenter presents regarding other off-site cities. Since Site-specific data gathered by EPA found no outdoor concentrations of benzene at levels that exceed 10 ppbv, it is reasonable for EPA to select 10 ppbv as a remediation goal for benzene in indoor air.

! The OSHA 8-hour permissible exposure limit is 1 part per million (ppm).
! The ACGIH threshold limit value is (TLV) is 10 ppm.
! The NIOSH recommended exposure limit is 100 ppb.

Response: Presumably the commenter is suggesting that EPA consider the these various standards, and revise its indoor air benzene remediation goal upward. The Occupational Safety and Health Administration (OSHA) standard, the National Institute of Occupational Safety and

Health (NIOSH) standard, and the American Conference of Government and Industrial Hygienists (ACGIH) standard are each based on assumptions related to a scenario in which the exposed individual is an adult exposed to benzene in the workplace during the workweek; whereas, the Site remediation goal for benzene is generally established for children and adults living in a residential space. It is true that the remediation goal will be applied to businesses, if any businesses are found to have indoor concentrations of benzene that exceed the remediation goal, but the higher industrial standards established by OSHA, ACGIH, and NIOSH, are not within the risk range identified for carcinogens in the NCP. Moreover, EPA's experience during the indoor air removal action shows that 10 ppbv is an attainable remediation goal.

! Numerous indoor and outdoor air studies by EPA experts indicate that ambient benzene concentrations can exceed 10 ppbv. Cigarette smoking, household chemicals, attached garages, building materials, etc. can impact benzene levels in indoor air.

! One drop of gasoline can produce 10 ppbv benzene in an average size room.

! Cigarette smoke is a major source of benzene in indoor air.

! Benzene studies recently cited by EPA have indicated that the benzene point-of-departure for indoor air may be as high as 430 ppb (13 ppm-years/30 years).

Response: With his submission of the four bulleted items that immediately precede this paragraph, the commenter presumably is suggesting that EPA should raise its remediation goal based on the facts the commenter presents. EPA disagrees. The facts presented in the four bulleted items are general statements, or statements regarding nationwide studies, but EPA has gathered extensive Site-specific data that paints an accurate picture of conditions as they exist in indoor air at the Site. Specifically, EPA has gathered Site-specific indoor air data from each of the dwelling units that were investigated during the TAGA study. EPA also has Site-specific information regarding the lifestyles (e.g., smoking habits, gasoline storage habits, etc.) of the occupants of the dwelling units. Finally, EPA has Site-specific soil and ground water data which shows that refinery-related benzene remains underground on the Site, and that it may migrate into the dwelling units. EPA's Site-specific data leads inexorably to the conclusion set forth in EPA's ROD, and that is that benzene from refinery-related waste materials has been released or threatens to be released into the indoor air on the Site. Although the general information provided by the commenter is useful for understanding the sources of benzene in

indoor air throughout the nation, it is not as useful as the EPA's Site-specific data for developing a remedial action to address conditions on the Site.

91. Comment: No unacceptable risk is posed at the Site and, if corrected to address errors and deficiencies, the MRC Baseline Risk Assessment would support this conclusion.

Response: The risk assessment techniques used in the Baseline Risk Assessment (February 25,

1999) were based on the techniques prescribed in the various volumes of EPA's Risk Assessment Guidance for Superfund (RAGS) which are part of the Administrative Record for this ROD. The Site-related risks to human health are described in Section 8 of the Baseline Risk Assessment.

92. The MRC BRA presents a gross mischaracterization of risks at the site. The many people who live and work at the Site are likely to be confused, alarmed and possibly outraged by this overstated risk. The numerous errors and omissions and the clear lack of objectivity in the MRC BRA report do not provide the Bossier City citizens, elected officials and business professionals with a quality document that they can confidently rely upon to develop a long term plan to address any real refinery-related impacts to the Site. After correcting for errors in the MRC risk assessment the MRC risk numbers are remarkably similar to Gradient's risk numbers that were calculated in 1995. The MRC BRA is fundamentally and fatally flawed for the following major reasons: [The commenter then presents a list of bulleted items. Each of these items are addressed in the text that immediately follows.]

! 80% of the estimated cancer risks from inhalation of indoor air is attributed to concentrations of methylene chloride, trichloroethylene, and 1,1,2,2-tetrachloroethane. With the exception of the two methylene chloride detections out of 102 deep (> seven feet) soil samples, these compounds were not detected in soils, ground water or surface water and therefore <u>are not refinery related</u> and may well be artifacts and laboratory contaminants.

! Risks were calculated, in direct violation of EPA guidance, on tentatively identified compounds (*e.g.*, acetaldehyde, acetone, and n-hexane) with concentration estimates that are highly uncertain and speculative.

! The MRC BRA contains incorrect toxicity factors. For example, 72% of the non-cancer risk from exposure to surface soils for a child resident is attributed to exposure to manganese; however, the toxicity factor used for manganese is incorrect. If the correct toxicity factor is used, there is no hazard from exposure to manganese at the Site. The manganese risks were calculated only on the basis of two samples from the entire 215-acre site. Furthermore, the maximum manganese concentration reported in soils is well within background levels in Louisiana soils.

Response: Methylene chloride, trichloroethylene, 1,1,2,2-tetrachloroethane, manganese, and the Tentatively Identified Compounds listed in these bullets were not included as COCs at the Site and, therefore, a remediation goal was not set for these chemicals. This comment is not relevant to the Selected Remedy which only includes remediation of COCs. Should additional contaminants be discovered during remediation activities at concentrations that may present an unacceptable risk to human health, EPA will determine whether or not they are Site-related. If any newly discovered contaminants are Site-related, a remediation goal shall be set. (See soil media remedial action objective number 3 in Section 8 of the ROD; see also response to comments numbered 91 and 101 regarding preparation of the risk assessment.)

! 99.7% of MRC's estimated cancer risk and 99.5% of the estimated noncancer hazard to on-site

residents is due to exposures to ground water which is based on the totally unrealistic assumption that people will drink affected ground water from wells with free-phase hydrocarbon liquid (even though regulations in place require the use of the public water system and effectively proscribe the drilling of any private ground water supply wells). EPA even states in their [sic] May 1997 Proposed Plan (page 13) "Water from the aquifer in this vicinity is not suitable for domestic and agricultural purposes and future land use is not anticipated."

Response: The baseline risk assessment did not grossly mischaracterize the risks at the site. In order to be protective, EPA used a conservative approach to calculating risk. The approach used in the Baseline Risk Assessment is appropriate, and it is in accordance with the Risk Assessment Guidance for Superfund (RAGS.) (See response to comments numbered 56 and 91.) The EPA has held numerous open house meetings, and prepared fact sheets in order to communicate with the community at this Site about Site risks. In addition, the EPA has had much informal contact with the residents on the Site, including door-to-door contact with many residents during the recent lead sampling done in February through March 2000. The residents contacted during this sampling were cooperative and did not appear to be alarmed.

The State has categorized the shallow contaminated ground water aquifer that underlies the Site as an aquifer that is not now used but could potentially be used in the future as a source of drinking water. (This makes the aquifer a Class II aquifer under "EPA Guidelines for Ground-Water Classification" (Final Draft, December 1986) (see 55 Fed. Reg. 8666, 8732 (March 8, 1990)). Since the ground water could potentially be used, EPA evaluated the risk that it posed as part of its Baseline Risk Assessment. Under the NCP, 40 CFR §300.430, the role of the Baseline Risk Assessment is to address the risk associated with a site in the absence of any remedial action or control, including institutional controls (institutional controls include laws that prohibit ground water use). The Baseline Risk Assessment is essentially an evaluation of the no-action alternative (see 55 Fed. Reg. 8666, 8710-8711, March 8, 1990); accordingly, in developing its Baseline Risk Assessment, it is appropriate for EPA to disregard the effect of laws which prohibit ground water use. Finally, under the NCP, EPA expects to return usable ground waters to their beneficial uses wherever practicable; within a time frame that is reasonable given the particular circumstances of the site (see 40 CFR § 300.430(a)(1)(iii)(E)); consequently, in the RI stage (the stage at which the Baseline Risk Assessment is performed) it is appropriate for EPA to analyze the risk that the on-site aquifer could pose. While it is true that EPA later determined that remediation of the contaminated aquifer was technically impracticable, it was consistent with the expectations of the NCP for EPA to determine the risk that the aquifer may pose if used. Id.

! MRC has calculated indoor air risks based on concentrations of chemicals in buildings that have subsequently been the subject of removal actions. For example, indoor air concentrations in commercial buildings are based on two samples from the Residence Inn (Units 211 and 214) and one sample from the Motel 6 (Unit 123) but both buildings were addressed by removal actions prior to the completion of the MRC BRA. Although the Indoor Air Removal Action (Indoor Air RA) is described in the MRC RI, Volume I, the indoor air data used in the MRC BRA are only

the same data that were used to identify buildings to be remediated under the Indoor Air UAO.

Response: Please see the response to comment number 56.

! Without citing any scientifically valid reason, MRC chose not to include the validated indoor air data collected by Law Environmental Inc. (LAW, 1994) in their Baseline Risk Assessment and thereby totally biased their assessment. Averaging over two time periods of exposure would provide a much better assessment of long-term exposures at the Site. ATSDR even recommended this (using multiple data sets collected at different times and seasons) in their June 4, 1996 Public Health Assessment. They also chose not to include some data from other media. All validated data must be included in any credible risk assessment.

Response: In regard to the indoor air data collected by Law Environmental, because OXY did not provide the raw analytical data presented in these reports, the EPA could not determine the usability of the data, and consequently, the data was not used. In regard to the use of averaged data over several time periods, Page 5-2 of Volume I of RAGS recommends combining data from different time periods only if they are based on (1) similar analytical methods, (2) similar QA/QC (quality assurance/quality control) procedures, and (3) the measured concentrations are similar in magnitude. The EPA did not have the QA/QC information, nor was the data similar in magnitude. Therefore, the data from this study was not used in the risk assessment.

b. Responses to comments made in letter from Dave Millard of Conestoga-Rovers & Associates dated May 26, 1999

This May 26, 1999, letter is a reiteration of the major points submitted in the February 24, 1998, letter which is addressed in responses to comments numbered 86-92. The February 24, 1998, letter was also answered through a July 29, 1998, letter from EPA which is part of the administrative record. Because the May 26, 1999 letter is a reiteration of previous letters, and because many of the same points have been responded to previously in this responsiveness summary, only the title of each section of this letter is presented as a comment below.

93. Comment: Comment regarding potentially responsible parties.

Response: See response to comments numbered 40, 69, and 70; and see comment B. of EPA's July 29, 1998, letter.

94. Comment: Comments on data presentation--lead presence in surface soil and benzene presence in indoor air

Response: We presume that the purpose of this comment is to ask EPA why certain PRP data was not used in the Remedial Investigation (RI). A data usability table was included as Table 1 of the RI Report, and this table explains EPA's evaluation of the various available data including

PRP data. The table indicates why certain data was not used. See also the response to comment number 91 (bullet five); and see comment B. of EPA's July 29, 1998, letter, which concluded that "differences in collection methodologies, analytical procedures, spatially co-located and temporally co-located samples, etc., have created an incompatible data set for statistical analysis to date."

The commenter goes on to list several PRP-generated reports for EPA to consider. Under the NCP, EPA is not required to include documents in the administrative record file that do not form a basis for the selection of the response action (see 40 CFR § 300.810(b).) The EPA reviewed the documents that the commenter submitted, and included some of the documents in the administrative record file. The documents that the commenter submitted, but which were not included in the administrative record, were documents that do not form the basis for the selection of the response action.

95. Comment: General RI comment regarding blood lead testing

Response: The commenter states that a sentence from the RI regarding blood lead levels in children is technically correct, but that the sampling was biased and that the data set is conservative. The EPA's current statement about the blood lead sampling (from Section 2 of the ROD) is

> "In July 1995, LOPH and ATSDR tested the blood of Site children whose parents came forward in response to Site-wide notices. The purpose of the testing was to determine whether children living on-site had elevated blood lead levels. Blood lead values were found to be in the normal range, below the levels requiring medical follow-up. Although the blood lead levels of children tested in the exposure investigation were below levels requiring follow-up, LOPH was only able to get consent from parents to test 55 out of the approximately 370 children ages six months to six years who live on-site. The children tested may not have been representative of the larger population of children living on-site."

The EPA does not believe that the sampling was biased conservatively and stands by the current statement. As stated in the response to comment number 43, the EPA has found that, because of the numerous rental properties on-site, the population in parts of the Site is relatively transient, with new people moving in and out all the time. The transient nature of the Site residents further supports the statement that the children (the majority of whom lived in the

southern part of the Site) tested may not have been representative of the larger population of children living on-site.

96. Comment: General RI comment regarding benzene in indoor air

Response: See response to comments numbered 35, 40, 68, and 73.

97. Comment: General comments regarding benzene sources and pathway

Response: See response to comments numbered 35, 40, 68, and 73.

98. Comment: Comments regarding the baseline risk assessment for the Site

Response: See response to comments numbered 48, 81, 91, and 92.

General comment stated or implied in all comment letters submitted by the PRP

99. Comment: The EPA did not consider all the data available for the Site and the EPA did not perform the risk assessment properly because it used overly conservative exposure scenarios. This resulted in the selection of Chemicals of Concern (COCs) that should not have been selected or were not refinery-related.

Response: During the course of investigating the Site, a large amount of data was collected. The data was acquired under many different types of conditions, by numerous parties, with or without the oversight of EPA or its agent. As explained in response to comments numbered 91 and 94, for various reasons, some of the data was not of the reliability or quality necessary for EPA to use in a risk assessment. (Note that much of the body of data from the Site was used to scope subsequent sampling programs and investigations.) For the risk assessment, EPA only used data in which we had a high degree of confidence. The data that was used was collected in accordance with standard EPA procedures and passed EPA's Quality Assurance/Quality Control (QA/QC) procedures.

The methodology followed in the Baseline Risk Assessment for assessing potential risk at the Site is based on pertinent EPA risk assessment guidelines, including procedures described in the Risk Assessment Guidance for Superfund (RAGS), Volume I (EPA, 1989a), Exposure Factors Handbook (EPA, 1989b), and the Supplemental Guidance for Exposure Assessment (EPA, 1991a). As stated in response to comments numbered 59, 60, and 81, EPA uses conservative exposure assumptions intended to ensure protectiveness. The RAGS takes a conservative approach to risk assessment that is consistent with the NCP.

The EPA used the results of the Baseline Risk Assessment along with other Site factors to select the site-related contaminants that could present an unacceptable risk at the Site. These contaminants were benzene, carcinogenic polynuclear aromatic hydrocarbons (PAHs), and lead–all common contaminants at refinery sites. The EPA then calculated remediation goals for each one of these contaminants in each medium they affected at the Site. These remediation goals were presented in the Proposed Plan.

In summary, EPA gathered data and information on the Site and found a significant risk

that must be addressed or the potential that there is a significant risk that must be addressed. Even if EPA were to use a different data set of previously collected Site data, and find that it led to a different conclusion, we could not ignore the conclusion based on the data and information we did use during the Remedial Investigation process which led us to set remediation goals for benzene, carcinogenic PAHs, and lead. Remedial action will only be taken in soils and indoor air if contamination is found at concentrations that exceed remediation goals.

State of Louisiana Comments

100. Comment: The state of Louisiana has questions about implementation of the Selected Remedy.

Response: The August 28, 2000, EPA letter responding to the State's questions is appended to this responsiveness summary.