UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

AUG 0 7 2000

Reply To
Attn Of: WCM-126

Ching-Pi Wang
Ecology, NW Regional Office
3190 160th Ave SE
Bellevue, Washington 98008-5452

Dear ~~Mr.~~ Wang: Ching-Pi

On August 3, 2000, I forwarded to you two memos which reflected EPA's conclusions of the J.H. Baxter (Baxter) Draft Remedial Investigation (DRI). It has come to my attention that the attached memos were copied out of order in our first transmittal. Enclosed please find the memos in the corrected order.

If you have any further questions or would like to discuss this please contact me at (206)553-2137.

Sincerely,

Cheryl Williams

Cheryl Williams
Environmental Protection Specialist

Enclosures

CC: Jean Tran, NWRO, Ecology
Dave Misko, NWRO, Ecology
Ron Lavigne, WA AG's Office

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Ching-Pi Wang
Ecology NW Regional Office
3190 160th Ave SE
Bellevue, Washington 988008-5452

Dear Mr. ~~Wang~~; Ching-Pi,

Enclosed, please find two memos which reflect EPA's conclusions of the J.H. Baxter (Baxter) Draft Remedial Investigation (DRI).

In summary, we have determined that the data provided by Baxter in this draft report raises a number of significant questions. EPA's concerns include the following:

1. the DRI does not adequately characterize the groundwater and determine the nature and extent of the contamination throughout the facility,

2. there are not enough monitoring wells to draw the conclusions made by Baxter about the movement of the contaminant plumes beyond the facility boundary,

3. conclusions regarding the levels of PCP and dioxin in the groundwater are suspect due to the limitations of the data which was used and,

4. little or no consideration was given to sources of PCP and dioxin contamination at the site other than the documented spills.

If you have any further questions or would like to discuss this please contact me at (206)553-2137 or by e-mail at "williams.cherylb@epa.gov".

Sincerely,

Cheryl Williams

Cheryl Williams
Environmental Protection Specialist

Enclosure

cc: Jean Tran, NWRO, Ecology
Dave Misco, NWRO, Ecology
Ron Lavigne, WA AG's Office

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

19 May 2000

MEMORANDUM

SUBJECT: Comments on J H Baxter Remedial Investigation Report Draft, dated March 10, 2000

FROM: Rene Fuentes, Hydrogeologist
Office of Environmental Assessment

TO: Cheryl Williams, Project Manager
RCRA Compliance

I have reviewed the Draft Remedial Investigation Report (DRI) and some other background documents and letters related to this site, as you requested. Based on that information I have a number of comments on the DRI.

General Comments

1. A Remedial Investigation report should summarize all the information and data that is known and documented for a contaminated site, but this report ignores most of the data obtained prior to 1999. The investigation should also attempt to meet the objective of fully characterizing the site over the entire space and time of concern, which should include the entire facility history, and the likely distance which the contaminants may have traveled during that period. Since this DRI seems to have many major data gaps due to the limited sampling carried out, and also due to the limited period of time covered by the other data presented, both of these factors need to be addressed before this DRI can be considered a credible statement of the extent of contamination and a full characterization of the contamination from this facility. This report presents a conflicting picture -- there appear to be several major sources of contamination at this facility which would require a more detailed characterization to fully understand and remediate, but there is very limited contaminant sources and ground-water contamination characterization presented in the report. The DRI also appears to discount much of the currently existing and past contamination, both presently underneath the facility, and also probably uncontrolled releases that have gone beyond the facility boundary. This combination of factors produce a somewhat limited conceptual model of the extent of contamination caused by the sources at the facility. As presently written there is insufficient data used in this report to support the conclusion that there are not major contamination problems, given the

many years of pentachlorophenol (PCP) treatment and the history of discharges and product spills at the site. Therefore, the concept that major contamination exists at the facility, and beyond the facility's boundary, must be maintained as the hypothesis from which we need to proceed with future work. That hypothesis has not been ruled out by the data presented thus far.

2. The site data presented in the DRI documents that concentrations of PCP presently vary widely within relatively short distances, as indicated most clearly by the monitoring points available near the "butt treating plant", where the concentrations range from 58,000 µg/L in BT-S-GW to 0.5 U µg/L in MW-1, during October 1999. This large variability within a short lateral distance (about 100 feet in figure 5) near one source area, indicates that it is unlikely that, given all the many known and potential sources at the site (spills, butt tank area source, and many french drains which drain the site directly into the ground water aquifer), a single off-site well (HCMW-7) is sufficient to characterize the potential plumes going off site. Similarly, there are too few data points to understand the on-site contamination.

3. There needs to be more vertical and horizontal definition in the contaminant sampling, not just, for example, one sample from a well which has a twenty foot screen length, in order to adequately characterize the vertical contaminant distribution so that supportable conclusions can be drawn from the data. PCP has a specific gravity much greater than water, and there should be some discussion of that characteristic in the text and the conceptual model, supported by sufficient vertical sampling to document that the PCP is not sinking, going below the monitoring well screens, and therefore, not being sampled. Similarly if the PCP and the oil are mixed in the treatment process, the DRI should consider a combined PCP/oil product which would then float as an LNAPL, and there should be discussion and sampling for LNAPLs in addition to the dissolved PCP sampling.

4. There is a lack of sufficient monitoring wells both on-site and off-site, especially given that there may be a ground water divide on the south side of the site, and the gradients do not seem to have been fully characterized for different seasons. The fact that the gradients turn from westward to northward near the butt tank area, and the fact that these gradients may still be shifting near the northern boundary of the site is one major cause for concern that the gradients have not been characterized sufficiently to understand the direction of flow of the contaminants. Similarly, there is no data to characterize the gradients from the south side of the facility.

5. The DRI contains a mixture of data sets which are not clearly comparable to each other, and it is not clear what the rationale for the selection of the sampling locations and method of collection was. For example, there are many borings in areas which are documented to be highly contaminated, but the only samples were taken of the boring water and no permanent monitoring wells were ever installed. In addition, it is hard to understand why samples taken of the water from the french drains were composited. Also, arguments were made that turbidity affects the concentration of the water which

infiltrates past the french drains, but no monitoring wells have been installed to provide data from those areas that would be comparable to data from other monitoring wells, so that this issue of contamination to the ground water can be verified or disproved based on data collected directly from wells. In addition, many wells have very long well screens, or are screened too deep, which probably decreases the reliability of the data obtained from those water samples. A more complete routine sampling schedule, with more consistent sampling points and sampling techniques, needs to be adopted by the facility to develop a reliable ground water data set, including collecting samples during different seasons and at different water levels.

6. It is not clearly documented in the DRI that other directions of surface or ground water flow (south or southwest) have been studied, but it is possible that there may be other flow directions from the site given an apparent surface water drainage basin to the south and a nearby City of Arlington pumping well west of the site. In addition to the DRI, the Stormwater AKART Analysis done for J.H. Baxter by AGI Technologies, dated July 30, 1997, states that "it is believed that the shallow groundwater table in the site vicinity serves as a steady recharge to Quilceda Creek and that discontinuing infiltration may have an adverse effect on the hydrologic cycle and ultimately on fish and wildlife." Therefore, this data gap needs to be filled to assure that there are no other directions of flow for the water and potential contaminants to leave the site.

7. There appear to have been numerous spills and/or disposal activities occurring at the site over its history. The number of french drains into the upper aquifer are numerous, are spread over a large area, and it seems that not all of these french drain discharge areas have been monitored in the ground water. This is a major data gap which will need to be filled in for the characterization to be considered acceptable.

8. It is implausible, given the many documented and potential source areas, that a couple of wells more or less randomly located can be expected to locate and adequately characterize the potential plumes. A more complete characterization, perhaps using some type of push technology sampling technique, should provide a better characterization of the areas of concern, vertically and horizontally, to determine whether there are major plumes above the clean-up criteria, where permanent monitoring wells should be located. Note that the MCL for PCP is 1 μg/L. Since, even with the limited data presented in the DRI, there are several locations near the edge of the facility where PCP has been documented at levels many orders of magnitude above that value, it should be expected that there are plumes exceeding the MCL in many locations.

9. It is clear that all the data available for the J.H. Baxter site is not included in the DRI, and this is misleading and unacceptable. Using other data report, such as the Stormwater AKART Analysis, which was generated for J.H. Baxter, or the Site Assessment Report from WDOE, it is easy to develop a totally different conceptual model of the site, including that contamination of the soil and ground water has occurred in multiple locations, and that the extent of that contamination should be beyond the facility

boundary. While the DRI seems to develop a very benign picture which shows MW-2 at the north end of the site with 2 µg/L of PCP in 1999 (Figure 20), the Site Hazard Assessment report, with Woodward-Clyde Consultants data tables, indicates a value of 150 µg/L in one well in 1990, and concentrations in another well of 440 µg/L at the property boundary in 1991. These two totally different data sets create two totally different conceptual models to use to study the site, and raises questions about the validity of the conclusions in the DRI regarding the potential extent of contamination. The present data set which has value of "ND" in HCMW-7, located as far north as MW-2, but located about 300 feet to the west may just indicate that the plume has not been sampled by this well. The ground water concentration for PCP of 2 µg/L at well MW-2 could mean any number of things, including that the data represents sampling just the end of the plume that moved away from that source area, or that the PCP plume is now above, below or to the side of the present water sampling depth or well location. The point of this comparison (1990 data to 1999 data) is that, at a minimum, all the data available for the site needs to be used to develop an acceptable RI. These data should be included in this report, and used with all the other data available, to create a more complete and realistic conceptual model of the potential extent of contamination. It is clear that there is also a need to do much more additional sampling to define the vertical and horizontal extent of the contamination.

10. Additional sampling should include PCP and potential break-down products and other potential contaminants of PCP. In addition, other contaminants, including potential by-products of PCP (such as chlorohydroquinones) should also be included since there is no evidence that indicates that if PCP has been degraded it is into more benign compounds. Future reports must also include more complete interpretation of the conventional parameters and major ions data, both as tracers and as supporting evidence of dilution or other mechanisms of attenuation. While some samples were taken for a few conventional parameters, and analyses were carried out by the laboratory, not much use is made of that data in this report.

11. It is not clear what samples have been taken for LNAPL and whether these samples have been analyzed for all the key parameters listed above (and including dioxins and furans). The report should separate and identify the different media (ground water, soil, NAPL, etc), areas sampled and parameters of concern in the text, the tables, and the figures. Once the data is presented in a form that it is easily found in the report, then composite concepts and figures can be created with all the relevant data sets to support them.

12. The maps used in the report indicate that they were created from a survey, but there needs to be a supporting table(s) of the field surveyed locations (state plane coordinates) for all the other key points shown on the maps (wells, borings, french drains, source areas, survey bench marks, etc.). Since there is no supporting evidence of any of these data, it is hard to determine the reliability of their mapped locations or any related feature features outside the facility map (distances, nearby houses and wells, etc.). This lack of

confidence on the uncertainty of locations adds a further complication to any calculations made to calculate travel times, size of plumes, and other such calculations.

13. I include in the specific comments listed below major issues which I have found with the DRI, but these comments are not supposed to take the place of the complete, formal MTCA review which I expect WDOE will do on the report submitted to them. However since there are so many problems and deficiencies I strongly suggest that a new draft be prepared and re-submitted for review before a final is submitted for agency acceptance. This revised document will probably still indicate further proposals for characterization, but it will present an entire picture of what has occurred at the site and the data to support the characterization to date. It would be helpful to have a list of where these comments are revised in the report.

Specific Comments

14. The report should have separate sections which discuss soil, ground water, and NAPL. It appears that some of the values presented should be LNAPL but they are not discussed as such in the DRI. The concentrations presented for BT-S-GW and BT-W-GW which are listed as ground water samples in Table B-3 (Chemical Results for Groundwater Samples), have very high concentrations of TPH and are likely to be LNAPL. I am providing this comment first and out of sequence with the other specific comments because I found the report hard to follow due to the mixing of media and how the data is presented in the text, tables, and figures. The report should be structured so that the reader does not have to hunt for the major data pieces which support the conceptual model of the site. In addition the report should include an electronic file with the data presented in it to allow different interpretations of the data presented.

15. Page 1. It is not clear what the three parcels are. Is parcel C the facility to the north which I have seen in a map?

16. Page 2. The scope of the investigation as presented in the scope of work seems very limited given the likely extent of contamination as explained above in the general comments, and unlikely to be sufficient to characterize the contamination.

17. Page 3. It is not clear how much PCP was spilled in the 1990 Butt Tank spill, or where that was disposed of after clean-up. That should be documented in the revised report. Similarly all other known past spills and disposal areas should be documented, and referenced to original documents. Similarly all known ongoing contributions to contamination on site should be documented.

18. Page 4. It is not clear that the "former butt treating thermal tank" area has been carefully located or fully investigated. Since this seems to be one of the major sources known to exist at the site it must be fully investigated.

19. Page 5. It is not clear why the infiltration was calculated assuming no runoff, and whether this is or is not expected to be more conservative for the contaminant migration. Also, if the precipitation occurs mostly in the winter in this area, and is routed to french drains, it is not clear why the majority of the precipitation is not considered as recharge, without a large proportion (about half of the precipitation in this case) being allocated to evapotranspiration. Since this is a facility with little vegetative cover, there is no reason to assume that most of the precipitation is not directly recharged to the aquifer.

20. Page 9. Text gives a flow rate range of 0.4 to 5 ft/day, which translates into 150 to 1500 feet per year. Such information should be used to determine what the likely extent of the PCP or degradation products of the plume could be since a documented plume was at the facility boundary prior to 1990.

21. Page 9. It is not clear where the lag time estimates come from or what it is based on. How is this related to the paragraph previous to it which has ground water flow rates of 150 to 1500 ft/yr? Does this estimate include the infiltration from the french drains which the facility has been using? Until this issue is resolved to the satisfaction of the agencies this paragraph should be removed because it is potentially misleading.

22. Page 11. The concept of using MTCA Modified Method B for the cleanup levels is simply an unacceptable concept. While the facility itself may be an industrial setting, the land adjacent to it is residential and the water supply wells need protection unrelated to the facility zoning. Therefore, this statement and related concepts must be removed from the DRI and the concept of using the ground water MCL of 1 µg/L needs to be incorporated into the report for any areas beyond the facility boundary now, and for the entire aquifer after remediation of the contamination caused by the facility.

23. Page 15. Dioxin may be hydrophobic, but since PCP is normally applied as a mixture with oil there needs to be some more work to determine whether dioxin has migrated to the ground water with the oil mixture, and whether the oil/PCP mixture is remaining in site or migrating. It is not clear from the data collected if any LNAPL was sampled, and if it was, it is not clear if any LNAPL collected at the site has dioxin contamination. Similar issue for furans.

24. Page 16. It is interesting to note that in BT-W a product sheen was noted from the "shallowest sample to the deepest sample collected beneath the water table sample at 32 feet", but it is not clear why there were no more samples beyond 32 feet until there was no detection of contaminants in a vertical direction so that the complete vertical extent of the contamination could be determined and documented. It is unclear that this source area has been fully characterized. This appears to be another major data gap that needs to be resolved.

25. Page 20. The report states that PCP in MW-2 is "less than 10 µg/L", but as stated above, this seems to be based on a limited data set, and it is unclear whether the changes between these data and the 1990 data are due to true decreases or due to changes in sources or gradients from source areas to that well or to some other factor.

26. Page 20. While the concern about turbid samples may be true, such that more turbid samples give higher PCP concentrations, it should be noted that PCP is not expected to be present in normal soil background. Given that PCP may be correlated to turbidity, which is not necessarily accepted as valid given the correlation data presented in this DRI, it may be necessary to obtain more such "turbid" samples from wells and future sampling points to more carefully delineate the path of the contaminant plume in the past. At a minimum this should be carefully considered and discussed with the WDOE as a potential approach in the future studies at this facility.

27. Page 22. Again, the case is made that high PCP concentration may be associated with turbidity in MW-2. Since PCP is not expected to be found in background soils, unlike some metals, the presence of PCP should be taken as a source of contamination, and not as a sampling outlier which should be removed by changing to different sampling techniques.

28. Page 26. It is not very useful to debate the merits of PCP degradation based on modeling results since neither the site characterization, nor the modeling based on that characterization data can be considered very reliable at this point. There is no apparent reason to extrapolate that based on not finding high concentrations of PCP in a few wells there is sufficient data to determine biodegradation rates of PCP. In addition, as stated above, the degradation of PCP may only indicate that we have different toxic compounds which have been overlooked and which need to be included in future analyses.

29. Page 27. The issue of risk associated with PCP in ground water is not acceptable as presented. The characterization of the plumes needs to be continued and improved until we fully understand the extent and rate of migration of any PCP plume, and its break-down products, and then determine whether there are any drinking water supplies or ecosystems endangered by it.

30. There should be a more detailed map similar to Figure 3 which includes all the supply wells in the area, and which documents in detail how the wells were or were not found. If Portage Creek is considered a discharge boundary for the plume it needs to be documented with actual ground water data. If the plume is likely to go beyond the Creek, then nearby wells found on the north side of it should also be included in the mapping and sampling. Similarly, if Quilceda Creek is determined to be a discharge boundary for the south side of the site similar concerns have to be investigated there.

31. Figure 5. It is unclear how the Penta Storage location can be placed at the northern end of the facility boundary and not to have any monitoring points around it. This area should

be considered a source area until proven otherwise. Some soil and ground water monitoring of that area should be considered, and if it has been done it should be included in the DRI. Similarly, there should be some monitoring wells near and to the west of the retorts and tank farm area.

32. Figure 6 and 7. The wells used for background BXS-4 and MW-4 seem to be much deeper relative to the water table surface than the other wells nearer to the treatment area. That may present a problem with the detection of any contamination from the Parcel B area and may make any comparison to background questionable.

33. Figure 6, 7 and 8. The water elevation in the wells has varied by many feet over the years presented (about 15 feet between 1994 and 1997 in some wells). This variability makes any comparison of water quality and gradients very difficult. To verify the actual gradients it may be necessary to install transducers or go to a more routine (weekly) water level monitoring schedule. Water quality may have to be compared to periods where the well has had similar water elevations rather than just to the previous water samples in order to provide reasonable comparisons of the data to show trends. It is not clear why BT-S and BT-W were not completed as monitoring wells since these borings appear to be located near the source areas. Wells in the source areas should be installed soon to attempt to characterize the sources and begin to have a data set of those areas.

34. Figure 10. It seems that this figure is somewhat optimistic at considering such limited data as a valid determination of the K_{oc}.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

July 26, 2000

MEMORANDUM

SUBJECT: Review Comments on the March 10, 2000, J H Baxter Draft Remedial Investigation Report

FROM: Julius U. Nwosu, Toxicologist
Office of Environmental Assessment

TO: Cheryl Williams, Project Manager
RCRA Compliance

Please find below my review comments on the 2000 Draft Remedial Investigation Report (DRI). My comments are based on the DRI and other site related documents made available to me.

Purpose of the Review

The purpose of my reviewing this document is to ascertain if current and past practices at the Baxter Facility resulted in the contamination of groundwater in the areas near the site and vicinity, and also to determine if the contamination poses any threat to human health and the environment.

General Comments

1. It was not clear why conclusions were drawn concerning the non detection of pentachlorophenol (PCP) at HCMW-7. In May 1990, PCP at a concentration of 150 ppb was detected in a well on the northwest corner of the property, but no well identification information was mentioned in the document (Ecology Site Assessment Report). Also, in August 1991, PCP at a concentration of 440 ppb was detected at MW-3, during the same period (Ecology Site Assessment Report). Based on the information provided, it appears that only one well exists between BXS-1 and HCMW-7, and also the concentrations of PCP detected in some of the nearby wells (MW-2 and MW-3), exceeds State and Federal groundwater regulatory limits for PCP (Groundwater Regulatory limit- MCL for PCP is 1 ppb) [Ecology, 1999; EPA, 2000]. Therefore, it appears that groundwater

characterization in the northeast corner of the Baxter Facility is inadequate. In addition, the data provided in the report does not support the assumption stated in the DRI that the PCP plume is only confined to the areas within the site boundaries.

2. The fate and transport model (pages 25-26 of the DRI), seemed to show that the source most strongly contributing to the detected PCP in groundwater at MW-3 seems to be the LNAPL beneath the Butt Tank and in the SB-6 area. The French drains also appear to represent a surface pathway for PCP to reach groundwater at the site, but were not mentioned in the DRI as a contributing source to groundwater contamination. Based on limited site data, the DRI concludes that groundwater at the site flows toward the northwest; if this is true, areas around MW-3 and vicinity are the likely recipients of any PCP contained in the plume along that flow path. The DRI (Page 4) also indicated that there are several active wells in the site vicinity, however, it was not clear whether these wells were directly located downgradient of the site, and why no PCP monitoring data exists for these wells.

3. It was stated in the DRI that PCP migrating offsite posed a potential source of groundwater contamination in the area. It was also stated in the DRI that no PCP was detected at HCMW-7(the one well offsite which has been sampled), which is located approximately 300 feet downgradient from the site. Using this limited data, it was concluded that there is the possibility of PCP "attenuation" taking place prior to the contaminated groundwater reaching any existing wells, therefore mitigating the potential for offsite contamination of groundwater by PCP. Based on this limited data, it was suggested that the PCP in groundwater at the site does not pose any current threat to human health (Page 27 of the DRI). Without additional monitoring well data, this statement lacks support.

4. Page 22 of the DRI contains the following statements: *" Although dioxin concentrations detected at MW-2 were above screening levels, given the strong association of dioxin compounds with suspended solids, the January 2000 dioxin concentration detected at MW-2 may still be associated with suspended solids."* This statement conveys that the dioxin that is present in groundwater at the site may not be free, that is, the dioxin is tied up by suspended solids. Though high total suspended solids (TSS) may be associated with high turbidity, it is not generally true that most hydrophobic compounds in highly turbid environments are all tied up; it appears that the undissolved fraction will have a higher affinity for suspended solids than the dissolved fraction. Notwithstanding, in January 2000, **2.5 pg/L** dioxin was detected in MW-2; this is approximately **four times** higher than the current screening level of **0.6 pg/L** (Ecology, 1999). Thus, regardless of what the groundwater TSS values are, the detected dioxin concentrations should be the basis for any groundwater risk management at the site.

Specific Comments

1. Page 1. It was stated that the Baxter Facility is located in an area zoned industrial. However, the information provided in the DRI shows that there is a residential neighborhood close to the facility boundary. The Facility appears to be located in a mixed-zoned area which is not strictly industrial, therefore, it is appropriate to apply a residential cleanup standard when making any cleanup decisions.

2. Page 2. The current scope of the investigation as presented seems to be very narrow. Given the likely nature and extent of the contamination at the site, the scope should be broadened to deal with all the contaminant issues around the site including potential offsite contamination. In addition, the process should clearly demonstrate what the remedial investigation (RI) intends to accomplish, and the underlying limitations, such as, groundwater data collection and plume characterization. Nevertheless, a broad investigation of the nature and extent of contamination at the site should be the main focus.

3. Page 3. It was not clear how the 1990 Butt Tank spill was handled. No record is presented in the DRI of how the spill happened or what contaminants were contained in the spilled material, even though it appears that the spills are the main focus of the investigation. A review of the information presented in the DRI from Baxter and the Snohomish County Health District about the PCP/oily solution spill seems to be incomplete. This is because there was no adequate chemical profile of the substance(s) or other supporting evidence made available concerning the spill.

4. Page 4. There is no evidence presented in the DRI or any other document that supports the claim that the "stained soil areas" detected by aerial photographs in the northeast and southeast areas of Parcel A are primarily vegetation. It seems some of the "dark ground" appearing in the photos may have been caused by spills from site activities.

5. Page 4. The area well water inventory as presented in the DRI did not state what the PCP levels were in 1990 before the mobile home park was connected to the City of Arlington water supply. It seems like some information gaps exist regarding the mobile home park wells; it would be valuable to see all the well inventory data and also the results of the chemical analysis performed on these wells during the 1990 inventory and prior to 1990.

6. Page 4. The Sweet-Edwards field survey of 1988 identified several wells that may still be used by the residents as drinking water sources or for irrigation. Residential wells 25, 26, 27, 28, 29, 35 and 32 are situated along the eastern fringes of the Baxter facility, and no monitoring data is provided for these wells (EMCON, 1989). Of particular interest is the well on the Loughnan property, which is near Catch basins 18, 19, 20 and MW-4.

PCP was detected in MW-4 at a concentration of 0.60 ppb in April of 1995 (Table A-2, page 43 of the DRI). Since the groundwater on the Southern portion of the site has not been adequately characterized, the potential exists for PCP and dioxin from contaminated groundwater on-site to migrate to the well in the Loughnan property and other residential wells along the eastern boundary of the Baxter Facility. It is not clear why this potential is not explored comprehensively in the DRI.

7. Page 5. In August 1990, PCP at a concentration of 440 ppb was detected in MW-3 (Woodward-Clyde, December 1990). Also, during the same period, 52 ppb PCP was detected at BXS-1. With the 1990 data in mind, it becomes clear that an adequate groundwater characterization is needed (i.e., installation of new monitoring wells) in the areas north of BXS-1 and vicinity in order to fully characterize the nature and extent of groundwater contamination at the facility and beyond the facility boundaries.

8. Page 7. It was mentioned in the last paragraph of the Hydrologic setting section of the DRI (page 5), that the closest surface drainage feature near the Baxter Facility is Portage Creek, a tributary to the Stillaguamish River. According to this document, it appears that this Creek is the likely discharge point for groundwater from the outwash aquifer. The DRI documents a flow rate range of 0.4 to 5 ft/day (which is 150 to 1,500 feet per year), therefore, it seems likely that the plume is moving closer to Portage Creek (which is 5,000 feet, north of the site). This scenario is corroborated by the preliminary groundwater flow pattern presented in the DRI. It was documented that groundwater at the site appears to flow to the northwest (this is based on limited site groundwater flow data). However, it appears that there is a more westerly flow on the eastern part of the site that curves around to the northwest beneath the main pole treatment area. From the limited data available, the DRI assumed that groundwater in this area ultimately discharges into Portage Creek. In light of this presumption, it becomes imperative that at a minimum, more monitoring wells should be installed on the northwestern portion of the site to help determine the extent of the PCP plume that may be traveling toward Portage Creek. The DRI did not discuss whether other flow patterns for surface water and groundwater have been investigated at the site. Several local groundwater flow anomalies were reported in the DRI (pages 7 & 8), and the report pointed out that the water levels measured in MW-1 and HCMW-5 suggested a local preferential southwest flow pattern may exist around the butt tank area. The existence of this preferential flow pattern may imply that groundwater and surface water in the southern portions and any wells along this path may be impacted. In addition, other documents prepared by the Facility's contractor indicate that a shallow groundwater table in the site vicinity serves as a steady recharge to Quilceda Basin (AKART (AGI) Analysis, July 30, 1997, page 27). The groundwater in the southern portion of the Facility has not been characterized, therefore, it is critical that additional monitoring wells are put in place in the southern portions of the site to help characterize the extent of groundwater contamination in the area.

9. Page 11. The use of a Modified MTCA Method B approach to calculate soil cleanup levels for groundwater protection for PCP is unacceptable. The Baxter Facility may be an industrial site, but the land adjacent to it is residential and the water supply wells need to be protected regardless of the zoning. Therefore, the modified MTCA Method B approach and related statements should be expunged from the DRI . The MTCA Method B soil cleanup level is **0.22 mg/kg** (Ecology, 1999), for surface soil which would result to a groundwater cleanup level of 1 ppb (i.e., MCL); this should be used as the soil cleanup standard for all areas within and beyond the facility boundaries. Also, the MCL of 1 ppb (Ecology, 1999; EPA, 2000), should be used as the cleanup standard for the entire groundwater systems (i.e., the aquifer) at the site.

10. Page 12. The application of the Modified MTCA Method B concept to compute soil cleanup levels for groundwater protection for dioxins and cPAHs is unacceptable. The soil screening level for dioxins for soil to groundwater is 5.6E-06 mg/kg (EPA, 1999a), and the corresponding groundwater concentration is 6.0E-07 mg/L (this is based on the MCL). The published MCL for dioxin is 3.0E-05 ppb (EPA, 2000). Also, the standard Method B groundwater protection level of 2 mg/kg should be used for cPAHs cleanup in soil (Ecology, 1999).

11. Pages 13 /14. The statistical inference made in the DRI concerning surface soil concentrations of PCP, dioxins, TPH and PAHs is incomprehensible. In particular, the introduction of lognormality to characterize the surface soil data in relation to groundwater protection, is not supported by the limited soil data available. In many instances, it was indicated in the DRI that the levels of these constituents detected in surface soil in affected areas at the site are all well above the soil screening levels. For example, it was stated in the DRI that the highest surface soil concentrations of PCP were detected in the shallow samples from SS-3 (90 mg/kg) located near the railroad loading area in the treated wood storage area, and the 2.5-foot deep samples from boring SB-5 (110 mg/kg) located just east of the drip pads. The MTCA Method B and EPA PCP soil screening level for an unsaturated zone (using the default at a dilution Factor of 20) for groundwater protection are **0.022 mg/kg** and **0.03 mg/kg**, respectively (Ecology, 1999; EPA, 1999b). Thus, with these exceedances above the soil screening level, it appears that the use of lognormality in characterizing the surface soil data is inappropriate.

12. Page 15. It is stated in the DRI that the dioxin levels detected in surface soil at the site are above MTCA Method C for industrial facilities. Since the State has an established cleanup guideline for dioxins, these guidelines should be **strictly** followed.

13. Page 16. The DRI states that there appears to be some consistency in the lower concentrations of PCP detected in SB-4 and also at HCMW-6. The DRI suggests that the lack of PCP in deeper soils and the consistently low concentration of PCP detected at SB-4 indicate that PCP leaching from treated poles in the pole storage yard is not a significant source of groundwater contamination at the Facility. The data that gave rise to

this conclusion comes from a single sampling point (HCMW-6). Since there are no other monitoring wells within this area, the conclusion that the treated pole storage yard is **not** a significant source for groundwater contamination at the site is not supported by the data. Groundwater data from more monitoring wells is needed in this area in order to fully evaluate this potential source.

14. Page 18. The DRI states that storm water samples from the site were generally turbid, and that because of the high turbidity and the hydrophobicity (compound that is immiscible with water) of PCP, the detected PCP concentrations were unlikely to represent the true dissolved concentrations. Although there have been some reports on the influence of turbidity on dissolved forms of organic constituents in both surface and groundwater, it would be more acceptable to use the total measured concentrations of PCP in the storm water without any modifications, than to use data from manipulated samples.

15. Pages 19 thru 21. The influence of turbidity may exist, but it may not necessarily mean that the levels of PCP measured in these wells should be considered as not significant. Regardless of turbidity, it appears that PCP levels measured in groundwater from the monitoring wells exceeded the regulatory standard or MCL of 1 ppb (page 20 of the DRI).

16. Page 22. Once again, the DRI states that high dioxin levels are associated with turbidity in MW-2. It should be noted that not all of the contaminants of concern are expected to be found in background soils (particularly, PCP and dioxins). Then, unlike TPH, PAHs, and some metals, the presence of PCP and dioxins in the monitoring wells must be considered as site-related, regardless of the level of turbidity. So, the level of dioxins detected in MW-2 is site-related, and may be attributed to the occurrence of PCP and it is relevant in the determination of the nature and extent of groundwater contamination at the site. Equally, the levels of dioxins detected in MW-2 are relevant in the evaluation of risk to humans and the environment. Overall, it appears that there is some established correlation between the occurrence of dioxins and PCP site-wide. Again, regardless of turbidity, it seems like the detections of dioxins in MW-2 are related to the occurrence of PCP in groundwater at the site, and is tied to the operations at the Baxter Facility.

17. Page 26. A fate and transport model was used in the RI to show that biodegradation of PCP is occurring at the site. According to the fate and transport model, the source most strongly contributing to the detected PCP in groundwater at MW-3 seems to be the LNAPL beneath the Butt Tank and in the SB-6 area. However, it appears that the old Butt Tank area and MW-3 are not the only sources of PCP at the site. The French drains also appear to represent a surface pathway for PCP to reach groundwater at the site, but were not mentioned in the DRI as a contributing source to groundwater contamination. It was also stated that the model results for PCP were higher than field values due to the fact that the model did not incorporate any biodegradation factors. The conclusions

found in the DRI do not appear to be supported because neither the site characterization, nor the modeling is based on adequate groundwater data. Therefore, there is no apparent reason to generalize (based on not finding high concentrations of PCP in a few wells) that there is sufficient evidence to suggest that biodegradation of PCP may be occurring. Given the limited data available, an equally likely conclusion is that unless the source is eliminated and the contaminated groundwater mitigated, the PCP plume will continue to become larger and will move offsite toward MW-3 and possibly to HCMW-7 and beyond.

18. Page 27. The conclusion that PCP and dioxins in groundwater at the site do not pose any current threats to human health is unsupported. Additional site groundwater characterization is needed to fully understand the extent and rate of migration of these contaminants, and then a determination must be made whether there are any potential drinking water supplies endangered by these contaminants.

19. Table 10. It seems that this Table was erroneously cited in the document on page 18 as Table 9. The text should read Table 10, instead of Table 9.

References Cited

AGI, 1997. Stormwater AKART Analysis, Baxter Facility, Arlington, Washington. (Prepared by AGI Technologies, July 30, 1997)

Ecology, 1999. Proposed Amendments: The Model Toxics Control Act, Cleanup Regulation (Chapter 173-340 WAC), Public Participation Grants (Chapter 173-321 WAC) Remedial Action Grants and Loans (Chapter 173-322 WAC) Washington Department of Ecology, Toxics Cleanup Program. November.

EPA, 1999a. Soil Screening Levels: In Risk Assessment and Superfund Calculation Tools. U.S.EPA, Office of Emergency and Remedial Response. (Washington, DC.) May.

EPA, 1999b. Preliminary Remediation Goals (PRGs). EPA Region IX PRG Tables (San Francisco, California. October.

EPA, 2000. Technical Fact sheet on Dioxin. National Primary drinking Water Regulations. U.S. EPA Office of Groundwater and drinking Water (Washington, D.C.). June.

EMCON (formerly Sweet-Edwards/EMCON), 1989. Hydrogeologic Report, J. H. Baxter South Woodwaste Landfill, Arlington, Washington. Prepared by Sweet-Edwards/EMCON.

Woodward-Clyde, 1990. Soil and Groundwater Investigation, Arlington, Washington Wood Treatment Facility. Prepared by Woodward-Clyde Consultants. November.