



Loureiro Engineering Associates, Inc.

December 18, 2002

United States Environmental Protection Agency
Region I, New England
One Congress Street
Suite 1100 (HBT)
Boston, MA 02114-2023

Attn. Mr. Aaron Gilbert

**Re: Pratt & Whitney Andrew Willgoos Turbine Laboratory
Documentation of Environmental Indicator Determination,
Migration of Contaminated Groundwater under Control (CA 750)**

Dear Mr. Gilbert:

On behalf of our client, United Technologies Corporation/Pratt & Whitney Division (UTC/P&W), this letter has been prepared to address written draft comment received from United States Environmental Protection Agency (EPA) regarding the March 2000 Documentation of Environmental Indicator Determination (EID) for Migration of Contaminated Groundwater Under Control at the Pratt & Whitney Willgoos facility located on Pent Road in East Hartford, Connecticut. The comments were received from the EPA as final on December 13, 2002. This letter is formatted to provide each of the draft comments followed by the response to the comment in italics. Submitted with this letter are two copies of the EID that has been revised in accordance with the responses provided. This revised EID also incorporates revisions made as a result of previous comments from the EPA.

General Comments

1. In an attempt to minimize the time and effort spent making revisions to this EID we request that any future versions of this document, or response to comment, contain redline and strikeout text only for the new comments.

To further clarify, if the comments below are not redlined, then the response you have provided to date is satisfactory and thus we prefer not to see a new/revised response (likewise, the accepted response should not appear as redlined in your next deliverable).

All redlined text in the EID document from previous revisions will be accepted/rejected using track changes. Only the latest November 2002 revisions will be redlined in order to facilitate your review.

2. Please include a reference in the CA 750 Environmental Indicator Evaluation (EID) which clearly notifies the reader whether the comments EPA provided on the Human Exposures



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Controlled EID were incorporated into this revised deliverable.

As noted in Question 2 of the CA 750 document, the evaluation of groundwater presented herein, takes into consideration all comments received from EPA regarding CA 725. In addition, the CA 750 presents the results of the April 2002 and August 2002 sampling performed in accordance with a sampling plan identified in LEA's October 12, 2001 response to comments letter submitted with the revised (CA 725) Documentation of Environmental Indicator Determination Current Human Exposures Under Control.

3. We understand that sediment and surface water samples were collected as part of P&W's efforts to demonstrate stabilization. However, none of the data is presented as evidence that GW releases are controlled.

We further understand that you do not believe the surface water and sediment samples collected are representative of impacts from GW discharging to surface water. At a minimum, please discuss this in the EID (provide us a specific reference to where this new language can be found) and elaborate on why you felt additional sampling for this media was not necessary.

Furthermore, please note that Table 3-6 of Appendix A contains out-of-date values from the CT DEP Water Quality Standards. The May 15, 1992 Surface Water Quality Standards, which we understand were used to develop these screening levels, were updated on April 8, 1997.

Therefore, as necessary, please revise the Table 3-6 values and re-screen the surface water results against the more current standards. This is especially important in cases where the standards have become more protective.

As noted in Question 2 of the CA 750 document, surface water and sediment samples presented in the CA 725 are not included in the CA 750. Surface water and sediment samples were collected at storm water outfall locations and not from the Connecticut River surface water body. The primary function of the storm water outfalls at the facility is to convey surface water runoff to the Connecticut River. As such, data from surface water and sediment samples collected from the outfalls are not appropriate for evaluation of groundwater at the site.

Additional sampling for these media was not pursued because of the current and historic use of the Connecticut River for receiving a wide-variety of industrial wastewaters, which may have contributed to contaminants present in surface water and sediments and would be considered more than likely to present "false positives". Furthermore, there are no small brooks or streams located on the Willgoos facility site. It is for these reasons that the approach to evaluating groundwater discharge to surface water at this facility has relied



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upon groundwater data collected the existing monitoring well network at the facility. As such, the Table 3-6 criteria are not applicable in the preparation of the CA 750 document.

It should be noted, however, that the referenced changes to Table 3-6 criteria would represent an increase in the screening level concentration in comparison to those originally presented in the CSM. The only exception to this would be hexavalent chromium where the screening level was decreased by 0.001 mg/l.

4. At times it is difficult to locate exactly where you demonstrate that an identified exceedance of applicable screening criteria can be disregarded. To address this, please direct the reader (i.e. provide a specific page and paragraph reference), from start to finish, on how these exceedances are dealt with.

As requested in the draft August 2002 EPA Comments, specific page and paragraph references have been added to the discussion of each exceedance to direct the reader to where additional evaluation(s) are referenced.

Specific Comments

Environmental Indicator Determination, Question 2:

5. Page 4 references the GW data that was used as part of this evaluation. Since new data was collected on April 25, 2002 at wells SW-MW-A4; SW-MW-D3; SW-MW-I3 and SW-MW-10, please be sure to incorporate this data in the Final version of this document. (Likewise, additional sampling that is conducted subsequent to finalizing this document should be included as well.) Please include the date of these sampling events and be sure to add all data points to Drawing No. 1 (e.g. there was a new exceedance, based upon residential air inhalation, for Trichloroethylene at NW-MW-61 collected June 11, 2001).

A discussion of data from all sampling events conducted between April and September 2002 have been added to the CA 750 document. Discussions of the various exceedances due to method detection limits for these compounds/samples have been expanded and clarified to allow the reader to better identify the sampling events for which detection limit issues occurred. Where appropriate, discussions of subsequent samples that achieved lower detection limits will also be included. Drawing No.1 has been revised to include the additional monitoring wells sampled between April 2002 and September 2002.

6. The narrative on page 6 needs to be qualified to clarify that the metals analysis that was generated from the January 1999 sampling events were conducted on filtered GW samples.

The filtering of the groundwater samples have been noted in Question 2 of the CA 750 document.



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7. P&W has argued that it is appropriate to eliminate exceedances from further evaluation because method detection limits are “not likely to be technically achievable”. However, after a brief review of the data it appears that while there are cases in which the method detection limits for a given compound were not met, the same limits were achieved for other similar samples.

More specifically, with respect to the 1999 VCAP Initial GW Sampling event as discussed on page 6, and page 3 of Appendix C, it appears that the method detection limits for ethylene dibromide, 1,1-dichloroethylene, vinyl chloride and isobutyl alcohol were achieved in all of 14 samples except SW-MW-B2 (see Table C4a). Likewise, acrylonitrile, isobutyl alcohol, propionitrile and methacrylonitrile were achieved in all of 14 samples except again SW-MW-B2 (see Table C4b).

Please elaborate further on this issue. At a minimum, it may be necessary to present and discuss the relative magnitude of difference between the method detection limit and the applicable standard. (It would help if you noted on page 7, second paragraph of the August 2002 revision that the method detection limit for methacrylonitrile was < 10 ug/l for all wells except at SW-MW-B2 where it was < 100 ug/l. Further, that the Table 3-5 screening criteria is 5 ug/l. Likewise, please note on page 7, fourth paragraph of the August 2002 revision that the method detection limit for ethylene dibromide was < 1 ug/l for all wells except at SW-MW-B2 where it was < 10 ug/l. Further, that the Table 3-7 screening criteria is 0.5 ug/l) This holds true as well, especially for the analysis of hexochlorobenzene from GW samples collected on August 9, 2001 (see paragraph 2 page 10 and table E10).

(Please Note: If the method detection limit exceedances were noted in only one sample, then further clarification should be provided so as to clearly identify why this data is being disregarded.)

Furthermore, it is not clear how you dealt with the numerous elevated detection limits for sampling conducted on August 9, 2001. No explanation is provided on page 4, Appendix E of the February 2002 revision. Likewise, page 12 of the August 2002 EID checklist refers the reader to Question 5, however it is difficult to follow how this issue is dealt with (therefore, please provide a specific reference to Question 5, including page and paragraph).

In any event, the most direct way of dealing with the questionable data is to demonstrate how follow-up sampling has shown the exceedance (which was triggered by an elevated method detection limit) to be erroneous. On the other hand, if the application of site-specific dilution attenuation factors eliminated the exceedance of applicable screening criteria for those compounds with elevated detection limits, please clearly state as such in the appropriate sections of the EID checklist and appendices.

Discussions of the various exceedances due to method detection limits for these compounds/samples have been expanded and clarified to allow the reader to better identify



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the sampling events for which detection limit issues occurred. Where appropriate, discussions of subsequent samples that achieved lower detection limits have also been included.

However, a specific discussion for each detection limit exceedance to enumerate the method detection limit, the elevated detection limit and the Table 3-7 criteria is not believed to be necessary. As indicated in the EPA's comment (above), a subsequent discussion is presented (under Question No. 6) and applies a site-specific dilution attenuation factor that eliminates the exceedances of applicable screening criteria for those compounds with elevated detection limits. Appropriate references have been placed under Question No. 2 to point the reader to the site-specific dilution attenuation factor discussion presented in Question No. 6.

Exceptions to applying the site-specific dilution attenuation factor to method detection limit exceedances are noted for samples collected from NW-RW-01, NW-MW-25, and NW-MW-40 between November 1999 and December 1999. As discussed in Question 2, the sample collected from NW-RW-01 was heavily contaminated, as it was collected from the initial recovery well located very near the spill source, and is not considered representative of groundwater outside of the spill release area. Also discussed in Question 2, samples collected from NW-MW-25 and NW-MW-40 were diluted by a factor of 100 and lower detection limits were unable to be achieved by the laboratory. NW-RW-01, NW-MW-25, and NW-MW-40 are located in the capture zone for the groundwater barrier treatment system, which collects and treats groundwater from the location of these wells. Furthermore, NW-MW-40 was destroyed in 2000 during the permanent installation of the dual phase extraction system. Therefore, these wells are not considered representative of groundwater that is discharging to a surface water and these detection limit issues are not recommended for further evaluation.

Note that the various Appendices are provided in support of the CA 750 document and are presented as summary reports for the various groundwater sampling events at the facility. It is not the intent of the Appendices to present an evaluation of the significance of each exceedance; that discussion and evaluation is presented in the CA 750 document under Question No. 6.

8. With respect to the initial VCAP GW monitoring event of 1999, page 7 of the August 2002 text revision incorrectly states that the Table 3-5 Screening criteria are not applicable as all wells sampled are located downgradient of all residential structures. This is not true for SW-MW-11I and SW-MW-11S and therefore this argument needs to be qualified and further supported.

It appears that there is a misunderstanding with regard to statements made in the revised text regarding the applicability to the Table 3-5 criteria to wells SW-MW-11I and SW-MW-11S. The revised text indicates that the Table 3-5 criteria are not considered applicable to



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location NW-MW-B2, as this location is downgradient of a residential structure.

As such, Table 3-5 criteria are considered applicable to the evaluation of the data from wells SW-MW-11I and SW-MW-11S. Further explanation has been provided with respect to the detection limit issue for groundwater samples collected at SW-MW-11I and SW-MW-11S:

“While SW-MW-11I and SW-MW-11S are representative of groundwater that could potentially exist beneath an offsite residential structure, methacrylonitrile has never been detected in groundwater at the site and is not a constituent of concern for the site based on the nature of facility operations. Furthermore, methacrylonitrile was not detected in groundwater samples collected in August 2002 from monitoring wells representative of groundwater in the same portion of the site as SW-MW-11I and SW-MW-11S. The detection limits for methacrylonitrile in monitoring wells SW-MW-10, SW-MW-D3, SW-MW-I3 were less than one microgram per liter, which is well below the Table 3-5 criterion of five micrograms per liter. Therefore, this detection limit issue is not recommended for further evaluation.”

9. The following compounds, which were identified as exceedances in question number 2, were not included in the question number 5 discussion.

From the August 2002 revision, page 7, paragraph 1 (regarding Table 3-5) and paragraph 3 (regarding Table 3-7): isobutyl alcohol.

It is also not clear whether there was a typo in paragraph 1 when referencing well SW-MW-B2 and NW-MW-B2? (It appears an argument is made for the former well but the latter reference is provided.)

From the August 2002 revision, page 7, paragraph 2 (regarding Table 3-5) and paragraph 3 (regarding Table 3-7): methacrylonitrile.

Furthermore, wells SW-MW-11 I & SW-MW-11S are not downgradient of all residential structures and therefore this needs to be clarified and discussed in Question number 5 .

From the August 2002 revision, page 7, paragraph 3 (regarding Table 3-7): propionitrile

From page 9, last paragraph: 1,1-dichloroethylene, vinyl chloride and trichloroethylene.

Furthermore, it is not clear at which wells these exceedances were found and the date of this sampling. According to the August 2002 revision, page 12, second paragraph, it is not clear whether these exceedance were



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identified during the April 2002 sampling event. Likewise, page 11, beginning of paragraph 2, October 2002 revision states: "Dichlorofluoromethane were detected above the Table 3-7 criteria in the sample collected from monitoring well NW-MW-42." However you do not specify the date of the sampling associated with the Table 3-7 exceedances. Therefore, please verify and note the appropriate sample date (we believe it may have been December 28, 1999).

In any event, please provide further discussion on the two rounds of groundwater sampling that were to be collected to verify groundwater conditions offsite in the vicinity of the Tank farm area (for more details refer to your response to comment number 8, as incorporated within the October 2001 Human Exposures Controlled EID for Pent Road).

From page 8, paragraph 5 (or page 9, paragraph 5 of the August 2002 revision):
benzene

From page 10, second paragraph: hexachlorobenzene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and benzo(k)fluoranthene.

For these compounds we note they were included in the Table shown on page 23 of the August 2002 EI revision. However, there is no discussion on how the elevated detection limit issue was dealt with. Therefore, please add this discussion to Question 6.

Please provide further discussion as to why these exceedances were not considered significant as they relate to demonstrating GW Releases Controlled.

As noted above, it appears that there is a misunderstanding regarding conclusions regarding the evaluation process for SW-MW-111 and SW-MW-11S. The paragraph discussing 1,1-dichloroethylene, vinyl chloride and trichloroethylene is generic in that it identifies all detection limit exceedances for either Table 3-5 or Table 3-7 criteria. As mentioned in the following paragraph of the CA 750 document (page 13, third paragraph), concentrations of 1,1-dichloroethylene, vinyl chloride and trichloroethylene detected in samples collected in April 2001 and June 2001 are in excess of the Table 3-5 criteria. Therefore, a discussion of these exceedances in Question 5 is not warranted as this question applies to the evaluation of groundwater discharging to a surface water body.

With the exception of benzene, all other compounds are to be addressed in discussions presented under Question No.6. In this table, maximum detected concentrations (or the reported "not detected" value, as appropriate) for Table 3-7 exceedances are compared to alternative SWPC (in accordance with the State of Connecticut Remediation Standard Regulations) by applying a site-specific dilution attenuation factor (DAF), which was



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calculated by multiplying the 7Q10 of the Connecticut River in the Hartford area, to the lower of applicable human health or aquatic life criteria in Appendix D of the State of Connecticut Water Quality Standards. In certain cases, Gradient Corp. developed other applicable criteria that were not present in the Appendix D Water Quality Standards.

Appropriate references have been placed under Question No. 2 to point the reader to the site-specific dilution attenuation factor discussion presented in Question No.6.

The benzene exceedance is associated with the sample collected from NW-RW-01, a contaminated groundwater product recovery well located within the "capture zone" of the groundwater treatment system and is not considered representative of groundwater discharging to a surface water. This has been clarified in the text.

Question 2 will be revised to indicate the date of the groundwater sample collected from NW-MW-42 that contained dichlorofluoromethane above the Table 3-7 criteria (December 1999).

10. It is difficult to understand the date of sampling as discussed in the narrative beginning on page 8 (for the sampling performed November 1999 through April 2002). Therefore, it would help if you presented this data in a separate sampling event section, as was done on page 7 and the top of page 6 (i.e. separate sampling events with bold title/text).

For example, it is not clear whether the second to last paragraph of the August 2002 revision, page 9, refers to a December 1999 sampling event.

Likewise, it is not clear whether the third paragraph of the September 2002 revision, on page 10, refers exclusively to the December 1999 sampling event. For this section, we are unable to verify the exceedance of xylenes in wells NW-MW-09 and NW-MW-10, and yet, noted exceedances of these compounds were still missing for wells NW-MW-25 and NW-MW-40.

Additionally, while you identify (in the fourth paragraph of the September 2002 revision) the exceedance of dichlorodifluoromethane in well NW-MW- 42, there is no mention of the detection limit exceedances at wells NW-MW-25 or NW-MW- 40.

Furthermore, it is not clear which sampling events are being evaluated within the second and third paragraph (on page 12) of the August 2002 revision. Please elaborate by including the sample date and locations of the exceedance along with a reference to where the data table can be found (e.g. we expected to find them in revised Table E9, and E10, page 5 of 5). For the August 2002 sampling, due to elevated detection limits at well SW-MW-A4, we ask that you resample.

Finally, it appears that as a result of the August 2002 sampling you will need to revise Appendix E. If this is true, please forward to EPA as soon as possible.



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Exceedances of the Table 3-7 criteria for xylenes were incorrectly reported for NW-MW-09 and NW-MW-10 in Question 2 of the CA 750 document. The exceedances of xylenes correspond to samples from NW-MW-25 and NW-MW-40. The text in Question 2 has been revised as necessary. Detection limits above the Table 3-5 and Table 3-7 criteria for NW-MW-25 and NW-MW-40 were noted in Question 2 in previous revisions.

The text has been revised to clearly indicate the sampling events/dates associated with the various discussions. Appendix E has been revised to include the most recent sampling results. In addition, LEA received the analytical data from the August 2002 sampling event as well as the additional sample collected from September 2002 from monitoring well NW-MW-A4. These data have been included in Appendix E of the final CA 750 document.

11. The bottom of page 9, within the February 2002 revision, discusses the exceedance of xylenes (apparently in NW-MW-43, from a December 28, 1999 sampling date). It then refers the reader to Question 5 for further evaluation. However, there is no additional discussion of this exceedance.

Furthermore, while you have provided additional information in the September 2002 revision (second paragraph of page 13), you neglected to mention the exceedance of xylene at NW-MW-39 in April 2001. Please address these discrepancies.

As similarly discussed above, xylenes is presented in the table appearing in Question 6. An appropriate reference has been placed under Question No. 2 to point the reader to the site-specific dilution attenuation factor discussion presented for xylenes in Question No. 6.

The exceedance of xylenes at NW-MW-39 in April 2001 has been clarified in the text in Question 2.

12. As we may not agree whether GW detections in well SW-MW-A4 are representative of conditions beneath offsite residential structures, we prefer then to rely on your September 2002 sampling to ensure compliance with Table 3-5 Criteria for indoor air. As a result, please modify the discussion in the last paragraph, page 13, of the October 2002 revision. More specifically, clarify that only wells NW-MW-71, NW-MW-74, NW-MW-75 and NW-MW-79 are not considered representative of groundwater that could potentially exist beneath an offsite residential structure.

The text will be clarified to exclude monitoring well SW-MW-A4 from the statement indicating the monitoring wells that are not considered representative of groundwater that could potentially exist beneath an offsite residential structure.

Furthermore, while in this same paragraph, last sentence (top of page 14, October 2002 revision), you discuss the detection limits for the September 2002 sampling, you failed to discuss the results and whether there were any exceedances of the Table 3-5 indoor criteria.



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Consistent with the rest of the EID document, only compounds with exceedances or with detection limits above Table 3-5 or Table 3-7 criteria are referenced in the text. The text indicates that all sampling and analytical information are provided in tabular format in Appendix E of the EID.

Finally, we find the discussion in paragraph 2 of page 15 (December 2002 revision) confusing. It appears the discussion relates to elevated detection limits of Table 3-7 criteria for samples taken in August 2002 at SW-MW-A4. However, later in that paragraph you mention **April** 2002 sampling as well as Table 3-5 criteria. As mentioned above, we prefer to rely on results of your September 2002 sampling, therefore, please modify the discussion to focus on those results (i.e. a simple statement that concentrations and detection limits were below the applicable criteria would help to clarify things).

Please revise the GW EI by elaborating on the results within the sections noted here.

The reference to Table 3-5 is an error. The text has been edited to reference Table 3-7. Additionally, additional text has been added to clarify the paragraph.

Environmental Indicator Determination, Question 3 and Question 4:

13. The February 2002 revision, page 14, third paragraph states that: “although dissolved Jet-A constituents have been detected downgradient of the barrier system, the groundwater concentrations reported are insignificant with respect to dissolved groundwater migration to surface water.” (You should understand that EPA tries to avoid using general statements (e.g. “insignificant”) within the EID, especially those which can not be easily verified.)

A similar statement is made on page 16, fourth paragraph. While we suspect these are defended in the latter part of the EID, a specific reference to where this argument is presented should be provided. In fact, this procedure should be applied to all other similar cases, where they exist.

This issue has become especially important as we were unable to find a discussion within the August, September, or October 2002 revisions. Therefore, please include in the narrative in Question 3 and Question 4 of the EID, those dissolved Jet-A constituents that were detected downgradient of the barrier system. While we appreciate the additional reference that was added to the September 2002 revision (i.e. for cis-1,2, dichloroethylene in NW-MW-74), you fail to mention there, the exceedances of cis-1,2-dichloroethylene in wells NW-MW-58, NW-MW- 59, NW-MW-60 and NW-MW-61 from sampling performed in June 2001. As a result, please be sure to include a reference and/or discussion (e.g. your latest comment response) about these exceedances on page 19, third paragraph and page 21 fourth paragraph of the October 2002 revision.



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References in Question 3 and Question 4 to the site-specific dilution attenuation factor in Question 6 have been provided in previous revisions. Text will be added to Question 3 and Question 4 to clarify the discussion of dissolved-phase contamination downgradient of the barrier well treatment system. Additionally, the term "insignificant" will be reworded in the text.

References to monitoring wells NW-MW-58 through NW-MW-61 have not been added in Question 3 and Question 4 as they are not downgradient of the barrier well treatment system.

Environmental Indicator Determination, Question 5:

14. While EPA may agree that discharges of contaminated groundwater into surface water are currently acceptable, we must first ensure that the correct process for making this demonstration is followed. More specifically, given that there are cases in which the maximum concentration of contaminants discharging into the CT River are greater than 10 times their appropriate GW level (i.e. the Generic P&W Groundwater Screening Levels based upon Surface Water Protection) it appears the correct answer to Question 5 of your Environmental Indicator Evaluation would be "no". As a result, after providing the necessary information in Question 5, you could then proceed (in Question 6) to demonstrate how the effects of dilution might show that the discharge of contaminants into surface water are currently acceptable.

Please revise the EID to address each requirement of question 5. For example, begin by documenting:

- 1) "the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater level."
- 2) "the value of the appropriate level(s)"
- 3) "if there is evidence that the concentrations are increasing"
- 4) the total mass discharging into surface water for any contaminants greater than 100 times their appropriate groundwater level; and finally
- 5) "identify if there is evidence that the amount of discharging contaminants is increasing"

The answer to Question 5 has been changed to "no". As such, the demonstration of how each applicable exceedance is addressed by evaluating the detection limit values against the product of the ambient water quality standard and the site-specific dilution attenuation factor (DAF) has been moved to Question 6.

The maximum known concentration of each contaminant in excess of the Table 3-7 criteria are provided in the table of "Site-Specific Surface Water Protection Criteria" in Question 6. An assessment will be made to determine if concentrations of compounds in excess of 10 times the Table 3-7 criteria are increasing over time. Additionally, the total mass



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discharging into surface water for any contaminants greater than 100 times their respective screening level will be added to the text.

15. While, as presented in the December 2002 revision, we calculate no net change to your dilution attenuation factor (DAF), we question the following assumptions which were presented in Figures 4 and 5 (as necessary, please correct the figures):

- A. Your equation for the calculation of hydraulic permeability, K . While we agree with the value calculated, there appears to be a typo. We believe d_{10} is squared (vs. raised to 21st power as shown).
- B. there appears to be a typo in your assumption for the plume width as presented in your DAF calculation in Figure 5. More specifically, you assigned a value of 640 feet to the width, w , yet the value used in your area calculation (i.e. 730 feet) seems more correct. As well, please provide a discussion in the EIE as to why you located the plume boundaries at wells SW-MW-12 and SW-MW-D2 (i.e. why so much further north than SW-MW05).

The d_{10} in the hydraulic conductivity calculation is in fact squared and not raised to the 21st power. The superscripted "1" refers to Note 1. In order to avoid confusion in the final Drawings, the superscripted 1 has been moved next to "K", which directs the reader to Note 1.

The width used to calculate the plume flowrate is 730 ft. The value 640 ft is an error and has been edited. Additionally, the plume width was extended from monitoring well SW-MW-D2 to SW-MW-12 instead of from SW-MW-D2 to SW-MW-05 because a detection limit above the Table 3-7 criteria for a groundwater sample collected from SW-MW-12 in 1999 is evaluated against the site-specific DAF in Question 6 of the EID document. We feel that the width from SW-MW-D2 to SW-MW-12 is more conservative and also encompasses the location of monitoring well SW-MW-05.

16. From a review of your potential mass loading calculation for xylenes (DRAFT November 14, 2002 Memo from Dave Fiereck, LEA) it is not clear how you developed an assumed plume area of 200 square feet. We also question the appropriateness of basing the hydraulic gradient, I , on groundwater located in the Jet A plume area when the xylenes in question emanate from the Southern Tank Farm (i.e. SW-MW-A4).

We therefore ask that you provide more details on the specifics of these assumptions. (Note: From a quick review of the data, we believe the xylene plume is better represented by an area bounded upstream at SW-MW-05 and downstream at SW-MW-D2.)

Furthermore, as a result of questioning these assumptions, we now feel compelled to verify the plume area that was used in calculating the Dilution Attenuation Factor (DAF) which was



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applied to those compounds exceeding the Generic P&W Groundwater Screening Levels (based upon Surface Water Protection) as presented in Question 6, page 31. To help us address this issue please modify the table of "Site-Specific Surface Water Protection Criteria", as presented in Question 6, by adding columns which notes the sample date and location of the maximum concentration detected.

Finally, we will also need to verify the location of all Generic P&W Groundwater Screening Levels exceedances (based upon Surface Water Protection) so as to ensure the assumed plume is appropriate for the DAF you calculated.

Calculations of the flow rate have been modified to more accurately represent the conditions in the Tank Farm area. Additionally, the flow rate of the plume in the vicinity of the northwest courtyard area has been revised to more accurately represent current site conditions. Separate dilution attenuation factors (DAFs) have been calculated for the plume in the Northwest Courtyard area and in the Tank Farm area. Calculations of DAFs including the widths of each plume will be provided in new drawings (Drawing 4 and Drawing 5) in Appendix B of the EID document and referenced in the text as necessary.

The "Site-Specific Surface Water Protection Criteria" table in Question 6 will be modified to incorporate both site-specific dilution attenuation factors and the maximum concentration of each compound that exceeds the Table 3-7 criteria in each respective location (i.e. the Tank Farm area and the northwest courtyard area). To further clarify the location of the maximum concentration of each exceedance, location identifiers and sample dates will be added to the table.

17. The table provided at the top of page 23 in the September 2002 EI revision is helpful with explaining how the downgradient wells act as a check on those upgradient. However, if you were to rely solely on this argument, someone might question the validity of your findings and thus you would need to elaborate further on the expected flow path of each contaminant (i.e. LNAPL or DNAPL), hydrogeology and distance between wells. (Especially for the Table 3-7 exceedances of dichlorodifluoromethane on December 23, 1999, as well as methyl tert butyl ether (MTBE) and cis-1,2-dichloroethylene from the June 2001 sampling event.)

Furthermore, as we can not be certain about the flow path of any given contaminant it would not be appropriate to simply rely on the results from just one downgradient well. In fact, for each well you designate as "upgradient", it appears there was more than one sampled well downgradient and yet we don't understand why you would ignore those results. For example, at NW-MW-42: wells NW-MW-10; NW-MW-75 and NW-MW-74 appear to be physically downgradient.

In any event, it appears based upon your October 2002 revisions that you have decided instead to rely on application of a DAF to develop and demonstrate compliance with Site-Specific Surface Water Screening Levels. We agree with this method. Therefore, please



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modify the October 2002 response to this comment by removing your latest statement: "The text has been revised to elaborate and include a discussion regarding flow paths, distances and hydrogeology for these wells in Question No. 5." (We do not need to see these details. More importantly, they were not added to the degree we requested, so please remove the statement suggesting this issue is resolved.)

The exceedances for these wells have been evaluated in a similar manner via comparison taking into account the site-specific dilution attenuation factor discussion under Question No.6.

18. It appears that the August 2002 EI revision may have incorrectly stated, in the second paragraph of page 22, that only zinc has a higher screening level as a result of your updating of the Table 3-7 criteria. It appears that PCBs may have a higher standard now as well. Please check these numbers and make any necessary changes to the text in this section of the EI.

This discussion has been revised to indicate that both PCBs and zinc have a higher screening level as a result of updating the Table 3-7 criteria.

19. The text on page 20 needs to be revised to reflect the more protective MCL for Arsenic. (The standard is no longer 50 ug/l, but now 10 ug/l.) It would also help if you included with this discussion a reference to the highest concentration of arsenic detected and whether that value exceeds the applicable screening criteria.

The text has been revised and a screening level of 10 times the arsenic MCL of 10 ug/l (using the default DAF of 10) has been used. A discussion has been included to reference that the highest concentration of arsenic in groundwater discharging to surface water is 55 ug/l, which is less the revised screening level of 100 ug/l.

20. As a result of answering "no" in question 5 of the October 2002 revision, we understand why the Table of "Site-Specific Surface Water Protection Criteria" would apply to Question 6. However, it appears while trying to move this Table, you may have forgot to delete it from Question 5.

Furthermore, it appears that the last paragraph of Question 5, which discusses the bioaccumulative effects of arsenic, should also be moved to Question 6.

The table of "Site-Specific Surface Water Protection Criteria" was deleted from Question 5 during the October 2002 revision using track changes. There is a single red line through the table indicating rejection, which can easily be missed. This table will no longer appear in Question 5 as all previous track changes will be accepted/rejected in response to Comment No. 1. The discussion of the bioaccumulative effects of arsenic will be moved to Question 6.



United States EPA
October 12, 2001
Page 15 of 18

Environmental Indicator Determination, Question 7:

21. Please clarify in the third paragraph that the wells downgradient of the containment system are being monitored for water/free product levels and not specifically a dissolved plume. (As a result, P&W is reminded that in order for the findings of this EIE to remain true and current, periodic dissolved phase GW monitoring is necessary downgradient of the containment system.)

It will be clarified that the referenced wells were also sampled for water/product level via an interface probe. Note that, at this time, no proposed groundwater monitoring for dissolved constituents is planned for wells downgradient of the containment system. Sampling at locations downgradient of the hydraulic control in response to prior EPA comments has resulted in the conclusion that dissolved phase constituents do not pose a risk to surface water. The current program of bi-weekly monitoring water/product levels and inspecting the bank of the Connecticut River has been determined to be appropriate for the purposes of evaluating the effectiveness of the hydraulic control in ensuring LNAPL does not migrate to the Connecticut River. As referenced in previous documents submitted to EPA, this ongoing monitoring to assess the effectiveness of the containment system will not be discontinued without EPA's consent.

However, when it is determined that the recovery system is no longer effective in recovering free-phase product, the system will be reconfigured such that it performs as a bioventilation remediation system. It is anticipated that wells downgradient of the containment system will be monitored for dissolved-phase contamination in groundwater.

Appendices

22. It is not clear from the discussion on page 1, Attachment D1, that your evaluation of GW releases to surface water are adequately protective of the environment. More specifically, in the second to last sentence of the first paragraph it states that: "since the program objective is to achieve "stabilization" at the P&W facilities, the modified screening levels were developed to be protective of human health."

Additionally, in the second paragraph it is stated: "...these standards also considered potential ecological effects, which do not need to [be] addressed as part of "stabilization"." This latter statement is not true.

Finally, page 4, last paragraph of Attachment D1 discusses how the Modified Generic Screening Levels for GW discharge to Surface Water are "protective of human exposures to surface water". The lack of emphasis towards the environment is concerning.



United States EPA
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Page 16 of 18

Please revise the GW Releases Controlled EIE checklist by elaborating on whether or not P&W considered the protection of surface water, sediments and the eco-system as part of your evaluation (Question number 5 of the GW EI).

Groundwater data from the site has been evaluated against the Table 3-7 criteria. Table 3-7 is titled, Generic P&W Groundwater Screening Levels (SLs) Based on Surface Water Protection, P&W VCAP, Connecticut Facilities. These criteria were developed by the Connecticut Department of Environmental Protection in efforts to support its goal of maintaining surface waters and sediments free from chemical constituents in concentrations or combinations which will or can reasonably be expected to result in acute or chronic toxicity to aquatic organisms or impair the biological integrity of aquatic or marine ecosystems. By comparison of groundwater data to the Table 3-7 criteria, consideration of impacts of groundwater to ecological receptors and eco-systems was performed. An explanation of the consideration of the impacts of groundwater to ecological receptors and systems has been included in Question 6.

23. Please note that page 1 of Appendix E was missing from our Draft, February 2002, copy.

We apologize for this oversight and inconvenience, which resulted from mis-collation of the document. You were e-mailed a copy of the missing page suitable for printout and insertion into your copy in September 2002.

24. We understand that the August 2002 EID Revision incorporates site-specific dilution attenuation factors for a number of compounds (e.g. in Question 6 §) resulting in the elimination of numerous screening level exceedances. Therefore, where applicable, the text of the Appendices needs to be revised to reflect these changes as well. This seems especially relevant to Appendix E.

For example, page 4 of Appendix E discusses how the majority of screening level exceedances were found in the initial recovery well, NW-RW-01. However there is no explanation as to how you addressed the exceedances in Table E4 for wells, NW-MW-09; NW-MW-10; NW-MW-42 and NW-MW-43 and Table E5 for wells, NW-MW-25; NW-MW-40, NW-MW-42 and NW-MW-43.

While making these changes P&W must be sure to elaborate on any exceedances of applicable screening criteria.

As noted above, the various Appendices are provided as summary reports for the various groundwater sampling events at the facility. It is not the intent of the Appendices to present an evaluation of the significance of exceedances; those discussions and evaluations are presented in the CA 750 document under Question No. 5 and Question No. 6.



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25. There appears to be a discrepancy between those compounds which had elevated detection limits for the April 2001 through August 2001 sampling. More specifically, page 4 of Appendix E notes an exceedance of benzo(c)pyrene, whereas page 10 of the EID checklist does not. Please correct this error.

Furthermore, while the September 2002 revision to Appendix E acknowledges the exceedance of Table 3-7 criteria for xylenes in the duplicate sample pairs collected from well SW-MW-A4 (in August 2002), there is no discussion of the elevated detection limits for the other compounds listed therein. As we discussed, it is necessary to resample well SW-MW-A4 to eliminate the elevated detection limits for compounds other than xylenes.

That reference to benzo(c)pyrene in Appendix E was in error and was corrected. Text has been added to discuss elevated detection limits reported at monitoring well SW-MW-A4 in a duplicate sample pair collected in August 2002. An additional sample was collected from SW-MW-A4 in September 2002 and the text has updated as appropriate.

26. Please revise the title of Section 3.3, Appendix E, by referencing the September 2002 GW sampling event. The Table of Contents should be revised as well.

The section title and table of contents of Appendix E have been revised to be inclusive of the September 2002 sample collection.

End of Comments



United States EPA
December 18, 2002
Page 18 of 18

We hope that the above responses and the attached revised CA 750 document meets your satisfaction. Should you have any questions or comments regarding this letter or any other aspect of the project, please do not hesitate to contact me.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Brian A. Cutler, P.E.
Vice President

Attachments

cc: Joseph Tota, United Technologies Corporation
Manu Sharma, Gradient Corporation
Ernest Waterman, United States EPA
David Ringquist, Connecticut Department of Environmental Protection



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 1

1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

December 13, 2002

Mr. Joe Tota
Untied Technologies Corporation
United Technologies Building
Hartford, CT 06101

Re: EPA comments on the February 2002, Migration of Contaminated Groundwater Under Control (CA750), Environmental Indicator Evaluation of the Willgoos Facility, Pent Road, East Hartford, CT (EPA ID No. CTD000845131)

Dear Mr. Tota:

The purpose of this letter is to share EPA's comments on the Migration of Contaminated Groundwater Under Control, Environmental Indicator Determination (MCGWUC EID) Report that Pratt & Whitney (P&W) submitted for the Willgoos Facility on Pent Road in East Hartford, CT.

As you will see, the majority of the attached comments have already been raised by EPA during numerous discussions we held since this deliverable was first submitted in February 2002. However, I must remind you, since P&W is not currently planning long-term chemical monitoring of dissolved phase contaminants in groundwater (GW) downgradient of your pump and treat system, this evaluation is valid only for such a period that we can assume hydraulic control remains in effect. Furthermore, in the future, EPA would like to see additional sampling downgradient of the Southern Tank Farm area so as to ensure that concentrations of Xylene in GW are not increasing.

We are requesting a written response to each of the attached comments along with a revised MCGWUC EID Report; we would appreciate two copies of each deliverable. Upon receipt of these documents we will conduct a final review. Ultimately, given your previous achievement with demonstrating that human exposures are controlled, we anticipate providing a written confirmation that the migration of contaminated groundwater is also currently under control and thus your site would be Stabilized. We look forward to making this significant milestone with you.

If you have any questions please feel free to call me directly at (617) 918-1238.

Sincerely,

A handwritten signature in black ink that reads "Aaron R. Gilbert".

Aaron R. Gilbert, P.E.
RCRA Facility Manager

attachment

cc: Brian Cutler, LEA
Lauren Levine, UTC (letter only)
David Ringquist, CT DEP
Ernest Waterman, EPA (letter only)

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**EPA Comments on Pratt & Whitney's,
Documentation of Environmental Indicator Determination,
Migration of Contaminated Groundwater under Control,
dated February 2002 (including subsequent revisions)**

General Comments

1. In an attempt to minimize the time and effort spent making revisions to this EID we request that any future versions of this document, or response to comment, contain redline and strikeout text only for the new comments.

To further clarify, if the comments below are not redlined, then the response you have provided to date is satisfactory and thus we prefer not to see a new/revised response (likewise, the accepted response should not appear as redlined in your next deliverable).

2. Please include a reference in the CA 750 Environmental Indicator Evaluation (EID) which clearly notifies the reader whether the comments EPA provided on the Human Exposures Controlled EID were incorporated into this revised deliverable.
3. We understand that sediment and surface water samples were collected as part of P&W's efforts to demonstrate stabilization. However, none of the data is presented as evidence that GW releases are controlled.

We further understand that you do not believe the surface water and sediment samples collected are representative of impacts from GW discharging to surface water. At a minimum, please discuss this in the EID (provide us a specific reference to where this new language can be found) and elaborate on why you felt additional sampling for this media was not necessary.

Furthermore, please note that Table 3-6 of Appendix A contains out-of-date values from the CT DEP Water Quality Standards. The May 15, 1992 Surface Water Quality Standards, which we understand were used to develop these screening levels, were updated on April 8, 1997.

Therefore, as necessary, please revise the Table 3-6 values and re-screen the surface water results against the more current standards. This is especially important in cases where the standards have become more protective.

4. At times it is difficult to locate exactly where you demonstrate that an identified exceedance of applicable screening criteria can be disregarded. To address this, please direct the reader (i.e. provide a specific page and paragraph reference), from start to

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finish, on how these exceedances are dealt with.

Specific Comments

Environmental Indicator Determination, Question 2:

5. Page 4 references the GW data that was used as part of this evaluation. Since new data was collected on April 25, 2002 at wells SW-MW-A4; SW-MW-D3; SW-MW-I3 and SW-MW-10, please be sure to incorporate this data in the Final version of this document. (Likewise, additional sampling that is conducted subsequent to finalizing this document should be included as well.) Please include the date of these sampling events and be sure to add all data points to Drawing No. 1 (e.g. there was a new exceedance, based upon residential air inhalation, for Trichloroethylene at NW-MW-61 collected June 11, 2001).
6. The narrative on page 6 needs to be qualified to clarify that the metals analysis that was generated from the January 1999 sampling events were conducted on filtered GW samples.
7. P&W has argued that it is appropriate to eliminate exceedances from further evaluation because method detection limits are “not likely to be technically achievable”. However, after a brief review of the data it appears that while there are cases in which the method detection limits for a given compound were not met, the same limits were achieved for other similar samples.

More specifically, with respect to the 1999 VCAP Initial GW Sampling event as discussed on page 6, and page 3 of Appendix C, it appears that the method detection limits for ethylene dibromide, 1,1-dichloroethylene, vinyl chloride and isobutyl alcohol were achieved in all of 14 samples except SW-MW-B2 (see Table C4a). Likewise, acrylonitrile, isobutyl alcohol, propionitrile and methacrylonitrile were achieved in all of 14 samples except again SW-MW-B2 (see Table C4b).

Please elaborate further on this issue. At a minimum, it may be necessary to present and discuss the relative magnitude of difference between the method detection limit and the applicable standard. (It would help if you noted on page 7, second paragraph of the August 2002 revision that the method detection limit for methacrylonitrile was < 10 ug/l for all wells except at SW-MW-B2 where it was < 100 ug/l. Further, that the Table 3-5 screening criteria is 5 ug/l. Likewise, please note on page 7, fourth paragraph of the August 2002 revision that the method detection limit for ethylene dibromide was < 1 ug/l for all wells except at SW-MW-B2 where it was < 10 ug/l. Further, that the Table 3-7 screening criteria is 0.5 ug/l) This holds true as well, especially for the analysis of hexachlorobenzene from GW samples collected on August 9, 2001 (see paragraph 2 page

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10 and table E10).

(Please Note: If the method detection limit exceedances were noted in only one sample, then further clarification should be provided so as to clearly identify why this data is being disregarded.)

Furthermore, it is not clear how you dealt with the numerous elevated detection limits for sampling conducted on August 9, 2001. No explanation is provided on page 4, Appendix E of the February 2002 revision. Likewise, page 12 of the August 2002 EID checklist refers the reader to Question 5, however it is difficult to follow how this issue is dealt with (therefore, please provide a specific reference to Question 5, including page and paragraph).

In any event, the most direct way of dealing with the questionable data is to demonstrate how follow-up sampling has shown the exceedance (which was triggered by an elevated method detection limit) to be erroneous. On the other hand, if the application of site-specific dilution attenuation factors eliminated the exceedance of applicable screening criteria for those compounds with elevated detection limits, please clearly state as such in the appropriate sections of the EID checklist and appendices.

8. With respect to the initial VCAP GW monitoring event of 1999, page 7 of the August 2002 text revision incorrectly states that the Table 3-5 Screening criteria are not applicable as all wells sampled are located downgradient of all residential structures. This is not true for SW-MW-11I and SW-MW-11S and therefore this argument needs to be qualified and further supported.
9. The following compounds, which were identified as exceedances in question number 2, were not included in the question number 5 discussion.

From the August 2002 revision, page 7, paragraph 1 (regarding Table 3-5) and paragraph 3 (regarding Table 3-7): isobutyl alcohol.

It is also not clear whether there was a typo in paragraph 1 when referencing well SW-MW-B2 and NW-MW-B2? (It appears an argument is made for the former well but the latter reference is provided.)

From the August 2002 revision, page 7, paragraph 2 (regarding Table 3-5) and paragraph 3 (regarding Table 3-7): methacrylonitrile.

Furthermore, wells SW-MW-11 I & SW-MW-11S are not downgradient of all residential structures and therefore this needs to be clarified and

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discussed in Question number 5 .

From the August 2002 revision, page 7, paragraph 3 (regarding Table 3-7):
propionitrile

From page 9, last paragraph: 1,1-dichloroethylene, vinyl chloride and
trichloroethylene.

Furthermore, it is not clear at which wells these exceedances were found and the date of this sampling. According to the August 2002 revision, page 12, second paragraph, it is not clear whether these exceedance were identified during the April 2002 sampling event. Likewise, page 11, beginning of paragraph 2, October 2002 revision states:
“Dichlorofluoromethane were detected above the Table 3-7 criteria in the sample collected from monitoring well NW-MW-42.” However you do not specify the date of the sampling associated with the Table 3-7 exceedances. Therefore, please verify and note the appropriate sample date (we believe it may have been December 28, 1999).

In any event, please provide further discussion on the two rounds of groundwater sampling that were to be collected to verify groundwater conditions offsite in the vicinity of the Tank farm area (for more details refer to your response to comment number 8, as incorporated within the October 2001 Human Exposures Controlled EID for Pent Road).

From page 8, paragraph 5 (or page 9, paragraph 5 of the August 2002 revision):
benzene

From page 10, second paragraph: hexachlorobenzene, benzo(a)anthracene,
benzo(b)fluoranthene, benzo(a)pyrene and benzo(k)fluoranthene.

For these compounds we note they were included in the Table shown on page 23 of the August 2002 EI revision. However, there is no discussion on how the elevated detection limit issue was dealt with. Therefore, please add this discussion to Question 6.

Please provide further discussion as to why these exceedances were not considered significant as they relate to demonstrating GW Releases Controlled.

10. It is difficult to understand the date of sampling as discussed in the narrative beginning on page 8 (for the sampling performed November 1999 through April 2002). Therefore, it

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would help if you presented this data in a separate sampling event section, as was done on page 7 and the top of page 6 (i.e. separate sampling events with bold title/text).

For example, it is not clear whether the second to last paragraph of the August 2002 revision, page 9, refers to a December 1999 sampling event.

Likewise, it is not clear whether the third paragraph of the September 2002 revision, on page 10, refers exclusively to the December 1999 sampling event. For this section, we are unable to verify the exceedance of xylenes in wells NW-MW-09 and NW-MW-10, and yet, noted exceedances of these compounds were still missing for wells NW-MW-25 and NW-MW-40.

Additionally, while you identify (in the fourth paragraph of the September 2002 revision) the exceedance of dichlorodifluormethane in well NW-MW- 42, there is no mention of the detection limit exceedances at wells NW-MW-25 or NW-MW- 40.

Furthermore, it is not clear which sampling events are being evaluated within the second and third paragraph (on page 12) of the August 2002 revision. Please elaborate by including the sample date and locations of the exceedance along with a reference to where the data table can be found (e.g. we expected to find them in revised Table E9, and E10, page 5 of 5). For the August 2002 sampling, due to elevated detection limits at well SW-MW-A4, we ask that you resample.

Finally, it appears that as a result of the August 2002 sampling you will need to revise Appendix E. If this is true, please forward to EPA as soon as possible.

11. The bottom of page 9, within the February 2002 revision, discusses the exceedance of xylenes (apparently in NW-MW-43, from a December 28, 1999 sampling date). It then refers the reader to Question 5 for further evaluation. However, there is no additional discussion of this exceedance.

Furthermore, while you have provided additional information in the September 2002 revision (second paragraph of page 13), you neglected to mention the exceedance of xylene at NW-MW-39 in April 2001.

Please address these discrepancies.

12. As we may not agree whether GW detections in well SW-MW-A4 are representative of conditions beneath offsite residential structures, we prefer then to rely on your September 2002 sampling to ensure compliance with Table 3-5 Criteria for indoor air. As a result, please modify the discussion in the last paragraph, page 13, of the October 2002 revision.

December 13, 2002

More specifically, clarify that only wells NW-MW-71, NW-MW-74, NW-MW-75 and NW-MW-79 are not considered representative of groundwater that could potentially exist beneath an offsite residential structure.

Furthermore, while in this same paragraph, last sentence (top of page 14, October 2002 revision), you discuss the detection limits for the September 2002 sampling, you failed to discuss the results and whether there were any exceedances of the Table 3-5 indoor criteria.

Finally, we find the discussion in paragraph 2 of page 15 (December 2002 revision) confusing. It appears the discussion relates to elevated detection limits of Table 3-7 criteria for samples taken in August 2002 at SW-MW-A4. However, later in that paragraph you mention **April** 2002 sampling as well as Table 3-5 criteria. As mentioned above, we prefer to rely on results of your September 2002 sampling, therefore, please modify the discussion to focus on those results (i.e. a simple statement that concentrations and detection limits were below the applicable criteria would help to clarify things).

Please revise the GW EI by elaborating on the results within the sections noted here.

Environmental Indicator Determination, Question 3 and Question 4:

13. The February 2002 revision, page 14, third paragraph states that: “although dissolved Jet-A constituents have been detected downgradient of the barrier system, the groundwater concentrations reported are insignificant with respect to dissolved groundwater migration to surface water.” (You should understand that EPA tries to avoid using general statements (e.g. “insignificant”) within the EID, especially those which can not be easily verified.)

A similar statement is made on page 16, fourth paragraph. While we suspect these are defended in the latter part of the EID, a specific reference to where this argument is presented should be provided. In fact, this procedure should be applied to all other similar cases, where they exist.

This issue has become especially important as we were unable to find a discussion within the August, September, or October 2002 revisions. Therefore, please include in the narrative in Question 3 and Question 4 of the EID, those dissolved Jet-A constituents that were detected downgradient of the barrier system. While we appreciate the additional reference that was added to the September 2002 revision (i.e. for cis-1,2, dichloroethylene in NW-MW-74), you fail to mention there, the exceedances of cis-1,2-dichloroethylene in wells NW-MW-58, NW-MW- 59, NW-MW-60 and NW-MW-61 from sampling performed in June 2001. As a result, please be sure to include a reference and/or

December 13, 2002

discussion (e.g. your latest comment response) about these exceedances on page 19, third paragraph and page 21 fourth paragraph of the October 2002 revision.

Environmental Indicator Determination, Question 5:

14. While EPA may agree that discharges of contaminated groundwater into surface water are currently acceptable, we must first ensure that the correct process for making this demonstration is followed. More specifically, given that there are cases in which the maximum concentration of contaminants discharging into the CT River are greater than 10 times their appropriate GW level (i.e. the Generic P&W Groundwater Screening Levels based upon Surface Water Protection) it appears the correct answer to Question 5 of your Environmental Indicator Evaluation would be “no”. As a result, after providing the necessary information in Question 5, you could then proceed (in Question 6) to demonstrate how the effects of dilution might show that the discharge of contaminants into surface water are currently acceptable.

Please revise the EID to address each requirement of question 5. For example, begin by documenting:

- 1) “the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater level.”
 - 2) “the value of the appropriate level(s)”
 - 3) “if there is evidence that the concentrations are increasing”
 - 4) the total mass discharging into surface water for any contaminants greater than 100 times their appropriate groundwater level; and finally
 - 5) “identify if there is evidence that the amount of discharging contaminants is increasing”
15. While, as presented in the December 2002 revision, we calculate no net change to your dilution attenuation factor (DAF), we question the following assumptions which were presented in Figures 4 and 5 (as necessary, please correct the figures):
- your equation for the calculation of hydraulic permeability, K . While we agree with the value calculated, there appears to be a typo. We believe d_{10} is squared (vs. raised to 21st power as shown).
 - there appears to be a typo in your assumption for the plume width as presented in your DAF calculation in Figure 5. More specifically, you assigned a value of 640 feet to the width, w , yet the value used in your area calculation (i.e. 730 feet) seems more correct. As well, please provide a discussion in the EIE as to why you located the plume boundaries at wells SW-MW-12 and SW-MW-D2 (i.e. why so much further north than SW-MW05).
16. From a review of your potential mass loading calculation for xylenes (DRAFT November

December 13, 2002

14, 2002 Memo from Dave Fiereck, LEA) it is not clear how you developed an assumed plume area of 200 square feet. We also question the appropriateness of basing the hydraulic gradient, I, on groundwater located in the Jet A plume area when the xylenes in question emanate from the Southern Tank Farm (i.e. SW-MW-A4).

We therefore ask that you provide more details on the specifics of these assumptions. (Note: From a quick review of the data, we believe the xylene plume is better represented by an area bounded upstream at SW-MW-05 and downstream at SW-MW-D2.)

Furthermore, as a result of questioning these assumptions, we now feel compelled to verify the plume area that was used in calculating the Dilution Attenuation Factor (DAF) which was applied to those compounds exceeding the Generic P&W Groundwater Screening Levels (based upon Surface Water Protection) as presented in Question 6, page 31. To help us address this issue please modify the table of "Site-Specific Surface Water Protection Criteria", as presented in Question 6, by adding columns which notes the sample date and location of the maximum concentration detected.

Finally, we will also need to verify the location of all Generic P&W Groundwater Screening Levels exceedances (based upon Surface Water Protection) so as to ensure the assumed plume is appropriate for the DAF you calculated.

17. The table provided at the top of page 23 in the September 2002 EI revision is helpful with explaining how the downgradient wells act as a check on those upgradient. However, if you were to rely solely on this argument, someone might question the validity of your findings and thus you would need to elaborate further on the expected flow path of each contaminant (i.e. LNAPL or DNAPL), hydrogeology and distance between wells. (Especially for the Table 3-7 exceedances of dichlorodifluormethane on December 23, 1999, as well as methyl tert butyl ether (MTBE) and cis-1,2-dichloroethylene from the June 2001 sampling event.)

Furthermore, as we can not be certain about the flow path of any given contaminant it would not be appropriate to simply rely on the results from just one downgradient well. In fact, for each well you designate as "upgradient", it appears there was more than one sampled well downgradient and yet we don't understand why you would ignore those results. For example, at NW-MW-42: wells NW-MW-10; NW-MW-75 and NW-MW-74 appear to be physically downgradient.

In any event, it appears based upon your October 2002 revisions that you have decided instead to rely on application of a DAF to develop and demonstrate compliance with Site-Specific Surface Water Screening Levels. We agree with this method. Therefore, please modify the October 2002 response to this comment by removing your latest statement:

December 13, 2002

“The text has been revised to elaborate and include a discussion regarding flow paths, distances and hydrogeology for these wells in Question No. 5.” (We do not need to see these details. More importantly, they were not added to the degree we requested, so please remove the statement suggesting this issue is resolved.)

18. It appears that the August 2002 EI revision may have incorrectly stated, in the second paragraph of page 22, that only zinc has a higher screening level as a result of your updating of the Table 3-7 criteria. It appears that PCBs may have a higher standard now as well. Please check these numbers and make any necessary changes to the text in this section of the EI.
19. The text on page 20 needs to be revised to reflect the more protective MCL for Arsenic. (The standard is no longer 50 ug/l, but now 10 ug/l.) It would also help if you included with this discussion a reference to the highest concentration of arsenic detected and whether that value exceeds the applicable screening criteria.
20. As a result of answering “no” in question 5 of the October 2002 revision, we understand why the Table of “Site-Specific Surface Water Protection Criteria” would apply to Question 6. However, it appears while trying to move this Table, you may have forgot to delete it from Question 5.

Furthermore, it appears that the last paragraph of Question 5, which discusses the bioaccumulative effects of arsenic, should also be moved to Question 6.

Environmental Indicator Determination, Question 7:

21. Please clarify in the third paragraph that the wells downgradient of the containment system are being monitored for water/free product levels and not specifically a dissolved plume. (As a result, P&W is reminded that in order for the findings of this EIE to remain true and current, periodic dissolved phase GW monitoring is necessary downgradient of the containment system.)

Appendices

22. It is not clear from the discussion on page 1, Attachment D1, that your evaluation of GW releases to surface water are adequately protective of the environment. More specifically, in the second to last sentence of the first paragraph it states that: “since the program objective is to achieve “stabilization” at the P&W facilities, the modified screening levels were developed to be protective of human health.”

Additionally, in the second paragraph it is stated: “...these standards also considered

December 13, 2002

potential ecological effects, which do not need to [be] addressed as part of “stabilization”.” This latter statement is not true.

Finally, page 4, last paragraph of Attachment D1 discusses how the Modified Generic Screening Levels for GW discharge to Surface Water are “protective of human exposures to surface water”. The lack of emphasis towards the environment is concerning.

Please revise the GW Releases Controlled EIE checklist by elaborating on whether or not P&W considered the protection of surface water, sediments and the eco-system as part of your evaluation (Question number 5 of the GW EI).

23. Please note that page 1 of Appendix E was missing from our Draft, February 2002, copy.
24. We understand that the August 2002 EID Revision incorporates site-specific dilution attenuation factors for a number of compounds (e.g. in Question 6 5) resulting in the elimination of numerous screening level exceedances. Therefore, where applicable, the text of the Appendices needs to be revised to reflect these changes as well. This seems especially relevant to Appendix E.

For example, page 4 of Appendix E discusses how the majority of screening level exceedances were found in the initial recovery well, NW-RW-01. However there is no explanation as to how you addressed the exceedances in Table E4 for wells, NW-MW-09; NW-MW-10; NW-MW-42 and NW-MW-43 and Table E5 for wells, NW-MW-25; NW-MW-40, NW-MW-42 and NW-MW-43.

While making these changes P&W must be sure to elaborate on any exceedances of applicable screening criteria.

25. There appears to be a discrepancy between those compounds which had elevated detection limits for the April 2001 through August 2001 sampling. More specifically, page 4 of Appendix E notes an exceedance of benzo(c)pyrene, whereas page 10 of the EID checklist does not. Please correct this error.

Furthermore, while the September 2002 revision to Appendix E acknowledges the exceedance of Table 3-7 criteria for xylenes in the duplicate sample pairs collected from well SW-MW-A4 (in August 2002), there is no discussion of the elevated detection limits for the other compounds listed therein. As we discussed, it is necessary to resample well SW-MW-A4 to eliminate the elevated detection limits for compounds other than xylenes.

26. Please revise the title of Section 3.3, Appendix E, by referencing the September 2002 GW sampling event. The Table of Contents should be revised as well.

December 13, 2002

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
11 TECHNOLOGY DRIVE, N. CHELMSFORD, MA 01863

MEMORANDUM

DATE: 9/30/02

SUBJ: Review of methodology proposed by Pratt and Whitney for the purpose of developing site specific surface water quality screening values.

FROM: Mr. David McDonald, USEPA Region 1, Aquatic Biologist

TO: Mr. Aaron Gilbert, USEPA Region 1, RCRA Project Manager

Aaron,

I have completed my review of the methodology for developing site specific surface water quality screening values proposed for use by Pratt and Whitney. The site specific screening values are to be developed for those contaminants of concern (COCs) for which there are no ambient water quality criteria currently in place. The COCs pertaining to this effort are cis-1,2-dichloroethylene, proprionitrile, methacrylonitrile, dichlorodifluoromethane and isobutyl alcohol.

Protocols used for the establishment of national ambient water quality criteria require that a certain number of high quality acute and chronic toxicity data points, inclusive of certain taxa, be utilized. In the absence of these requirements being met, other methodologies have been proposed to develop similar types of numbers. One such methodology is that documented in a USEPA 1993 document, Proposed Water Quality Guidance for The Great Lakes System. This is the method proposed for use at the Pratt and Whitney site for the specific purpose of screening risk from the above mentioned COCs to the Connecticut River aquatic system.

I have reviewed Pratt and Whitney's use of the method. I have also reviewed the resulting screening values proposed. In my estimation, in the absence of other more suitable values, and for this limited site specific purpose, these values are suitable to demonstrate surface water risk potential to non-human receptors.

Lastly, in the future, I would recommend that surface

water samples be taken at the point(s) of discharge and immediately downstream of the discharge for the purpose of field verifying modeled plume concentrations.

If you have any questions please feel free to contact me at your convenience. I can be contacted by telephone at (617) 918-8609 or e-mail at mcdonald.dave@epa.gov.

Sincerely,

David F. McDonald
USEPA Region 1

**DOCUMENTATION OF
ENVIRONMENTAL INDICATOR
DETERMINATION MIGRATION OF
CONTAMINATED GROUNDWATER
UNDER CONTROL**

**Pratt & Whitney
Pent Road
(Willgoos)
East Hartford, CT**

**March 2000
Revised February 2002
Revised December 2002**

Prepared for

**PRATT & WHITNEY
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Prepared by

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LEA Comm. No. 68VC401

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APPENDICES

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Tables

Table 3-2	Generic P&W Soil Screening Levels (SSLs) Based on Trench Air Inhalation
Table 3-3	Generic P&W Groundwater Screening Levels (SLs) Based on Trench Air Inhalation
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Table 3-9	Summary of Exposure Parameter Values by Receptor for Pratt & Whitney Generic Soil Screening Levels
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Appendix C Groundwater Monitoring in Support of VCAP Risk Assessment

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Drawing C1	Groundwater Sampling Locations
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Attachment

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Drawing

Drawing D1	Groundwater Sampling Locations
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Attachment

Attachment D1	Development of Modified Generic Screening Levels Pratt & Whitney, VCAP Connecticut Facilities
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Drawing

Drawing E1	Areas of Observed LNAPL
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Attachment

Attachment E1	Surface Water Levels for the Protection of Human Health and the Environment, Pratt & Whitney, VCAP Connecticut Facilities
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