



Loureiro Engineering Associates, Inc.

October 12, 2001

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
Revised Current Human Exposures Under Control (CA 725)**

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 Current Human Exposures 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 October 9, 2001. 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 for Current Human Exposures Under Control 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. Given that EPA and P&W have not yet reached agreement on the degree of groundwater (GW) sampling that is necessary to demonstrate control of the November 1999 Jet-A Fuel Release, the comments below are focused primarily towards ensuring that human exposures are controlled. As a result, during revision of the HEC EID, EPA requests that P&W try to limit inclusion of narrative, etc., to that which is only relevant to human exposures.

This request is being made with the expectation that P&W has evaluated the potential migration of contaminated groundwater. Therefore, without substantially changing the content or unnecessarily deleting text, EPA encourages P&W to remove language not specifically relative to the HEC EID. Needless to say, this exercise should be done carefully as there is some overlap between the HEC and GW Releases Controlled (GWRC) EID's.

The goal is to generate a new HEC EID document that EPA can approve in its entirety. As a result, it may be necessary that P&W add narrative which discusses how it is that there are no



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human exposure risks, even while the issue of GW releases currently remains unresolved (e.g. unresolved to the extent that EPA is not yet prepared to concur with your proposition that long-term chemical monitoring of groundwater is not necessary downgradient of the 1999 Jet-A Fuel Release and associated Hydraulic Control System).

We understand that EPA has yet to concur that migration of contaminated groundwater at the site has been demonstrated. We also appreciate the request to remove language which is only related to the migration of contaminated groundwater and that this should be done with care as there is some overlap between the HEC and GW Releases Controlled (GWRC) EID's. With regard to the discussions of human exposures to groundwater contamination, there are two primary exposure pathways that are evaluated in CA 725: 1) groundwater migration to surface water and ingestion of surface water; and 2) inhalation of indoor air potentially impacted through the migration of volatile organic compounds from impacted groundwater into indoor airspaces. We believe that the CA 725 text has been appropriately revised to focus on the issues specifically associated with the demonstration that human exposures are controlled.

2. In the appropriate section of this document please provide details (e.g. narrative and SOP) of the Indoor Air sampling method that was used for collection of this data set.

Information is not available regarding the methods employed during historic sampling activities. With regard to all sampling performed in support of stabilization (i.e. events described in reports provided as Appendix C through H), sampling activities were performed in accordance with Standard Operating Procedures (SOPs). With the exception of Indoor Air, SOPs were previously submitted to EPA in the VCAP Work Plan for the Connecticut Facilities. The SOP for Indoor Air Sampling has been included in the revised CA 725 as Attachment F1 in Appendix F.

3. For all sample analysis, include details on whether there were cases in which the detection limits exceeded the applicable screening criteria. If exceedances occurred, this could raise questions with the adequacy of the data set.

Therefore, P&W must provide some justification as to why additional sampling is not necessary (e.g. historic data sets, facility's lack of use with suspect hazardous materials, statistical evaluation, etc.). This is especially important for the GW data that EPA recently received for the sampling period from April through August 2001 (as discussed on page 13 of the preliminarily revised HEC EID narrative and page 3 of Appendix E).

A review of all relevant/significant data was performed to assess the presence or absence of instances where detection limits exceeded applicable screening levels. A discussion has been



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provided at the appropriate point(s) within the CA 725 text to identify those instances where detection limits exceeded screening levels.

It has been noted at the appropriate point(s) within the CA 725 text that method detection limits (MDLs) for select VOCs and SVOCs were above applicable screening criteria. Instrument sensitivity and sample purging characteristics may have limited the detection limits achieved for these compounds. Efforts have been made during sampling events performed in support of VCAP risk assessment activities to obtain the lowest technically achievable reporting levels from each analytical laboratory. In those instances where MDLs exceed reporting criteria, efforts have been made to obtain written verification from the given analytical laboratory that lower reporting limits cannot be technically achievable. A letter from Lancaster Laboratories has been provided as Attachment C1 and Attachment D1 of Appendix C and D, respectively.

As the achievement of lower reporting limits is not likely to be technically achievable, we believe that additional sampling is not warranted for these compounds as instrument sensitivity and sample purging characteristics would likely result in similar data (i.e. elevated MDLs for the compounds in question).

4. If applicable, please provide a reference for the 7Q10 that was used to develop any DF values that were developed.

In response to this comment, the response to Question No. 2 has been revised to provide a reference for the 7Q10 of the Connecticut River. The 7Q10 of the Connecticut River in the vicinity of the site was estimated at 2,422 ft³/s. This was provided by Ken Major of the Connecticut Department of Environmental Protection Bureau of Water Management and was based on gauge data collected by the United States Geologic Survey from a station located in the immediate vicinity of the site.

Specific Comments

Environmental Indicator Determination, Question 1:

5. On page 2, question 1, Pratt & Whitney states that all information has been considered. To supplement this response, please include, as an attachment to the Environmental Indicator Determination, a copy of the Loureiro Engineering Associates (LEA) map: Willgoos Facility, Location of Known Historic Releases, dated February 22, 2000.

In response to this comment, Drawing 4, "Location of Known Historic Releases" has been provided in the revised CA 725 document. In an effort to avoid confusion regarding the totality of information provided on Drawing 4, the map has been updated to provide the



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approximate location of the November 1999 release of Jet-A fuel. As such, the map is a compilation of the current understanding of all known historic releases at the site as of the date of this letter.

Environmental Indicator Determination, Question 2:

Groundwater

6. On page 6, P&W discusses GW sampling that was conducted to support the EID. However, we were not able to locate the well, SW-MW-02, on the map. Please revise the map to include this well, along with those that were installed as part of the June, July and August 2001 sampling investigations (e.g. NW-MW-:58; 61; 71; 74; 75 and 79).

Furthermore, please include a separate map showing all existing monitoring wells that exist for this site.

All the wells noted in the above comment are shown on Drawing 1 provided in Appendix B of the revised CA 725. Please note that this drawing only depicts those wells for which samples were collected and analyzed and are evaluated in the CA 725 document.

In response to the request for a separate map, Drawing C-1 and Drawing D-1 in Appendix C and D, respectively, have been revised to depict all groundwater monitoring wells that exist or have historically existed at the site and clearly depict which wells were sampled during each respective event.

Note that in the March 2000 CA 725 report, LEA sample identification numbers 1833974 and 1833973 were mis-assigned to monitoring wells SW-MW-02 and SW-MW-06, respectively. The correct well assignments are as follows: 1833974 was collected from SW-MW-05; and 1833973 was collected from SW-MW-01. Additionally, monitoring wells SW-MW-B2 and SW-MW-D2 were mislabeled SW-MW-B02 and SW-MW-D02, respectively. The text, tables and drawings have been corrected in the CA 725 document (and Appendices) to reflect these changes.

7. Page 6 discusses the first round of GW data that was collected in January 1999 and identifies well SW-MW-01 and SW-MW-05 as being sampled. However the data is missing from Table 3 of Attachment 3.

Furthermore, Table 2 of Attachment 3 references sample ID No. 1833974 which was collected from well, SW-MW-02. However, there's no mention of this data on page 6, nor is this well located on the February 23, 2000 Site Plan Sampling Map. This was repeated for sample 1833973 and well SW-MW-06.



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Please correct these errors.

Please refer to the response to Comment No. 6 (above) wherein we have provided a response to this comment.

8. In the last sentence of the second to last paragraph on page 6, it states that the monitoring well network along the Western property boundary is determined adequate, in number and spatial distribution, to assess the quality of groundwater that discharges to surface water bodies at the site. However, P&W should briefly discuss (generally speaking) why they believe this to be so. For example, a discussion on the nature and extent of site wide contamination (including a consideration of the location and quantity of historic releases of contamination), past and current facility operations and location of hazardous material handling areas should be added.

Similarly, P&W should briefly discuss why the GW monitoring system is adequate to evaluate the potential for human exposures to contaminated GW via the indoor air pathway (e.g. to off-site receptors) given the lack of monitoring well data North of NW-MW-04, South West of SW-MW-D2 or between the Tank Farm and residential properties.

In other words, P&W should focus this discussion on whether GW has been characterized adequately enough to ensure there are no Human Exposures.

As requested in Comment No. 5 (above), Drawing 4 "Location of Known Historic Releases" has been provided in the revised CA 725 document. This map is a compilation of the current understanding of all known historic releases at the site. In addition, generalized groundwater contours for the facility are show on Drawing 2. Lastly, Drawings C-1 and D-1 (found in Appendices C and D, respectively), have been revised to depict all groundwater monitoring wells that currently exist at the facility (those without a "D" = destroyed or "H" = converted to hi-vacuum extraction well designation).

We believe that the number and spatial distribution of the existing monitoring well network is adequate to assess the quality of groundwater at the facility and provides adequate coverage for all known and suspected release areas, facility materials handling/product storage areas, as well as identified exposure areas established for the Conceptual Site Model (CSM).

With regard to the northern and southern flanks of the facility and the coverage afforded by the existing groundwater monitoring wells, we would like to note the following:

- (1) *Well NW-MW-04 is located approximately 175 feet from the northern property boundary and there are no manufacturing, product storage/handling, waste management areas, etc.*



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north of this well; all nearby buildings are east of this well and in the upgradient direction, and;

(2) the tank farm is currently undergoing a significant reconstruction, which includes removing/relocating the southern-most bulk storage tanks and consolidating the tank farm to a much smaller footprint to the north - thereby leaving a number of wells (specifically the SW-MW-A, -B, -C, -D and -I clusters) situated between the tank farm and the residences.

Furthermore, in response to EPA's concerns about groundwater quality in the vicinity of the tank farm, P&W/UTC proposes additional sampling to be performed at wells SW-MW-A4, SW-MW-D3, SW-MW-I3 and SW-MW-10. These wells will be sampled during two events in one calendar year (to correspond with seasonal low and seasonal high groundwater conditions) and all samples will be analyzed for the presence of VOCs by EPA Method SW-846 8260B. The specific compounds to be reported will be per the VCAP target compound list (TCL) and will include halogenated and non-halogenated volatile organic compounds.

9. Although the detection of Trichloroethylene at 96 ug/l does not exceed the CT RSR Residential Volatilization Criteria Standard of 219 ug/l in SW-MW-12, it is within a range which raises concern for potential exposure to off-site receptors via the air pathway. Furthermore, in some instances here, the method detection limits exceeded the groundwater screening level (e.g. vinyl chloride and 1,1-dichloroethylene). We therefore request that P&W propose some follow-up targeted GW sampling which will ensure this site remains stabilized. In making this proposal EPA reminds P&W of our concerns regarding seasonal variations in GW conditions.

Finally, we would like to reiterate our concern for possible volatile GW contamination in the vicinity of wells SW-MW-A4; SW-MW-10; SW-MW-13 and SW-MW-12.

Please refer to the response to Comment No. 8 (above) wherein we have provided an outline for proposed additional groundwater monitoring.

10. EPA does not intend to concur, through approval of the HEC EID, with P&W's proposal that long-term chemical monitoring is not necessary to confirm and/or ensure that the pump & treat system is successful in preventing dissolved-phase Jet-A contamination releases to the CT River. Instead, our immediate concern is with ensuring that human exposures are controlled. Be sure to include a brief narrative as to why the Jet-A, regardless of whether a dissolved plume exists, does not provide any human exposure.

With respect to monitoring of the water/product levels, P&W needs to be more descriptive on the frequency of this effort. In a worst case scenario, Jet A contamination that discharges as



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seeps to the banks of the CT River could provide a direct pathway for human exposure by trespassers.

Finally, P&W has stated on page 10 of the preliminary revised HEC EID (in the second paragraph of the new section, "Supplemental Groundwater Sampling Performed November 1999 to August 2001") that the system will be monitored until such time that it is determined that another frequency is necessary to ensure effectiveness of the system. This statement is repeated again on page 1 of Appendix F.

Please Note: EPA's stabilization determination will depend upon P&W's continued monitoring of systems currently in place, to ensure human exposures remain controlled. Therefore, P&W can not unilaterally decide that less frequent monitoring of existing systems can be reduced. As a result, we expect P&W to first consult with EPA on any monitoring changes which they would like to undertake.

We understand that EPA does not intend to agree, through approval of the CA 725, with our position that chemical monitoring is not necessary to demonstrate the effectiveness of the groundwater barrier system installed in response to the Jet-A release. The revised CA 725 text discusses the effectiveness of the barrier system in terms of a demonstrated ability in stopping separate-phase Jet-A from reaching the Connecticut River. This has been documented since the initial report of the release through two-years of frequent and on-going monitoring for the presence/absence and thickness of separate-phase product within wells installed around the perimeter and downgradient of the release area. To date, there has been no indication that separate-phase Jet-A has passed the barrier system.

With regard to the dissolved-phase contamination from the Jet-A release, additional sampling collected in April and August 2001 indicates that although dissolved Jet-A constituents have been detected downgradient of the barrier system, the groundwater concentrations reported do not present an unacceptable human exposure for the complete pathway of dissolved groundwater migration to surface water and ingestion of surface water. Furthermore, indoor air monitoring data obtained from sampling locations within an occupied building immediately downgradient of the release area also support the conclusion that the release does not present an unacceptable human exposure for the complete pathway of inhalation of indoor air potentially impacted through the migration of volatile organic compounds from impacted groundwater into indoor airspaces.

With regard to the second part of the comment, the CA 725 document has been revised to clearly indicate the current bi-weekly performance of water/product level measurements and the addition of observations of the Connecticut River bank downgradient of the November 1999 release of Jet-A fuel for seeps of separate-phase product during each event. It is



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agreed that P&W/UTC will confer with EPA prior to any proposed changes in the system(s) performance monitoring.

11. The first paragraph on page 9 discusses how GW exceedances of xylene and dichlorodifluoromethane were found when compared against the generic P&W Screening Criteria. Please specify the exact criteria that were exceeded and discuss why this does not create a human exposure.

In response to this comment, the CA 725 document has been revised to clearly indicate the data were screened against the Table 3-5 and Table 3-7 criteria from the document entitled "Conceptual Site Models and Screening Levels for Pratt & Whitney's VCAP Connecticut Facilities", prepared by Gradient Corporation (Gradient Report). This report was issued on December 19, 1997 and revised on September 18, 1998, and September 15, 1999. The fact that the exceedances of the generic screening criteria do not result in significant human exposure, as defined in the EI document, is discussed in the revised response to Question No. 4.

Indoor Air

12. Please update the section on page 9 to include an evaluation of all indoor air sampling that was conducted. This must include a discussion of data trends of all indoor air sampling that has been taken since P&W signed into the Voluntary Corrective Action program (VCAP) with EPA.

In response to this comment, the CA 725 document has been revised to provide an evaluation of all indoor air data collected to date in support of the VCAP (a total of four sampling events). In general, there are no discernible trends in indoor air concentrations at the Willgoos facility. Air monitoring data appears to be related only to operations in the vicinity of the individual sampling location(s) and do not appear to be affected by changes in environmental conditions.

13. The Generic P&W Screening Level excerpts (i.e. applicable narrative and Tables) that were included along with the HEC EID proved quite helpful with EPA's review. However, you were not consistent with providing these details. For example, while Tables were provided for screening of groundwater (Table 3-6); surface water (Table 3-7) and soil (Table 3-10) we were not able to locate a copy of Table 3-5, GW Screening Levels based on residential Indoor Air Inhalation. Please include this Table, along with others that may have been inadvertently omitted, along with Volume I, Appendix A (Note: see comment No. 23) of the revised HEC EID.



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As requested, copies of all relevant Tables from the VCAP Conceptual Site model have been provided in Appendix A (Volume I) of the revised CA 725 document.

14. Page 1 of Attachment No. 6 (Summary of Indoor Air and Analytical Data...) mentions that "modified" EPA Method T01/T02 was used to collect indoor air samples. Please elaborate on your use of the term "modified". For example, has P&W modified an EPA Standard Method in order to collect samples for this project? If so, what method of approval was given?

Furthermore, we understand that a copy of the SOP used for this sampling procedure was developed previously for another P&W VCAP facility. Please include this documentation in Appendix F, Volume II, of the revised HEC EID.

In response to this comment, a description of the modification to EPA Method T01/T02 has been provided in the text portion of Appendix F. As described in the revised CA 725 document, rather than use Tenax as specified by Method T01, AceUsa (former CIGNA's Environmental Health Laboratory in Cromwell, Connecticut) used multimedia tubes consisting of three different adsorbents to increase the adsorbent capability of the mixture. The actual analysis of the tubes was performed by GC/MS as specified in the EPA method.

As noted in our response to Comment No. 3 (above) the SOP for Indoor Air has been included as Attachment F1 in Appendix F.

Surface Soil

15. It is noted that the project-specific practical quantitation limit (PQL) of 330 ug/kg for n-nitrosodimethylamine was established prior to EPAs final concurrence with P&W's Conceptual Site Model and Screening Levels. Yet, the revised Groundskeeper screening level for this compound is 230 ug/kg.

We understand that this compound was not detected in any of the samples analyzed and based upon historic sampling, manufacturing use and operational knowledge, you do not expect it to be a constituent of concern. However, it would be helpful to briefly mention in the HEC EID, in the last paragraph on page 10, that (if true) the PQL was established by the sample method and is not an arbitrary number that can be simply changed to meet the screening level.

In response to this comment, the CA 725 document has been revised to provide a statement that the practical quantitation limit (PQL) of 330 ug/kg for n-nitrosodimethylamine is based mainly on CLP default limits as well as a limitation of the method. The CLP default reporting limit is 330 ug/kg. The laboratory method detection limit for this compound is 50



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ug/kg. Therefore, the reporting limit (5 times the MDL) is 250 ug/kg. The reporting limit with an adjustment for percent moisture (assuming approximately 25% moisture) would be approximately 330 ug/kg. Therefore, the PQL is not an arbitrary number.

Surface Water

16. The first sentence on page 11 is confusing. As written it appears that surface water samples were taken at three different locations, WG-RSK-SD-01 through -03. However, we were not able to locate sample WG-RSK-SD-03 on Drawing 1. Furthermore, we were not able to locate data for this sample in Attachment No. 8. Please clarify whether samples were taken at two or three separate locations.

In response to this comment, the response to Question No. 2 in the CA 725 document has been revised to clearly state that surface water samples were collected from two locations WG-RSK-SD-01 and WG-RSK-SD-02. Tabular presentations of the analytical data were previously provided in the March 2000 submission but may have been difficult to locate. The analytical data tables are presented in Appendix H as Tables H1 through H4 in the revised CA 725 document.

17. It is not clear how many exceedances of P&W's Generic Screening Levels for Surface Water were first identified. According to the text on page 11, two surface water exceedances were noted (Chromium and Copper). This statement is repeated on page 2 of Attachment No. 8, Summary of Surface Water and Sediment Analytical Data and Constituents Detected in Surface Water and Sediment.

Due to the breadth and length of this comment, a deviation to the previous approach to addressing comments at the end of the comment occurs here. For this comment only, responses are provided to each subsection.

With regard to exceedances of surface water screening levels, the revised CA 725 document has been revised to clearly indicate consistently that chromium and copper were detected in surface water at concentrations greater than the Table 3-6 screening levels.

Please re-write this section to accurately reflect the number of initial exceedances that occurred and the subsequent process that was followed. While so doing please be sure to address the following:

- Please include a complete list of all Generic Screening Criteria exceedances, being sure to include, at a minimum, the sample: ID, location, date collected, analyte, detection limit, etc..



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- It is critical that the HEC EID clearly outline the process that was followed in developing Generic and Modified Screening Levels.

In response to this portion of Comment No. 17, the CA 725 document has been revised to clearly indicate that chromium and copper were detected in surface water at concentrations greater than the Table 3-6 screening levels. The exceedances are summarized in Table H4 of Appendix H. With regard to the subsequent evaluation process, the CA 725 document has been revised to state that the groundwater data were then compared to the maximum contaminant level (MCL) for chromium and the drinking water action level of copper as both are available criteria for the evaluation of human health effects based on surface water ingestion. This subsequent comparison resulted in the conclusion that the concentrations present in surface water would not present significant human exposure as defined in the EI document and no further evaluation of the surface water data was warranted.

- As a result of various previous statements, EPA would simply like to remind P&W that the GWRC EI specifically considers protection of human health and the environment (e.g. see Question No. 2, footnote and Question No. 5 of the GWRC EI).
- To justify the protectiveness of exposure factors that were used, the narrative in this section states that the surface water bodies at P&W facilities are small brooks or streams.
- Please clarify the location of the surface water samples that were taken. If in fact they were taken in the CT River, state as such. Also please clarify whether small brooks and streams exist at the Pent Road facility.

Surface water samples were collected at a storm water outfall and not from the Connecticut River. In addition there are no small brooks or streams located on the Willgoos facility site. The CA 725 text has been revised to clearly indicate this.

- Given that the detections of Barium in surface water were below the Generic P&W Screening Levels it is not clear why discussion of this element was included on page 17 of the preliminarily revised HEC EID. So as to minimize confusion, P&W should consider eliminating the discussion as presented in the last paragraph of the surface water section of Question No. 2.

CA 725 and the facility Conceptual Site model require an evaluation of the significance of the detection of all bioaccumulative compounds. The discussion referenced in the above comment is intended to address this requirement. As a result, the discussion of barium detected in surface water has been preserved in the revised CA 725 document.



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Environmental Indicator Determination, Question 3:

18. With regards to the drinking water survey that was conducted, it is not clear (from either the March 2000 HEC EID or subsequent Draft interim deliverables submitted by P&W) exactly how many parcels may have a private well.

In the first paragraph of the Draft interim deliverable for this section (submitted in 2001) you begin by saying that 101 parcels were not recorded as being served with municipal water. Then in the second paragraph, last sentence, you state that all of these parcels did indeed have municipal water. However, it's not clear exactly which parcels you are referring to. Is it the 85 parcels (all of them), or the 10 parcels that indeed have municipal water?

Furthermore, regardless of the number of parcels in question, P&W must take additional measures to clarify the likelihood of parcels being effected by releases from the Pent Road facility. Simply stating that 16 parcels were not available for inspection due to access restrictions is not adequate.

Therefore, with respect to the parcels in question, please elaborate on the following:

- Exactly how many parcels have not been confirmed to have public water?
- Exactly what type of restrictions are preventing inspection?
- What is the location of the unconfirmed parcels with respect to the Pent Road facility (e.g. how far away, side or up-gradient)

The text in the Draft interim deliverable was unclear and has been revised to clarify the results of the drinking water survey.

In summary, of the 110 parcels (initially) not recorded with the water company, 85 were inspected and 16 could not be inspected. Of the 85 that were inspected, 10 parcels had improvements that indicated the potential for municipal water service; these ten were subsequently confirmed via follow-up with the water company to have municipal water supply, which was not reported during the earlier inquiry. The remaining 75 parcels (of the 85 parcels inspected) were not developed.

The 16 parcels that could not be inspected are all remote and upgradient of the Willgoos facility and the CA 725 text has been revised to clarify this.

19. Sediment has been left out of your Summary Exposure Pathway Evaluation Table that is presented along with Question No. 3. Please include this media and be sure to provide the necessary discussion in the rationale section for any complete pathways.



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Question No. 3 specifically requires the identification of all contaminated media and an evaluation of completeness of exposure pathways. As sediment was not identified in Question No. 2 as a contaminated media, it has been stricken from the tabular presentation of contaminated media in Question No. 3. No revisions to the CA 725 document have been made to address this comment.

**EPA Comments on Pratt & Whitney's Draft - interim deliverables
(i.e. September, 2001 revisions to the HEC EID)**

20. It appears there may be a typo on page 14 of the EID Narrative. Should the 3rd bullet under the Indoor Air Section be referencing a March 1, 2001 sampling event?

Yes. This has been corrected in the revised CA 725 text.

21. The last sentence on the bottom of page 15/top of page 16 states that the latest monitoring did not show any exceedances of Table 3-4 Screening Levels (SLs). P&W should also confirm that there were no exceedances of SLs presented in Gradient's Memorandum's dated July 6 and September 10, 2001 (which is found in Attachment F1).

All indoor air sampling results were compared against the additional SLs provided by Gradient in Attachment F1 and there were no identified exceedances. The text has been clarified to indicate this.

22. Page 17, Surface Water, first paragraph, second to last sentence refers to sampling "from the river" when in fact it appears that sampling was taken from a stormwater outfall. Please clarify as this conflicting statement leads to confusion.

As noted in our response to Comment No. 17 (above) surface water samples were collected at a storm water outfall and not from the Connecticut River. The CA 725 text has been revised to clearly indicate this.

23. Give the large amount of GW data that was recently added to HEC EID it would be helpful if you separated this deliverable into two separate Volumes. We would especially like to minimize Volume I and therefore suggest that this consist solely of: the HEC questionnaire/narrative as well as materials currently proposed for Appendix A (Conceptual Site Model and Screening Level info) and Appendix B (drawings 1- 4).

The CA 725 has been revised to be a two volume set in accordance with the above comment.

24. The revisions made to the GW Contour Map, Drawing 2 are helpful. However, it is not clear whether you believe there was an error with either of the August 2001 elevations taken at



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SW-MW-11I and-11S. (We believe you recorded a GW elevation at SW-MW-11I of 22.98 feet on September 14, 2001. However, the most recent GW contour map, dated August 31, 2001 shows an elevation of 18.02 feet.)

If an error was made we request a similar justification as was given for SW-MW-C4. In any event, please be sure to discuss (either on the map or within the HEC EID) that the results you are reporting are further supported by readings that were taken during the 1999 sampling events.

Furthermore, to help us evaluate GW flow between the tank farm and wells SW-MW-11I and -11S, we ask that you include any topography or other existing off-site features (buildings, streams, etc.) which are available for plotting with the GW contour map. We understand this will require that you move the inset map that was included and we therefore suggest you could relocate this east of wells SW-MW-11I and-11S.

We believe that the groundwater elevation measurement collected in August 2001 at well SW-MW-11S is accurate. The elevation is consistent with measurement at this well from the previous data obtained in 1999, and, in fact, this well was also measured on September 14, 2001 in response to concerns raised by EPA about the August 2001 measurement at well SW-MW-C4.

It is apparent that the groundwater elevation measured for well SW-MW-11I was in error from the 8/28/01 collection event (as was the case with well SW-MW-C4). This has been confirmed by a review of the data collected at wells SW-MW-11I and SW-MW-11S. The elevation measured for these two wells are summarized in the table below:

Well	Date	Groundwater Elevation
SW-MW-11I	April 1999	25.06
SW-MW-11S	April 1999	24.11
SW-MW-11I	August 2001	18.02
SW-MW-11S	August 2001	23.49
SW-MW-11I	September 2001	22.98
SW-MW-11S	September 2001	23.04

From the above table, it is apparent that the 8/28/01 measurement was in error and the 9/14/01 measurement appears to be in general agreement with the 1999 measurement.

Please note that the elevation for SW-MW-11I was not used in the generation of the groundwater contours depicted on Drawing 2 because it is an intermediate depth ("I") well; rather, the elevation from the shallow ("S") well SW-MW-11S was used to develop



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the groundwater contours in the vicinity of this well cluster. The CA 725 text will be revised to reference that the contours generated from the August/September 2001 elevations are in agreement with the 1999 data.

With regard to EPA's request for additional off-site topography, features etc., we are sorry that we cannot provide the requested information. Our current mapping for the facility does not include any additional off-site features. The topography depicted on drawings provided as part of the revised CA 725 document is presented to the limit of the aerial photogrammetry taken for the facility.

Environmental Indicator Determination, Question 4:

Surface Water as a result of GW discharging to Surface Water (SW)

25. EPA is not convinced of your statements that, for dichlorodifluorometahne, MTBE and cis-1,2-dichloroethylene, GW exceedances that were detected are not representative of contamination discharging to SW. Your argument is that additional GW sampling downgradient of the exceedance locations have shown that these compounds are not being released. However, as an example, cis-1,2-dichloroethylene was detected at 100 ug/l in NW-MW-74 on July 19, 2001. Yet we see no evidence of any further downgradient samples which would support the claim that this concentration is not being discharged to SW.

It appears the quickest way to resolve this is to follow the same approach taken for evaluation of the other GW to SW exceedances. More specifically, P&W should apply the allowable site-specific dilution factors to appropriate risk based levels. In the absence of a CT Remediation Standard P&W should evaluate other EPA risk based values that have been developed for screening purposes (e.g. the Region IX, Preliminary Remediation Goals).

In accordance with the approach used to address surface water criteria exceedances (as a result of groundwater discharging to surface water) in other CA 725 and CA 750 documents, UTC/P&W has performed a point by point evaluation of all relevant/significant data under Question No. 2. If this evaluation results in the identification of an exceedance, then the completeness of the pathway (Question No. 3) and the significance of the exceedance (question No. 4) must be evaluated in sequence. In the evaluation of a groundwater discharge to surface water, the evaluation of the completeness of the pathway begins with the assessment of the representativeness of the data (i.e. are the data representative of groundwater discharging to a surface water). To address this comment, a table has been inserted within the rationale and references portion of Question No. 3 in the CA 725 text to provide a point-by-point reference of wells that are representative of groundwater discharging to surface water at the site.



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In addition, we have also eliminated the reference to NW-MW-74 as, based on further review, a well that is undeniably downgradient from this location is not present at the site. As a result, the presence of cis-1,2-dichloroethylene at well MW-NW-74 has been further evaluated within the CA 725 document using the allowable site-specific dilution factors applied to the risk-based level for that compound.

Indoor Air - Onsite

26. EPA is concerned by the exceedances of on-site indoor air screening criteria that is discussed on page 30. We understand you expect the detections were from background sources or anomalies of the data. However, there is no data to confirm your belief. Therefore, until sampling results can demonstrate there are no indoor-air exceedances we are unable to concur with your finding that Human Exposures are controlled. As a result, we recommend that you postpone submittal of the Final HEC EID document until this data is received and is incorporated into the narrative of this deliverable.

We also ask that you elaborate, in the narrative of the HEC EID, on the indoor air sampling that you will be taking on a regular basis. Therein, please be sure to include a discussion of the process you followed to determine the timing of the seasonal worst case sampling events - which will occur into the future (e.g. justify through results of the 2001 sampling).

The results from the most recent indoor air monitoring on September 21, 2001 indicate that there are no exceedances of applicable VCAP criteria.

The sampling will continue to be performed on an annual basis at all six locations. The next sampling event is scheduled for June 2002. The quarterly event exhibiting the highest concentrations of VOCs, based on the results obtained during the quarterly sampling from WG-RSK-AS-06, (or WG-RSK-AS-16 as it is currently represented) will be selected for annual sampling events. The highest VOC concentrations were observed during the June 2001 indoor air monitoring event. Sampling events will be conducted on an annual basis during the selected quarter (June of each year) at the six locations.

Indoor Air-Offsite

27. In the last section of Question No. 4, you discuss how exceedances of P&W 's generic screening criteria were detected at 13 GW monitoring wells. To help EPA visualize the location of these exceedances with respect to the property boundary and known historic releases, please include and highlight these wells on Drawing 3, Indoor Air Sampling Locations.



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Furthermore, since this will result in a more inclusive figure than what is currently provided in Drawing F1, Indoor Air Sampling Locations, EPA asks that this revised figure replace Drawing F1. More specifically, we suggest that revised - Drawing 3 be provided in Volume 1 and Volume 2, Appendix F1 (in lieu of Drawing F1), or alone in Volume 1 (i.e. remove drawing from Appendix F1 altogether).

Drawing 3 has been revised as requested and Drawing F1 was removed from Appendix F.

EPA comments on Pratt & Whitney's, Draft - Revised Appendix F (October 2001)

28. Within the summary section of page 1, P&W discusses how indoor air sampling will be conducted at all six locations on an annual basis. Please note that EPA is willing to discuss a reduction of this sampling frequency if P&W can demonstrate, through screening against the CT Remediation Standard Regulations, Industrial/Commercial Volatilization Criteria for GW, that such a change is warranted.

In any event, this screening would aid with P&W and EPA's long-term planning toward a Final Remedy at this site. Therefore, we would be interested to discuss the results of this effort should you be willing to compile this information for our review.

We appreciate the opportunity to discuss a reduction in the proposed sampling frequency, and UTC/P&W will evaluate screening against the CT Remediation Standard Regulations, Industrial/Commercial Volatilization Criteria for groundwater.

29. For all sampling events, please also state whether or not there were exceedances of compounds for which established indoor air screening levels do not exist. Specifically, verify whether there were exceedances of screening levels as presented in the July 6, 2001 and September 10, 2001 Memorandum's from Gradient Corporation.

As noted in the response to Comment No. 21 (above), all indoor air sampling results were compared against the additional SLs provided by Gradient in Attachment F1 and there were no identified exceedances. The text has been clarified to indicate this.

30. Please clarify which is the correct Occupational Indoor Air Level for 1,1,2,2-tetrachloroethane. The value provided in Gradient's Memorandum dated July 6, 2001, (54 mg/m³) does not correspond to the 2000 Conceptual Site Model value as presented for the P&W Middletown facility (6.9 mg/m³).

The occupational indoor air level for 1,1,2,2-tetrachloroethane is 6.9 mg/m³ as presented in the 2000 Conceptual Site Model report. The value of 54 mg/m³ provided in the Gradient Memorandum dated July 6, 2001 is for 1,1,1,2-tetrachloroethane, an isomer for



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tetrachloroethane. This value was derived using the occupational indoor air level for 1,1,2,2-tetrachloroethane (6.9 mg/m³) as explained in the memorandum. The occupational indoor level for 1,1,2,2-tetrachloroethane remains unchanged at 6.9 mg/m³.

31. To aid EPA with evaluation of your findings that the most conservative annual sampling event should occur in June, please revise the data as presented in Table F2. Specifically, to the best of your ability, we ask that you provide all of the quarterly sampling results for each location, on one page. For example, as currently presented, page 3 of 16 should provide all sampling data for location WG-RSK-AS-11 only. Likewise, all data for location WG-RSK-AS-12 only should be presented on page 4 of 16.

Table F2 has been revised as requested.

32. EPA does not concur with how the Occupational Indoor Air Level for *n* Butylbenzene was established. While a concentration of 137 mg/m³ (25 ppm) for *n*-butylbenzene is sufficient to demonstrate stabilization, the rationale presented in Gradient Corporation's memo, dated September 10, 2001, is not. By analogy with ethylbenzene, the carcinogenic effects are also important (see Attachment).

Therefore, in the future, Gradient should also discuss both the noncarcinogenic and carcinogenic effects of the analogous compound. As well, a discussion on the lack of quantitative data for *n*-butylbenzene and the possible difficulties of using ethylbenzene as should be provided.

To aid with future evaluations of this compound EPA is providing the following attachment as a reference: NCEA. 2001. *Risk Assessment Issue Paper for: Evaluating the Carcinogenicity of Ethylbenzene (CASRN 100-41-1)*. Memorandum from Superfund Technical Support Center, National Center for Environmental Assessment. July 26, 2001.

We appreciate this information and will consider it for future evaluations.

End of Comments



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We hope that the above responses and the attached revised CA 725 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

**DOCUMENTATION OF
ENVIRONMENTAL INDICATOR
DETERMINATION
CURRENT HUMAN EXPOSURES
UNDER CONTROL**

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

**March 2000
Revised October 2001**

Prepared for
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LEA Comm. No. 68VC401

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APPENDICES

Appendix A Copies of Applicable Sections, *Conceptual Site Models and Screening Levels for Pratt & Whitney's VCAP Connecticut Facilities*, Gradient Corporation, December 19, 1997, revised September 18, 1998, and September 15, 1999

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
Table 3-4	Generic P&W Indoor Air Screening Levels (SLs)
Table 3-5	Generic P&W Off-Site Groundwater Screening Levels (SLs) Based on Residential Indoor Air Inhalation
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Table 3-8	Generic P&W Groundwater Screening Levels (SLs) Based on Dermal Contact
Table 3-9	Summary of Exposure Parameter Values by Receptor for Pratt & Whitney Generic Soil Screening Levels
Table 3-10	Generic P&W Soil Screening Levels (SSLs) Based on Soil Ingestion and Dermal Contact (mg/kg)
Table 3-11	Development of DPR Threshold Soil Concentrations

Appendix A, Tables (cont.)

Table 6-1	Summary of Facility-Specific Receptors and Comparison to Generic P&W Receptors - (Gradient Corp.)
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Figure

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Appendix B Drawings

Drawing 1	Exposure Areas and Sample Locations
Drawing 2	Site-wide Generalized Groundwater Contour Map
Drawing 3	Indoor Air Sampling Locations
Drawing 4	Willgoos Facility Location of Known Historic Releases

VOLUME II

Appendix C Groundwater Monitoring in Support of VCAP Risk Assessment

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Table C3	Summary of Analytical Results
Table C4a	Exceedances of P&W VCAP Risk-Based Limits Based on Residential Air Inhalation
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Drawing

Drawing C1	Groundwater Sampling Locations
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Attachment

Attachment C1	Letter from Lancaster Laboratories
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Appendix D Groundwater Monitoring in Support of VCAP Risk Assessment, Step 2

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Appendix D (cont.)

Drawing

Drawing D1 Groundwater Sampling Locations

Attachment

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

Appendix E Special Groundwater Sampling Report

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Drawing

Drawing E1 LNAPL in Northwest Courtyard

Appendix F Indoor Air Monitoring in Support of VCAP Risk Assessment

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Appendix F (cont.)

Attachments

Attachment F1	Standard Operating Procedure “Air Sampling for Employee Exposure Monitoring”
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Appendix G Surface Soil Sampling In Support of VCAP Risk Assessment

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Drawing

Drawing G1	Surface Soil Sampling Locations
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Attachment

Attachment G1	Letter from Lancaster Laboratories
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Appendix H Surface Water and Sediment Sampling in Support of VCAP Risk Assessment

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Table H7	Summary of Analytical Results - Sediment Sampling

Drawing

Drawing H1	Sediment & Surface Water Sampling Locations
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Attachment

Attachment H1	Letter from Lancaster Laboratories
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