May 22, 2001

Richard E. Post
Senior Environmental Engineer
UTC Corp. - Sikorsky Aircraft
1 Financial Plaza
Hartford, CT 06101

Subject: Sikorsky Aircraft Corporation, Stratford, Connecticut, Technical Review of Environmental Indicators RCRIS Code CA725.

Dear Mr. Post:

We have conducted a review of the December, 2000 RCRA Corrective Action Environmental Indicator (EI) RCRIS Code CA725 Report Current Human Exposures Under Control, prepared by Sikorsky Aircraft Corporation (Sikorsky) for their 6900 Main Street, Stratford, Connecticut facility. Our review of this document considered previous risk-based documents prepared in support of the RCRA corrective action program. Specifically, these documents included the Second Interim Deliverable (SID) Part I Human Health Risk Assessment of the February, 1999 Draft Final Public Health and Environmental Risk Evaluation (PHERE), the revised Phase I RCRA Facility Investigation (RFI) Report (December, 1998), long-term monitoring program results through April, 2000, technical memoranda, and monthly progress reports.

In response to Question No. 6 of the CA725 Evaluation Sheet, Sikorsky indicates that a "YE" should be assigned to the CA725 RCRIS status code. As indicated below, this conclusion is primarily based on the results of the SID submitted to EPA in February, 1999, along with additional analysis provided in this CA725 Evaluation Sheet. Our review indicates that exposures to the off-site resident, ball field recreator, and bridge construction worker, who represent a future receptor, were not considered to be significant. Although exposures to the maintenance worker, trespasser, and fisher person were found to be high, Sikorsky demonstrates that the risks have been mitigated through the use of site-specific institutional controls. In addition, several of the outstanding issues regarding the SID have been resolved, and Sikorsky has updated the CA725 Evaluation Sheet to include the resolutions. Based on this analysis, current human exposures appear under control and a "YE" status code will be assigned to the CA725 RCRIS for the Sikorsky Stratford facility.

Review

The EI CA725 was reviewed to determine whether any unacceptable human exposures to contamination (i.e., contaminants in concentrations in excess of appropriate risk-based levels) can be reasonably expected under current land and groundwater-use conditions. For ease of review, the information in this letter follows the format of the information provided in Sikorsky's CA725 Evaluation Sheet.

In response to Question No. 2 on the CA725 Evaluation Sheet, Sikorsky indicates that, with the exception of indoor and outdoor air, all media (groundwater, surface soil, surface water, sediment, and subsurface soil) are contaminated above appropriate risk-based levels. In the SID, concentrations of constituents in all media were evaluated to identify chemicals of potential concern (COPCs). COPCs were selected in the SID using both the EPA Region 3 risk-based concentrations (RBCs) and the State of Connecticut Department of Environmental Protection (CTDEP) Remediation Standard Regulations (RSRs). Since the submission of the SID, Sikorsky has performed several additional investigations to support the CA725 EI. These investigations have included the AC-6 indoor air analysis, the AC-1 seep investigations, and the AC-1 fence alignment. The additional data from these activities were screened for COPCs, using the appropriate risk-based levels, and are provided in the CA725 Evaluation Sheet. For indoor air, AC-6 indoor air and soil gas results were compared to Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) criteria, National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Levels (REL), and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV).

In response to Question No. 2, Sikorsky identifies numerous contaminants including inorganics, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), and pesticides/polychlorinated biphenyls (PCBs), in the media identified above (i.e., groundwater, surface soil, surface water, sediment, and subsurface soil), which exceed appropriate risk-based levels. Some of these contaminants were found to exceed risk-based levels and are major human health COPCs in each medium. These COPCs include, but are not limited to: arsenic, cadmium, 1,2-dichloroethene, benzene, chloroform, and vinyl chloride in groundwater; arsenic, cadmium, chromium VI, benzo(a)pyrene, dibenzo(a,h)anthracene, 2,3,7,8-TCDD and equivalents, Aroclor 1254 and tetrachloroethene in surface soil/subsurface soil; arsenic, benzo(a)pyrene, dibenzo(a,h)anthracene, 2,3,7,8-TCDD and equivalents, and tetrachloroethene in surface water; and arsenic, cadmium, chromium VI, benzo(a)pyrene, dibenzo(a,h)anthracene, and 2,3,7,8-TCDD and equivalents, in sediment.

In response to Question No. 3, Sikorsky evaluates potential human exposure pathways for groundwater, surface soil, surface water, sediment, and subsurface soil. Sikorsky indicates that complete exposure pathways exist for several receptors. Specifically, off-site residents exhibit a complete exposure pathway to surface soil via airborne deposition of particulates entrained on dust; maintenance workers exhibit complete exposure pathways to surface soil, surface water, and sediment via routine activities such as landscaping, brush cutting, and incidental repairs; and construction

workers exhibit complete exposure pathways to groundwater, surface and subsurface soil, surface water, and sediment via construction work. Note that Sikorsky has indicated that there is no construction activity ongoing at the facility with the exception of a future planned US Route 15 bridge replacement. Thus, construction work associated with the US Route 15 bridge is considered the only construction-related complete exposure pathway. Trespassers exhibit complete exposure pathways to surface soil, surface water, and sediment. Sikorsky also identifies three types of recreators, including ball field player, fisher person, and boater. Surface soil represents a complete exposure pathway for the ball field player. Surface water and sediment represent complete exposure pathways for the fisher person and boaters. In addition, surface water and sediment represent media that constitute a complete exposure pathway for the ingestion of fin fish or shellfish harvested from the Far Mill River and Housatonic River. No other complete exposure pathways are thought to exist at the facility. Sikorsky indicated that groundwater is not used at the facility, and that groundwater from the facility discharges directly into the Housatonic River which is immediately adjacent to the facility. Because there are no residential, public or private wells between the facility and the river, groundwater does not represent a complete exposure pathway. Based upon this evaluation, Sikorsky has retained the off-site resident, the maintenance and construction worker, the trespasser, the recreator, and food as receptors requiring additional risk analysis.

In response to Question No. 4, Sikorsky indicates that reasonable maximum exposures (RME) to the maintenance worker, the trespasser, and the fisher person were considered significant while the off-site resident, ball field recreator and bridge construction worker were considered to have acceptable risk based upon the evaluation of RME exposures. As a result, only the maintenance worker, the trespasser, and the fisher person were further evaluated.

The carcinogenic excess lifetime cancer risk (ELCR) for the maintenance worker is 2E-04, which is at the higher end of EPA's acceptable risk range of 1E-04 to 1E-06. The risk for the maintenance work is primarily driven by dermal contact with polyaromatic hydrocarbons (PAHs) in surface water. However, exposure to PAHs and dioxin equivalents via ingestion and dermal contact of soil at areas EU1 and EU2 also contribute to the risk for a maintenance worker.

The ELCR for the facility-wide trespasser, the trespasser at AC-1 seeps, and in the AC-10 area, are 3E-06, 7E-03, and 2E-06, respectively, and also exceed EPA's risk threshold. The risks to the trespasser are primarily due to PAHs and Aroclor 1254 and 1260 in sediment. A HI of one was exceeded for the trespasser exposed to AC-1 seeps, thereby indicating the potential for adverse effects.

The ELCR for the fisher person is 1E-04, which also exceeds the EPA's risk threshold. This exceedence is primarily due to PAHs in sediment and arsenic in fish tissue. Data used for this evaluation were from filtered surface water samples in which no organic constituents were detected. Organic constituents were detected in unfiltered samples. The HI exceeded one for the fisher person.

In response to Question No. 5, Sikorsky indicates that all significant exposures can be shown to be within acceptable limits. While the RME is above EPA's acceptable risk range for carcinogens, central tendency estimates (CTE) fall within EPA's acceptable risk range at 8E-06. Specifically, for

the maintenance worker, the largest contributor to the ELCR is exposures to PAHs in surface water in the AC-1 and AC-6/10 areas. To mitigate this exposure, Sikorsky has installed a fence around AC-1 thereby restricting access to this area. In addition, this area is secured with controlled access, and Sikorsky maintains an environmental safety and health plan which would require appropriate personal protection for anyone entering this area. Furthermore, Sikorsky states that the nature of PAHs in the environment is such that they would be hydrophobic, thereby attaching to solid particles. Thus, using filtered samples rather than unfiltered data would more accurately reflect risks associated with contact to surface water. Considering that the risks for the maintenance worker are driven by direct contact to surface water in AC-1, and institutional controls (i.e., fencing) are now in place to preclude direct contact to this area, risks to the maintenance worker are currently controlled.

Risks to the facility-wide trespasser were primarily due to incidental ingestion of PAHs in sediment. Sikorsky has argued that the facility is not a destination area for trespassers, but rather a transit area and the frequency of trespassers observed is anecdotally lower than assumed. Furthermore, given the extensive security system required for the facility, including television and a 24-hour security staff, trespassers are rarely observed and immediately detected. Sikorsky also states that PAHs preferentially absorb to solid particles and do not tend to transfer across the water and skin layers that are encountered during actual exposure. Therefore, given the institutional controls (i.e., fencing, security system) and limited trespasser activity in this area, risks to facility-wide trespassers appear controlled.

Trespassers evaluated based on exposure to AC-1 seeps also demonstrated risks in excess of EPA's acceptable risk level, primarily due to dermal contact with Aroclor 1254 and 1260. However, to mitigate this exposure, Sikorsky has installed a fence around the AC-1 landfill seep and posted signs warning of hazardous materials on the fence along the perimeter of AC-1. Furthermore, Sikorsky states that the seeps are seasonal and directly enter the tidal water, resulting in rapid dilution during high tide. Thus, the seeps are only exposed and available for contact for less than 6 hours a day. Therefore, given the institutional controls, including the AC-1 fence, signage and site security, and that exposure to the seepage is limited to low tide conditions during the spring, risks to the AC-1 seeps trespasser are considered currently controlled.

Risks to the AC-10 trespasser are primarily due to PAHs, arsenic, and Aroclor 1254, via dermal contact and ingestion of sediment located within the tidal channels. However, Sikorsky states that this area is not desirable for trespassers, as there is always standing water and it is not along a route to a desired destination. In addition site security includes fencing and on-site security personnel that would deter trespasser access to this area. Therefore, given the institutional controls including site security, fencing, and that this area is not desirable for trespasser access, risks to the AC-10 trespasser appear controlled.

Risks to the fisher person are at the high end of EPA's acceptable risk range primarily due to incidental ingestion and dermal absorption of PAHs in sediment, and the consumption of fish. With regard to exposures to sediment, Sikorsky discusses PAH's preference to adhere to the sediment and not transfer across water and skin layers, as is usually assumed when evaluating dermal absorption.

As a result, Sikorsky argues that risks may be overestimated for the dermal and ingestion exposure pathways. In addition, Sikorsky reasonably argues that the frequency of exposure has been overestimated given that fisher persons were not observed adjacent to the facility during a five-month long field investigation.

With regard to fish ingestion, Sikorsky uses filtered surface water samples to determine fish tissue concentrations. Sikorsky states that filtered data is more appropriate for use given that the fish assumed to be consumed in this area are predatory and therefore are not expected to dwell or forage in sediments. While this may be true, fish can accumulate contaminants via bioconcentration from the water column, via incidental ingestion of sediment, and via the food chain. Basing fish tissue concentration estimates on filtered water only accounts for bioconcentration, which will result in an underestimation of concentrations in fish tissue. Furthermore, in the evaluation of the dataset, there were no detections of organic constituents in filtered data. However, unfiltered and sediment data detected organic constituents including dioxin equivalents and PAHs. Thus, filtered data may not accurately reflect exposure to organics if detection limits are elevated. Additionally, Sikorsky does not present non-detected constituents in their detection limits in the EI CA725 Table C-7, Statistical Summary and Screening of COPCs in Filtered Surface Water. Arsenic is presented as the only carcinogen and thus, the ELCR due to fish ingestion of 7E-05 is a result of arsenic. As a result of the uncertainties in using filtered data, as well as uncertainties associated with fish tissue modeling, Sikorsky does indicate that they are planning a fish tissue sampling program for 2001 to more accurately estimate risks associated with COPC uptake in fish tissue. Despite some of the uncertainties associated with the filtered surface water samples, Sikorsky reasonably argues that the risks to the fisher person should be considered currently controlled. Specifically, Sikorsky argues that the calculated RME risk is overestimated as it is based on a fish ingestion exposure frequency of 84 meals/years. Since fisher persons were not observed in the area over a five month long field investigation, Sikorsky believes the exposure frequency of 84 meals/year is high. Furthermore, since the risk from fish ingestion does fall within EPA's acceptable risk range, albeit at the high end, a more realistic exposure frequency would reduce the risk to a more acceptable value. Therefore based on current conditions and data, it does appear that the risks via fish ingestion are currently controlled. Furthermore, since Sikorsky is planning on fish tissue sampling in the spring, the ability to reevaluate this exposure exists should actual fish tissue data indicate that concentrations are in excess of appropriate screening criteria, and significant risks are present.

If you have any questions regarding this letter, please contact me at (617) 918-1360.

Sincerely,

Robert A. O'Meara
RCRA Facility Manager

Harding ESE
A MACTEC COMPANY

Harding ESE, Inc.
511 Congress Street
Portland, ME 04101

Telephone: 207/775-5401
Fax: 207/772-4762
Home Page: www.mactec.com

December 7, 2000

Mr. Robert O'Meara
USEPA, New England Region (HPR-CAN1)
John F. Kennedy Federal Building
Boston, MA 02203-2211

Subject: **Environmental Indicator Form CA 725 Revision**
Stratford RCRA Corrective Action Program (Docket No. RCRA-I-90-1011)

Dear Mr. O'Meara:

On behalf of United Technologies Corporation (UTC), Harding ESE, Inc. (Harding) submits the enclosed revised RCRA Environmental Indicator Form CA 725 pertaining to the Sikorsky Aircraft Corporation facility in Stratford, Connecticut. This form, originally submitted to you in July of last year, has been revised to reflect our current understanding of site human health exposure conditions based on recently collected Phase II Remedial Facility Investigation (RFI) data and to address review comments provided by the USEPA during the meetings held on September 18 and 19, 2000, and written review comments received in a letter from the USEPA dated September 23, 2000.

Please contact either Dick Post of UTC (860-728-6521) or me (207-828-3523) if you have any questions or require further information.

Sincerely,

HARDING ESE, Inc.

John L. Baron, C.H.M.M.
Associate Project Manager

Cc w/enclos.: R. Post, UTC
W. Schew, ESI
G. Shteynberg, CTDEP
C. Crossley, BAH
R. Kuhlthau, ASE
M. Barron, BAH

Cc w/o enclos.: R. Araujo, SAC
M. DiNoia, CTDEP
C. Morrissey, SAC

ENVIRONMENTAL INDICATOR FORM CA725

CORRECTIVE ACTION PROGRAM
STRATFORD FACILITY

Prepared for:

SIKORSKY AIRCRAFT CORPORATION
6900 MAIN STREET
STRATFORD, CT 06615

Prepared by:

HARDING ESE, INC.
511 CONGRESS STREET
PORTLAND, MAINE 04101

DECEMBER 2000

Harding ESE, Inc.
Engineering and Environmental Services
511 Congress Street
P.O. Box 7050
Portland, Maine 04112-7050

ENVIRONMENTAL INDICATOR FORM CA725

TABLE OF CONTENTS

LIST OF CA725 TABLES

1	Media Receptor Exposure Matrix
2	Groundwater Volatilization Screening Results
3	Route 15 Bridge Worker Summary of COPCs in Groundwater
4	Route 15 Bridge Worker Statistical Summary of COPCs in Surface Water
5	Route 15 Bridge Worker Statistical Summary of COPCs in Sediment
6	AC-10 Trespasser Statistical Summary of COPCs in Surface Water
7	AC-10 Trespasser Statistical Summary of COPCs in Sediment

LIST OF SECOND INTERIM DELIVERABLE - PART 1 REFERENCED TABLES

QUESTION 2

Groundwater:

4.2-37A & B	Office Worker Exposure Unit 2-Groundwater
4.2-39A & B	Office Worker Exposure Unit 3-Groundwater
4.2-49A & B	Construction Worker Exposure Unit 2-Groundwater
4.2-51A & B	Construction Worker Exposure Unit 3-Groundwater

Surface Soil:

4.2-5A & B	Off-Site Resident Exposure Unit–Soil
4.2-11A & B	Trespasser Exposure Unit–Soil
4.2-17A & B	Recreator Exposure Unit–Surface Soils
4.2-23A & B	Maintenance Worker Exposure Unit–Soil

Surface Water:

4.2-9A & B	Fisher Person Exposure Unit–Surface Water
4.2-15A & B	Trespasser Exposure Unit–Surface Water
4.2-27A & B	Maintenance Worker Exposure Unit–Surface Water

Sediment:

4.2-7A & B	Fisher Person Exposure Unit–Sediment
4.2-13A & B	Trespasser Exposure Unit–Sediment
4.2-25A & B	Maintenance Worker Exposure Unit–Sediment

Subsurface Soil:

4.2-43A & B	Construction Worker Exposure Unit 2–Soil
4.2-45A & B	Construction Worker Exposure Unit 3–Soil

LIST OF SECOND INTERIM DELIVERABLE - PART 1 REFERENCED TABLES

QUESTION 4:

4.3-2	Reasonable Maximum Exposure Parameters Utilized for Human Receptors
4.3-1	Central Tendency Exposure Parameters Utilized for Human Receptors
4.3.1-42	Dermal Exposure to Soil by Maintenance Worker – EU 1 – RME
4.3.1-43	Ingestion of Soil by Maintenance Worker – EU 1 – RME
4.3.1-48	Dermal Exposure to Soil by Maintenance Worker – EU 2 – RME
4.3.1-49	Ingestion of Soil by Maintenance Worker – EU 2 – RME
4.3-58	Dermal Exposure to Surface Water by Maintenance Worker – RME
4.3-61	Dermal Exposure to Sediment by Maintenance Worker – RME
4.3-62	Ingestion of Sediment by Maintenance Worker – RME
4.3-6	Dermal Exposure to Soil by Off-Site Resident – RME
4.3-7	Ingestion of Soil by Off-Site Resident – RME
4.3-36	Dermal Exposure to Soil by Recreator – RME
4.3-37	Ingestion of Soil by Recreator – RME

QUESTION 5:

4.3.1-39	Dermal Exposure to Soil by Maintenance Worker-EU 1 – Central Tendency
4.3.1-40	Ingestion of Soil by Maintenance Worker – EU 1 – Central Tendency
4.3.1-45	Dermal Exposure to Soil by Maintenance Worker – EU 2 – Central Tendency
4.3.1-46	Ingestion of Soil by Maintenance Worker – EU 2 – Central Tendency
4.3-57	Dermal Exposure to Surface Water by Maintenance Worker – Central Tendency
4.3-59	Dermal Exposure to Sediment by Maintenance Worker – Central Tendency
4.3-60	Ingestion of Sediment by Maintenance Worker – Central Tendency

LIST OF FIGURES

LIST OF SECOND INTERIM DELIVERABLE - PART 1 REFERENCED FIGURES

ACRONYM LIST

AC	area of concern
AOC	area of concern
Al	aluminum
AAQS	Ambient Air Quality Standards
As	arsenic
Be	beryllium
Ba	barium
bgs	below ground surface
Cd	cadmium
COPCs	chemicals of potential concern
Cr	chromium
CTE	central tendency exposure
Cu	copper
DDT	dichlorodiphenyl-trichloroethane
1,2-DCE	1,2-dichloroethene
ECLR	excess lifetime cancer risks
EI	Environmental Indicator Form CA725
ELUR	environmental land use restriction
EU	exposure unit
Fe	iron
FID	first interim deliverable
ft	foot or feet
GPRA	Government Performance and Results Act
Hg	mercury
HI	hazard index
HpCDD	heptachlorodibenzo-p-dioxin
HpCDF	heptachlorodibenzofuran
inorg.	inorganic
Mn	manganese
NAPL	non-aqueous phase liquid
OCDD	octachlorodibenzo-p-dioxin
OCDF	octachlorodibenzofuran
org.	organic
OSHA	Occupational Safety and Health Administration

ACRONYM LIST

PAH	polynuclear aromatic hydrocarbons
Pb	lead
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PEL	Permissible Exposure Level
Pest	pesticide
PHERE	public health and ecological risk evaluation
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RFI	RCRA facility investigation
RME	reasonable maximum exposure
RSR	Remediation Standard Regulation
RU	regulated unit
Sb	antimony
SID	second interim deliverable
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TCDD	tetrachlorodibenzodioxin
Tl	thallium
V	vanadium
VOC	volatile organic compound
Zn	zinc

LIST OF APPENDICES

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: Sikorsky Aircraft Corporation
Facility Address: 6900 Main Street, Stratford, CT 06614
Facility EPA ID #: RCRA-I-90-1011

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__X__ If yes - check here and continue with #2 below.
Completion of this Environmental Indicator (EI) determination drew upon information presented to the agency in interim deliverables of the Public Health and Ecological Risk Evaluation (PHERE), including the First Interim Deliverable (FID) and the Second Interim Deliverable (SID) Part I – Human Health Risk Assessment February 2000 (Part II addressing ecological risks pending) and RCRA Facility Investigation (RFI) Phases I and II, long-term monitoring program results through April 2000, technical memoranda and monthly progress reports. Figures and tables referenced in completing this form are attached to the form. A map showing the facility location is provided as Figure 1 and Figure 2 shows the AOC or AC locations and long-term monitoring locations. Additional information collected during the Phase II RFI or voluntary investigations undertaken that pertains to this determination were considered and is appended (i.e., Stratford AC-6 Indoor Air Investigation Summary, AC-1 Seep Results, AC-1 Fence Alignment) to the agency. Figures and tables referenced in this EI determination are attached. Those figures developed for the CA725 form are sequentially numbered (i.e., 1, 2, 3, 4, 5). Those adapted from the SID retain their original numbers and are grouped separately.

_____ If no - re-evaluate existing data, or

_____ If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			inorg. and org. COPCs (1)
Air (indoors)[2]		X		OSHA PELS not exceeded (2)
Surface Soil (e.g., <1 ft)	X			inorg. and org. COPCs (3)
Surface Water	X			inorg. and org. COPCs (4)
Sediment	X			inorg. and org. COPCs (5)
Subsurf. Soil (e.g., >1 ft)	X			inorg. and org. COPCs (6)
Air (outdoor)		X		Based on SID evaluations detected chemicals do not cause CTAAQS to be exceeded.

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s): **The SID of the PHERE submitted February 1999 screened available media data against health criteria to identify volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticide and polychlorinated biphenyl (Pest/PCB), and inorganic compounds (inorg.) to identify Chemicals of Potential Concern (COPCs). Because additional data were collected since the SID was prepared, some data sets were re-screened using current information as well as historical data. Screening of non-carcinogenic compounds using USEPA Region III risk-based screening criteria was done using one tenth of the criterion. This conservative approach was done in recognition of potentially additive effects on the same target organ. Appendix A depicts the locations of all groundwater, surface water, sediment, and soil sampling locations.**

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

To answer this question, Table 1 was compiled to summarize the various media that receptors evaluated in the SID would encounter at the facility. Only current or imminent receptors are evaluated in this CA725 Form. This table then was used to access the appropriate portions of the SID and update compilations of environmental samples (if needed) to identify COPCs. The following information presents the evaluation of each medium and the COPCs identified.

(1) Groundwater:

Facility office workers and construction workers were identified in the SID as receptors who may be exposed to contaminants found in groundwater. The SID identified four exposure units (EUs) or areas where these receptors may encounter facility contaminants (see SID Figures 4.2-9, 4.2-10, 4.2-11, and 4.2-12, respectively). The area shown in EU 1 is not suitable for construction or office worker exposure as the area is part of the landfill and not suitable for construction or occupied buildings. EU 2, primarily the ball field, could represent exposure to both receptors if a structure was built in this area. EU 3 represents the fuel calibration area where there are no current offices or construction activities. EU 4 was intended to evaluate exposures at the main manufacturing facility where both receptors could be exposed to contaminants in groundwater. The SID did not evaluate risks in this EU since there are no validated environmental sample results available for this area. To address this area for the purposes of this CA725 form, comparison of unvalidated groundwater samples was made to Connecticut Department of Environmental Protection (CTDEP) Remediation Standard Regulations (RSRs) developed for screening potential risks that may be posed by volatile organic compounds in groundwater under industrial commercial (I/C vol) facilities where the groundwater is within 15 ft of the building structure. Comparison of groundwater samples collected within 15 ft of the building indicates no RSR I/C vol criteria were exceeded (see Table 2), therefore, no COPC is identified for this EU.

During discussions with the USEPA in September 2000, it was noted that construction work on the replacement bridges for US Route 15 (Merritt Parkway) was imminent and should be included in this CA725 assessment. This construction worker receptor is also listed on Table 1. A comparison of results from samples collected within the CTDOT right-of-way (ROW) with tap water screening criteria indicates only iron exceeds the criteria (see Table 3).

Water discharging from the landfill and draining across the ground surface toward the nearby wetlands and surface water is referred to as seepage. There are approximately seven areas or seeps where this seepage has been observed and sampled (see Figure 3). These seeps, located outside the AC-1 fence alignment, represent perched groundwater that is discharging through the ground surface. Receptors exposed to this seepage would be the trespasser. Maintenance or construction workers would not be expected to encounter these seeps as they are in wetland areas (e.g., below the tidal wetland limit elevation) that do not require maintenance or construction activities. However, a trespasser may contact these seeps as surface water. Therefore, the seeps will be addressed under surface water.

Based on the evaluation of the groundwater exposure medium as summarized in Table 1 and described above, the following COPCs were identified for EU 2 and EU 3 as presented in the SID (based on tap water screening criteria developed by USEPA Region III):

MAXIMUM GROUNDWATER EXPOSURE CONCENTRATION, mg/L

COPC	Office Worker	Construction Worker	Screening Criteria
As	1.41	1.41	0.000045
Fe	45.5	45.5	1.10
Mn	2.37	2.37	0.084
Tl	0.0048	0.0048	0.00026
bis(2-ethylhexyl)phthalate	0.004	0.004	0.00034
benzene	0.005	0.05	0.00036
chloroform	0.002	0.002	0.00015

(see Table 3 and SID Tables 4.2-37A and B, 4.2-39A and B, 4.2-49A and B, and 4.2-51A and B)

(2) Indoor Air:

No COPCs. See Appendix B

Volatile organic compounds in groundwater under the manufacturing building and vinyl chloride (not detected in groundwater under the building but analyzed for) were not detected in indoor air for comparison to OSHA regulations (see Appendix B). TO-15 volatile analysis of soil vapors indicated several volatiles present (1,1-dichloroethene, acetone, chloroform, benzene, trichloroethene, and tetrachloroethene). These compounds were present at levels below Connecticut Department of Environmental Protection (CTDEP) Remediation Standard Regulations (RSR) for industrial/commercial facilities (I/C) volatile organic compounds in soil vapor criteria. They also did not cause the detectable presence of VOCs in sampled and analyzed indoor air immediately above the vapor sampling locations. Compounds detected in groundwater under the building or outside and along the building perimeter close to AC-6 were all below RSR groundwater volatilization criteria (see Table 2 for maximum groundwater concentrations and criteria and Appendix B for exploration locations and results of indoor air and soil vapor analyses). RSRs are used for screening purposes only pending completion of a comprehensive risk assessment currently underway.

(3) Surface Soil:

Receptors identified in the SID that may come in contact with surface soil (identified in the SID as 0-1 ft bgs) include the off-site resident, recreator at the ball field, trespasser, and maintenance worker. Construction workers would also be in contact with surface soil but both surface and subsurface soil are included when evaluating subsurface soil conditions and identifying COPCs. Screening criteria for surface soil off-site evaluations were residential screening criteria developed by USEPA Region III. Other receptor exposures were based on USEPA Region III risk-based industrial screening criteria.

The off-site resident is assessed using an EU depicted in SID Figure 4.2-1. This area is not expected to be affected by operations directly, but may be affected by past airborne contaminant deposition, if any. The areas identified are downwind (direction of prevalent wind across the facility) of facility operations. A statistical summary of sample results and identification of COPCs is presented in SID Tables 4.2-5A and B respectively.

The ball player recreator is assessed by an EU depicted in SID Figure 4.2-5 which incorporates the ball field and immediate surrounding area. A statistical summary and identification of COPCs are presented in SID Tables 4.2-17A and B, respectively.

The trespasser is assessed in the SID with a soil EU (see SID Figure 4.2-4) that is located outside the security fence. Since the SID was prepared, a fence has been installed at the landfill (AC-1 – see

Figure 3) that should prevent the trespasser from contacting surface soil at the landfill. However, to be protective, this CA725 response to Question 2 relies on the evaluations made in the SID prior to construction of the fence. A statistical summary and identification of COPCs encountered by the trespasser are provided in Tables 4.2-11A and B, respectively.

The maintenance worker is assessed in the SID with three EUs. EUs 1 and 2 are parts of EU 3 (see SID Figure 4.2-8) which is assumed for this CA725 evaluation to represent current potential exposure conditions to surface soil. A statistical summary and identification of COPCs in EU3 are provided in SID Tables 4.2-23A and B, respectively.

Based on the evaluation of the surface soil exposure medium as summarized in Table 1 and described above, the following COPCs were identified as presented in the SID (based on residential screening criteria for the off-site resident and industrial screening criteria for the recreator, maintenance worker, and trespasser as developed by USEPA Region III):

MAXIMUM SURFACE SOIL EXPOSURE CONCENTRATION, mg/kg

COPC	Off-site Resident	Recreator	Maintenance Worker	Trespasser	Screening Criteria
Al			753,000	753,000	200,000
As		6.90	28.8	28.8	3.8
Cd			277	277	100
Cr			11,800	11,800	1000
Cu			39,300	39,300	8200
Fe			108,000	108,000	61,000
Zn			68,300	68,300	61,000
Benzo[a]anthracene	2.9		- 30	30	7.8 (0.87)
benzo[a]pyrene	2.0		28	28	0.78 (0.087
benzo[b]fluoranthene	2.6		38	38	7.8 (0.87)
dibenz[a,h]anthrance	0.32		31.9	31.9	0.78 (0.087)
indeno[1,2,3-cd]pyrene	1.1		20	20	7.8 (0.87)
1,2,3,4,6,7,8-HpCDD			0.40	0.40	0.000037
1,2,3,4,6,7,8-HpCDF			0.024	0.024	0.000037
1,2,3,6,7,8-HeCDD			0.011	0.011	0.000037
1,2,3,6,7,8-HeCDF				0.0015	0.000037
1,2,3,4,7,8-HeCDF				0.0014	0.000037
OCDD			5.3	5.3	0.000037
OCDF			0.45	0.45	0.000037
Aroclor 1254			140		2.9
tetrachloroethene (PCE)			250	250	110

Screening criteria in parentheses are for residential exposure
(see SID Tables 4.2-5A&B, 11A&B, 17A&B, 23A&B)

(4) Surface Water:

Receptors identified in the SID that may be exposed to surface water include the fisher person, trespasser, maintenance worker, and boater. The boater exposure is believed to be less extensive than the trespasser or the fisher person since it is assumed that these two other receptors have more contact with surface water and also more contact with sediment. The fisher person may also ingest fish that are caught and therefore this route of exposure to contaminants that may be present in surface water and bioaccumulate in edible portions of fish is also addressed. Several long-term monitoring events since the SID was completed have added information on contaminants that may be found in surface water and sediment. Consequently the data base was updated and the SID

statistical summary and identification of COPCs were revised accordingly.

Subsequent to the SID, a study of sediment quality in AC-10 was completed, and a preliminary evaluation of risks to the trespasser in this area was also completed. These risks and identification of COPCs are presented separately.

Plans to replace the US Route 15 bridge that traverses the southern portion of the facility call for construction to begin in 2001 and therefore this potential construction worker exposure to surface water has been added to this CA725 form in addition to the evaluations presented in the SID. Surface water results from the entire tidal channel were used to evaluate risks, instead of the more limited number of samples available in the CTDOT ROW for the bridge. Consequently the number of COPCs and associated risks may overestimate actual exposure conditions.

The fisher person is assumed to be a shoreline fisher with an EU as depicted in SID Figure 4.2-3. This area includes a portion of AC-1 which is now fenced and not accessible to the fisher person. Analysis results from surface water samples collected in this EU were tabulated and screened against tap water criteria developed by USEPA Region III and criteria established by CTDEP and USEPA for protection of health from ingestion of aquatic organisms. A statistical summary and identification of COPCs are presented in revised SID Tables 4.2-9A and B, respectively.

Fish tissue accumulation of facility contaminants found in surface water where fish may also be found is addressed by the EU shown in SID Figure 4.2-2. A similar compilation for current data in filtered surface water is presented in Appendix C, Table C-7.

Trespasser exposure to surface water is identical to the fisher person, with the same statistical summary and identification of COPC. A separate tabulation was presented at SID Table 4.2-15A&B.

Maintenance worker exposure to surface water is depicted in SID Figure 4.2-4. This area is similar to that of the fisher person and trespasser, but does not include some of the surface water sampling locations in the Far Mill River that are part of the long-term monitoring program. It does include some locations for which additional data have been collected since the SID was completed. A statistical summary and identification of COPCs are presented in SID Tables 4.2-27A and B respectively.

Construction worker exposure within the CTDOT ROW is depicted in Figure 4 and includes SW0062, SW0063, SW0068, and SW0069. However, the preliminary evaluation of risks and identification of COPCs was based on additional surface water sampling locations (also shown in Figure 4) found within the tidal channel, that are closer to the facility. These data were screened (see Table 4) against the same criteria as were used for the fisher person to identify COPCs.

A summary of the surface water COPCs follows:

MAXIMUM SURFACE WATER EXPOSURE CONCENTRATION, mg/L

COPC	Fisher Person	Trespasser AC-10	Trespasser	Maintenance Worker	Bridge Construction Worker	Screening Criteria
Al	141		141	141	141	3.7
As	0.0789	0.003	0.0789	0.0789	0.0789	0.000045 (0.00014)
Ba	1.28		1.28	1.28	0.95	0.26
Cu	6.49		6.49	6.49	6.49	0.15
Fe	333	1.4	333	333	333	1.1
Mn	15.5		15.5	15.5		0.084
Tl	0.00830		0.00830	0.00750	0.0071	0.00029 (0.0063)
V	0.471		0.471	0.471	0.471	0.026
Zn	12.4		12.4	12.4	12.4	1.1
Pb	1.41		1.41		1.41	
Hg					0.0095	0.011
benzo[a]anthracene	0.023		0.023	0.023		0.000092 (0.000031)
benzo[a]pyrene	0.029		0.029	0.029		0.0000092 (0.000031)
benzo[b]fluoranthene	0.048		0.048	0.048		0.000092 (0.000031)
benzo[ghi]perylene	0.017		0.017			(0.000031)
benzo[k]fluoranthene	0.015		0.015	0.015		0.00092 (0.000031)
bis(2-ethylhexyl)phthalate	0.008		0.008	0.0080		0.0048
carbazole	0.004		0.004	0.0040		0.0034
chrysene	0.036		0.036	0.036		0.0092
ideno[1,2,3-cd]pyrene	0.019		0.019	0.019		0.000092
phenanhrene	0.028		0.028			(0.000031)
di-n-octylphthalate					0.0030	0.0000092
1,2,3,4,6,7,8-HpCDD	0.0000057		0.0000057	0.0000057		0.00000000045 (0.000000000014)
OCDD	0.000050		0.000050	0.000050		0.00000000045 (0.000000000014)
tetrachloroethene				0.032		0.0011

Criteria in parentheses are CTDEP and USEPA for ingestion of aquatic organisms

(see Table 4, Appendix C Table C-7 and SID Tables 4.2-9A&B, 15A&B, 27A&B,)

(5) Sediment:

Receptors identified in the SID that may be exposed to sediment include the fisher person, trespasser, maintenance worker, and boater. The boater exposure is believed to be less extensive than the trespasser or the fisher person since it is assumed that these two other receptors have more contact with surface water and also more contact with sediment. EUs for these receptors are the same as for surface water. Statistical summaries and identification of COPCs for the fisher person, trespasser and maintenance worker are presented in SID Tables 4.2-7A and B, 13A and B, and 25A and B, respectively. Updated identification of COPCs for the trespasser is presented in Appendix C, Table C-6. Screening criteria used for all three receptors were industrial soil ingestion screening criteria developed by USEPA Region III for the fisher person, maintenance worker, and trespasser.

As with surface water, the bridge construction worker is also exposed to sediment. A statistical summary and identification of COPCs is presented in Table 5. Screening criteria were the same industrial soil ingestion criteria as above.

The SID also identified the facility construction worker to come in contact with sediment and surface water in EU 1. However, this area is unsuitable for construction and is therefore not included in this CA725 evaluation.

Subsequent to the SID, there was a comprehensive investigation of sediment in the AC-10 wetlands. Results of this investigation are included in this CA725 evaluation.

MAXIMUM SEDIMENT EXPOSURE CONCENTRATION, mg/kg

COPC	Fisher Person	Trespasser AC-10	Trespasser	Maintenance Worker	Bridge Construction Worker	Screening Criteria
As	161	19.1	161	161	10.5	3.8
Be				2.0		1.3
Cd	2790		2790	510		100
Cr	11,900		11,900	11900		1000
Cu	0.93		0.93			8200
Fe	195,000		195,000	195,000		61,000
Pb	5630	430			1420	
acenaphthylene		1.3			0.53	
benzo[a]anthrancene	46		46	46	7.05	7.8
benzo[a]pyrene	49	5.1	49	49	6.45	0.78
benzo[b]fluoranthene	59		59	59	7.90	7.8
benzo[ghi]perylene		4.1			3.50	
bis(2-ethylhexyl)phthalate	490		490	490		410
dibenz[a,h]anthracene	7.6	1.1	7.6	7.6	1.11	0.78
indeno[1,2,3-cd]pyrene	28		28	28	4.15	7.8
phenanthrene		16			16.5	
1,2,3,4,6,7,8-HpCDD	0.048		0.048	0.048		0.000037
OCDD	0.66		0.66	0.66		0.000037
Aroclor-1248		0.81				2.9
Aroclor-1254	41.8	4.8	41.8	41.8		2.9
Aroclor-1260	20.1	0.562	20.1	20.1		2.9

(see Table 5, Appendix C Table C-6, and SID Tables 4.2-7B, 13B, 25B)

(6) Subsurface Soil:

The SID identified the office worker and construction worker as potential receptors of contaminants in subsurface soils at the main manufacturing building. Also, the addition of the bridge construction worker would include subsurface soil exposure. In each of these exposure conditions, there are no validated subsurface soil data available on which to screen for COPCs or evaluate risks. However, the office worker and facility construction worker could be exposed at the main manufacturing facility. As described above for indoor air, no volatile compounds were present above screening criteria in soil vapor beneath the floor or indoor air. For the bridge construction worker, only iron in groundwater was identified as a COPC. It is unlikely that there would be any other COPCs in subsurface soil at this location.

The SID also evaluated potential future exposure conditions that these workers may face (e.g., construction of an office building at AC-4 above the weathered fuel contaminated soil and at the ball field). Consequently, no COPCs are identified for current office worker and construction worker exposure conditions at the main manufacturing building, but COPCs were identified for future possible exposures if office buildings are constructed at the ball field or AC-4.

MAXIMUM SUBSURFACE SOIL EXPOSURE CONCENTRATION, mg/kg

COPC	Construction Worker EU 2	Construction Worker EU 3	Construction Worker Bridge	Screening Criteria
As	36.6	28.5	10.5	3.8
acenaphthylene			2.9	na
benzo[a]anthrancene			7.05	7.8
benzo[a]pyrene			6.45	0.78
benzo[b]fluoranthene			7.9	7.8
Benzo[ghi]perylene			3.5	na
dibenz[a,h]anthracene			1.11	0.78
indeno[1,2,3-cd]pyrene			4.15	7.8
phenanthrene			16.5	na
OCDD	0.00096	0.00053		0.000037

(see Table 5 and SID Tables 4.2-43B, 45B)

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Off-Site Residents	Maint. Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]	Office Worker
Groundwater	no	no	no	YES	no	no	no	no
Air (indoors)	X	X	X	X	X	X	X	X
Soil (surface, e.g., <1 ft)	YES	YES	no	YES	YES	YES	no	no
Surface Water	no	YES	no	YES	YES	YES	YES	no
Sediment	no	YES	no	YES	YES	YES	YES	no
Soil (subsurface e.g., >1 ft)	no	no	no	YES	no	no	no	no
Air (outdoors)	X	X	X	X	X	X	X	X
Reference	1	2	3	4	5	6	7	8

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above. **Indoor (see Appendix B – AC-6 Indoor Air Evaluation) and outdoor air do not have COPCs.**

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Footnote: [3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.) Rationale and Reference(s):

Completeness of exposure pathways was evaluated in the SID for current and future conditions. For this CA725 evaluation, only current conditions will be addressed for each of the identified receptors. Currently, the facility is operating as an industrial manufacturing facility and is in the process of securing an Environmental Land Use Restriction (ELUR) as part of the long-term use of the facility. As a US Government defense contractor, the facility has substantial security personnel and measures that include fencing, security cameras, and guard posts. A recreational ball field is located in AC-11.

1. Off-Site Residents:

The exposure pathway for contaminants from the Stratford facility is interpreted to be limited to surface soil which may have become contaminated as a result of airborne deposition. The EU identified represents sampling locations in areas down-wind of the prevalent wind direction. In addition, there are some residences further downgradient in this prevalent southerly wind direction. Consequently, surface soil represents a possible exposure pathway.

Any exposure to Stratford facility contaminants in surface water and sediments would be addressed in the evaluation of trespasser exposure. These media are not expected in the residential areas or to be contaminated by Stratford operations at locations remote from the facility. Therefore these are not considered complete exposure pathways.

Groundwater from the facility is interpreted to discharge into the Housatonic River except for the shallow perched groundwater in the AC-1 area that is interpreted to discharge into the Far Mill river or adjacent tidal marsh. These discharges occur immediately adjacent to the facility. Sikorsky owns the land between the rivers and the facility and does not allow any withdrawal of groundwater from this land. There are no houses or public or private water supply wells between the facility and the rivers. Groundwater hydraulic gradients and sample analyses along the perimeter of the facility confirms this interpretation (see CA750 submitted November 17, 2000 for the Stratford facility). Consequently, groundwater does not represent a complete exposure pathway for off-site residents which are cross-gradient, not down-gradient, of the facility and more than a half mile remote from the facility.

As part of the Interim Deliverables for the PHERE a Conceptual Site Model was developed for the Sikorsky facility. USEPA New England agreed at that time that future use of the site would remain industrial. Currently there is no use of groundwater, and no potable use is planned. Sikorsky owns and therefore controls all land from the rivers to any potential sources of contamination to groundwater at the Stratford facility.

Off-site dumping of facility wastes into current residential areas is not known, or suspected, to have occurred. Since groundwater does not flow toward the residences, potentially bringing facility contaminants, then subsurface soil at off-site residences does not represent a complete exposure pathway.

2. Maintenance Workers:

The SID identified complete exposure pathways for maintenance workers to include surface water, sediment, and surface soil. These media could reasonably be expected to be contacted by maintenance workers during normal activities such as landscaping, brush cutting, and incidental repairs to surficial infrastructure associated with the facility.

Groundwater and subsurface soil are not considered complete exposure pathways as these media are not encountered by routine maintenance activity. If repairs or installations are needed that may encounter these media, then construction workers would be involved. This exposure condition is addressed separately in the SID and this CA725 evaluation.

3. Day-Care Workers and Clients:

Sikorsky does not maintain an on-site day-care facility. There are no known day-care centers in the immediate vicinity of the facility, including the zone between the facility and the two rivers. As noted for off-site residents, there is no means by which facility contaminants could migrate off-site to a day-care center except possibly by airborne means. There are no day-care centers known to be located in the residential areas down wind of the facility. Day care centers are not known to frequent the fenced and guarded facility or the ball field near AC-11. For these reasons, there is no complete exposure pathway for day-care workers or clients.

4. Construction Workers:

Sikorsky has a procedure that require an Environmental Review Form be completed for construction projects that involve soil excavation. This 2 page form is reviewed and approved by the Sikorsky Stratford Facility Environmental Department. The SID identified groundwater, surface soil, surface water, sediment, and subsurface soil as media that represent a complete exposure pathway for construction workers. The SID addresses surface and subsurface soil as one exposure pathway. Construction workers associated with the imminent US Route 15 bridge replacement activity within the CTDOT ROW are expected to contact each of these media. Currently, there is no construction activity ongoing at the facility. EU 2 represents the ball field and EU 3 represents the fuel calibration area where there are no current offices or construction activities. The CA725 addresses only current conditions. Therefore, EU 2 and EU 3 are not included in this CA725 evaluation of current conditions. The only completed current exposure pathway for the construction worker is associated with the bridge.

5. Trespasser:

Complete exposure pathways for the trespasser include surface water, sediment, and surface soil. Groundwater and subsurface soil are not considered media that the trespasser would contact. Surface soil may also be a complete exposure pathway for maintenance workers, construction workers, and trespassers in the northern portion of the facility, particularly in the vicinity of AC-1 and possibly in the vicinity of AC-2, AC-3, AC-4, AC-5 AC-11, and AC-12. Of these three receptors, the trespasser is restricted by security personnel and a fence from entering AC-2, AC-3, AC-4, AC-5, and AC-12. A fence prevents access by the trespasser to the AC-1 area and to the most contaminated of seven seeps.

6. Recreation:

Three recreators are considered in this CA725 evaluation:

- ball field player;
- fisher person; and
- boater.

Surface soil represents a complete exposure pathway for the ball field player. It is unlikely that sediment or surface water would represent a exposure pathway. The ball player would not be expected to encounter groundwater or subsurface soil. The outfield of the ball field overlaps into the boundary of AC-11, the remediated former shooting range. Residual contaminants are present in AC-11, but outside the fenced-in area of right field. Samples were collected from the baseline and were found to be uncontaminated (AC-11 Investigation and Remedial Action by Soil Excavation 1990).

The fisher person would be expected to encounter surface water and sediment while fishing from the bank. If the fish that are caught are also ingested, then the food pathway (below) would also be a complete exposure pathway. Contact with surface soil is not considered in evaluating fisher person exposures. These are evaluated as part of the trespasser. Subsurface soil and groundwater are not considered complete exposure

pathways for these recreators.

Boaters could also be exposed to surface water and sediment as would be the fisher person. However, these complete exposure pathways are considered to be less in magnitude and duration than that experienced by the fisher person.

7. Food:

There is no arable land within the fenced area of the facility or in the land area between the fence and the rivers that would be suitable for growing crops or livestock. Furthermore, Sikorsky owns all the land between the facility and the rivers and does not allow such use. Consequently, these potential food exposure pathways are not considered complete for groundwater, surface water, sediment or surface soil that may contain contaminants from the Stratford facility.

Food can represent a complete exposure pathway for aquatic organisms that may be harvested from the Far Mill River or the Housatonic River. These may be fin fish or shellfish. There is no evidence of subsistence fishing in the Far Mill River and Housatonic River immediately adjacent to the facility. Consequently, surface water and sediment represent media that constitute a complete exposure pathway. The use of Far Mill River and the Housatonic River by fisher persons in the vicinity of the facility is assumed. Recreational harvesting for human ingestion of shellfish and fin fish is possible. Recreational fishing from boats is occasionally observed. These rivers are also assumed not to be useful as a potable water supply due to the brackish content and tidal (-1 foot low and +6 feet high) conditions of the river water. These rivers are also affected by non-Sikorsky contamination from the upstream landfill and other industrial and commercial land uses.

8. Office Worker:

Office workers can be expected to encounter surface soil if they participate in the recreational league at the ball field near AC-11. Any other contact with surface soil would be considered incidental and less in magnitude than represented by the ball field exposure. They may also be exposed to vapors that migrate through building foundations from volatile contaminants that may be present in underlying subsurface soil or groundwater. This route of exposure was shown in Question 2 to not represent a current contaminated medium for the office worker as demonstrated by the data presented in Appendix B. Should a building be constructed in the AC-4 area than such an exposure would need to be re-evaluated. Since this CA725 addresses only current conditions, these potential future exposure conditions are not included. Office workers would not be expected to encounter surface water or sediment as part of their worker activity.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

__X__ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

SID RISK EVALUATION:

The draft final SID was submitted to USEPA February 1999 as one of several interim deliverables toward the completion of a comprehensive Public Health and Ecological Risk Evaluation. Review comments from the USEPA are considered useful, but do not alter the outcome of this preliminary risk evaluation. None of the USEPA comments would change the magnitude of the estimated risks for the completed exposure pathways. Evaluations completed subsequent to the SID relied on the same approach used in the SID.

Estimates of risk presented in the SID were for carcinogenic effects and non-carcinogenic effects. Cancer risks are expressed as excess lifetime cancer risk (ELCR) above the U.S. baseline for the general population. This baseline incidence of cancer is one in two for men and one in three for women. The USEPA has an acceptable range of 1 in 10,000 to 1 in 1,000,000 (1E-04 to 1E-06) depending on exposure conditions and controls to prevent exposure. Non-carcinogenic effects are estimated using a hazard quotient for each chemical and summing the quotients to produce a Hazard Index (HI). The hazard quotient is calculated by dividing an exposure concentration by and a criterion that is not expected to produce an adverse effect. A quotient greater than 1 indicates an adverse effect may be expected in a portion of the exposed population. The USEPA has an acceptance range of 1 to 10 for the HI depending on exposure conditions and controls to prevent exposure.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

Tables of pertinent risk evaluations for the different completed pathways are included in the compilation of SID tables and in Appendix C.

Identification of significant exposure pathways was made based on the Reasonable Maximum Exposure (RME) assumptions in accordance with USEPA guidance and the SID. The RME is based on the maximum value of contaminant measured at the facility or a number calculated to represent an average value that 95 percent of all measured values would be expected to be lower. RME exposure parameters assumed for the SID are presented in Table SID 4.3-2. Risks associated with more average or Central Tendency Exposure (CTE) assumptions are presented in response to Question 5 for the significant exposure pathways. CTE exposure parameters assumed for the SID are presented in Table SID 4.3-1.

SIGNIFICANT RECEPTOR EXPOSURE PATHWAYS:

1. Maintenance Workers

The RME summary (as presented in SID Tables 4.3.1-42, 43, 48, and 49 and 4.3-58, 61, and 62) is as follows:

	HI	ELCR
EU 1 Soil Contact	7.16E-03	2.42E-05
EU 1 Soil Ingestion	2.61E-02	2.09E-05
EU2 Soil Contact	4.87E-02	1.68E-05
EU 2 Soil Ingestion	1.11E-01	1.05E-05
Surface Water	7.79E-05	1.05E-04
Sediment Contact	2.94E-02	1.54E-06
Sediment Ingestion	9.78E-03	3.70E-07
Total	2.32E-01 (2E-01)	1.79E-04 (2E-04)
	0.2	2 in 10,000

Based on the ELCR risk estimates, the complete pathway for the maintenance worker exposed to soil, surface water, and sediment at AC-1 and to soil at the ball field is considered significant under the RME assumption. The ELCR is controlled by exposure to surface water containing polynuclear aromatic hydrocarbons (PAHs).

2. Trespasser - Facility

The RME summary (presented in Appendix C Tables C-22, 23 and 24) is as follows:

	HI	ELCR
Surface Water Filtered	6.63E-07	2.35E-11
Sediment Contact	4.40E-03	2.03E-06
Sediment Ingestion	6.46E-03	7.06E-07
Total	1.09E-02 (1E-02)	2.74E-06 (3E-06)

Based on the ELCR estimates, the complete pathway for the facility trespasser exposed to sediment and surface

water (based on filtered data) is slightly above the USEPA threshold of 1E-06. The ELCR is controlled by PAHs in sediment. This pathway is therefore considered significant and will be addressed in response to Question 5.

3. Trespasser – AC-1 Seeps

During the Spring of 2000 seven seeps were observed in the vicinity of AC-1 (see Figure 3). As described in Appendix C, risks were evaluated for a trespasser the may encounter each of the seeps. Since it was found that one of the seeps presented the bulk of the risk (Appendix Table C-25), the seep was fenced and the risks recalculated for the remaining six seeps (Appendix Table C-27). A summary of the risks is presented below:

	HI	ELCR
Seep Water – seven locations	**8.03E+02**	**6.89E-03**
Seep Water – six locations	**2.17E+00**	**1.86E-05**

The trespasser exposure pathway to AC-1 seeps was found to be significant for both evaluations. Fencing around Seep 1 dramatically reduced both the HI and ELCR. The remaining risk is still considered significant and will be discussed further in response to Question 5. The HI and ELCR are controlled by Aroclor 1254 which typically is found associated with particulates suspended in water.

4. AC-10 Trespasser

The RME summary of estimated risks (see Appendix C Tables C-1, 16 and 17) is as follows:

	HI	ELCR
Surface Water Ingestion	**4.12E-04**	**1.59E-08**
Surface Water Contact	**5.19E-07**	**2.00E-11**
Sediment Ingestion	**1.28E-02**	**4.27E-07**
Sediment Contact	**3.78E-02**	**1.14E-06**
Total	**5.10E-02 (5E-02)**	**1.58E-06 (2E-06)**

Based on the ELCR estimates for the AC-10 Trespasser exposed to surface water and sediment, the assumed RME conditions would result in a significant risk. The ELCR is controlled by dermal contact exposure to PAHs and to a lesser extent to arsenic and Aroclor 1254 in sediment.

5. Fisher Person (including ingestion of catch as food)

The RME summary of estimated risks to the fisher person is presented below based on Appendix C Tables C-18, 19, 20, and 21.

	HI	ELCR
Filtered Surface Water Contact	**1.42E-05**	**1.67E-09**
Sediment Contact	**1.44E-02**	**3.59E-05**
Sediment Ingestion	**1.46E-02**	**9.85E-06**
Fish Tissue Ingestion	**1.08E+00**	**7.08E-05**
Total	**1.11E+00 (1E+00)**	**1.17E-04 (1E-04)**

Based on the ELCR of 1E-04, the fisher person exposure pathway is considered significant, though within the USEPA range of potentially acceptable risk. The ELCR is controlled by assumed exposures to PAHs in sediment and arsenic in fish tissue. The acceptability of this risk will be discussed further in response to Question 5.

RECEPTOR EXPOSURE PATHWAYS NOT CONSIDERED SIGNIFICANT:

1. Off-Site Residents

Based on the SID evaluation of risks for this receptor, an HI is not applicable since the COPCs are carcinogens and the ELCR is estimated at 1.18E-06 (1E-06) (see SID Tables 4.3-6 and 7). Since these risk indices are less than that considered significant by USEPA, these completed exposure pathways are not considered significant for the purposes of this CA725 evaluation.

2. Ball Field Recreator

Based on the SID evaluation of risks for this receptor, the estimated HI is 2E-03 and the estimated ELCR is 4E-07(see SID Table 4.3-36 and 37). Since these risk indices are less than that considered significant by USEPA, these completed exposure pathways are not considered significant for the purposes of this CA725 evaluation.

3. Bridge Construction Worker

The RME summary (as presented in Appendix C Tables C-11, 12, 13, 14 is as follows:

	HI	ELCR
Surface Water Ingestion	1.64E-02	6.14E-08
Surface Water Contact	3.57E-04	9.82E-11
Sediment Ingestion	5.05E-03	2.13E-07
Sediment Contact	5.31E-03	8.54E-07
Groundwater	na	na
Total	2.71E-02 (3E-02)	1.13E-06 (1E-06)

Based on the ELCR risk estimates, the complete pathway for the bridge construction worker exposed to surface water, sediment and groundwater at the CTDOT ROW is not considered significant under the RME assumption. The ELCR is controlled by exposure to sediment containing polynuclear aromatic hydrocarbons (PAHs).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

__X__ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

1. Maintenance Worker:

The interim RME estimate of the ELCR of 2E-04 (2 in 10,000) for the maintenance worker is slightly above the range of potentially acceptable risks. The majority of the estimated risk is associated with maintenance activities that would involve contact with surface water in the AC-1 and AC-6/10 areas. Under assumed CTE conditions, the ELCR would be (see SID Tables 4.3.1-39, 40, 45, and 46 and 4.3-57, 59, and 60):

	HI	ELCR
EU-1 Soil Contact	1.02E-03	1.54E-06
Soil Ingestion	2.47E-03	1.38E-06
EU-2 Soil Contact	4.68E-03	7.21E-07
Soil Ingestion	8.40E-03	4.70E-07
Surface Water Contact	1.19E-06	4.17E-06
Sediment Contact	4.38E-03	9.86E-08
Sediment Ingestion	1.14E-03	2.65E-08
Total	2.33E-02 (2E-02)	8.41E-06 (8E-06)

Under the more likely exposure assumptions of the CTE, the maintenance worker summary exposure risks would still be greater (8 times) than the low end of the acceptable range (1E-06). The largest contributor to the ELCR is exposure to PAHs in surface water. These compounds are typically hydrophobic, preferring to attach to solid particles than to be freely dissolved in water. Surface water sampling frequently entrains particles usually associated with sediment, particularly in shallow bodies of surface water. Filtered water samples would more accurately represent risks through the surface water medium. If filtered data were used then the ELCR would be reduced further.

Samples containing the higher concentrations of contaminants are found AC-1 at (EU 1) as can be seen in the ELCR for this EU. There is a fence around AC-1 which restricts access to the area. Sikorsky personnel

gaining access to this area must obtain the required keys and permission through security personnel. Therefore, access to this area is controlled. The only maintenance required in this area is occasional brush cutting along the fence and infrequent repairs to storage trailers that are kept in this area.

The maintenance worker will be protected from undue exposure through an environmental safety and health procedure for all work performed at the Stratford facility (a Department procedure has been in place for a number of years). Under this procedure, work environments are assessed and appropriate personal protection required to be donned by workers. The EH&S staff monitor compliance with this procedure through audits.

Recognizing that

- access to EU-1 is restricted by fences and requires the security clearance to obtain keys to enter the area,
- there is limited need for maintenance activity in EU 1
- filtered surface water results more accurately represent the actual uptake of contaminants through this exposure pathway, and
- the CTE is within a factor of 8 from the acceptable threshold without accounting for the factors,

then any remaining risks to the maintenance worker is considered under control and acceptable.

2. Trespasser – Facility

The facility trespasser exposure pathway is considered significant based on an estimated RME ELCR of 3E-06 compared to 1E-06. The risk is dominated by PAHs found in sediment that is assumed to be incidentally ingested. The typical trespasser is not likely to ingest sediment as the area is not a destination but a transit area. The assessment of risk also did not fully address the preference for PAHs to associate with solids and not transfer across the water and skin layers that are encountered during actual exposure. Based on anecdotal observations, the frequency and duration of trespassers in the EU is less than assumed (observed once during a 5-month field investigation).

The trespasser exposure pathway risk is considered acceptable for the following reasons:

- estimated risk based on conservative assumptions is within the USEPA acceptable risk range and near the low end of this risk range,
- actual frequency of trespassers observed in the EU is anecdotally lower than assumed,
- actual uptake of PAHs from sediment does not fully account for preference to stay attached to solid particles,
- risks associated with ingestion of sediment are overestimated since the exposure unit is not a destination, but a temporary exposure during travel to a destination,
- the facility has an extensive security system, including television and 24-hour-a-day security staff. Encroachment into the wetlands exposure unit is cause for concern and trespassers are invited to leave.

3. Trespasser – AC-1 Seeps

This trespasser was considered to have a significant exposure based on an HI of 800. This risk was controlled by the detection of Aroclor 1254 and 1260 at AC-1 Seep 1. Other risk contributors were the PAHs.

To protect the trespasser from contacting the higher exposure location for the observed seeps along the northern margin of the AC-1 landfill, a high visibility temporary fence was installed around the seep area identified as AC-1 Seep 1 (see Figure 3). Aroclor 1254 and 1260, the major contributors to risk at the Seep 1, were non-detectable or 20 to 300 times lower at the other seep locations compared to the concentrations reported at AC-1 Seep 1. Assuming the seep fence prevents access by the trespasser to Seep 1, then the resulting HI is 2.17(see Appendix C), well within the acceptance range of 1 to 10.

In addition to installing the temporary fence to prevent access to Seep 1, signs are installed on the fence along the perimeter of AC-1 and within sight of AC-1. The signs are in English and Spanish. The signs read:

CAUTION
DO NOT ENTER
INDUSTRIAL LANDFILL AREA
SOIL OR SEDIMENT MAY CONTAIN
HAZARDOUS MATERIALS

Practically, there is low likelihood that a trespasser would encounter these seeps as they are well removed from the main thread of the Far Mill River, being separated from the river by several hundred feet of soft mucky wetland that is difficult to traverse. Because the substrate in the vicinity of the seeps consists of wetland "muck", it is nearly impossible for anyone to approach these seeps along the tidal channel, even from a boat. Access to the seeps from the land is prevented by the newly installed AC-1 fence and the rest of the Sikorsky security system, including television and full-time on-site security personnel. Furthermore, the seeps are seasonal, consisting of perched groundwater that drains from the landfill in the spring and leaving a reddish stain on the ground surface as a result of iron leaching from the landfilled wastes. This color is not observed at other times of the year after the seeps drain the perched water condition. The seep samples were collected by pooling the thin (less than an inch) seepage that drains across the surface until there was sufficient sample to analyze. During high tide, seepage directly enters the tidal water and is rapidly diluted, thereby preventing exposure by the trespasser to the reported high seep concentrations. The seeps are visible during low tide and thus are only exposed (available for direct contact) for less than 6 hours during the day. This limited amount of seepage condition indicates that only very limited exposure to trespasser skin can be expected. This exposure can only occur during low tide when the seepage is exposed in the Spring.

The apparent risk of this exposure is controlled to acceptable levels for the following reasons:

- **exposure to the seepage is limited to only low tide conditions during the Spring,**
- **there is limited amount (thickness) of seepage when it is exposed,**
- **there is limited access to the seeps due to security and other fences and difficult to traverse wetlands**
- **a temporary fence is installed to prevent access to the problematic seep (a reduction in the HI to less than 40) until such time as it can be shown there is no longer a risk,**
- **signs are installed within sight of the seeps warning trespassers about the hazardous condition, and**
- **a maintenance program will be included as part of the on-going long-term monitoring program.**

4. <u>AC-10 Trespasser:</u>

The trespasser in this area would be exposed to an ELCR of 2E-06, just above the acceptable threshold of 1E-06. The ELCR is controlled by dermal contact exposure to PAHs and to a lesser extent to arsenic and Aroclor 1254 in sediment located within the tidal channels. This sediment is quite soft and does not represent a good surface on which to traverse the wetland area by foot. It is more effective to walk within the phragmites dominated wetland areas adjacent to the tidal channels. Samples collected within these adjacent areas indicate contaminants are absent or present at much lower (up to 100 times lower) concentrations compared to the tidal channel sediments. Currently, most of the sediments with higher concentrations of PAHs, Aroclor 1254, and arsenic are covered with water, even at low tide. This condition makes it unlikely that the trespasser would contact sediment as much as was assumed in the conservative exposure

assumptions. There is little reason for a trespasser to be traversing the AC-10 area as it is not along a route to a desired destination. Landward access to the AC-10 area is prevented by Sikorsky security systems including fences, television, and fulltime on-site security personnel. Access by a trespasser is possible by boat landing along the Housatonic River or by small watercraft moving up the tidal channel from the Housatonic River. The latter event would be of immediate concern to security personnel as the tidal channel is adjacent to the security fence. Landings on the Housatonic River bank occurs, but there would no obvious attraction for trespassers to leave the bank and traverse the wetlands toward the Sikorsky security systems.

For these quantitative and procedural reasons, the apparent significant exposure to the AC-10 trespasser is controlled and exposure likely would not occur at the assumed conditions on which the estimated risks were based.

5. Fisher Person:

The fisher person exposure pathway was considered complete and significant based on the estimated ELCR of 1E-04. This RME risk is within, but at the high end of the USEPA acceptable risk range. The risk is controlled by PAHs in sediment that may be dermally absorbed or incidentally ingested by the fisher person, and arsenic that is assumed to be absorbed into fish tissue from surface water. The body burdens of fish were modeled based on exposure to surface water contaminants near the Stratford facility. The levels of PAHs typically found in fish are usually low because this group rapidly metabolizes PAHs; furthermore, higher molecular weight PAHs, which include the largest class of chemical carcinogens, do not seem to accumulate in fish. In a USEPA cited study (AWQC for Polynuclear Aromatic Hydrocarbons, EPA 440/5-80-069, 1980), the concentration of benzo(a)pyrene in skin of cooked fish was much higher than in other tissues, suggesting that skin may serve as a barrier to the migration of PAHs in body tissues. To more accurately estimate risks associated with COPC uptake into fish tissue, a fish tissue sampling program is planned for 2001.

As presented for the trespasser and the maintenance worker, PAHs prefer to remain with the sediment and not transfer across water and skin layers as is assumed for dermal absorption. The conservative approach taken for this preliminary evaluation of risks did not fully account for this preference for PAHs, to stay on solids, and therefore overestimated the risk.

The frequency of exposure to the assumed exposure conditions at the Sikorsky Facility is likely over estimated for the fisherperson. Anecdotally, fisher persons have not been observed adjacent to the facility during four long-term monitoring events conducted since September 1999. Based on this observation, it is unlikely that subsistence fishing occurs adjacent to the facility.

For the following reasons the fisher person exposure pathway risks are considered acceptable.

- Body burdens of contaminants in fish tissue were modeled and not based on actual tissue sample analyses. Modeling, by nature of the uncertainties involved, typically overestimate exposure concentration by one to two orders of magnitude to be conservative. These analyses are to be obtained in 2001.

- PAHs, the primary risk contributor, are usually found in fish at low concentrations. The higher molecular weight PAHs (the ones contributing the risk at Sikorsky) do not seem to accumulate in fish. This indicates the PAH risk may be over estimated. Where found, PAHs are typically concentrated in the skin, not in the meat of fish.

- PAHs tend to remain attached to particulates, and not transfer across water and skin layers. Thus, risk estimates based on sediment and unfiltered surface water tend to overestimate associated risks.

- The frequency of exposure (and associated risk) assumed at the Sikorsky facility is likely overestimated

based on observations over a 5-month long field investigation and four long-term monitoring events of 2-week duration each.

- Security systems at the Sikorsky facility would invite fisher persons who are on Sikorsky property to leave, thereby reducing exposure duration and frequency.

Summary

In summary, based on the extensive environmental sampling and analyses completed to date and assessment of current exposure conditions, the following receptor media exposure pathways are not considered significant:

1. Off-Site Resident
2. Bridge Construction Worker
3. Ball field recreator

Receptor media exposure pathways which were found to be significant, but within the USEPA acceptable range, include:

1. Maintenance Worker
2. Trespasser – Facility
3. Trespasser – AC-10 (including the Housatonic River Boater who beaches at the facility)
4. Fisher Person (including ingestion of catch)

Physical barriers (e.g., fences), security systems, EH&S procedures to protect workers, consideration of more realistic exposure conditions, and consideration of filtered surface water chemical analysis data bring these risks that are within the USEPA acceptable range under control and therefore acceptable for the purposes of this CA725 evaluation. A long-term monitoring program samples and observes facility conditions three times a year to evaluate if conditions are changing and require specific action to control future risks. As more investigation and the PHERE are completed, permanent corrective actions will be identified and implemented to prevent continuance of any significant unacceptable risks.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Sikorsky Aircraft Corporation** facility, EPA ID **#RCRA-I-90-1011**, located at **6900 Main Street, Stratford, CT 06614** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) Facility report provided to & reviewed by: _____ Date 5/3/01
(print) R O'Neal
(title) RPM

Supervisor (signature) _____ Date 6/6/01
(print) Matthew K. Haagsma
(title) Section Chief
(EPA Region or State) Reg. I.

Locations where References may be found:

Contact telephone and e-mail numbers

(name)

(phone #)

(e-mail)

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.