



UNITED STATES AIR FORCE

EIELSON AIR FORCE BASE, ALASKA

2013 Five Year Review Addendum

Final

Contract Number: FA8903-08-D-8777

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March 2015

**Addendum to 2013 Five Year Review Report for Eielson Air Force Base,
February 2014**

A Five-Year Review (FYR) addendum is generally completed for remedies where the protectiveness determination is deferred until further information is obtained. When deferring protectiveness in the FYR report, the US Environmental Protection Agency (EPA) typically provides a timeframe for when the information will be obtained and a protectiveness statement can be made. This document provides progress since the 2013 FYR (dated February 2014) and protectiveness determinations for the remedies where the statement was deferred in the 2013 FYR. The deferrals were intended to allow the incorporation of the Conceptual Site Model (CSM) updates and Supplemental Remedial Investigations (SRI) which were ongoing at the time of the 2013 FYR.

The 2013 FYR for Eielson Air Force Base (AFB), Alaska, was signed by Mark D. Kelly, Brigadier General, US Air Force (USAF) Commander on 25 April 2014.

This FYR Addendum addresses only those items that were deferred from the 2013 FYR as follows:

- Protectiveness determinations for each of the Operable Units (OUs) identified in the 2013 FYR as being deferred until further information was obtained.
- Progress since the 2013 FYR.
- Issues and Recommendations.

Protectiveness Statements

The Protectiveness Statements provided below are for the source areas in OUs 1, 2, 3, 4, and 5, and the Sitewide OU which the 2013 FYR identified as being applicable. The following source areas, listed by OU, were identified as needing a FYR Addendum:

- OU1: ST020 and ST048
- OU2: ST010, SS014, ST013, and DP026
- OU3: WP045 and SS057
- OU4: SS035 and SS037
- OU5: LF003 and FT009
- Sitewide: SS067

The protectiveness statements outlined in the 2013 FYR for each OU were as follows:

<i>Operable Unit:</i> OU1 (ST20, ST48, ST49, SS50, SS51, SS52)	<i>Protectiveness Determination:</i> Not protective	<i>Addendum Due Date</i> (only applicable to ST20 and ST48): March 2015
<i>Protectiveness Statement:</i> The remedy for OU1 is not considered to be protective currently or in the future. This determination is based on the lack of supplemental soil samples, which were required as part of the Record of Decision (ROD) remedy, at Source Areas SS50, SS51, and SS52. In the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of institutional controls (ICs); ICs will be maintained as per the requirements of the Settlement Agreement.		

<i>Operable Unit:</i> OU2 (LF05, ST10/SS14, ST11, ST13/DP26, ST18, ST19, SS31)	<i>Protectiveness Determination:</i> Not protective	<i>Addendum Due Date</i> (only applicable to ST10/SS14 and ST13/DP26): March 2015
<i>Protectiveness Statement:</i> The current protectiveness determination of the remedy for OU2 is deferred and the determination for the future is non-protective. The future non-protective determination is based on the recommendation included in the EPA concurrence letter instead of the USAF evaluation which was for deferral. The USAF deferral determinations are based on: (1) evaluation of vapor intrusion (VI) (ST10/SS14, ST11, ST13/DP26, ST18, ST19, LF05, and SS31), (2) evaluation of chemicals of concern (COCs) specified in the ROD which exceeded associated final remediation goals (FRGs) and had inconclusive concentration trends (ST10/SS14, ST11, ST13/DP26, ST19); and (3) the fact that the current Alaska Department of Environmental Conservation (ADEC) Soil Cleanup Levels for Migration to Groundwater are lower than the ROD FRGs for soil (ST10/SS14 and ST13/DP26). In the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs; ICs will be maintained as per the requirements of the Settlement Agreement.		

<i>Operable Unit:</i> OU3 (DP44, WP45/SS57, ST56, SS61)	<i>Protectiveness Determination:</i> Not protective	<i>Addendum Due Date</i> (only applicable to WP45/SS57): March 2015
<i>Protectiveness Statement:</i> The remedy is not protective currently and in the future at OU3. This determination was made based on conditions at source area WP45/SS57, consisting of: (1) a preliminary VI screening which identified concentrations of volatile organic constituents (VOCs) that exceeded indoor air target levels and (2) the unknown stability of the trichloroethene (TCE) plume. In the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs; ICs will be maintained as per the requirements of the Settlement Agreement.		

<i>Operable Unit:</i> OU4 (DP25, ST27, WP33, SS35, SS36, SS37, SS39/63, ST58, SS64)	<i>Protectiveness Determination:</i> Not protective	<i>Addendum Due Date</i> (only applicable to SS35 and SS37): March 2015
<i>Protectiveness Statement:</i> The remedy for OU4 is not considered to be protective currently or in the future. This determination is based on data gaps that have been identified at SS35 in surface water, soil, and sediment. In the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs; ICs will be maintained as per the requirements of the Settlement Agreement.		

<i>Operable Unit:</i> OU5 (LF02, LF04, LF03/FT09, LF06)	<i>Protectiveness Determination:</i> Protectiveness deferred	<i>Addendum Due Date</i> (only applicable to LF03/FT09): March 2015
<i>Protectiveness Statement:</i> The current protectiveness determination of the remedy for OU5 is deferred and the determination for the future is non-protective. The future non-protective determination is based on the recommendation included in the EPA concurrence letter instead of the USAF evaluation which was for deferral. The USAF deferral determinations are based on (1) 2008 FYR recommendation to perform VI evaluation (LF03/FT09) and (2) the detection of volatile constituents in groundwater samples collected in 2012 and the lack of data to fully evaluate VI (LF06). In the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs; ICs will be maintained as per the requirements of the Settlement Agreement.		

<i>Operable Unit:</i> Sitewide (SS67)	<i>Protectiveness Determination:</i> Protective	<i>Addendum Due Date:</i> March 2015
<i>Protectiveness Statement:</i> The remedy at the Sitewide OU is considered currently protective. The remedy at Sitewide OU is not protective in the future because at SS67 because (1) the fish tissue remedial action objective (RAO) has not been achieved and (2) the distribution of polychlorinated biphenyls (PCBs) within Garrison Slough sediment has not been fully characterized. In the interim, exposure pathways that could result in unacceptable risks are being controlled through implementation of engineering controls (ECs) and ICs. Soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs; ICs will be maintained as per the requirements of the Settlement Agreement.		

Progress since the Five-Year Review Completion Date

The attached Site Summary Report details the issues leading to the protectiveness determination from the 2013 FYR and summarizes additional investigations, evaluations, and actions that have been taken since completion of the 2013 FYR.

Issues and Recommendations

The attached Site Summary Report details any remaining issues and provides recommendations regarding future actions that should be considered at each source area. The following tables provide a summary of these issues.

Issues identified in the 2013 FYR that are outside the scope of this Addendum or are already included in the 2013 FYR report are not repeated in this document. Refer to the 2013 FYR report for a complete list of issues and recommendations identified for Eielson AFB.

Issues and Recommendations Identified in the Five-Year Review Addendum for OU1:

OU(s): OU1	Issue Category: Monitoring and Changed Site Conditions			
	Issue for ST020: Data gaps have been identified related to delineation of the benzene, toluene, ethylbenzene, and xylene groundwater plume and the extent of ethylene dibromide in groundwater; the extent of surface water and sediment contamination in Pond 1 and Pond 2; the potential presence of wetlands within the source area boundary; seasonal fluctuations in groundwater; and the potential presence of PCBs in groundwater. In addition, an assessment of the VI pathway was on-going in 2014, but a report of the findings is not currently available.			
	Recommendation: Perform a Supplemental Remedial Investigation (SRI) to address the identified data gaps and review and evaluate the results of the VI assessment of Source Area ST020. Include information gathered under the Source Evaluation Report (SER) program as part of the review of ST020. Update the Source Area boundary, as necessary, based on the contaminant plume extent.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU1	Issue Category: Monitoring			
	Issue for ST020: Metals concentrations in soil and groundwater have not been compared to background conditions.			
	Recommendation: Upon completion of the background metals study, compare concentrations of metals in soil and groundwater to background levels.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU1	Issue Category: Changed Site Conditions			
	Issue for ST020 and ST048: Chemicals have been detected at ST020 and ST048 at concentrations above ADEC cleanup levels that are not part of the COCs identified in the ROD.			
	Recommendation: Update the Risk Assessment to assess chemicals of potential concern (COPCs) and identify COCs that should be added to the ROD. The ROD will be appropriately modified following the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	March 2018

OU(s): OU1	Issue Category: Remedy Performance			
	Issue for ST020 and ST048: Current ADEC cleanup levels for migration-to-groundwater are stricter than the remediation goals established in the ROD.			
	Recommendation: Per the 2013 FYR, assess the cleanup levels to determine if the lower ADEC cleanup levels should be established as site remediation goals and, if so, the ROD will be appropriately modified following the CERCLA process.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Defer	USAF	EPA/ADEC	March 2018

OU(s): OU1	Issue Category: Institutional Controls			
	Issue for ST020 and ST048: The selected remedies for these Source Areas include ICs.			
	Recommendation: Continue to implement ICs to comply with the Settlement Agreement and make programmatic changes as needed to execute the Land Use Controls (LUC) Implementation Plan (IP).			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU1	Issue Category: Monitoring and Changed Site Conditions			
	Issue for ST048: Data gaps have been identified related to the presence or extent of COCs in surface and subsurface soil, in the vadose zone, and in shallow and deep groundwater and related to an assessment of the VI pathway.			
	Recommendation: Perform a SRI to address the identified data gaps and complete a full assessment of the VI pathway. Update the Source Area boundary, as necessary, based on the contaminant plume extent. Evaluate the results of the SRI and determine if additional remediation is required at ST048.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU1	Issue Category: Monitoring			
	Issue for ST048: There are insufficient data to evaluate seasonal variations in the vertical and horizontal groundwater gradients at ST048 and to determine trends in the solute plume.			
	Recommendation: Continue long-term groundwater monitoring to determine trends in the solute plume at ST048 and evaluate seasonal variations in the vertical and horizontal groundwater gradients.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU1	Issue Category: No Issue			
	Issue for ST048: Other potential sources of contamination have been identified in the vicinity of ST048 and their status is unknown.			
	Recommendation: Evaluate the available data regarding the other potential sources of contamination near ST048, determine a path forward, and perform appropriate administrative actions, if needed.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

Issues and Recommendations Identified in the Five-Year Review Addendum for OU2:

OU(s): OU2	Issue Category: Monitoring and Changed Site Conditions			
	Issue for ST010 and SS014: Data gaps have been identified related to potential sediment contamination in Spruce Lake and whether site boundaries are inclusive of wetland areas.			
	Recommendation: Perform a SRI to address the identified data gaps. Based on the findings of the SRI, update the risk assessment to assess COPCs and identify COCs that should be added to the ROD and update the source area boundaries, as necessary, based on the contaminant plume extent.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	February 2018

OU(s): OU2	Issue Category: Monitoring			
	Issue for ST010 and SS014: A full assessment of the VI pathway was on-going in 2013, but a report of the findings is not currently available.			
	Recommendation: Review and evaluate the results of the full VI assessment of Source Areas ST010 and SS014.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Defer	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU2	Issue Category: Remedy Performance			
	Issue for ST010 and SS014: Current ADEC cleanup levels for migration-to-groundwater are stricter than the remediation goals established in the ROD.			
	Recommendation: Per the 2013 FYR, assess the cleanup levels to determine if the lower ADEC cleanup levels should be established as site remediation goals and, if appropriate, modify the ROD following the CERCLA process.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Defer	USAF	EPA/ADEC	September 2018

OU(s): OU2	Issue Category: Changed Site Conditions			
	Issue for ST010, SS014, ST013, and DP026: Chemicals have been detected at ST010, SS014, ST013, and DP026 at concentrations above ADEC cleanup levels that are not part of the COCs identified in the ROD.			
	Recommendation: The ROD will be appropriately modified following the CERCLA process.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	March 2020

OU(s): OU2	Issue Category: Institutional Controls			
	Issue for ST010, SS014, ST013, and DP026: The selected remedies for these Source Areas include ICs.			
	Recommendation: Continue to implement ICs to comply with the Settlement Agreement and make programmatic changes as needed to execute the LUC IP.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU2	Issue Category: Monitoring and Changed Site Conditions			
	Issue for ST013 and DP026: Data gaps have been identified related to the extent of COCs in groundwater and soil and an assessment of the VI pathway.			
	Recommendation: Perform a SRI to address the identified data gaps. Based on the findings of the SRI, update the risk assessment to assess COPCs and identify COCs that should be added to the ROD and update the source area boundaries, as necessary, based on the contaminant plume extent.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Defer	Yes	USAF	EPA/ADEC	February 2018

OU(s): OU2	Issue Category: No Issue			
	Issue for ST013 and DP026: SER Site SS078 lies within the boundaries of DP026/ST013 and has ongoing work or review external to the contaminated sites program.			
	Recommendation: Include SER documents as part of the site review to fully analyze onsite characterization.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU2	Issue Category: Remedy Performance			
	Issue for ST013 and DP026: Current ADEC cleanup levels for migration-to-groundwater are stricter than the remediation goals established in the ROD.			
	Recommendation: Issue a ROD amendment or Explanation of Significant Difference to reduce the site remediation goals to be protective of migration-to-groundwater risks.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Defer	USAF	EPA/ADEC	March 2020

Issues and Recommendations Identified in the Five-Year Review Addendum for OU3:

OU(s): OU3	Issue Category: Remedy Performance			
	Issue for WP045 and SS057: A pilot study of in-situ chemical reduction and oxidation was performed on TCE source areas in shallow groundwater as part of the SRI conducted between 2008 and 2010.			
	Recommendation: Perform a Feasibility Study (FS) to assess the results of the pilot study, evaluate future remedial alternatives for addressing remaining TCE in groundwater, and recommend remedial actions.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	October 2015

OU(s): OU3	Issue Category: Monitoring			
	Issue for WP045 and SS057: Data gaps have been identified related to the extent of TCE contamination in soil, the extent of fuel-impacted soil at SS057, the extent of diesel range organic (DRO) contamination in groundwater, the extent of benzene in groundwater at SS057, sources of contaminants detected in indoor and sub-slab air samples, and the assessment of the VI pathway.			
	Recommendation: Conduct supplemental soil and groundwater sampling, perform a full assessment of the VI pathway, and update the risk assessment based on the findings of the VI assessment.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU3	Issue Category: Monitoring			
	Issue for WP045 and SS057: Data gaps have been identified related to groundwater data and trends and biodegradation of groundwater COCs.			
	Recommendation: Continue groundwater monitoring to evaluate the long-term effects of the EHC [®] injection on TCE and cis-1,2 dichloroethene concentrations; perform annual monitoring of downgradient groundwater wells to determine stability of the contaminant plumes; continue groundwater sampling to monitor TCE attenuation and to confirm the 2013 deep low-flow results; measure seasonal fluctuations in groundwater levels; and evaluate whether limiting factors are affecting biodegradation.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU3	Issue Category: Remedy Performance			
	Issue for SS057: The 2013 FYR recommended the evaluation of a technical impracticability (TI) waiver for TCE contamination at depth.			
	Recommendation: Conduct a TI waiver evaluation.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

Issues and Recommendations Identified in the Five-Year Review Addendum for OU4:

OU(s): OU4	Issue Category: Monitoring			
	Issue for SS035: Data gaps have been identified related to contaminant sources, particularly potential drums identified by the geophysical survey, subsurface soil contamination, sediment and surface water contamination upstream of the source area, the areal extent of VOC and pesticide contamination in surface soil, the VI pathway, and aquatic organism monitoring.			
	Recommendation: Perform a SRI to address the identified data gaps.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Monitoring			
	Issue for SS035: The hydrodynamics of the Garrison Slough Pond are not well understood.			
	Recommendation: Investigate the hydrodynamics of the Garrison Slough Pond.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Monitoring			
	Issue for SS035: Insufficient data is available to determine the source of PCBs in the Pond.			
	Recommendation: Investigate the source of the PCBs in the Pond.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Changed Site Conditions			
	Issue for SS035: The COC Audit identified data gaps associated with the former locations of four features at the site, soil/sediment characterization associated with historical drum removals, and the status of two, on-site wells.			
	Recommendation: Conduct research to determine the former locations of the features identified in the COC Audit as having unknown locations. In addition, determine the status of the two, on-site, abandoned wells at SS035 and if soil/sediment underlying the 55-gallon drums removed in 1989 and 1997 was characterized.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Remedy Performance			
	Issue for SS035 and SS037: The 2013 FYR concluded that, after completion of the CSM Updates, the RAOs for SS035 and SS037 should be re-evaluated.			
	Requirement of the 2013 FYR: Re-evaluate RAOs to identify specific performance metrics and an associated approach to determine achievement of RAOs at Source Areas SS035 and SS037.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Institutional Controls			
	Issue for SS035 and SS037: The selected remedies for these Source Areas include ICs.			
	Recommendation: Continue to implement ICs to comply with the Settlement Agreement and make programmatic changes as needed to execute the LUC IP.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Monitoring and Changed Site Conditions			
	Issue for SS037: Data gaps have been identified related to the extent of fuel-contaminated soil between SS037 and Source Areas ST013/DP026; the extent of benzene, perchloroethylene, and 1,2-dichloropropane contamination in soil; the extent of benzene and DRO in groundwater; and the VI pathway for SS037. Additionally, groundwater COCs were not identified in the ROD.			
	Recommendation: Perform a SRI to address the identified data gaps. Based on the findings of the SRI, update the source area boundary, as necessary, based on known plume extent.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Monitoring			
	Issue for SS037: Arsenic has been detected historically in groundwater at SS037 at concentrations above its Maximum Contaminant Level (MCL) and needs to be compared to background concentrations.			
	Recommendation: Arsenic may be naturally occurring in groundwater. Recommendations regarding arsenic in groundwater are deferred pending the results of a background metals study.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Changed Site Conditions			
	Issue for SS037: Fuel-related chemicals have been detected in groundwater at concentrations above ADEC cleanup levels and may affect the protectiveness of the remedy.			
	Recommendation: Revise the risk assessment to address these findings and, if appropriate, modify the ROD following the CERCLA process.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	March 2017

OU(s): OU4	Issue Category: Monitoring			
	Issue for SS037: Data gaps remain regarding COCs resulting from the former fire training exercises at these source areas.			
	Recommendation: Conduct additional research to determine if perfluorochemicals were used at the fire training areas and, if so, evaluate in accordance with USAF guidance on perfluorinated compounds.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Changed Site Conditions			
	Issue for SS037: The COC Audit identified data gaps associated with the former locations of two features at the site, underground storage tank (UST) Closure Assessments for the removal of three buried storage tanks, and the status of four, 55-gallon buried drums.			
	Recommendation: Conduct research to resolve if UST Closure Assessments were conducted for the three buried storage tanks that were removed from SS037 in 1987; to determine the status of four, 55-gallon drums encountered during the 1987 tank removal; and to determine the former locations of the features identified in the COC Audit.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU4	Issue Category: Monitoring and Remedy Performance			
	Issue for SS037: The 2013 FYR identified requirements regarding continued groundwater monitoring at SS037 and an assessment of the protectiveness of the remedy.			
	Requirements of the 2013 FYR: Continue COC monitoring to evaluate concentration trends and monitor increasing trends at isolated SS037 wells, assess the protectiveness of the SS037 remedy, and evaluate the need for active treatment to enhance groundwater remediation.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

Issues and Recommendations Identified in the Five-Year Review Addendum for OU5:

OU(s): OU5	Issue Category: Monitoring			
	Issue for LF003/FT009: Data gaps remain regarding COCs resulting from the former fire training exercises at these source areas.			
	Recommendation: Conduct additional research to determine if perfluorochemicals were used at the fire training areas and, if so, evaluate in accordance with USAF guidance on perfluorinated compounds. In addition, advance soil borings to determine whether dioxins are COPCs at LF003/FT009.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU5	Issue Category: Monitoring and Institutional Controls			
	Issue for LF003/FT009: Data gaps remain regarding COCs in groundwater, the sources of those groundwater COCs at LF003/FT009, and soil and groundwater contaminants in the vicinity of Building 4371.			
	Recommendation: Perform a SRI to address the identified data gaps. Based on the findings of the SRI, expand the IC boundaries to encompass the estimated areas of known soil and groundwater contamination.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	USAF	EPA/ADEC	September 2018

OU(s): OU5	Issue Category: Remedy Performance			
	Issue for LF003/FT009: An evaluation of the VI pathway was a requirement of the 2008 FYR.			
	Requirement of 2008 FYR: Complete the ongoing VI pathway evaluation and reassess associated risks.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Defer	Defer	USAF	EPA/ADEC	March 2017

OU(s): OU5	Issue Category: Changed Site Conditions			
	Issue for LF003/FT009: The 2013 FYR indicated that radioactively-contaminated photographic chemicals may have been disposed of at LF003.			
	Recommendation: Conduct research into past disposal practices to determine if further investigation of this COPC is required. In addition, research is recommended to locate the historical radiation ground survey report.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU5	Issue Category: Monitoring			
	Issue for LF003 and FT009: Arsenic has been detected historically in groundwater at concentrations above its MCL and needs to be compared to background concentrations.			
	Recommendation: Arsenic may be naturally occurring in groundwater. Recommendations regarding arsenic in groundwater are deferred pending the results of a background metals study.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU5	Issue Category: Monitoring			
	Issue for LF003 and FT009: COPCs added to the monitoring program in 2012 need to be assessed to determine whether they need to be incorporated into the LF003/FT009 ROD/remedy, and whether an updated risk assessment is required to account for the additional COPCs.			
	Recommendation: Update the concentration data for the soil and groundwater COCs that were previously evaluated in the human health risk assessment.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU5	Issue Category: Monitoring, Operations and Maintenance, and Remedy Performance			
	Issue for LF003 and FT009: The 2013 FYR identified several requirements regarding monitoring, landfill operations and maintenance, and the remedy for LF003 and FT009.			
	Requirements of the 2013 FYR: Prepare a landfill Operation, Maintenance, and Inspection Plan; determine if further evaluation of environmental impacts is required given the source area's location within a wetland; continue groundwater monitoring to determine contaminant trends; re-evaluate RAOs to identify specific performance metrics and an associated approach to determine achievement of RAOs; and take administrative action to prevent uncontrolled excavation/digging or erecting buildings at the landfill.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

OU(s): OU5	Issue Category: Institutional Controls			
	Issue for LF003 and FT009: The selected remedies for these Source Areas include ICs.			
	Recommendation: Continue to implement ICs to comply with the Settlement Agreement and make programmatic changes as needed to execute the LUC IP.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

Issues and Recommendations Identified in the Five-Year Review Addendum Sitewide:

OU(s): Sitewide	Issue Category: Remedy Performance			
	Issue for SS067: PCBs were detected at concentrations exceeding the ROD cleanup goal in subsurface soil at SS067, so further removal actions are required to fully implement the ROD.			
	Requirement: Implement the ROD, which includes removal of soil/sediment with PCB concentrations above 10 parts per million, long-term monitoring, and fish sampling.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	USAF	EPA/ADEC	September 2018

OU(s): Sitewide	Issue Category: Changed Site Conditions			
	Issue for SS067: Lateral delineation of PCBs in surface soil and sediment are incomplete, and the results of the delineation investigation may require changes to the site boundaries.			
	Requirement: Based on the findings of the Supplemental SRI, update the site boundaries.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	No	USAF	EPA/ADEC	September 2018

Assessment of Protectiveness Statements

The protectiveness statements for OUs 1, 2, 3, 4, and 5 and the Sitewide OU were evaluated based on new information and/or actions taken since the 2013 FYR completion date of February 2014. Following are the findings of the protectiveness statements assessment.

Operable Unit 1: ST020 and ST048

The 2013 FYR report concluded that the remedy for OU1 was not protective currently or in the future. There are no changes to these protectiveness determinations due to outstanding issues at the OU1 Source Areas.

For the individual sites, the protectiveness determinations for ST020 and ST048 are deferred, as noted in the 2013 FYR report and CSM Updates, until their VI pathways have been evaluated. The VI Assessment for ST020 was deferred from the scope of the CSM Update and is being performed under a separate task. An evaluation of the VI pathway for ST020 was recommended in the 2013 FYR report.

The VI pathway evaluation for ST048 was performed in Summer and Winter of 2013 and the report for this is pending. Ongoing in 2014, and in the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs. The ICs will be maintained per the requirements of the 2013 Settlement Agreement among ADEC, EPA, and USAF.

Operable Unit 2: ST010, SS014, ST013, and DP026

The 2013 FYR report deferred the current protectiveness determination for the remedy for OU2 and concluded that the remedy was not protective in the future. There is no change to this overall protectiveness determination due to outstanding issues at the OU2 Source Areas.

For the individual sites, the current protectiveness determination for the remedy for Source Areas ST010 and SS014 is deferred. The 2014 CSM Update addressed the critical data gaps at these Source Areas; however, a protectiveness determination cannot be made until the full assessment of the VI pathway is complete. The future protectiveness determination is also deferred pending the results of an assessment of the cleanup levels to determine if the lower ADEC standards should be established as site remediation goals for ST010 and SS014.

For Source Areas ST013 and DP026, a determination regarding current protectiveness is deferred and the remedy was determined to be not protective in the future. The current protectiveness determination is deferred until completion of the VI pathway evaluation at these Source Areas. Critical data gaps remain at these two Source Areas, resulting in the determination that the remedy is not protective in the future.

In the interim, soil and groundwater exposure pathways that could result in unacceptable risks at the OU2 Source Areas included in this assessment are being controlled through the implementation of ICs. The ICs will be maintained per the requirements of the 2013 Settlement Agreement among ADEC, EPA, and USAF.

Operable Unit 3: WP045 and SS057

The 2013 FYR report concluded that the remedy for OU3 was not protective currently or in the future. There are no changes to these protectiveness determinations because the full assessment of the VI pathway at WP045 and SS057 has not been completed yet and because of the need to address the sources of Chloroform and Freon 12 in sub-slab air, as their origins have not been determined. However, in the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs. The ICs will be maintained per the requirements of the 2013 Settlement Agreement among ADEC, EPA, and USAF.

Operable Unit 4: SS035 and SS037

The 2013 FYR report concluded that the remedy for OU4 was not protective currently or in the future. This determination was based on data gaps that were identified at SS035 in surface water, soil, and sediment. Although the recent investigation provided additional data, there are no changes to the protectiveness determinations because data gaps, especially related to the COCs associated with the buried drums indicated by the geophysical survey and the source of the PCB contamination, remain at SS035. Data gaps were also identified at SS037 in relation to the VI pathway and the extent of fuel-contaminated soil at the source area. However, in the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the implementation of ICs. The ICs will be maintained per the requirements of the 2013 Settlement Agreement among ADEC, EPA, and USAF.

Operable Unit 5: LF003 and FT009

The 2013 FYR report deferred the current protectiveness determination for the remedy for OU5 and concluded that the remedy was not protective in the future. As part of the CSM Update, a VI study was conducted in 2013 at Building 4371 to investigate sub-slab soil-gas and indoor air for TCE, naphthalene, and mercury as COPCs. Results did not detect the COPCs above screening levels for sub-slab soil-gas, except for one low-level mercury detection (estimated). Mercury exceeding the screening level in two samples for indoor air. The conclusions were that the mercury detections were the result of indoor air sources and not from subsurface contamination. However, based on groundwater flow direction, the benzene plume on the east side of LF003 appears to have migrated towards Building 4371 but there are no sampling data that bound the plume between the source and the building. Inhalation of contaminated outdoor and indoor air is considered a possible exposure risk and remains a potential exposure pathway as the COCs are volatile and have been detected within 15 feet of the ground surface.

Additionally, the use of aqueous film-forming foam, which includes perfluorinated compounds, is not discussed in previous investigations at FT009, and this Source Area has not been investigated for dioxins, a byproduct of combustion.

The OU5 protectiveness determinations cannot be reassessed until the VI pathway assessment is completed and until the data gaps identified in this Addendum associated with the former use of LF003/FT009 for fire training exercises are evaluated. In the interim, soil and groundwater exposure pathways that could result in unacceptable risks are being controlled through the

implementation of ICs. The ICs will be maintained per the requirements of the 2013 Settlement Agreement among ADEC, EPA, and USAF.

Sitewide Operable Unit: SS067

The 2013 FYR report concluded that the remedy for the Sitewide OU was protective currently but that it was not protective in the future. The basis for the not protective determination was that the fish tissue RAO had not been achieved and that the distribution of PCBs within Garrison Slough sediment had not been fully characterized.

The Sitewide OU protectiveness determinations cannot be reassessed until the following actions are completed: additional years of fish tissue data are evaluated; data gaps associated with the extent of PCBs in surface soil and sediment are addressed; and a partial removal action to address PCB-contaminated subsurface soil is performed. In the interim, exposure pathways that could result in unacceptable risks are being controlled through the implementation of ECs and ICs. These controls will be maintained per the requirements of the 2013 Settlement Agreement among ADEC, EPA, and USAF.

Protectiveness Summary

There were no changes to the overall OU protectiveness statements included in the 2013 FYR report. Changes to the protectiveness statements for the individual Source Areas are detailed above.

Next Five-Year Review

The next FYR will be completed on 28 September 2018, 5 years after the signature of the 2013 FYR report.

Michael P. Winkler
Colonel, US Air Force
Commander

Date_____

Attachment:

Site Summary Report, Eielson Air Force Base, Alaska. March 2015.