

F1 to F4

[2015 Field Validations of the F2:F3b Ratio and BOC-adjusted PHC F3 Calculation for Resolving False Detections of Crude Oil and Diesel Petroleum Hydrocarbons in Clean Soils](#)

- [2009 UoW_DRAFT Part 1 Biogenic Petrogenic F3a F3b DRAFT Report](#)
- [2009 UoW_DRAFT BiogenicPetrogenicF3aF3bDRAFTReport](#)
- [2012 University of Waterloo_Petroleum Index Presentation](#)
- [2016 CH2M_ Field Validations of PHC Fractions F2 and F3](#)

[2013 Proposed Management Limits for F2 and F3 Hydrocarbons at Remote Alberta Green Zone Sites](#)

- [2013 MEMS and AITF_Green Zone Presentation](#)
- [2013 MEMS and AITF_Proposed Management Limits for F2 and F3 Petroleum Hydrocarbons at Remote Alberta Green Zone Sites](#)

[2013 Subsoil Guidelines for Green Zone Sites, Proposed Exclusion Depths for the Ecological Direct Contact Exposure Pathway at Remote Alberta Green Zone Sites](#)

- [2013 MEMS and AITF_ReportAlberta Green Zone Rooting Depth Study](#)

[2013 Residual Saturation, Fire/Explosion Hazard and Hydrophobicity](#)

- [2013 AITF_Residual Saturation Fire Explosion Report](#)

[2012 Validation of Petroleum Hydrocarbon Stratified Remediation Subsoil Criteria](#)

- [2012 AITF_Validation of Petroleum Hydrocarbon Stratified Remediation Subsoil Criteria Report](#)
- [2013 AITF_Validation of PHC Stratified Remediation Subsoil Criteria Presentation](#)

2011 Validation of Petroleum Hydrocarbon Stratified Remediation Subsoil Criteria

- 2010 AITF_Validation of Subsoil Hydrocarbon Criteria for Stratified Remediation Report
- 2011 AITF_Validation of Petroleum Hydrocarbon Stratified Remediation Subsoil Criteria Report

2011 Standardization of an Analytical Method to Differentiate Petrogenic and Biogenic Inputs in Contaminated and Background Soils

- 2009 UoW and Env Canada_Biogenic Presentation
- 2012 Env Canada__Standardization of an Analytical Method to Differentiate Petrogenic and Biogenic Inputs in Contaminated and Background Soils_Report
- 2012 ENV Canada_Analytical Method to Differentiate Petrogenic and Biogenic Inputs Report

2011 Utilizing Carbon Ranges, Unresolved Complex Mixtures and Carbon Preference Index Signatures as a New Tool for Quantifying Biogenic vs. Petrogenic Hydrocarbons in Soils Contaminated with Heavy Petroleum Products

- 2010 UofWaterloo_Oil Contaminated Soil from Background_Presentation
- 2013 UoWaterloo_Publication_IS IT CLEAN OR CONTAMINATED SOIL Report
- 2013 UoWaterloo_Publication_IS IT CLEAN OR CONTAMINATED SOIL_Tables
- 2013 UoWaterloo_IS IT CLEAN OR CONTAMINATED SOIL_Figures

2010 Evaluating the Ecotoxicity of PHC F3 in Peat Soils versus Mineral Soils

2010 Weathered PHC F2 and the Eco-Contact Pathway, Phase 2, Effects of Soil Texture

- 2012 Axiom_Weathered F2 Eco-Contact Guideline Report 2010 Axiom_Weathered PHC F2 and the Eco-Contact

Pathway_Phase I Report

2009 Paragon Soil Comprehensive Literature Review on effect of Petroleum Hydrocarbons (PHC) on soil invertebrates with a focus on sub-soils below 1.5 m in both agricultural and natural areas in Alberta

- 2010 AITF and Paragon_Stratified Approach Soil Remediation Presentation

2009 Distinguishing Natural vs Petroleum F3 Hydrocarbons in Diesel Invert Biopiles

- 2009 UoW_Distinguishing Natural vs F3 Presentation

2009 Application of Different Measures of Bioavailability to Support the Derivation of Risk-Based (Tiers 2 or 3) Remedial Benchmarks for PHC-Contaminated Sites

- 2009_910651 PTAC Progress Report
- 2009 Stantec_Bioavailability Presentation
- 2010 Stantec_RiskBased Remedial Benchmarks for PHC Presentation

2008 Weathered PHC F2 and the Eco-Contact Pathway – Phase 1 – Quantifying the Effects of Weathering

- 2008 AENV_Draft Tier 2 Soil Ecocontact Guidelines PHC Presentation
- 2009 BodyCote and Axiom_Weathered PHC F2_Phase 1 Presentation
- 2009 Stantec_Weathered F2_Phase 1 Report
- 2010 Axiom_Weathered PHC F2 and EcoContact Pathway_Phase 2 Presentation
- 2012 Stantec_Weathered F2_Phase 2 Report

2008 Validation of Subsoil Hydrocarbon Criteria for Stratified Remediation at Upstream Oil and Gas Facilities in Alberta: Field Study

- [2010 AITF and Paragon_Stratified Approach Soil Remediation Presentation](#)

[2007 Validation of Subsoil Hydrocarbon Criteria for Stratified Remediation at Upstream Oil and Gas Facilities in Alberta](#)

- [2008 AITF and Paragon_Stratified Approach Soil Remediation Presentation](#)

[2007 Environmentally Acceptable Endpoints for Weathered/Aged \(Residual\) Petroleum Hydrocarbons CCME CWS Fraction F3 in Soil, Phase 3](#)

- [2007 Axiom_ENVIRONMENTALLY ACCEPTABLE ENDPOINTS FOR WEATHERED:AGED PETROLEUM HYDROCARBON FRACTION F3 Report](#)
- [2007 Worley_Bioremediation of Weathered Petroleum Hydrocarbons_Literature Review](#)

[2007 Distinguishing Natural vs Petroleum F3 Hydrocarbons in Oil Spill Impacted Muskeg Material](#)

- [2007 UofWaterloo_Natural vs F3 in Oil Spill Impacted Muskeg Project Scope](#)
- [2007 UofWaterloo_Natural vs F3 in Oil Spill Impacted Muskeg Presentation](#)

[2006 Field-Scale Assessments of the Phytoremediation of Weathered Hydrocarbons in Soil](#)

- [2006 UoS_Phytoremediation in SK Report Yr 4](#)
- [2006 UoS_Phytoremediation in SK Presentation Yr 4](#)
- [2007 UoS_Phytoremediation in SK Project Update](#)

[2006 Ecotoxicity Evaluation of Composted Site and Reference Soils Contaminated Predominantly with PHCs and Arsenic](#)

- [2006 Stantec_ECOTOXICITY EVALUATION OF SOILS CONTAMINATED WITH PHCS AND ARSENIC](#)
- [2006 WorleyParsons_Bioremediation of F3 Presentation](#)

[2006 Assessment and Refinement of Ecotoxicity Methods for](#)

Development of Tier 2 Soil Eco-contact Standards and Application to Site-specific Risk Assessments (Tier 3)

- 2007 Stantec_Tier 2 Soil EcoContact Site Specific Risk Assessments Presentation

2005 Environmentally Acceptable Endpoints for Weathered/Aged (Residual) Petroleum Hydrocarbons CCME CWS Fraction F3 in Soil, Phase 2

- 2005 Matrix and Axiom_Acceptable Endpoints for PHC Fraction F3 Presentation
- 2005 Axiom_ENVIRONMENTALLY ACCEPTABLE ENDPOINTS FOR F3 Presentation

2005 Investigations into the Fraction-specific Toxicity of PHC in Soil: Evaluation of the Toxicity of Fraction F3 on the Exposure, Uptake and Toxicity of Individual and Binary Mixtures of CCME PHC Fractions

- Stantec and UoWaterloo_PHC Fraction 3 Phase 3 Presentation
- 2005 Stantec_CCME F3 Binary Yr 2 Presentation
- 2006 Stantec and UoWaterloo_F3 Report

2005 Summary of Chronic Screening Toxicity Test Results with Reference Soils and Soils Contaminated with Petroleum Hydrocarbon Residuals

- 2005 Stantec_Toxicity Tests with Soils Contaminated with Petroleum Hydrocarbon Residuals Report

2005 PHC CWS Ecotoxicity Data Compilation and Analysis

- 2001 UMA and Komex_Petroleum Hydrocarbon CanadaWide Standards
- 2005 Axiom_PHC CWS ECOTOXICITY DATA_Report
- Norwest_Validation of the Alternate CCME method_Project Proposal

2005 Ecotoxicity Risk Assessment of Hydrocarbon Residuals in Bioremediated Oil-Contaminated Clay Soils

- 2003 ERAC_Ecotoxicity Risk Assessment of PHC in Clay Matrix_PHC Bioremediated Oil Contaminated Clay Soil
- 2003 Matrix_Petroleum Hydrocarbons to Soil Organisms_Phase 3 Final Report
- 2005 Matrix_F3 Presentation

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- 2005 UoWaterloo_Phytoremediation_Part 1
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- 2005 UoWaterloo_Phytoremediation_Part 3
- 2005 UoWaterloo_Phytoremediation_Part 4

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- 2004 EAE CWS PHC F3 in Soil_Project Scope
- 2004 EAE CWS PHC F3 in Soil_Letter
- 2004 Axiom_Environmentally Acceptable Endpoints for Fraction 3 Report

2004 Compost amendment of oil field waste to remediate high concentrations of petroleum hydrocarbons F3 and F4 fractions

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- 2002 Gladys_Tier 2 Site Specific Development of Soil Contact Cleanup Standards for PHC Contaminated Sites Presentation
- 2003 Stantec_Framework for Tier 2 Presentation
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- 2005 Stantec_Toxicity Tests with Soils Contaminated with Petroleum Hydrocarbon Residuals Report

2003 Toxicity of Petroleum Hydrocarbons to Soil Organisms and the Effect on Soil Quality, Field Studies, Phase 2

- 2003 Matrix and Stantec_Petroleum Hydrocarbons to Soil Organisms_Phase 2 Field Studies
- 2003 Matrix and Stantec_Toxicity and Guideline Development for Crude Oil_Phase 2 and 3_Presentation
- 2003 Matrix_Petroleum Hydrocarbons to Soil Organisms_Phase 3 Final Report
- 2003 EBA_Environmentally Acceptable Endpoints for F3 Presentation

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- 2003 Stantec and Matrix_TOXICITY OF PHCs TO SOIL ORGANISMS AND THE EFFECTS ON SOIL QUALITY, PHASE 1_Report

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- [2002 ARC_Phytoremediation to Enhance Hydrocarbon Remediation in Landfarms](#)
- [2004 UoS_Phytoremediation_Presentation](#)

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- [2000 Komex_Constructed Wetlands for Treatment of Condensate Presentation](#)
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- [2002_Constructed Wetlands for Hydrocarbon Removal ERAC Update](#)
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- 2003 Matrix and Stantec_Toxicity and Guideline Development for Crude Oil_Phase 2 and 3_Presentation
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