

F1 to F4

2018-2019 Re-Evaluation of F2 and F3 Petroleum Hydrocarbon Management Limits – Phase I and II

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

2005 Case Study Analysis on Phytoremediation across Canada

- 2005 Imperial_Phytoremediation of Salt Sites
- 2005 UoWaterloo_Phytoremediation_Part 1
- 2005 UoWaterloo_Phytoremediation_Part 2
- 2005 UoWaterloo_Phytoremediation_Part 3
- 2005 UoWaterloo_Phytoremediation_Part 4

2004 Environmentally Acceptable Endpoints (EAE) of CCME Canada-Wide Standards (CWS) Petroleum Hydrocarbons Fraction F3 for Weathered Petroleum Hydrocarbons in Soil, Phase 1

- 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 CCME Fraction 3 – Gap Study

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

2003 Framework Foundation and Guidance for Tier 2 Site-Specific Development of Soil Contact Cleanup Standards for PHC-contaminated sites

- 2001_ERAC Framework Foundation for Tier 2 Soil Contact Cleanup Standards for PHC Contaminated Sites
- 2002 Gladys_Tier 2 Site Specific Development of Soil Contact Cleanup Standards for PHC Contaminated Sites Presentation
- 2003 Stantec_Framework for Tier 2 Presentation
- 2003 Stantec_Tier 2 Site Specific Development of Soil Contact Cleanup Standards for PHC Presentation
- 2003 Stantec_FRAMEWORK AND GUIDANCE FOR TOXICITY ASSESSMENT OF CONTAMINATED LANDS Report
- 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

2003 Toxicity of Petroleum Hydrocarbons to Soil

Organisms and the Effect on Soil Quality, Fraction-Specific Toxicity of Crude Oil, Phase 1

- Matrix and Stantec_Toxicity and Guideline Development for Crude Oil_Phase 1_Field Studies Presentation
- 2003 Stantec and Matrix_TOXICITY OF PHCs TO SOIL ORGANISMS AND THE EFFECTS ON SOIL QUALITY, PHASE 1_Report

2003 Comparison of the Soil Ecotoxicity of the Light and Heavy Ends of Fraction 3

- 2003 ERAC_Soil EcoToxicity of PHC F3 Fraction
- Stantec_Soil Test Methods for Assessing Toxicity in Contaminated Soil Presentation
- Stantec_Soil Ecotoxicity of Fraction 3 Presentation

2002 Field-Scale Assessments of the Phytoremediation of Weathered Hydrocarbons in Soil

- 2001 Germida & Farrell_Phyto Proposal
- 2002 UoS_Phytoremediation_Field Studies Report
- 2002 ARC_Phytoremediation to Enhance Hydrocarbon Remediation in Landfarms
- 2004 UoS_Phytoremediation_Presentation

2001 Modification of plant roots to accelerate microbial degradation of hydrocarbons

2001 Treatment Of Hydrocarbon Contaminated Water Using Constructed Wetlands Phase 3

- 2004 Komex_CONSTRUCTED WETLAND PILOT PROJECT AT THE STRACHAN GAS PLANT
- 2000 Komex_Constructed Wetlands for Treatment of Condensate Presentation
- 2000 Komex_Constructed Wetlands
- 2001 Komex_Constructed Wetlands for Treatment of PHC Presentation

2001 Plant Uptake And Degradation Of Process Chemicals And Hydrocarbons in Wetlands

- 2002_Constructed Wetlands for Hydrocarbon Removal ERAC Update
- 2002 Komex_Wetlands_Field Update Presentation

2001 Monitored Natural Attenuation for Upstream Oil and Gas

- 2000 Komex_Uptake of Sulfolane by Cattails Report
- 2001 Komex_MNA Presentation
- 2001 UoA_Natural Attenuation
- 2002_Remediation by MNA_ERAC
- 2002 Komex_MNA Letter Update
- 2002 Komex_Diffusion Samplers in MNA Letter Update
- 2002 Armstrong_Assessment MNA Report
- 2003 ERAC_Remediation of PHC Site by MNA
- 2004 Komex_Sulfate Reduction_MNA
- 2004 Komex_MNA Presentation
- 2005 Komex_MNA Presentation

2001 Assessment of Phytoremediation In Situ Technique for Cleaning Oil Contaminated Sites Phase 2

- 2000 UoS_Phytoremediation as an InSitu Technique for Cleaning OilContaminated Sites_Final Report
- 2001_ERAC Phytoremediation
- 2001 UoS_Phytoremediation

2000 Assessment of Fraction Specific Toxicity and Derivation of Recommended Soil Quality Guidelines for Crude Oil in Agricultural/Grassland Soils

- 1998 Assessment of fraction specific toxicity and derivation of recommended soil quality guidelines
- 2001 Matrix and Stantec_Soil Quality Guideline for Crude Oil in Agricultural Soils_Presentation
- Matrix and Stantec_Toxicity and Guideline Development for Crude Oil_Phase 1_Field Studies Presentation
- 2003 Matrix and Stantec_Toxicity and Guideline Development for Crude Oil_Phase 2 and 3_Presentation
- Matrix and Stantec_Toxicity and Guideline Development for Crude Oil in Agricultural Soils_V2 Presentation

1999 Assessment of Phytoremediation In Situ Technique for Cleaning Oil Contaminated Sites Phase 1

- 1999 UoS_Phytoremediation Presentation
- UoS_ Database of Plants that Play a Role in the

Phytoremediation of Petroleum Hydrocarbons

- 1999 UoS_Phytoremediation as an InSitu Technique for Cleaning Oil Contaminated Sites_Report