


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p>1011</p> <p>Accredited to ISO/IEC 17025:2017</p>	Jacobs Clean Energy Ltd.	
	Analytical Services 612 Faraday Street Birchwood Park Birchwood Warrington Cheshire WA3 6GN	Issue No: 038 Issue date: 21 April 2020
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Testing performed at the above address only		

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
SEDIMENT, SOIL, CONCRETE, GEOLOGICAL MATERIALS MILK, SEWAGE SLUDGE, PLASTICS, SOFT WASTE, GRAPHITE, AQUEOUS SOLUTIONS, WATER: Natural, process, waste and potable	<u>Radiochemical Analysis</u> Tritium - ³ H	Documented In-House Method OM Pyrolysis, tritium analysis by pyrolysis and liquid scintillation
WATER: Natural, process, waste, potable and sea water	Tritium - ³ H	Documented In-House Method OM H-3 based on ISO 9698:2019 by liquid scintillation
MILK	Tritium - ³ H	Documented In-House Method OM H-3 by distillation and liquid scintillation counting
SEDIMENT, SOIL, CONCRETE, WATER: Natural, process, waste and potable	Gross alpha and beta radioactivity (thick source method) relative to: Alpha - ²³⁹ Pu, ²⁴¹ Am Beta - ¹³⁷ Cs, ⁴⁰ K	Documented In-House Method OM ABTS based on ISO 9696:2017 and ISO 9697:2017, by proportional counting
FREEZE-DRIED SEAWEED, CRUSTACEA, MOLLUSCS AND FISH	Gross beta radioactivity (thick source method) relative to: ⁴⁰ K	Documented In-House Method OM ABTS based on ISO 9697:2008 by gas-flow proportional counting
NUCLEAR POWER STATION EFFLUENT	Gross beta radioactivity relative to ¹³⁷ Cs, ³ H/ ¹³⁷ Cs, ³⁵ S/ ¹³⁷ Cs and ⁵⁵ Fe/ ³⁵ S	Documented In-House Method OM GBLSC by liquid scintillation counting
ACIDIC AQUEOUS BUBBLER SOLUTIONS	Gross beta radioactivity relative to Tritium ³ H and Sulfur - ³⁵ S	Documented In-House method OM GBBUB by liquid scintillation counting



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	<u>Radiochemical Analysis (cont'd)</u>	
ALKALINE AQUEOUS BUBBLER SOLUTIONS	Gross Beta radioactivity relative to Carbon - ¹⁴ C	Documented In-House method OM GBBUB by liquid scintillation counting
NUCLEAR POWER STATION EFFLUENT MILK, GRASS/HERBAGE	Sulfur – ³⁵ S	Documented In-House method OM S-35 by liquid scintillation counting
SWABS, SEDIMENT, SOIL, CONCRETE, BUILDING MATERIALS, GEOLOGICAL MATERIALS, WATER: Natural, process, waste and potable	Strontium - ⁹⁰ Sr	Documented In-House Method OM Sr-90 by liquid scintillation and ICP-MS (partial and full ingrowth)
LARGE SEDIMENT & SOIL SAMPLES (up to 28 g) MILK, FISH (FREEZE-DRIED) & MOSS (FREEZE-DRIED)	Strontium - ⁹⁰ Sr	Documented In-House method OM Sr-90 and OM Sample Preparation by liquid scintillation counting and ICP-MS (partial and full ingrowth)
SEDIMENT, SOIL, CONCRETE, GEOLOGICAL MATERIALS, STEEL, SWABS, WATER: Natural, process, waste and potable	Iron - ⁵⁵ Fe	Documented In-House Method OM Fe-55 by liquid scintillation
SOIL, CONCRETE, STEEL, SWABS, WATER: Natural, process, waste and potable	Nickel - ⁶³ Ni	Documented In-House Methods OM Ni-63 & OM ICPMS Ni63 by liquid scintillation and ICP-MS
CONCRETE, PAPER SWABS, SODIUM CARBONATE SOLUTION, AQUEOUS SOLUTIONS, MILK, WATER: Natural, process, waste and potable	Carbon - ¹⁴ C	Documented In-House Method OM Pyrolysis by liquid scintillation counting of Beta radioactivity
FISH (FREEZE-DRIED), GRASS and HERBAGE	Carbon - ¹⁴ C	Documented In House Method OM Pyrolysis by Pyrolysis and Liquid Scintillation
SOIL	Carbon - ¹⁴ C	Documented In House Method OM Pyrolysis by Pyrolysis and Liquid Scintillation



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SEDIMENT, SOIL, CONCRETE, GEOLOGICAL MATERIALS, SEAFOOD, WATER: Natural, process, waste and potable	<u>Radiochemical Analysis (cont'd)</u> Technetium - ⁹⁹ Tc	Documented In-House Methods OM Tc-99 Solid, OM Tc-99 Water, OM ICPMS Tc99 by ICP-MS
	<u>Determination of alpha emitting radionuclides</u>	
SEDIMENT, SOIL, CONCRETE, GEOLOGICAL MATERIALS, WATER: Natural, process, waste and potable	Natural Uranium isotopes ²³⁸ U, ²³⁵ U, ²³⁴ U	Documented In-House Method OM U and OM AS by alpha spectrometry
SEDIMENT, SOIL, CONCRETE, GEOLOGICAL MATERIALS, WATER: Natural, process, waste and potable	Recycled Uranium isotopes ²³⁸ U, ²³⁶ U, ²³⁵ U, ²³⁴ U, ²³³ U, ²³² U	Documented In-House Method OM U, OM AS and OM ICPMS-URECYC by alpha spectrometry and ICP-MS
SWABS, SEDIMENT, SOIL, CONCRETE, GEOLOGICAL MATERIALS, WATER: Natural, process, waste and potable	<u>Non-Uranic Actinides</u> Americium - ²⁴¹ Am Curium - ²⁴² Cm, ²⁴³⁺²⁴⁴ Cm Plutonium - ²³⁹⁺²⁴⁰ Pu, ²³⁸ Pu, ²⁴¹ Pu, ²⁴² Pu Thorium - ²³² Th, ²³⁰ Th, ²²⁸ Th	Documented In-House Method OM ACT and OM AS by alpha spectrometry and liquid scintillation
FISH (FREEZE-DRIED) AND MILK	Americium – ²⁴¹ Am	Documented In-House Methods OM ACT and OM AS by alpha spectrometry
FISH (FREEZE-DRIED) AND MILK	Plutonium – ²³⁹⁺²⁴⁰ Pu, ²³⁸ Pu, ²⁴² Pu	Documented In-House Methods OM ACT and OM AS by alpha spectrometry
ENVIRONMENTAL SAMPLES (Water, aqueous solutions, leachates, biota, air filters, soils, sediment and geological materials)	<u>Gamma Emitting Nuclides</u> Gamma Spectrometry (Energy Range: 60 keV to 2 MeV)	Documented In-House Methods OM GSSP, OM GSSOP and OM GS
FOODSTUFFS	Gamma Spectrometry (Energy Range: 60 keV to 2 MeV)	Documented In-House Methods OM GSSP, OM GSSOP and OM GS
NON-ENVIRONMENTAL SOLIDS AND LIQUIDS	Gamma Spectrometry (Energy Range: 60 keV to 2 MeV) (up to density: 2.5 g cm ⁻³)	Documented In-House Methods OM GSSP, OM GSSOP and OM GS
END		