

# Schedule of Accreditation



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| Organisation Name                             | Marine Institute  |
| Trading As                                    |   |
| INAB Reg No                                   | 130T  |
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| Accreditation Standard                        | EN ISO/IEC 17025 T  |
| Standard Version                              | 2017  |
| Date of award of accreditation                | 01/07/2002  |
| Scope Classification                          | Biological and veterinary testing   |
| Scope Classification                          | Chemical testing  |
| Services available to the public <sup>1</sup> | No  |

<sup>1</sup> Refer to document on interpreting INAB Scopes of Accreditation

| Sites from which accredited services are delivered   |                               |                            |
|--|-------------------------------|----------------------------|
| (the detail of the accredited services delivered at each site are on the Scope of Accreditation) |                               |                            |
|  |                               |                            |
|  | Name                          | Address                    |
| 1  | Marine Institute Headquarters | Rinvilla, Oranmore, Galway |

# Scope of Accreditation

## Marine Institute Headquarters

### Biological and Veterinary Testing

Category: A

| Biology/veterinary field - Tests   | Test name  | Technique  | Matrix                       | Equipment  | Std. reference   |
|--|--|--|------------------------------|--|--|
| 802 Preparation of films on slides followed by microscopic examination with or without fixation and staining with dyes as required - .02 Microscopic examination for parasites                     | FHU-106 Monitoring for Gyrodactylus salaris  | Microscopic identification of proteinase-K digested gyrodactylid parasites, removed from finfish fins. Range: present/absent   | Fish                         | Binocular Stereo dissection microscope<br>Light microscope | Laboratory SOP FHU-106. Based on OIE Manual of Diagnostic Tests for Aquatic Animals Chapter 2.3.3, in accordance with Commission Implementing decision (EU) 2021/60  |
| 802 Preparation of films on slides followed by microscopic examination with or without fixation and staining with dyes as required - .05 Microscopic examination for constituents of animal origin | FHU-095 Screening of histology from Ostrea edulis for the presence/absence of Marteilia refringens | Preparation of stained histological slides and screening of slides for the presence or absence of the protistan parasite Marteilia refringens the causative agent of Marteiliiosis (Aber disease) in the flat oyster Ostrea edulis | Molluscs (Oysters)           | Binocular microscope, tissue processor, slide stainer      | Laboratory SOP FHU-95 and FHU-86. Based on methods laid down in EURL diagnostic manuals and procedures. and in the OIE Manual of Diagnostic Tests for Aquatic Animals in accordance with Commission delegated Regulation (EU) 2020/689 |
| 803 Culture of organisms in liquid or agar based culture media with visual or instrument monitoring for  | MIC-006 Escherichia coli Enumeration in Molluscan Bivalve Shellfish                                | Most probable number test for enumeration of Escherichia coli in Molluscan Bivalve Shellfish   | Fish, Shellfish and molluscs | Cultures Incubator<br>Most probable number technique       | Laboratory SOP MIC-06. Based on ISO 16649-3 Microbiology of food and foodstuffs – Horizontal method for the enumeration  |

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| growth - .01 Culture of bacteria   |  |  |                              | for enumeration of Escherichia coli | of $\beta$ glucuronidase-positive Escherichia coli – Part 3. Most probable number techniques using 5-bromo-4-chloro-3-indolyl- $\beta$ -Dglucuronide.   |
| 805 Detection and/or identification of bacterial, parasite, fungal and viral nucleic acids using appropriate techniques - .03 Nucleic acid amplification tests, CE marked commercial systems | MBU-004 Detection of norovirus genogroups I and II bivalve shellfish               | Detection of norovirus genogroups I and II bivalve shellfish by real-time reverse transcription polymerase chain reaction (RT- PCR Instrument). Range: 100 to $2 \times 10^7$ genome copies/g of shellfish hepatopancreas tissue                           | Fish, shellfish and molluscs | Real-Time PCR Instrument            | Laboratory SOP MBU-4. Based on ISO 15216-1:2017   |
|  | MBU-110 Detection of hepatitis A virus bivalve shellfish                           | Detection of hepatitis A virus in bivalve shellfish by real-time reverse transcription polymerase chain reaction (RT- PCR). Range: Detected/ Not detected.   | Fish, shellfish and molluscs | Real-Time PCR Instrument            | laboratory SOP MBU-110. Based on ISO 15216-2:2019.  |
| 805 Detection and/or identification of bacterial, parasite, fungal and viral nucleic acids using appropriate techniques - .04 Nucleic acid amplification tests, in house developed assays    | Detection of specified DNA-based pathogens using real-time Probe-based PCR (rtPCR) | Koi Herpesvirus (KHV)<br>Renibacterium salmoninarum (BKD)<br>Gyrodactylus salaris<br>Ostreid herpes virus 1 (OsHV-1)<br>Whitespot syndrome virus (WSSV)<br>Mareilia refringens<br>Detection by real-time Probe-based PCR (rtPCR). Range: positive/negative | FinFish, Shellfish, Molluscs | Real-time PCR instrument            | Laboratory SOP MBU-125 based on EURL finfish, Molluscan and Crustacea diagnostic manuals; WOA (OIE) Diagnostic manuals. Regulation (EU) 2016/429, Commission Delegated Regulation (EU) 2020/689, Commission Implementing Decision (EU) 2021/260 |
|  | MBU-067 Detection of Infectious Salmon Anaemia in Salmonid Fish Tissue             | Detection of Infectious Salmon Anaemia virus in Salmonid Tissue by real-time PCR. Range: positive/negative   | Fish                         | Real-Time PCR Instrument            | Laboratory SOP MBU-67. Based on method outlined in Snow et al., 2006. Developments in Biologicals (Basel) 126, 133-145 and EURL diagnostic manuals and procedures in accordance with commission delegated Regulation (EU) 2020/689              |

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| 810 Culture of virus and other obligate intracellular pathogens using in vivo or in vitro techniques | FHU-065 Virological examination of samples for the presence of Viral Haemorrhagic Septicaemia (VHS), Infectious Haematopoietic Necrosis (IHN), Infectious Pancreatic Necrosis (IPN) and Spring Viraemia of Carp (SVC) in Finfish. | Screening Finish for VHSV, IHN, IPNV and SVCV by cell culture.<br>Range: positive/negative   | Fish   | Tissue Homogeniser<br>Microscope,<br>ELISA Plate Reader       | Laboratory SOP FHU-65. Based on Commission delegated Regulation (EU) 2020/689 and EURL diagnostics manuals and procedures and the OIE Manual of Diagnostic Tests for Aquatic Animals Chapter 2.3.9.                                   |
| 820 Miscellaneous  | FHU-086 and FHU-087 Preparation and Screening of heart imprints from <i>Ostrea edulis</i> for the presence of <i>Bonamia ostreae</i>  | Histological and microscopic preparation and examination of slides   | Molluscs (Oysters)   | Binocular microscope, downdraft, fumehood                     | Laboratory SOP FHU-87 and FHU-86. Based on methods laid down in EURL diagnostic manuals and procedures and in the OIE Manual of Diagnostic Tests for Aquatic Animals in accordance with Commission delegated regulation (EU) 2020/689 |
|  | PHY-009 Phytoplankton Test Identification and enumeration of Phytoplankton  | Phytoplankton Test Identification and enumeration of Phytoplankton by the Utermöhl Cell Counting Method<br>Range: 40 cells/l upwards (see appendix 1 for details list) | Biota: Species list:<br>Toxic species – PSP Toxin Producers (Saxitoxins) (Also linked to fish mortalities)<br>Alexandrium tamarense<br>Alexandrium minutum<br>Alexandrium ostenfeldii<br>Alexandrium spp.<br>Alexandrium cysts<br>Toxic species – DSP Toxin Producers (Okadaic acid, DTX's, Pectenotoxins)<br>Dinophysis acuminata<br>Dinophysis acuta<br>Dinophysis caudata | Utermöhl Cell counting method using Inverted light microscope | Laboratory SOP PHY-9. Based on EN15204:2007 and EU Directive 853/2004.  |

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|  |  |  | Dinophysis dens<br>Dinophysis fortii<br>Dinophysis hastata<br>Dinophysis miles<br>Dinophysis mitra<br>Dinophysis<br>mucronata<br>Dinophysis nasutum<br>Dinophysis norvegica<br>Dinophysis ovum<br>Dinophysis parva<br>Dinophysis pulchella<br>Dinophysis rotundata<br>Dinophysis sacculus<br>Dinophysis tripos<br>Dinophysis sp.<br>Prorocentrum lima<br>Prorocentrum<br>minimum/balticum<br>Phalacroma rapa<br>Phalacroma spp.<br>Toxic species. - ASP<br>Toxin Producers<br>(Domoic Acid)<br>Pseudo-nitzschia<br>delicatissima group <<br>3 µm<br>Pseudo-nitzschia<br>seriata group >3 µm<br>Toxic species. –<br>Yessotoxins, Homo-<br>yessotoxin producers<br>Lingulodinium<br>polyedrum<br>Protoceratium<br>reticulatum<br>Gonyaulax spinifera<br>Dinophysis sacculus<br>Dinophysis tripos<br>Dinophysis sp.<br>Prorocentrum lima<br>Prorocentrum<br>minimum/balticum<br>Phalacroma rapa |  |  |
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|  |  |  | Phalacroma spp. |  |  |
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## Chemical Testing

Category: A

| Chemistry Field - Tests                                       | Test name   | Analyte  | Range of measurement  | Matrix  | Equipment/technique                              | Standard reference/SOP   |
|---|---|--|---|---|--|--|
| 751 Food testing - .03 Compositional analysis                 | CHE-052 Determination of Moisture content in Marine Biota                                       | Moisture   | Range: Moisture Content: 2.0%-90%   | Fish, Shellfish and molluscs (marine biota)                                   | Moisture content by oven determination           | Laboratory SOP CHE-52. Based on the AOAC official method for moisture in Meat, official methods of analysis of AOAC International.   |
| 752 Chemical residue testing - .01 Drugs and drug metabolites | CHE-008 Screening and Confirmatory Chemical Test of Ivermectin and Emamectin B1a and Doramectin | Ivermectin and Emamectin B1a and Doramectin  | Range: Ivermectin: 0.2-300 ngg-1<br>Emamectin B1a: 29-1000 ngg-1<br>Doramectin: 0.2-300 ngg-1   | Fin Fish - skin and muscle in natural proportions                             | UPLC   | Laboratory SOP CHE-8. Based on Laboratory developed methods for the analysis of Ivermectin and Emamectin B1a and Doramectin by UPLC  |
|   | CHE-220 CHE-220 Analysis of Antibiotics by LCMSMS (semi and full quantitative confirmatory )    | Quinolones<br>Ciprofloxacin<br>Danofloxacin<br>Difloxacin<br>Enrofloxacin<br>Flumequine<br>Marbofloxacin<br>Nalidixic acid<br>Norfloxacin<br>Oxolinic acid<br>Sarafloxacin<br>Sulphonamides<br>Sulfachloropyridazine<br>Sulfadiazine<br>Sulfadimethoxine<br>Sulfadoxine<br>Sulfaguanidine<br>Sulfamerazine<br>Sulfamethazine | 5-400 µg/kg<br>10-800 µg/kg<br>30-2400 µg/kg<br>5-400 µg/kg<br>60-4800 µg/kg<br>10-800 µg/kg<br>10-800 µg/kg<br>10-800 µg/kg<br>10-800 µg/kg<br>3-240 µg/kg<br>10-800 µg/kg<br>5-400 µg/kg<br>10-800 µg/kg<br>10-800 µg/kg<br>5-400 µg/kg<br>5-400 µg/kg<br>5-400 µg/kg<br>5-400 µg/kg<br>5-400 µg/kg | fin-fish matrices, skin and muscle in natural proportions, and prawn matrices | LCMSMS (Liquid Chromatography Mass Spectrometry) | Laboratory SOP CHE-220. The development and validation of a multiclass LC_MS/MS procedure for the determination of veterinary drug residues in animal tissue using a QUECHERS approach. Analytica Chimica Acta 637 ( 2009),68-78 |

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|  |   | Sulfamethizole<br>Sulfamethoxazole<br>Sulfamethoxypyridazine<br>Sulfamonomethoxine<br>Sulfapyridine<br>Sulfaquinoxaline<br>Sulfathiazole<br>Sulfisoxazole<br>Sulfacetamide<br>Sulfameter<br>Sulfamoxole<br>Sulfisomidine<br>Sulfatroxazole<br>Sulfachloropyrazine<br>Sulfaethoxypyrazine<br>Sulfasalazine<br>Sulfabenzamide<br>Sulfaphenazole<br>Tetracyclines<br>Chlortetracycline<br>Demeclocycline<br>Doxycycline<br>4-epi-Chlortetracycline<br>4-epi-Oxytetracycline<br>4-epi-Tetracycline<br>Oxytetracycline<br>Tetracycline Other<br>Trimethoprim<br>Dapsone | 5-400 µg/kg<br>0.5-40 µg/kg   |  |  |  |
|  | CHE-233 Analysis of Dyes by Thermo LCMSMS | Malachite green,<br>Crystal Violet, Victoria Blue, Leuco Crystal Violet, Leuco Malachite Green, Brilliant Green  | Confirmatory method: Qualitative & Quantitative Analysis<br><br>Quantitative Range: 0.2- 8 µg/kg<br><br>Qualitative Range: determination at lowest calibration level 0.20 µg/kg | Finfish muscle and skin in natural proportions | LCMSMS (Liquid Chromatography Mass Spectrometry) | Laboratory SOP CHE-233.<br>Based on the Journal of Chromatography/A/2011 Vol 1218, NUMB 12, pages 1632-1645 with adaptations |



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| 752 Chemical residue testing - .02 Elements             | CHE-032 Screening and Confirmatory Chemical test Mercury                                   | Mercury  | Range: 0.007-50 mg.kg-1 wet weight  | Fish, Shellfish and molluscs (marine biota)               | Cold Vapour-Atomic Fluorescence Spectrometry   | Laboratory SOP CHE-32 Digestion Method. Based on Hatch and Ott, 1968. Analytical method for determination of total mercury based on manufacturers recommendations (PS Analytical).                                |
|   | CHE-178 Screening and Confirmatory Analysis of trace metals in marine biota                | As, Cd, Cu, Pb, Zn   | Range: As 0.002 - 200 mg/kg ww<br>Cd 0.002 – 200 mg/kg ww<br>Cu 0.01 - 200 mg/kg ww<br>Pb 0.02 - 200 mg/kg ww<br>Zn 0.14 – 500 mg/kg ww | Fish, Shellfish and molluscs (marine biota)               | Inductively coupled plasma - Mass Spectrometry | Laboratory SOP CHE-178 Digestion method based on in-house developed method and ICPMS manufacturer recommendations   |
| 752 Chemical residue testing - .04 Pesticide residues   | CHE-215 Quantitative Screening Analysis of Cypermethrin and Deltamethrin in farmed finfish | Quantitative Screening Analysis of Cypermethrin and Deltamethrin                               | Cypermethrin 25-400 ug/kg. Deltamethrin 5-80 ug/kg  | Finfish- muscle and skin in natural proportions           | Gas Chromatography Mass Spectrometry           | Laboratory SOP CHE215 Based on Roscoe, Veronica, Judge, Judy, Rawn, Dorothea F.K., "Application of the QuEChERS Extraction Method for the Analysis of Pyrethrin and Pyrethroid Pesticides in Fin and non-Fin Fish |
| 752 Chemical residue testing - .05 Organic contaminants | CHE-170 Determination of Lipid Content and analysis of Organic Contaminants                | Quantitative Analysis of Polychlorinated Biphenyls, Hexachlorobenzene and Hexachlorobutadiene. | Range: 0.001 - 10,000ng.g ww and/or lipid weight  | marine and freshwater fish, shellfish and marine mammals. | Gas Chromatography Mass Spectrometry           | Laboratory SOP CHE-170. Based on an internationally recognised method for the extraction of lipids from biota followed by the analysis of contaminants by GC-MS.  |

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|   |  | Quantitative Analysis of Polycyclic Aromatic Hydrocarbons and Polybrominated Diphenyl Ethers | Range: 0.001 - 70.00ng.g ww and/or lipid weight   | biota)                             | Gas Chromatography Mass Spectrometry   | Laboratory SOP CHE-170. Based on an internationally recognised method for the extraction of lipids from biota followed by the analysis of contaminants by GC-MS [ICES No 53 Techniques in Marine Environmental Sciences] |
| 752 Chemical residue testing - .07 Nutrients                | CHE-209 Nutrients in Sea and Estuarine Water   | Quantitative Analysis of total oxidized nitrogen (TOxN), nitrite, silicate and phosphate     | Range: Nitrite 0.04-20µM, Phosphate 0.16-50µM, Total Oxidised Nitrogen 0.26-2000µM and Silicate 0.38-1500µM | marine and estuarine water         | Continuous Flow Analyser (computer controlled, continuous flow, wet chemistry analytical system using colorimetry) | Laboratory SOP CHE-209. Based on manufacturers recommendations (Skalar auto-analyser Methods).   |
| 766 Environmental testing (inc waters) - .01 Metal analysis | CHE-168 Determination of Total Mercury in Estuarine and Marine Waters                | Total mercury  | Range: 0-20 ppt   | Estuarine and marine waters        | Cold Vapour Atomic Fluorescence Spectrometry with gold trap pre-concentration                                      | Laboratory SOP CHE-168. Based on USEPA Method 1631: Determination of mercury in water by cold vapour atomic fluorescence spectrometry with gold trap   |
|   | CHE-169 Screening and Confirmatory Analysis of metals in estuarine and marine waters | Ag, As, Cd, Cr, Cu, Ni, Pb, Zn   | Range: 0.05-1000 µg/l   | Saline, Estuarine and other Waters | ICP-MS (Inductively Coupled Plasma Mass Spectrometry)  | Laboratory SOP CHE-169. Based on USEPA Method 200.8 Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma – Mass Spectrometry Revision 5.4.   |
| 766 Environmental testing (inc waters) - .05 Inorganic      | CHE-141 Salinity analysis in Sea and Estuarine Water                                 | Salinity   | Range: 0.03 (i.e. LOQ) - 41.81 psu  | Saline Waters                      | Portasal Salinometer TM8410A   | Laboratory SOP CHE-141. Based in Technical Manual for Portasal Salinometer.  |

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| 797 Miscellaneous materials and products - .03 Other tests | BCT-078 Analysis of Lipophilic toxins, including semi quantitative screen for Domoic Acid | Okadaic acid, AZA, Yessotoxin, Domoic Acid | Range: OA Equivalents 0.015-13.21 µg/g<br>AZA Equivalents: Range 0.005-7.5 µg/g<br>Yessotoxin Equivalents: Range 0.2-2.39 µg/g<br>Semi Quantitative Screen: Domoic Acid by LC-MS/MS: Range 2.0 -113 mg.kg-1 | Fish, shellfish and molluscs                        | UPLC MSMS   | Laboratory SOP BCT-78. Based on Gerssen, P.P.J. Mulder, M.A. McElhinney, J. de Boer, 2009. Journal of Chromatography A, 1216, 9, 1421 - 1430 and the EU Reference method for lipophilic toxin analysis (EU-RL LCMSMS) |
|  | BCT-088 Chemical Confirmatory Test: Domoic and Epi-Domoic Acid analysis                   | Domoic acid and Epi-Domoic Acid            | Range Domoic and Epi-Domoic acid: 0.8 – 2500 mg.kg-1  | Fish, shellfish and molluscs. Shellfish: All Tissue | UHPLC DAD   | Laboratory SOP BCT-88. Based on the international procedure by Quilliam et al. 1995 used and recommended by the European Reference Laboratory for Marine Biotoxins (EURLMB).  |
|  | BCT-096 Analysis of Biotoxins in Shellfish  | Okadaic Acid, AZA, Yessotoxin, Domoic Acid | OA Equivalents: Range 0.015 – 4.5 µg/g<br>AZA Equivalents: Range 0.005 – 4.3 µg/g<br>Yessotoxin Equivalence: Range 0.03 – 6.2 µg/g<br>Semi Quantitative Screen: Domoic Acid: Range 0.7 – 53.8 mg.kg-1       | Fish, shellfish and molluscs. Shellfish: All Tissue | UPLC-Xevo G2-S MS-ToF   | Laboratory SOP BCT-96. Based on the EU Reference method for lipophilic toxin analysis (EU-RL LC/MS-MS)  |
|  | BCT-100 Paralytic Shellfish Toxins by pre-column oxidation UHPLC-FD                       | Saxitoxin STX, GTX Neo                     | Range: Toxin Range (LOQ-ULQ)<br>Units: µg STX diHCLeq-kg<br>STX 34 → 2263<br>dcSTX 17 → 1459<br>GTX 2,3 26 → 3359   | Fish, shellfish and molluscs                        | Ultra High Pressure Liquid Chromatography with Fluorescence Detector. UHPLC | Lawrence JF, Niedzwiedek B, Menard C "AOAC Official Method 2005.06  |

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|  |  |  | GTX5 2 → 155<br>dcGTX2,3 14 → 1405<br>C1,2 4 → 509<br>NEO 145 → 4481<br>GTX1,4 245 → 3984<br>dcNEO 25 → 1513 |  |  |  |
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### Chemical Testing

Category: B

| Chemistry Field - Tests | Test name  | Analyte  | Range of measurement | Matrix  | Equipment/technique | Standard reference/SOP  |
|-------------------------|--|--|----------------------|---|---------------------|---|
| 798 Sampling            | CHE-006 Procedure for taking samples for surveillance monitoring of finfish farming products | As specified in the annual plan for monitoring and detection of residues in aquaculture products | n/a                  | Fin Fish - skin and muscle in natural proportions | Sampling            | Laboratory SOP CHE-6 , based on Regulations (EU)2022/1644, (EU)2022/1646, (EU) 2021/808 Annex 1 |