

Notes on Pre-disposal Sampling Results

Ground Investigation Location

1. The location of the Ground Investigation and the samples to which the sample form refers are deemed to be representative of the ground conditions which will be encountered during the dredging and construction activities. The Atkins Geotechnical Interpretative Report provides specific cross sections to correlate the data provided from the Fugro marine ground investigation works.
2. These cross sections specifically provide two transects of the east-west and north-south and detail the geological conditions and that ground contamination is not present within these areas. There is no obvious sources of pollution to the west of the existing Invergordon Service Base and these results are deemed to be representative.

Physical Characteristics

1. Original location data in British National Grid eastings and northings converted Degrees Decimal Minutes (DDM) using Ordnance Survey Coordinate transformation tool convertor at <https://www.ordnancesurvey.co.uk/gps/transformation/> [Accessed 25/4/18].
2. Height data input to tool from Fugro (2017), corrected to Ordnance Datum Newlyn from chart datum by adding 2.1m.
3. Standard rounding rules to 3 decimal places applied to decimal minute result from convertor tool.
4. PSD results for samples from BH01, BH02 and BH03 are from separate bulk/disturbed samples from same depth.
5. Specific Gravity – none of the actual environmental samples listed were tested for Specific Gravity (Natural or Particle density). Two bulk/disturbed samples were tested within the same strata and these have been included in the spreadsheet. Other specific gravity results from samples in Fugro reports <10m are given in the table below:

Sample ID	Particle Density Mg/m ³	Method
BH2 6.5m	2.66	small pycnometer
BH3 9.5m	2.70	small pycnometer
BH4 4.5m	2.70	small pycnometer
BH18 7.5m	2.72	small pycnometer
BH35 4.1m	2.72	small pycnometer
CPT18 9.4m	2.7	Glass jar

6. No TOC data available for the environmental samples listed. There is % organic matter tested in other bulk or disturbed samples as follows:

Sample ID	Sample type	% organic matter	% TOC (calculated from OMx0.58)
BH04 2.5m	D	1.1	0.638
BH06 8.00m	B	0.1	0.058
BH08 6.00m	B	<0.1	<0.058
BH19 5.00m	D	0.2	0.116
BH32 9.6m	B	0.1	0.058
BH33 7.8m	B	0.2	0.116
BH34 9.3m	B	<0.1	<0.058
BH35 5.1m	B	<0.1	<0.058
MEAN TOC %			0.145%

Chemical data sheets - General

7. Samples have been analysed on an as received basis, but it is not clear from the laboratory certificates if the results have been reported on a dry weight basis. This is being clarified with the laboratory but in the meantime, it has been assumed that results are reported on a dry weight basis.
8. Where analytical result is at the reporting limit, then this has been input to the spreadsheets as though recorded at the reporting limit e.g. <0.1 has been input as 0.1 such that conditional formatting can be applied.

Trace Metals and organotins

9. There is an error with the conditional formatting on line 35 e.g. blue highlight for Zn at 39mg/kg when the AL1 is 130mg/kg

PAH

10. Benzo(B)fluoranthene and Benzo(K)fluoranthene not split in PAH analysis undertaken and therefore total of Benzo(B)fluoranthene and Benzo(K)fluoranthene has been input to the Benzo(K)fluoranthene column.

PR Details

11. For the purposes of calculating a mean for analytical results, any results returned at the reporting limit have been counted as though recorded at that concentration and so true mean is most likely lower than that recorded.
12. Until clarification has been received from the laboratory, it has been assumed that the chemical analysis results are reported on a dry weight basis (including moisture) and therefore the moisture content has been used to calculate the wet weight result for each sample using the following formula:

$$\text{Wet weight} = \text{dry weight} \times \left(1 - \left(\frac{\% \text{moisture}}{100}\right)\right)$$

The mean has then been calculated from the calculated wet weight concentrations for input to the table in this tab.

Laboratory 1 Details

13. The information input for recoveries is based on Concept Life Sciences job reference 637304. The laboratory have confirmed that this should be representative of the other jobs covering the project but it should be noted the recovery data could show variation across other jobs.
14. Similarly reporting limits quoted are standard reporting limits as quoted for the test method but may be amended for specific samples/jobs to allow for matrix effects and/or dilutions required.
15. Q3 - Concept Life Sciences have produce QC charts for most analyses and carry out monthly checks using CRM as part of their quality procedures for UKAS accredited testing.
16. Q4 and Q5 - Concept Life Sciences participate in CONTEST which is a proficiency testing scheme for soils.
17. Q6, Q7, and Q8 - under the CONTEST scheme the lab tests material provided through the scheme and reports the results of the analysis to CONTEST. The composition or

concentration of the components being tested are not previously advised to the labs.
Collated results are then distributed back to the participating labs.

Reference

Fugro (2017). Factual Report on Ground Investigation: Invergordon Service Base, Phase 4 Development. Phase 4 Marine Ground Investigation, Fugro Document No.: G170001U, 4 September 2017.

Fugro (2017). Factual Report on Ground Investigation: Invergordon Service Base, Phase 4 Development. Berth 5 Seabed Verification Marine Ground Investigation, Fugro Document No.: G170001U, 07 April 2017