7.0 Laboratory Analysis

7.1 Sediment Quality Component

7.1.1 Chemical and Physical Characteristics

As noted in Section 3, sediment are processed for particle size, organic and inorganic carbon, metals, BTEX, $>C_{10}$-C_{21} hydrocarbons and $>C_{21}$-C_{32} hydrocarbons, PAHs, sulphides and ammonia. The most recent EEM reports should be consulted for details on these tests.

7.1.2 Toxicity Testing

Sediment toxicity testing consists of Amphipod survival and luminescent bacteria (Microtox) assays, in accordance with Environment Canada (1998) and Environmental Canada (2002) for amphipod survival and Microtox, respectively.

7.1.3 Benthic Community Status

The two cores collected for examination of benthic community status are processed separately. Sandy samples are washed through a 0.5 mm sieve. Samples with larger proportions of coarse material (gravel and shell) are elutriated and sieved by directing a high volume (1 L/s) flow of freshwater into the sample, tilting the sample bucket and catching the overflow on the sieve. This washing removes the silt/clay and finer sand fractions from the samples. The procedure is adjusted to leave coarser sediment fractions in the pail. The flow suspends the less dense organisms (e.g., polychaetes) and separates small gastropods and clams which, with a suitable balance of flow in and out of the bucket, can be separated as well. Elutriation is continued until the water leaving the pail is free of organisms and when no additional heavier organisms can be seen after close examination of the sediment. Usually, larger organisms such as scallops and propeller clams are separated manually as they are found. Barnacles and sponges are scraped off rocks. With coarser sediments such as gravels, which are occasionally encountered, a 1.2 cm mesh in combination with the 0.5 mm screen is used to aid in separating the organisms. Organisms are placed in 70% alcohol after sieving.

Samples are sorted under a stereomicroscope at 6.4x magnification, with a final scan at 16x. After sorting, substrate from 10% of samples is reexamined by a different sorter to determine sorting efficiency. Wet weight biomass (g/sample) is estimated by weighing animals to the nearest milligram at the time of sorting after blotting to remove surface water. None of the samples are sub-sampled. Organisms are then identified to the lowest practical taxonomic level, typically to species, using conventional literature for the groups involved.

7.2 Water Quality Component

Water samples are processed for BTEX, >C_{10}-C_{21} and >C_{21}-C_{32} hydrocarbons, PAHs and alkyl PAHs, phenols and alkyl phenols, organic acids, metals, ammonia, organic and inorganic carbon and total suspended solids. If Husky Energy has determined through modeling exercises that additional constituents could act as tracers for produced water, these may be added to the suite of standard water chemistry variables. The most recent EEM report should be consulted for a list of chemistry tests.

7.3 Commercial Fish Component

7.3.1 Allocation of Samples

The amount of plaice and crab tissue available for processing can sometimes be constrained by catch rates. Ideally, plaice and crab from 10 trawls in the Study Area and three trawls in each of the Reference Areas are used for body burden analysis, taste tests and fish health analyses. Within reason, more trawls are performed if sufficient tissue is not obtained with that number of trawls.

Normally, plaice bottom fillets and liver tissues are composited to generate 10 individual body burden samples for fillet and liver for the Study Area and three composites for each of the Reference Areas. Minimum number plaice per composite is six fish per composite in the Study Area and 10 fish per composite in the Reference Area. Those numbers are dictated by the number of fish required for fish health analyses (see below). Trawls can be combined to generate a composite, but two composites cannot be obtained from one trawl. When sufficient tissue is available, tissue from individual fish is archived for subsequent body burden analysis on individuals, if warranted by results of health analyses. Top fillets from a subset of fish used in body burden analysis are used in taste analysis. As much as feasible, taste test tissues are selected so as to generate relatively constant weights over composites within the Study Area or over each of the Reference Areas. Fish health analyses are conducted on individual fish rather than composite samples but, when feasible, tissue from those fish used in body burden are used in health analyses (i.e., should a fish not be used in body burden analyses, it would be excluded from fish health analyses, and vice versa).

Crab tissue from right legs is composited to generate 10 composite body burden samples for the Study Area and three composite samples for each of the four Reference Areas. A minimum of six crab per composite is required. Again, trawls can be combined to generate a composite, but two composites cannot be obtained from one trawl. Left leg tissue is then used in taste analysis. As much as feasible, taste test tissues are selected so as to generate relatively constant weights over all composites within the Study Area or over each of the Reference Areas.

7.3.2 Body Burden

Body burden composites are currently processed for the variables listed in Table 7-4.

Table 7-1 Body Burden Variables

Variable	Detection Limits	Units
Hydrocarbons		
$>C_{10}$-C_{21}	15	mg/kg
$>C_{21}$-C_{32}	15	mg/kg
PAHs		
1-Chloronaphthalene	0.05	mg/kg
2-Chloronaphthalene	0.05	mg/kg
1-Methylnaphthalene	0.05	mg/kg
2-Methylnaphthalene	0.05	mg/kg
Acenaphthene	0.05	mg/kg
Acenaphthylene	0.05	mg/kg
Anthracene	0.05	mg/kg
Benz[*a*]anthracene	0.05	mg/kg
Benzo[*a*]pyrene	0.05	mg/kg
Benzo[*b*]fluoranthene	0.05	mg/kg
Benzo[*ghi*]perylene	0.05	mg/kg
Benzo[*k*]fluoranthene	0.05	mg/kg
Chrysene	0.05	mg/kg
Dibenz[*a,h*]anthracene	0.05	mg/kg
Fluoranthene	0.05	mg/kg
Fluorene	0.05	mg/kg
Indeno[1,2,3-*cd*]pyrene	0.05	mg/kg
Naphthalene	0.05	mg/kg
Perylene	0.05	mg/kg
Phenanthrene	0.05	mg/kg
Pyrene	0.05	mg/kg
Metals		
Aluminum	2.5	mg/kg
Antimony	0.5	mg/kg
Arsenic	0.5	mg/kg
Barium	1.5	mg/kg
Beryllium	0.5	mg/kg
Boron	1.5	mg/kg
Cadmium	0.05	mg/kg
Chromium	0.5	mg/kg
Cobalt	0.2	mg/kg
Copper	0.5	mg/kg
Iron	15	mg/kg
Lead	0.18	mg/kg
Lithium	0.5	mg/kg
Manganese	0.5	mg/kg
Mercury	0.01	mg/kg
Molybdenum	0.5	mg/kg
Nickel	0.5	mg/kg
Selenium	0.5	mg/kg
Silver	0.12	mg/kg
Strontium	1.5	mg/kg
Thallium	0.02	mg/kg
Tin	0.5	mg/kg
Uranium	0.02	mg/kg
Vanadium	0.5	mg/kg
Zinc	1.5	mg/kg

Variable	Detection Limits	Units
Other		
Percent Lipids/Crude Fat	0.5	%
Moisture	1	%

Note: - The detection limit is the lowest concentration that can be detected reliably within specified limits of precision and accuracy during routine laboratory operating conditions. Laboratory detection limits may vary from year to year because instruments are checked for precision and accuracy every year as part of QA/QC procedures.

7.3.3 Taste Tests

Plaice and crab samples are delivered frozen to a testing laboratory for sensory evaluation using triangle and hedonic scaling taste test procedures. Since no procedures have been established to compare multiple Reference Areas to one Study Area, samples are selected from each of the Reference Areas to generate one set of Reference Area samples to be compared to Study Area samples.

Frozen plaice samples are thawed for 24 hours at 2°C and tissue from the Study or Combined Reference Areas is then homogenized in a food processor. Samples from each Area are allocated to either the triangle taste test or the hedonic scaling test. Samples are enclosed in individual aluminum foil packets, labeled with a predetermined random three-digit code and cooked in a convection oven at 82°C for 11 minutes. Samples are served in glass cups at approximately 35°C.

Frozen crab samples are cooked, shucked of meat and stored overnight at 4°C. Meat from the Study or Combined Reference Areas is then homogenized in a food processor and allocated to either the triangle taste test or the hedonic scaling test. Crab is served to taste panelists in glass cups at room temperature.

Each taste panel includes 24 panelists who are provided with score sheets and briefed on the presentation of samples prior to taste tests. Panelists are instructed that samples are being tested for uncharacteristic odour or taste and that grit, cartilage and texture should not be considered in their assessment. Panelists are also instructed not to communicate with each other and to leave immediately upon completion of the taste tests.

For the triangle test, panelists are presented with a three-sample set (triangle) of samples and asked to identify the sample that is different from the others. Half of the panelists receive sets composed of two samples from Treatment A (Study Area) and one from Treatment B (Reference Areas). The other panelists receive sets composed of one sample from Treatment A and two from Treatment B. There are six possible orders in which the samples are presented to panelists, after Botta (1994): ABB, AAB, ABA, BAA, BBA and BAB.

The rest of the samples are used for hedonic scaling tests. In this test, one sample from the Study Area and one from the Reference Areas are presented to panelists. Panelists are instructed to rate how much they like or dislike each sample on the form provided to them. A nine-point hedonic scale is used, with ratings ranging from "like extremely" (9) to "dislike extremely" (1) (see the most recent EEM report for the full list of ratings).

7.3.4 Fish Health Analyses

Laboratory analyses on fish health are currently performed as described in Sections 7.3.4.1 to 7.3.4.3.

7.3.4.1 Haematology

Blood smears are stained with Giemsa stain and examined with a Wild Leitz Aristoplan bright field microscope to identify different types of cells based on their general form and affinity to the dye (Ellis 1976). Size, shape and degree of haemoglobinization of red blood cells are examined and recorded.

Differential blood cell counts are performed on lymphocytes, neutrophils and thrombocytes and expressed as a percentage of each type of cells on 200 white blood cells counted. Cells are counted under x400 magnification in fields along a row, starting from the front edge of the smear and continuing parallel to the slide edge until the total number of cells is counted.

7.3.4.2 Mixed Function Oxygenase

MFO induction is assessed in liver samples of plaice as 7-ethoxyresorufin O-deethylase (EROD) activity using modified methods from Pohl and Fouts (1980) and Porter et al. (1989).

Sample Preparation

Liver samples are thawed on ice within four weeks of storage at -65°C and homogenized in four volumes of 50 mM Tris buffer, pH 7.5 (1 g liver to 4 ml buffer), using at least 10 passes of a glass Ten Broek hand homogenizer. Homogenates are centrifuged at 9,000 g for 15 minutes at 4°C and the post-mitochondrial supernatant (S9 fraction) is frozen in triplicate at -65°C until assayed. Assays are carried out within four weeks of storage of S9 fractions.

EROD Assay

The enzymatic conversion of 7-ethoxyresorufin to resorufin is measured at an excitation wavelength of 544 nm and an emission wavelength of 590 nm at 27°C using a FluoStar Optima multi-mode microplate reader. The reaction mixture in each well, final volume of 340 µl, contain 50 mM Tris buffer, pH 7.5, 2 µM ethoxyresorufin (Sigma) dissolved in dimethyl sulphoxide, 0.15 mM NADPH and 6.7 µl of S9 fraction (diluted 10 times in accordance with linearity considerations). All samples and five concentrations of resorufin (from 2.89 to 23.45 pmol/ml) are run in triplicate. An external positive control (a pool of liver homogenates with known activity) is also run in triplicate with each batch of samples to ensure consistency of measurements. Protein concentration of each S9 sample is determined using the Lowry protein method (Lowry et al., 1951) with bovine serum albumin as standard. The rate of enzyme activity in pmol/min/mg protein is obtained from the regression of fluorescence readings against concentrations of resorufin.

7.3.4.3 Histopathology

Fixed liver and gill samples are processed by standard histological methods (Lynch et al. 1969) using a Tissue-Tek® VIP Processor. A graded ethyl alcohol series of 70%, 80%, 95% and two changes of 100% are used for dehydration of the samples. The tissues are then cleared in four changes of xylene. Finally, the tissues are impregnated with three changes of molten embedding media, Tissue Prep 2™. The processed tissues are embedded in steel molds using molten embedding media and topped with labeled embedding rings. After cooling, the hardened blocks of embedded tissues are removed from their base molds. The blocks are then trimmed of excess wax. Sections are cut at 6 µm on a Leitz microtome, floated on a 47°C water bath and then picked up on labeled microscope slides. After air drying, slides are fixed at 60°C for approximately two hours to remove most of the embedding media and allow the tissue to adhere properly to the slide. Sections are stained using Mayers Haematoxylin and Eosin method (Luna 1968). Coverslips are applied using Entellan® and the slides are left to air dry and harden overnight.

Histological examination of each tissue is conducted by the same investigator. One slide with four to six sections is examined per fish. If an abnormality is found in a section, the other sections are checked for the same abnormality. To minimize interpretive bias, a "blind" system in which the examiner is not aware of the site of capture of specimen is used. This is accomplished by using a "pathology" number on the slide label generated from a random number table matched with the actual specimen number.

Liver Histopathology

All liver samples are assessed microscopically for the presence of different lesions previously identified as having a putative chemical aetiology in fish (e.g., Myers et al. 1987; Boorman et al. 1997; ICES 2004; Blazer et al. 2006). Lesions can include:

1. Nuclear pleomorphism
2. Megalocytic hepatosis
3. Eosinophilic foci
4. Basophilic foci
5. Clear cell foci
6. Hepatocellular carcinoma
7. Cholangioma
8. Cholangiofibrosis
9. Proliferation of Macrophage aggregates
10. Hydropic vacuolation
11. Fibrillar inclusions
12. Bile duct hyperplasia

Any other observations are also recorded. Among them, hepatocellular vacuolation, parasitic infestation of the biliary system, inflammatory response, pronounced cytoplasmic vacuolation of hepatocytes and golden rings around the bile ducts.

Lesions (except macrophage aggregates and inflammatory response) are recorded for each fish as not detected (0) or detected (1).

Macrophage aggregation is recorded on a relative scale from 0 to 7 and prevalence is calculated for fish showing a proliferation of macrophage aggregates (considered here as 4 or higher on the scale).

Inflammatory response is rated on a scale of 0 to 3 (0-absent, 1-mild, 2-moderate and 3-heavy).

The percentage of fish affected by each type of lesions or prevalence of lesion is then calculated.

Gill Histopathology

Each gill sample is examined microscopically, first under low magnification (x20) for a general overview of the entire section and to record any abnormalities or parasites present. Four filaments, or primary lamellae, sectioned at a correct angle (with the central venous sinus visible in at least two-thirds of the filament and secondary lamellae of equal length on both sides) are selected and examined under x250 magnification for the presence of gill lesions associated with chemical toxicity (Mallat 1985). This includes observations for epithelial lifting (separation of the epithelial layer from the basement membrane), telangiectasis (dilation of blood vessel at the tip of the secondary lamellae), lamellar hyperplasia (thickening of the epithelium due to an increase in the number of epithelial cells), fusion (fusion of two or more adjacent secondary lamellae) or oedema (swelling within cells).

A semi-quantitative examination is carried out for the various lesions (with the exception of oedema), where the total number of secondary lamellae as well as the lamellae presenting the lesions are counted on each selected filament as follows: (1) basal hyperplasia is recorded when an increase in thickness of the epithelium near the base of the lamellae reaches at least 1/3 of the total length of the lamellae; (2) distal hyperplasia is recorded when there are more than two cell layers all around the two sides of the secondary lamellae; and (3) tip hyperplasia is recorded when there are more than three cell layers at least 2/3 around the secondary lamellar tip. Results of the lamellar counts for each fish are expressed as the percentage of secondary lamellae presenting the lesion in relation to the total number of lamellae counted. The prevalence of the various types of lesions (presence or absence of each lesion for each fish) is also examined. Up to approximately 1000 lamellae are counted per fish.

The prevalence of the various types of lesions (presence or absence of each lesion for each fish) is also examined.

No count is carried out for oedema, but the severity of the condition (here, the swelling within cells) is recorded on a 0 to 3 scale (0-rare, 1-light, 2-moderate and 3-heavy).

7.4 Quality Assurance/Quality Control

Laboratories or consultants used to perform analyses must have recognized expertise or methods in their field with an acceptable QA/QC program. Ideally, analytical laboratories should be accredited to ISO/IEC 17025:2005 by a recognized accrediting body, such as the Standards Council of Canada (SCC) or the Canadian Association for Laboratory Accreditation (CALA). At present, most sediment, water and tissue chemistry analyses, as well as sediment toxicity, are assessed using methods accredited by the Standard Council of Canada. Methods used for quantification of seawater alkyl phenols, organic acids and alkyl PAHs are not accredited. Alkyl phenols and alkyl PAHs are quantified using USEPA method 625 (Base/Neutrals and Acids) and the United States Geological Survey's National Water Quality Lab Method (Determination of Polycyclic Aromatic Hydrocarbon Compounds). Volatile organic acids are quantified using Standard Method 5560D (Organic and Volatile Acids).

Taste tests follow procedures established in Botta (1994). Particle size analysis follows method BS 1377: 1990: Part 2 - Methods of Tests for Soils for Civil Engineering Purposes: Classification Tests (BSI, 1990).

The benthic invertebrate laboratory QA/QC procedures include resorting of 10% of samples to assess sorting efficiency. Identification is performed by a world-renowned benthic invertebrate taxonomist, using conventional literature.

For fish health, QA/QC procedures for MFO follow protocols recommended by Hodson et al. (1991) and Stagg and McIntosh (1998). QA/QC procedures for haematology follow the practical guidelines described by Blaxhall and Daisley (1973). QA/QC procedures for histopathology follow the guidelines described by Myers and Fournie (2002). To assure accuracy in histopathological diagnosis, established standardized terminology for liver lesions (e.g. Myers et al. 1987, Boorman et al. 1997, ICES 2004, Blazer et al. 2006) and gill lesions (Mallat 1985) are followed. Any questionable lesions are also screened by a fish pathologist for confirmation of diagnoses.

8.0 DATA ANALYSIS

The sections below describe data analysis only very generally. Recent EEM reports should be consulted for details on data analysis and changes in data analysis methods.

8.1 Sediment Quality Component

As noted in Section 5.1, the sediment quality portion of the White Rose EEM Program follows a gradient design. This type of design assesses change in monitoring variables with distance from source (i.e., drill centres). For most sediment quality variables, five statistical tools are used to explore spatial variation with distance from drill centres.

Spearman rank correlations (Tool 1) are used to statistically test for associations between distance from the nearest active drill centre and variables selected for detailed analysis.

Threshold models (Tool 2) are constructed in order estimate the spatial extent (distance) of influence of active drill centres on variables that have been demonstrated with Spearman Ranks to be significantly correlated with distance from the nearest active drill centre.

The third tool (Tool 3) involves visual inspection of response variable data. Scatterplots of concentration (or percent as appropriate) in relation to distance from the nearest active drill centre are produced in order to visualize the nature of the relationship with distance for each sample year.

Maps (Tool 4) indicating levels of select variable within and exceeding the variability observed in baseline (2000) are generated to visually assess the effects of individual drill centres on variables and to provide per-drill centre insight into the estimate of the spatial extent of effects based on threshold models. Maps also help to assess potential overlapping areas of influence of drill centres. Those maps have typically been generated for concentrations of $>C_{10}$-C_{21} hydrocarbons and barium, and benthic community indices.

Repeated-measures regression (Tool 5) is currently used to test for spatial and temporal variation of $>C_{10}$-C_{21} hydrocarbons and barium, and other variables brought forward for detailed analysis. This analysis can only be carried out on the 36 stations that have been repeatedly sampled in all years; the method cannot include any new stations added to accommodate new drill centres.

Statistical analysis methods for all components of the EEM Program, by necessity, are not fixed and have changed over the years. Analyses often need to be modified to deal with the data at hand. For instance, threshold models were added for the 2007 EEM Program (Husky Energy 2007) and maps of effects around each drill centre were added for the 2010 EEM Program (Husky Energy 2011). Additional detail on current analysis methods for the sediment quality component of the EEM Program can be found in Husky Energy (2011).

8.2 Water Quality Component

Data analysis for the water quality component of the White Rose EEM Program currently involves:

- Modeling of produced water constituents to assess the relative environmental risk associated with specific constituent, as well as the likelihood of detecting produced water constituents in either sediment or water samples;
- Analysis of seawater chemistry data following a control-impact design; and
- Analysis of sediment chemistry data, using sediment chemistry information from water and sediment quality stations, following a gradient design.

As noted in Section 8.1, statistical analysis methods for all components of the EEM Program, by necessity, are not fixed. This is particularly true for the water quality component of the EEM Program because the component relies on modeling to iteratively improve the water and/or sediment sampling designs (also see Section 6.2). As the designs change, the details of the analyses also need to change.

To date, the concentration of selected produced water constituents have been modeled using information on produced water chemistry (obtained through produced water chemical characterizations), local wind and currents, and the models DREAM (for water column concentrations) and ParTrack (to assess deposition to sediments). Model results have led to repositioning of some water quality stations, and a more focused analysis on iron in sediments.

The White Rose seawater sampling design currently relies on a set of near-field stations, a set of mid-field stations and two sets of far field stations (see Figure 5-2 for details). ANOVA is used to test for differences in seawater chemistry among Areas and among sampling depths at these stations.

All stations (sediment quality and water quality stations) are used to examine iron concentration in sediments. Analyses of iron concentrations in relations to distance from the *SeaRose FPSO* are similar to analyses of other sediment chemistry variables in relation to distance from drill centres (Section 8.1). Correlations between iron concentrations in sediments and distance to the *SeaRose FPSO* are computed; plots of

the Spearman rank correlations over time and maps of iron concentration relative to baseline concentration are produced; and repeated-measures regression is used to test for changes in iron concentrations across the sampling area from before to after produced water discharge from the *SeaRose FPSO*. Because iron covaries with other metals in the sampling area, these analyses are also performed with residuals from regression of iron concentrations (log_{10}) on PCA axis scores for sediment metals.

8.3 Commercial Fish Component

Body burden analyses for the commercial fish component of the EEM Program rely predominantly on AN(C)OVA to compare data among Areas and among years. Like other components of the EEM Program, there have been differences in the exact nature of these analyses. For instance, the ANOVA method used for body burden analysis for the 2012 EEM Program was a Completely Random ANOVA. The analysis in 2010 used a repeated-measures ANOVA with data from five Areas (*i.e.*, five observations) and four time periods. The repeated-measures ANOVA had just enough degrees of freedom in 2010 to be used as an analysis tool. A repeated-measures ANOVA was not possible in 2012 because the number of repeated observations (*i.e.*, Areas) must exceed the number of years (*i.e.*, parameters) and in 2012 this was five – 2004, 2005, 2006, 2010 and 2012. These details can be found in individual EEM reports.

Analysis of morphometrics and life history characteristics, taste test results and fish health also rely predominantly on AN(C)OVA, but analysis are performed within year, with qualitative comparison to previous years, if warranted. In some years for fish health results, an Unpaired t-test or the Mann-Whitney Rank Sum test was used when data were not normally distributed. Fisher's Exact Test has been used to compare the Study and Reference Areas for plaice sex ratios and maturity stages, presence versus absence of hepatocellular vacuolation and biliary parasites, and the frequencies of plaice with at least one gill lamella affected lesions.

9.0 REPORTING AND PROGRAM REVIEW

9.1 Reporting

EEM results are reported in an interpretative document. The report contains the following basic elements:

- An executive summary highlighting key results;
- An introduction that provides an overview of the White Rose project, project commitments with respect to the EEM Program, a summary of EEM Program design and changes to the EEM Program and a list of EEM Program objectives and monitoring hypotheses;
- Methods and results sections for each of the three components of the EEM Program. Modeling results for the water quality component of the EEM Program are integrated into the EEM report if modeling has occurred since the previous Program cycle. As much as feasible, a plain language summary of results is provided at the end of each of these sections;

- A discussing section that includes a comparison of results with effects predictions and monitoring hypotheses; and
- Recommendations for future EEM cycles.

9.2 Decision Making

The EEM Program is a component of Husky Energy's environmental management system. The Program provides Husky Energy with the information necessary to make project-related decisions related to the environmental components targeted by the EEM Program.

9.3 Review and Refinement of Environmental Effects Monitoring Program

The EEM Program is reviewed after each year that data are collected. Each of the steps in the Program is evaluated and, if necessary, refined to better meet the objectives of the EEM Program.

Once finalized, after regulatory review, the EEM report is made available in Adobe Acrobat file format on the Husky Energy and C-NLOPB websites.

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11.0 Definitions and Acronyms

AN(C)OVA	Analysis of Variance or Analysis of Co-variance
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
C Drill Centre	Central Drill Centre
C-NLOPB	Canada-Newfoundland Offshore Petroleum Board
CTD	Conductivity, Temperature and Depth
DPA	Development Plan Application
EEM	Environmental Effects Monitoring
EIS	Environmental Impact Statement
EROD	enzyme activity referred to as 7-ethoxyresorufin O-deethylase
FPSO	Floating Production, Storage and Offloading (facility)
MFO	Mixed Function Oxygenase
N Drill Centre	Northern Drill Centre
NA Drill Centre	North Amethyst Drill Centre
NWRX Drill Centre	North White Rose Extension Drill Centre
PAH	Polycyclic Aromatic Hydrocarbon
QA/QC	Quality Assurance/Quality Control
Redox	Oxydation/Reduction Potential
S Drill Centre	Southern Drill Centre
TIC	Total Inorganic Carbon
TOC	Total Organic Carbon
TSS	Total Suspended Solids