IMS14-07 – Surface Water Monitoring

IMS Procedure		**Page 1 of 7**
Surface Water Monitoring		**Revision Number: 0**
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Surface Water Monitoring	
Purpose	To define and document the companyôs procedure for monitoring surface water within the field ditches and reens detailing the following: - The monitoring locations - The monitoring frequency - The sampling method - Suite of analysis and trigger Criteria - The reporting details This document is aimed to enables the procedure to be communicated to employees of companies within the group and identifies responsibilities for their implementation.
Scope	This procedure applies to the surface water monitoring work at both Neal Soil Suppliers limited and Atlantic Recycling limited.
Other Relevant Documents	Documents & Record (IMS01-01) Water Monitoring Schedule (IMS14-04) Drawing JCD0170-03 Rev 12 to be updated with details on Drawing JCD0170- 087 once details are approved by NRW.
References	EPR1.00 How to Comply with your Environmental Permit, Sector Guidance S5.06, Waste Treatment BREF environmental management tool kit- Waste handling industry
Responsibilities	The **Managing Director** has overall responsibility for the implementation of this procedure with support from the Compliance Director and Technical Assessment Chemist to ensure compliance is maintained and training is kept up to date.
Action	**Methodology**
A. General Requirements	1. It is the responsibility of the Technical Assessment Chemist to ensure that monitoring is carried out by the companyôs assigned consultants according to the specified frequencies, locations, sampling method and to include the complete suite of determinands.

	2. It is the responsibility of the Technical Assessment Chemist to ensure that the monitoring results are assessed against the agreed trigger criteria by relevant consultants and that factual and interpretation reports are submitted to the relevant authorities on time.
B. Monitoring Location	Monitoring Location are shown on the following plans: Drawing JCD0170-03, Rev 12 Drawing JCD1070-87 These include the following location: The outfall (D2), SW01, SW02, SW04, SW05, SW06, SW07, SW08, SW09, SW12, SW15, SW16, SW17, SW18, SW19, SW20, SW20N, SW21, SW22, SW23, SW24, SW25, SW26, SW26S, SW27, SW28, FP1, HP1, QC Note: SW03, SW10, SW11 and SW13 were removed from the previous list of monitoring locations for the following reasons: - being in negligible ditches other than the designated SSSI field ditches - not suitable as reference point locations as was initially intended for them to be (SW03 and SW13) - regularly dry yielding no samples (SW03 was found to be dry throughout the last few years). - The ditch within SW10 and SW11 are located has been incorporated within the new WWTP which will have a monitoring location with a QC ditch. The above removed locations were replaced by SW20N, SW26S, SW28, FP1, HP1 and QC
C. Frequency of monitoring	**QC:** Initially daily for a while to be reduced to weekly if a pattern was identified after a satisfactory period of monitoring and a reduced monitoring frequency is agreed with NRW **Discharge point(D2):** Monthly **Others:** (The remaining above listed monitoring location), Quarterly
	The Sampling procedure: The laboratory shall be called to arrange sample pick-up time from an appropriate location. Ice packs shall be placed in all cool boxes to be used for sample storage and transportation to the designated laboratories. Two people will be present during water sampling. Prior to commencing sampling, a safe sampling position and any site-specific hazards of note (including bank stability / gradients; bank structure / surface conditions; ease of access to water; overhead constraints / hazards; and lateral constraints considering length of extendable pole) will be determined. The designated sampler shall have access to an inflatable life jacket / buoyancy aid when sampling. The sampler shall put the life jacket on whilst 10 m away from the water course before approaching the sample point. No watercourses shall be entered during these works. However, in the event any surveyor should get into difficulty in the water they will

D. Sampling and Testing Method	be rescued by the accompanying surveyor using a throw rope. A surface water sample shall be taken from the water course from a safe position on the bankside using an extendable pole and bottle holding attachment (i.e. grab sample). A clean sample container shall be fixed to the bottle holder attachment for the extendable pole. The designated sampler will not lean over the channel / water body when sampling. The sample pole bottle shall be submerged in the surface water course rinsed three times. Water shall be decanted into the required clean, pre-labelled sample containers. All personnel shall wear the appropriate PPE to avoid skin contact with the water whilst sampling. This should include long sleeves, nitrile gloves and safety glasses, To avoid injury / accident during sampling, over extension with the pole extended shall be avoided. The time of sampling shall be recorded. A record of the ditches characteristics including the flow conditions, vegetation cover, appearance of water in terms od colour and clarity and any visual and olfactory characteristics shall be recorded, including the presence of any hydrocarbon sheens etc. (this shall include notes regarding detailed sample location and general water quality in the vicinity of the sample location). Where the sample is to be collected from an emission point, the sampling containers will be prepared ready to collect the sample from the discharge point. The sample should be collected as close as possible to the discharge point to avoid cross contamination. Sufficient sample shall be taken to enable the measurement of the parameters in the laboratory. The sample containers will be clearly labelled with date, sample location and project code. Sample containers will be rinsed before sampling. All sample containers shall be filled to the top, making all efforts not to trap any air within the container. Sample bottles shall be placed in cool box with ice packs. Samples from potentially contaminated locations shall be placed in a sealed plastic bag sealed or separate cool box. The sampling will be follow ISO 5667 standard on water quality sampling
	Equipment to be used (tools, plant, safety, PPE etc): <u>PPE</u> Buoyancy Aid / Life Jacket Throw Rope with a loop/knot tied at the end to make it easier to grasp Hi Visibility clothing Warm, waterproof clothing Long sleeved jacket/top and suitable trousers to protect against scratches Sturdy footwear with good ankle support Joint support where individual considers necessary Gloves (Disposable nitrile gloves) Safety glasses <u>Water Sampling</u> Extendable pole and bottle holding head Throw Rope with handle or knot at end Bailers String

Sample containers,
Cool boxes
Ice packs
Chain of Custody Forms

General Equipment
Camera
Note book
Pens / pencils
Permanent marker
Maps (sample locations)
Parcel tape

Personal Hygiene / Cleaning / First Aid
Bottled Clean Water for Rinsing
Blue Towel
First Aid Kit
Wipes & Hand gels

Testing

All samples are tested in a UKAS/MCERT accredited lab that operates according to current UK applicable standard including ISO 14001 and ISO17025.

E. Suit of Analysis and Trigger Criteria

Suite of Analysis and Trigger Criteria

Determinand	Trigger Levels
pH	6.8 - 8.5
Conductivity	>2000 microS/cm
Total Suspended Solids	>250 mg/l on one occasion >100 mg/l in 3 consecutive samples >60+mg/l in 4 consecutive samples
Biological Oxygen Demand (BOD)	>18 mg/l on one occasion 10+ mg/l on three consecutive occasions
Nitrite (NO_2)	>1 mg/l
Nitrate (NO_3)	>1 mg/l
Ammoniacal Nitrogen	>1 mg/l on one occasion >0.5 mg/l on 4 consecutive occasions
Total Oxidised Nitrogen (TON)	>2 mg/l
Orthophosphate	>1mg/l
Total Sulphates	>300 mg/l
Chloride	>300 mg/l
Total Calcium	>300 mg/l
Total Zinc	>1 mg/l
Dissolved Lead	>0.25 mg/l
Total Cadmium	>0.005 mg/l

Dissolved Nickel	>0.1mg/l
Total petroleum hydrocarbons C6-C40- fully speciated total petroleum hydrocarbons	>2 mg/l
DO	Less than 2 mg/l on one occasion Less than 5 mg/l in 3 consecutive samples

Lab analysis Recommendation

Parameter	Unit	LOD	Former CCW TL	Analytical Methodology		Sampling Notes
Nutrients						
Ammoniacal Nitrogen (as N)	mg/l	<0.01	1	TM099	Determination of Ammonium in Water Samples using the Kone Analyser	Should be no air reamaining in the headspace of the sample collection to prevent loss of dissolved gases and colatiles which may lead to precipitaion of some analytes.
Phosphate (Measured as ortho-)	mg/l	<0.05	1	TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	
TON (as N)	mg/l	<0.1	2	TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	
Nitrate (as N)	mg/l	<0.0677	1	TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	
Nitrite (as N)	mg/l	<0.0152	1	TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	
Inorganic Parameters						
Sulphate (Dissolved)	mg/l	<2	300	TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	
Chloride (Dissolved)	mg/l	<2	300	TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	
Calcium (Dissolved)	mg/l	<0.057	300	TM228	Determination of Major Cations in Water by iCap 6500	

					Duo ICP-OES	
Physical Parameters						
pH		<1	6.8-8.5	TM256	Determination of pH in Water and Leachate using the GLpH pH Meter	
Electrical Conductivity	mS/cm	<0.005	2	TM120	Determination of Electrical Conductivity using a Conductivity Meter	
DO	mg/l	<0.3	2	TM187	Dissolved Oxygen in Natural and Waste Waters HMSO 1979 ISBN 011 751442	Temperature of the samples should be maintained to avoid significant temperature changes between sampling and analysis
BOD	mg/l	<1	18	TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids	For the most accurate sample, collection should be from the point of highest flow where possible
TSS	mg/l	<2	250	TM022	Determination of total suspended solids in waters	
Metals						
Cadmium (Dissolved)	mg/l	<0.5	0.005	TM191	Determination of Unfiltered Metals in Water Matrices by ICP-MS	To be filtered in the field to determine dissolved concentration (Filtration through a 0.45 εm filter). Filtered into wsample container with preservative. Should be no air reamaining in the headspace of the sample collection to prevent loss of dissolved gases and colatiles which may lead to precipitaion of some analytes.
Nickel (Dissolved)	mg/l	<0.44	0.1	TM152	Analysis of Aqueous Samples by ICP-MS	
Lead (Dissolved)	mg/l	<0.1	0.25	TM152	Analysis of Aqueous Samples by ICP-MS	
Zinc (Dissolved)	mg/l	<3	1	TM191	Determination of Unfiltered Metals in Water Matrices by ICP-MS	
Organic Parameters						
GRO C5-C10	ug/l	<10	2000	TM172	EPH in Waters	Given the nature of the sample locations (frequently highly concentrated with organic matter and of very low flow) application of EPH_Gel clean up may be necessary at the laboratory stage. This is recommended for sample where the
GRO (C10-C12)	ug/l	<10				
EPH (DRO) C10-C40	ug/l	<46	2000	TM172	EPH in Waters	

						source is known to have vegetation or peat present and may cause a positive result due to the presence of humic acids.

F. reporting	1. Quarterly factual and assessment reports will be issued to NRW. 2. The factual reports will be issued within 3 weeks of the end of the monitoring period presenting the monitoring results. 3. the assessment reports will be issued within 28 days of the end of the monitoring period discussing the monitoring results and propose any mitigation, management or/and improvement work considered necessary to protect and enhance the environment. 4. Annual reports will be issued at the end of each year assessing trends and variability, likely causes/sources/influences and any management measures. Such management measures will be based on the findings, conclusions and recommendations of both the water and biological (botanical and invertebrates monitoring work) The current monitoring times are as below: Outfall (D2)- middle of each calendar month Remaining locations excluding QC - middle of February, May, August and November