Attachment F

Control & Monitoring

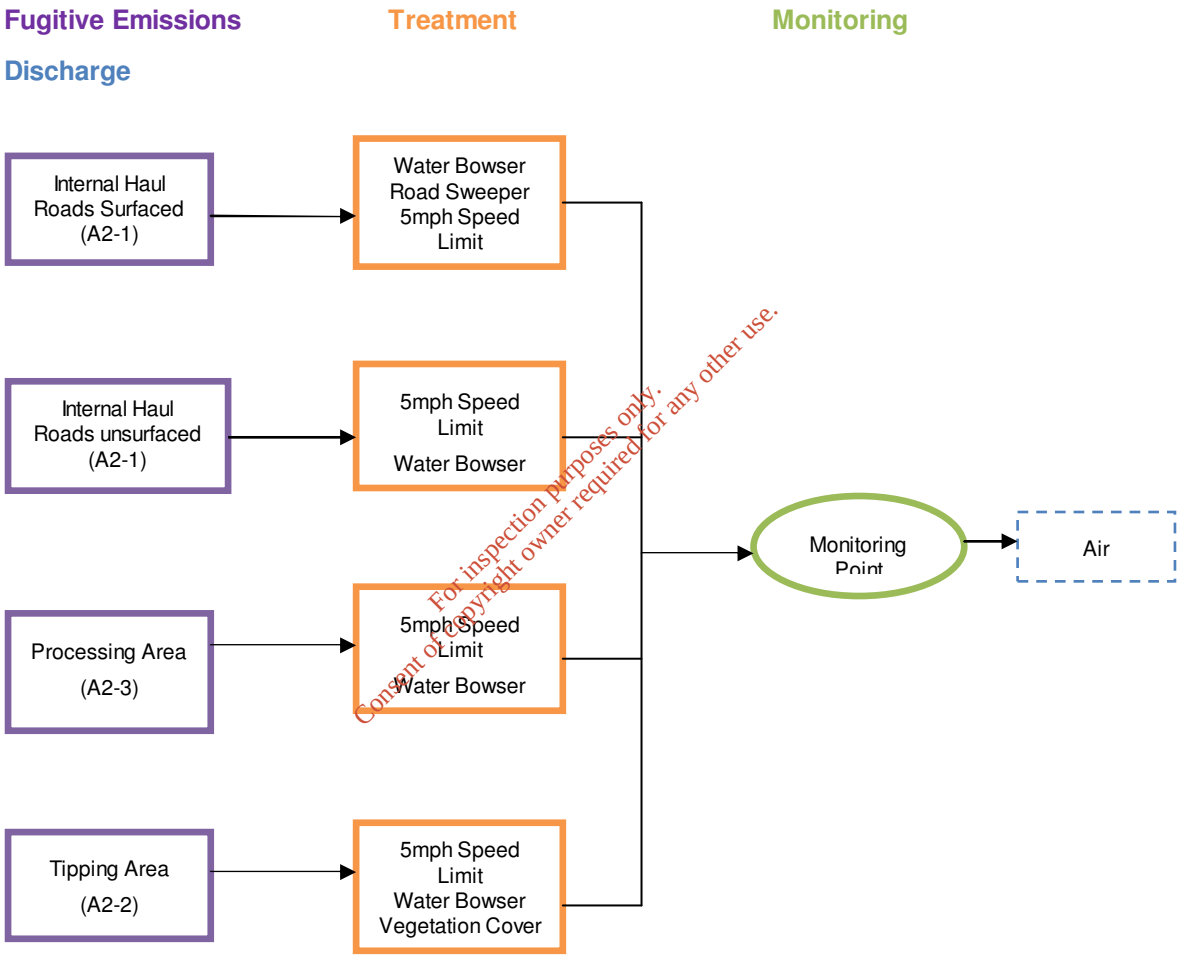
Tables

F.1 Treatment, Abatement and Control Systems

The following section details the techniques for preventing, or reducing the emissions from the existing recovery facility including treatment/abatement systems as necessary.

F.1.1 To Atmosphere

The following flow diagram shows the sources of fugitive dust emissions arising on site and the methods of treatment/abatement employed.



Emissions

Within the application area, the following site activities may give rise to potential fugitive dust emissions:

- Internal movement of vehicles (A2-1)
- Tipping and levelling of placed materials (A2-2)
- Loading and Unloading of Vehicles (A2-2, A2-3)
- Processing Area (A2-3)

The impact of fugitive dust will be direct, temporary and non-cumulative and largely confined to the application site.

Abatement

A number of measures have been adopted to minimise dust emissions to the atmosphere from general site activity, internal haulage and tipping operations as follows:

- During dry weather the haul roads and stockpiles are sprayed with water to dampen any likely dust blows. A water bowser is maintained on site for this purpose.
- Consideration will be given to location of mobile plant so as to ensure that any principle dust sources cannot adversely affect sensitive off-site locations.
- Static and mobile wet dust suppression systems will be located at strategic points in the process if required.
- Drop heights are kept to a minimum by using short conveyors and maintaining stocks under the head drum load out points.
- A wheel wash facility has been installed on site and all vehicles are required to pass through the wheel wash on exiting the site.
- Main site haulage routes within the site shall be maintained with a good temporary surface.
- All internal roadways will be adequately drained, to prevent ponding.
- The operator has purchased a road sweeper and ensures that the site entrance and adjoining public roadway is regularly cleaned. The sweeper is readily available at short notice to sweep up any materials which may accidentally fall onto the public roadway.
- Suitable vegetation is to be provided on restored areas at the earliest opportunity.

TABLE F.1.1: ABATEMENT / TREATMENT CONTROL - AIR

Emission point reference number *:Fugitive Dust Emissions (A2-1 to A2-3)*

Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up
Air Quality – Fugitive Dust	Water Bowser	Routine	Not Applicable	Not Applicable
	Wheel Wash	Daily - Visual	Not Applicable	Not Applicable
	Road Sweeper	Routine	Not Applicable	Not Applicable
	Dust Suppression	Daily - Visual	Not Applicable	Not Applicable

Control[1] parameter	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
Air Quality – Fugitive Dust	Bi-annually	Bergerhoff gauges	Analysis by accredited Laboratory

[1] List the operating parameters of the treatment / abatement system which control its function.
[2] List the equipment necessary for the proper function of the abatement / treatment system.
[3] List the monitoring of the control parameter to be carried out.

F.1.2 To Surface water/Sewer/Ground (water)

Emissions

As the only material to be imported to site is "Soil and stone" and inert construction and demolition waste there will be no source of possible contamination of surface and/or ground waters.

There are no surface water courses adjoining the site. Surface water-off within the site percolates to ground through the floor of the sand and gravel pit into the underlying limestone bedrock. There is no discharge of surface water run-off from the site.

On site activities will not discharge to any sewerage system. The applicants propose to use the existing toilet facility within the sand and gravel pit. The location of the toilet, septic tank and percolation area is shown on the attached Figure D.1.1 near the southern entrance to the sand and gravel pit. This facility is adequate to meet the continued requirements of the existing development given that the facility will be operated by the existing staff of two to three.

A groundwater monitoring programme will also be put in place to ensure that there is no impact on water quality as a result of the recovery operations.

Abatement

Our client is proposing to replace the existing bunded fuel storage tank on site with a mobile double skinned (integrated bunding) fuel bowser to refuel mobile plant on site. The bowser will be provided with a Spill tray and spill kit.

Oil and Waste oil products are stored under cover. All oil barrels and lubricants will be stored on spill pallets/ spill trays. Waste oils are disposed of by a licensed waste contractor and removed off site.

Spill kits will also be maintained on site and the Company will put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation.

The wash-water is recycled through a system of containment tanks. The tanks will be periodically cleaned and the silt will be used within the restoration of the site.

A groundwater monitoring programme will also be put in place to ensure that there is no impact on water quality as a result of the recovery operations.

TABLE F.1.2: ABATEMENT / TREATMENT CONTROL – SURFACE WATER

***Emission point reference number*: NOT APPLICABLE**

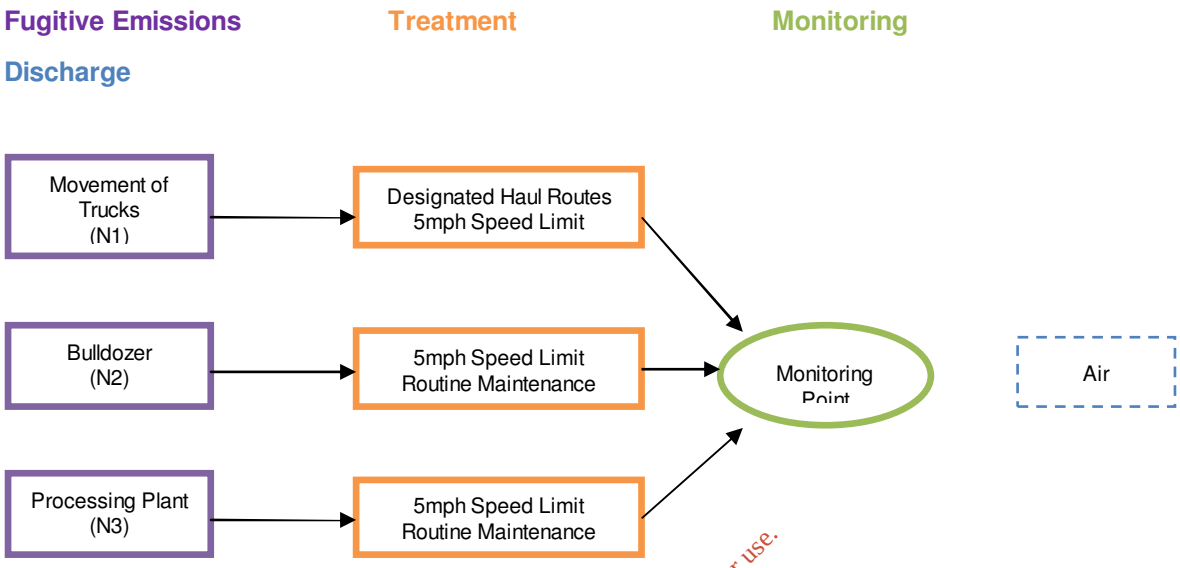
Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up

Control[1] parameter	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration

[1] List the operating parameters of the treatment / abatement system which control its function.
[2] List the equipment necessary for the proper function of the abatement / treatment system.
[3] List the monitoring of the control parameter to be carried out.

F.1.3 Noise Emissions

The following flow diagram shows the main sources of noise emissions arising on site and the methods of treatment/abatment employed.



Emissions

The main source of noise and vibration on site is from:

- Movement of trucks on internal haul roads and tipping of material (N1)
- Bulldozer placing and grading the infill material (N2)
- Processing Plant (N3)

Abatement

A number of noise containment measures are proposed:

- The provision of temporary peripheral screen banks to screen site activities from outside views.
- General site activity will be within the existing pit and below the level of the nearest residences.
- The use of designated haul roads to ensure that site traffic is removed from nearest noise sensitive receptors.
- Regular maintenance of all plant and machinery is an integral part of site management and is important in helping to minimise noise impact.

- All plant and equipment will conform to noise emission limits set out in Statutory Instrument No. 320 of 1998 European Communities Construction Plant and Equipment-Permissible Noise Levels (Regulations, 1998) and amendment set out in Statutory Instrument No. 359 of 1996.
- Noise monitoring can be carried out at three noise monitoring stations (N4-N6) in the vicinity of the nearest noise sensitive properties (Refer to Figure F 1.0) in accordance with any monitoring programme agreed with the EPA.

The results of monitoring to date shows that the development can comply with the noise level threshold as specified and as a consequence the development will have no significant effects regards noise levels in the area.

TABLE F.1.3: ABATEMENT / TREATMENT CONTROL - NOISE

Emission point reference number *:N1-N3*

Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up
Air - Noise	Trucks	Routine	Not Applicable	Not Applicable
	Bulldozer	Routine	Not Applicable	Not Applicable
	Processing Plant	Routine	Not Applicable	Not Applicable

Control[1] parameter	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
Air - Noise	Bi-annually	Sound Level Meter	Annually

[1] List the operating parameters of the treatment / abatement system which control its function.
[2] List the equipment necessary for the proper function of the abatement / treatment system.
[3] List the monitoring of the control parameter to be carried out.

F.2 Monitoring & Sampling Points - Air

In accordance with condition No. 9 of planning permission P.A. Reg. Ref. QY 48 (QC. 17.QC 2113) "total *dust deposition (soluble and insoluble) from the site operations associated with the development shall not exceed 350mg/sq.m/day, averaged over a continuous period of 30 days.*".

In order to comply with this condition the operator has set up a dust monitoring programme using Bergerhoff Dust Gauges. Two dust monitoring stations (A2-4, A2-5) were established at the site boundary (Refer to Environmental Monitoring Plan Figure F 1). It is proposed to commence dust monitoring during the summer months.

Dust fall is measured using the Bergerhoff method as set out in German Standard VDI 2119. The normal recommended standard for dust emissions for this type of development is that "dust deposition shall not exceed 350 mg/m^2/day measured at the site boundaries and averaged over 30 days". This limit refers to total dust (using DIN method).

The above standard is also in accordance with guidance issued by both the Department of the Environment and the EPA in relation to dust deposition monitoring for these types of developments and will continue to be applied.

This programme will allow on-going monitoring of fugitive dust emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

TABLE F2: ENVIRONMENT MONITORING AND SAMPLING LOCATIONS - Fugitive Dust

Monitoring Point Reference No (s): **A2-4, A2-5**

Parameter	Monitoring frequency	Accessibility of Sampling point
mg/m^2/day	Bi-annually	Easily accessible via site entrance

F.3. Monitoring & Sampling Points – Surface Water

The nearest significant watercourse to the application site is the Boycetown River which is approximately 750m from the boundary of the site. There are no surface water courses adjoining the site.

There is no discharge of surface water run-off from the site. It is not considered necessary to monitor surface water in the area

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TABLE F.3: EMISSIONS MONITORING AND SAMPLING POINTS - Surface Water

Emission Point Reference No(s). : ***NOT APPLICABLE***

Parameter	Monitoring frequency	Accessibility of Sampling Points
pH		
Temperature		
Electrical conductivity EC		
Ammoniacal nitrogen NH_4-N		
Chemical oxygen demand		
Biochemical oxygen demand		
Dissolved oxygen DO		
Calcium Ca		
Cadmium Cd		
Chromium Cr		
Chloride Cl		
Copper Cu		
Iron Fe		
Lead Pb		
Magnesium Mg		
Manganese Mn		
Mercury Hg		
Nickel Ni		
Potassium K		
Sodium Na		
Sulphate SO_4		
Zinc Zn		
Total alkalinity (as $CaCO_3$)		
Total organic carbon TOC		
Total oxidised nitrogen TON		
Nitrite NO_2		
Nitrate NO_3		
Faecal coliforms (/100mls)		
Total coliforms (/100mls)		
Phosphate PO_4		

F.4. Monitoring & Sampling Points – Sewer Discharge

On site activities will not discharge to any sewerage system. The applicants propose to use the existing toilet facility within the sand and gravel pit. The location of the toilet, septic tank and percolation area is shown on the attached Figure D.1.1 near the southern entrance to the sand and gravel pit. This facility is adequate to meet the continued requirements of the existing development given that the facility will be operated by the existing staff of two to three.

TABLE F.4: EMISSIONS MONITORING AND SAMPLING POINTS – Sewer

Emission Point Reference No(s). : _____

Parameter	Monitoring frequency	Accessibility of Sampling Points
	NOT APPLICABLE	

F.5. Monitoring & Sampling Points – Groundwater

There are three wells on site (Refer to Environmental Monitoring Plan Figure E 1.0).

It is proposed to monitor these wells in accordance with the conditions as attached to the waste licence for the facility. Refer also to Table F5 below with respect to suite of parameters and monitoring frequency

TABLE F.5: EMISSIONS MONITORING AND SAMPLING POINTS - Groundwater

Emission Point Reference No(s). : GW1, GW2 GW3

Parameter	Monitoring frequency	Accessibility of Sampling Points
pH	Quarterly	Wells- Contact Facility Manager to facilitate access
Temperature	Quarterly	As above
Electrical conductivity EC	Quarterly	As above
Ammoniacal nitrogen NH_4-N	Quarterly	As above
Dissolved oxygen DO	Quarterly	As above
Residue on evaporation (180°C)	Quarterly	As above
Calcium Ca	Quarterly	As above
Cadmium Cd	Quarterly	As above
Chromium Cr	Quarterly	As above
Chloride Cl	Quarterly	As above
Copper Cu	Quarterly	As above
Cyanide Cn, total	Quarterly	As above
Iron Fe	Quarterly	As above
Lead Pb	Quarterly	As above
Magnesium Mg	Quarterly	As above
Manganese Mn	Quarterly	As above
Mercury Hg	Quarterly	As above
Nickel Ni	Quarterly	As above
Potassium K	Quarterly	As above
Sodium Na	Quarterly	As above
Phosphate PO_4	Quarterly	As above
Sulphate SO_4	Quarterly	As above
Zinc Zn	Quarterly	As above
Total alkalinity (as $CaCO_3$)	Quarterly	As above
Total organic carbon TOC	Quarterly	As above
Total oxidised nitrogen TON	Quarterly	As above
Arsenic As	Quarterly	As above
Barium Ba	Quarterly	As above
Boron B	Quarterly	As above
Fluoride F	Quarterly	As above
Phenol	Quarterly	As above
Phosphorus P	Quarterly	As above
Selenium Se	Quarterly	As above
Silver Ag	Quarterly	As above
Nitrite NO_2	Quarterly	As above
Nitrate NO_3	Quarterly	As above
Faecal coliforms (/100mls)	Quarterly	As above
Total coliforms (/100mls)	Quarterly	As above
Water level (m OD)	Quarterly	As above

F.6. Monitoring & Sampling Points - Noise

Noise monitoring is carried out at nearby residences and site boundaries adjoining same (Refer to Environmental Monitoring Plan Figure F 1). Continuous noise monitoring is carried out in accordance with ISO 1996/1 – 1982 "Acoustics – Description and Measurement of Environmental Noise" using a Larson Davis Model 812 Sound Level Meter which is calibrated using a Larson Davis Acoustic Calibrator CAL 200. The results of noise monitoring are provided in Attachment I.6.

The operator has established an environmental monitoring programme to include noise monitoring. It is proposed to continue to carry out noise monitoring at the site boundary adjoining nearest dwelling houses on a quarterly basis. Noise levels will be monitored in accordance with ISO 1996 *"Acoustics – Description and measurement of environmental noise"* Part 1, 2 and 3. Continuous noise monitoring will be carried out using a Larson Davis Model 812 Sound Level Meter, which will be calibrated by an Acoustic Calibrator CAL 200.

TABLE F6: ENVIRONMENT MONITORING AND SAMPLING LOCATIONS - Noise

***Monitoring Point Reference No* (s):** N4, N5, N6,

Parameter	Monitoring frequency	Accessibility of Sampling point
$L(A)_{EQ}$[30 minutes] **$L(A)_{10}$[30 minutes]** **$L(A)_{90}$[30 minutes]** **Frequency Analysis** (⅓ **Octave band analysis)**	Annually Annually Annually	Easily accessible via site entrance

F.7. Monitoring & Sampling Points - Meteorological Data

As the only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste it is considered that the proposed development will not have any direct or indirect impacts on the regional or local climatic conditions. Therefore no site monitoring is considered necessary with respect to recording of Meteorological Data.

F.8. Monitoring & Sampling Points - Leachate

As only inert materials are being used to restore the lands, no leachate will be created and therefore no monitoring of leachate is required.

F.9. Monitoring & Sampling Points - Landfill Gas

As only inert materials are being used to restore the lands, no landfill gas will be created and therefore no monitoring is required.