Attachment F.1: Abatement Systems

F.1.1 Air Emissions

As outlined in Attachment D and E no additional emission sources to atmosphere are proposed in this application. Therefore no additional abatement systems are required. Further details on treatment, abatement and control for the existing emission points are given in the relevant tables of Attachment E, Appendix E.

Table F.1.a: Abatement and Treatment Techniques for Emissions Point A2-1

Emission to be treated / abated	Treatment / abatement process
Particulates (dust), Hydrocarbons (expressed as Total Organic Carbon (TOC), pollutants relating to the presence of certain wastes (e.g. chlorine due to presence of PVC)	Abatement: The quality of waste entering the furnace impacts on the completeness of combustion and on the nature of gases released. Waste acceptance and handling procedures are in place to ensure wastes are screened and mixed in the bunker to remove any non-conforming items and provide for complete combustion.
Carbon Monoxide (CO), TOC	Abatement: The temperature and residence time of waste in the furnace affects the completeness of combustion. Regulation of temperature is a critical factor for CO abatement. As the waste travels through the furnace the initial heat (temperature range of 50°C to 100°C) will drive moisture from the waste. The next stage in combustion will be the release of volatiles such as CO. The volatilisation of combustible gases takes place typically at temp range 200°C to 750°C, and then combustion takes place above the waste on the grate at 850°C. To achieve burnout of organics and abate TOC in the flue gasses, a minimum temperature of 850°C will be maintained for at least 2 seconds in the first pass of the boiler.
Poly-Chlorinated Dibenzo Dioxins (PCDD) and Poly-Chlorinated Dibenzo Furans (PCDF)	A minimum temperature of 850°C will be maintained for at least 2 seconds in the first pass of the boiler to abate PCDD and PCDF formation. Other dioxin abatement measures such as rapid cooling over the range 450°C to 250°C by increasing the velocity of the flue gases through the section of the boiler where cooling over this temperature range will occur, to prevent re-formation of dioxins and regular cleaning will also take place of heat transfer surfaces to remove any metals which could act as a catalyst in the formation of dioxins.

Oxides of Nitrogen (NO_x)	Treatment: A Selective Non-Catalytic Reduction (SNCR) reagent of 24.9% ammonia solution is injected at two levels into the furnace to react with and remove NO_x from the flue gases.
Particulates, PCDD, PCDF, heavy metals	Treatment: Expanded clay and activated carbon are injected in two stages in the flue gas treatment system to trap these components. The clay, carbon and entrained particulates are then removed from the flue gases in the baghouse filter
Sulphur Dioxide (SO_2), Hydrogen Chloride (HCl), Hydrogen Fluoride (HF)	Treatment: Lime slurry is injected in the spray drier absorber, and, where necessary, fresh hydrated lime in the reaction duct to react with these acid gases. The reaction salts are then removed from the flue gases in the spray drier absorber or in the baghouse filter
Visible plume	Abatement: The temperature of the emissions exiting the stack is approximately 140°C, which is high enough to mitigate against a visible plume. It is not possible to avoid completely the visible plume as it also depends on the ambient air conditions and in winter months the plume will be visible and less visible in summer months.

F.1.2 Effluent Emissions

F.1.2.a Point and Area Source Effluent Emissions

As outlined earlier the facility generates no process water discharge. Spillages and washwater from within the main process building are sent directly to a spilled water tank and returned to the process. Attachment D.1.k and Chapter 11 of the accompanying EIS describes these systems in greater detail.

SW1

The surface water drainage system has been designed to ensure that any discharge from the site will be similar in nature and quality to greenfield agricultural runoff. A schematic of the system and an outline of the abatement measures taken to control the quality and flow of the discharge are provided in Chapter 11 of the accompanying EIS.

GW1-GW3

There are no emissions to sewer from the facility. Domestic effluent collected from staff and visitor facilities is treated in Puraflo® systems prior to discharge to engineered percolation areas in the overburden (emissions point GW1-GW3). The systems are described in Chapter 10 of the EIS and the relevant sections of Attachments D and E.

F.1.2.b Fugitive Emissions

All substances with the potential to cause a negative impact on groundwater or surface waters are stored in appropriate containers within the main process building and/or in bunded areas.

All waste entering the facility (non hazardous and hazardous EWC codes) will be stored in fully contained structures therefore in the unlikely event of a spillage or a particularly wet load of incoming waste, there will be no potential for leakage to soils. All waste storage facilities are impervious to the materials stored therein. The waste bunker has a base thickness of 1.1m and a wall thickness underground of 800mm, with a secondary containment system with fully sealed membrane and leak detection system to ensure that at all times the bunker remains water tight. The leak detection system is checked on a monthly basis. In the event that any liquid is encountered in this leak detection system the source of the liquid will be investigated and mitigation works completed as and when required.

All other concrete bunding structures (for storage of fuels and other raw materials) have been constructed as watertight structures in accordance with the requirements of relevant Codes of Practice such as BS8007 British Standard for Design and Construction of Aqueous Liquid Retaining Structures. These structures will be integrity tested in accordance with the requirements of the facility licence and guidelines given in the Code of Practice for leakage to confirm that they are watertight.

As outlined in Attachment E.1.2, all storage, treatment and handling of residues and consumables and any plant cleaning operations, with the exception of fuel & ammonia solution storage, takes place within the main process building. The proposed additional fuel tank (see Attachment D.1.g) and ammonia storage tank in the service yard will be double skinned. Materials stored within the main process building will also be provided with bunding where necessary. Any spills or washwater will be contained within the building and directed to the spill tank for recirculation.

These measures ensure that there are no fugitive emissions to groundwater.

Attachment F.2-F.9: Monitoring & Sampling

Schedule C of existing facility licence W0167-02 details the monitoring requirements at the facility. A summary of the monitoring requirements are present on Table F.1 below. The location of all emission points and monitoring points is shown on drawing 21098\WL010 Rev A provided in Appendix F1. As outlined in Attachment D and E and throughout this application, no additional emissions to surface water, sewer or noise are proposed by this application. It is considered that the slight changes to the emissions to atmosphere and the additional minor emissions to groundwater are sufficiently dealt with by the existing monitoring requirements. In conclusion it is considered that there is no requirement to make any additions to the existing monitoring programme. Tables F2 to F8 and Table Ff have therefore been omitted.

However consideration of the following suggested amendments to the monitoring programme are requested.

In relation to Schedule B1 of the licence, Emission Limits to Air, Indaver request that Note 3 to the Table be amended. The licence requires the sample period for average values for dioxin and furans to be measured over a sample period of minimum 6hrs to maximum 8 hours. Indaver currently have a continuous monitoring system in place so it is recommended that the note be updated/removed.

In relation to Schedule C4 of the licence, monitoring of incinerator residues, it is requested that Note 1 to the table be amended. The licence requires analyses of residues to be conducted at an accredited laboratory employing accredited procedures. Indavers experience is that while many laboratories are accredited for soil analyses few are accredited for the equivalent analyses in bottom ash. Indaver would like if the note were amended to say accredited laboratories where possible.

Table F.1

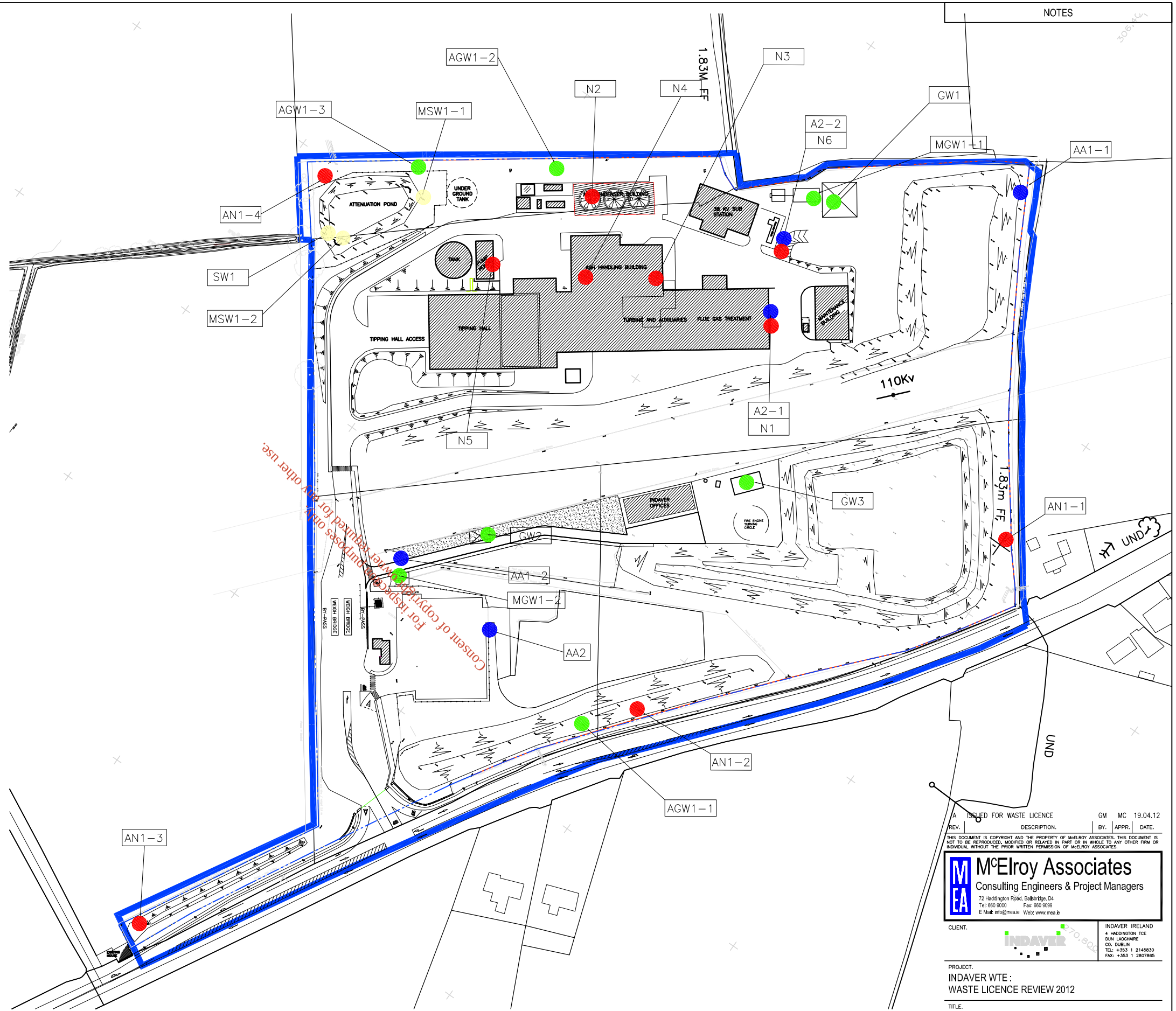
Emission Type/Aspect:	Licence Condition Ref:	Details:
Air	C1.1 to C.1.2	Process Control and Monitoring of Air (including continuous monitoring) at A1-1 Stack and A1-2 Back up Generator

Surface Water	C.2.1 to C.2.3	Storm Water emissions at SW1 (including continuous monitoring)
Sewer Discharge	C.3.1 to C.3.2	No discharge
Groundwater (Ambient)	C.6.1	Monthly and Biannual monitoring at Upgradient and Downgradient monitoring boreholes (AGW1-1 to AGW1-3)
Noise (Ambient)	C.6.2	Annual monitoring at Boundary Locations (AN1-1 to AN1-4)
Meteorological Data	C.5	On site weather monitoring station AA2

Appendix F1

NAME	LABEL
A2–1	STACK AIR EMISSION/MONITORING POINT
A2–2	EMERGENCY GENERATOR AIR EMISSION
AA1–1	DOWNWIND ODOUR MONITORING
AA1–2	UPWIND ODOUR MONITORING
SW1	SURFACE WATER DRAINAGE OUTFALL EMISSION
MSW1–1	SURFACE WATER MONITORING CHAMBER 1
MSW1–2	SURFACE WATER MONITORING CHAMBER 2
GW1	GROUNDWATER PERCOLATION AREA EMISSION
GW2	GROUNDWATER PERCOLATION AREA EMISSION
GW3	GROUNDWATER PERCOLATION AREA EMISSION
MGW1–1	GROUNDWATER PURAFLO MONITORING CHAMBER
MGW1–2	GROUNDWATER PURAFLO MONITORING CHAMBER
AGW1–1	UPSTREAM GROUNDWATER MONITORING WELL
AGW1–2	DOWNSTREAM GROUNDWATER MONITORING WELL 1
AGW1–3	DOWNSTREAM GROUNDWATER MONITORING WELL 2
N1	STACK NOISE EMISSION
N2	AIR COOLED CONDENSOR NOISE EMISSION
N3	TURBINE COOLING NOISE EMISSION
N4	GRATE COOLING No's 1& 2 NOISE EMISSION
N5	PUMP HOUSE LOUVER NOISE EMISSION
N6	EMERGENCY GENERATOR LOUVRE NOISE EMISSION
AN1–1	AMBIENT NOISE MONITORING 1
AN1–2	AMBIENT NOISE MONITORING 2
AN1–3	AMBIENT NOISE MONITORING 3
AN1–4	AMBIENT NOISE MONITORING 4
AA2	WEATHER MONITORING STATION

NOTES



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PROJECT.
INDAVER WTE :
WASTE LICENCE REVIEW 2012

TITLE.
EMISSION AND
MONITORING POINT LOCATIONS

DESIGNED:	CHECKED:	APPR'D:
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