



**Mooresfort,
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28 July 2011

Sonja Smith,
Office of Climate, Licensing & Resource Use,
EPA,
PO Box 3000,
Johnstown Castle, Estate,
County Wexford.

RE Reg No: P0467-02 of the Integrated Pollution Prevention and Control (IPPC) Licence

Dear Sir/Madam

I refer to the application for a review of the Integrated Pollution Prevention and Control (IPPC) licence, by Mr Tim Culinane, Reg No: P0467-02, which was submitted on 24 November 2008 and your request for further information dated 18th August 2010

In accordance with the provisions of Section 90 of the EPA Acts 1992 to 2007, we submit the following information detailed below so that the Agency may complete a comprehensive assessment of the [PPC application:

We submit our response to your letter of 18th August in the same numerical format as your request.

- 1(i) Provide an updated drawing/map:
to show all the current and proposed groundwater wells at the proposed anaerobic digester plant at Ballaghveny.*

There is one existing well on the site which is used as a monitoring source for the adjacent land fill site, Waste Licence No W0078-03. This well is indicated as AGW4 on the attached site Plan. This is located adjacent to the door on the reception building.

The water use within the facility is low compared with the consumption at the Pig Breeding or Fattening Unit so it is not the intention to bore a production well on the site, therefore it is intended to use public mains as the source of water supply to the Anaerobic Digester and to augment the mains supply by harvesting the rainwater from the reception building for washing.

The integrity of the Anaerobic Digester can be monitored by the leak detection system under the digester structures as shown in the site plan. 201 Rev 2

A copy of the Site Plan is attached in Attachment 2

1(ii) To show the location of the mixing tanks, material tanks, quarantine area, gas purification system, biofilter(s) and all other plant in the proposed reception building at Ballaghveny.

The biofilter & mix tanks are shown on attached Drawing No 017 shows the location of the mixing tanks, material tanks, quarantine area, gas purification system, biofilter(s) and all other plant within and surrounding the reception building, and 405 Rev1 Process flow diagram shows the plant processes pumping arrangement schematics for the entire plant with the exception of the hot water circuits in the interest of clarity. These are submitted in Attachment 2

2. *Provide details on the type of biofilter system (including media) to be installed at the anaerobic digester plant at Ballaghveny.*

Details of the Biofilter are included in drawing no 212 in attachment 2 of this submission. The biofilter proposed is a box type filter using wood chip media within the filter, the filter dimensions are 21m x 6m x 1.3m high with a minimum of 1.05m of media within the filter. The air distribution system will be a central header on the floor of the filter container and a series of diffusing distribution pipes off the header. A drainage valve will be located at the South-east corner of the filter chamber. Drainage from the biofilter will be ducted to the intake pit at the reception building. The reception building will be maintained under negative pressure by 2 sources of air abstraction, firstly the CHP Unit, the combustion air intake will be ducted from the reception area the combustion air volume for the CHP Engine equates to 0.5 Air Changes per hour. The odour laden air from the reception area will be abstracted by a 3m³/s fan and ducted to the biofilter, the high odour air displacement parts of the process such as transferring batches of biomass to and from the Pasteuriser will be ducted directly to the biofilter. The duct routes to the biofilter are indicated on the Process diagram as a Cyan colour.

3. *Complete Section E and associated tables of the IPPC application form, as appropriate, please find enclosed tables associated with Section E for your ease of reference*

The completed tables for SECTION E are submitted in Attachment 3

4. *Please clarify the proposed use for the solid/fibrous digestate and the sulphate from the proposed gas purification unit.*

The fibrous portion of the digestate post separation, is a high quality product, with a multiple of possible applications, some of which have potential for generating an income stream. However it is not possible to tie down these commercial options, until a continuity of supply can be guaranteed, which by extension makes the development dependent on planning and IPPC license. We have set out hereunder a list of the possible recovery or sale options for this fibrous digestate. During the development stage it is intended to negotiate the recovery/sale of the fibrous portion in the best commercial interest of the project. Due to commercial sensitivities we cannot disclose the names of the possible interested companies.

- (i) For use as a filler product to displace peat usage. As a class a product, with guaranteed continuity of supply the fibrous digestate is an excellent option.
- (ii) Horticultural/Nursery applications. Nursery applications have been investigated as part of this AD project, The use of pasteurised material as a nursery media has been received well by Nurseries however the feedback is positive but they need to sure of continuity of supply and will only commit to using the product when in production
- (iii) Land Remediation: there are a number of land remediation projects within the catchment of the proposed Anaerobic Digester which require a fibrous material to incorporate into the soil as a growing media. In these applications continuity of supply is paramount and will only commit to using the product when in production.
- (iv) Recovery as a fertilizer source for agricultural land, in accordance with nutrient requirements of proposed crop, and in compliance with S.I. No 610 of 2010.

Sulphur content of the Biogas produced at the plant is directly affected by the source of the biomass used in the process the expected content in the region of 5000ppm. Gas engine manufacturers advise that biogas for consumption in an Internal Combustion engine should have sulphur content less than 250ppm. The means of achieving this is pass a small amount of air into a controlled chamber to allow aerobic microbial activity to collect the sulphur. The chamber is washed down on a regular basis ant the wash is directed to the final liquid digestate storage basin. The quantity of sulphur is less than 0.04% of the Gas volume and is therefore a negligible trace element when diluted in the liquid digestate.

In addition to the above please also provide an updated non-technical summary to reflect the information provided in your reply

Non technical Summery Rev 2 is included in Attachment 1 of this submission

Yours Sincerely,



Michael McEniry,

NRGE Ltd.

On Behalf of Tim Cullinane

Attachment 1

Non technical Summery Rev 2

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1. NON-TECHNICAL SUMMARY- Rev 2

- 1.1 This proposal for an Anaerobic Digester adjacent to the proposed Grain Storage Sheds at Ballaghveny (Grid Ref E197246, N181819), the pig fattening unit at Ballyknockane (Grid Ref E198148 N181804), and the pig breeding unit at Woodville (Grid Ref E196501, N182023) is being put forward by NERGE (Nutrient Recovery to Generate Electricity) Ltd, whose registered office is at Mooresfort Lattin Co Tipperary. This application has been prepared and submitted by NERGE on behalf of Woodville Pigs Ltd, whose registered office is at Woodville, Ballymackey, Nenagh, Co Tipperary to generate green energy (Electricity and heat), and a uniform balanced fertiliser, at the digester by treating the pig manure from the associated farms, when mixed with imported organic waste, in support of the IPPC License Review application (IPPC Reg No P0467-02). The facility will conform to the highest standards. The proposal is fully in line with the Regional Waste Management Plan.
- 1.2 The proposed stock numbers for the 2 No associated pig farms incorporated with the proposed anaerobic digester, included in the review of this IPPC License (Reg No P0467-02) are 350 farrowing Sows, 850 dry sows, 300 gilts, 15 boars, 6600 weaners, and 8000 fattening pigs
- 1.3 The planning status of the proposed development of an anaerobic digester (Planning File No 07/510108), is that Full Planning Permission was granted by An Bord Pleanala by decision dated 21/01/09. The An Bord Pleanala file Ref No was 22.226891. A copy of the An Bord Pleanala decision is included in Attachment No 3 of this report.

The planning file Reference No for the proposed new loose dry sow house, guilt house and extension to the farrowing house at Woodville Pig Breeding unit is 10/510163. A Further Information request has been issued by North Tipperary County Council on the 8th of June 2010 in respect of this application. A full copy of this planning application, and the F.I. issued by North Tipperary County Council is included in Attachment 17 of this report. A response will be issued shortly in respect of this F.I. from North Tipperary County Council, and a copy of this document will also be forwarded directly to the Agency. A full copy of the Grant of planning permission, with conditions granted for the Pig Fattening unit at Ballyknockane (Planning File No.07/51/0106), is included in Attachment No 4 submitted in the previous submission

- 1.4 The proposed AD development at Ballaghveny will occupy a landscaped site of approximately 9.33 hectares, (23.1 acres). The proposed works will also provide for the construction of two No.grain stores, and a mill, which will supply milled grain to adjacent farms. It is planned to utilise heat from the CHP plant of the proposed Internal Combustion Generator to dry the grain. This will reduce the dependency of fossil fuels currently used for this process.

The breeding unit development at Woodville, will occupy a landscaped site of approximately 2.34 hectares, (5.78 acres). The proposed works will increase the sow numbers on site, from the current level of 920 to 1200.

The fattening unit at Ballyknockane occupies a landscaped site of approximately 2.74 hectares, (6.77 acres) The proposed works will not increase the stock numbers on site, which is currently 8,000 pigs reared to bacon weight, but rather provide compliance with the forthcoming E.C. Regulations on Animal Welfare, Nitrate Directives, and incorporates emission reduction measures, as required by regulation, along with the replacement of existing old structures on site. The combination of these units provides an integrated facility.

- 1.4. The buildings and their layout are state of the art for the industry. All clean water from the three Sites, is collected via the storm water collection system (See Site Layout Plans, in Attachments 13, 14, and 15), and directed into the monitoring points identified, and marked on said drawings. These monitoring points will be visually inspected weekly, and sampled quarterly. All soiled water in the pig breeding and fattening units will be All soiled water will be diverted into reception tank or storage tanks.
- 1.5 This proposed development complies fully with the requirements of the IPC Licence's Reg No P 0467-01, issued by the Environmental Protection Agency, in respect of the breeding unit located at Woodville, Ballymackey, Nenagh, Co Tipperary. The fattening unit at Ballyknockane, Ballymackey, Nenagh, Co Tipperary, which is associated with Woodville Pig farm, now makes this facility an integrated facility. All stock bred and reared at the Woodville breeding unit, are finished to factory weight at the Ballyknockane fattening unit.. The main components of this proposal are;

- (i) Removal of pig manure from under pig houses on the two referenced pig farms to the proposed anaerobic digester for treatment within 2-4 weeks of production.
 - (ii) Construction of 2 No. Grain Stores for drying and storage of locally produced grain, prior to milling and resale to local pig farms. It is planned to purchase grain from customer farms who use digestate as a fertiliser source.
 - (iii) Treatment of pig manure in anaerobic digester adjacent to site, to produce electricity, heat, and a uniform balanced fertiliser for supply to local customer farms.
- 1.6 The estimated annual production of pig manure from the three referenced pig farms is 15,134 M3 from the Ballyknockane fattening unit, 11,183 M3 from Woodville Pig Farm. The location of these units in relation to the proposed site are identified in a location map (Scale 1:50,000) included in Attachment 1 of this report. Therefore the total volume of pig manure to be treated by the proposed Anaerobic Digester is 26,317M3 annually.
- 1.7 The proposed development will give direct employment to 1 full time staff member, and a trained manager, at the anaerobic digester site, 5 full time staff members and a trained manager, at the breeding unit, and 2 full time staff members and a trained manager at the fattening unit. . It will also give rise indirectly to another 40 jobs in the pig meat processing, milling and service sectors.
- 1.8 The digestate will be supplied to customer farms who currently utilise pig manure from the above referenced pig farms. The application of fertilisers to farm land is now regulated under S.I. 101 of 2009, and all distribution of digestate will comply with those regulations.
- 1.9 It is planned to import an additional 22,500 tonnes of organic material per annum to mix with the pig manure to increase the efficiency of the proposed Anaerobic Digester. The volume of organic material was increased, to ensure the viability of this project. This organic material will be accepted in the reception building and discharged directly to the mixing tank after inspection, it will be mixed with pig manure to make a pumpable substraight and pumped to the holding tanks where the mixed biomass will be added to the heating module as part of the recipe per batch. The organic materials will be green crop (maize, grass, oil seed or corn), or alternatively will be belly grass from adjacent meat factories, cake sludge from adjacent dairy processing plants, fish waste, or by-products from green energy processing plants etc. It is proposed to use only organic materials that are currently being applied to land, as this process will greatly reduce current environmental impacts. The approval of the Environmental Protection Agency, North Tipperary County Council and the Department of Agriculture will have to be granted to permit the treatment of other waste types at this proposed anaerobic digester.
- 1.10 The proposed development of an Anaerobic digester on site will significantly reduce the risk to surface and groundwater, generally in the area.
- 1.11 However with the development of the anaerobic digester the P content of the resultant liquid digestate, will be reduced by 80%% due to the separation of fibrous material after treatment. The fibrous portion of the digestate will be used in alternative applications not necessarily in agriculture such as, mine tailing pond remediation, nursery and horticultural applications.
- 1.12 Following a detailed review of all available alternative technologies, to treat pig manure, as required by the above referenced IPC licence's issued by the Environmental Protection Agency, it has been decided that the most suitable technology for this site is Anaerobic Digestion, which is simply the natural breakdown of organic waste in the absence of air. A Digester is simply a warmed, mixed, airless vessel which creates ideal conditions for the necessary bacteria, to naturally break down this material. A chain reaction of different bacteria, attack the carbon in the digesting material, giving off methane gas as biogas (65% Methane). This gas can be collected, contained, and then burned to create electricity, and/or heat, or in some cases processed further into a vehicle fuel. It is now accepted within the EU that farming and life in general must become more sustainable with regard to care taking the environment, and maintaining rural life. There is now a significant amount of legislation that is demanding this sustainable and integrated approach. The use of anaerobic digestion can help to meet many of these targets

- (i) The pig manure produced on these pig farm's will provide over 50% of the required fuel waste for this anaerobic digester
- (ii) The additional fuel waste required will be sourced, and transported to the facility by lorry, at a rate of 18-25 loads per week.
- (iii) The gas generated will be used to generate electricity for sale to the National Grid, and the heat from the CHP turbine will be used to maintain the AD process, heat adjacent properties, facilities, and dry grain, thus replacing oil usage.
- (iv) The excess power will be exported to the national grid.
- (v) The solids will be separated, including 80% of the P.
- (vi) The liquid fertiliser will be supplied to customer farms, in accordance with the requirements of S.I. No 101 of 2009.
- (vii) The odour impact of spreading digestate vv pig manure will be reduced by 80% min.
- (viii) The digestion process will destroy 98% of all pathogens & parasites.
- (ix) The digestate is relatively stable, and will not produce a crust in storage.
- (x) The digestion process will kill all weed seeds.
- (xi) The digestate is a pleasant, clean and easy material to handle.
- (xii) The digestate is a more uniform and stable fertiliser source, than pig manure

1.13 An Environmental Impact Statement was compiled following an environmental assessment of these proposed developments of an Anaerobic Digester, and extension to the breeding unit at Woodville, the subject of this IPPC License Review application. Flora & Fauna, archaeological monuments and traffic levels were also noted. The following statements may be made.

- (a) This proposed facilities are located in a rural area where agricultural is predominant. The proposed sites are a disused quarry (in respect of the AD plant), with varying levels, pits and mounds as can be seen on the site layout plan in Attachment 13, of this report, as determined by the site survey. Ballaghveny Landfill Site is located across the road from the proposed AD site. The associated pig farms are both existing facilities. The overall emissions from these existing farms, and associated operations, will be reduced as a result of this proposed development. (See Attachment 10 of this report)
- (b) The quality of the surface and groundwater adjacent to the proposed sites are currently being monitored by the EPA, with regard to the adjacent landfill site, which provides a good baseline pre development. It is proposed to expand this monitoring with up gradient and down gradient groundwater monitoring on site, and quarterly grab monitoring of all storm water leaving the proposed AD facility via a monitoring point. Storm water monitoring at the associated pig farms is carried out in accordance with Agency requirements, as well as groundwater monitoring at both units. A review of these results indicates that the results are within guideline limits.
- (c) The impacts from traffic, noise and odours from the proposed development will be insignificant after all practical steps have been taken to mitigate them.
- (d) Pig manure will be delivered to the proposed development via tankers, and digestate will be delivered to customer farms by lorry tanker.
- (e) The customers lands selected whereupon pig manure digestate will be used are well drained and are mostly deficient to low in phosphorus, one of the main plant nutrients supplied by pig manure. No contamination of surface waters with run-off waters containing high phosphorus content can be foreseen with the applied management. Neither will contamination of groundwater with nitrate-nitrogen take place.
- (f) The quality of the surface and groundwater leaving the area of customer farms is good.
- (g) Pig manure digestate will be applied using tankers equipped with low trajectory splash plate or the band spreading method.

- 1.14 Proposals for monitoring surface and ground waters at the sites are set down in the Environmental Impact Statement. A register of digestate quantities, date of delivery and name of landowner will be maintained on site for inspection by North Tipperary County Council, The Department of Agriculture, and the EPA at all reasonable times.
- 1.15 The flora, fauna and habitats of the site were studied. Flora and fauna should not be affected by the development and there will be no loss of habitat
- 1.16 There will be no damage to any site of archaeological or historic interest as a result of the proposed development. Disturbance of the landscape will be minimal during the construction period, and all excavated material will be reused within the site boundary. The site will be suitably landscaped, with the planting of trees etc., in a manner sensitive to the environment. There will be no negative effects on tourism in the area.
- 1.17 The development will have a positive impact on human beings from the increased employment it will create, and the resultant reduction of existing impacts from emissions. The three number developments is located in an agricultural area, the buildings will blend into the surrounding area. Also, the developments will be landscaped with a screening of trees, shrubs and flowers. Thus, there will be no nuisance or loss of amenity.

Effects of the development on air are insignificant outside the buildings and adjoining yards. The application of digestate will replace the current practice of pig manure application to land, resulting in an 80% reduction of odours generated, due to gas extraction. Pig manure will also be moved fresh from the pig farms to the Anaerobic Digester, within 2-4 weeks of production, thereby reducing emissions from those pig farms. Low protein diets are been utilised on these farms, which can achieve a reduction of 30%, of emissions from those farms. The fresh removal of pig manure from these pig farms and regular delivery o the proposed anaerobic digester will further reduce emissions by 20-50%. The enclosing of the Reception pits in an enclosing building capable of allowing lorries to tip inside the building and the maintainance of the negative pressure within the reception building using the combustion air intake for the CHP unit and a bio-filter system significantly mitigates odour impacts from the Anaerobic Digester facility. Accumulated leachade from the bio-filter will be directed to the reception tank.

Noise levels from the development are unlikely to be a nuisance. The main sources of noise at the development will be the gas turbine which will be mitigated by the construction of a sound proof generation room. There will also be some noise from delivery vehicles. However, at a distance of 100 metres from the development noise levels are not greatly above background noise levels.

The development will have an insignificant effect on the climate of the area.

Thus the measures that have been put in place will ensure that impact/effects of the Development on human beings, noise, air, climate and the interaction of human beings, Fauna, soils, air, water, climate, landscape and material assets will be minimised.

- 1.18 In a discussion paper published by the Environmental Protection Agency (January 2005), it concluded that "*Anaerobic Digestion has the potential to deliver multiple environmental benefits, including reduced water pollution potential, lower green house gas emissions, and reduced odours from agricultural slurries*" (see Appendix 4).
- 1.19 This proposed development has the potential to benefit all stakeholders adjacent to the proposed site and the 2 No referenced pig farms, as well as customer farms in the area. The nett result of this proposed development will be a reduction of existing impacts to the order of 20-50%, from the existing pig farms and 80% from the application of digestate in place of pig manure to customer farms.

- 1.20 This proposed development has the potential to provide an economic outlet for crops grown by customer farmers in the area, on lands that may not otherwise be utilised fully. These crops can be fertilised by the digestate from the process. It is also worth stating that the existing pig farm provides a market for locally grown grain, which can also be fertilised by the digestate resulting from this process.
- 1.21 There is sufficient storage capacity available for the digestate post treatment, by means of 2 No storage basins at the proposed digester site, and the secondary digester, amounting to 12090 M3, the provision of an additional basin at the fattening unit, amounting to 4545 M3, and the proposed provision of potentially 3 No additional storage basins, on customer farms, which will be the subject of separate planning applications.

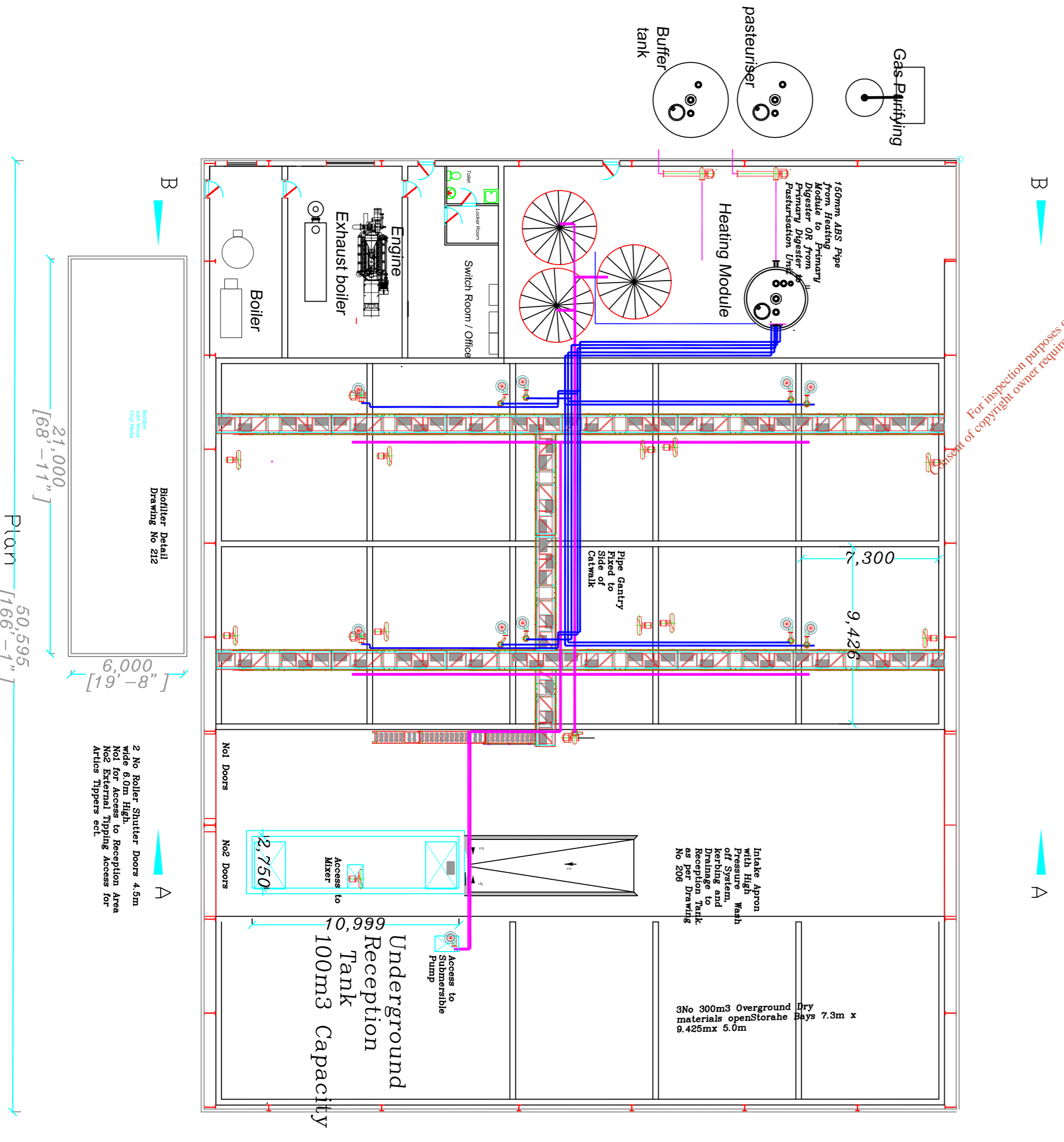
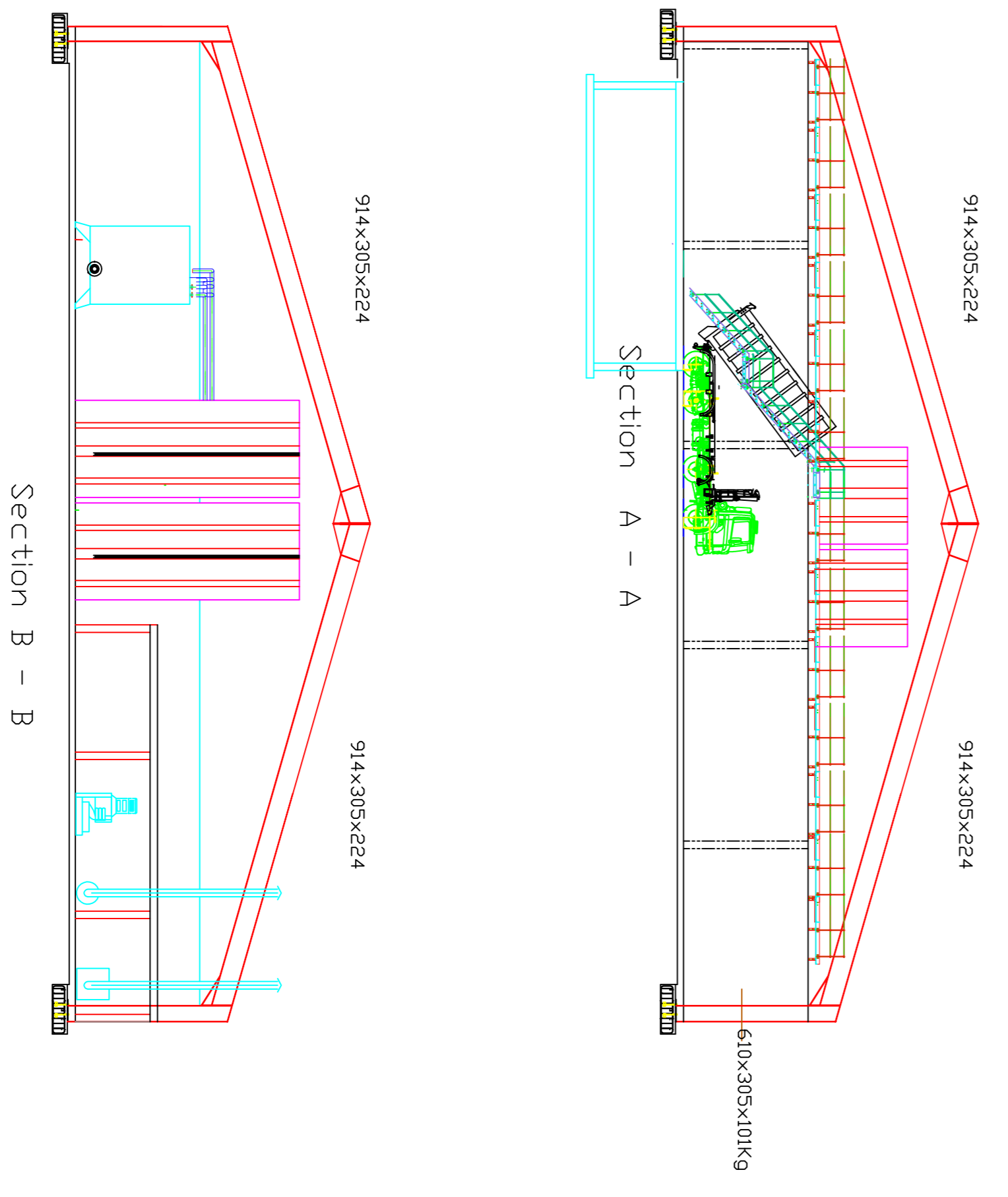
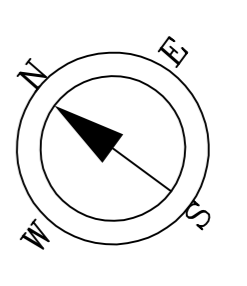
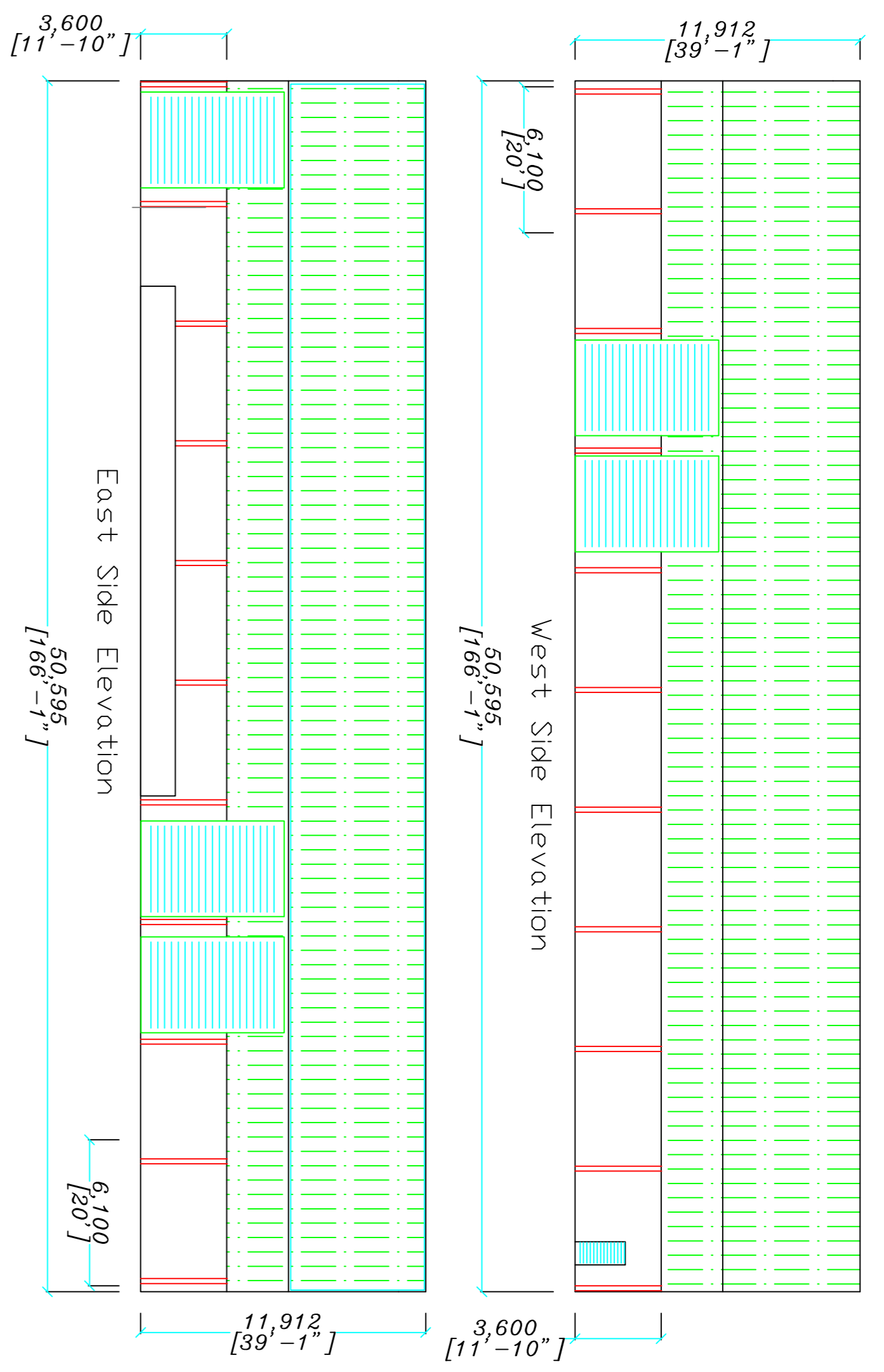
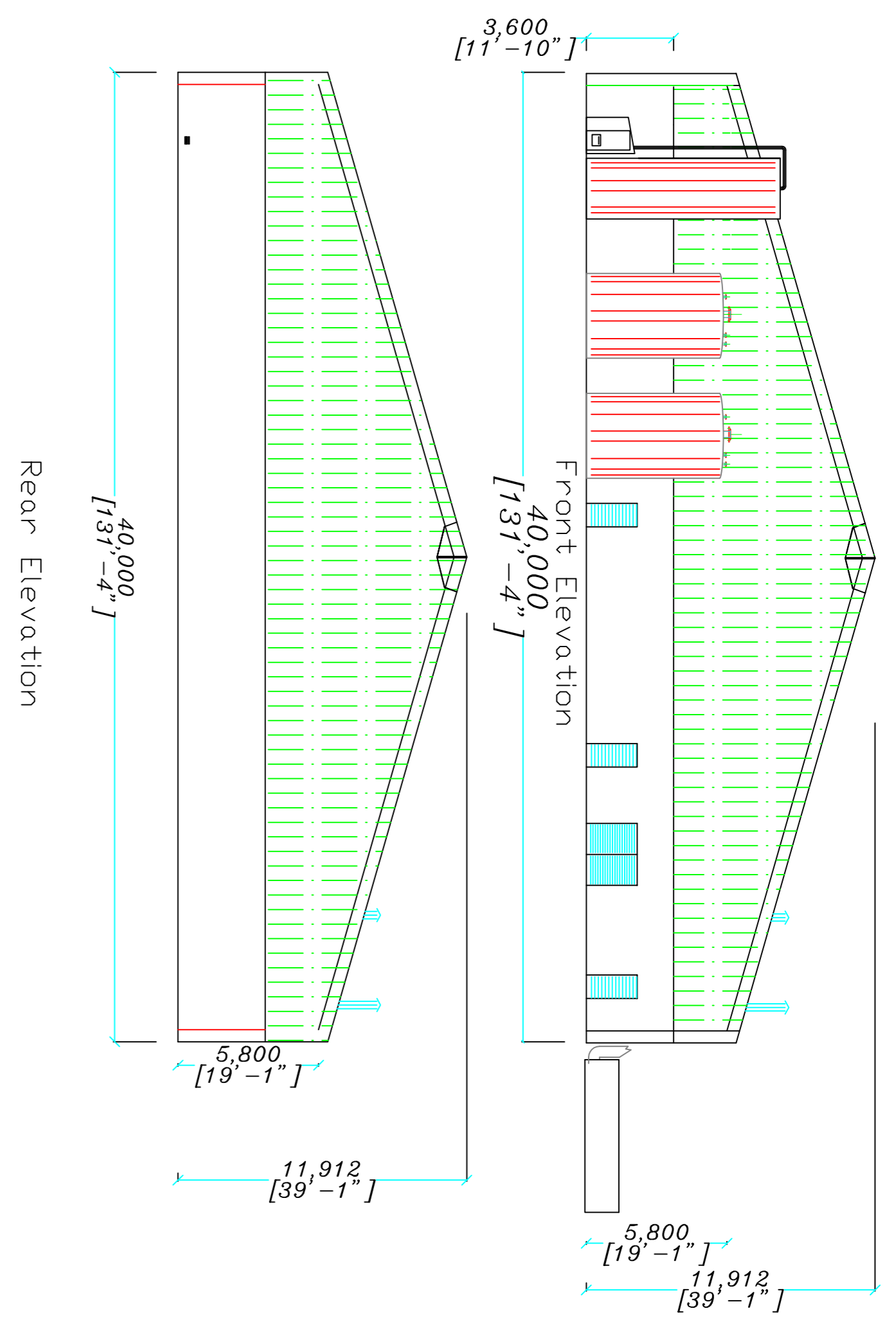
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Attachment 2

Drawings

Drawing No	Description	Scale	Size
201 Rev1	Reception Building	1:200	A1
017	Layout Plan	1:500	A1
405 Rev2	Process Flow diagram	N.T.S.	A3
212	Biofilter Detail	1:100	A3

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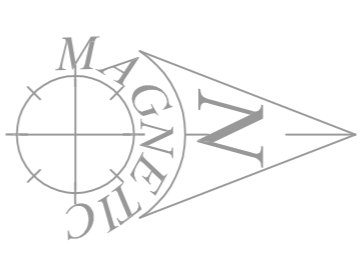
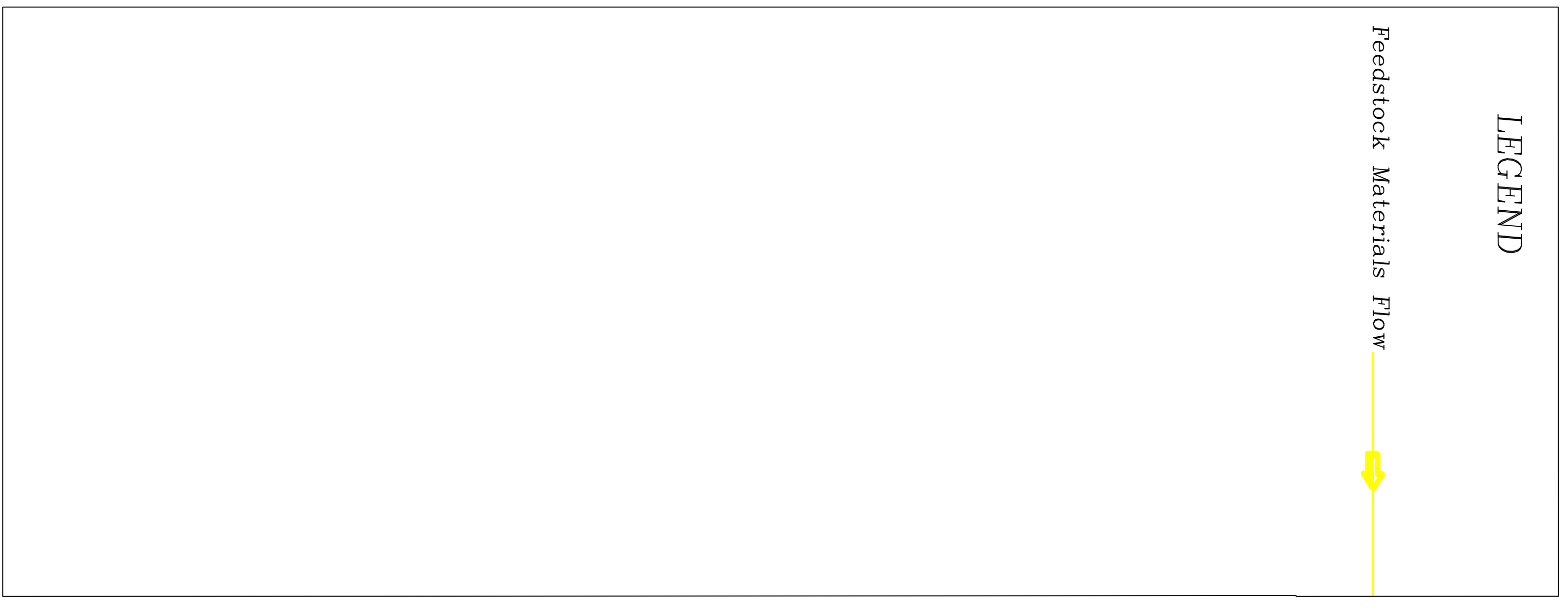
NRCE
 Moorsfort
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 Co Tipperary
 Phone 064 53385
 Fax 064 53483
 Email NRCE@tdale

Title: Proposed Reception Building
 Woodville Pigs

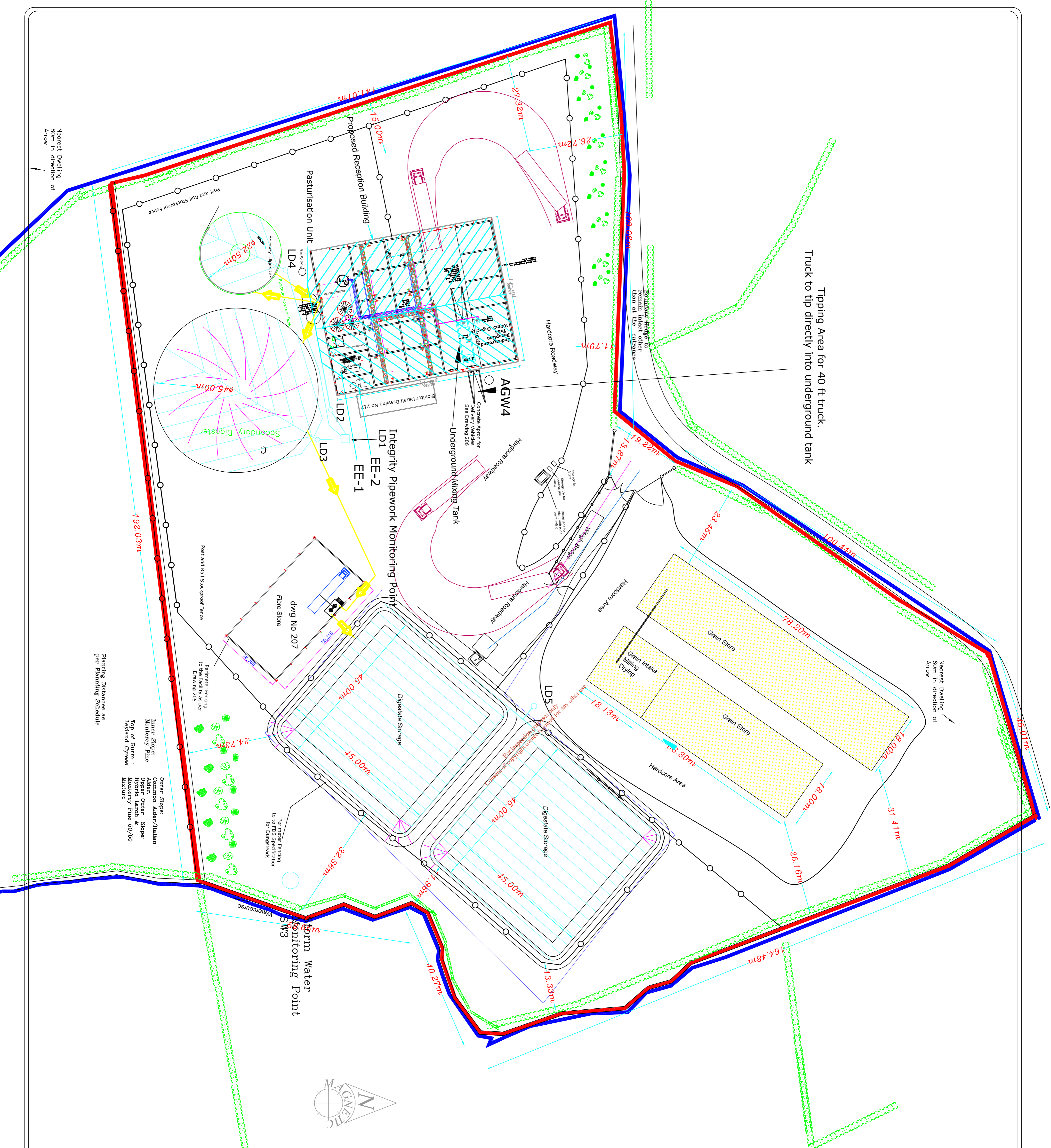
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 Drawn By:

LEGEND

Feedstock Materials Flow 

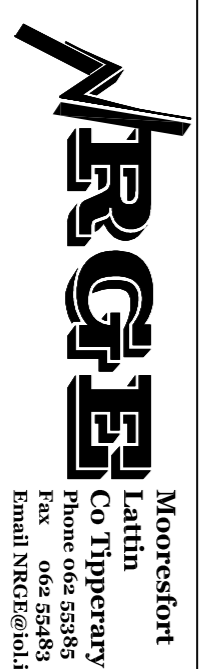


Tipping Area for 40 ft truck.
Truck to tip directly into underground tank.



Planting Distances as per Planting Schedule

- Inner Slope: Alder/Italian Mixture 7:50
- Top of Burn: Leyland Cypress
- Outer Slope: Alder/Italian Mixture 90/50

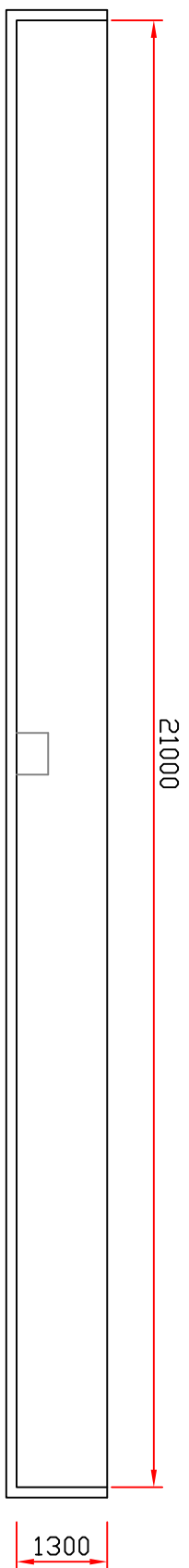


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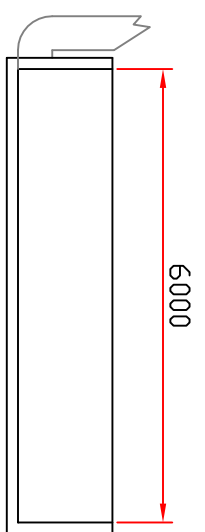
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Leak Detection Monitoring Points

Rev 1 Reorder of Entrances to Separate Grain Store Access from Biogas Plant Access, Reorder Boundary Fences

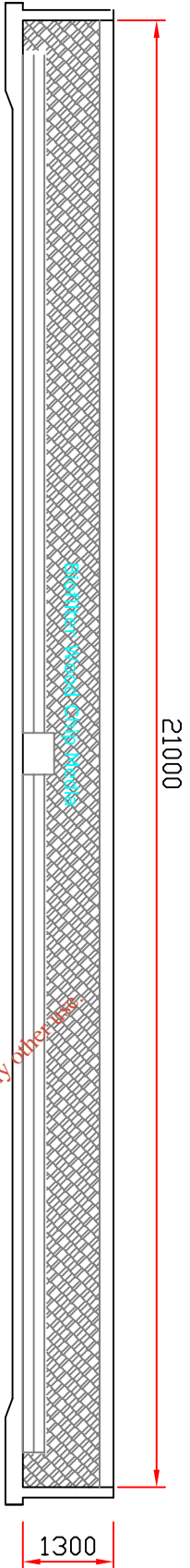
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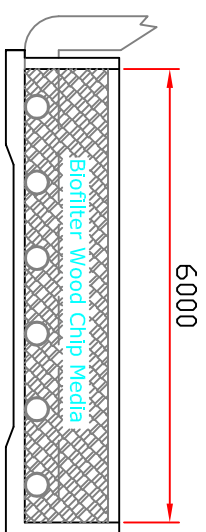
Side Elevation



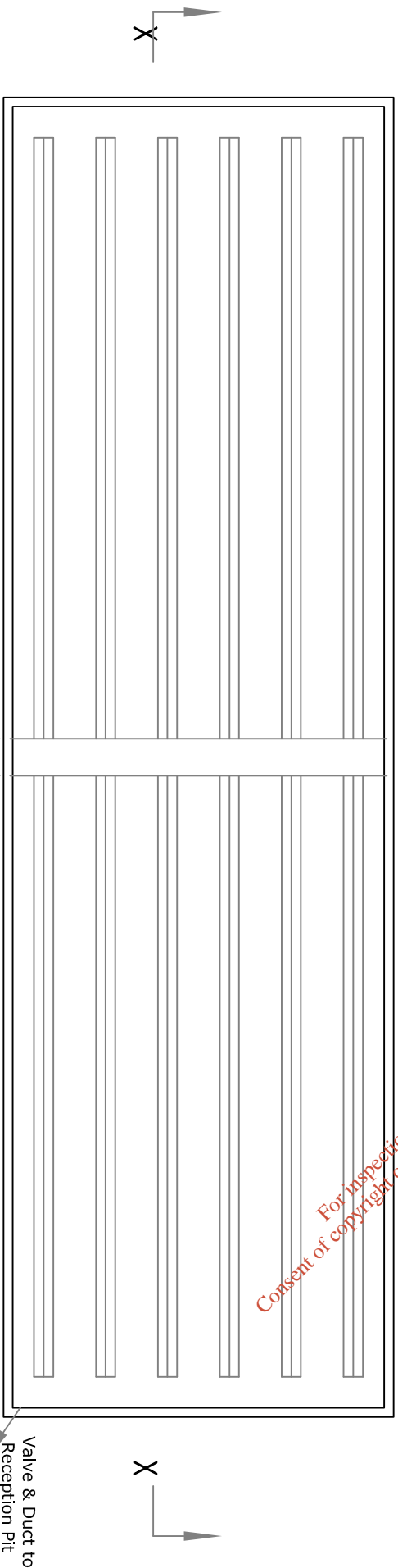
Plan View



Section X-X



Section Y - Y



Plan View

Wood Chip Size distribution (expressed as a percentage of total wet mass):
 < 64 mm (43%);
 64-127 mm (29%);
 127-191 mm (16%);
 191-254 mm (6%); and > 254 mm (6%).

Wood Chip Depth 1050mm (min)

Air Distribution Header 600mm x 600 Distribution header with 12 no 300mm diameter ducts

Walls & Floor:
 Lay 1000 gauge polythene membrane on finished hardcore with 600mm taped overlaps.
 Floor slab shall be 125mm concrete increased to 225mm for 1.2m wide strip at the outer edge of the base
 Floor to be sloped at 1:250 to one corner.
 Walls to be 150mm thick 1.3m high
 Concrete to be the basis of a characteristic 28 day crushing strength of 35N/mm². Minimum cement content shall be 300 kg/m³.



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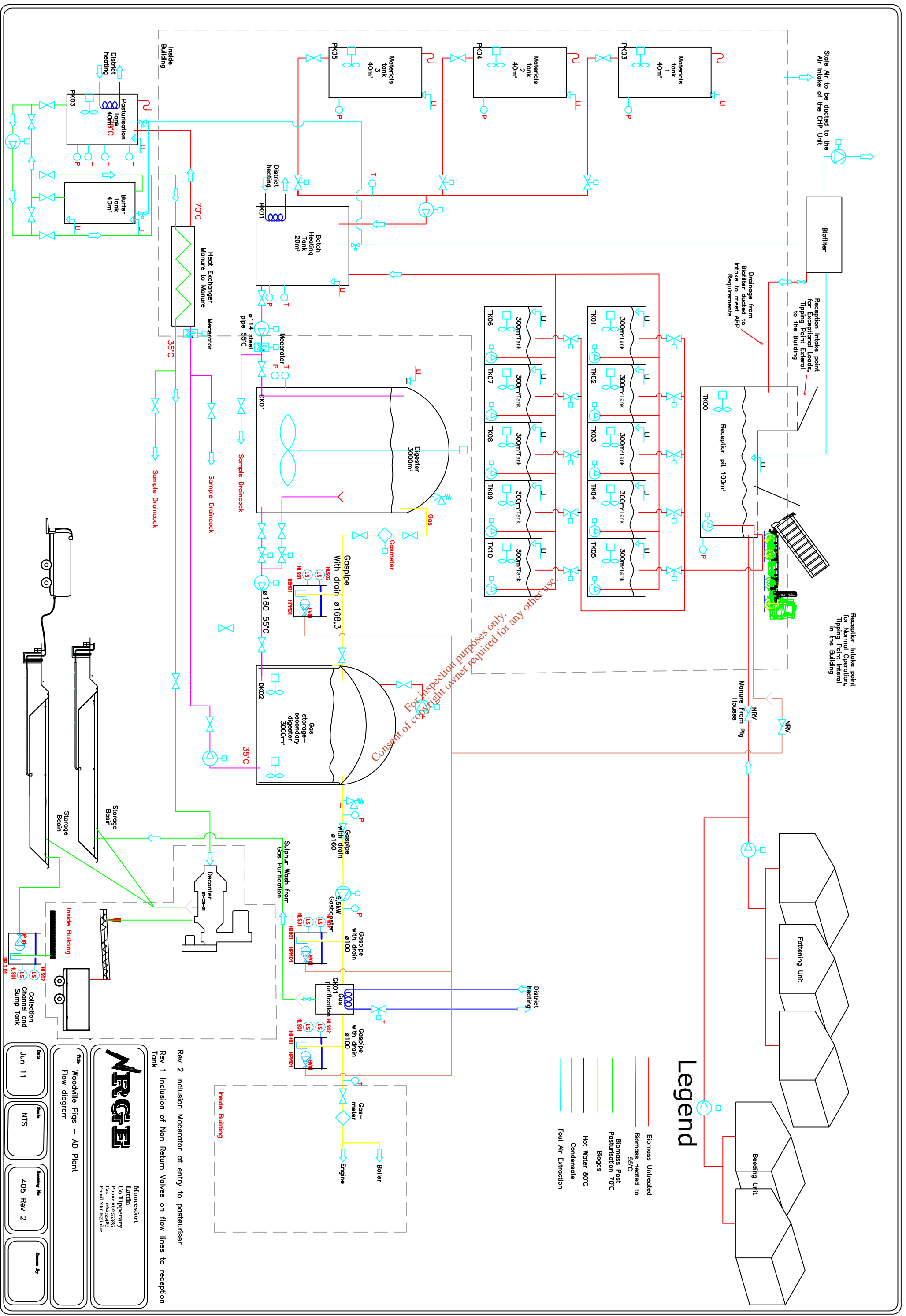
Title
Biofilter Detail

Date
 Jul 11

Scale
 1:100

Drawing No
 212

Drawn By



Legend

- Biomass Untreated
- Biomass Heated to 55°C
- Biomass Post-Pasteurisation 70°C
- Biogas
- Hot Water 80°C
- Condensate
- Foul Air Extraction

Rev 2 Inclusion Macerator at entry to pasteuriser
 Rev 1 Inclusion of Non Return Valves on flow lines to reception Tank

NRCE

Moorestown
 Lattin
 Co Tipperary
 Phone: 052 53385
 Fax: 052 53480
 Email: NRCE@nrce.ie

Title: Woodville Pigs - AD Plant
 Flow diagram

Date	Issue	Drawn By	Checked By
Jun 11	NTS	405 Rev 2	

Attachment 3

Section E Tables

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Table E.1 (i) BOILER EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point:

Emission Point Ref. N ^o :	EE1	
Location:	Plant Room - Reception Building -Ballyvenagh ,	
Grid Ref. (12 digit, 6E,6N):	ITM 597179, 681887	
Vent Details	Diameter: 250mm	Height above Ground(m): 8.1m
Date of commencement of emission:	once the biogas plant is constructed	

Characteristics of Emission:

Boiler rating Steam Output: Thermal Input:	Pel (kW) 1063		kg/hr MW
Boiler fuel Type: Maximum rate at which fuel is burned % sulphur content: NOx	212m ³ /hr @Specific Gravity 0.55 5000 p.p.m		kg/hr
Maximum volume* of emission	500mg/m ³ n	0°C. 3% O ₂ (Liquid or Gas), 6% O ₂ (Solid Fuel)	mg/Nm ³ m ³ /hr
Temperature	400 °C(max) 100 °C(min)	0°C, 3 % O ₂ (liquid or gas), 6 % O ₂ (solid fuel)	°C(avg) 250

* Volume flow limits for emissions to atmosphere shall be based on Normal conditions of temperature and pressure, (i.e. 0°C,101.3kPa), dry gas; 3% oxygen for liquid and gas fuels; 6% oxygen for solid fuels.

(i) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up/shutdown to be included*):

Periods of Emission (avg)	8700 hours per year	_____min/hr	_____hr/day	_____day/yr
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Note: Any telephone enquiries in relation to the above should be directed to **Jennifer Cope** at the number above.
All written communications and replies should be directed to Sonja Smith, Office of Climate, Licensing & Resource Use, EPA, PO Box 3000, Johnstown Castle Estate, County Wexford.

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N ^o :	EE 1
Source of Emission:	Jenbacher CHP Unit Internal Combustion Engine
Location:	Plant Room - Reception Building - Ballybenagh
Grid Ref. (12 digit, 6E,6N):	ITM 597179, 681887
Vent Details	250mm
Diameter:	
Height above Ground(m):	8.1m
Date of commencement:	

Characteristics of Emission:

(i) Volume to be emitted:	
Average/day	8200 Nm ³ /d Maximum/day 8200 Nm ³ /d
Maximum rate/hour	341 Nm ³ /h Min efflux velocity m.sec ⁻¹
(ii) Other factors	
Temperature	400 °C(max) 100 °C(min) 250 °C(avg)
For Combustion Sources: Volume terms expressed as : <input type="checkbox"/> wet. <input type="checkbox"/> dry. <input type="checkbox"/> %O ₂	

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up / shutdown to be included*):

Periods of Emission (avg)	8760 hrs per year (Continuous operation) _____ min/hr _____ hr/day _____ day/yr
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TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: _____

EE 1

Parameter	Prior to treatment ⁽¹⁾			Brief description of treatment	As discharged ⁽¹⁾								
	mg/Nm ³		kg/h		mg/Nm ³		kg/h.		kg/year				
	Avg	Max	Avg		Max	Avg	Max	Avg	Max				

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1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

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TABLE E.1(iv): EMISSIONS TO ATMOSPHERE - Minor atmospheric emissions

Emission point Reference Numbers	Description	Emission details ¹			Abatement system employed
		material	mg/Nm ₃ ⁽²⁾	kg/h.	

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- 1 The maximum emission should be stated for each material emitted, the concentration should be based on the maximum 30 minute mean.
- 2 Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C/101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

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TABLE E.1(v): EMISSIONS TO ATMOSPHERE – Fugitive and Potential atmospheric emissions

Emission point ref. no. (as per flow diagram)	Description	Malfunction which could cause an emission	Emission details (Potential max. emissions) ¹		
			Material	mg/Nm ³	kg/hour

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¹ Estimate the potential maximum emission for each malfunction identified.

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Table E.1 (i) BOILER EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point:

Emission Point Ref. N ^o :	EE 2		
Location:	Plant Room - Reception Building - Ballybenagh		
Grid Ref. (12 digit, 6E,6N):	ITM 597179, 681887		
Vent Details	Diameter: 250mm	Height above Ground(m): 8.1	
Date of commencement of emission:	On commissioning of Biogas Plant		

Characteristics of Emission:

Boiler rating Steam Output: Thermal Input:	1200Kw		kg/hr MW
Boiler fuel Type: Maximum rate at which fuel is burned % sulphur content:	212m ³ /hr @ Specific Gravity 0.55		kg/hr
NOx	500	mg/Nm ³ 0°C. 3% O ₂ (Liquid or Gas), 6% O ₂ (Solid Fuel)	
Maximum volume* of emission			m ³ /hr 0°C, 3 % O ₂ (liquid or gas), 6 % O ₂ (solid fuel)
Temperature	400 °C(max)	°C(min)	°C(avg)

* Volume flow limits for emissions to atmosphere shall be based on Normal conditions of temperature and pressure, (i.e. 0°C,101.3kPa), dry gas; 3% oxygen for liquid and gas fuels; 6% oxygen for solid fuels.

(i) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up/shutdown to be included*):

Periods of Emission (avg)	_____min/hr _____hr/day _____day/yr
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TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N ^o :	EE 2
Source of Emission:	Stadby - Dual fuel Boiler
Location:	Plant Room - Reception Building - Ballybenagh
Grid Ref. (12 digit, 6E,6N):	ITM 597179, 681887
Vent Details Diameter:	250mm
Height above Ground(m):	8.1m
Date of commencement:	on commissioning of Biogas Plant

Characteristics of Emission:

(i) Volume to be emitted:				
Average/day	8200	Nm ³ /d	Maximum/day	8200 Nm ³ /d
Maximum rate/hour	341	Nm ³ /h	Min efflux velocity	m.sec ⁻¹
(ii) Other factors				
Temperature	400 °C(max)	100 °C(min)	250 °C(avg)	
For Combustion Sources: Volume terms expressed as : <input type="checkbox"/> wet. <input type="checkbox"/> dry. _____ %O ₂				

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included*):

Periods of Emission (avg)	200 hrs per year (Operatioal on Startup and when CHP unit is in service _____min/hr _____hr/day _____day/yr
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TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission

(1 table per emission point)

Emission Point Reference Number: EE 1

Parameter	Prior to treatment ⁽¹⁾				Brief description of treatment	As discharged ⁽¹⁾					
	mg/Nm ³		kg/h			mg/Nm ³		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max

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1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

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TABLE E.1(iv): EMISSIONS TO ATMOSPHERE - Minor atmospheric emissions

Emission point Reference Numbers	Description	Emission details ¹				Abatement system employed
		material	mg/Nm ₃₍₂₎	kg/h.	kg/year	

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- 1 The maximum emission should be stated for each material emitted, the concentration should be based on the maximum 30 minute mean.
- 2 Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C/101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

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TABLE E.1(v): EMISSIONS TO ATMOSPHERE – Fugitive and Potential atmospheric emissions

Emission point ref. no. (as per flow diagram)	Description	Malfunction which could cause an emission	Emission details (Potential max. emissions) ¹		
			Material	mg/Nm ³	kg/hour

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¹ Estimate the potential maximum emission for each malfunction identified.

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