



COMAH Status Review

Prepared for:

Deeside SPV Ltd /
BioConstruct
NewEnergy Ltd
Weighbridge Road
Deeside
CH5 2LL

Project Manager:

Darren Smith

by:

ENVIROSOLUTION LTD

0151 291 6451
www.envirosolution.co.uk

on:

21 February 2025

Document Verification

Site Address	Weighbridge Road, Deeside, CH5 2LL
Report Title	COMAH Status Review
Date Issued	21/02/2025
Prepared by	M Peacock
Checked by	W Chambers
Revision	2

Table of Contents

1	Introduction	4
1.1	Overview	4
1.2	Personnel Involved	4
2	Substances	5
3	Tonnage Summary.....	6
4	COMAH Qualification	7
5	COMAH Tier	8
6	Summary	8
7	Next steps.....	9
	APPENDIX 1 – Substances.....	10
	APPENDIX 2 – Calculation Detail.....	16

1 Introduction

1.1 Overview

The land to the south side of Weighbridge Road, Deeside Industrial Park, Deeside, CH5 2LL is being developed into a food waste anaerobic digestion facility comprising: a waste reception building with depacking equipment, anaerobic digestion tank farm (3 fermenters, 1 post-fermenter, 2 digestate storage tanks, 1 heated pre-storage tank), pasteurisation system, biogas upgrading unit for biomethane grid injection, 3 CHP engines, emergency flare, and associated infrastructure.

The anaerobic digestion aspect of the operation produces large quantities of methane gas, hydrogen and hydrogen sulphide. It also handles propane for injection into upgraded biomethane to bring final gas to required calorific value.

These substances are considered to be 'dangerous' and therefore may be subject to regulation under the Control of Major Accident Hazard (COMAH) Regulations 2015.

A review of the materials that may be present on site (as listed in Appendix 1) has been carried out against the Threshold values in Schedule 1 of the COMAH Regulations, to determine the COMAH status of the proposed facility.

The calculations are summarised in this report and in Appendix 2 and indicate that the proposed facility should be considered as a **Lower Tier COMAH Establishment**.

This is due to the quantity methane and propane on site, that are considered as **P2 FLAMMABLE GASES (Flammable gases, Category 1 or 2)** in Schedule 1, Part 1 of the COMAH Regulations.

1.2 Personnel Involved

The following persons were involved in this work:

Name	Company
Mike Peacock	EnviroSolution
William Chambers	EnviroSolution
Darren Smith	BioConstruct NewEnergy
Darren Smith	BioConstruct NewEnergy

2 Substances

A wide range of substances are handled on site, and these are summarised in the Table in Appendix 1.

Potential COMAH substances are highlighted in pink.

The following raw materials were considered in this calculation:

- Propane
- Engine Oil: Castrol Vecton 15W-40
- Diesel
- MagReSyn Amine

And as part of the Biogas produced in Anaerobic Digestion:

- Methane
- Hydrogen
- Hydrogen Sulphide

3 Tonnage Summary

Raw Materials:

Propane is classified as a P2 Flammable gas under COMAH owing to its low flashpoint.

Name	No. of tanks	Max Capacity (m3)	Total Volume (m3)	Operating Capacity (%)	Total Mass (Tonnes)
Propane	5	4.8	24	85%	10.1

Other Raw Materials:

The following raw materials were also considered and the Safety Data Sheets provided by the client were reviewed in all cases:

Name	No. of tanks	Max Capacity (m3)	Total Volume (m3)	Operating Capacity (%)	Total Mass (Tonnes)
Engine Oil: Castrol Vecton 15W-40	1	1	1	90%	0.8
Diesel	1	2	2	90%	1.49
MagReSyn Amine	10	1	10	90%	9.0

No other raw materials were considered to qualify as dangerous substances under COMAH.

Biogas

Biogas is produced from anaerobic digesters and is a mixture of a wide range of gasses.

It contains substances such as methane and carbon dioxide, which are produced by bacteria breaking down organic matter (like food waste, manure, or plant material) in an oxygen-free environment within a sealed tank called an anaerobic digester.

Biogas produced on this site is composed of methane (around 58%) and carbon dioxide, with smaller amounts of hydrogen and hydrogen sulphide and water vapor.

The concentrations of biogas vary throughout the process.

To calculate the mass of dangerous substances the total (worst case) volume of Biogas was considered and then the typical concentration used to determine the mass that may be present on the site.

The total Biogas volume was considered to be 33,880m³, and composed of the following dangerous substances:

Name	Concentration in Biogas	Total Mass (Tonnes)
Methane	58%	12.9
Hydrogen	2%	0.06
Hydrogen Sulphide	0.2%	0.09

4 COMAH Qualification

The substances that do not qualify are greyed out:

Ref	Substance	Relevant H-code	Quantity (tonnes)	DS??	% of LT	COMAH Qualification?
1	Methane	H220: Extremely flammable gas	12.91	Y	129.1%	Qualifies
2	Hydrogen	H220: Extremely flammable gas	0.06	Y	0.6%	Below 2% - not counted for COMAH P2
3	Hydrogen Sulphide	H220: Extremely flammable gas	0.09	Y	0.9%	Below 2% - not counted for COMAH P2
		H330: Fatal if inhaled			1.8%	Below 2% - not counted for COMAH H1
		H400: Very toxic to aquatic life			0.09%	Below 2% - not counted for COMAH E1
4	Propane	H220: Extremely flammable gas	10.06	Y	100.6%	Qualifies
5	Engine Oil	H316: Causes mild skin irritation	9.00	N	n/a	No COMAH hazard - does not qualify
6	Diesel	H227: Combustible Liquid	1.49	N	n/a	Does not qualify: fp is 61.5degC
7	MagReSyn Amine	H226: Flammable Liquid	9.00	Y	0.2%	Below 2% - not counted for COMAH P5c

5 COMAH Tier

The following table summarises the results of the proposed COMAH Tier Status at the new establishment that is to be developed in Deeside.

Where the result is more than 100% the site is considered to fall under COMAH.

COMAH Schedule 1 Category:	COMAH Thresholds:		Relevant Substances	Maximum Site Capacity	Lower Tier		Upper Tier	
	Lower Tier	Upper Tier			%	Result	%	Result
P2 FLAMMABLE GASES Category 1 or 2	10	50	Methane, Propane	22.97	230%	Lower Tier	46%	Not classed as Upper Tier
H1 ACUTE TOXIC Category 1, all exposure routes	5	20	Hydrogen Sulphide	0.09	1.8%	n/a	0.5%	n/a
E1 Hazardous to the Aquatic Environment Category Acute 1 or Chronic 1	100	200	Hydrogen Sulphide	0.09	0.1%	n/a	0.0%	n/a
P5c FLAMMABLE LIQUIDS Flammable liquids, Categories 2 or 3 not covered by P5a and P5b	5000	50000	MagReSyn Amine, Diesel	10.49	0.2%	n/a	0.0%	n/a

6 Summary

The site is considered to be **Lower Tier** status owing to the quantity of P2 FLAMMABLE GASES (Category 1 or 2) that it may hold on site.

Further actions are required – see next steps.

7 Next steps

The following steps should now be taken in relation to the site, prior to its operation:

1. As per the Planning (Hazardous Substances) Regulations 2015, apply to the local Planning Office for Hazardous Substance Consent to allow the calculated quantities of hazardous substances to be handled on site. Notify Members of the Public using the local press.
2. Notify the Competent Authority (HSE or EA) of the intended COMAH Status. Use the approved COMAH Notification form and submit it to the Competent Authority by email.
3. Prepare and issue a Major Accident Prevention Policy (MAPP) for the site, that meets the relevant CA guidance.
4. Carry out a detailed risk assessment of the proposed activity, using a suitable COMAH-focused tool such as a Hazard Identification (HAZID) Study, or equivalent, to verify that the risks are as low as reasonably practicable.

APPENDIX 1 – Substances

Product	Maximum Usage Per Year	Fate of Raw Materials in the Facility	Potential Environmental Impact	Storage Arrangements	COMAH Substance?
Biogas	Unknown at present.	Produced in the facility – gaseous emission from anaerobic digestion	Biogas from anaerobic digesters is a mixture of gases, primarily methane and carbon dioxide, produced by bacteria breaking down organic matter (like food waste, manure, or plant material). Contains Methane ~58% and 0.2% H2S.	Stored in vapour space of AD plant. Total vapour space is maximum of 33,8880m ³ . Considered as total Biogas volume. Methane: 12.9 tonnes Hydrogen: 0.06 tonnes H2S: 0.06 tonnes	Yes P2 Flammable gas: Methane, Hydrogen H2S
Fuels and Oils – Engine Oil	4000 litres Feedstock dependant, quality of the gas being used to run the engines and the maintenance and testing schedule.	CHP engines.	Toxic to animals and humans. Can have long term, persistent impacts if areas of land or water become contaminated following uncontrolled release. Also, direct physical impact on aquatic environment if lost to sewer, via exclusion of oxygen, and physical impacts by coating plants and animals.	Stored in 1,000 litre dedicated tank inside engine container. 0.8 tonnes	No

Product	Maximum Usage Per Year	Fate of Raw Materials in the Facility	Potential Environmental Impact	Storage Arrangements	COMAH Substance?
Diesel	On average 350 litres per month per wheel loader working 2-3 hours a day.	Operation of vehicles on site.	As above.	Stored in dedicated integrally bunded store in outer compound. 1.49 tonnes.	No
Amine-based solvents (MEA, MDEA, DEA, etc.)	Annual Amine Makeup: ~150 m ³ /year	Used within the Co2 Liquification plant	<p>Amine Degradation Products (Ammonia, Nitrosamines, Nitramines)</p> <p>Amines can degrade into harmful byproducts when exposed to oxygen, NOx, and heat.</p> <p>Nitrosamines and nitramines are carcinogenic and can persist in the environment, leading to potential public health risks.</p> <p>Released ammonia (NH₃) contributes to acid deposition and eutrophication. Toxicity to Aquatic Life.</p> <p>Spills or leaks into water bodies can increase pH levels, harming aquatic ecosystems.</p> <p>Eutrophication Risks.</p> <p>Amines contain nitrogen, which can contribute to excessive algal growth in rivers and lakes.</p>	<p>Stored in dedicated integrally bunded store in outer compound.</p> <p>10 IBCs</p> <p>9.0 Tonnes</p>	Yes But below 2%

Product	Maximum Usage Per Year	Fate of Raw Materials in the Facility	Potential Environmental Impact	Storage Arrangements	COMAH Substance?
Propane	500m3	Injected into upgraded biomethane to bring final gas to required calorific value.	None	24 m3 max capacity at any one time at the site in 5 x 4.8t above ground tanks. 10.06 tonnes	Yes P2 Flammable gas
Ferric Chloride	200t	Addition to digesters to manage hydrogen sulphide.	Corrosive – will cause skin irritation to humans and animals if it comes into contact.	Stored in HDPE tank inside process building which is located in bunded area.	No
De-Foaming/Anti-Foaming Agent	Approx. 2,000 litres dependant on feedstock cannot be defined precisely at present until feedstock is fed into the fermenters.	Dosed into the digesters to prevent or inhibit foaming of substrate.	Oil based materials may have impacts on the environment if	In IBC in dosing station located in process building in bunded area.	No
Trace elements	Unknown at present.	Dosing of digesters to maintain health of bacterial community .	May have short term localised impacts if uncontrolled release, depending on nature of bespoke mix.	Stored indoors on sealed surface in small containers raised up on pallets or in plastic containers.	No
Grease	60 litres of grease year dependant on feedstock.	Maintenance of site machinery.	Can cause blockages to infrastructure leading to uncontrolled releases of substances to the environment.	Stored in small plastic cartridges in indoor store.	No

Product	Maximum Usage Per Year	Fate of Raw Materials in the Facility	Potential Environmental Impact	Storage Arrangements	COMAH Substance?
Water for process	560,000 litres dependant on feedstock and other liquids available for use in the process	Addition to process material to optimise digestion process and usage in odour abatement system.	No identified impact. Component of final digestate spread to land.	Stored in water buffer tanks located inside main waste reception building.	No
Water for washing	500,000 litres pa. to wash down areas, 2000 litres a day maximum on average.	Washing of vehicles and yard areas.	Potentially lightly contaminated with oils, grit, mud, wastes or digestate, which may impact on the aquatic environment in a variety of ways if uncontrolled release.	Mains water or harvested rainwater stored in buffer tanks located inside main waste reception building	No
Oxygen	Unknown at present.	Injection into head of digesters for management of hydrogen sulphide.	Generated as required in small amounts and injected immediately so little potential for impacts.	Generated when needed for via oxygen generator so no storage facility required.	No
Activated carbon	84t of active carbon per year filling 2 x 3.5t filters once a month on a medium level of sulphate content in feedstock.	Maintenance of Carbon filters in upgrading unit and odour abatement system.	Replaced/removed by outside contractor responsible for maintaining equipment.	Material contained inside operating equipment. Replacement media brought to site on an as needed basis – no storage of raw material at the site.	No
Glycol	1000 litres.	Use for weather protection in pressure relief valves and engines.	High BOD liquid – will have impact on water quality if released to ground water or surface water.	Stored on concrete surfaces on mobile bund or in inside store on a mobile bund.	No

Product	Maximum Usage Per Year	Fate of Raw Materials in the Facility	Potential Environmental Impact	Storage Arrangements	COMAH Substance?
Biocides - Disinfectant	50 litres of disinfectant a year on 2 x wheel washes, 6 x foot mats.	Use in foot dips, and to sterilise equipment when required.	Irritant to staff if inhaled/on skin. Accidental release to sewer may have an impact on aquatic environment or operation of sewage treatment plant.	Stored in approx. 25l plastic tubs in indoor store.	No
Pesticides - Rodenticide -	Small amounts in bait stations laid by contractor.	Use in designated bait stations for management of pests on site.	Anticoagulant may impact on other wildlife if not controlled in suitable bait stations.	Stored off site and provided by pest control contractor as needed.	No
De Greaser	25 litres.	Maintenance of site machinery.	Potential short-term impact of uncontrolled releases of synthetic chemicals to the receiving environment. Will vary depending on the product type and use.	Stored in indoor store.	No
Cleaning Products	200 litres of floor and wall/surface cleaner a year of varied strengths and applications.	Cleaning of domestic facilities	Potential short-term impact of uncontrolled releases of synthetic chemicals to the receiving environment. Will vary depending on the product type and use.	Small containers stored in the lab and staff welfare areas.	No

Product	Maximum Usage Per Year	Fate of Raw Materials in the Facility	Potential Environmental Impact	Storage Arrangements	COMAH Substance?
Lab Chemicals	Deionised Water - 65l Sulfuric Acid - 7l Buffer pH Solution 4.01 – 2.5l Buffer Solution pH 7 – 2.5l Buffer Solution pH 10.01 – 2.5l Spectrophotometer cuvette reagents – 3l	Analysis of waste, digestate, and environmental impacts for ongoing monitoring activities and waste acceptance procedures. Spend chemicals collected by supplier for disposal.	Will vary depending on chemicals. Accidental release to sewer may impact on aquatic environment or operation of sewage treatment plant.	Small volumes stored in packaging provided by lab supply provider in trays inside the lab container.	No
Gas Odorant (TERTIARY BUTYL MERCAPTAN and DIMETHYLSULPHIDE)	Estimate 0.42 tonnes	Injected into upgraded biomethane to give the gas an odour to allow early detection in the event of a leak.	Even small amounts will cause a strong smell of gas and may create impacts on amenity due to odours. Also impacts on perception of releases/safety factors at the site.	Odorant is not stored on site, only one GA50 bottle in use is kept on site, this is delivered with a maximum of 40kg fill. Robinson brothers exchange the near empty bottle with a full GA50 at low level alarm. Connection is made using dry fit couplings.	No
Sulfuric acid	3000trs	For use in the ammonium washing unit within the gas upgrading compound.	Toxic and corrosive to humans and animals. Acidification of water systems and impact on aquatic environments.	In banded IBCs within the banded area/technical building.	No

APPENDIX 2 – Calculation Detail

Deeside Anaerobic Digestion - Substances Calculation

Liquid Propane

Name	No. of tanks	Max Capacity (m3)	Total Volume (m3)	Operating Capacity (%)	Total Mass (Tonnes)
Propane	5	4.8	24	85%	10.1

Other raw materials considered

Name	No. of tanks	Max Capacity (m3)	Total Volume (m3)	Operating Capacity (%)	Total Mass (Tonnes)
Engine Oil: Castrol Vecton 15W-40	1	1	1	90%	0.8
Diesel	1	2	2	90%	1.49
MagReSyn Amine	10	1	10	90%	9.0

Biogas

Name	Tank internal diameter (m)	Tank internal height (m)	Roof height (m)	Substrate volume (m3)	Concrete height above substrate level (m)	Tank			Roof	
						Max volume of biogas in tank (m3)	Mass of Methane (kg - at conc below)	Assumption	Max volume (may vary) of biogas in roof (m3)	Mass of Methane (kg if at 65% conc)
Pre storage tank 1	10	8	2	580	0.6	47	18	Tank full of substrate	60	23
Pre storage tank 2	10	8	2	580	0.6	47	18	Tank full of substrate	60	23
Fermenter 1	30	8	6	5230	0.6	425	162	Tank full of substrate	2230	850
Fermenter 2	30	8	6	5230	0.6	425	162	Tank full of substrate	2230	850
Fermenter 3	30	8	6	5230	0.6	425	162	Tank full of substrate	2230	850
Post fermenter	30	8	6	5230	0.6	425	162	Tank full of substrate	2230	850
Digestate storage tank 1	33	10	6	8040	0.6	8553	3259	Worst case - tank is empty	2970	1132
Digestate storage tank 2	33	10	6	8040	0.6	8553	3259	Worst case - tank is empty	2970	1132
Sum						18900	7202	-	14980	5708

TOTAL Biogas volume	m3	-	33880
---------------------	----	---	-------

Name	Concentration in Biogas	Total Mass (Tonnes)
Methane	58%	12.9
Hydrogen	2%	0.06
Hydrogen Sulphide	0.2%	0.09

Assumptions:

Density Liquid Propane	493 kg / m3
Density Fuel Oil	870 kg / m3
Density Diesel	830 kg / m3
Density MagReSyn Amine	1000 kg / m3
Density Biogas	1.158 kg / m3
Density Methane Gas	0.657 kg / m3
Density Hydrogen Gas	0.083 kg / m3
Density Hydrogen Sulphide Gas	1.36 kg / m3

Biogas from anaerobic digesters is a mixture of gases, primarily methane and carbon dioxide, produced by bacteria breaking down organic matter (like food waste, manure, or plant material) in an oxygen-free environment within a sealed tank called an anaerobic digester.

Biogas is primarily composed of methane (around 50-70%) and carbon dioxide, with smaller amounts of hydrogen sulfide and water vapor.

Typical composition of Biogas

Compound	%
Methane	55–75
Carbon dioxide	25–45
Nitrogen	0–10
Hydrogen	0 – 3
Hydrogen sulfide	0.1 - 0.5
Oxygen	trace

Source: "Basic Information on Biogas". www.kolumbus.fi. Archived from the original on 6 January 2010.

<https://web.archive.org/web/20100106022729/http://www.kolumbus.fi/suomen.biokaasukeskus/en/enperus.html>

COMAH SUMMARY

Ref	Substance	Relevant H-code	Quantity (tonnes)	Dangerous Substance?	2% Rule	COMAH Qualification?
					% of Lower Tier	
1	Methane	H220: Extremely flammable gas	12.91	Y	129.1%	Qualifies
2	Hydrogen	H220: Extremely flammable gas	0.06	Y	0.6%	Below 2% - not counted for COMAH P2
3	Hydrogen Sulphide	H220: Extremely flammable gas	0.09	Y	0.9%	Below 2% - not counted for COMAH P2
		H330: Fatal if inhaled			1.8%	Below 2% - not counted for COMAH H1
		H400: Very toxic to aquatic life			0.09%	Below 2% - not counted for COMAH E1
4	Propane	H220: Extremely flammable gas	10.06	Y	100.6%	Qualifies
5	Engine Oil	H316: Causes mild skin irritation	9.00	N	n/a	No COMAH hazard - does not qualify
6	Diesel	H227: Combustible Liquid	1.49	N	n/a	Does not qualify: fp is 61.5degC
7	MagReSyn Amine	H226: Flammable Liquid	9.00	Y	0.2%	Below 2% - not counted for COMAH P5c

COMAH Categorisation

COMAH Categories:		COMAH Thresholds:		Relevant Substances	Maximum Site Capacity	Lower Tier		Upper Tier	
		Lower Tier	Upper Tier			%	Result	%	Result
P2	FLAMMABLE GASES Category 1 or 2	10	50	Methane, Propane	22.97	230%	Lower Tier	46%	Not classed as Upper Tier
H1	ACUTE TOXIC Category 1, all exposure routes	5	20	Hydrogen Sulphide	0.09	1.8%	n/a	0.5%	n/a
E1	Hazardous to the Aquatic Environment Category Acute 1 or Chronic 1	100	200	Hydrogen Sulphide	0.09	0.1%	n/a	0.0%	n/a
P5c	FLAMMABLE LIQUIDS Flammable liquids, Categories 2 or 3 not covered by P5a and P5b	5000	50000	MagReSyn Amine, Diesel	10.49	0.2%	n/a	0.0%	n/a

Site is considered to be **Lower Tier COMAH** on basis of quantity of **Flammable Gases (Cat 1 or 2)** that are present, namely **Methane** and **Propane**.