

Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Appendix 21.1: Preliminary COMAH Assessment

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1 Introduction

- 1.1.1 The Control of Major Accident Hazards (COMAH) regulations aim to prevent and mitigate the effects of major accidents involving dangerous substances which can cause serious damage/harm to people and/or the environment. COMAH treats risks to the environment as seriously as those to people. [1]
- 1.1.2 This report will document the current design intention for the use and storage of dangerous substances (as described by COMAH regulations) at the proposed waste water treatment plant (WWTP) and will provide a conclusion on the expected COMAH status for the works.
- 1.1.3 A site which has any dangerous substance present at or above the threshold limit will be subject to COMAH regulations. There are two limits for each substance (upper tier and lower tier) which will define the level of risk assessment and reporting required. [2]

2 Calculation Requirements

- 2.1.1 The assessment of intended storage mass of potentially dangerous substance must be carried against the absolute value limit for upper and lower tier COMAH classification but also on an aggregate basis. If the intended storage mass of any one substance and/or an aggregate of a single class of dangerous substances (Health, Physical or Environmental Hazards) exceeds the lower or upper tier limits then the COMAH regulations will apply. Note depending on its classification a substance can fall under more than one of the hazard categories. The classification system used for COMAH assessment is the European CLP Regulation 2008 (Classification, Labelling & Packaging). [5]
- 2.1.2 See Table 2 – Table 5, in section 3.2 for the results of the aggregate calculations for the current design intention for the proposed WWTP.

3 COMAH Calculations

3.1 Dangerous Substances to be Stored On-Site

Table 1: Named dangerous substances

Ref. Schedule 1, Part 2, COMAH 2015, CD266, HSE, 2014

Substance (tonnes)	LT QQ	UT QQ	Total MQ
Biogas	10.00	50.00	2.32
Propane	10.00	50.00	0.09
Biomethane (upgraded biogas)	50.00	200.00	0.00
LNG	50.00	200.00	2.00
Diesel	5000.00	50000.00	42.50
Sulphuric Acid (96%)	-	-	0.00
Sodium Hydroxide (50%)	-	-	15.00
Liquid Polyelectrolyte (50%)	-	-	13.50
Powder Polyelectrolyte	-	-	11.00
Ferric sulphate solution (11-14%)	-	-	210.00

3.2 Dangerous Substance Hazard Category Aggregate Calculations

Table 2: Section 'H' - HEALTH HAZARDS dangerous substance categories aggregation rule calculation

Ref. Schedule 1, Part 1, COMAH 2015, CD266, HSE, 2014

Substance (tonnes)	LT QQ	UT QQ
H1/H2/H3 ACUTE TOXIC	-	-
<i>Sub-totals</i>	<i>0.00</i>	<i>0.00</i>
TOTALS	0.00	0.00

Table 3: Section 'P' PHYSICAL HAZARDS dangerous substance categories aggregation rule calculation

Ref. Schedule 1, Part 1, COMAH 2015, CD266, HSE, 2014

Substance (tonnes)	LT QQ	UT QQ
Biogas		
P2 FLAMMABLE GASES	10.00	50.00
<i>Sub-totals</i>	<i>0.23</i>	<i>0.05</i>
Substance (tonnes)	LT QQ	UT QQ
Propane		
P2 FLAMMABLE GASES	10.00	50.00
<i>Sub-totals</i>	<i>0.01</i>	<i>0.00</i>
Substance (tonnes)	LT QQ	UT QQ
LNG		

Key:

LT	Lower tier
UT	Upper tier
QQ	Qualifying quantity
MQ	Maximum quantity (stored at the establishment)
Blue text	Calculated values
Shaded	Input values
Shaded	Exceeds LT threshold
Shaded	Exceeds UT threshold

P2 FLAMMABLE GASES (18. Liquefied Flammable Gases)	50.00	200.00
<i>Sub-totals</i>	<i>0.04</i>	<i>0.01</i>
Substance (tonnes)	LT QQ	UT QQ
Diesel		
P5c FLAMMABLE LIQUIDS	5000.00	50000.00
<i>Sub-totals</i>	<i>0.01</i>	<i>0.00</i>
TOTALS	0.29	0.06

Table 4: Section 'E' - ENVIRONMENTAL HAZARDS dangerous substance categories aggregation rule calculation

Ref. Schedule 1, Part 1, COMAH 2015, CD266, HSE, 2014

Substance (tonnes)	LT QQ	UT QQ
Diesel		
E2 Hazardous to the Aquatic Environment	5000.00	50000.00
<i>Sub-totals</i>	<i>0.00</i>	<i>0.00</i>
TOTALS	0.00	0.00

Table 5: Section 'O' - OTHER HAZARDS dangerous substance categories aggregation rule calculation

Ref. Schedule 1, Part 1, COMAH 2015, CD266, HSE, 2014

Substance (tonnes)	LT QQ	UT QQ
O1/O2/O3 EUH029, contact with water, EUH029	-	-
<i>Sub-totals</i>	<i>0.00</i>	<i>0.00</i>
TOTALS	0.00	0.00

4 Conclusion

- 4.1.1 With reference the total storage masses shown in Table 1 and the aggregate calculations shown in Table 2 – Table 5, it can be concluded that the current design basis for the proposed WWTP does not exceed either the lower or upper tier threshold on either a single substance or aggregate basis for any of the potentially dangerous substances to be stored on site. Therefore, at this stage it is not anticipated that the new treatment works will be registered as a COMAH site under the Control of Major Accident Hazards regulations 2015.
- 4.1.2 Please note that the substances shown greyed out in Table 1 are not deemed dangerous substances in the COMAH/CLP classification system. There is currently no intention to store any upgraded biomethane on site, however, this has been included and shown with zero maximum quantity for completeness.

5 References

Reference Number	Title	Link
[1]	COMAH Regulations 2015	Control Of Major Accident Hazards Regulations 2015 (COMAH) (hse.gov.uk)
[2]	COMAH Regulations 2015, guidance document	The Control of Major Accident Hazards Regulations 2015. Guidance on Regulations L111 (hse.gov.uk)
[3]	Anaerobic Digestion journal article, (biogas density)	Biogas for Clean Energy IntechOpen
[4]	Flogas product page, LNG bulk tank storage estimate	Bulk Tanks Flogas
[5]	CLP Classification	Classification of Substances and Mixtures under CLP: In-depth Croner-i (croneri.co.uk)

Hazard Identification Record

Risk event	Impact source/ pathway	Receptor(s)	Source Document(s)	Reasonable worst consequence if risk event occurs	Cross discipline effect likelihood											Embedded mitigation	Could risk event lead to a major accident and disaster with existing mitigation in place ?	Are consequences managed to an acceptable level ?	Further mitigation	Are consequences managed to an acceptable level (ALARP)with additional mitigation ?		
					Agriculture and soils	Air	Biodiversity	Community	Health	Historic Environment	Land quality	Landscape	Noise	Odour	Waste and materials						Traffic and transport	Water resources
CONSTRUCTION																						
Tunnel collapse	Tunnelling - transfer tunnel	Soils, farm holdings, people, heritage assets, landscape character, waste infrastructure, PRoW, River Cam navigation, A14, WAML	Designers risk assessment Ground Investigations (GI) of the Proposed Development as referenced and assessed within Chapter 14 Land Quality (Application Document Ref 5.2.14)	Surface subsidence and structural damage to assets and buildings Risk to life / human health Localized morphological changes to surface water body / local change in flood risk	Y		Y	Y			Y				Y	Y	Y	Managed via CDM: tunnel design and construction methods include risk assessment for overlying structures and monitoring or mitigation if required.	No	Yes	Emergency response plans required by CoCP to manage incidences	Yes
	River crossings - Waterbeach pipeline		Designers risk assessment Ground Investigations (GI) of the Proposed Development as referenced and assessed within Chapter 14 Land Quality (Application Document Ref 5.2.14)	Secondary effects to surface features (habitats, footpaths) Secondary effects from remediation and restoration activities	Y		Y	Y			Y		Y	Y	Y							
Ground collapse / land slip	Extreme events impact earth bank ie drought followed by rainfall event	Users of LERMP area Proposed WWTP Landscape character	Designers risk assessment	Structural damage to proposed WWTP for slips inward of the earth bank. For slips external to earth bank obstruction to pathways surrounding proposed WWTP, obstruction of main access, change in landscape and loss of screening function, loss of ecological mitigation (planting and habitat features)	Y		Y	Y			Y							Managed via CDM: earthworks design and construction methods include risk assessment and method statement. Post construction monitoring via LERMP.	No	Yes	Emergency response plans required by CoCP to manage incidences	Yes

Risk event	Impact source/ pathway	Receptor(s)	Source Document(s)	Reasonable worst consequence if risk event occurs	Cross discipline effect likelihood												Embedded mitigation	Could risk event lead to a major accident and disaster with existing mitigation in place ?	Are consequences managed to an acceptable level ?	Further mitigation	Are consequences managed to an acceptable level (ALARP)with additional mitigation ?			
					Agriculture and soils	Air	Biodiversity	Community	Health	Historic Environment	Land quality	Landscape	Noise	Odour	Waste and materials	Traffic and transport						Water resources		
Flood event	Fluvial flood event affects construction areas	River Cam Local users of PRoW within 500m of construction area Soils and farm businesses Terrestrial and aquatic habitats and species	Designers risk assessment Flood risk assessment	Flooding of construction areas causes a secondary pollution event by washing materials / chemicals into flood water Flooding displaces equipment resulting in increased flood risk as equipment obstructs flood water	y		y	y	y	y		y	y							Managed via CDM: temporary river works design and construction methods include risk assessment and method statement. Managed via requirements secured by Environmental Permit (Flood Risk Activities)	Yes	No	Application of CoCP Part A includes flood management plans, emergency response plans, pollution response plans	Yes
Aviation hazard	Change in bird species assemblages changes birdstrike risk potential resulting in aviation incident	People (human health), local communities, land quality, habitats, and species	Section 4 Outline Wildlife Hazard Plan	Excavated areas, temporary water storage structures and waste result in changes species assemblages increasing risk of birdstrike and aviation disruption/emergency incidences	y	y		y	y										y	Managed via CDM: earthworks design, temporary water storage design and construction methods include risk assessment and method statement.	No	No	Application of CoCP requires preparation of WLHMP	Yes
	Presence of tall structures and cranes presents aviation collision hazard and aviation incident		Designers risk assessment	Use of cranes and tall structures increases obstructions in the safeguarding area resulting in aviation disruption/emergency incidences	y	y		y	y											y	Managed via CDM: design and construction methods include risk assessment and method statement. Managed via requirements secured by Crane permit from CAA	No	Yes	Application of CoCP requires ongoing coordination with CAA and acquiring all required permits including crane permit
DECOMMISSIONING																								
Fire or explosion	Decommissioning and cleaning of anaerobic digestors presents risk of fire or explosion	People, air, water resources, land quality	Designers risk assessment	Explosion and or fire results in loss of life or injury, local air quality changes, secondary water quality effects from fire water/foams	y	y		y	y		y		y	y	y				y	Managed via CDM: design and construction methods include risk assessment and method statement. Managed via requirements secured approved decommissioning management plan	No	Yes	Emergency response plans required by CoCP to manage incidences Fire prevention plans required by CoCP	Yes

Risk event	Impact source/ pathway	Receptor(s)	Source Document(s)	Reasonable worst consequence if risk event occurs	Cross discipline effect likelihood													Embedded mitigation	Could risk event lead to a major accident and disaster with existing mitigation in place ?	Are consequences managed to an acceptable level ?	Further mitigation	Are consequences managed to an acceptable level (ALARP)with additional mitigation ?		
					Agriculture and soils	Air	Biodiversity	Community	Health	Historic Environment	Land quality	Landscape	Noise	Odour	Waste and materials	Traffic and transport	Water resources							
Major emission of airborne toxins	Decommissioning and cleaning tanks and digestors presents risk emissions to air	People (human health), air quality and odour receptors	Designers risk assessment Outline Decommissioning Management Plan	The desludging and cleaning of the tanks could release toxic airborne substance into the nearby environment and people				Y	Y	Y							Y			Managed via CDM: design and construction methods include risk assessment and method statement. Managed via requirements secured approved decommissioning management plan	No	Yes	Emergency response plans required by CoCP to manage incidences	Yes
OPERATION																								
Fire and or explosion	Gas storage related incident - digestors	People, habitats, air, users of Horningssea Road	Designers risk assessment	Explosion leads to loss of life and or injury to people, release of gases and smoke, secondary impacts relating to fire water run-off (ground and water), function of water treatment compromised leading to secondary effect in river Cam		Y	Y	Y	Y			Y	Y	Y	Y	Y		Y	Managed via CDM: design and construction methods include risk assessment and method statement. Inclusion fire detection and suppression systems, leak detection systems, controlled working practices by zones. EMS with operational management plans and procedures secured by environmental permit including emergency response plans	No	Yes			

Risk event	Impact source/ pathway	Receptor(s)	Source Document(s)	Reasonable worst consequence if risk event occurs	Cross discipline effect likelihood													Embedded mitigation	Could risk event lead to a major accident and disaster with existing mitigation in place ?	Are consequences managed to an acceptable level ?	Further mitigation	Are consequences managed to an acceptable level (ALARP)with additional mitigation ?	
					Agriculture and soils	Air	Biodiversity	Community	Health	Historic Environment	Land quality	Landscape	Noise	Odour	Waste and materials	Traffic and transport	Water resources						
Fire and or explosion	Gas storage related incident - LNG	People, habitats, air, users of Horningsea Road	Designers risk assessment Outline Hazardous Area Risk Assessment	Explosion leads to loss of life and or injury to people, release of gases and smoke, secondary impacts relating to fire water run-off (ground and water), function of water treatment compromised leading to secondary effect in river Cam No COMAH/ hazardous facilities in proximity that would compound this event		Y	Y	Y	Y			Y	Y	Y	Y	Y		Y	Managed via CDM: design and construction methods include risk assessment and method statement. LNG impact protection in design EMS with operational management plans and procedures secured by environmental permit including emergency response plans	No	Yes		
Fire and or explosion	Incident triggered by lightning strike to proposed WWTP	People, habitats, air, users of Horningsea Road	Designers risk assessment Outline Hazardous Area Risk Assessment	Resultant explosion or fire leads to loss of life and or injury to people, release of gases and smoke, secondary impacts relating to fire water run-off (ground and water), the function of water treatment compromised leading to secondary effect in river Cam No COMAH/ hazardous facilities in proximity that would compound this event		Y	Y	Y	Y			Y	Y	Y	Y	Y		Y	Managed via CDM: design and construction methods include risk assessment and method statement. Lighting protection installed in accordance with regulations and standards EMS with operational management plans and procedures secured by environmental permit including emergency response plans	No	Yes		Yes
Malicious attack or vandalism	Inferior cyber security leads to abnormal operation of WWTP	People, habitats, water quality, land quality, users of river Cam	Designers risk assessment	Function of water treatment compromised leading to secondary effect in river Cam	Y	Y	Y	Y	Y			Y			Y	Y		Y	Managed via CDM: system security design and include risk assessment for overlying structures and monitoring or mitigation if required. Visitor Centre visits by appointment Legal obligations under SEMD direction including operational	No	Yes		Yes
	Vandalism / security breach leads to abnormal operation of WWTP			Function of water treatment compromised leading to secondary effect in river Cam	Y	Y	Y	Y	Y			Y		Y	Y		Y			Y	No	Yes	

Risk event	Impact source/ pathway	Receptor(s)	Source Document(s)	Reasonable worst consequence if risk event occurs	Cross discipline effect likelihood													Embedded mitigation	Could risk event lead to a major accident and disaster with existing mitigation in place ?	Are consequences managed to an acceptable level ?	Further mitigation	Are consequences managed to an acceptable level (ALARP)with additional mitigation ?				
					Agriculture and soils	Air	Biodiversity	Community	Health	Historic Environment	Land quality	Landscape	Noise	Odour	Waste and materials	Traffic and transport	Water resources									
Aviation hazard	Change in species assemblages changes birdstrike risk potential as a result of habitat changes within the LERMP	People, habitats, water quality, land quality, human health	Section 4 Outline Wildlife Hazard Plan	New landscape features changes species assemblages increasing risk of birdstrike and aviation disruption/emergency incidences	y	y	y	y	y						y	y				y		management plans and ongoing security updates. EMS with operational management plans and procedures secured by environmental permit	Yes	No	Preparation of operational WHMP and continual update to align with ongoing coordination with CAA	Yes
	Presence of tall structures, solar infrastructure, and lighting within the proposed WWTP presents new or different aviation hazard	People, habitats, water quality, land quality, human health	Designers risk assessment Glint and glare assessment Lighting assessment	Presence of permanent structures and lighting safeguarding area resulting in aviation disruption/emergency incidences	y	y		y	y							y	y			y		Managed via CDM: Building and lighting design Design in consultation with Cambridge Airport	Yes	Yes		
Hydrologi cal event - fluvial flood risk	Fluvial flood on River Cam affects operation of the outfall and subsequent impacts to the proposed WWTP	River water quality People and assets in flood plain	Designers risk assessment Flood Risk Assessment Fluvial flood report Velocity mixing report	Operation of outfall compromised and secondary impact to proposed WWTP	y		y		y											y		Managed via CDM: approved outfall design and construction methods include risk assessment for outfall structure and monitoring or mitigation if required. EMS with operational	No	Yes		

Risk event	Impact source/ pathway	Receptor(s)	Source Document(s)	Reasonable worst consequence if risk event occurs	Cross discipline effect likelihood											Embedded mitigation	Could risk event lead to a major accident and disaster with existing mitigation in place ?	Are consequences managed to an acceptable level ?	Further mitigation	Are consequences managed to an acceptable level (ALARP)with additional mitigation ?	
					Agriculture and soils	Air	Biodiversity	Community	Health	Historic Environment	Land quality	Landscape	Noise	Odour	Waste and materials						Traffic and transport
																management plans and procedures secured by environmental permit					
Hydrological event - surface water flood risk	Flooding from surface water accumulations within the proposed WWTP	People, surface water, land quality	Drainage strategy	Flooding of the proposed WWTP and secondary impacts to people, water and land quality Flooding impedes access for workforce affecting operational performance of WWTP Flooding affects landscape masterplan area and compromises ecological and landscape mitigation	y		y	y					y			Managed via CDM: approved surface water drainage design and construction methods include risk assessment all aspects of system and inclusion of groundwater monitoring measures and mitigation if required. EMS with operational management plans and procedures secured by environmental permit	No	Yes			

Get in touch

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Visiting our website at 

You can view all our DCO application documents and updates on the application on The Planning Inspectorate website:

<https://infrastructure.planninginspectorate.gov.uk/projects/eastern/cambridge-waste-water-treatment-plant-relocation/>