

ACCIDENTS AND THEIR CONSEQUENCES RISK ASSESSMENT

1.0 Introduction

- 1.1 A risk assessment has been undertaken to determine if any accident or emergency situations at Natural UK Limited's Healthcare Management Facility may have an effect on any receptors located within close proximity of the facility boundary.
- 1.2 **Table 1** includes a list of the receptors that have been identified through a desktop assessment of the locality. **Drawing Reference Number: NU1000/06/04** illustrates the site location in relation to the receptors within 1km listed in **Table 1**.
- 1.3 Risks have been considered during the operational phase of the site, with particular cognizance given to the additional proposed treatment process at the site, which will see heat treatment carried out upon hazardous clinical waste to provide disinfection (this will be achieved via either microwave or steam sterilisation). The proposed additional waste code 19 08 01 - Sewage screenings (which will be treated in the existing non-hazardous treatment plant on site) has also been considered as part of this assessment.
- 1.4 While Management Plans currently exist for the site (these include plans for odour, litter, spillage, dust, bioaerosols, noise & vibration, vermin & insects, fire and emergency & incident response), this risk assessment has been prepared to account for the proposed additional operation and proposed additional waste code (19 08 01), outlined in the accompanying Supporting Statement (**Document Reference No.: NU1000/05**). The existing Emergency & Incident Response Management Plan will be revised in accordance with the findings of this risk assessment. As is already the case, this Management Plan will continue to be regularly reviewed and updated, if deemed necessary. Incidents and near misses will be recorded and investigated, and remedial and preventative measures will be undertaken in accordance with the Emergency & Incident Response Management Plan and the site Working/Management Plan.

Table 1: Identified potential receptors within 1000m of the facility.

Receptor ID	Receptor	Approximate distance from the operational area	Direction from the facility
R1	Middle Coal Measures Secondary A Designated Aquifer	Underlying	-
R2	Commercial / Industrial Properties (Including Capel Hendre Industrial Estate)	Adjacent up to 750m	All Directions
R3	B4297 Public Highway	53m	E
R4	Residential Properties on Hendre Road	220m	N & NE
R5	Agricultural Land	260m	All Directions
R6	Residential Properties on Lotwen Road	270m	NW
R7	Nant Arw (water course)	280m	NE
R8	Residential Properties on Waterloo Road	280m	NNW
R9	Residential Properties on Saron Road	285m	NNW

Receptor ID	Receptor	Approximate distance from the operational area	Direction from the facility
R10	Fferrws Brook (water course)	315m	SE
R11	Residential Properties on Heol Cwper	500m	SE
R12	Caeau Capel Hendre SSSI	585m	N
R13	Caeau Mynydd Mawr SAC	780m	W - NW
R14	Caeau Lotwen SSSI	780m	W - NW
R15	Saron Primary School	800m	NNE

2.0 Methodology

- 2.1 The scoring methodology employed in the H1 Guidance is used as a framework for assessing the risk from various accident scenarios identified. The scoring system attributes a nominal score to the likelihood and consequence of an identified scenario, and then uses a matrix to identify whether the risk is acceptable. The scoring system is outlined below.

Likelihood categories

Category	Description	Score
Extremely unlikely	Incident occurs between once per 100 years and once every 1000 years	1
Very unlikely	Incident occurs between once per 50 years and once every 100 years	2
Unlikely	Incident occurs between once per 10 years and once every 50 years	3
Somewhat unlikely	Incident occurs between once per 5 years and once every 10 years	4
Fairly probable	Incident occurs between once per year and once every 5 years	5
Probable	Incident occurs at least once per year	6

Consequence categories

Category	Description	Score
Minor	<ul style="list-style-type: none"> nuisance on site only (no off-site effects) no outside complaint 	1
Noticeable	<ul style="list-style-type: none"> noticeable nuisance off-site e.g. discernible odours minor breach of Permitted emission limits, but no environmental harm one or two complaints from the public 	2
Significant	<ul style="list-style-type: none"> severe and sustained nuisance, e.g. strong offensive odours or noise disturbance major breach of Permitted emissions limits with possibility of prosecution numerous public complaints 	3
Severe	<ul style="list-style-type: none"> hospital treatment required public warning and off-site emergency plan invoked hazardous substance releases into water course with ½ mile effect 	4
Major	<ul style="list-style-type: none"> evacuation of local populace temporary disabling and hospitalisation serious toxic effect on beneficial or protected species 	5

	<ul style="list-style-type: none"> widespread but not persistent damage to land significant fish kill over 5 mile range 	
Catastrophic	<ul style="list-style-type: none"> major airborne release with serious offsite effects site shutdown serious contamination of groundwater or watercourse with extensive loss of aquatic life 	6

Risk assessment matrix

Likelihood	Consequence					
	Minor	Noticeable	Significant	Severe	Major	Catastrophic
Extremely unlikely	1	2	3	4	5	6
Very unlikely	2	4	6	8	10	12
Unlikely	3	6	9	12	15	18
Somewhat unlikely	4	8	12	16	20	24
Fairly probable	5	10	15	20	25	30
Probable	6	12	18	24	32	36

Risk scores

Magnitude of risk	Score
Acceptable	6 or less
Acceptable if reduced as much as reasonably practical	8 to 12
Unacceptable	15 or more

2.2 The identification of the hazards and the risk assessment process is documented in **Table 2**.

Table 2: Accidents and emergencies risk assessment matrix

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Spillage during delivery or dispatch of waste materials.	Run-off, absorption to ground and airborne	Land, site personnel, site users, and local population.	Somewhat Unlikely	4	Significant	3	12	Acceptable if reduced as much as reasonably practical.	<ol style="list-style-type: none"> 1. Procedures and employee training for leaks and spillages are described in Appendix 8 of the accompanying Supporting Statement (Document Reference NU1000/05). 2. All operations will be closely monitored to allow immediate deployment of mitigation measures in the event of a spillage. 3. All wastes will be stored for as short a time as possible in containers and on suitably engineered areas of impermeable concrete. All treatment operations are to be conducted within an enclosed building with a sealed drainage system with controlled discharge to foul sewer. 4. Vehicles for dispatch will not be overfilled and will be supervised during loading. 5. Training will be provided to relevant personnel on the existing Emergency & Incident Response Plan (Appendix 14 of the accompanying Supporting Statement, Document Reference NU1000/05) and awareness of the emergency contacts. 6. Emergency spill kits will be available for use should any spillage occur; these include drain covers, absorbent pads, socks, granules, pellets and booms for mopping up spillages. 7. All vehicles hauling waste will be sheeted or enclosed.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Spillage of raw materials (oils and chemicals) during refuelling of plant/ equipment.	Run-off, absorption to ground and wider site operations.	Land, groundwater and surface water.	Probable	6	Minor	1	6	Acceptable.	<ol style="list-style-type: none"> 1. All refuelling operations will be conducted on impermeable surfaces with a sealed drainage system. 2. Emergency spill kits will be available for use should any spillage occur; these include drain covers, absorbent pads, socks, granules, pellets and booms for dealing with spillages. 3. Plant and equipment fuel tank levels will be checked prior to a delivery/ordering dispatch to ensure sufficient capacity is available.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Damage to containment facilities for stored raw materials.	Run-off, absorption to ground and site drains.	Land, groundwater and surface water.	Fairly probable	5	Minor	1	5	Acceptable.	<ol style="list-style-type: none"> 1. Responsible managers will be accountable for ensuring that materials used on the site are adequately stored in order to prevent accidental spillage and release. 2. All oils and fuels in containers over 200 litres are to be stored in or on bunded containment in accordance with General Pollution Prevention Guidance (GPP2) "Above ground oil storage tanks". 3. All oils, fuels and chemicals in containers up to 1,000 litres are to be stored in or on bunded containment in accordance with General Pollution Prevention Guidance (GPP26) "Safe storage of drums and intermediate bulk containers. 4. All containers and UN approved packaging will be used in accordance with the instructions. 5. Emergency spill kits will be available for use should any spillage occur; these include drain covers, absorbent pads, socks, granules, pellets and booms for dealing with spillages. 6. Storage will be conducted on impermeable surfaces with dedicated sealed drainage with isolation of discharge possible. 7. Any repairs will be affected as soon as possible or within 5 working days (subject to replacement material availability). Mitigation measures will be undertaken immediately if there is a possibility of pollution. 8. The facility COSHH Risk Assessment will be regularly reviewed to understand the types and quantities of potentially harmful materials and chemicals held on site.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Damage to storage facilities for incoming waste pending treatment /transfer.	Run-off, absorption to ground and site drains, airborne.	Land, groundwater and surface water, adjacent commercial/industrial land users	Somewhat Unlikely	4	Significant	3	12	Acceptable.	<ol style="list-style-type: none"> 1. All treatment and storage operations will be conducted on impermeable concrete which has low infiltration capabilities and a sealed drainage system which discharges to foul sewer. General surface run off will be directed to a specific surface water management system. 2. Waste Materials will be containerised on receipt prior to the treatment process 3. Storage duration of hazardous clinical waste will be kept to a minimum. 4. Emergency spill kits will be available for use should any spillage occur; these include drain covers, absorbent pads, socks, granules, pellets and booms for addressing spillages. 5. Storage areas will be checked to ensure required capacity is available and that they remain in suitable condition and are fit for purpose. 6. Any repairs will be affected as soon as possible. Mitigation measures will be undertaken immediately if there is a possibility of pollution. 7. Good housekeeping will be promoted in order to keep waste confined to designated storage areas.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Major fire or explosion.	Airborne	Site personnel, site users, local population and air quality.	Very Unlikely	2	Severe	4	8	Acceptable if reduced as much as reasonably practicable.	<ol style="list-style-type: none"> 1. Procedures and employee training to be followed in the event of a fire are described in Appendix 13 of the accompanying Supporting Statement (Document Reference NU1000/05). 2. No fires are permitted on site. 3. Smoking is only permitted on site at the dedicated smoking area located away from the main operational buildings.. 4. Immediate action will be taken to extinguish all fires if safe to do so. 5. Plant and equipment will be operated in accordance with manufacturers and company guidelines and procedures. 6. Good housekeeping will be employed to ensure the build-up of dry, dusty or potentially combustible materials does not occur. 7. Firefighting equipment will be available and maintained, and site operators will be trained in their correct use. 8. Fire detection equipment (e.g., smoke detectors and alarms) are present on site to raise the alarm as quickly as possible in the event of a fire. Detection systems are frequently tested and maintained. The fire brigade will be contacted as soon as the alarm is raised. 9. Access doors to buildings will remain closed during processing / transfer operations for the purpose of fire containment in the event of a breakout.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Failure to contain firewater.	Run-off, absorption to ground and site drains.	Land, groundwater and surface water.	Very Unlikely	2	Significant	3	6	Acceptable.	<ol style="list-style-type: none"> 1. In the unlikely event of a fire in the operational area, all firewater will be contained on site with suitable containment controls emplaced as necessary, utilising the engineered sealed drainage system. On site spillage kits may also be used to contain firewater, including drain covers. 2. Firewater falling on surfaces will be contained as above and removed from site as appropriate. 3. Stocks of firewater containment equipment (including bunds and mats) will be maintained on site.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Flooding.	Saturation of ground, rising groundwater levels and via site drainage.	Land (commercial, industrial, agricultural and residential), surface waters.	Very Unlikely	2	Significant	3	6	Acceptable.	<ol style="list-style-type: none"> 1. According to a National Flood Risk Assessment (NaFRA, 2008) the site has a negligible risk of flooding from rivers or the sea (greater than 1 in 1,000 chance of flooding in any given year). According to NRW's Flood Risk Map, the site lies within the river basin district of Western Wales. The most likely flood source would result from surface water and small watercourses, although there is considered to be a low risk of this occurring. 2. Site and general informal drainage will be checked frequently to ensure it is in good condition and free from ponding. 3. Any ponding of surface water found will be removed immediately, or where this is not possible as soon as it is practical.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Loss of power.	Airborne.	Local population, land, surface water, groundwater.	Unlikely	3	Minor	1	3	Acceptable.	1. In the unlikely event that power/water is lost for a sufficiently long period of time where it has the potential to affect ancillary functions and the main operations (e.g., treatment plant / equipment, weighbridge etc.) an alternative means of power generation/water supply will be sought.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Vandalism/ breach in security.	Over land.	Site personnel, site users, plant and equipment.	Somewhat unlikely.	4	Noticeable.	2	8	Acceptable if reduced as much as reasonably practicable.	<ol style="list-style-type: none"> 1. The facility has fencing, CCTV and lockable gates. This enables the site to remain secure out of hours and be monitored remotely (via the CCTV). 2. All visitors to the site (including personnel) must report to the site office to sign in.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Operator error.	Airborne and over land.	Local and distant human population, surface water, groundwater,	Somewhat Unlikely	4	Minor.	1	4	Acceptable.	<ol style="list-style-type: none"> 1. Technically Competent Manager and his/her staff will oversee the management of activities of the site, in accordance with the relevant industry training requirements and fit and proper person tests. 2. Training (including refresher training) will be given to all site staff on the environmental permit, health and safety and incident response. 3. In the case of the heat treatment unit to be added to the site to disinfect and shred hazardous clinical waste, the system is fully automated (although it can be manually overwritten) which reduces the risk of operator error.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Emissions from plant or equipment due to abnormal conditions.	Airborne and over land.	Local human population, land, surface water, groundwater.	Somewhat unlikely	4	Noticeable	2	8	Acceptable if reduced as much as reasonably practicable.	<ol style="list-style-type: none"> 1. All machinery used on site will be operated and maintained in accordance with manufacturers' recommendations; 2. All operational areas are underlain with a suitable concrete, tarmac or hardstanding surface as is appropriate to the environmental risk posed by that part of the overall operation. 3. Treatment operations occur within an enclosed building with doors that are only opened for access and egress. 4. The new sterilisation unit that is proposed to be added to the site to conduct heat treatment to disinfect hazardous clinical waste, will likely have air extractors which automatically activate when the loading hopper door opens to ensure that no contaminated dust is emitted from the unit. 5. All machinery will be subject to regular checks and maintenance. 6. Periodic background monitoring of microorganisms should be carried out on surfaces in and around the operational facilities using swabs and air monitoring plates. The swabs and plates will then be analysed by a third-party laboratory and records will be maintained. Furthermore, periodic environmental checks will be undertaken around the site and documented (i.e. weekly environmental inspections). Should any problematic emissions be occurring due to abnormal conditions, they will be picked up by these procedures. 7. Ozonation devices may be employed to combat microorganisms and volatile organic compounds in the areas with risk of bio aerosol generation e.g., over waste storage areas.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Inadequate waste acceptance procedures.	Transported by vehicle.	Site operatives and site users.	Unlikely	3	Significant	3	9	Acceptable if minimised as much as reasonably practicable.	<ol style="list-style-type: none"> 1. All wastes will undergo an acceptance procedure in accordance with Duty of Care Requirements. 2. All operatives on site will have knowledge of the Environmental Permit and on the types of waste accepted and prohibited at the site. 3. Accompanying paperwork will be scrutinised to ensure the details are correct and all fields are completed. 4. All waste loads will be visually inspected during deposit in the waste reception areas. 5. Any non-conforming wastes will be segregated as soon as possible and stored in the quarantine area awaiting removal off site.

7.0 Conclusions

- 7.1 All risks have been categorised as either 'acceptable' or 'acceptable if reduced as much as reasonably practicable'. Of the hazards categorised as 'acceptable if reduced as much as reasonably practicable' there are a significant number of mitigation measures available that effectively nullify the hazard identified