

Responses to EA questions for duly making

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1. Current permit

The current permit has a site name of Penfold's Waste Recycling Facility, however the application form refers to a site name of Lincoln Storm Limited. We therefore need confirmation of the site name, with any change confirmed by the submission of the application form part CO.5: Application for an environmental permit: part CO.5 administrative change to a standard or bespoke permit - GOV.UK (www.gov.uk).

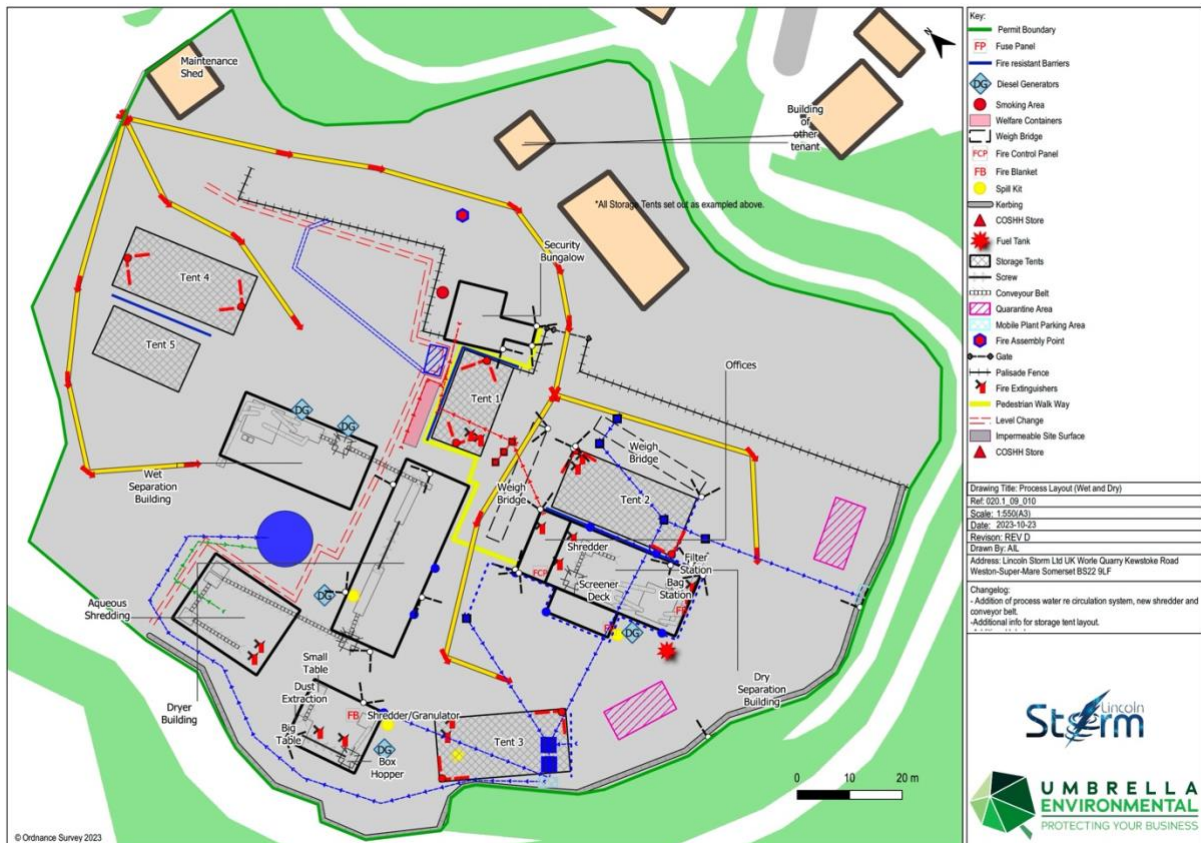
The permit was transferred under the Environmental Permitting (England & Wales) Regulations 2016 with variation application number EPR/KB3002CW/V002 with effect from 16/11/2022 to Lincoln Storm Ltd. Lincoln Storm Ltd is now the operator. A copy of the Notice of Variation is attached at **Annex 1** to this document.

2. MA6 Site Plan

We need you to provide an updated version of this document which addresses the below:

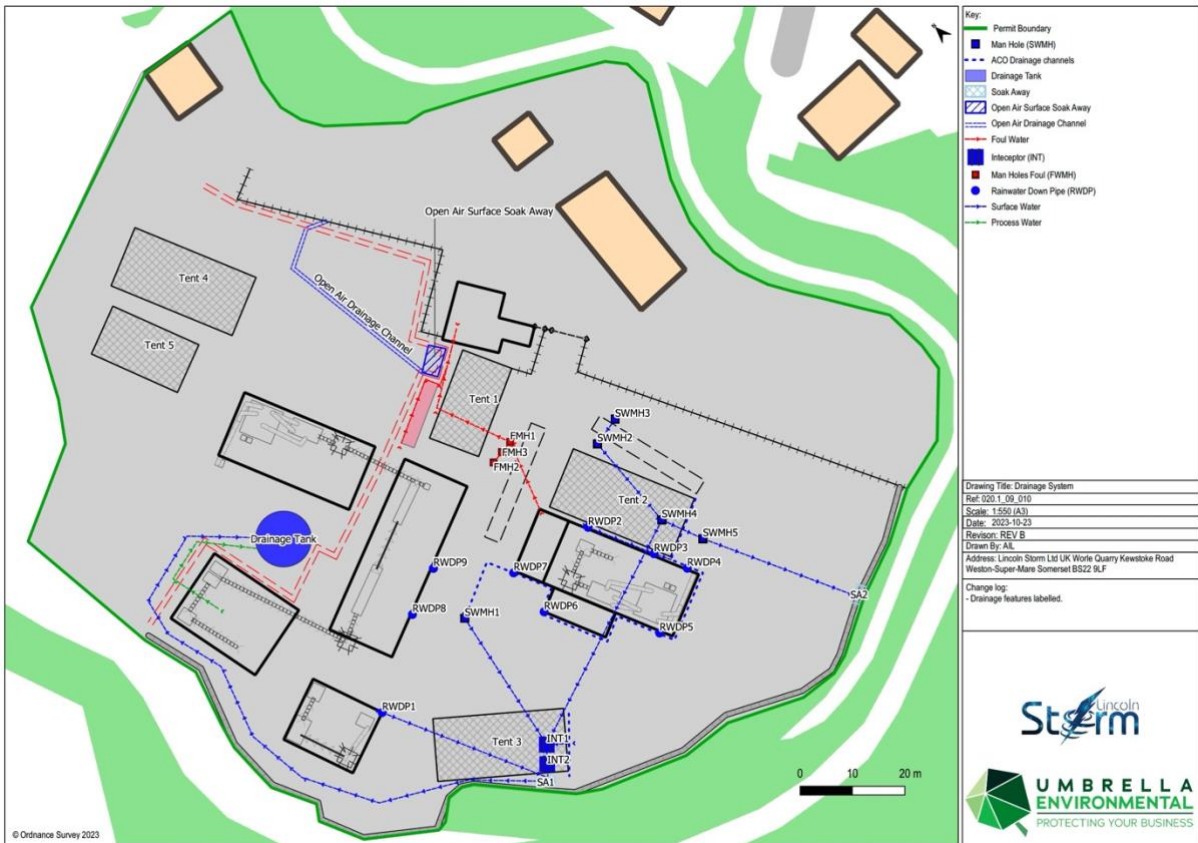
The proposed permit boundary on the Main plan includes unidentified buildings, and is a different boundary to that shown on the Drainage Fall lines plan.

Please see amended plan below, also supplied as separate documents.



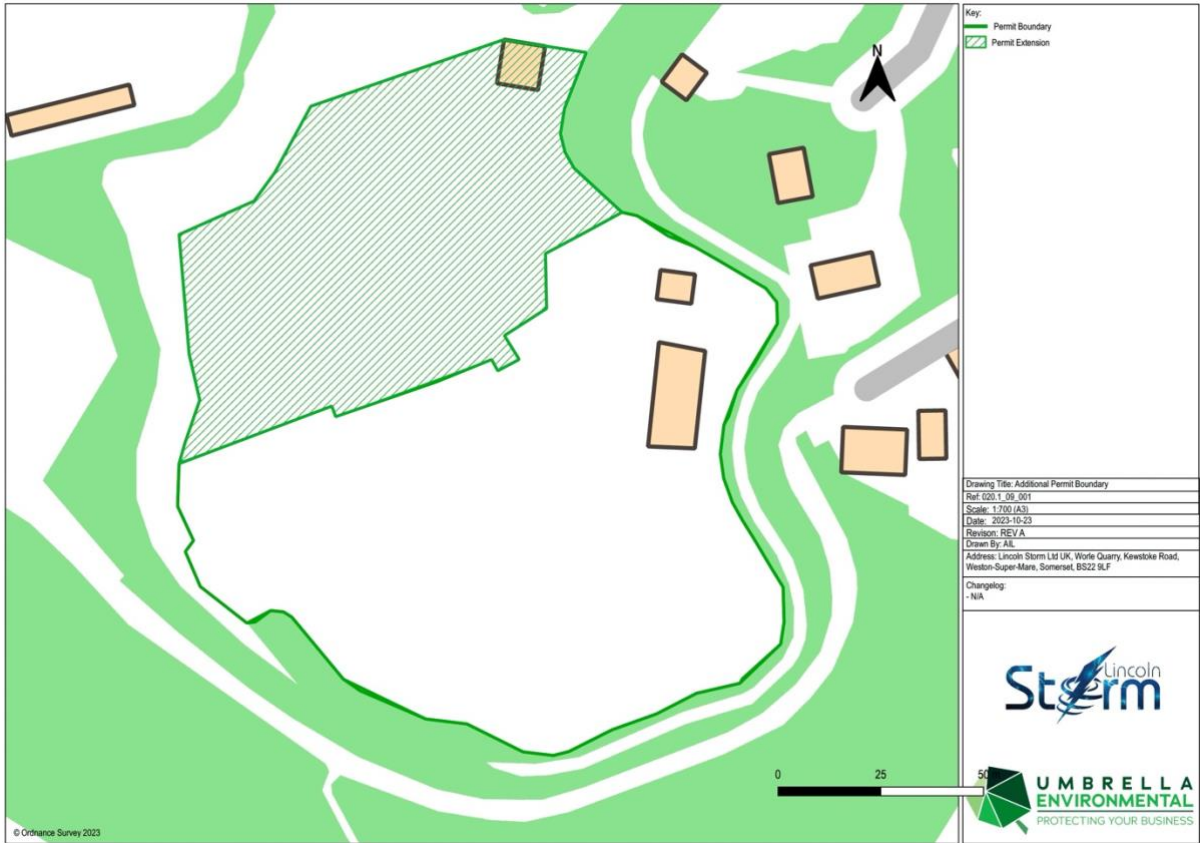
In relation to the Drainage plan, we need the legend updated to cover everything shown on the plan, as well as interceptors labelled and confirmation that surface water flow directions are all correct. The red and blue flow lines and squares need referencing in the legend and there is a blue flow line that looks to be going in the opposite direction to that expected.

Please see amended Drainage Plan below. Thank you for spotting the water flow direction, which has been corrected. Labels as required also.



We need a plan that clearly identifies the boundary extension, i.e. the land that is proposed to be added compared to the current permit boundary.

Please see below.



For duly making purposes, I will assume that where the plans in MA6 appear in other documents, they should instead be the plans in the updated MA6 document that is submitted in response to the above.

That is correct, please use the plans above (and supplied as separate documents)

3. MA4 Site condition report:

In line with our guidance (Environmental permitting: H5 Site condition report - GOV.UK (www.gov.uk)), we require you to identify any Relevant Hazardous Substances and complete a Stage 1-3 assessment within the Site Condition Report. Further details of this assessment are set out in the EC Commission Guidance on baseline reporting (2014/C 136/03) dated 6th May 2014. This is in accordance with Schedule 7 (paragraph 5 [m]) of the EPR regulations 2016 / Article 22 of IED.

Please consider the following material as part of the Site Condition Report (it can be incorporated into a new version of the report if required)

Under paragraph 5(m) of Schedule 7 of the Environmental Permitting Regulations 2016, the site must be compliant with Article 22 of the Industrial Emissions Directive (IED), excluding the last sub-paragraph of Article 22(2).

Article 22 requires, where an activity “activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination at the site of the installation” that the operator “prepare and submit to the competent authority a baseline report before starting operation of an installation”. This Baseline Report shall contain:

- “the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities”, including at least:
- “Information on the present use and, where available, on past uses of the site”; and
- “where available, existing information on soil and groundwater measurements that reflect the state at the time the report is drawn up or, alternatively, new soil and groundwater measurements having regard to the possibility of soil and groundwater contamination by those hazardous substances to be used, produced or released by the installation concerned”.

Following an arson incident in March 2023, which led to water used for fire suppression entering the groundwater under the site through the drains, interceptors and soakaway:

- a) the site’s drainage was sealed (as explained in the OTEMS and FPP); and
- b) a detailed independent analysis was performed by Adler & Allan. Adler & Allan’s report was annexed to the submitted Site Condition Report. The OTEMS, FPP and Adler & Allan analysis allow completion of the stage 1, 2 and 3 assessments specified in C136/03 as provided below.

Stage 1: Identify which hazardous substances are used, produced or released at the installation and produce a list of these hazardous substances.

Hazardous substances are prescribed by Article 3 of Regulation (EC) No 1272/2008 of the European Parliament and Council on “Hazardous substances and mixtures and specification of hazard classes”, which states that “a substance or a mixture fulfilling the criteria relating to physical hazards, health hazards or environmental hazards, laid down in Parts 2 to 5 of Annex I is hazardous and shall be classified in relation to the respective hazard classes provided for in that Annex” and that “where, in Annex I, hazard classes are differentiated on the basis of the route of exposure or the nature of the effects, the substance or mixture shall be classified in accordance with such differentiation”.

The ‘hazardous substances’ at the site comprise:

- Cathode material and electrolyte contained in the battery material (16 06 05) used as feedstock for the production of Storm Black; and
- Storm Black itself.

Our assessment is that the hazardous substances are therefore as set out in the Safety Data Sheet (MSDS, attached at **Annex 2**) for Storm Black, as follows (given the hazardous substances cathode material as the same as those in Storm Black):

Table 1: Storm Black Componen

Storm Black component	CAS ^[1] code
Graphite, C	CAS 7782-42-5
NMC (Lithium Nickel Manganese Cobalt Oxide), $\text{LiNi}_{0.33}\text{Mn}_{0.33}\text{Co}_{0.33}\text{O}_2$	CAS 182442-95-1
Lithium hexafluorophosphate	CAS 21324-40-3
Poylmer PVDF – Poly(vinylidene fluoride) $-(\text{C}_2\text{H}_2\text{F}_2)_n-$ (by-product, separated)	CAS: 24937-79-9
Copper (by-product, separated)), Cu	CAS 7440-50-8
Aluminium (by-product, separated), Al	CAS 7429-90-5

Table 2: Statement and description of hazardous ingredients of SB, consistent with arguable comparators, stated in Table 1 (above) [source: global suppliers]:

Component	classification	Code	description	HP
NMC	Acute Tx. 2,	H330	Fatal if inhaled	6
	Resp. Sens 1	H334	May cause	13
	Carc. 1A	H350	allergy/asthma/breathing Sx's if	7
	Repr. 1B	H360	inhaled	10
	STOT RE 1	H372	May cause cancer	5
	Skin Irrit. 2	H315	May damage fertility or unborn	4
	Eye Irrit. 2	H319	child	4
	Skins Sens. 1	H317	Case damage to organs	13
	Aquatic	H412	Skin irritation	14
	Chronic 3		Cause serious eye irritation May cause allergic skin reaction Harmful to aquatic life with long lasting effects	

For the electrolyte it is:

Lithium hexafluorophosphate	Acute Tox. 3 STOT RE 1 Skin Corr. 1A Eye Dam.1	H301 H372 H314 H318	Toxic if swallowed Cause damage to organs Causes severe skin burns and eye damage Causes serious eye damage	6 5 4 & 8 4
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⁽¹⁾ Chemical Abstract Service number

These are in solid form, or in solution in water (through the aqueous shredding process).

To this, we add diesel oil the other substance which could be hazardous.

Stage 2: Identifying the relevant hazardous substances

Identify which of the hazardous substances from Stage 1 are ‘relevant hazardous substances’ (see Section 4.2). Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.

Relevant Hazardous substances are those produced or used at the site, capable of contaminating soil or groundwater.

The Adler & Allan report shows the groundwater conditions at the site currently. This reported that currently, i.e., for baseline purposes, the following contaminants were identified (and their concentrations):

- “Recycled Battery Waste – containing heavy metals”;
- “Diesel Generators – hydrocarbons”;
- “Fuel storage tanks – hydrocarbons”; and
- “Historic landfill – hydrocarbons, PAHs, heavy metals, asbestos etc.”.

Plus “Firefighting water – potential to contain PFAAS compounds”. This is being addressed with a remediation plan with Adler & Allan and in discussions with the Agency’s groundwater specialists.

We therefore conclude that all three hazardous substances identified at Stage 1, should also be considered as relevant hazardous substances for the purposes of Stage 3:

- NMC (solid, but may be in liquid form if in solution, eg because of water used for fire suppression);
- Lithium hexafluorophosphate (bound with NMC); and
- Hydrocarbons in the form of diesel fuel (viscous liquid form).

Stage 3: Assessment of the site-specific pollution possibility

For each relevant hazardous substance brought forward from Stage 2, identify the actual possibility for soil or groundwater contamination at the site of the installation, including the probability of releases and their consequences, and taking particular account of: the quantities of each hazardous substance or groups of similar hazardous substances concerned; how and where hazardous substances are stored, used and to be transported around the installation; where they pose a risk to be released; In case of existing installations also the measures that have been adopted to ensure that it is impossible in practice that contamination of soil or groundwater takes place.

In terms of the specific issues required to be considered as part of Stage 3:

- (i) *The quantity of each hazardous substance handled, produced or emitted in relation to its environmental effects.*

The upper part of table below shows storage of types of material and the lower part the input and output respectively of 16 06 05 material (and similar materials with the same composition in terms of relevant hazardous substances) and Storm Black.

	C & M 2.4 MT (3 High)	Storm Black™ 2.0 MT (1 high)	Polymer 0.45 MT (3 high)	Al & Cu 1.50 MT (2 high)	Total MT in each tent
Tent 1	-	-	17.1 MT	30 MT	47.1 MT
Tent 2	60.0 MT	-	-	-	60 MT
Tent 3	-	200 MT	6.75 MT	22.5 MT	229.25 MT
Tent 4	98.4 MT	-	-	-	-
Tent 5	60.0 MT	-	-	-	-
Total material held on site	218.4 MT	200 MT	23.85 MT	52.5 MT	494.75 MT
One line only in operation					
Weeks of production (storage period)	2.275	3.33	2.385	2.02	~ 2
Annual throughput	5,678 MT	3,120 MT	620 MT	1,365 MT	10,783
Daily arrival	21 MT	-	-	-	21 MT
Daily departure	-	12 MT	2.4 MT	5.25 MT	19.65 ¹
Two lines in operation					
Weeks of production (storage period)	1.136	1	1.193	1.01	~ 1
Annual throughput	11,350 MT	6,240 MT	1,240 MT	2,730 MT	21,560
Daily arrival	42 MT	-	-	-	42 MT
Daily departure	-	24 MT	4.8 MT	10.50 MT	39.30 MT ¹

Permit variation is for 1000 MT to be held on site at any time, given space for additional material to be held

Permit variation is for 30,000 MT annual throughput given targeted production efficiencies

Permit variation is for 100 MT daily processing given targeted production efficiencies

¹ In practice containers will arrive and depart less frequently than every day, but the average can be expected to be one 20 MT container each day, in and out with one line operational and two 20 MT containers in and out when two lines are operational.

The maximum amount of these substances can be identified from this, with 21 MT to 42 MT arriving as 16 06 05 or similar (where NMC content is c. 40%) and 12 MT to 24 MT of Storm Black leaving (where NMC content is close to 100%). At any one time c. 220 MT of 16 06 05 material or similar would be stored on site and c. 200 MT of Storm Black.

- (ii) *The location of each hazardous substance on the site e.g. where it is or will be delivered, stored, used, moved around the site, emitted etc., in particular in view of the characteristics of the soil and groundwater at that part of the site*

At all times, from arrival to departure, the relevant hazardous substances will be delivered, stored, used, moved around the site and otherwise handled on impermeable (concrete/hardstanding) sealed (bund) surfaces with sealed drainage. This is described in the submitted OTEMS and FPP. Handling procedures at acceptance of material and packaging and despatch of material is carefully supervised with compliant containers used at all times. If there was to be accidental emission, any of the relevant hazardous materials would be cleaned up or would move through drains to the interceptors to be pumped out to a separate 100,000 litre tank, from which hazardous wastewater would be removed by tanker. We consider these containment mechanisms to be sufficient for the purposes of stage 3.

- (iii) *In case of existing installations: the presence and integrity of containment mechanisms, nature and condition of site surfacing, location of drains, services or other potential conduits for migration.*

The site drainage was surveyed by Adler & Allan (as described in their independent report) and the bunding and sealing of drainage was completed this year. The site is inspected daily to ensure that the structure and surfacing; and drainage are in good order and functioning as intended, including to ensure that there has been no chemical attack on surfaces.

We consider that the drainage and sealing measures are sufficient and, despite that on this basis a baseline report might not be required, the Adler & Allan report provides the information that would be required for a baseline report under stages 4 to 8.

4. MA1 Non-technical summary:

We need you to provide further details on the aqueous shredding process, in terms of describing the 'secondary shredding' shown in the process flow diagram and explaining whether the reference to dry materials being shredded under an extraction system is referring to this or a separate process, and if a separate process, what the inputs and outputs are.

The processes are variants of the same process, with the aqueous shredding being an added step to allow the safe shredding of 'wet' material, i.e., material which contains electrolyte. The aqueous shredding step, by first shredding/crushing in water, removes the risk of ignition of the electrolyte. Once this process is complete, the material moves to the same shredding stage as the dry material. This dry material can be safely shredded under extraction, rather than needing to be shredded in water. Therefore:

- Inputs are both 16 06 05 but if there is electrolyte in the battery/cell module it is put through the aqueous shredding process.
- Outputs are, in both cases, the 16 06 05 in shredded form which passes to the dryer and on to the separation line.

Further details on the aqueous shredding process are as follows:

- Each battery pack (modules, electrical storage systems (ESS) or residential energy storage units (RESU)) weighs up to 100 kg.
- These packs have the form-of '*prismatic cells*', i.e., cells with sheets of anodes, cathodes, and separators pressed to fit into a metallic and hard-plastic housing in cubic form.
- The ends of these packs contain steel and titanium which (a) may create sparks when shredded; and (b) adds contamination to the shredded material.
- The aqueous process removes the ends/sides of each battery pack (Modules/ESS/RESU) by using a crushing system in water, which removes the end of the packs before shredding, mitigating the risk of fire.
- The crushing takes place in a closed system which recirculates the cold water from the crushing chamber, while being able to recover any valuable powders that may be liberated during this crushing motion.
- The volume of water in the system is c. 50,000 litres, which is contained within a closed loop.
- The water is changed following 2000 MT being processed through the system. If 21-42 MT are input each working day, the water will be changed every 10-20 weeks. The wastewater will contain some electrolyte residue and graphite (material which will pass through the systems screens).

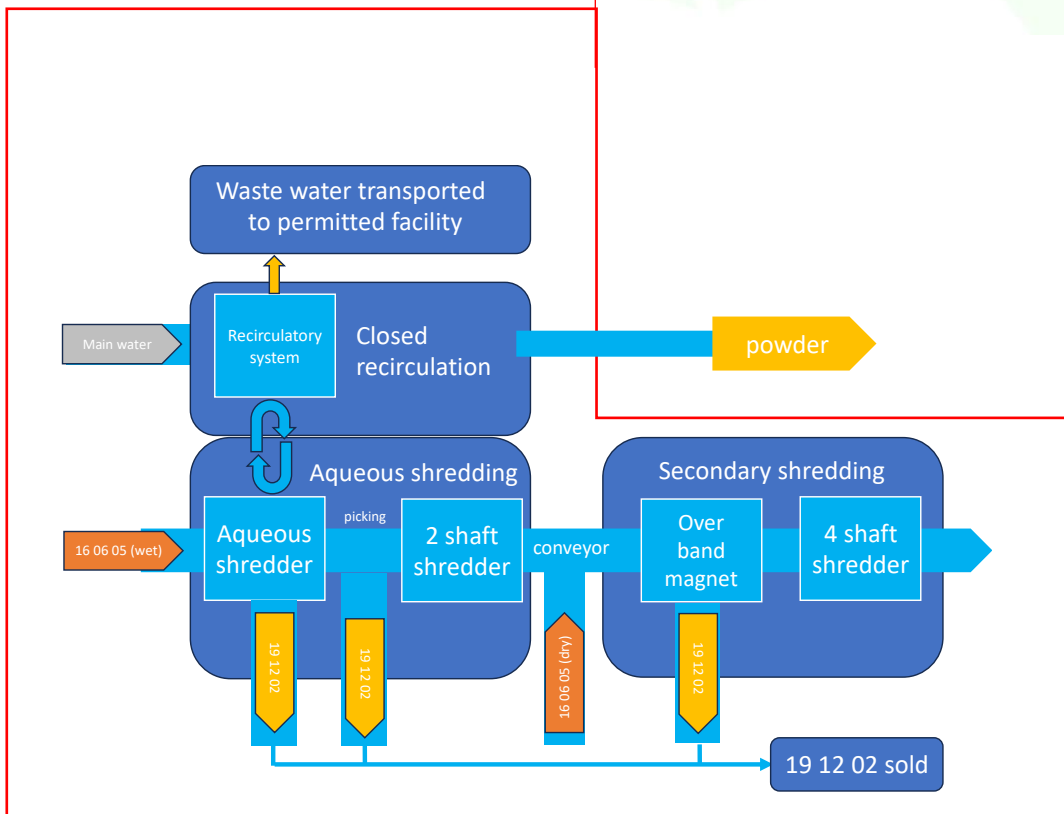
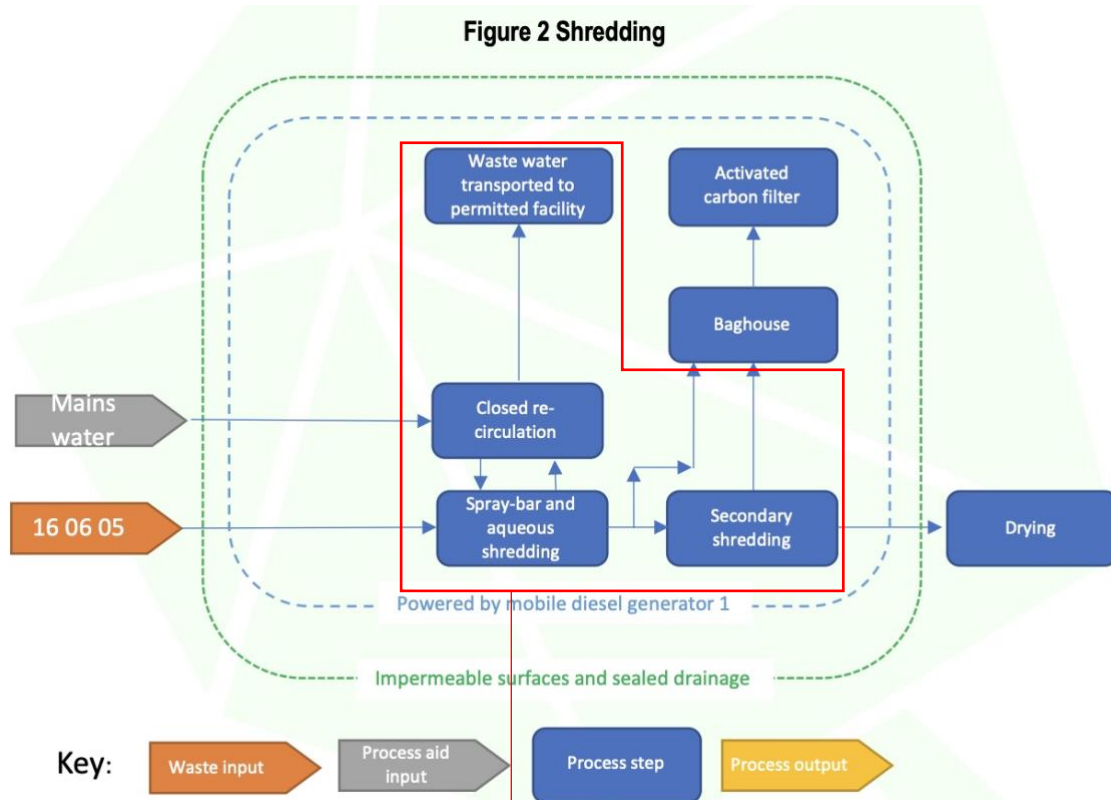
Once the ends have been removed they are separated manually from picking stations on the conveyor to the shredder, with 'overband' magnets removing any residual ferrous material.

The remaining material (still 16 06 05) are dead battery cells, which are then—like the dry material—shredded in a continuous closed process to eradicate any dust escape during the shredding.

This second shredder is not aqueous and the shredded cells are transported on a sealed conveyor, which carries the shredded cells, feeds into our bespoke drying system. This creates the Storm Black product. The slight polymer, copper and aluminium content which remains is then removed in the backend separation plant, to give an ultra pure Storm Black Product.

The schematics for the closed circulatory system are provided in **Annex 3**.

The process is shown diagrammatically below:



Only some of the waste codes proposed for acceptance are referred to in the application, in terms of the hazardous waste treatment and storage and the non-hazardous waste transfer station (referred to as for batteries and antifreeze only). We therefore need you to confirm whether other waste transfer and/or treatment will be taking place or submit an updated list of proposed waste codes that will be accepted.

No other treatment will be taking place.

The reason for the additional waste codes is to 'future proof' the feedstock supply, as there is significant variation and uncertainty in the EWCs being assigned by different national competent authorities to the same types of lithium-ion battery material arising from the lithium-ion battery supply chain. We have therefore applied for a variation that allows the processing of the waste codes that we consider could be assigned to the materials involved in our process.

Waste transfer in respect of all codes requested could occur.

5. Application form part C2, 3b:

Technical competency has been assessed for Mr Ricky O'Brien, for whom the information requested in this section of the application forms has been provided. In line with Appendix 2, we also require his date of birth.

Mr Ricky O'Brien's date of birth is 24th January 1991.

6. Application form part C2, 3c:

Please be advised that we will not assess the full Environmental Management System that has been submitted. We will assess the sections relevant to this application. In line with this, we need you to submit an updated Environmental Management System (or summary) which:

Includes any additional air emission points that are identified in line with point 7 below.

We believe that this is all now covered in the new Dust and Emission Management Plan which replaces the original MA13 document.

Includes a plan for maintaining the infrastructure of the site and any machinery. Section 2.15 refers to section 3.8.3 providing a summary of the Planned Preventative Maintenance, but this section appears to be missing - section 3 only goes up to 3.5.

Apologies, this is a misnumbering. This section is on page 33 and is in section 4 of the OTEMS. It is shown below.

Additional plant and equipment including, but not limited to, water bowser, spray equipment and road sweeper are made available as required.

All items of plant and equipment used on site are maintained in accordance with manufacturer's recommendations.

3.8.3 Plant Maintenance

The site's maintenance procedure, checklist, and record is included in the accompanying appendices.

All maintenance audits and monitoring will be carried out in accordance with the manufacturer's specifications, which are kept in the site office or available online.

Lincoln Storm takes a proactive approach involving a planned **preventative** maintenance program for the site, see **appendix 06**.

Site operatives are aware of their particular responsibilities for maintenance checking. The Site Manager ensures that all site operatives are aware of any amendments and additions to the checklist.

The table below summarises the **preventative** maintenance schedule.

Equipment	Weekly	Monthly	Quarterly	Annually
Pre-shredder and shredder	Inspect blades	Lubricate bearings Check belts for wear	Replace blades	Inspect motor Inspect electrical system
Rotary drier	Inspect seals and filters/extraction Check belt tension	Lubricate bearings Check belts for wear	Inspect drive Inspect drum	Inspect motor Inspect electrical system
Dry separation line	Inspect seals and filters/extraction Inspect mill and screens Check belt tension	Lubricate bearings Check belts for wear	Replace tools	Inspect motor Inspect electrical system
Conveyors	Inspect belts/rollers Check belt tension	Lubricate bearings Check belts for wear	Inspect structure	Inspect motor Inspect electrical system
Forklift trucks	Check fluids Inspect brakes/lights	Inspect tires Inspect forks	Replace fluids	Inspect engine Inspect electrical system
Gravity separation Table	Inspect seals and filters/extraction Inspect deck surface Check belt tension	Lubricate bearings Check belts for wear	Inspect frame	Inspect motor Inspect electrical system

Outputs of all plant at checked at the end of each day and survey of each piece of equipment is performed daily.

When a maintenance issue is dealt with, a maintenance record form is completed for each separate piece of equipment or infrastructure. The record form will include the following information to be recorded:

- The item requiring maintenance;
- The frequency of the required maintenance;
- Completed date and who carried out by; and
- Any particular comments.

The record forms will be kept in the site office to ensure there is access for all site operatives to the records.

In the event that plant replacement is required, Lincoln Storm will choose new plant with the lowest emission standard available at the time of purchase.

The following control measures will be in place to reduce emissions as much as possible during operations:

- Use of low sulphur fuel;
- Mobile plant to be switched off when not in use to avoid idling; and
- Planned, **preventative** maintenance schedule to be rigidly followed to avoid the operation of poor performing or inefficient plant.

7. Application form part C2.5 and part C3, 2:

We need you to ensure that you have identified all air emission points. For example, there are references to dust bag house filters (and it should be made clear whether these have individual emission points or one combined emission point) and dry materials being shredded under an extraction system.

We believe that this is all now covered in the new Dust and Emission Management Plan which replaces the original MA13 document.

We need you to provide an air emissions risk assessment that covers all air emissions points and follows our guidance: Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk). Reference is made in document MA11 to using our H1 Tool so as part of this assessment you should submit the data and results from this. If detailed modelling is required, you should refer to our guidance. Please note that the use of Selective Catalytic Reduction as an abatement system requires assessment of ammonia.

We have supplied the H1 spreadsheet but we and Dr Nick Ford at SOCOTEC have had some issues with it, particularly the long term PC and short term PC on air release points and inventory page. SOCOTEC have reviewed their monitoring reports and below the inputs should be as shown below:

Air release points and emissions inventory													
1. Add release point details in the top table.													
2. In the bottom table, select release point in the 1st column and fill in substance details.													
3. Once done, click on 'Calculate' and 'Dispersion' menus.													
Environmental Assessment													
Add release point Delete selected row Copy selected row Paste row in selected location Clear the information of selected row													
Release point code	Location or grid reference	Activity/Activities	Effective height (metres)	Dispersion factor (Long term)	Dispersion factor (Short term)	Efflux velocity (m/s)	Total flow (m ³ /h)						
1	020000		2	124.8	3236	36.9	359						
2	020000		2	124.8	3236	35.7	87						
3	020000		2	124.8	3236	21.3	150						
4	020000		2	124.8	3236	36.9	359						
5	020000		2	124.8	3236	35.7	87						
Add Substance Delete Selected Row													
Release Point	Substance	Measurement method	Operating mode(s)	Long term conc (mg/m ³)	Release rate g/s (Rate term)	Measurement basis (Long term)	Short term conc (mg/m ³)	Release rate g/s (Short term)	Measurement basis (Short term)	Annual rate (t/y)	Long term PC (µg/m ³)	Short term PC (µg/m ³)	Total Flow
1	Nitrogen Dioxide	Spot	Normal	408	0.20	3900	716	0.03	3900	2.24	8.88	0.00	369.00
2	Carbon monoxide (8h mean)	Spot	Normal	205	0.14	3900	469	0.02	3900	1.56	6.17	0.00	369.00
3	Nitrogen Dioxide	Spot	Normal	2138	0.07	3900	233	0.01	3900	0.75	2.97	0.00	87.00
4	Carbon monoxide (8h mean)	Spot	Normal	362	0.02	3900	83	0.00	3900	0.26	1.04	0.00	87.00
5	Nitrogen Dioxide	Spot	Normal	447	0.02	3900	67	0.00	3900	0.21	0.84	0.00	150.00
6	Carbon monoxide (8h mean)	Spot	Normal	2819	0.08	3900	288	0.00	3900	0.90	3.58	0.00	150.00
7	Nitrogen Dioxide	Spot	Normal	408	0.20	3900	716	0.03	3900	2.24	8.88	0.00	369.00
8	Carbon monoxide (8h mean)	Spot	Normal	205	0.14	3900	469	0.02	3900	1.56	6.17	0.00	369.00
9	Nitrogen Dioxide	Spot	Normal	408	0.20	3900	716	0.03	3900	2.24	8.88	0.00	369.00
10	Carbon monoxide (8h mean)	Spot	Normal	205	0.14	3900	469	0.02	3900	1.56	6.17	0.00	369.00
Environmental Assessment													
Add release point Delete selected row Copy selected row Paste row in selected location Clear the information of selected row													
Release point code	Location or grid reference	Activity/Activities	Effective height (metres)	Dispersion factor (Long term)	Dispersion factor (Short term)	Efflux velocity (m/s)	Total flow (m ³ /h)						
EMP 1	51-21-51.88 N, 2-56-11.3 W	Generator for Dryer	2	124.8	3236	36.9	359						
EMP 2	51-21-50.94 N, 2-56-18.2 W	Generator for Shredder	2	124.8	3236	35.7	87						
EMP 3	51-21-50.94 N, 2-55-58.30 W	Generator for Dry Separation Line	2	124.8	3236	31.3	150						
EMP 4	51-21-51.4 N, 003-58-00 W	Dryer Stack	5	90	2740	146.413	0.18						
EMP 5	51-21-51.4 N, 003-58-00 W	Generator for Wet Separation Line (Shredder)	2	124.8	3236	36.9	359						
EMP 6	51-21-51.4 N, 003-58-00 W	Generator for Wet Separation Line (Dry)	2	124.8	3236	36.9	359						
Add Substance Delete Selected Row													
Release Point	Substance	Measurement method	Operating mode(s)	Long term conc (mg/m ³)	Release rate g/s (Rate term)	Measurement basis (Long term)	Short term conc (mg/m ³)	Release rate g/s (Short term)	Measurement basis (Short term)	Annual rate (t/y)	Long term PC (µg/m ³)	Short term PC (µg/m ³)	Total Flow
EMP 1	Nitrogen Dioxide	Spot	Normal	408	0.20	3900	716	0.03	3900	2.24	8.88	0.00	369.00
EMP 1	Carbon monoxide (8h mean)	Spot	Normal	205	0.14	3900	469	0.02	3900	1.56	6.17	0.00	369.00
EMP 2	Nitrogen Dioxide	Spot	Normal	2138	0.07	3900	233	0.01	3900	0.75	2.97	0.00	87.00
EMP 2	Carbon monoxide (8h mean)	Spot	Normal	362	0.02	3900	83	0.00	3900	0.26	1.04	0.00	87.00
EMP 3	Nitrogen Dioxide	Spot	Normal	447	0.02	3900	67	0.00	3900	0.21	0.84	0.00	150.00
EMP 3	Carbon monoxide (8h mean)	Spot	Normal	2819	0.08	3900	288	0.00	3900	0.90	3.58	0.00	150.00
EMP 4	Nitrogen Dioxide	Spot	Normal	408	0.20	3900	716	0.03	3900	2.24	8.88	0.00	369.00
EMP 5	Carbon monoxide (8h mean)	Spot	Normal	205	0.14	3900	469	0.02	3900	1.56	6.17	0.00	369.00
EMP 6	Nitrogen Dioxide	Spot	Normal	408	0.20	3900	716	0.03	3900	2.24	8.88	0.00	369.00
EMP 6	Carbon monoxide (8h mean)	Spot	Normal	205	0.14	3900	469	0.02	3900	1.56	6.17	0.00	369.00

Dr Ford has used performed his own analysis as shown below.

Air Impacts

Calculate Process Contributions of Emissions to Air

This table estimates the Process Contribution (PC), calculated as the maximum ground level concentration for each emission listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dispersion modelling, this may be entered as indicated and will be used instead of the estimated PC.

Number	Substance	Long Term			Short Term		
		EAL µg/m ³	PC µg/m ³	* Modelled PC µg/m ³	EAL µg/m ³	PC µg/m ³	Modelled PC µg/m ³
1	Nitrogen Dioxide	40	57.3		200	742	
2	Carbon monoxide		52.1		10000	1,350	

Note that the Process Contribution shown for each substance is the sum of the individual process contributions of each point from which the substance is emitted. Process Contributions obtained from modelling data should incorporate all relevant release points and flow conditions.

* State the location of any detailed air dispersion modelling and also the main assumptions: Comments

As expected these all exceed the required limits and those emission limits we propose (see next section) as they are taken without abatement. And we now propose to join the grid so that (abated) generators would only be used for emergency backup.

We need you to propose emission limit values and monitoring (including monitoring standards and frequencies) in relation to all air emission points. For those related to the diesel generators, these should be in line with the Medium Combustion Plant Directive.

We propose the following limits. We propose monitoring on a monthly basis with independent MCERTS automated monitoring for all emissions or potential emissions.

For 'Dust' we propose the limit specified in BAT 25 ('Emissions to Air') which gives a BAT-Associated Emission Level (BAT-AEL) as set out in Table 6.3 of the BAT Conclusions document of:

2-5 mg/Nm³ of Dust

The independent stack test performed on the Dry Separation Line by SOCOTEC the MCERTS testing for Total Particulate Matter had a result of 0.33 mg/m³ (and 3.39 g/hr) within calculated uncertainties of +/- 0.65 (6.78). The filter is therefore considered to be effective in ensuring the BAT-AEL is adhered to. As soon as permitted, the same test will be performed on the shredders, al/cu separation unit and dryer, to ensure they are operating within the BAT-AEL limit.

For other substances (for diesel generators) these would be as follows, based on [Table 2 of Medium Combustion Plant Directive](#), emission limit values:

120 mg/Nm³ for SO₂
190 mg/Nm³ for NO_x

8. Application form part C3, 3a:

Currently, there is no appropriate measures guidance specific to the treatment or transfer of waste batteries. However, we would expect waste battery transfer and treatment facilities to be permitted and operated in line with the standards (including emission limits) set out in existing appropriate measures guidance where relevant,

Please review the requirements and demonstrate how the requirements will be met. Where you do not meet the requirements you must explain why and justify any alternative measures you are proposing, specifically:

Waste electrical and electronic equipment (WEEE): appropriate measures for permitted facilities - Guidance - GOV.UK (www.gov.uk)

Applicability: Although waste batteries are not a type of WEEE, they are common electrical components of WEEE and we would expect standards for their treatment or transfer to be consistent with those set in this guidance.

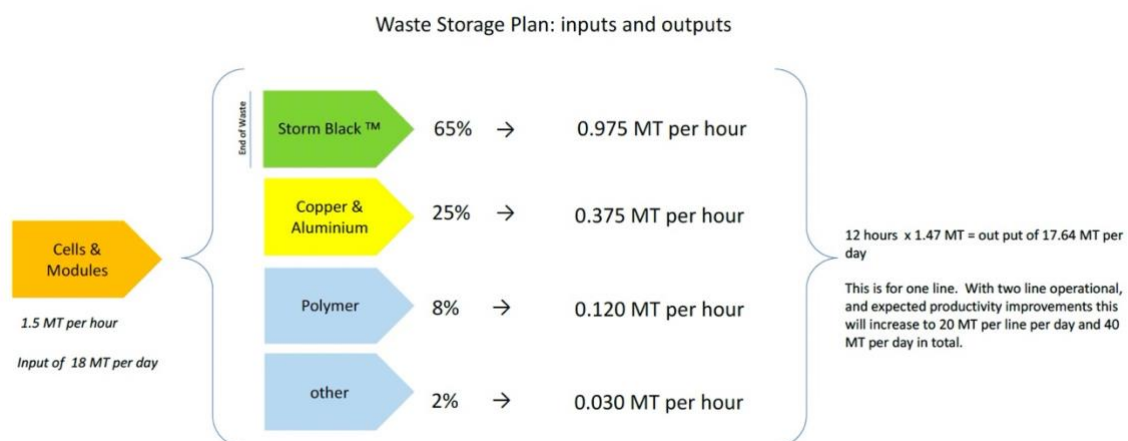
We have reviewed the sections which might be considered relevant within Section 5 of the Manual (Waste electrical and electronic equipment (WEEE): appropriate measures for permitted facilities):

5.1 is not relevant as the processes do not relate to preparation for re-use.

5.2 General Waste Treatment is relevant:

1. Where WEEE cannot be prepared for reuse it must be treated to maximise the recycling and recovery of materials whether that is at the same facility or by further downstream processing.

Standard met: the recovery rate for the 16 06 05 and other lithium-ion battery material is 98%, as illustrated in the diagram below:



2. *You must fully understand, monitor and optimise your waste treatment process to make sure you treat waste effectively and efficiently. You must not treat waste to deliberately dilute it or mix any hazardous outputs with any non-hazardous outputs.*

Standard met: as described in the Non-Technical Summary, and shown above, the waste is treated effectively and efficiently. It is not diluted nor are hazardous outputs mixed with any non-hazardous outputs.

3. *The treated output material must meet your expectations and you must fully classify and characterise them to ensure they are suitable for their intended disposal or recovery route.*

Standard met: As described in the submitted material, the process produces a specific limited set of outputs (see above), with specific disposal and recovery routes (as described elsewhere), including for wastewater, copper, aluminium, polymer and residual ferrous fractions, as well as the Storm Black product itself (which is subject to independent assay).

4. *You must identify and characterise emissions from the process and take appropriate measures to control them at source.*

Standard met: As explained and discussed through the Agency's pre-application process (and explained in sections earlier in this document):

- we have identified the emission points as the diesel outlets from five planned diesel generators; and
- an H₂O (steam) outlet from the dryer stage.

The characteristics are described in the earlier section, its supporting material and the Agency's HS1 spreadsheet.

In the case of each of these:

- The diesel generators will be fitted with abatement (either ad-blue or through a 'wet scrubber' system). However, our intention, subject to being duly made and a site survey (commissioned) by the local power supplier, is to move all fixed plant on the site to be powered from the mains/grid. This will require laying of new cables to the site, and a new transformer. This is part of our energy efficiency programme.
- The steam outlet will be directed to a condensation unit, converting the steam to water which will then be disposed of with other waste water (removed by tanker).

As explained above, and discussed as part of the pre-application process, we have not classified the baghouse filters as emission points, as the units are enclosed and have active carbon filters fitted to them and 'socks'. The fine particles are collected as they are black mass which is used for Storm Black.

5. *You must have up-to-date written details of your treatment activities, and the abatement and control equipment you are using. This should include information about the characteristics of the waste you will treat, and the waste treatment processes, including: simplified process flowsheets that show the origin of any emissions, details of emission control and abatement techniques for emissions to air and water, including details of their performance, diagrams of the main plant items where they have environmental relevance – for example, storage, tanks, treatment and abatement plant design, details of manual dismantling processes, for example removal of cables and plugs, removal of batteries, capacitors and printer cartridges, draining of oil from radiators, details of physical treatment processes, for example shredding, separation, compaction, filtration, heating, cooling or washing. details of any chemical treatment processes, details of any biological treatment processes, details of any effluent treatment, including a description of any flocculants or coagulants used, an equipment inventory, detailing plant type and design parameters – for example, time, temperature, pressure, waste types to be subjected to the process, the control system philosophy and how the control system incorporates environmental monitoring information, process flow diagrams (schematics), venting and emergency relief provisions, a summary of operating and maintenance procedures, process instrumentation diagrams.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

6. *You must have up to date written details of the measures you will take during abnormal operating conditions to make sure you continue to comply with permit conditions. Abnormal operating conditions may include: unexpected releases, start up, momentary stoppages. shut down*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

7. *You should use material flow analysis for relevant contaminants in the waste to help identify their flow and fate. You should use the analysis to determine the appropriate treatment for the waste either directly at the site or at any subsequent treatment site.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

8. *Material flow analysis considers the contaminant quantity in the: waste input, different waste treatment outputs, waste treatment emissions.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

9. *You should use the analysis and your knowledge of the fate of the contaminants to make sure you correctly treat and either destroy or remove them.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

10. *The use of material flow analysis is risk-based considering: the hazardous properties of the waste the restricted chemicals in the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, knowledge of the previous waste holders.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

11. *A treatment process may destroy certain substances in the waste. It could also put substances into the air, water or the ground, or produce residues which are sent for disposal. You should minimise the weight of these outputs. The treatment process may produce residues for recovery or reuse and you should maximise the weight of these outputs.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

12. *You must not proceed with the treatment if your risk assessment or material flow analysis indicates that losses from a process will cause: the breach of an environmental quality standard, the breach of a benchmark, a significant environmental impact.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

13. *To track and control the process of change, you must have a written procedure for proposing, considering and approving changes to technical developments, or to procedural or quality changes.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

14. *You must minimise the release of diffuse emissions to air from activities which may give rise to them (for example, shredding or granulating) by: carrying out the activity using enclosed equipment or in an enclosed building, maintaining the enclosed equipment or buildings under an appropriate pressure, collecting and directing the emissions to an appropriate abatement system.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required. See also above.

15. *Unless you are preparing it for reuse, you must remove all fluids from WEEE along with those substances, mixtures and components listed in Annex VII of the WEEE Directive.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

16. *Removal may be a staged process and may be undertaken at different facilities. You must be able to demonstrate either: you have removed the substances, mixtures and components listed in Annex VII of the WEEE Directive from WEEE as required by the conditions of your permit those substances, mixtures and components will be removed at a suitably authorised downstream treatment facility.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

17. *You must make sure that any substances, mixtures and components removed as part of your treatment process are subsequently recovered or disposed of at an appropriately permitted facility.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

18. *If you transfer partially treated WEEE to another site you must properly describe it, so the recipient knows which treatments are complete and which still need to be done.*

Not applicable. All material is processed.

19. *You should no longer routinely find certain hazardous items and substances that were once used in electrical appliances but are now banned. However, they may still be present on occasions. For example, any capacitors found in equipment manufactured before 1987 should be assumed to contain polychlorinated biphenyls (PCBs) unless there is clear evidence to the contrary. Asbestos may be found in old coffee pots and heating elements. You must be alert to these possibilities and ensure you have documented procedures in place to identify and remove them for appropriate disposal before any mechanical or shredding operation takes place.*

Not applicable. This material is not in the feedstock.

Capacitors containing PCB are POPs waste and must be treated in a way that results in the destruction of the PCB content.

Not applicable. This material is not in the feedstock.

20. *You must monitor and record the outputs of your treatment activity, including their weight. The monitoring must be used to provide evidence that the treatment and removal of these components and substances has been carried out to a satisfactory standard.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

21. *When removing components, you must safely remove the whole item where breaking it up might: pollute the recycle or waste stream; result in unacceptable emissions.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

22. Components that you must always remove whole, that is intact and identifiable, (unless this guidance states specific circumstances where you do not need to) include: capacitors containing PCBs, mercury containing components, toner cartridges, components with asbestos, components with refractory ceramic fibres, components with radioactive substances, gas discharge lamps including CCFL backlights, cathode ray tubes, electrolyte capacitors containing substances of concern that have a height or diameter greater than 25mm, or have a proportionately similar volume, batteries and powerpacks.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

23. *Instead of removing them as whole components, you may recover the following as fragments or materials using mechanical treatment: chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs), hydrocarbons (HCs), external electric cables, printed circuit boards liquid crystal displays, the activated coating in cathode ray tubes (CRTs), plastic with brominated flame retardants (BFRs).*

Not applicable. This material is not in the feedstock.

24. *You may either: sort batteries on site, send batteries as a mixture of chemistry types to a specialist battery treatment operator for sorting.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required. Although no 'sorting' occurs. ABTO status is being applied for in parallel with this variation and the facility is already an ABE.

25. *You must pack and store lithium and lithium-ion batteries removed from WEEE during treatment in a way to minimise the likelihood of electrical shorting, physical impact and overheating.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

26. *All outdoor WEEE treatment areas must have an impermeable surface with a sealed drainage system. It must collect all surface water run-off and channel it to a blind sump unless it may be lawfully discharged.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required. There are no outside treatment areas.

27. *Indoor WEEE treatment areas must have an impermeable surface and you must provide spillage collection facilities appropriate to the materials being handled.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

28. *WEEE treatment should take place under weatherproof covering such as a roofed building. Where this is not practicable, for example, due to the large size of the plant, appropriate measures must be taken to minimise the exposure of waste to rain and wind. This may include the covering of: hoppers, conveyors, skips of treated materials, storage bays containing treated materials*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

5.3 is not relevant as the process and materials involved do not contain BFRs or POPs

5.4 Process Monitoring is relevant:

1. *At least once a year, for every WEEE stream you treat, you must carry out a mass balance exercise to determine and record the mass of each individual output fraction derived from a given mass of input material. The batch size must be large enough to make sure you can assess a representative sample of typical input materials.*

Standard met: mass balance checks will be performed and linked to the assay results on all material. This is scheduled to be quarterly.

2. *You should compare each set of results with previous results to monitor the performance of your site and to ensure it is performing optimally.*

Standard met: longitudinal checks and comparisons will be performed as part of the mass balance and assay checks described above.

3. *Where process monitoring requires chemical analysis to be carried out on waste fractions and residues produced by your treatment process, this must be carried out by an independent accredited laboratory, using recognised accredited methods where they are available.*

Standard met: all results are analysed (including assays on all outputs) by independent laboratories.

4. *You must have, and be able to provide, a full description of the material testing and analysis procedures and methods used, which provide details of the calibration methods and reference standards used.*

Standard met: this will be done (and results provided on request).

5. *You must choose the sample containers and packaging used for storing and transporting according to the nature and requirements of the materials they will contain. For example, chemical properties, pressure and gas tightness.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

6. *You must clearly label sample containers with at least the name of the treatment facility, a description of the waste material or residue contained, the waste stream it was produced from and the date of sampling.*

Standard met: this will be done and is in accordance with our current sampling / testing procedures.

7. *You must make sure that any required sample is representative of the waste and has been taken by someone technically competent to do so. A representative sample is one that takes account of the full variation and any partitioning of the material.*

Standard met: this will be done and is in accordance with our current sampling / testing procedures.

8. *Samples must be stored in a dark, cool place and dispatched to the laboratory for analysis as soon as possible, preferably within 24 hours of being taken.*

Standard met: this will be done and is in accordance with our current sampling / testing procedures.

9. *You must carry out sampling under normal operating conditions unless otherwise stated.*

Standard met: this will be done and is in accordance with our current sampling / testing procedures.

10. *If process monitoring shows that the performance of your treatment plant does not meet any of the standards stated in this guidance, you must send a report to the Environment Agency, summarising: the actions you will take to improve performance in order to achieve the standards given, including any additional sampling and testing; the dates you will complete these actions by, including the dates for any additional sampling and testing.*

Standard met: this will be done and is in accordance with our current sampling / testing procedures.

11. *Wherever possible you should sample waste fractions and residues in line with relevant guidance, for example: WM3 Waste classification – Guidance on the classification and assessment of waste – Appendix D, EN 14899 Characterization of waste – Sampling of waste materials – Framework for the preparation and application of a Sampling Plan, CEN/TR 15310 1 Characterization of waste – Waste Collection – Part 1: Guide on the selection and application of criteria for sampling under various conditions, CEN/TR 15310 2 Characterization of waste – Waste Collection – Part 2: Guide on sampling techniques, CEN/TR 15310 3 Characterization of waste – Waste Collection – Part 3: Guide on procedures for sub sampling in the field, CEN/TR 15310 4 Characterization of waste – Waste Collection – Part 4: Guide to the packaging procedures for storage, conservation, transportation and delivery of samples, CEN/TR 15310 5 Characterization of waste – Sampling of waste – Part 5: Guide on the process of developing a sampling plan. Other guidance on waste sampling and analysis can be found in A10 Weeelabex de-pollution monitoring specification*

Standard met: this will be done and is in accordance with our current sampling / testing procedures.

5.5 is not relevant as no treatment of gas discharge lamps takes place.

5.6 is not relevant as no treatment of cathode ray tubes takes place.

5.7 is not relevant as no treatment of FPD equipment takes place.

5.8 is not relevant as no treatment of SMW takes place.

5.9 is not relevant as no treatment of IT, telecommunications and business takes place.

5.10 is not relevant as no treatment of LDA takes place.

5.11 is not relevant as no treatment of photovoltaic panels takes place.

5.12 Post shredding treatments is relevant:

1. *You may use a range of separation technologies to further segregate and purify shredded fractions of WEEE. For example, eddy-current separators, electrostatic separators, and density separation, either at the shredding facility or elsewhere.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

2. *You must fully characterise and classify fractions produced by these processes.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

3. *Where materials originate from WEEE that was POPs waste, fractions of plastic containing brominated flame retardants must be managed as POPs waste.*

Not applicable. The feedstock does not contain these substances.

4. *Where materials originate from WEEE that was not POPs waste, fractions of plastic containing brominated flame retardants must be assessed to determine if they are POPs waste.*

Not applicable. The feedstock does not contain these substances.

5. *You must fully characterise and classify (including for POPs) process solutions and washings from density separation processes before determining suitable disposal options. Where these originate from the treatment of POPs waste, any POPs must be destroyed.*

Not applicable. The feedstock does not contain these substances.

6. *You must only use waste codes for single material outputs, for example plastic, where the treatment involved is aimed at producing a pure material fraction. Contamination by other materials must be negligible.*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

Process monitoring for the separation of BFR containing plastic

7. *You must monitor at least once every 3 months how much BFR containing plastic is present in any fraction destined for recycling.*

Not applicable. The feedstock does not contain these substances. The regular monitoring will be able to confirm this.

5.13 Record keeping for treatment residues is relevant:

1. *You must record in the waste tracking system:*

- *that the WEEE has been treated or consigned to another WEEE treatment facility*
- *what WEEE has been prepared for reuse or has been consigned to a preparing for reuse operator*
- *what the treatment residues, treated components and fractions are*

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

Treating metal waste in shredders: appropriate measures for permitted facilities - Guidance - GOV.UK (www.gov.uk)

Applicability: Waste batteries contain metal and are usually treated for the primary purpose of recovering this metal we would also expect any additional relevant standards set in this guidance to be met where batteries are shredded.

1. Mechanical treatment in shredders includes plant such as: hammer mills, chain mills, rotary shears other similar equipment designed to fragment metal into smaller pieces to separate metallic and non-metallic fractions, Mechanical treatment in shredders includes using the equipment to re-size metal into smaller fragments for logistical or transport reasons. It does not include shearers and guillotines which use a range of hydraulic machinery with hard steel blades to cut metals into manageable sizes.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

1.1 When appropriate measures apply

There is a lot of overlap between best available techniques (BAT) for waste installation facilities and necessary measures for waste operation facilities. The Environment Agency uses the term 'appropriate measures' to cover both sets of requirements.

Appropriate measures are the standards that operators should meet to comply with their environmental permit requirements. This guidance sets out what you must consider when you assess the appropriate measures for your site. It is not definitive, and it does not replace your obligation to assess appropriate measures fully.

Some measures may not be suitable or relevant for your operation. Appropriate measures will depend on the: activities being carried out, size and nature of the activities, location of the site.

For installations there are additional requirements for using energy and raw materials (including water) efficiently. These are called 'process efficiency measures'.

Where a measure is not suitable, an operator can propose alternative measures that achieve the same level of environmental protection. Or they can provide an explanation of why the specific measure is not appropriate.

In certain situations, you may need to provide a higher standard of environmental protection, for example: where there are local sensitive receptors, if there is a risk that an operation may exceed an Environmental

Quality Standard

This guidance also covers some activities where legislation applies directly to that activity. This guidance, and any time scales for the appropriate measures, does not remove the need to comply with that legislation. For example, legislation relating to F-gases, persistent organic pollutants (POPs), or hazardous waste. This is not an exhaustive list.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

1.2 Different types of measures that apply

The standards in this technical guidance have been grouped into the following sections. All sections apply to regulated facilities with an environmental permit to mechanically treat metal waste in shredders. General management, Waste pre-acceptance, acceptance and tracking, Waste storage, segregation and handling, Waste treatment, Emissions control, Emissions monitoring and limits, Process efficiency (measures for using energy, raw materials and water apply to Industrial Emissions Directive (IED) installations only), Other generic technical guidance also applies to metal shredding facilities, including guidance on emissions, odour and noise.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

You also need an approved fire prevention plan that meets the requirements of our fire prevention plan guidance.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

Medium combustion plant (MCP) with a rated thermal input between 1 megawatt but less than 50 megawatts must comply with the relevant requirements of the Medium Combustion Plant Directive. Specified generator controls, unless excluded, apply to generators with a rated thermal input of up to 50 megawatts. See our guidance to find out if you need to meet the MCP or specified generator regulations

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

1.3 Implementing appropriate measures at new and existing facilities

The appropriate measures in this guidance apply to both new and existing facilities with a permit to mechanically treat metal waste in shredders.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

For new facilities the appropriate measures must be in place before operations start. For existing facilities, if the cost of complying with the appropriate measures is disproportionate to the environmental benefit, immediate compliance may not be reasonable.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

Through permit reviews, the Environment Agency will assess the current operating techniques of existing facilities against the relevant appropriate measures.

Noted.

Where an operator is not using appropriate measures, we will expect them to provide improvement plans and timetables for implementing the relevant appropriate measures. We will review these proposals and set formal timescales for making the improvements needed. We will do this by varying the environmental permit to include improvement conditions. Improvements at existing facilities are likely to fall into 1 of the following 2 categories.

Standard good practice requirements

For example, these could be:

- updated management systems
- waste, water and energy efficiency measures
- measures to prevent fugitive or accidental emissions
- waste acceptance and handling techniques
- appropriate monitoring equipment

Where these improvements are relatively low cost, operators should implement them as soon as possible and in any event within 12 months.

Larger, more capital-intensive improvements

For example, these could be:

- installing significant abatement equipment
- using a pre-shredder
- the significant redesign of facility layout, including the design and installation of new buildings or treatment plant

Operators should complete these improvements as soon as practicable and in any event within 3 years. However, local environmental impacts may mean you need to take action more quickly than the timescales provided here. For example, if there are sensitive receptors or an air quality management area close by.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

The areas of improvement, and focus of our improvement plans focus on:

- energy efficiency and the approach described in the energy efficiency plan (including connecting to the grid in place of (abated) diesel generators, and longer-term using battery (wet feedstock) discharging as a power source.
- Water treatment to extract valuable material from waste water from aqueous shredding and producing clean water that could, with permission, be released direct to drain.
- Continued improvement and refinement of storage and end to end and automated processing.

Complying with BAT AELs

Existing installations must comply with relevant BAT Associated Emission Levels (AELs) by August 2022, unless we approve a derogation. BAT AELs are set out in the published Waste Treatment BAT Conclusions document.

New installations (including new or replacement plant at existing facilities or a substantial change to existing plant) must comply with any relevant BAT AELs from when operations begin, unless we approve a time limited derogation. Section 3.6 of our Environmental Permitting charges guidance explains what we mean by a substantial change.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

1.4 Site design and suitability

You should consider the potential impacts of climate change when selecting a site, especially: flood risk Drought, extreme temperatures, extreme weather events.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

You should have enough space on site to manage wastes and to make sure that you minimise potential pollution impacts on nearby receptors. For example, you should have enough space for appropriate fire breaks between stockpiles of combustible waste, and to allow access for fire-fighting.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

You must store and handle waste as far as technically and economically possible from sensitive receptors and watercourses. You must minimise unnecessary handling.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

You must have enough space on site to operate your plant and equipment safely, and to segregate waste to prevent cross-contamination.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

At the design stage you should consider: how you will monitor emissions from your site, the access to waste treatment processes so you can take representative samples.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

Chemical waste: appropriate measures for permitted facilities - Guidance - GOV.UK (www.gov.uk)

Applicability: Where the waste chemical components, materials or residues of, or from, waste batteries (e.g., black mass, electrolyte) are treated as a waste activity or waste operation we would expect the relevant standards set in this guidance to be met.

1. *When appropriate measures apply*

Assessing appropriate measures for your site, the measures that apply to different types of facilities and implementing measures at new and existing facilities.

There is a lot of overlap between best available techniques (BAT) for waste installation facilities and necessary measures for waste operation facilities. The Environment Agency uses the term 'appropriate measures' to cover both sets of requirements.

Appropriate measures are the standards that operators should meet to comply with their environmental permit requirements. This guidance sets out what you must consider when you assess the appropriate measures for your site. It is not definitive and it does not replace your obligation to assess appropriate measures fully.

Some measures may not be suitable or relevant for your operation. Appropriate measures will depend on the: activities being carried out, size and nature of the activities, location of the site

For installations there are additional requirements for using energy and raw materials (including water) efficiently. These are called process efficiency measures.

Where a measure is not suitable, an operator can propose alternative measures that achieve the same level of environmental protection. Or they can provide an explanation of why the specific measure is not relevant.

In certain situations, you may need to provide a higher standard of environmental protection, for example: where there are local sensitive receptors, if there is a risk that an operation may exceed an Environmental Quality Standard

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

1.1 Measures that apply to different types of facilities

This is how the standards in this technical guidance apply to different types of facilities that treat or transfer chemical waste.

The following sections apply to transfer stations: General management

Waste pre-acceptance, acceptance and tracking, Waste storage, segregation and handling, Emissions control, Emissions monitoring and limits, Process efficiency (measures for using energy, raw materials and water apply to Industrial Emissions Directive (IED) installations only)

The following sections apply to treatment activities (treating chemical wastes by a method other than incineration): General management, Waste pre-acceptance, acceptance and tracking, Waste storage, segregation and handling, Waste treatment, Emissions control, Emissions monitoring and limits
Process efficiency (measures for using energy, raw materials and water apply to IED installations only)

Specific technical guidance may also be appropriate. For example, there is additional technical guidance for operators of sites that incinerate waste, and operators who store or treat healthcare wastes.

We consider the accident and fire prevention measures specified in this guidance are appropriate measures for managing the fire risks of chemical waste. If you have a permit to carry out an activity involving the storage of other non-hazardous combustible wastes, you may need an approved fire prevention plan that meets the requirements of our fire prevention plan guidance.

Combustion plant with a rated thermal input less than 50 megawatts must comply with the relevant requirements of the Medium Combustion Plant Directive and specified generator regulations. See guidance on the requirements for medium combustion plant and specified generators.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

1.2 Implementing appropriate measures at new and existing facilities

The appropriate measures in this guidance apply to both new and existing facilities that treat or transfer chemical waste. For new facilities the appropriate measures must be in place before operations start.

For existing facilities, if the cost of complying with the appropriate measures is disproportionate to the environmental benefit, immediate compliance may not be reasonable. Through permit reviews, the Environment Agency will assess the current operating techniques of existing facilities against the relevant appropriate measures.

Where an operator is not using appropriate measures, we will expect them to provide improvement plans and timetables for implementing the relevant appropriate measures. We will review these proposals and set formal timescales for making the improvements needed. We will do this by varying the environmental permit to include improvement conditions.

Improvements at existing facilities are likely to fall into one of the following 2 categories.

1. Standard good practice requirements

- For example, these could be:
- updated management systems
- waste, water and energy efficiency measures
- measures to prevent fugitive or accidental emissions
- waste handling techniques
- appropriate monitoring equipment
- Where these improvements are relatively low cost, operators should implement them as soon as possible and within 12 months.

2. Larger, more capital-intensive improvements

For example, these could be:

- installing significant abatement equipment
- the significant redesign of facility layout, including the design and installation of new buildings or treatment plant
- Operators should complete these improvements as soon as practicable and within 3 years.

Local environmental impacts (for example, having sensitive receptors or an air quality management area close by) may mean an operator has to take action more quickly than the timescales provided here.

Standard met: this information has been provided as part of the application materials. Further details on any elements / plant / processes can be provided if required. And as mentioned in previous section, the areas of improvement, and focus of our improvement plans focus on:

- energy efficiency and the approach described in the energy efficiency plan (including connecting to the grid in place of (abated) diesel generators, and longer-term using battery (wet feedstock) discharging as a power source.
- Water treatment to extract valuable material from waste water from aqueous shredding and producing clean water that could, with permission, be released direct to drain.
- Continued improvement and refinement of storage and end to end and automated processing.

By August 2022, unless we approve a derogation, existing installations must comply with relevant BAT associated emission levels (AELs). These are set out in the waste treatment BAT conclusions.

New installations (including new or replacement plant at existing facilities) must comply with any relevant BAT AELs from when operations begin, unless we approve a derogation.

Standard met: this information has been provided as part of the application materials and/or elsewhere in this document. Further details on any elements / plant / processes can be provided if required.

9. Form C3, 3c:

We need you to identify all raw materials that will be used in the proposed activities. These should include:

The water used within the aqueous shredding process, with details of the re-circulation of water within this process in terms of amounts.

As described at section 4 above, the only raw material input to the process (other than diesel fuel, see below), is main water:

- The volume of water in the system is c. 50,000 litres, which is contained within a closed loop.
- The water is changed following 2000 MT being processed through the system. If 21 to 42 MT are input each working day, the water will be changed every 10 to 20 weeks.

The diesel used within the diesel generators, with details of the maximum amount stored on site at any one time and the annual throughput.

The fuel tank on-site (see image below), holds 1,350 litres.

The anticipated average annual fuel use is 150,000 litres of diesel fuel.

As discussed in the Energy Efficiency Plan document, we are actively reviewing alternative power sources to diesel, including installation of a dedicated mains transformer and cabling.



10. Application form part C3, 6e:

Changing the composition of waste means that you are regarded as the producer of the waste. We therefore need you to describe how you will avoid waste production in accordance with Council Directive 2008/98/EC on waste. This should include clarification of what happens to the output classified as 19 12 02.

We believe that the relevant section of CD 2008/98/EC is Article 9 'Prevention' and specifically section 1(f) "reduce waste generation in processes related to industrial production, extraction of minerals, manufacturing, construction and demolition, taking into account best available techniques".

The question at 6e asks for a description of, if we produce waste, how we recover it and if it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Please take the following as the document providing the response to this.

As explained in document MA1 the operation produces the following outputs which could be classified as waste:

- **Wastewater** from the circulatory system supporting aqueous shredding (16 10 01*/ 02). This water is filtered to remove powder which can be used for Storm Black. Although we are reviewing whether material of value derived from electrolyte can be recovered from the wastewater using water treatment techniques, for the time being wastewater will be transported to a permitted facility for disposal (and treatment).
- **Ferrous metal** from the ends of modules (19 12 02, and potentially some non-ferrous 19 12 03 (eg titanium). This is sold including to [name].
- **Polymers (PVDF)** – 19 12 04 which is transported to an energy recovery facility.
- **Copper** (19 12 03) which is transported to refining facilities to create new copper products.
- **Aluminium** (19 12 03) which is transported to refining facilities to create new aluminium products.

11. Dust management plan

Our guidance states that a dust management plan must be provided for sites that receive, process or produce fine or dusty materials and are within 500m of a sensitive receptor. We therefore need you to send us a Dust Management Plan. This should explain how you'll prevent or minimise dust in line with our guidance control and monitor emissions for your environmental permit (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-that-do-not-have-set-limits>). The charge for our assessment of your plan is not included in your baseline application charge and is £1,241. No additional payment is however required as this would be resolved through the abatement of application charge that has been approved.

We believe that this is all now covered in the new Dust and Emission Management Plan which replaces the original MA13 document.

We appreciate the abatement and look forward to the review feedback.

Please also note:

We have assumed that where the unit MT is used throughout the application, this refers to metric ton and not megatonne. Please advise if this is not the case.

That is correct. Where 'MT' is used, this is an abbreviation for 'Metric Tonne'.

You have based the application on a self-assessment of an output from the treatment processes being a product as opposed to a waste. We would assess this at determination.

We have a self-assessment, and we have a submission with the Agency's Definition of Waste Service seeking their confirmation of end-of-waste status.

We have not assessed part C6 since this is not required – there are no point source emissions to water now that the site has sealed drainage and given that water only leaves the site in tankers.

Thank you for confirming this.

MA4 Site condition report (SCR): As part of this application, we only need to assess sections 1 to 3 in relation to the area of land being added to the permitted area, which form the application SCR. Sections 4 - 7 should continue to be maintained throughout the operational phase of the permit and sections 8 – 10 are for completion at surrender.

Thank you for confirming this.

You have submitted a Fire Prevention Plan, which is required as part of this application, however the charge for our assessment of your plan is not included in your baseline application charge and is £1,241. No additional payment is however required as this would be resolved through the abatement of application charge that has been approved.

Thank you. Our FPP is kept under continuous review and a new version will be ready shortly which we will share. We appreciate the abatement.

An updated FPP for current operations at the site was submitted to the Agency's Area Team on 19th October 2023, and will be used as the basis of the updated FPP for the permit variation (i.e. subject to any further comments provided by the Agency on this updated FPP for current operations at the site.

Annex 1: Notice of Variation



Notice of variation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Lincoln Storm Ltd
Lincoln Storm Ltd UK
Worle Quarry
Kewstoke Road
Weston-Super-Mare
Somerset
BS22 9LF

Variation application number

EPR/KB3002CW/V002

Permit number

EPR/KB3002CW

Lincoln Storm Ltd UK Permit number EPR/KB3002CW

Introductory note

This introductory note does not form a part of the notice.

The following notice gives notice of the variation of an environmental permit.

The permit has been varied at the request of the operator to reflect a change in Site Name from Penfold's Waste Recycling Facility to Lincoln Storm Ltd UK.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Permit Determined EPR/BB3139RA	02/12/2011	Permit issued for transfer station taking non-biodegradable wastes.
Variation determined EPR/BB3139RA	25/07/2014	Permit varied to add depollution of end-of-life vehicles, add hazardous waste codes and increase site boundary.
Application EPR/KB3002CW/T001 (full transfer of permit EPR/BB3139RA)	Duly made 03/05/2022	Application to transfer the permit in full to Lincoln Storm Ltd.
Transfer and Environment Agency variation determined EPR/KB3002CW	02/11/2022	Full transfer and Environment Agency initiated variation of permit complete.
Notified of change of Site Name	10/11/2022	Site Name changed to Lincoln Storm Ltd UK
Variation issued EPR/KB3002CW/V002	16/11/2022	Varied permit issued to Lincoln Storm Ltd

End of introductory note

Notice of variation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies

Permit number

EPR/KB3002CW/V002

Issued to

Lincoln Storm Ltd ("the operator")

whose registered office is

3 Whittaker Close

Congleton

CW12 1LW

company registration number 13780413

to operate a regulated facility at

Lincoln Storm Ltd UK

Worle Quarry

Kewstoke Road

Weston-Super-Mare

Somerset

BS22 9LF

as follows on the permit page the Site Name of the operator is changed from Penfold's Waste Recycling Facility to Lincoln Storm Ltd UK.

This notice shall take effect from 16/11/2022.

Name	Date
Adam Hollis	16/11/2022

Authorised on behalf of the Environment Agency

Annex 2: MSDS for Storm Black

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date: 18.02.2022

Version No: 3.00 (replaces version 2.02)

Revision: 18.02.2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

- **1.1 Product identifier**
- Trade name: **Storm Black**
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
- Application of the substance / the preparation: Chemical intermediate
- Uses advised against: No further relevant information available.
- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
LincolnStorm Ltd
Yn Rheash, Corlea Road
IM9 3BA, Malew, Isle of Man
United Kingdom
Tel.:+44 (0) 7624 486123
Mail: info@lincolnstorm.com
- **1.4 Emergency telephone number:**
+44 (0) 7624 486123 (07:00 - 20:00 GMT)
Opening hours: 24h, 365 days/year
Languages of the phone service are: English

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**

Acute Tox. 4	H302 Harmful if swallowed.
Acute Tox. 2	H330 Fatal if inhaled.
Skin Irrit. 2	H315 Causes skin irritation.
Eye Dam. 1	H318 Causes serious eye damage.
Resp. Sens. 1	H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sens. 1	H317 May cause an allergic skin reaction.
Carc. 1A	H350 May cause cancer.
Repr. 1B	H360 May damage fertility or the unborn child.
STOT RE 1	H372 Causes damage to the lung, the bone tissue and the teeth through prolonged or repeated exposure.
Aquatic Chronic 3	H412 Harmful to aquatic life with long lasting effects.

2.2 Label elements

- **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
- **Hazard pictograms**



GHS05 GHS06 GHS08

- **Signal word** Danger
- **Hazard-determining components of labelling:**
cobalt lithium manganese nickel oxide

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Safety data sheet
according to 1907/2006/EC, Article 31

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Trade name: Storm Black

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Lithium hexafluorophosphate(1-) (LiPF₆)

Hazard statements

- H302 Harmful if swallowed.
- H330 Fatal if inhaled.
- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H317 May cause an allergic skin reaction.
- H350 May cause cancer.
- H360 May damage fertility or the unborn child.
- H372 Causes damage to the lung, the bone tissue and the teeth through prolonged or repeated exposure.
- H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P284 [In case of inadequate ventilation] wear respiratory protection.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 Immediately call a POISON CENTER/doctor.
- P330 Rinse mouth.
- P362+P364 Take off contaminated clothing and wash it before reuse.
- P405 Store locked up.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Additional information:

Restricted to professional users.

2.3 Other hazards

Results of PBT and vPvB assessment

- PBT: Not determined.
- vPvB: Not determined.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Description:

CAS: 24937-79-9 EC number: 607-458-6	Polymer PVDF – Poly(vinylidene fluoride)	2.5 - 7%
CAS: 7782-42-5 EC number: 231-955-3	Graphite	25 - 35%

Dangerous components:

CAS: 182442-95-1 EC number: 480-390-0 Reg.nr.: 01-0000020085-78-XXXX	cobalt lithium manganese nickel oxide Acute Tox. 2, H330; Resp. Sens. 1, H334; Carc. 1A, H350; Repr. 1B, H360; STOT RE 1, H372; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317; Aquatic Chronic 3, H412	50 - 70%
CAS: 21324-40-3 EC number: 244-334-7 Reg.nr.: 01-2119383485-29-XXXX	Lithium hexafluorophosphate(1-) (LiPF ₆) Acute Tox. 3, H301; STOT RE 1, H372; Skin Corr. 1A, H314; Eye Dam. 1, H318	1 - 4%

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· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

· **4.1 Description of first aid measures**

· **General information:**

Take affected persons out of danger area and lay down.
Immediately remove any clothing soiled by the product.
Remove breathing equipment only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
Involve doctor immediately.

· **After inhalation:**

Supply fresh air or oxygen; call for doctor.
In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:** Immediately rinse with water.

· **After eye contact:**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a doctor immediately.

· **After swallowing:**

Call a doctor immediately.
Rinse mouth.
Do NOT induce vomiting.

· **Information for doctor:**

When the mixture is heated above 50 ° C and when stored in a warm and/or moist atmosphere, the conductive salt LiPF₆ may decompose to hydrogen fluoride due to the presence of hydrogen/ atmospheric moisture.

When the mixture is burned or when heated above 400 ° C, the binder PVDF may decompose to hydrogen fluoride. Hydrogen fluoride forms hydrofluoric acid when dissolved in water.

Hydrofluoric (HF) acid burns require immediate and specialized first aid. Within 24 hours depending on the concentration of HF symptoms can show. After decontamination with water penetration/ absorption of the fluoride ion can cause further damage. Treatment should be directed to exposure and binding of fluoride ion. Skin exposures can be treated with a 2.5% calcium gluconate gel.

Heavy exposures of skin may make subcutaneous calcium gluconate necessary until stinging stops. This applies to all exposures apart from exposure to fingers, due to the potential for tissue injury from increased pressure and should be considered when undergoing decontamination.

If swallowed the absorption of the fluoride ion can be prevented by giving milk, chewable calcium carbonate tablets or milk of magnesia when the patient is conscious.

Conditions like hypocalcaemia, hypomagnesaemia and cardiac arrhythmias should be monitored.

· **4.2 Most important symptoms and effects, both acute and delayed**

No further relevant information available.

· **4.3 Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**

· **Suitable extinguishing agents:**

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Use fire extinguishing methods suitable to surrounding conditions.

· **For safety reasons unsuitable extinguishing agents:** Water with full jet

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- **5.2 Special hazards arising from the substance or mixture**
Formation of toxic gases is possible during heating or in case of fire.
In case of fire, the following can be released:
Carbon monoxide
Carbon dioxide
Hydrogen fluoride (HF)
Toxic metal oxide smoke
Phosphorus compounds
- **5.3 Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.
- **Additional information**
Cool endangered receptacles with water spray.
Collect contaminated fire fighting water separately. It must not enter the sewage system.

SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation.
Wear protective clothing.
Avoid formation of dust.
Keep away from ignition sources.
- **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
Pick up mechanically.
Do not flush with water or aqueous cleansing agents
Send for recovery or disposal in suitable receptacles.
Dispose of the material collected according to regulations.
Small amounts (up to 0,5 kg): Use ethanol and a paper towel to remove the mass.
Big amounts (more than 0,5 kg): Use industrial vacuum cleaner with with appropriate filters (e.g. H14) if applicable, otherwise sweep up and shovel the mass into a closed container for disposal.
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**
Prevent formation of dust.
Any unavoidable deposit of dust must be regularly removed.
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
- **Information about fire and explosion protection:**
Dust can combine with air to form an explosive mixture.
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep respiratory protective device available.
- **Handling:** Handle and store under inert gas. Hydrolyses readily. Air and moisture sensitive.

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Version No: 3.00 (replaces version 2.02)

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Trade name: Storm Black

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- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store only in the original receptacle.
Unsuitable material for receptacle: glass
- **Information about storage in one common storage facility:** Store away from oxidising agents.
- **Further information about storage conditions:**
Store in cool, dry conditions in well sealed receptacles.
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with limit values that require monitoring at the workplace:

CAS: 7440-44-0 Activated Carbon

WEL (Great Britain)	Long-term value: 10* 4** mg/m ³ *inhalable dust **respirable
---------------------	--

CAS: 7440-48-4 cobalt

WEL (Great Britain)	Long-term value: 0.1 mg/m ³ as Co; Carc, Sen
---------------------	--

CAS: 7439-96-5 manganese

WEL (Great Britain)	Long-term value: 0.2* 0.05** mg/m ³ as Mn *inhalable fraction **respirable fraction
IOELV (EU)	Long-term value: 0.2* 0.05** mg/m ³ as Mn; *inhalable, **respirable fraction

Nickel compounds, inorganic, water-insoluble

WEL (Great Britain)	Long-term value: 0.5 mg/m ³ as Ni, not Ni(CO) ₄
---------------------	--

- **8.2 Exposure controls**
- **Appropriate engineering controls** No further data; see item 7.
- **Individual protection measures, such as personal protective equipment**
- **General protective and hygienic measures:**
Do not eat, drink, smoke or sniff while working.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Store protective clothing separately.
Do not inhale gases / fumes / aerosols.
Avoid contact with the eyes and skin.
The usual precautionary measures are to be adhered to when handling chemicals.
- **Respiratory protection:**
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

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· **Hand protection**



Protective gloves

Only use chemical-protective gloves with CE-labelling of category III. The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

· **Material of gloves**

Nitrile rubber, NBR

Recommended thickness of the material: ≥ 0.11 mm

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**

≥ 480 min

Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

· **For the permanent contact gloves made of the following materials are suitable:**

Nitrile rubber, NBR

· **As protection from splashes gloves made of the following materials are suitable:**

Nitrile rubber, NBR

· **Eye/face protection**

Face protection

Safety glasses

EN 166

· **Body protection:**

Use protective suit.

The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

· **Environmental exposure controls** No further relevant information available.

SECTION 9: Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**

· **General Information**

· **Physical state**

Solid

· **Form:**

Powder

· **Colour:**

Black

· **Odour:**

Characteristic

· **Odour threshold:**

Not determined.

· **Melting point/freezing point:**

> 290 °C (lit. - CAS 182442-95-1)

· **Boiling point or initial boiling point and boiling range**

Not applicable.

· **Flammability**

Not determined.

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· Lower and upper explosion limit	
· Lower:	Not applicable.
· Upper:	Not applicable.
· Flash point:	Not applicable.
· Ignition temperature:	> 400 °C (CAS 182442-95-1)
· Decomposition temperature:	> 175 °C (CAS 21324-40-3)
· pH	Not applicable.
· Viscosity:	
· Kinematic viscosity	Not applicable.
· Dynamic:	Not applicable.
· Solubility	
· water at 20 °C:	0.143 g/L (CAS 182442-95-1)
· Partition coefficient n-octanol/water (log value)	Not determined.
· Vapour pressure at 32 °C:	20 hPa (CAS 24937-79-9)
· Density and/or relative density	
· Density:	Not determined.
· Relative density	Not determined.
· Vapour density	Not applicable.
· Relative gas density	4.63 (CAS 182442-95-1)
· 9.2 Other information	
· Explosive properties:	Product does not present an explosion hazard.
· Oxidising properties	No
· Evaporation rate	Not applicable.

SECTION 10: Stability and reactivity

- 10.1 Reactivity No further relevant information available.
- 10.2 Chemical stability No decomposition if used and stored according to specifications.
- Thermal decomposition / conditions to be avoided:
No decomposition if used according to specifications.
- 10.3 Possibility of hazardous reactions Attacks materials containing glass and silicate.
- 10.4 Conditions to avoid Exposure to moisture
- 10.5 Incompatible materials: Reacts with strong oxidising agents.
- 10.6 Hazardous decomposition products:
Toxic metal compounds
Phosphorus oxides (e.g. P2O5)
Hydrogen fluoride

SECTION 11: Toxicological information

- 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008
- Acute toxicity
Harmful if swallowed.
Fatal if inhaled.

· LD/LC50 values relevant for classification:	
CAS: 182442-95-1 cobalt lithium manganese nickel oxide	
Oral	LD50 > 2000 mg/kg (Rat) (OECD Guideline 420)

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Safety data sheet
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Trade name: Storm Black		
(Contd. of page 7)		
Dermal	LD50	> 2000 mg/kg (Rat) (OECD Guideline 402)
Inhalative	LC50	0.07 mg/L (Rat) (OECD Guideline 403, inhalation:aerosol) 5 d
CAS: 21324-40-3 Lithium hexafluorophosphate(1-) (LiPF₆)		
Oral	LD50	50 - 300 mg/kg (Rat) (OECD Guideline 423)
<ul style="list-style-type: none"> · Skin corrosion/irritation Causes skin irritation. · Serious eye damage/irritation Causes serious eye damage. · Respiratory or skin sensitisation May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. · Germ cell mutagenicity Based on available data, the classification criteria are not met. · Carcinogenicity May cause cancer. · Reproductive toxicity May damage fertility or the unborn child. · STOT-single exposure Based on available data, the classification criteria are not met. · STOT-repeated exposure Causes damage to the lung, the bone tissue and the teeth through prolonged or repeated exposure. · Aspiration hazard Based on available data, the classification criteria are not met. · Additional toxicological information: Fluoride ion can reduce serum calcium levels possibly causing fatal hypocalcemia. Symptoms may be: burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary, edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Lithium hexafluorophosphate) Large doses of lithium ion have caused dizziness and prostration, and can cause kidney damage if sodium intake is limited. Dehydration, weight loss, dermatological effects, and thyroid disturbances have been reported. Central nervous system effects that include slurred speech, blurred vision, sensory loss, ataxia, and convulsions may occur. Diarrhea, vomiting, and neuromuscular effects such as tremor, clonus, and hyperactive reflexes may occur as a result of repeated exposure to lithium ion. Similar effects to Lithiumcarbonate: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments. Lithium and its compounds are possible teratogens by analogy to lithium ca positive animal teratogenic data. Overexposure may cause reproductive disorder(s) based on tests with laboratory animals. Effects on or via lactation. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Men exposed to manganese dusts showed a decrease in fertility. Chronic manganese poisoning primarily involves the central nervous system. Early symptoms include languor, sleepiness and weakness in the legs. A stolid mask-like appearance of the face, emotional disturbances such as uncontrollable laughter and a spastic gait with tendency to fall in walking are findings in more advanced cases. High incidence of pneumonia has been found in workers exposed to the dust or fume of some manganese compounds. 		
<ul style="list-style-type: none"> · 11.2 Information on other hazards 		
<ul style="list-style-type: none"> · Endocrine disrupting properties 		
None of the ingredients is listed.		

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Safety data sheet
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Printing date: 18.02.2022

Version No: 3.00 (replaces version 2.02)

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SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**

CAS: 182442-95-1 cobalt lithium manganese nickel oxide

LL50 (96h) (static)	> 100 mg/L (Fish) (OECD Guideline 203, Pimephales promelas) nominal
EL50 (static)	> 100 mg/L (Algae) (OECD Guideline 201, Pseudokirchneriella subcapitata) 96 h nominal
EL50 (48h) (static)	> 100 mg/L (Daphnia) (OECD Guideline 202, Daphnia magna) nominal
NOELR (static)	100 mg/L (Algae) (OECD Guideline 201, Pseudokirchneriella subcapitata) 96 h nominal
NOEC (21d)	> 0.1 - ≤ 1 mg/L (Daphnia) (calculation)
NOEC (28d)	> 0.1 - ≤ 1 mg/L (Fish) (calculation)

CAS: 21324-40-3 Lithium hexafluorophosphate(1-) (LiPF₆)

LC50 (96h)	68 mg/L (Fish) (calculation)
EC50 (48h) (static)	0.62 mg/L (Daphnia) (OECD Guideline 202, Daphnia magna) Li
EC50 (3h)	> 1000 mg/L (Bacteria) (OECD Guideline 209, activated sludge) nominal
EC50 (72h) (static)	> 100 mg/L (Algae) (OECD Guideline 201, Pseudokirchneriella subcapitata) nominal
NOEC (static)	22 mg/L (Algae) (OECD Guideline 201, Pseudokirchneriella subcapitata) nominal 4.9 mg/L (Daphnia) (calculation) 3.1 mg/L (Fish) (calculation)

· **12.2 Persistence and degradability** No further relevant information available.

· **12.3 Bioaccumulative potential** No further relevant information available.

· **12.4 Mobility in soil** No further relevant information available.

· **12.5 Results of PBT and vPvB assessment**

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

· **12.6 Endocrine disrupting properties**

The product does not contain substances with endocrine disrupting properties.

· **12.7 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**

· **Recommendation:**

Lincoln Storm Ltd takes back powdered residual quantities and packaging free of charge.
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

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- **Uncleaned packaging**
- **Recommendation:** Handle contaminated packaging in the same way as the substance itself.
- **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

SECTION 14: Transport information

· 14.1 UN number or ID number · ADR/RID/ADN, IMDG, IATA	UN3288
· 14.2 UN proper shipping name · ADR/RID/ADN · IMDG, IATA	3288 TOXIC SOLID, INORGANIC, N.O.S. (cobalt lithium manganese nickel oxide) TOXIC SOLID, INORGANIC, N.O.S. (cobalt lithium manganese nickel oxide)
· 14.3 Transport hazard class(es) · ADR/RID/ADN, IMDG, IATA	 · Class 6.1 Toxic substances. · Label 6.1
· 14.4 Packing group · ADR/RID/ADN, IMDG, IATA	II
· 14.5 Environmental hazards:	Not applicable.
· 14.6 Special precautions for user · Hazard identification number (Kemler code): · EMS Number: · Stowage Category	Warning: Toxic substances. 60 F-A,S-A B
· 14.7 Maritime transport in bulk according to IMO instruments	Not applicable.
· Transport/Additional information:	
· ADR/RID/ADN · Tunnel restriction code	D/E
· UN "Model Regulation":	UN 3288 TOXIC SOLID, INORGANIC, N.O.S. (COBALT LITHIUM MANGANESE NICKEL OXIDE), 6.1, II

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I** None of the ingredients is listed.

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- **Seveso category H2 ACUTE TOXIC**
- **Qualifying quantity (tonnes) for the application of lower-tier requirements 50 t**
- **Qualifying quantity (tonnes) for the application of upper-tier requirements 200 t**

SECTION 16: Other information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Lincoln Storm Ltd shall not be held liable for any damage resulting from handling or from contact with the above product.

· **Relevant phrases**

- H301 Toxic if swallowed.
- H314 Causes severe skin burns and eye damage.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H318 Causes serious eye damage.
- H319 Causes serious eye irritation.
- H330 Fatal if inhaled.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H350 May cause cancer.
- H360 May damage fertility or the unborn child.
- H372 Causes damage to organs through prolonged or repeated exposure.
- H412 Harmful to aquatic life with long lasting effects.

· **Abbreviations and acronyms:**

- REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals
- MARPOL: (from Marine Pollutant) International Convention for the Prevention of Marine Pollution from Ships
- IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
- UN: United Nations (also UNO: United Nations Organization)
- NOEC: No Observed Effect Concentration
- OECD: Organisation for Economic Co-operation and Development
- ASTM: American Society for Testing and Materials
- WAF: Water Accommodated Fraction
- ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
- IMDG: International Maritime Code for Dangerous Goods
- IATA: International Air Transport Association
- GHS: Globally Harmonised System of Classification and Labelling of Chemicals
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- Acute Tox. 3: Acute toxicity – Category 3
- Acute Tox. 4: Acute toxicity – Category 4
- Acute Tox. 2: Acute toxicity – Category 2
- Skin Corr. 1A: Skin corrosion/irritation – Category 1A
- Skin Irrit. 2: Skin corrosion/irritation – Category 2
- Eye Dam. 1: Serious eye damage/eye irritation – Category 1
- Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
- Resp. Sens. 1: Respiratory sensitisation – Category 1
- Skin Sens. 1: Skin sensitisation – Category 1
- Carc. 1A: Carcinogenicity – Category 1A
- Repr. 1B: Reproductive toxicity – Category 1B
- STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

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Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard – Category 3

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· * **Data compared to the previous version altered.**

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Annex 3: closed loop recirculatory system

Company Registration no: 1124062 (England and Wales)
Website: www.parnaby.co.uk
Date: 03.03.23



Scott Mackenzie
Storm Energia,
251 Little Fall Dr.,
Wilmington,
Delaware,
USA, 19808

QUOTATION NO: Q208/20
OUR REF: IP
ENQUIRY REF: E2023/010

Email:
scott@stormenergia.com

DATE: 03rd March 2023.

Dear Scott,

Thank you for your valued enquiry, after looking at your effluent treatment requirements on your application, please find below our proposal for an ultra-fines classification module. The unit is designed to be a 20m³ water storage vessel protected by a vibrating trash screen. This system includes a classifying cyclone with a D50 cut at 30um, this material is removed from the circuit by a dedicated orbital screen, and the remaining water is recirculated into the tank.

DUTY: With the feed rate and flow rates stated below:

Plant feed capacity: <10% solids, upto 20 m³/hr to ensure heat dissipation.

Scope of Supply: Ultra-fines classification module - c/w:
1mm aperture trash protection screen
100um fines recovery orbital screen
30um cut classifying cyclone
20m³ water tank and cyclone feed pump

Plant Voltage: 415V / 3PH / 50 HZ

Reference:

Appendix A - General Arrangement 21058

Author: Ian Parnaby

Quotation No: Q208/20

Enquiry No: E2023/010

Equipment and Services, comprising as follows:-

Re: “Ultra-fines Classification Water Treatment Module”

Section A) - The Ultra-fines Classification Module, comprising:-

- A01. Effluent Transfer pump – 3/2 CAH, CW:
 - .01 5.5kW Drive motor
 - .02 Vee drive
 - .03 Support frame
 - .04 Guard

- A02. HF Dewatering Screen – 3’ x 6’ Screen
 - .01 1 mm Poly panels
 - .02 Vibrating motors
 - .03 Support frame
 - .04 Chutework

- A03. Collection/Classifying Cyclone Feed tank – 20m³. CW:
 - .01 Support Structure
 - .02 Suction pipe
 - .03 Ultrasonic Level sensor
 - .04 Access

- A04. Cyclone Feed Pump – 3/2 CAH, CW:
 - .01 5.5kW Drive motor
 - .02 Vee drive
 - .03 Support frame
 - .04 Guard

- A05. Classifying Cyclone – VV165 Classifying Cyclone
 - .01 Overflow box
 - .02 Collection chute
 - .03 Access
 - .04 Support frame
 - .05 Valves

- A06. HF Orbital Dewatering Screen – 48” Screen
 - .01 100um mech deck
 - .02 Vibrating motors
 - .03 Support frame
 - .04 Chutework

- A07. Clean Water Return Pump – 3/2 CAH, CW:
 - .01 11kW Drive motor
 - .02 Vee drive
 - .03 Support frame
 - .04 Guard

- A08. Pipework
 - .01 Cyclone feed Delivery pipe
 - .02 Cyclone feed Suction pipe
 - .03 Clean Water Return Suction pipe

Company Registration no: 1124062 (England and Wales)
Website: www.parnaby.co.uk
Date: 03.03.23



- A09. Preparation works CW:
 - .01 Drawing office
 - .02 Trial/sub assembly
 - .03 Dismantling/loading to transport

- A10. Electrics CW:
 - .01 Automatic start-up and shutdown sequence
 - .02 Manual override
 - .03 Safety isolation
 - .04 Touch Screen Panel
 - .05 Instrumentation
 - .06 Localised wiring prior to shipment

ALL DESCRIBED ABOVE i.e. A01 – A10.06
SUPPLIED, EX-WORKS :- **£155,943.00 Net**
(One hundred and fifty-five thousand nine hundred and forty-three pounds – Sterling)

TOTAL INSTALLED POWER: 26.4 kW
LEADTIME TO EX. WORKS: 18 weeks to ex-works
WARRANTY: 12 months from manufacture Ex. Works.
TERMS OF PAYMENT: 20% on Deposit (on confirmation of order)
70% on Completion of manufacture (divided into interim payments)
10% on Completed delivery

(DPCI's attached Terms and Conditions will apply to any equipment sale.)

Please Note: We have **not** included for the following:-

1. Civils works.
2. Site Labour or any sort including commissioning.
3. Feed pipework to and from the Water Treatment Module.
4. Cabling works, main incoming electrical supply – 415V/3ph/50HZ.
5. Coupling to town water supply: the water requirement would need to equal up to a maximum of 0.8 m3/hr.
6. Frost protection.
7. Consumables – i.e. anti-foam, anti-bacterial, medium generation (salt, chalk etc).
8. Any other contractual terms – i.e. bank / performance guarantees etc.

We trust the above is adequate for your present requirements, however should you need any further information please do not hesitate to contact us.

Yours sincerely,

DEREK PARNABY CYCLONES INTERNATIONAL LTD.

Ian Parnaby

Ian Parnaby,
Project Manager

Author: Ian Parnaby

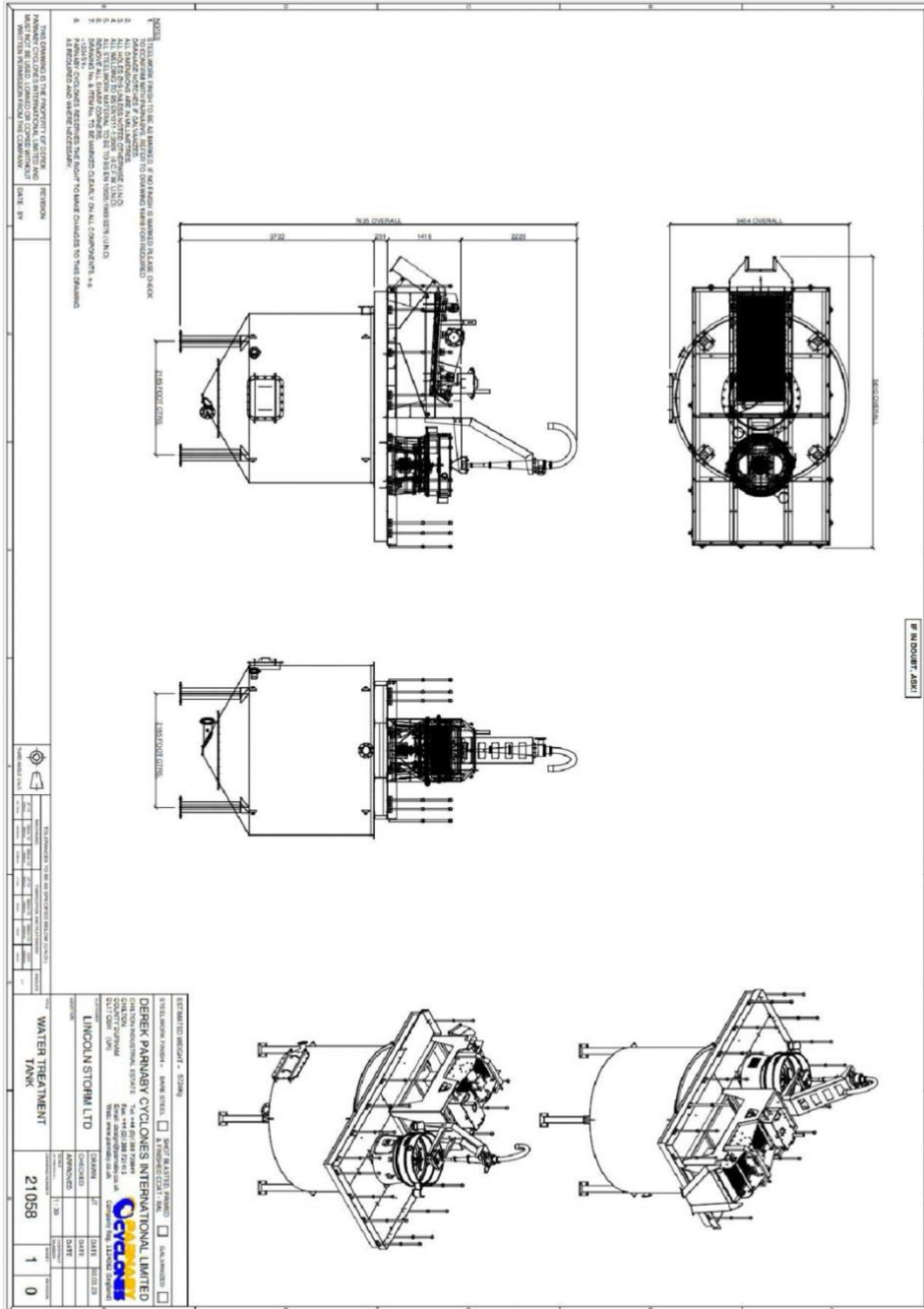
Quotation No: Q208/20

Enquiry No: E2023/010

Company Registration no: 1124062 (England and Wales)
 Website: www.parnaby.co.uk
 Date: 03.03.23



Appendix A



Author: Ian Parnaby

Quotation No: Q208/20

Enquiry No: E2023/010

'PARNABY' CONDITIONS OF SALE

1. The acceptance of our tender includes the acceptance of the following terms and conditions.
2. Unless previously withdrawn, our tender is open for acceptance within the period stated therein or, when no period is so stated, within thirty days only after its date.
3. Acceptance of our tender shall not be binding upon the company until the company has accepted in writing.
4. All specifications, drawings and particulars submitted with our tender are approximate only. After acceptance of our tender a set of certified outline drawings will be supplied free of charge on request.
5. If tests, other than our standard, are required at our works before despatch, these will be charged for. In the event of any delay on your part in attending such tests, after seven days notice that we are ready, the tests will proceed in your absence and shall be deemed to have been made in your presence.
6. We will accept no liability for failure to attain any performance figures quoted by us unless we have specifically guaranteed them in writing, subject to any tolerances specified or agreed to by us, in an agreed sum as liquidated damages with provision for a corresponding bonus. If the performance figures obtained on any test provided for in the contract are outside of the rejection limits specified therein you will be entitled to reject the goods. Before you become entitled to claim liquidated damages, or to reject the goods, we are to be given reasonable time and opportunity to rectify their performance. If you become entitled to reject goods, we will repay to you any sum paid by you to us on account of the contract price thereof and any sum that may have accrued due to you in respect of delay in despatch under clause 7 up to the date of such rejection. You assume responsibility that goods stipulated by you are sufficient and suitable for your purpose, save in so far as your stipulations are in accordance with our advice.
7. The period quoted for delivery and completion will run from the date of our confirmation of your order, subject to the prior receipt by us of all particulars affecting the execution of the order. Unforeseen events which are beyond our reasonable control, such as lack or delays in supplies of raw material and/or deliveries by other manufacturers, labour disputes, epidemics, fire, accidents, whether occurring in our own works or those of our suppliers, and whether occurring before or after the time limit accordingly and exonerate us from any liability in respect of part of such delay. Unless specifically agreed in writing by us at the time of our acknowledgement of your order we will accept no financial or other responsibility for the reason that deliveries from us exceed the period stated in our quotation.
8. We will make good, by repair or at our option, by the supply of a replacement, defects which under proper use appear in the goods within a period of six calendar months after the goods have been delivered and arise solely from faulty design, materials or workmanship. Provided always that defective parts are promptly returned by you free to our works, unless otherwise arranged. The repaired or new parts will be delivered by us free of charge.
9. Terms of payment are as stated in our quotation. Completion of contract is achieved when goods to be supplied not requiring erection by us are actually received by you or when delivered to a suitable carrier or your authorised agent. A contract under which plant and machinery is to be erected by us shall be deemed to have been completed when the same is fit for commercial use not withstanding minor omissions or defects which do not materially affect such use. In the event of non-payment of our account on the due date we reserve the right to charge interest on all or any outstanding sums at the bank rate in force at the time plus one per cent up to and including the date on which final settlement is actually made.
10.
 - a. The contract shall not be modified or cancelled except by mutual agreement in writing.
 - b. Deposit with order is non-returnable in the event of cancellation of the contract except by mutual agreement in writing.
11. Whenever we provide services on site, not withstanding the provisions of clause 8, we will indemnify you against direct damage or injury to your property or person, or that of others, occurring while we are working on the site to the extent caused by the negligence of ourselves, our sub-contractors or agents, but not otherwise, by making good such damage to property or compensating personal injury.

Provided that:-

 - a. Our total liability for damage to your property shall not exceed £10,000.00 or the contract price, whichever sum is the lesser and
 - b. We shall not be liable to you for any loss of profit or of contracts or save as aforesaid, for any loss, damage or injury of any kind whatsoever. Save as provided in clause 8, we shall not be liable for any damage or injury occurring after our completion of work on site.
12. Reservations as to Title— The title of goods shall not pass to the customer until payment has been made of the full contract price, that the risk shall pass upon delivery. In the case of non-payment we shall be entitled to possess or trace the goods or the proceeds of sale in your hands or in the hands of any liquidator or receiver.
13. Legal construction- The contract shall in all respects be construed and operate as an English contract and in conformity with English Law.
14. In the event of the contract requiring services on site the following conditions shall apply-
 - a. Adequate access for mobile crane, of our specification and articulated vehicles, of our specification, must be provided.
 - b. The site to be hardcored, or otherwise suitable, to enable the use of mobile crane, of our specification, during erection and off-loading.
 - c. Adequate storage space to be allotted adjacent to or on site to the satisfaction of our site staff.
 - d. Suitable messing and toilet facilities to be made available, free of charge, for use by our staff and sub-contractors.
 - e. Off-loading and erection to be carried out in one continuous site visit unless otherwise dictated by ourselves.