SEM Energy Ltd
ANSS Greenhead Base, Gremista, Lerwick, Shetland Island

Substantial variation
VN03

PPC/A/1103677

CONTENTS

1 NON TECHNICAL SUMMARY OF DETERMINATION

The installation currently accepts and stores category 2 fish mortality waste on site. This variation is to authorise the site to macerate and ensile this fish waste using formic acid to stabilise the mixture prior to storage and reduce the potential for odour generation and degradation of the category 2 fish mortality.

These are accepted into a reception corral before being transferred via metal detection conveyor where they are further checked by operators for foreign objects/metal. The fish waste is then moved by auger to the indoor hopper prior to macerating and mincing. The processed fish slurry will then be dosed with formic acid until a pH value of <4 is achieved. The pH is tested by the in-house lab and once approved, the batch is stored in a holding tank for 24 hours, minimum, prior to further proposed processing of the ensiled fish slurry.

The operator proposes to further treat this waste on site to separate the solids, oil and water. The solids will be used within biomass or for fertiliser production. the resulting fish oil will be used to make biodiesel. The produced water will be treated via an on-site water treatment facility. A variation application for this part of the process is currently being prepared and will be submitted to SEPA imminently.

Glossary of terms

BAT - Best Available Techniques
CO - Coordinating Officer
ELV - Emission Limit Value

2 EXTERNAL CONSULTATION AND SEPA'S RESPONSE

Is Public Consultation Required -

Advertisements Check:	***Date***	***Compliance with advertising requirements***
Shetland Times	27/10/2021	Yes
Edinburgh Gazette		SEPA error, applicant not advised to advertise in Edinburgh Gazette. Applicant advised of this 16/12/2021.

Officer checking advert: SM

No. of responses received: 1

Summary of responses and how they were taken into account during the determination:
Email from Shetland News looking for a copy of the application 29/10/2021. No further comments made

Summary of responses withheld from the public register on request and how they were taken into account during the determination: N/A

***Is PPC Statutory Consultation* Required –**
Food Standards Agency: No response
Health Board: No response
Local Auth: No response
Scottish Water: No response
Discretionary Consultation – N/A
Enhanced SEPA public consultation - N/A
'*Off-site' Consultation* - N/A
***Transboundary Consultation* - N/A**
Public Participation Consultation - Yes
STATEMENT ON THE PUBLIC PARTICIPATION PROCESS **The Pollution Prevention and Control (Public participation)(Scotland) Regulations 2005 requires that SEPA's draft determination of this application be placed on SEPA's website and public register and be subject to 28 days' public consultation. The dates between which this consultation took place, the number of representations received and SEPA's response to these are outlined below.**

Date SEPA notified applicant of draft determination	21/12/2021
Date draft determination placed on SEPA's Website	21/12/2021
Details of any other 'appropriate means' used to advertise the draft	
Date public consultation on draft permit opened	
Date public consultation on draft permit consultation closed	
Number of representations received to the consultation	
Date final determination placed on the SEPA's Website	

Summary of responses and how they were taken into account during the determination:
Summary of responses withheld from the public register on request and how they were taken into account during the determination:
Officer:

3 ADMINISTRATIVE DETERMINATIONS

Determination of the Schedule 1 activity

The application was made to add section 6.8 Part B a) and c) activities to the existing permit, however once enough information had been submitted to duly make the application (including throughput, sizes of tanks and information on the biodiesel production) process it became clear this was a larger capacity operation than first anticipated:

The chemical treatment of fish oil to create biodiesel, as described in the application, will require to be authorised under section 4.1 Part A (b) of the Pollution Prevention and Control (Scotland) Regulations 2012.

It is likely that due to the scale of operations and capacity of the plant described in the application, the processing of ABP fish waste will require authorisation under section 6.8 Part A (b) of the above regulations. It was mentioned that DEFRA had limited the throughput of the plant and this could potentially class as a legal limitation and will be investigated further.

On discussion with the applicant, it was agreed that determination of the application would continue but focusing on adding the Part B ensiling process to the permit, and the biodiesel and rendering/separation stages would be applied for in separate variation once the information required to show that BAT conclusions and produce the soil and groundwater site/baseline reports was available.

Schedule 1 activity to be added:

Section 6.8 Part B c)

SECTION 6.8 Treatment of animal and vegetable matter and food industries
PART B
(c)The ensiling or storage of dead fish or fish offal in plant capable of retaining volumes—
(iii)of more than 50m^3 of ensiled liquor.

Determination of the stationary technical unit to be permitted:

50m^3 Treatment tank, maceration and formic acid dosing equipment and the tanks associated with the storage of ensiled fish.

Determination of directly associated activities:

Facilities for loading and unloading of fish waste via road or vessel, equipment for the transfer of fish waste around the site, metal detection conveyor for removal of metal contaminants, formic acid dosage system, storage of chemicals and odour abatement.

Determination of 'site boundary'

No change

Officer:

4 INTRODUCTION AND BACKGROUND

4.1 Historical Background to the activity and variation

The site is currently permitted for PPC section 5.3 and 5.4 activities for the processing and storage of hazardous and non-hazardous waste. This has been used for many processes in the past including treatment of offshore drilling muds, and more recently as a generic Part A waste transfer & treatment plant where they treated a variety of wastes including redundant polar cirkel salmon cages – chipping the HDPE for recycling.

This site has recently been transferred from Augean to SEM Energy who plan to use the site for K2 fish mortality storage, ensiling to stabilise the macerated morts, and rendering and separation of the oils and bone meal. The oils will then be chemically treated to create biodiesel and the bonemeal is to be used as a fertiliser, this will require a further variation to ensure that all of the relevant legislative requirements and BAT conclusions will be met. This variation will only cover the Part B fish ensiling activity and the rendering and biodiesel production will be covered by a separate variation.

The operator plan to retain the capability to carry out 5.3 and 5.4 activities and store the currently authorised waste types.

4.2 Description of activity

As described in 4.1 above, the site is authorised for waste management activities, these are being retained for the moment. Currently the site is being used to store K2 fish mortalities under the ABP regulations, this waste type is also listed in the current permit, however ABP waste is excluded by the Waste Framework Directive.

4.3 Outline details of the Variation applied for

The activity will involve the delivery of salmon mortalities which are CAT 2 Animal By Product waste, also known as K2 Fish Mortality. It is proposed that 3500T of this will be received at the installation every year.

The fish waste will be received at the installation and deposited into an intake hopper and directed to a corral or fish bin which is designed to hold 20T. These are taken by metal detection conveyor where they are checked by operators for foreign objects before being moved by auger to the indoor hopper prior to macerating and mincing where they will be dosed with formic acid until the pH reaches below pH4. The pH is tested by the in-house lab and once approved, the batch is stored in a holding tank for 24 hours, minimum, prior to further proposed processing of the ensiled fish slurry.

The separation and biodiesel activities will be part of a separate variation, but once authorised these will follow on from the ensiling step.

4.4 Guidance/directions issued to SEPA by the Scottish Ministers under Reg.60 or 61.

None

4.5 Identification of important and sensitive receptors

The site is based in a relatively industrial area with the energy recovery plant, sewage works and other fishery industry sites nearby, however this is not far from Lerwick town to the south and remote housing on Bressay island to the East. The applicant advises the installation is 0.9km North of the nearest sensitive receptor.

5 KEY ENVIRONMENTAL ISSUES

5.1 Summary of significant environmental impacts

The main impact from the ensiling process is odour, whilst the installation is almost 1km from non-industrial receptors (as mentioned in 4.5 above) there are other businesses nearby and this is a concern. The site is currently accepting and storing fish mortalities with a few odour complaints and this is why it has been agreed that this variation will be issued to authorise the operator to carry out the first step (ensiling) of the planned process will stabilise the material currently stored on site and reduce odour. The operator is currently engaging architects to design a building to cover all of the reception and process area and will be applying for a further variation to add the remaining process steps and full assessment will be carried out then.

5.2 Implications of the Variation on - Point Sources to Air

There are currently no conditions in the permit for monitoring point sources to air, and no requirements in the technical guidance notes for monitoring the point sources to air from the Part B ensiling process. This will be fully reviewed through determination of the variation to include the Part A rendering and biodiesel processes.

5.3 Implications of the Variation on - Point Source Emissions to Surface Water and Sewer

There are no point source emissions to water from fish ensiling process that is being included in the permit through this variation. The permit already includes surface water discharge conditions. A further variation is going to be applied for to cover the rendering and biodiesel processes and will include an assessment of whether the current discharge conditions will meet the Draft Slaughterhouse and ABP BREF.

5.4 Implications of the Variation on - Point Source Emissions to Groundwater

There are no point source emissions to groundwater from the site.

5.5 Implications of the Variation on - Fugitive Emissions to Air

The storage tanks that are being used to store the fish and ensiled fish currently vent to air, all tanks are to be fitted with carbon filters.

5.6 Implications of the Variation on - Fugitive Emissions to Water

There are many storage tanks on site however these are all within bunds which the operator has shown to be of adequate size to meet the permit requirements. The tanks are all fitted with high level alarms and a condition will be inserted into the permit to ensure regular checks of these.

Bund 1 volume 297m^3 and contains 4 x 110m^3 tanks and a 170m^3 tank which totals 610m^3. 25% of the total volume is 152m^3 and 110% of the largest tank is 187m^3 therefore this bund is adequately sized.

Bund 2 volume is 534m^3 and contains 14 x 100m^3 tanks which totals 1400m^3. 25% of the total volume is 350m^3 and 110% of the largest tank is 110m^3 therefore this bund is adequately sized.

The day or treatment tank is located within a building and sleeping policeman will be installed to bund the building. There are existing conditions in the permit surrounding bunding that the operator will be required to comply with.

Conditions surrounding liquid storage and bund size are already included in the permit. Additional conditions have been inserted into the permit to require regular bund checks and repairs if required, and also requiring checks and maintenance on the high level alarms.

5.7 Implications of the Variation on – Odour

The site is currently storing untreated K2 fish waste and has received odour complaints, once it was established that the biodiesel and rendering processes were of such a scale that they would be Part A activities, it was agreed that the best way forward was to include the conditions relevant to the ensiling of fish which should stabilise the slurry and allow for it to be stored and reduce the current odours from the site.

There are already a number of odour conditions in the existing permit, these include the standard "all emissions to air from the Permitted Installation shall be free from offensive odour, as perceived by an Authorised Person, outside the Permitted Installation Boundary". There are also requirements for at least daily assessments of odour around the site boundary, an odour management plan, and a 2 yearly systematic assessment and review of the odour emissions on site. A review of these documents is currently being carried out by the operator, the odour management plan has been sent in support of this application and is covers the odour assessment technique and steps that will be taken to ensure minimisation of odour from each part of the process, and action that can be taken if complaints are received.

All tanks are fitted with individual carbon filters. The site also plan to enclose the whole reception and process area within a building which will have odour abatement and allow greater control of odours.

5.8 Implications of the Variation on – Management

SEM Energy hold ISO 9001 and are working towards ISO14001 showing that a management system is in place. The site manager holds WAMITAB qualifications in managing hazardous waste transfer and physical and chemical treatment of hazardous waste. Whilst this is not directly related to ensiling of fish, it shows an understanding of the requirements of waste handling. All staff will go through a site induction including health and safety procedures.
There are conditions in the existing permit regarding production of a management plan and notifying SEPA of any changes, these conditions will remain. Examples of parts of the management plan have been sent to support the variation application and these appear comprehensive and further improvements have been suggested.

5.9 Implications of the Variation on - Raw Materials

The main raw material used on site will be the K2 fish waste which will be processed and once the remainder of the processes are permitted, should leave the site as non waste materials. K2 fish is an animal by product and therefore is excluded from the scope of the waste framework directive, however it is listed on the existing permit as a waste type that can be accepted on site under the current Part A 5.3 and 5.4 activities.

Formic acid will also be used in the ensiling of the fish waste and this will require to be listed on the permit. It is proposed that this will be stored in IBCs with a hard piped dosage system installed that directly inputs the chemical into the process without double handling.

5.10 Implications of the Variation on - Raw Materials Selection

Formic acid is the standard recommended chemical used in the ensiling process.

5.11 Implications of the Variation on - Waste Minimisation Requirements

There will be very little waste produced during the ensiling process, any fish rejected due to metal contamination will be reprocessed once the contamination is removed. Metal waste will be collected in a skip.

Once all the proposed activities are fully permitted, the operator plans to take K2 fish mortalities and process them producing 2 useable outputs (50% of the total weight):

Fish Oil: The resulting fish oil will be used to make biodiesel which the operator intends to treat and test according to HMRC requirements and sell as biodiesel.

Recovered Solids: The recovered solids will be tested at an accredited laboratory and used as bone meal fertiliser which will be used on farms on the island or for biomass fuel.

Once all proposed activities are permitted, the operator will be taking an ABP waste product and producing two products that can be reused.

5.12 Implications of the Variation on - Water Use

Minimal water will be used in the ensiling process.

5.13 Implications of the Variation on - Waste Handling

As per section 5.11. Minimal waste from the ensiling process. Any materials that do not meet the correct standards will be reprocessed.

5.14 Implications of the Variation on - Waste Recovery or Disposal

As per section 5.11. Minimal waste from the ensiling process

5.15 Implications of the Variation on – Energy

The operator proposes to operate a batch processing system to allow for planning of the next days operations and avoid repeated start and stop of the process. Although no heat is required for the ensiling process which is the focus of this variation, once fully operational, any pipework forming part of the steam heating system will be insulated to retain heat and reduce energy usage. Full assessment of this will be carried out during the next variation involving the rendering and biodiesel processes.

5.16 Implications of the Variation for - Accidents and their Consequences

The main risk of accident comes from spillages or damage to tanks. As noted above, the site have put in a number of measures to reduce the risk of this, these include adequately sized bunds and the formic acid being directly piped from IBCs in a chemical store rather than being moved around the site. There is a spill response procedure in place on site. There are also high level alarms on each of the tanks. All equipment will be subject to a planned maintenance program as and the operator has committed to regular inspections of storage tanks and bunds, and this will also be included in as a permit requirement. The majority of tanks on site are new and fit for use, with only 4 original tanks remaining which have been de-commissioned.

5.17 Implications of the Variation for – Noise

There is potential for noise from the process and the operator has identified that the macerator pump is likely to be the main source of noise from the ensiling process. This area is to be fully enclosed as part of the new building being developed which will reduce the noise from this area. There are existing requirements in the permit to monitor noise and carry out systematic assessments and the operator has been advised that a noise assessment should be submitted as part of the variation application to include the biodiesel and rendering processes as these will bring increased risk of noise.

5.18 Implications of the Variation for – Monitoring

There are no implications for monitoring at this time. There are no direct emissions to air or water from the ensiling process. There are already conditions in the permit regarding monitoring of the water emissions from the site and these will remain. All monitoring will be reviewed as part of the variation to add the rendering and biodiesel processes.

5.19 Implications of the Variation for – Closure

This is included in the site EMS, a draft version has been sent in support of the application. The site was recently transferred and the new operators are in discussion with SEPA contaminated land to carry out soil and groundwater monitoring and produce a site condition report which will be included in the

variation application for the rendering and biodiesel processes. The site decommissioning plan will be updated once this information is available.

5.20 Implications of the Variation for - Site Condition Report (and where relevant the baseline report)

The operator has been made aware that a site condition report and baseline should be carried out and submitted along with the substantial variation to add the two Part A activities to cover the Rendering and Biodiesel processes. The operator has been contacted by SEPA contaminated land staff to discuss this further.

5.21 Implications of the Variation for - Consideration of BAT

The applicant has demonstrated a knowledge of the BAT requirements for fish ensiling in this variation application and has an awareness of the permit requirements.

6 OTHER LEGISLATION CONSIDERED

Nature Conservation (Scotland) Act 2004* & *Conservation (Natural Habitats &c.) Regulations 1994

Is there any possibility that the proposal will have any impact on site designated under the above legislation? No

Justification: The nearest designated area is Easter Rova Head about 1.2km North of the site (https://sitelink.nature.scot/site/592), this is a SSSI for geological interest. It is not likely that these proposals contained within the variation will change the emissions from the original permit application and are very unlikely to impact the SSSI. I note there are cases on the nature scot internet page for the site which mention oil spills. Whilst there is oil being stored on site, this will be well managed and there are procedures in place.

Screening distance(s) used – 2km

Officer:

7 ENVIRONMENTAL IMPACT ASSESSMENT AND COMAH

How has any relevant information obtained or conclusion arrived at pursuant to Articles 5, 6 and 7 of Council Directive 85/337/EEC on the assessment of the effects certain public and private projects on the environment been taken into account? No

How has any information contained within a safety report within the meaning of Regulation 7 (safety report) of the Control of Major Accident Hazards Regulations 1999 been taken into account? N/A

Officer:

8 DETAILS OF PERMIT

Do you propose placing any non standard conditions in the Permit. No

Do you propose making changes to existing text, tables or diagrams within the permit? Yes

Outline of change: Renumbering of 1.1.4 to 1.1.3.2

Details including justification: A numbering error was made during VN02, this has been changed to allow the new activity to be added in the correct part of schedule 1.

Outline of change: Update of schedule 1 to include fish ensiling and storage activity (6.8 Part B (c)) and update of Stationary Technical Unit and Directly Associated Activities to include required equipment

Details including justification:
STU added:

1.1.5.2 A 50m^3 day tank with Landia system for the maceration and ensiling of fish by dosing with Formic Acid.
1.1.5.3 Eighteen ensiled fish storage tanks with a total capacity of 1910m^3.

These are the key pieces of equipment that are required for fish storage and ensiling

DAA added:

1.1.6.2 Facilities for the loading and unloading of ensiled fish to or from the storage tanks via road tanker, contained skip or vessel
1.1.6.3 Various conveyors, augers and hoppers for the transfer of fish waste on site.
1.1.6.4 Metal detection conveyor for removal of metal contaminants
1.1.6.5 Formic Acid dosage system
1.1.6.6 Facilities for the storage of process chemicals
1.1.6.7 Carbon odour abatement filters on all storage tanks

These are the key pieces of equipment that are directly associated with the fish storage and ensiling activity.

Outline of change: Requirement to check bunds, have high level alarms on tanks and inspect and maintain these.

Details including justification:
3.8.5 All bunds, including integral bunds, shall be subject to regular visual inspection which shall be recorded. Where defects are found the bund repairs will be actioned immediately.
3.8.6 All above ground liquid storage tanks containing liquids whose spillage could be harmful to the environment shall be fitted with high level alarms.
3.8.7 All high level alarms shall be subject to regular inspection and testing, which shall be recorded. Where defects are found the high level alarm repairs will be actioned immediately.

There are many tanks on site used for the storage of ensiled fish and the main risk of accident is if these are overfilled, damaged or bunds are damaged in some way. The permit already contains conditions in section 3.8: Storage of Liquids regarding the size and location of bunds, however these conditions will add in additional controls to ensure that warning systems are installed and maintained. These are taken from PPC/A/1121850 Aska, which authorised the manufacture of biodiesel from vegetable oil.

Outline of change: Inclusion of controls on raw material storage

Details including justification:

3.13 Raw Material Storage

3.13.1 The raw materials used in the Permitted Activities as described in Table 3.4, shall only be stored on the Permitted Installation at the location specified in that table using the method specified in that Table and shall not exceed the quantity specified in said table.

Table 3.4: Raw Material Storage

Description of raw material	Location of storage	Method of storage	Maximum quantity	Storage conditions
Formic Acid	Chemical store	Intermediate Bulk Container/ ISO tank	$20m^3$	Bunded Chemical Store
Diesel	Mobile	Bowser	2140 litres	Self bunded bowser

As the main operation carried out on site has changed, there are more chemicals required for the process so it is important that the storage of these are controlled.

9 EMISSION LIMIT VALUES OR EQUIVALENT TECHNICAL PARAMETERS/ MEASURES

Are you are dealing with either a permit application, or a permit variation which would involve a review of existing ELVs or equivalent technical parameters? No

Justification: There are no ELVs within the permit that will be impacted by the addition of the ensiling process. All ELVs will be reviewed as part of the determination of the variation to include the rendering and biodiesel production parts of the process to ensure that they meet the relevant BAT-AELS.

10 PEER REVIEW

Has the determination and draft permit been Peer Reviewed?

Name of Peer Reviewer and comments made: Query regarding tanks included in the bund calculations. Confirmed with applicant that all tanks on site are in adequately sized bunds.

11 FINAL DETERMINATION

Issue of a Permit - Based on the information available at the time

Issue a Permit – Based on the information available at the time of the determination SEPA is satisfied that

- The applicant will be the person who will have control over the operation of the installation/mobile plant,
- The applicant will ensure that the installation/mobile plant is operated so as to comply with the conditions of the Permit,
- That the operator is in a position to use all appropriate preventative measures against pollution, in particular through the application of best available techniques.
- That no significant pollution should be caused.

Officer:

12 REFERENCES AND GUIDANCE

Scottish Environment Protection Agency: Guidance Note On The Ensiling Of Fish And Fish Offal (September 2007)
Process Guidance Note 6/19(13) Statutory Guidance for Fish Meal and Fish Oil Processes and Installations (December 2013)
Reference document on Best Available Techniques in the Slaughterhouses and Animal By-Products Industries (May 2005 and DRAFT June 2021)
IED-TG-02 PPC Technical Guidance Note: Content and Scope of Site Reports (06/12/2013)
Noise - Summary guidance for Pollution Prevention and Control (PPC) applicants
IED-TG-03 Identifying a substantial variation (April 2018)
IED-TG-09 Guidance on PPC Activity capacity/threshold (September 2019)