APPLICATION FOR ENVIRONMENTAL PERMIT UNDER THE ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016 (AS AMENDED)

ENVIRONMENTAL RISK ASSESSMENT

MICROPHARM LIMITED, CNWCAU, CILGERRAN, SA43 2SN

ECL Ref: ECL.066.01.01/ERA
Version: Issue 1
January 2020

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ACRONYMS / TERMS USED IN THIS REPORT

AONB	Area of Outstanding Natural Beauty
CCTV	Closed Circuity Television
EA	Environment Agency
ECL	Environmental Compliance Limited
EMS	Environmental Management System
EP	Environmental Permit
ERA	Environmental Risk Assessment
LNR	Local Nature Reserve
MAGIC	Multi-Agency Geographical Information for the Countryside
MicroPharm	MicroPharm Limited
M	Molar
NGR	National Grid Reference
NNR	National Nature Reserve
NRW	Natural Resources Wales
H&SMS	Health and Safety Management System
OS	Ordnance Survey
PPE	Personal Protective Equipment
PPMR	Planned Preventative Maintenance Regime
Ramsar	The Ramsar Convention on Wetlands of International Importance
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest

1. INTRODUCTION

1.1. Overview

1.1.1. Environmental Compliance Limited ("ECL"), have been appointed by MicroPharm Limited ("MicroPharm") to prepare an Environmental Risk Assessment ("ERA") to form part of the Environmental Permit ("EP") application to be submitted to Natural Resources Wales ("NRW").

1.1.2. An ERA has been undertaken in accordance with the relevant requirements of the current version of the Environment Agency's ("EA") online Horizontal Guidance (as required by NRW) last updated 10th January 2019, in order to:

- identify potential risks that site operations may present to the environment;
- screen out any insignificant risks;
- assess potentially significant risks in detail; and
- decide on the appropriate control measures.

1.1.3. Accordingly, the assessment has addressed the potential risks relating to the operation of the proposed installation, namely:

- amenity and accident risks;
- discharges to air;
- discharges to surface water; and
- discharges to foul sewer.

1.1.4. Note that as the proposed activities do not involve any discharges to ground or groundwater, no assessment has been undertaken.

2. IDENTIFICATION OF RECEPTORS

2.1. Site Settings

2.1.1. The installation is located in Cnwcau, Cilgerran, SA43 2SN and is centred on the Ordinance Survey ("OS") National Grid Reference ("NGR") 220249 242714 and will occupy an area of approximately 1.09 Ha. The Block and Location Plan as Proposed (Drawing No. 37) details the EP boundary outlined in green and is provided in Appendix 1 of this document. Figure 1 shows the indicative location of the proposed installation (red outline) in relation to the surrounding area.

Figure 1: Site Location Map

2.1.2. The installation is on the eastern outskirts of Cilgerran Village which comprises of several residential areas, a school, shops, café, public houses, places of worship and Cilgerran Castle.

2.1.3. The installation is 0.26km NW from the residential area of Llwyncelyn and 1.3km SW of Malgwyn Castle. The installation is also located 1.7km SW of the village of Llechryd and is 4km SE from Cardigan Town.

2.2. Potentially Sensitive Ecological Receptors

2.2.1. A review of the area using the Multi-Agency Geographic Information for the Countryside ("MAGIC") website[1] identified that the proposed Installation is not located within 10km of any Special Protection Areas ("SPA") or Ramsar sites, however it is located within 10km of five Special Areas of Conservation ("SAC").

[1] https://magic.defra.gov.uk/MagicMap.aspx. Accessed Aug 2019

2.2.2. Figure 2 provides a visual representation with the purple hatched areas within the 10km search radius (encircled red) signifying the sites of ecological interest. Details of the ecological receptors, including the NGR together with their distance and heading for the installation boundary are provided in Table 1.

Figure 2: Magic Map of the SPA, Ramsar and SACs identified within 10km of the Installation Boundary

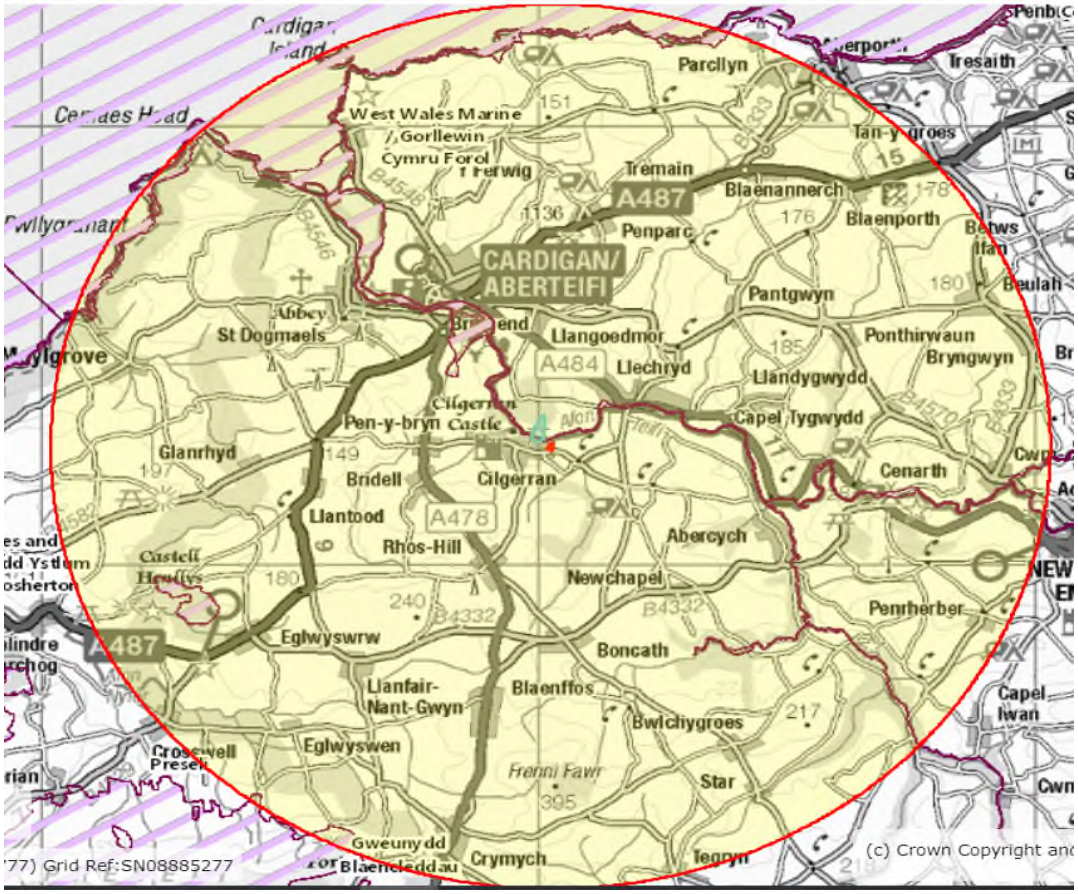


Table 1: Specific Ecological Receptors Considered for the Assessment within 10km of the Installation Boundary

Ref	Location	Type	Easting	Northing	Distance from Source (m)	Heading (degrees)
SA1	West Wales Marine	SAC	216940	251184	7960	323
SA2	North Pembrokeshire Woodlands	SAC	216014	233751	7678	243
SA3	Preseli Mountain	SAC	214406	234752	9687	206
SA4	Cardigan Bay	SAC	218680	251324	7290	323
SA5	River Teifi	SAC	220229	242876	160	355

2.2.3. The installation is located within 2km of one National Nature Reserve ("NNR") and three Sites of Specific Scientific Interest ("SSSI"). No Local Nature Reserves ("LNR") were identified within 2km of Site. Figure 3 provides a visual representation with the blue and green hatched areas within the 2km search radius (encircled) signifying the ecological sites of interest. The NGR of the potential ecological receptors are listed in Table 2, together with their distance and heading from the proposed Installation.

Figure 3: Magic Map of the SSSIs identified within 2km of the Installation Boundary

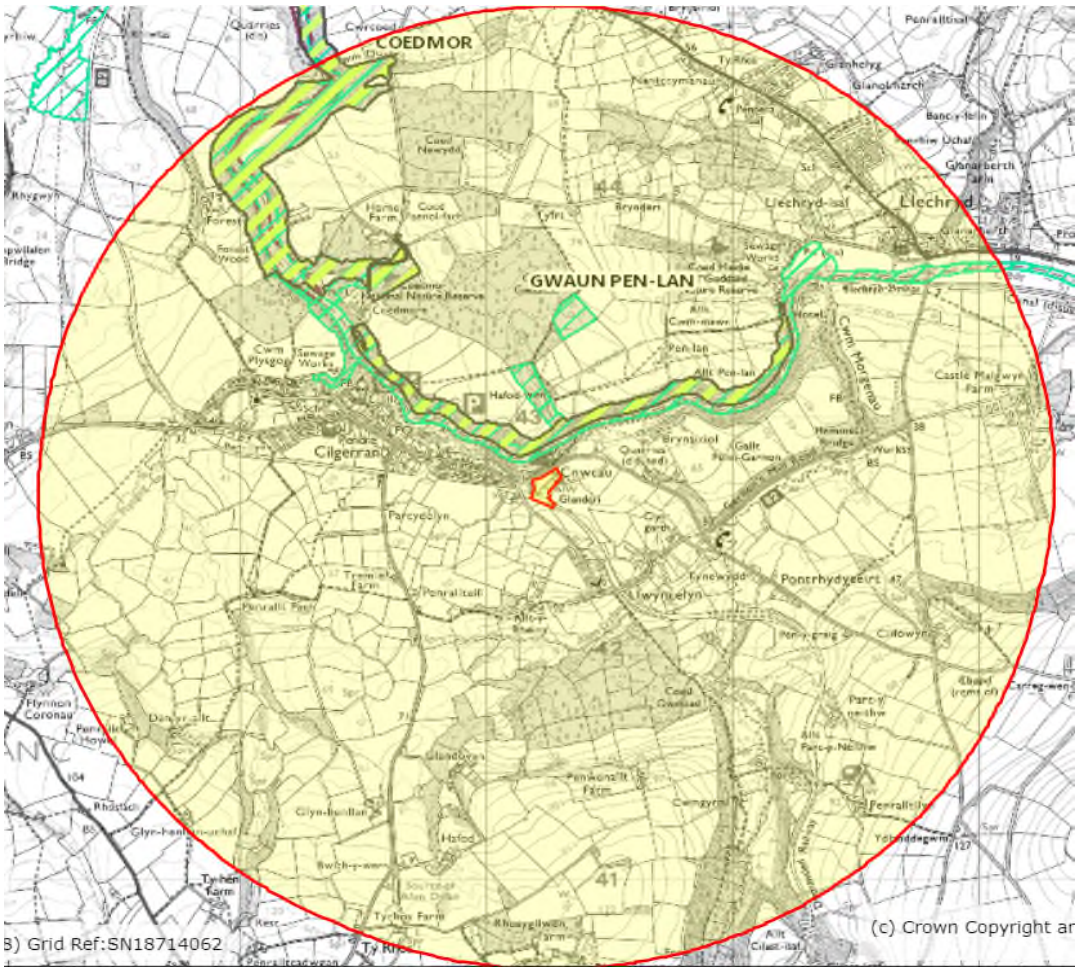


Table 2: Specific Sensitive Receptors Considered for the Assessment within 2km of the Installation Boundary

Ref	Location	Type	Easting	Northing	Distance from Source (m)	Heading (degrees)
NNR1	Coedmor	NNR	220234	242880	171	352
SSSI1	River Teifi	SSSI	220182	242816	130	324
SSSI2	Teifi Estuary Woodlands and Marshes	SSSI	220182	242816	130	324
SSSI3	Gwaun Pen-Lan	SSSI	220311	243341	632	5

2.2.4. In addition to the SACs, SPAs, Ramsars, NNRs, LNRs or SSSIs - other potentially sensitive land uses within 1km of the site were also considered. A review of the area using both the MAGIC site check indicates that none of the following sensitive land uses are located within a 1km radius of the site:

- Areas of Outstanding Natural Beauty ("AONB");
- Groundwater Source Protection Zones;
- Marine Conservation Zones;
- Marine Nature Reserves;
- National Parks; or
- Nitrate Vulnerability Zones.

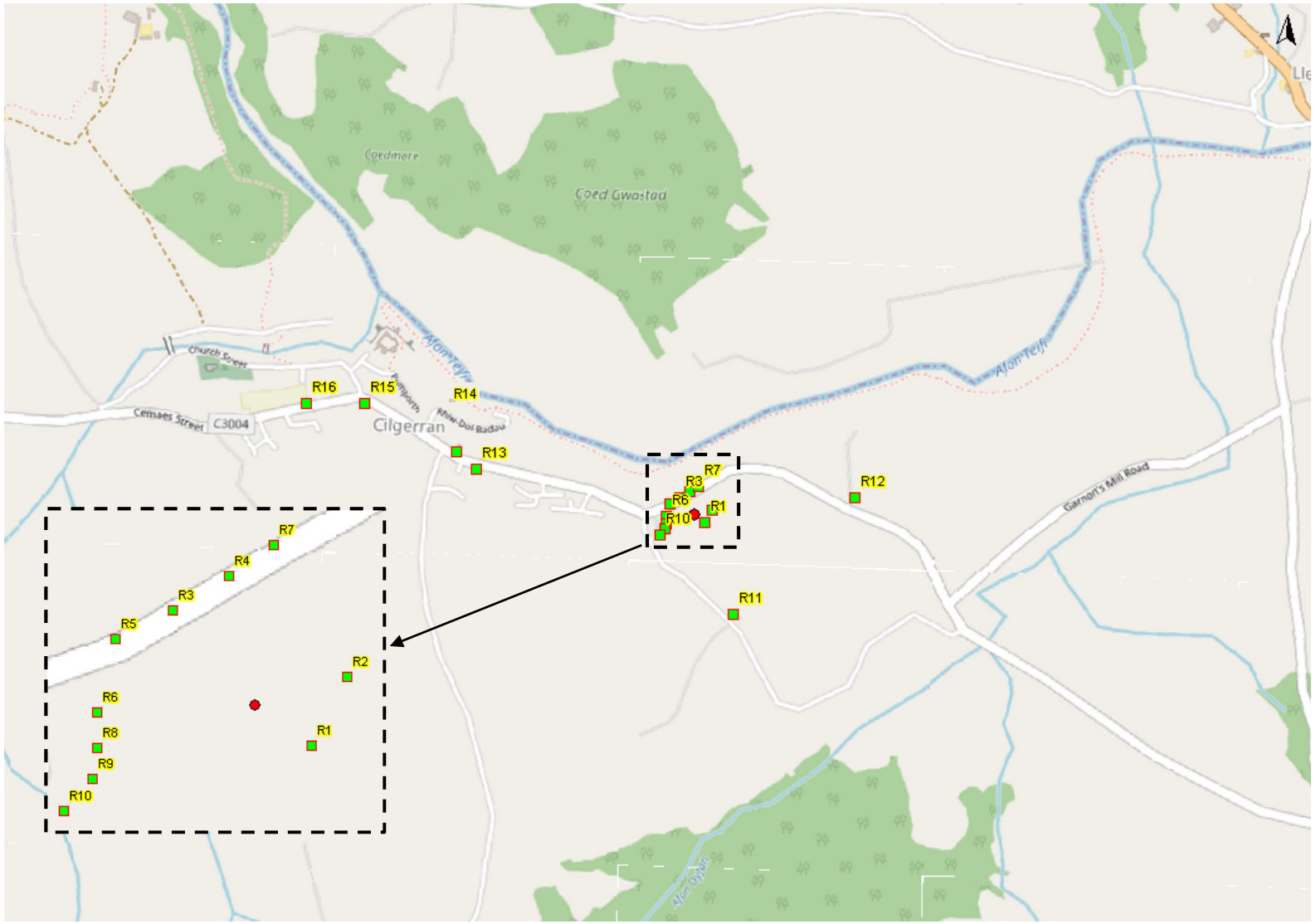
2.3. Potentially Sensitive Human Receptors

2.3.1. Within 2.5km of the site are sixteen potentially sensitive human receptors which have been considered in this study. These comprise residential properties, public houses, a farm, a school and a place of worship. These are listed in Table 3 and shown on Figure 4.

Table 3: Potentially Sensitive Human Receptors Within 1km of the Installation Boundary

Ref	Name	Easting (X)	Northing (Y)	Distance from Site Centre (m)	Heading (degrees)
R1	Property off unnamed road, to the east of the Installation	220284	242693	31	126
R2	Property off unnamed road, to the east of the Installation	220300	242724	43	72
R3	Property to the north of the Installation	220222	242754	57	319
R4	Property to the north of the Installation	220247	242769	59	348
R5	Property to the north of the Installation	220196	242741	70	295
R6	Property off Melin-Y-Coed Road	220188	242708	71	268
R7	Masons Arms	220267	242783	72	6
R8	Property off Melin-Y-Coed Road	220188	242692	73	255
R9	Property off Melin-Y-Coed Road	220186	242678	80	246
R10	Property off Melin-Y-Coed Road	220173	242664	98	241
R11	Property off unnamed road, to the south of the Installation	220354	242466	263	159
R12	EA Davies Dairy Farm	220654	242754	397	84
R13	Pendre Inn	219720	242826	551	282
R14	Penuel Baptist Church	219671	242870	609	285
R15	Cardiff Arms	219444	242988	861	289
R16	Cilgerran Primary School	219300	242989	998	286

Figure 4: Locations of Potentially Sensitive Human Receptors



3. IDENTIFICATION OF THE RISKS

3.1. Amenity Risks

3.1.1. Taking into account the nature of the activities that will be undertaken at the proposed installation, the main amenity risks identified are as follows:

- emissions to air;
- emissions to water; and
- noise emissions.

3.1.2. Point Source Emissions to Air

3.1.2.1. Identification of the Risks

Up to 500 litres of liquid nitrogen will be stored outside the main building in two storage vessels. A container of cells housing a small reservoir of liquid nitrogen and a transfer vessel will be stored internally. There will be one emission point to air, designated as A1, which is associated with this storage and use of liquid nitrogen. The approximate location of A1 is shown on the Block and Location Plan As Proposed (Drawing No.37) contained in Appendix 1 of this ERA.

There will also be two non-process related release points to air; boiler gas exhaust flue and ventilation from staff toilets. The boiler is exclusively used to provide ambient temperature heating for site personnel for welfare purposes. Therefore, the use of the boiler and release point of exhaust gases is not directly linked to the proposed operations and therefore, is not considered a process release/process contribution and as such, has not been considered in this assessment.

Additionally, the release point from the staff restroom is for ventilation purposes only and therefore, has not been considered in this assessment.

3.1.2.2. Assessment of the Risks

A1 is a process related emission point which will only occur in an emergency situation. Nitrogen gas will be released in the unlikely event of a catastrophic failure of the vessel or fittings (e.g. valves, hoses etc.).

In the event of a release of nitrogen gas, a severe reduction in oygen will occur which can cause aphyxiation. As such, the emergency release point has been located externally and away from humans and animals. This risk is a localised health and safety concern rather than an evnrionmental risk and as such, the risk and associated control measures are contained in the Health and Safety Management System ("H&SMS").

Air Products PLC will supply, install, own, service and maintain the liquid nitrogen vessels and associated ancillary equipment. These vessels/containers will be filled and maintained by Air Products PLC approximately every 6-8 weeks. The service and maintenance will be undertaken annually. The Planned Preventive Maintenance Regime ("PPMR") forming part of the site's Quality Management System ("QMS") will outline the

responsibilities, such as the MicroPharm Responsible Person and also detail the Air Products PLC contracts and maintenance schedule. The servicing and maintenance to be undertaken on the system by Air Products PLC will reduce the likelihood of an emergency external release of nitrogen gas.

3.1.2.3. Results of the Assessment

Given the release of nitrogen gas will only occur during an emergency situation, the gas is odourless, non-irritating with no hazardous properties and unreactive nature at ambient temperatures, it can be concluded that the point source emission to air will not present a significant risk

3.1.3. Discharges to Surface Water

3.1.3.1. Identification of Risks

There will be no direct process-related releases i.e. process contributions to surface water from the activities that will be undertaken at the proposed installation.

Storm water run-off from the building and impermeable hardstanding areas, such as car parking areas, will pass directly through to the installation's surface water drainage system into emission points designated W1 and W2, as displayed on the Block and Location Plan contained in Appendix 1.

Potentially contaminated firewater run-off resulting from a fire event at the installation will be discussed as part of the identified accident risks in Section 4 - Table 5 contained in this ERA.

3.1.3.2. Assessment of Risks

Only roof water and clean yard water will be discharged from the installation to the existing surface water drainage system.

Any potential spillages in the exterior areas of the installation, associated with the unloading, storage and use of fuel oil will be contained in the purposefully designed and installed concrete bunded area. Other potentially polluting materials will be delivered and stored in the designated 'Stores Areas'.

Any fuel oil spillage will captured within the bund will be subsequently tankered off site to an appropriately licenced Facility or Installation for disposal or re-use.

Any accidental spillage will be dealt with in accordance with the installation's emergency spillage response procedure which will form an integral part of the installation's QMS and EMS.

The installation will benefit from spill kits placed in strategic locations which contain

absorbent mats, drain covers and booms which will be deployed by suitably trained MicroPharm personnel in case of loss of containment.

Any spillages within the building would not physically be able to enter the surface water drainage network without travelling a considerable distance.

3.1.3.3. Results of the Assessment

Given the risk management measures detailed above, it can be concluded that there will not be a significant risk to surface water resulting from the operation of the installation provided that it is operated and managed in accordance with the proper documented procedures.

3.1.4. Discharges to Foul Sewer

3.1.4.1. Identification of Risks

There will be a direct process-related point source emission to foul sewer, designated as S1, from the activities that will be undertaken at the proposed installation. The proposed location of S1 is illustrated on the Block and Location Plan as Proposed (Drawing No. 37) in Appendix 1 of this ERA.

3.1.4.2. Assessment of Risks

The aqueous material discharged associated with the process will comprise the following:

- pharmaceutical grade water;
- low concentration solutions of salts, such as sodium chloride, sodium phosphate and sodium acetate;
- de-activated pepsin solution at 100 g/L
- sodium hydroxide (up to 2 molar concentration (“M”)) with the potential for further dilution;
- hydrochloric acid (up to 2M) with the potential for further dilution;
- diluted cleaning agent;
- waste from processing animal plasma.

The proposed S1 discharge will also include foul water arising from site facilities, such as toilets and sinks.

The point source emissions to foul sewer will be authorised with stipulated limits under a Trade Effluent Consent granted by Welsh Water. If required, a flow meter will be installed by MicroPharm. If deemed necessary, periodic sampling and analysis will be undertaken to confirm all trade effluent limits are adhered to.

Potentially contaminated firewater run-off resulting from a fire event at the installation will be discussed as part of the identified accident risks in Section 4 - Table 5 contained in this ERA.

3.1.4.3. Results of the Assessment

It can be concluded that there will not be a significant risk to foul water resulting from the operation of the installation provided that it is operated and managed in accordance with the Trade Effluent Consent issued by Welsh Water.

3.2. Accident Risks

3.2.1. The main accident risks have been identified are as follows:

- spillage of potentially polluting substances, such as fuel oil and raw materials;
- fire/explosion;
- major system failure; and
- vandalism

3.2.2. The assessments for accident risks identified above are provided in Tables 5 in Section 4.

4. ASSESSMENT OF RISK

4.1. Methodology

4.1.1. The risk assessments have been undertaken using the following approach for amenity and accident risks:

- identification of hazards associated with the risk that have the potential to cause harm;
- identification of potential receptors i.e. what is at risk (for the purposes of this assessment, typical potential receptors have been identified)?
- pathway i.e. how can the hazard get to the receptor?
- risk management measures employed to reduce the risk to an acceptable level;
- probability of exposure i.e. how likely is this contact?
- consequence i.e. what is the harm that can be caused?; and
- assessment of overall risk.

4.1.2. The assessments for the amenity and accident risks identified above are presented in Tables 4 and 5 respectively.

Table 4: Amenity Risk Assessment

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Noise						
Noise emissions from the condenser and fresh air units.	Human receptors in the surrounding area.	Human receptors are close enough for noise to be potentially audible.	The Environmental Noise Assessment submitted as part of the Planning Application (Report No. 9197, Dated January 2019) has demonstrated that, even with the proposed installation operating twenty-four hours a day in an area with low night time noise levels, noise pollution is not considered to be significant. A copy of the Environmental Noise Assessment is provided in Appendix 2. Operational noise levels will be required to comply with requirements of The Control of Noise at Work Regulations 2005 and a condition of the Planning Permission (Application Number 18/0988/PA) states that noise generated by the condenser and fresh air units will not exceed the background noise level by more than 5 dB (A) at the nearest residential property to the development site at any time when measured (and shall be assessed in accordance with BS4142: 2014). Based on the requirements outlined, routine noise inspections will be undertaken by site personnel during site walkabouts with the findings reported to management. Scheduled maintenance as part of the installation's PPMR will be carried out to the manufacturer's specification to ensure that the equipment is kept at optimal operational condition.	Unlikely. Risk management measures should prevent any significant noise emissions from reaching the identified receptors.	Noise nuisance	Not significant

Table 5: Accident Risk Assessment

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Spillage of Potentially Polluting Substances						
Loss of containment of heavy fuel oil during transfer from bulk tanker, storage and use.	Initially the ground immediately on the external site surface and potentially foul water/surface water via site drainage network	Routes across the external site surface, downward migration or via site drainage system.	There is a 5,000L single skinned oil tank housed at the installation for the purposes of fuelling the central heating system. The approximate location is shown on the Block and Location Plan As Proposed (Drawing Reference No. 37) contained in Appendix 1. The tank is housed within a concrete impermeably lined bund which has the capability of holding 110% of the tank capacity in the event of loss of containment. The integrity of the tank and bund will be regularly checked and maintained in accordance with the site condition checks as part of the EMS and H&SMS. During transfer of the fuel oil, checks are undertaken to ensure all transfer equipment is intact, placed within the bund and sufficient capacity is available within the tank prior to transfer. The filling coupling is located within the bunded area ensuring any small leaks (i.e. due to inadequate seals) would be captured. All other pipework associated with the storage tank are also located within the bunded area. MicroPharm personnel will supervise fuel unloading operations at all times. All site personnel are trained in spill response procedure outlined in the EMS. Spill kits will be well stocked and placed in strategic locations.	Unlikely. Risk Management measures should prevent any significant fuel spillages from reaching the identified receptors	Contamination of ground and/or contamination of controlled water.	Not significant

Table 5: Accident Risk Assessment (Cont.)

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Spillage of Potentially Polluting Substances						
Loss of containment of raw materials during transfer, storage and use.	Initially the ground immediately on the internal or external site surface and potentially foul water/surface water via site drainage network.	Routes across the internal or external site surface, downward migration or via site drainage system.	MicroPharm personnel will supervise all deliveries of raw materials onto site. All raw materials will be stored and used inside the main building which benefits from impermeable concrete hardstanding and in areas isolated from the surface water drainage network. The raw materials will be stored within dedicated, access controlled 'stores' areas until transferred to point of use. The location of the raw material storage areas are shown on the Block and Location Plan As Proposed (Drawing Reference No. 37) contained in Appendix 1. Only trained MicroPharm personnel with appropriate PPE will be authorised to transfer and handle the raw materials. MicroPharm personnel will be trained in the spill response procedure which will form part of the installation's QMS and EMS. Spill kits will be placed in strategic locations surrounding the raw material storage and usage areas and MicroPharm will deploy drain mats to cover foul water drains in the event of loss of containment of raw materials. Absorbent mats/booms will be used to contain any spillage and will be disposed of to an appropriately licenced Facility/installation.	Unlikely. Risk Management measures should prevent any significant loss of containment reaching the identified receptors	Human receptors - physical harm/tissue damage to those that come into contact. Contamination of ground and/or contamination of surface/foul water.	Not significant

Table 5: Accident Risk Assessment (Cont.)

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Explosion						
Explosion if nitrogen vessels affected by fire event.	Human population and ecological receptors in the surrounding area.	Release to air	The nitrogen storage area has been specifically chosen taking into account the explosion risk. The area will have security fencing and lockable entrance to prevent any unauthorised or untrained personnel accessing the liquid nitrogen. All MicroPharm personnel will be suitably trained in the explosion risk and emergency response procedures.	Unlikely. Risk Management should mitigate any potential for a pressure build up to occur.	Explosion	Not significant
Fire						
Fire at the installation.	Human population and ecological receptors in the surrounding area.	Release of gases/vapour to air.	The installation will be operated in accordance with MicroPharm's fire strategy which will form part of the installation's EMS and H&SMS Regular fire risk assessments will also be undertaken to identify and mitigate against potential fire hazards. A fire detection alarm systems is installed, maintained and tested in accordance with Fire and Rescue Service recommendations. PPMR includes the inspection and preventative maintenance on all electrical equipment. Designated smoking areas will be located a significant distance from operational areas and identified fire risks. All MicroPharm personnel will be suitably trained in the fire strategy, preventing fires on site, identify fire risks and emergency response procedures.	Unlikely. Risk Management measures should prevent any unauthorised releases from reaching the identified receptors.	Smoke, localised nuisance.	Not significant if procedures adhered to.

Table 5: Accident Risk Assessment (Cont.)

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Fire						
Release of potentially contaminated firewater.	Local watercourse network.	Overland routes across site and via drainage network.	The impermeable concrete hardstanding present on site will prevent the percolation and downward migration of firewater runoff into the ground and groundwater. In addition, all proposed operations will be housed internally within the main building. If a fire originates within the building, MicroPharm and the Fire and Rescue Service, if safe to do so, will deploy bunds and booms to contain the firewater and prevent any release from the building. The deployment of booms and bunds will enable the captured firewater to be tankered off site to an appropriately licenced installation. All drains will be covered using emergency drain covers to prevent any contaminated firewater from being discharged to the surface/foul water drainage system. If there is a risk of firewater leaving the installation, the sewerage undertaker will be informed and consideration could be given to utilising storage tanks at their offsite location in an emergency.	Unlikely. Risk Management measures should prevent any unauthorised releases from reaching the identified receptors.	Contamination of surface/foul water and associated local watercourse network.	Not significant if procedures adhered to.

Table 5: Accident Risk Assessment (Cont.)

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Major System Failure/Loss of Mains Electrical Power/Loss of Process Control						
Major system failure/loss of process control causing loss of containment.	Initially the ground immediately on the internal site surface and potentially foul water via site drainage network.	Routes across the internal site surface and via site drainage system.	Due to the nature of the operations and the relatively simple separation and purification technologies being proposed, the risk from loss of process control is considered low. All process operations will be undertaken internally within the main building which benefits from impermeable concrete hardstanding and is isolated from the surface water drainage system. Therefore, the risk to surface water is considered insignificant. To prevent loss of containment and a pollution incident via the foul water drainage system which is located internally, the following risk management measures will be implemented at the Installation: Some process stages, such as purification by chromatography, will be automated and semi-automatic. However, a MicroPharm Operator will be present to supervise all operations. Critical stages are monitored for key indicators, such as pH and temperature for prompt identification of any failures. There will also be a system installed to identify and alert MicroPharm Operators of any process problems.	Unlikely. Risk Management measures should prevent any unauthorised releases from reaching the identified receptors.	Contamination of foul water and associated local watercourse network.	Not significant if procedures adhered to.

Table 5: Accident Risk Assessment (Cont.)

Hazard	Receptors	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Major System Failure/Loss of Mains Electrical Power/Loss of Process Control						
Major system failure/loss of process control causing loss of containment.	Initially the ground immediately on the internal site surface and potentially foul water via site drainage network.	Routes across the internal site surface and via site drainage system.	The installation, including the storage areas will be connected to a call-out system for the monitoring of room pressures etc. Additionally, large items of electrical equipment have emergency stop buttons to halt process immediately in case of serious system failure. MicroPharm personnel will be trained in the spill response procedure which will form part of the installation's QMS and EMS. Spill kits will be placed in strategic locations and drain mats will be deployed. Any absorbent mats/booms used to contain spillages will be disposed of to an appropriately licenced Facility/Installation.	Unlikely. Risk Management measures should prevent any unauthorised releases from reaching the identified receptors.	Contamination of foul water and associated local watercourse network.	Not significant if procedures adhered to.
Vandalism						
Vandalism or unauthorised access causing any of the above.	Any of the above	Releases to air, land or water.	The installation is secured by a perimeter fence and a large lockable entrance gate. The installation benefits from an intruder alarm system which is set when the installation is unoccupied. If two or more sensors are triggered, an automatic dial out will be sent to on call MicroPharm nominated personnel. The police will also be contacted.	Unlikely Risk management measures should prevent any unauthorised releases from reaching the identified receptors.	Any of the above.	Not significant.

5. SUMMARY

5.1. Results of the Assessment

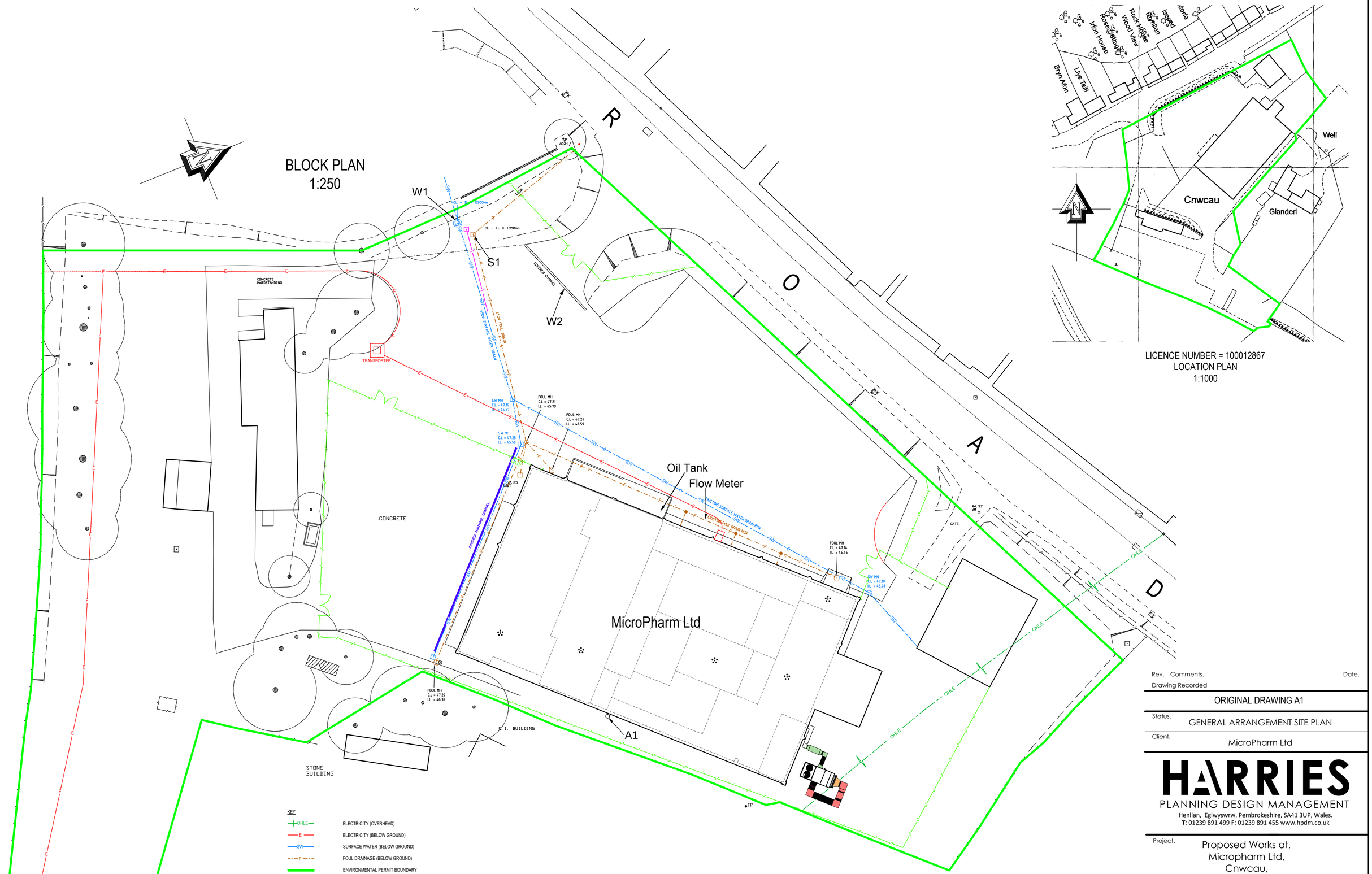
5.1.1. The results of both the Amenity and Accident Risks Assessments (Tables 4 and 5) indicate that none of the risks relating to the operation of the proposed installation will be significant if it is operated and managed in accordance with the EMS, QMS, H&SMS, PPMR and risk management measures.

5.2. Conclusion

5.2.1. The risks from the proposed installation, in terms of accident and amenity risk, can be considered not significant provided that all risk management measures are implemented.

APPENDIX 1
BLOCK AND LOCATION PLAN AS PROPOSED
(DRAWING NO. 37)

BLOCK PLAN
1:250



KEY

OHLE	ELECTRICITY (OVERHEAD)
E	ELECTRICITY (BELOW GROUND)
SW	SURFACE WATER (BELOW GROUND)
F	FOUL DRAINAGE (BELOW GROUND)
	ENVIRONMENTAL PERMIT BOUNDARY
	SECURITY FENCING
T	TELEPHONE (BELOW GROUND)
	DRAINAGE CHANNEL
S1	POINT SOURCE EMISSION TO SEWER
W1 / W2	POINT SOURCE RELEASE TO SURFACE WATER (CLEAN RUNOFF)
	LOCATION OF RAW MATERIALS

LICENCE NUMBER = 100012867
LOCATION PLAN
1:1000

Rev.	Comments.	Date.
	Drawing Recorded	

ORIGINAL DRAWING A1

Status. GENERAL ARRANGEMENT SITE PLAN

Client. MicroPharm Ltd

HARRIES
PLANNING DESIGN MANAGEMENT
Henllan, Eglwyswrw, Pembrokeshire, SA41 3UP, Wales.
T: 01239 891 499 **F:** 01239 891 455 www.hpdm.co.uk

Project.
Proposed Works at,
Micropharm Ltd,
Cnwcau,
Cilgerran,
Pembrokeshire,
SA43 2SN

Drawing Title.
BLOCK & LOCATION PLAN AS PROPOSED

Scale.	Drawn By.	Checked.	Date.
–	AP	WTH	12.06.2019

Job No.	Drawing No.	Rev.
1570	37	-

APPENDIX 2
ENVIRONMENTAL NOISE ASSESSMENT
(REPORT NO. 9197)

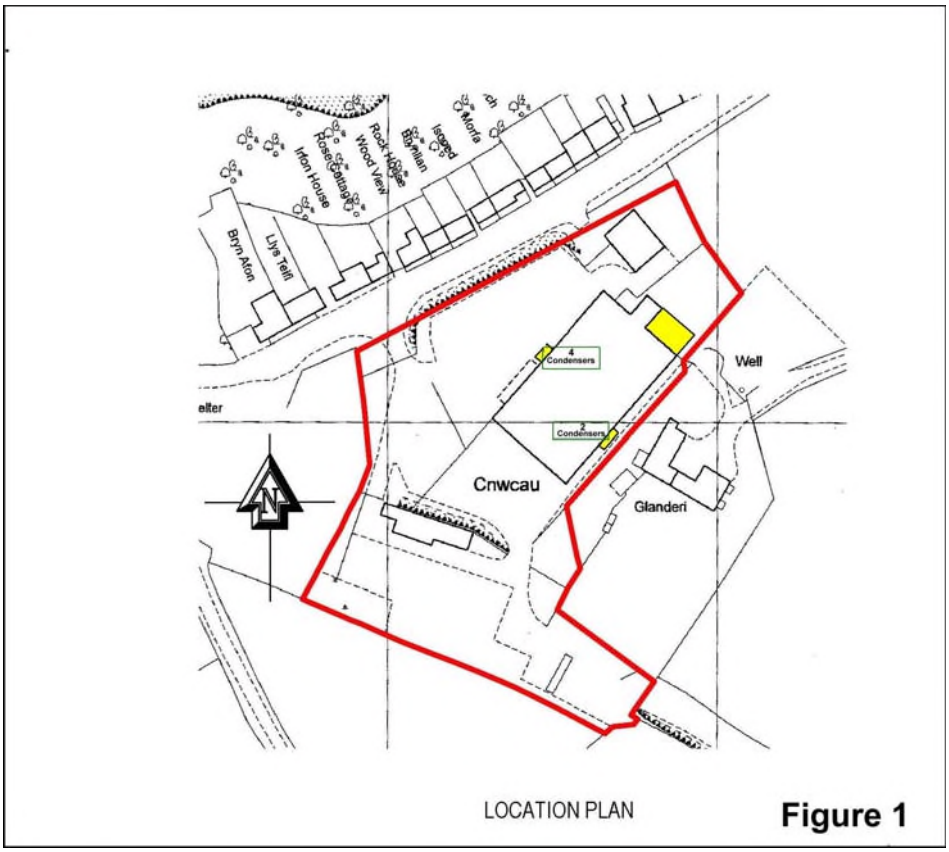
Industrial Noise & Vibration Centre Limited
889 Plymouth Road • Slough • Berkshire • SL1 4LP
Tel : 01753 698800 Fax : 01753 567988
Email : consult@invc.co.uk
Web : www.invc.co.uk

Email to	:	Nick Smith MicroPharm Ltd
Email address	:	nick.smith@micropharm.co.uk
From	:	Steve Ellis
Date	:	24 January 2019
Subject	:	Environmental noise assessment of proposed MicroPharm facility, Cilgerran, Pembrokeshire
Report no	:	9197

Introduction

Nick Smith, on behalf of MicroPharm, requested that the **Industrial Noise & Vibration Centre Limited (INVC)** undertake an environmental noise impact assessment of the proposed facility at Cilgerran, Pembrokeshire. This report details the results of the assessment and makes recommendations on noise attenuation.

Figure 1 shows the site in relation to the local area and particularly, the residential properties.



LOCATION PLAN **Figure 1**

Noise survey

A background (L_{A90}) an ambient (L_{Aeq}) noise survey was undertaken on 17 October 2018 in free field conditions using calibrated instrumentation conforming to the Type 1 specification of BS 61672–1–2003 at the location shown on Figure 2. Table 1 gives the 10 minute values recorded from 3:55 pm on 17 October 2018 through to 8:00 am on 18 October 2018.

report

TABLE 1

Date	Time 10 minute values	L_{Aeq}	L_{A10}	L_{A90}
17 October 2018	15:55	45	48	36
		46	48	36
		45	49	35
		43	47	35
		41	45	33
		47	49	34
change of batteries	17:05	42	47	35
	17:20	43	46	35
		41	45	33
		43	46	33
		40	44	32
		38	42	31
		40	44	31
		44	46	32
		45	48	32
		41	45	32
		40	44	32
	19:50	41	45	30

Table 1 continued

Date	Time 10 minute values	L_{Aeq}	L_{A10}	L_{A90}
17 October 2018	20:00	38	41	31
		39	44	30
		38	42	30
		38	40	29
		36	40	29
		35	38	29
		37	40	28
		30	32	27
		33	35	28
		32	33	28
		35	36	27
		33	34	27
		29	31	27
		33	35	27
		36	40	28
		34	36	26
		37	38	26
		41	41	
		40	41	28
		30	32	26
		33	37	26
		28	29	26
		27	28	26
		31	30	25
		27	28	25
		35	37	25
		26	28	25
		26	28	25
		25	26	25
		30	30	25
	00:00	27	29	25
18 October 2018	00:10	35	28	25
		33	34	25
		27	29	25
		26	28	25
		26	28	25
		25	25	25
		25	25	25
		26	27	25
		31	29	25
		25	26	25
		25	26	25
		25	26	25
		25	26	25
		25	26	25
		25	26	25
		34	37	24
		26	28	24
		26	28	24
		25	25	24
		24	25	24
		25	25	24
	03:40	26	26	24

Table 1 continued

Date	Time 10 minute values	L_{Aeq}	L_{A10}	L_{A90}
18 October 2018	03:50	25	25	25
		31	27	25
		28	30	25
		25	25	25
		37	39	25
		32	34	24
		25	27	24
		30	34	24
		29	32	25
		31	34	27
		33	37	27
		28	31	26
		29	31	26
		31	32	29
		32	34	30
		32	35	28
		36	38	31
		39	42	30
		45	49	33
		41	44	32
		43	43	34
		42	46	35
		40	43	33
		42	46	34
		50	52	37
	08:00	44	46	37

From the noise measurements it can be seen that the background level (L_{A90}) drops to 24 dB(A) with an attendant level of 25 dB L_{Aeq}. For the purposes of this assessment these have been taken as the levels from which to assess the noise impact, given that these are worst case.

The weather conditions were good, dry, no wind and hence can be taken as representative of the very low levels experienced in this rural location.

report

Predicted noise levels

Figures 3 and 4 show the location of the noise sources relative to local residential properties along with the combined noise levels depending on the number of noise sources at each location.

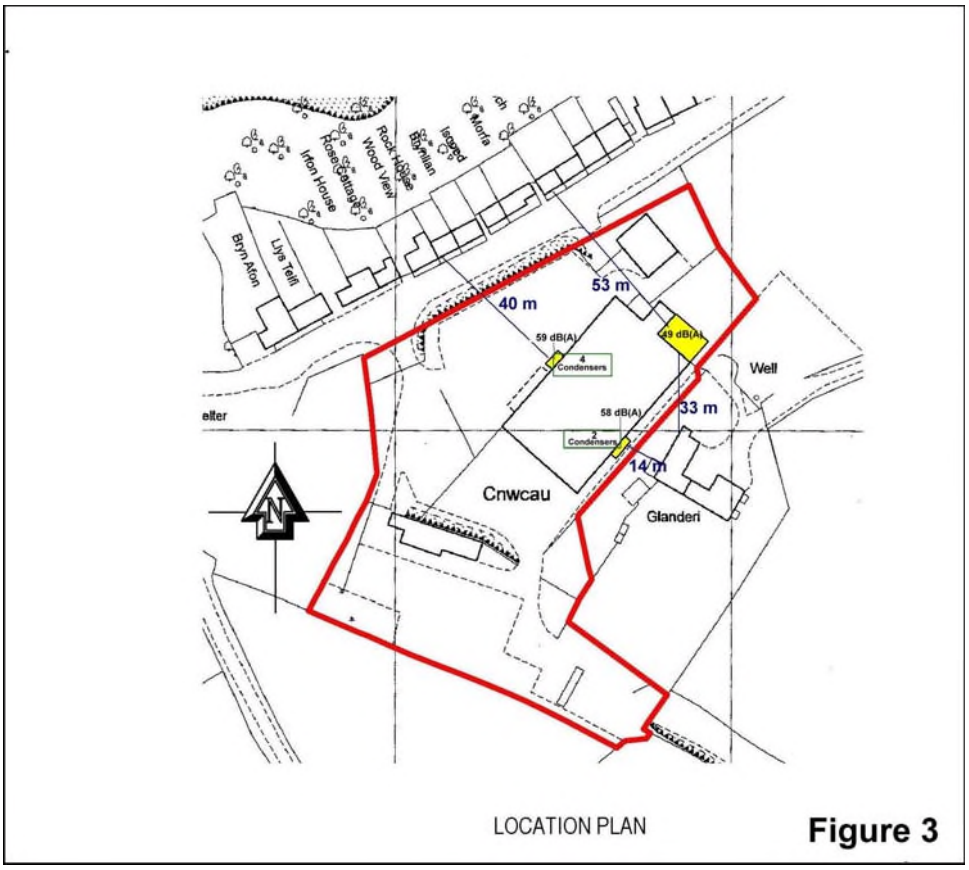


Figure 3

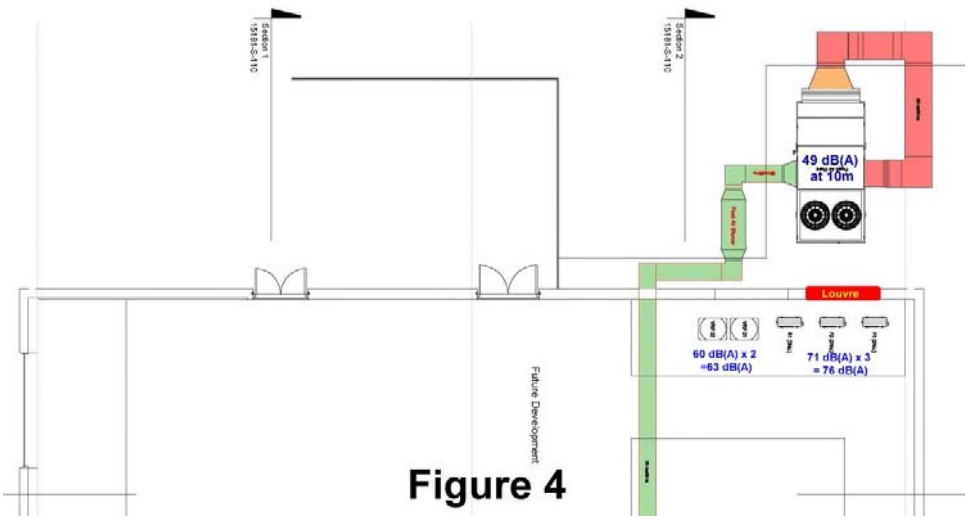


Figure 4

Given the information shown on Figures 3 and 4, the worst case predicted noise levels are as follows assuming that the noise attenuates at a basic rate of 6 dB per doubling of distance (inverse square law). Information on the plant noise levels are given at the end of this report (Appendix A).

report

Figure 5 gives the noise levels with the main building, the location of the louvres and the angle of view the external plant has of Glenderi.

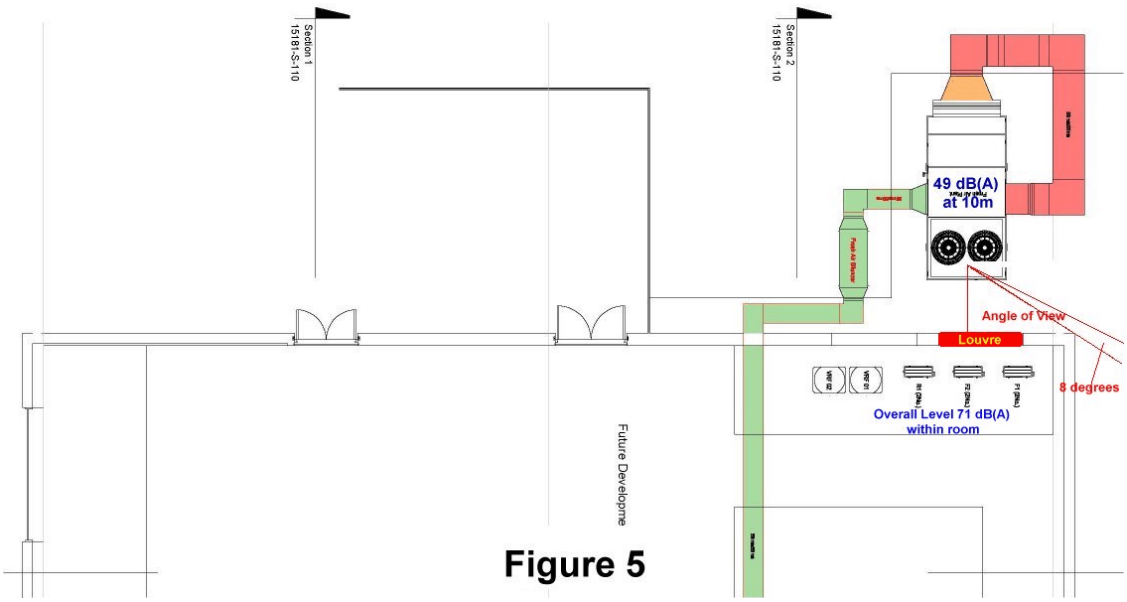


Figure 5

Housing on main road

Assuming the following:

4 condensers	=	59 dB(A) at 1m		distance	=	40m
Plant noise	=	49 dB(A) at 10m		distance	=	53m – 7 dB(A) for partial barrier effect
∴	at housing	59 - 20 log 40		=	27 dB(A)	condensers
		49 - 20 log $\frac{53}{10}$		=	27 dB(A)	plant noise

Internal plant noise included as level is too low

∴ combined noise level = 30 dB L_{Aeq}

Glenderi

Assuming the following:

2 condensers	=	58 dB(A) at 1m		distance	=	14m
Plant noise	=	49 dB(A) at 10m		distance	=	33m
∴	at Glenderi	58 - 20 log 14			=	35 dB(A) condensers
		48 - 20 log $\frac{10}{33}$	- 10 log $\frac{8}{180}$		=	24 dB(A) plant noise

The noise through the louvre from the internal plant needs to be considered. Assuming a sound reduction index of 35 for the main building and 10 dB for the louvre, an average SRI of 23.7 dB(A) has been calculated.

report

Using the following formula it is possible to calculate the noise level from the internal plant at Glenderi.

$$L_2 = L_1 - SRI + 10 \log s - 20 \log r - 14 \text{ dB}$$

where L_1 = internal level
SRI = sound reduction index of composite panel
s = area of panel (ie wall)
r = distance to receiver

$\therefore$ L_2 = 76 - 23.7 + 13.9 - 30.4 - 14

= 21.8, say 22 dB(A) - $10 \log \frac{8}{180}$ for angle of view

= 22 - 13 dB(A) = 9 dB(A)

Therefore the total noise level at Glenderi is:

35 dB(A) (condensers)	+	9 dB(A) (internal plant)	+	24 dB(A) (external plant)	=	35 dB(A)

In addition, it is considered reasonable to adjust the nighttime noise levels from the condensers because they will not need to work as hard. In view of this, the four condensers at the front of the building will be up to 15 dB(A) quieter because the fans will be running at half speed. Given that fan noise is to the $^1/_5$ power, then a reduction of 50% in speed means an attenuation of 16 dB(A).

At the nearest housing on main road:

Condensers = 30 - 16 = 18 dB(A)

The condensers, facing Glenderi, again assuming that they run at 50% during the night = 34 - 15 = 19 dB(A).

Giving consideration to Glenderi, the overall noise level at night has been calculated as follows:

19 dB(A) condenser + 9 + 24 dB(A) from internal plant which includes the correction for a nominal angle of view. Therefore the total level at Glenderi is 25 dB(A). A reduction of up to 5 dB(A) is possible with the plant running at 21% full power, which is more likely at night. This gives a total level at night of:

19 dB(A) (condensers)	+	9 dB(A) (internal plant)	+	20 dB(A) (external plant at 21%)	=	23 dB L_{Aeq}

Discussion of results

Based on the calculations, it can be seen that at the nearest housing on the main road the noise from the plant and condensers is 12 dB L_{Aeq} at night given the assumptions made which are that the condensers run at 50% full power.

A level of 18 dB L_{Aeq} is 6 dB(A) below the low background level.

Similarly, the external noise level for Glenderi would be 23 dB(A), some 2 dB(A) below the background level, assuming the condensers run at 50% at night and the internal plant runs at 21% at night.

Conclusions

Given the assumptions used in this report and the fact that the major items of plant, where possible, have been placed inside the building, residents should not be disturbed by the proposed facility running 24 hours/day even considering the low nighttime noise levels, hence noise should not be a reason for preventing the proposed planning application going ahead.

Please contact the author directly if any further clarification is required on this matter.

Author 

S ELLIS

attch Appendix A

EN196713	eNeRGy ADVANCED ULTRA HIGH EFFICIENCY & COMFORT	ErP COMPLIANT DIRECTIVE 2009/125/EC ECODESIGN — LENNOX — EUROVENT CERTIFIED PERFORMANCE
Micropharm	**1 x E016AH105FM1M**	

DIMENSIONS FOR THE UNIT EXCLUDING ACCESSORIES

Length	Width	Height	Operating weight
4601	**2270**	**2024**	**1850 ***

Non-certified pictures

(*) The weight values are provided as an indication. For helicopter or special crane transportation, plan to check the weight before the job.

ACOUSTIC DATA

Outdoor Part load

Lwa 21%	**75.5**	dB(A)	Lp	44.5	**dB(A)**
Lwa 47%	**76.8**	dB(A)	Lp	45.8	**dB(A)**

Outdoor Spectrum per octave band dB(A) (Full load)									
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 HZ	Lwa	Lp
57.6	**60.9**	**65**	**75**	**74.5**	**72.6**	**68.5**	**64**	**79.7**	**48.7**

Supply Spectrum per octave band dB(A) (Full load)								
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 HZ	Lwa: Sound power dB(A)
19.8	**50.7**	**67.4**	**75.7**	**80.4**	**78.1**	**74.9**	**66.9**	**84**

Return Spectrum per octave band dB(A) (Full load)								
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 HZ	Lwa: Sound power dB(A)
16.8	**44.7**	**58.8**	**66.9**	**68.5**	**69.3**	**67**	**59.8**	**74.4**

Lwa: Sound power dB(A)

Lp: Sound pressure at 10 m dB(A)

Global sound power level measured in compliance with ISO STANDARD 3744

Values are displayed according to norm EN12102

Tolerance to +/- 3 dB(A)

Panasonic

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Air Conditioning Experts

PACi Standard Inverter Three Phase

Product Code: U-100PZ2E8

Notes

- R32
- Good balance, system cost vs energy efficiency
- Top class SEER/SCOP as a Standard Inverter category
- Interchangeable controller with ECOi
- Suitable For Replacement Technology
- Three Phase

MODEL NUMBER		U-100PZ2E8
Nominal Cooling	kW	9.0 (3.0 - 9.7)
Nominal Heating	kW	9.0 (3.0 - 10.5)
Operating Range - Cooling (Outdoor Air)		-10°C to 43°C
Operating Range - Heating (Outdoor Air)		-15°C to 24°C
Height	mm	996
Width	mm	980
Depth	mm	370
Weight	mm	90
Airflow Rate	l/s	1267 - 1167
Sound Pressure Level	dB(A)	52 - 52
Pipe Connection Size - Gas	in	5/8"
Pipe Connection Size - Liquid	in	3/8"
Maximum Pipe Run	m	5 - 50
Maximum Height Difference	m	30
Refrigerant		R32
Precharged For	m	30
Factory Charge	kg	2.6
GWP (Tonnes CO2 Equivalent)		1.76
Additional Charge	g/m	45
Suitable For Replacement Technology		Yes
Power Supply	V- Ph - Hz	230 - 1 - 50
Interconnecting Cables		2 core
Suggested Fuse Size	A	TBC

* exact cooling and heating capacities will depend on connected indoor unit(s)

x3 front
x 2 back

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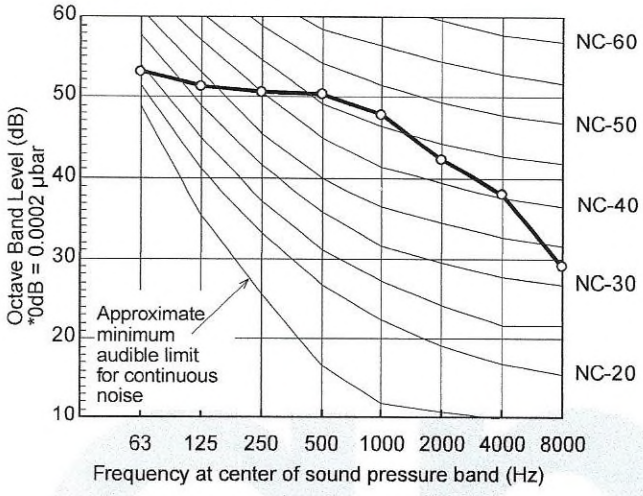
AMP Air Conditioning, Blenheim House, Blenheim Court, Brownfields, Welwyn Garden City, Hertfordshire AL7 1AD

1-6. Noise Criterion Curves

(B) Outdoor Units

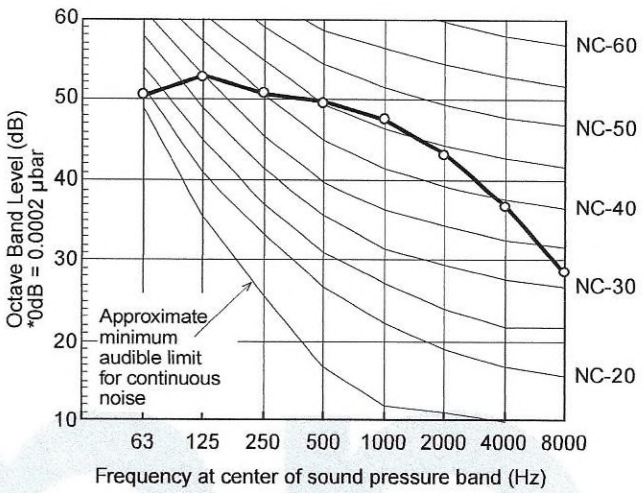
MODEL	: U-100PZ2R5, U-100PZ2R8
SOUND LEVEL	: Cooling 52 dB(A)
CONDITION	: 1 m in front at height of 1.5 m
SOURCE	:230-240V, 1 phase, 50Hz 400-415V, 3 phase, 50Hz

Cooling



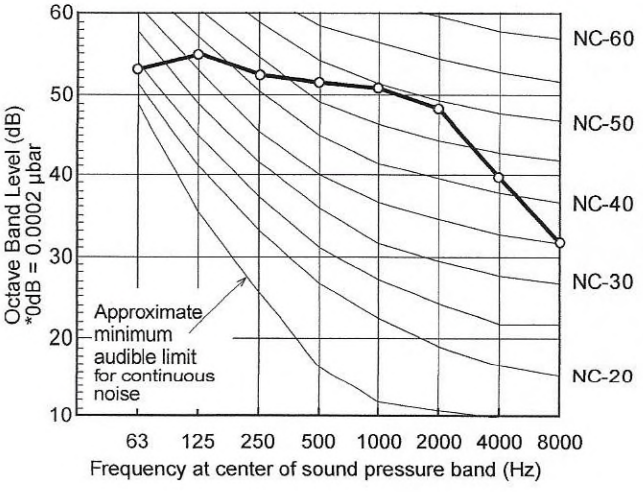
MODEL	: U-100PZ2R5, U-100PZ2R8
SOUND LEVEL	: Heating 52 dB(A)
CONDITION	: 1 m in front at height of 1.5 m
SOURCE	: 230-240V, 1 phase, 50Hz 400-415V, 3 phase, 50Hz

Heating



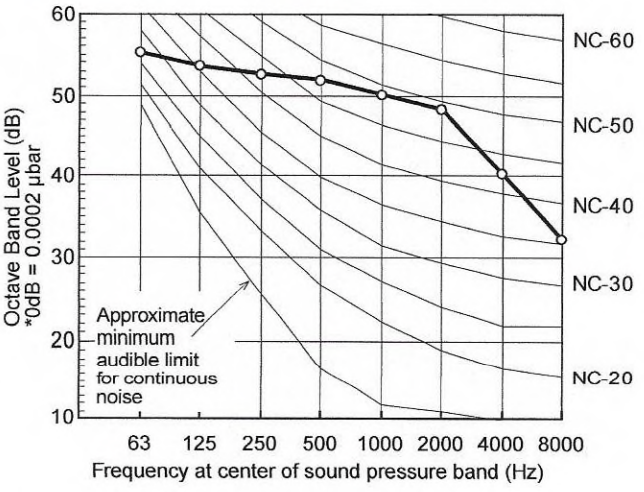
MODEL	: U-125PZ2R5, U-125PZ2R8
SOUND LEVEL	: Cooling 55 dB(A)
CONDITION	: 1 m in front at height of 1.5 m
SOURCE	: 230-240V, 1 phase, 50Hz 400-415V, 3 phase, 50Hz

Cooling



MODEL	: U-125PZ2R5, U-125PZ2R8
SOUND LEVEL	: Heating 55 dB(A)
CONDITION	: 1 m in front at height of 1.5 m
SOURCE	: 230-240V, 1 phase, 50Hz 400-415V, 3 phase, 50Hz

Heating



Panasonic

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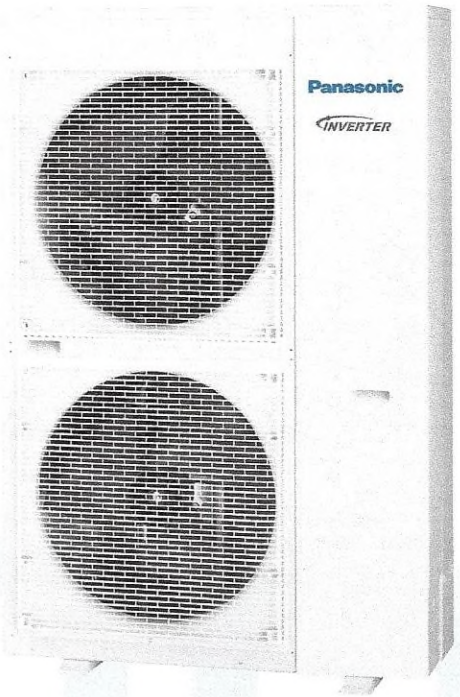
Air Conditioning Experts

PACi Elite Inverter Three Phase

Product Code: U-140PE1E8A

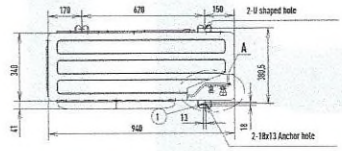


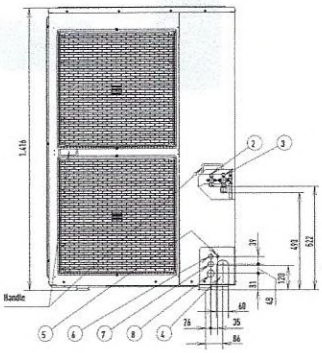
Notes

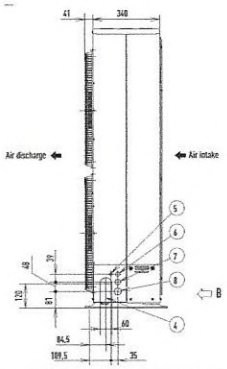
- Meeting all necessary safety approvals to ensure quality and safety
- Top-class SEER: & SCOP
- Cooling operation is possible when outdoor temperature as high as 46°C
- DC inverter technology combined with R410A for excellent efficiency
- Cooling operation is possible when outdoor temperature as low as -15°C
- Heating operation is possible when outdoor temperature as low as -20°C
- Compact outdoor units
- Auto restart from outdoor unit

MODEL NUMBER		U-140PE1E8A
Nominal Cooling	kW	14.0
Nominal Heating	kW	16.0
Operating Range - Cooling (Outdoor Air)		-15°C to 46°C
Operating Range - Heating (Outdoor Air)		-20°C to 24°C
Height	mm	1416
Width	mm	940
Depth	mm	340
Weight	kg	98
Airflow Rate	l/s	2250 - 2000 (Cool - Heat)
Sound Pressure Level	dB(A)	54 - 55 (Cool - Heat)
Pipe Connection Size - Gas	in	5/8"
Pipe Connection Size - Liquid	in	3/8"
Maximum Pipe Run	m	5 min - 75 max
Maximum Height Difference	m	30
Refrigerant		R410A
Precharged For	m	30
Factory Charge	kg	3.40
GWP (Tonnes CO2 Equivalent)		7.099
Additional Charge	g/m	50
Suitable For Replacement Technology		Yes
Power Supply	V- Ph - Hz	400 - 3 - 50
Interconnecting Cables		2 core
Suggested Fuse Size	A	16

* exact cooling and heating capacities will depend on connected indoor unit(s)







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