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Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

II-VI Compound Semiconductors Limited

Millennium Way Aycliffe Business Park Newton Aycliffe County Durham DL5 6JW

Variation application number

EPR/PP3231YU/V005

Permit number

EPR/PP3231YU

II-VI Compound Semiconductors Limited Permit number EPR/PP3231YU

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 authorise the use of Indium Phosphide (InP) in the manufacturing processes and to incorporate additional air emission points A11-A17. The site was permitted in 2005 to allow the manufacture of high value low volume semiconductor wafer devices using Gallium Arsenide (GaAs). With superior traits for fabricating optical and laser devices, the introduction of InP based substrates at the facility will expand the types and quantities of devices produced. Manufacturing techniques, tooling and chemicals used in the structuring of InP based substrates as well as associated waste streams and environmental risks remain similar to those associated with GaAs substrates.

InP and GaAs substrate wafers are supplied to the facility as single cut units. Various substrate fabrication, sizing and cleaning processes are then carried out using various engineering and chemical techniques within carefully controlled clean rooms and chambers. Techniques used include: Metal Organic Chemical Vapour Deposition (MOCVD) and Molecular Beam Epitaxy (MBE) for surface layering the substrates; photolithography for structuring electron mobility patterns; photo resist stripping for removing excess photo sensitive layering; Chemical Vapour Deposition and Dielectric / Facet coating for depositing dielectric substances onto wafer surfaces; Metal coating using electron beam evaporation, spluttering and electroplating; dry etching using speciated gases and wet etching using chemical and water solutions for targeted material removal. Back end processes include wafer grinding and cutting; and, wafer rinsing, cleaning and oven drying.

Rinsed solutions contaminated with chemicals and metals drained from the various processes are segregated within individual drainage systems for off-site recovery or disposal by specialist contractors. Contaminated water from the first washings flow to a tank system known as the 02WRT, where it is neutralised and analysed before being discharged to sewer under a discharge consent. Less contaminated water from the final washings flow to the ETP before controlled discharge to the River Skerne, in line with permit discharge limits. Monitoring systems are in place for both sewer and surface water discharges to ensure contaminant limits are not breached. Liquids containing captured particles from the grinding process pass through a filtration system which filters out the heavier particles. The liquid containing the remaining finer particles are then directed to the 01WRT tank to be tankered off-site for treatment and disposal.

Air emissions from the manufacturing processes will pass through designated abatement systems for treatment prior to release to atmosphere from air emission points A4 – A10. The inclusion of emission points A11 –A17 are seen as future proofing with emission sources, contaminants and pollution abatement methods similar to those associated with A4 – A10. Air emission points A1-A3 serve the three 7MW boilers and emit combustion fumes to atmosphere via a common stack. Under normal operating conditions natural gas is used as the fuel, with diesel oil as a back-up.

The facility comprises two buildings, the larger being the fabrication building containing the production areas, the smaller containing utility equipment including boilers, chiller, de-ionised water plant and Effluent Treatment Plant (ETP). Chemical storage is organised within both buildings while the yard area, which benefits from impermeable surfacing, encompasses air emission stacks various effluent containment tanks and a gas farm. The site is outside the screening distances for European designated Habitat sites or Sites of Special Scientific Interest. It is within 2km of five local wildlife sites and one protected species relating to the River Skerne. The site operates an Environmental Management System certified to ISO14001.

The schedules specify the changes made to the original permit.

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			
Application EPR/BX3490IQ/A001	Duly made 13/01/05				
Permit issued EPR/BX3490IQ	29/06/05	Original permit issued to Filtronic Compound Semiconductors Limited.			
Admin variation issued EPR/BX3490IQ/V002	23/06/09	Variation to reflect name change to RFMD (UK) Limited			
Transfer application EPR/BP3437ND/T001 (full transfer of permit EPR/BX3490IQ)	Duly made 28/08/13	Application to transfer the permit in full to Compound Photonics UK Limited			
Transfer issued EPR/BP3437ND/T001	04/09/13	Full transfer of permit complete.			
Partial Surrender Application EPR/BP3437ND/S002	Duly made 21/12/15	Application to surrender part of the installation land that has never been used for operations.			
Partial Surrender issued EPR/BP3437ND/S002	24/02/16	Partial surrender consolidated permit issued.			
Application EPR/PP3231YU/T001 (full transfer of permit EPR/BP3437ND)	Duly made 03/07/17	Application to transfer the permit in full to Kaiam Laser Limited.			
Transfer determined EPR/PP3231YU	12/07/17	Full transfer of permit complete.			
Notified of change of Company Name	13/12/17	Company name changed to II-VI Compound Semiconductors Limited			
Variation issued EPR/PP3231YU/V002	14/12/17	Varied permit issued to II-VI Compound Semiconductors Limited			
Variation application EPR/PP3231YU/V003 received	13/02/19	Application withdrawn by operator 27/08/19			
Notified of change of Registered office address	10/01/20	Registered office address changed to 25 Canada Square, Level 37, London, E14 5LQ			
Variation issued EPR/PP3231YU/V004	23/01/20	Varied permit issued to II-VI Compound Semiconductors Limited			
Variation application EPR/PP3231YU/V005	Duly made 29/10/20	Application for the inclusion of Indium Phosphide in the manufacturing process and seven			
(variation and consolidation)		additional air emission points			
Response to Schedule 5 dated 03/12/20	03/02/21	Waste water and waste gas capture, treatment and disposal routes.			
Response to Schedule 5 dated 03/12/20	08/02/21	Hazard Operational Study (consideration for InP).			
Variation issued EPR/PP3231YU/V005 (Billing Ref CP3805SL)	21/05/21	Varied permit issued to II-VI Compound Semiconductors Limited			

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/PP3231YU

Issued to

II-VI Compound Semiconductors Limited ("the operator")

whose registered office is

25 Canada Square Level 37 London E14 5LQ

company registration number 10505662

to operate a regulated facility at

II-VI Compound Semiconductors Millennium Way Aycliffe Business Park Newton Aycliffe County Durham DL5 6JW

to the extent set out in the schedules.

The notice shall take effect from 21/05/2021

Name	Date
Philip Lamb	21/05/2021

Authorised on behalf of the Environment Agency

Schedule 1

The following conditions were varied as a result of the application made by the operator:

Table S1.1 Activities referenced in condition 2.1.1 Addition of Section 4.2A(1)(c)(v) activity Update superseded Section 4.2A(1)(d) reference to Section 4.2 A(c)(iv)

Table S1.2 Operating Techniques referenced in condition 2.3.1 Addition of application EPR/PP3231YU/V005 references

Table S1.3 Improvement programme requirements referenced in condition 2.4.1 Addition of Improvement Conditions 6-10

Table S3.1 Point source emissions to air – emission limits and monitoring requirements referenced in condition 3.1.1

Addition of emission points A11-A17 and changes to location references and conditional monitoring

Table S3.2 Point Source emissions to water (other than sewer)— emission limits and monitoring requirements referenced in condition 3.1.1

Addition of conditional monitoring and changes to location references

Table S3.3 Point source emissions to sewer referenced in condition 3.1.1 Addition of monitoring for Indium

Table S4.1 Reporting of monitoring data referenced in condition 4.2.3 Addition of reporting of Indium monitoring

Schedule 5 Notification Form referenced in condition 4.3.2 Addition of permit number and operator name

Schedule 7 site plan referenced in condition 2.2.1

Updated site plan

Schedule 2 - consolidated permit

Consolidated permit issued as a separate document.

The Environmental Permitting (England and Wales) Regulations 2010

Permit number

EPR/PP3231YU

This is the consolidated permit referred to in the variation notice for application EPR/PP3231YU/V005 authorising,

II-VI Compound Semiconductors Limited ("the operator"),

whose registered office is

25 Canada Square Level 37 London E14 5LQ

company registration number 10505662

to operate an installation at

II-VI Compound Semiconductors Millennium Way Aycliffe Business Park Newton Aycliffe County Durham DL5 6JW

to the extent set out in the schedules.

Name	Date
Philip Lamb	21/05/2021

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
 - (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Energy efficiency

- 1.2.1 The operator shall:
 - (a) take appropriate measures to ensure that energy is used efficiently in the activities;
 - (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
 - (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

- 1.3.1 The operator shall:
 - (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities:
 - (b) maintain records of raw materials and water used in the activities;
 - (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and
 - (d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

- 1.4.1 The operator shall take appropriate measures to ensure that:
 - (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
 - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
 - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

- 2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- 2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.
- 2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
 - (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and,
 - (e) the waste code of the waste.
- 2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Total annual emissions from the emission point(s) set out in schedule 3 tables S3.1, S3.2 and S3.3 of a substance listed in schedule 3 table S3.4 shall not exceed the relevant limit in table S3.4.
- 3.1.4 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
 - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.
- 3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Odour

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.
- 3.3.2 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
 - (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

- (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
- (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

- 3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
 - (a) point source emissions specified in tables S3.1, S3.2 and S3.3;
 - (b) process monitoring specified in table S3.5;
- 3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.
- 3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2 and S3.3 unless otherwise agreed in writing by the Environment Agency.
- 3.5.5 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;
 - (b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

- 4.1.1 All records required to be made by this permit shall:
 - (a) be legible;
 - (b) be made as soon as reasonably practicable;
 - (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and,
 - (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and,
 - (ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.
- 4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:
 - (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
 - (b) the annual production /treatment data set out in schedule 4 table S4.2; and,
 - (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.
- 4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:
 - (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
 - (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and,
 - (c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.3 Notifications

- 4.3.1 In the event:
 - (a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately:—
 - (i) inform the Environment Agency,
 - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
 - (iii) take the measures necessary to prevent further possible incidents or accidents;
 - (b) of a breach of any permit condition the operator must immediately—
 - (i) inform the Environment Agency, and
 - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
 - (c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

- 4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.
- 4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.
- 4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address(es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.
- 4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:
 - (a) the Environment Agency shall be notified at least 14 days before making the change; and
 - (b) the notification shall contain a description of the proposed change in operation.
- 4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.
- 4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:
 - (a) a decision by the Secretary of State not to re-certify the agreement;
 - (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
 - (c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

- 4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.
- 4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 Activities				
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity		
Section 4.2 A(1)(c)(iv)	Any manufacturing activity involving the production of electronic components using gallium arsenide. The activity may result in the release into air and water of these elements or their compounds.	Between the receipt of raw materials to despatch of finished product.		
Section 4.2A(1)(c)(v)	Any manufacturing activity involving the production of electronic components using indium phosphide. The activity may result in the release into air and water of these elements or their compounds.	Between the receipt of raw materials to despatch of finished product.		
Section 5.4 A(1)(a) (ii)	Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving physico-chemical treatment. Effluent Treatment plant (ETP) designed to remove hydrogen peroxide from the effluent streams using sodium metabisulphite, neutralisation of any hydrochloric acid with caustic soda and cooling to less than 20 degree C.	From liquid collection to effluent discharge to sewer or River Skerne		
Directly Associated Acti	vity			
Scrubbers	Dry and wet air abatement equipment	Between the ducting of process gases to the scrubbing system to release of abated gases to atmosphere.		
Fuel, chemical and gas storage	Storage of process materials			
Combustion plant.	To include 3 x 7 MW gas boilers with heavy oil back-up.	Boiler house		
Waste storage and handling.	Storage of process wastes including effluents.			

Table S1.2 Operating techniques				
Description	Date Received			
Application BX3490IQ (EPR/BX3490IQ/A001)	Sections 4 to 7 in the main Application given in pages 20 to 60	13/01/05		
Application EPR/PP3231YU/V005	Documents as referenced in application forms Part C2 and Part C3	16/03.20		
Additional information	Gas Systems Overview, InP materials process flow, Two way valve,	29/10/20		

Table S1.2 Operating techniques						
Description Parts Date Received						
Schedule 5 responses	Process flow waste gases and process flows waste waters and waste gas capture, treatment and disposal.	03/02/21				
Schedule 5 responses	Hazard Operational Study (consideration for InP).	08/02/21				

Reference	Requirement	Date
1	The operator shall perform a quantitative mass balance for all process input substances at the Permitted Installation, to determine the nature of pollutants and routes of release to the environment. The Operator should have regard to The Environmental Code of Practice for the Microelectronics Industry (UKMEAC Environmental CoP), dated 16 January 2001. A written report shall be provided to the Agency detailing the mass balance and summarising the findings of the investigation. The report shall also include any indication of improvements to reduce the releases, together with a timetable for implementation. The report shall be agreed in writing by the Agency.	Complete
2	The Operator shall use the information delivered in item 1 above to assess the environmental impact of the emissions to air, using the Agency's H1 Guidance or equivalent. The environmental impact shall also include and assessment of the releases to air from the boiler exhausts, A1 to A3 as defined in Table 2.2.1 of the permit. The results of the environmental impact assessment shall be provided to the Agency in writing. The Agency will use the results to assess any necessary monitoring requirements at points A4, A5, A6 and A8 as defined in Table 2.2.1 of the permit.	Complete
3	The Operator shall investigate the options for reducing water usage at the Permitted Installation. The investigation shall include the use of reject water in other process systems. A summary report of the investigation shall be sent to the Agency identifying the process areas where improvements can be achieved and time-scales for the implementation of the identified options. The report shall be agreed in writing by the Agency.	Complete
4	The Operator shall investigate the options for the substitution of hazardous raw materials for less hazardous alternatives. A summary report of the investigation shall be sent to the Agency with justification where substitution is not feasible. This report should cover in particular the use of mercury-free or "low mercury" sodium hydroxide and include the time-scales for the implementation of identified substitutions. The report provided shall be agreed in writing by the Agency.	Complete
5	The Operator shall develop a written accident management plan having regard to the requirements set out in Section 2.8 of the Agency Guidance Note for the Inorganic Chemicals Sector (IPPC S4.03) and shall submit the plan in writing to the Agency.	Complete
6	The operator shall submit to the Environment Agency for agreement in writing a monitoring programme for testing emissions to air from air emission points A4–A17, under normal mass production conditions. The	31/10/2021

Reference	Requirement	Date
	programme must include a proposed suite of gaseous determinants, including VOC speciation where practicable, with justification for any exclusion from the suite of determinants which can be associated with all on-site processes following the introduction of Indium Phosphide. Methods of monitoring must be in line with Environment Agency online guidance 'Air emissions risk assessment for your environmental permit', taking into account the requirements of Environment Agency Technical Guidance Notes 'Sampling requirements for stack emission monitoring' (M1); and, 'Monitoring stack emissions: techniques and standards for periodic monitoring'.	
7	The operator shall conduct stack emission monitoring in line with the agreed monitoring programme as detailed in IC6. A report on the monitoring and impacts from the emissions are to be submitted to the Environment Agency for approval, and must include: • an assessment of the impact from the emissions using the Environment	Within 4 month of IC6 completion
	 Agency's H1 tool; detailed air dispersion modelling if the concentrations are shown to be significant at the second stage of screening on the H1 tool; any proposed emission limits and monitoring frequency for inclusion in table S3.1 of the permit; and, proposed methods of abatement on all air emission points and vent flows, and timescales of implementation of new and upgraded systems. 	
	The report shall be used to assess the requirement for setting any additional monitoring and improvements if applicable to ensure emissions are below the benchmark values listed in Annex 1 of the Environment Agency's guidance note for the Inorganic Chemicals Sector (EPR4.03).	
8	The operator shall carry out screening tests on discharges to sewer and surface water for potential discharges of hazardous chemicals and elements. Specific substances to be screened should be inclusive of indium and phosphide and hazardous chemicals and elements used in the site's processes as well as parameters such as COD and TOC. The screening tests shall follow the 'three stages to screening' detailed in Environment Agency guidance entitled: 'Surface water pollution risk assessment for your environmental permit guidance', published 01 February 2016, last updated 23 June 2020, found at Gov.UK.	28/02/2022
	Sampling of discharges shall be in line with Environment Agency guidance: 'Monitoring discharges to water: guidance on selecting a monitoring approach', published 11 June 2020, found at Gov.UK; and, assessment of the collected data shall be carried out using the Environment Agency's H1 software tool, obtainable along with the user guide via contacting the Environment Agency. As a minimum 12 samples of the surface water discharge and 12 samples of the sewer discharge. The samples should be evenly distributed and representative.	
	Once the screening assessment is completed a written report shall be submitted to the Environment Agency for approval in writing. The report should include detail of the methods used, results and conclusions. The report shall also consider the need for setting discharge limits, monitoring and reporting requirements and / or improvements to the effluent treatment (if applicable). Any discharge limits and / or monitoring deemed necessary following submission of the report will be inserted into the	

Table S1.3 I	Table S1.3 Improvement programme requirements				
Reference	Requirement	Date			
	permit. If screening tests results show a risk to the environment then the operator will carry out detailed modelling of potential impacts.				
9	The operator is to submit a report together with timelines for the adoption of one or a combination of techniques for sludge reduction destined for off-site treatment or disposal.	31/12/2021			
10	 The operator shall submit a Solvent Management Plan which identifies: all potential sources of fugitive and diffuse emissions to air and water; procedures for monitoring and eliminating or minimising sources, including during the purification of products stages; options for substituting hazardous solvents, in particular N-methyl pyrrolidone, with less harmful alternatives, or where that is not feasible, reducing use; and future options for reducing the on-site use of organic solvents. The Plan should include time-scales for the implementation of identified improvements. 	28/02/2022			

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels			
Raw materials and fuel description Specification			
-	-		

Schedule 3 – Emissions and monitoring

Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 601 [Identified as A1 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Boiler Exhaust	No parameters set	-			
A2 602 [Identified as A2 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Boiler Exhaust	No parameters set		-	-	-
A3 603 [Identified as A3 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Boiler Exhaust	No parameters set	-	-	-	-
A4 SC902 [Identified as A4 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: MOCVD Scrubber	To be agreed upon completion of IC7				
A5 SC906 [Identified as A5 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: Ammonia Scrubber	To be agreed upon completion of IC7				
A6 SC908 [Identified as A6 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: Acid Scrubber	To be agreed upon completion of IC7				
A7 EX909 [Identified as A7 on Point Source Emissions to Air Plan, drawing no.	Clean Room Operations: Solvent Exhaust	To be agreed upon completion of IC7				

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
ECL.079.01.01/03 dated12/03/20]						
A8 EX910 [Identified as A8 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: Hot Exhaust	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7
A9 EF913 [Identified as A9 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: Hot Exhaust	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7
A10 EF904 [Identified as A10 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: CVD Scrubber	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7
A11 899 [Identified as A11 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7
A12 900 [Identified as A12 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7	To be agreed upon completion of IC67	To be agreed upon completion of IC7	To be agreed upon completion of IC67	To be agreed upon completion of IC7
A13 901 [Identified as A13 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7
A14 903 [Identified as A14 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7	To be agreed upon completion of IC7

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A15 907 [Identified as A15 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7				
A16 911 [Identified as A16 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7				
A17 912 [Identified as A17 on Point Source Emissions to Air Plan, drawing no. ECL.079.01.01/03 dated12/03/20]	Clean Room Operations: To be confirmed	To be agreed upon completion of IC7				

Table S3.2 Point Source emissions to water (other than sewer)– emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 [Identified on Drainage Arrangements Plan, drawing no. ECL.079.01.01/0 4 dated	Trade test pit fed from Effluent Treatment Plant and De- ionisation plant	Flow volume of the 'combined discharge' during regeneration of the DI plant ¹	5300m ³ / day	Monthly maximum, minimum, average and total flow.	Continuous	MCerts Flow meter on discharge to River Skerne.
12/03/2020		Flow volume of the discharge from the ETP when DI plant is not regenerating	4300m ³ / day	Monthly maximum, minimum, average and total flow.	Continuous	MCerts Flow meter on discharge to River Skerne.
		Biochemical Oxygen Demand	10 mg/l	Spot	Monthly (Note 2)	BS EN 1889-1
		Suspended Solids	25 mg/l	Spot	Monthly (Note 2)	BS EN 872:1996;

Table S3.2 Point Source emissions to water (other than sewer)— emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
						BS 6068- 2.54:1996
		pH	6 to 8	Monthly maximum, minimum and average pH	Continuous	pH probe
		Temperature	<20 degC	Monthly maximum, minimum and average temperature	Continuous	Temperatur e probe
		Ammonia (as Nitrogen)	No limit	Daily composite sample (note 3)	Monthly	BS EN ISO 11732:1997
		Fluoride	No limit	Daily composite sample (note 3)	Monthly	Fluoride ion selective electrode (FIA). Blue book.: Fluoride in waters, effluents, sludges, plants and soils 1982 HMSO
		Arsenic	No limit	Daily composite sample (note 3)	Monthly	BS EN 26595:1993 BS6068 - 2.1:1983 ISO 6595:1985
		Total Mercury	5 μg/l	Spot	Annual	Compliance based on mass balance calculation
		Additional parameters to be agreed upon completion of IC8	To be agreed upon completion of IC8	To be agreed upon completion of IC8	To be agreed upon completion of IC8	To be agreed upon completion of IC8
W2 [Identified on Drainage Arrangements Plan, drawing no. ECL.079.01.01/0	Site interceptors and west road sump fed by un- contaminated surface water	Appearance	No visible signs of installation oils and chemicals including	Spot	Weekly	Visual inspection

Table S3.2 Point Source emissions to water (other than sewer)– emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
4 dated 12/03/2020]			waste products			

- Note 1: The instantaneous rate of flow of the 'combined discharge' shall not exceed 670m³/hour.
- Note 2: The monthly spot sample should be collected during the appropriate operating condition, when the DI plant is not regenerating.

Note 3: A daily composite sample shall be made up from at least four spot samples taken during appropriate conditions on an operational day, when the DI plant is not regenerating.

Table S3.3 Point source emissions to sewer							
Emission point ref. & location	Source	Parameter	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method	
S1 [Identified on Drainage Arrangements Plan, drawing no. ECL.079.01.01/04	- 02WRT Waste Tanks Discharge point -Cooling	Total Mercury	5 μg/l	Spot	Annual	Compliance based on mass balance calculation	
dated 12/03/2020]	Discharge Point -Out of	Discharge Point	Effluent discharge flow m³/day	No limit	Monthly total flow.	Continuous	MCerts Flow meter on discharge to sewer.
	Tank Discharge Point	Indium	No limit	Spot	Annual	BS EN ISO 17294	

Table S3.4 Annual limits			
Substance	Medium	Limit (including unit)	
Total Mercury	Water	25 g (Note 4)	
Total Mercury	Sewer	25 g (Note 4)	

Note 4: Based on Mass balance Calculation, definition in Section 6 Interpretation of the permit.

Table S3.5 Process monitoring requirements					
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications	
A4, A5, A6 and A8	Air emission abatement efficiency	Continuous	Differential pressure measurements as monitored on the DCS	Average differential pressure to be recorded weekly for each scrubber and reported as agreed	

Table S3.5 Process monitoring requirements					
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications	
				by the Environment Agency	

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data					
Parameter	Emission or monitoring point/reference	Reporting period	Period begins		
Mercury emissions to water (µg/l and g/year)	W1	Annually	01/01/05		
Emissions to water Parameters other than mercury as detailed in Table S3.2	W1	Every 3 months	01/01/05		
Mercury emissions to sewer (µg/l and g/year)	S1	Annually	01/01/05		
Effluent Discharge Flow to sewer	S1	Every 3 months	01/01/05		
Indium emissions to sewer (µg/l and g/year)	S1	Annually	01/01/21		

Table S4.2: Annual production/treatment		
Parameter	Units	
Production of Components	kg/year	

Table S4.3 Performance parameters					
Parameter	Frequency of assessment	Units			
Air emission abatement efficiency for emission points A4, A5, A6 and A8	Weekly	Differential pressure measurements as monitored on the DCS			
Specific Water consumption	Annually	Litres/kg product			
Water usage	Annually	m ³			
Energy usage	Annually	MWh			
Waste disposal and/or recovery	Annually	Tonnes			

Table S4.4 Reporting forms				
Media/parameter Reporting format Date of form				
Water (excluding sewer)	Form W1 or other form as agreed in writing by the Environment Agency	June 2005		
Sewer	Form S1 or other form as agreed in writing by the Environment Agency	08/03/2021		
Energy	Form E1 or other form as agreed in writing by the Environment Agency	June 2005		

Table S4.4 Reporting forms			
Media/parameter	Reporting format	Date of form	
Waste Return	Form R1 or other form as agreed in writing by the Environment Agency	June 2005	
Water usage	Form WU1 or other form as agreed in writing by the Environment Agency	June 2005	
Performance indicators	Form PI1 or other form as agreed in writing by the Environment Agency	June 2005	

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	EPR/PP3231YU	
Name of operator	II-VI Compound Semiconductors Limited	
Location of Facility	Millennium Way, Newton Aycliffe	
Time and date of the detection		

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution					
To be notified within 24 hours of detection					
Date and time of the event					
Reference or description of the location of the event					
Description of where any release into the environment took place					
Substances(s) potentially released					
Best estimate of the quantity or rate of release of substances					
Measures taken, or intended to be taken, to stop any emission					
Description of the failure or accident.					

(b) Notification requirements for the breach of a limit					
To be notified within 24 hours of detection unless otherwise specified below					
Emission point reference/ source					
Parameter(s)					
Limit					
Measured value and uncertainty					
Date and time of monitoring					

(b) Notification requirements for t					
To be notified within 24 hours of detection unless otherwise specified below					
Measures taken, or intended to be taken, to stop the emission					
Time periods for notification follo	wing detection of	of a breach of a limit			
Parameter			Notification period		
(c) Notification requirements for t	he breach of per	mit conditions not relate	d to limits		
To be notified within 24 hours of det	ection				
Condition breached					
Date, time and duration of breach					
Details of the permit breach i.e. what happened including impacts observed.					
Measures taken, or intended to be taken, to restore permit compliance.					
(d) Notification requirements for t	he detection of a	any significant adverse e	nvironmental effect		
To be notified within 24 hours of	detection				
Description of where the effect on the environment was detected					
Substances(s) detected					
Concentrations of substances detected					
Date of monitoring/sampling					
Part B – to be submit		n as practicable	,		
Any more accurate information on the matters for notification under Part A.					
Measures taken, or intended to be taken, to prevent a recurrence of the incident					

Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	
Name*	
Post	
Signature	
Date	

^{*} authorised to sign on behalf of the operator

Schedule 6 - Interpretation

"accident" means an accident that may result in pollution.

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"authorised officer" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"background concentration" means such concentration of that substance as is present in:

- water supplied to the site; or
- where more than 50% of the water used at the site is directly abstracted from ground or surface water on site, the abstracted water; or
- for emissions to surface water, the surface water quality up-gradient of the site; or
- for emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.

"day" means, for sampling purposes, a 24 hour period

"disposal" means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"Hazardous property" has the meaning in Annex III of the Waste Framework Directive.

"Hazardous waste" has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 (as amended).

"Industrial Emissions Directive" means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"monitoring" includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

"Permitted Installation" means the activities and the limits to those activities described in Table S1.1 of this Permit.

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"recovery" means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"sewer" means sewer within the meaning of Section 219(1) of the Water Industry Act 1991.

"year" means calendar year ending 31 December.

"Compliance based on Mass balance Calculation" means that for the purposes of demonstrating compliance or non-compliance with a specified limit the release shall be calculated. Annual mass releases for Mercury shall be calculated from the maximum potential calculation of the metal present as contamination multiplied by the volume of the chemicals used on the site during the year. An allowance may be deducted for any proportion of the chemicals used that can be demonstrated not to have reached the emission point. The concentration of Mercury shall be calculated from the annual mass release and the volume of effluent discharged during the year.

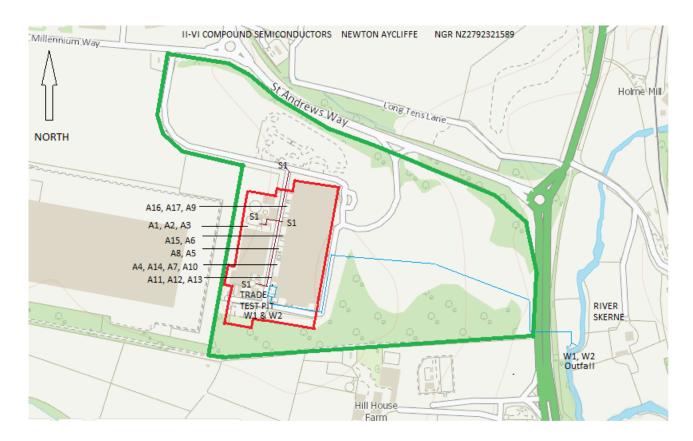
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

Where any condition of this Permit refers to the whole or parts of different documents, in the event of any conflict between the wording of such documents, the wording of the documents) with the most recent date shall prevail to the extent of such conflict.

Schedule 7 – Site plan



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