



Sherwin-Williams UK Ltd

ENVIRONMENTAL PERMIT VARIATION APPLICATION

Sherwin-Williams Packaging Coatings Deeside





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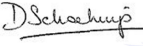
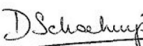
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NON-TECHNICAL SUMMARY

Sherwin-Williams UK Ltd (Sherwin-Williams), previously known as Valspar (UK) Corporation Ltd, manufacture resins and paints for coating applications for rigid containers and closures primarily for the food and drink industry. The operations fall under the Environmental Permitting (England and Wales) Regulations 2016, as amended, as the production of organic chemicals such as plastic materials, polymers, synthetic fibres and cellulose-based fibres and the manufacture of dyestuffs, printing ink and coating materials.

The environment permit (BU7545IM) was issued to Valspar on 24/05/07 superseding the original permits in the name of Dexter Packaging Products which were issued between 1993 and 1999. A consolidated permit was issued on 14/12/2017 under the Environmental Permitting (England and Wales) Regulations 2016 as variation EPR/BU7545IM/V002.

The permit has to be varied to allow Sherwin-Williams to undertake the production of a new commercial product for the beverage can market requiring a new intermediate resin and associated coating final product both of which will be additional to current production. The proposed changes to enable this to take place are described in detail throughout this environmental permit variation application. The overall changes comprise:

- Installation of a new tank for the bulk storage of raw material epoxy resin [REDACTED]
- The installation and operation of an epoxy upgrade reactor vessel [REDACTED]
- The installation and operation of an extension reactor vessel [REDACTED]
- Installation of three weigh vessels [REDACTED]
- New abatement plant for odour / VOC control;
- The repurposing of an existing vessel to be used as a filtration/finishing vessel [REDACTED]
- Installation of a new filtration / finishing vessel [REDACTED]
- Installation of a new powder handling facility [REDACTED]
- The repurposing of an existing vessel to be used as a wash solvent storage tank; and,
- Installation of a new tank for bulk storage of vessel caustic wash material.

The above proposed changes will take place within the existing permit boundary of the installation. Some building changes will be required to existing structures to house additional plant (an increase in height of a small area of the coatings building).

As part of this variation application the following subject areas have been considered:

- **Management systems:** Sherwin-Williams operate in accordance with an Environmental Management System (EMS) which is certified to ISO 14001. There will be no overarching changes to the EMS as a result of this permit variation; however relevant operational procedures and processes in relation to the proposed changes will be implemented and / or updated where required.
- **Energy Efficiency:** The proposed changes to be implemented as part of the permit variation will result in an increase in energy consumption at the site; the annual energy consumption is expected to approximately increase from 6,481 MWh (2020) to 9,073 MWh. This is due to the installation and operation of the proposed new equipment. However, the Specific Energy Consumption (SEC), which measures the total energy use against production capacity (i.e.

tonnes of product), is actually expected to slightly decrease from 0.542 MWh/t to 0.522MWh/t. The annual tCO₂ produced is expected to increase from 1827t to 2557t.

- **Raw Materials and Water:** There will be some increases in raw material and water consumption as a result of the installation of the new plant and equipment with the purpose of increasing the site's production capacity. The main increase will be the quantity of solvents, amine, monomers, catalyst, acids/anhydrides used, which are the main raw materials used for the existing production process.
- **Waste Management:** Minor new waste streams will be generated as a result of the proposals and the existing wastes generated will continue to be managed via the same contractors and recovery / disposal routes. Overall, following implementation of the proposed changes on site, the generation of waste is expected to directly reflect the increase in production capacity.
- **Emissions to Air:** Emissions to air from the high level point sources (stacks A1, A2, A3 and A5) will not change due to the proposals, a small increase will occur due to the addition of a new single point source, referenced as A4. The emission is are primarily of VOCs that can't be condensed and returned to the process, with some fugitive emissions via vents due to losses within the buildings, and tank breathing losses.
- **Emissions to Water:** There will be no new point source emissions to water, or changes to existing point source emissions to water, as a result of the proposed changes in this permit variation.
- **Emissions to Sewer:** There will be no new point source emissions to sewer, or changes to existing point source emissions to sewer, as a result of the proposed changes in this permit variation.
- **Emissions of Substances not Controlled by Emission Limits:** There will be a marginal increase in fugitive VOC emissions due to the proposed increase in production capacity. These will be managed as per the facility's existing Solvent Management Plan in line with permit requirements.
- **Odour:** An assessment has been undertaken of the proposed changes due to the increase in use and discharge of odorous substances and these will be managed appropriately to ensure there is no impact at local receptors (Appendix E).
- **Noise and Vibration:** A high level risk assessment and local survey was undertaken in a noise assessment (Appendix F). It considers sound from the existing and proposed fixed plant items. The results of the assessment indicate that the predicted rating levels from the cumulative operational activities are unlikely to generate an increase in noise at receptors.
- **Monitoring:** It is proposed that monitoring of the proposed point source emissions to air follows the same protocols as current point source testing.

- **Environmental Risk Assessment:** The expansion of the manufacturing capability at Sherwin Williams, Deeside site has necessitated the requirement to prepare an Environmental Risk Assessment of the activities associated with the expansion and covers the new processes proposed (Appendix B).
- **Best Available Techniques (BAT):** A full (Best Available Techniques) BAT review has not been undertaken for this variation application as most of the previous arrangements for demonstrating BAT at the installation still apply. However, where changes have been proposed on site, the relevant information has been provided to demonstrate that these meet BAT requirements. This is provided in Appendix D.
- **Site Condition Report (SCR):** As part of this environmental permit variation application, the facility's existing original ASR (Application Site Report) has been reviewed and a separate operational phase section of a Site Condition Report has been produced specifically for the proposed changes in line with the latest H5 guidance. This should be read in conjunction with the existing ASR and has been is attached to this application (Appendix G).

1 INTRODUCTION

This application for an environmental permit variation consists of this supporting technical document, the required variation application forms and additional relevant supporting information where necessary.

1.1 EPR APPLICATION FORMS & SUPPORTING INFORMATION

The following application forms have been completed and are included in Appendix A:

- Form Part A: About You
- Form Part C2: General: Varying a Bespoke Permit
- Form Part C3: Variation to a Bespoke Installation Permit
- Form Part F1: OPRA, Charges and Declarations

Pre-Application advice was received from Natural Resources Wales (NRW) in a letter dated 4 May 2021 (EPR/BU75745IM). This confirmed that a substantial permit variation should be applied for at the application stage, however this will be subject to final determination by NRW as to whether a normal or substantial permit variation is required, and fees refunded if necessary.

The content in the application forms is supported by the information provided in this supporting technical document, which comprises the main application document. This has been structured and developed in accordance with guidance available on the GOV.UK webpages for changing an environmental permit.

Relevant European BAT Reference Documents (BREFs) and UK Sector Guidance Notes were referred to throughout the environmental permit variation application dated November 2016. A full (Best Available Techniques) BAT review has not been undertaken for this variation application as most of the previous arrangements for demonstrating BAT at the installation still apply. However, where changes have been proposed on site, the relevant information has been provided to demonstrate that these meet BAT requirements.

1.2 EXISTING FACILITY

The address of the permitted facility is:

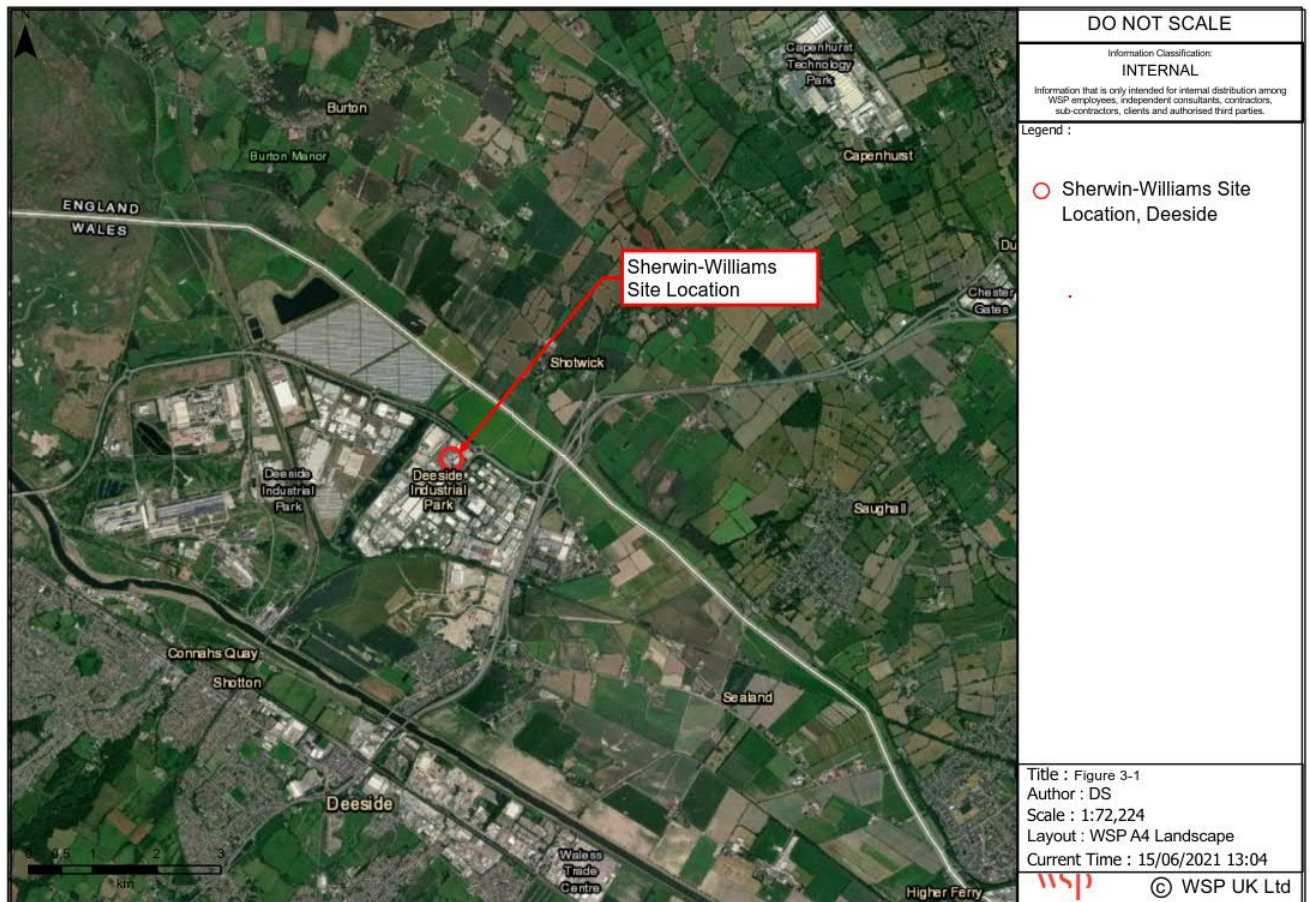
Sherwin-Williams UK Ltd
Deeside Packaging Coatings
Parkway
Deeside Industrial Park
Deeside
Flintshire
CH5 2NN

The facility is located within the Deeside Industrial Park, 7 km NW of Chester and comprises a factory, a laboratory and office accommodation. The site is bordered on all four sides by neighbouring industrial premises, including Iceland Frozen Foods, Farralls Group Industrial

warehousing and Soleil Distribution, a BP Service Station, Atlas Copco and a car dealership, as well as vacant general industrial units.

A site location map is shown below in Figure 1-1.

Figure 1-1 - Site Location



2 ACTIVITIES SUBJECT TO THE PERMIT VARIATION

An environmental permit for the facility was issued by NRW on 24/05/2007. A consolidated permit was issued on 14/12/2017 under the Environmental Permitting (England and Wales) Regulations 2016 (EPR), as amended. The prescribed activities authorised at the Part A1 installation are described in Table 2-1 below.

Table 2-1 – Prescribed Activities

Reference	Current	Change Required?
Section 4.1(a)(ii)	Producing organic chemicals such as - organic compounds containing oxygen (e.g. alcohols, aldehydes, ketones, carboxylic acids, esters, ethers, peroxides, phenols or epoxy resins) [Note the permit introduction makes reference to S4.1(a)(viii) plastic materials (for example polymers, synthetic fibres and cellulose-based fibres)]	No
Section 6.5 Part B (a)(i)	Manufacturing or formulating any other coating material containing or involving the use of organic solvent, where the carrying out of the activity is likely to involve the use of 100 tonnes or more of organic solvents in any period of 12 months	No

The Directly Associated Activities (DAA's) described in the permit and those proposed are shown in Table 2-2:

Table 2-2 – Directly Associated Activities

Permitted	Change to description required?
Deionised water supply, deionised water using reverse osmosis	No, however there will be an increase for new product line plant.
Waste Storage	No, however there will be an increase for new product line plant.
Hot water supply, 1MW thermal input gas fired boiler	Yes, increased production capacity will lead to an increase in heat demand, however this is to be supplied via electrically heated thermal oil (indicatively 0.8MWth)
Cooling water supply, 1 off cooling tower	Yes, the maximum peak cooling duty for the new plant is expected to be approximately 1MW. This will be provided by an additional cooling tower.
Nitrogen gas supply	No, however there will be an increase to reflect increased production capacity overall
Coolant supply, chilled glycol / water mix	No, however there will be an increase for new product line plant.
Compressed air supply	No, however there will be an increase for new product line plant.

The purpose of this environmental permit variation application is to allow Sherwin-Williams to undertake the production of a new commercial product for the beverage can market requiring a new intermediate resin and associated coating final product both of which will be additional to current production and therefore, will need to be reflected in the site's environmental permit.

The targeted annual production capacity of this alternative product is expected to be approximately [REDACTED]. To produce the new resin, an additional process line will need to be installed at the facility. This will make use of some existing vessels as well as the design and installation of several new vessels as detailed later. Contrary to the pre-application letter, the process line will primarily be housed within the existing coatings plant building on site which will be re-organised internally. The building will require a height increase over a partial area to house the reactors associated with the new line (referred to as the 'penthouse').

A new dedicated bund adjacent to the coatings plant building will also be installed for the storage of the raw material epoxy resin and a fume scrubbing plant. An additional utilities building has been constructed which is located on the southern side of the existing buildings, and the container style peroxide store in the northwest corner of the site has been replaced in situ with a brick built structure.

Sherwin-Williams are hence proposing to make the following changes to the existing facility which are the subject of this variation application (the numbers in brackets correspond to the tank and vessel reference numbers on the GB451023110 coatings building site plan shown in Appendix C to this application):

- New tank [REDACTED] and associated dedicated bund for raw material epoxy resin storage [REDACTED]
- The installation and operation of an epoxy upgrade reactor vessel [REDACTED]
- The installation of and operation of an extension reactor vessel [REDACTED]
- Weigh vessels [REDACTED]
- The installation of 1 off new tank and repurposing of 1 off existing tank to be used for filtration and finishing (with solvent and waxes) [REDACTED]
- New powder handling facility [REDACTED]
- The introduction of [REDACTED] new raw materials (similar to the materials currently in use);
- New abatement plant (scrubber on the site plan Appendix C) for new resin plant odour and VOC control (to be housed in the new bund for the raw material resin storage described above);
- A closed loop cleaning-in-place (CIP) chemical wash to clean the reactor vessels;
- New bulk storage tank [REDACTED] for vessel caustic washing solution;
- The repurposing of an existing vessel to be used as a wash solvent storage tank; and



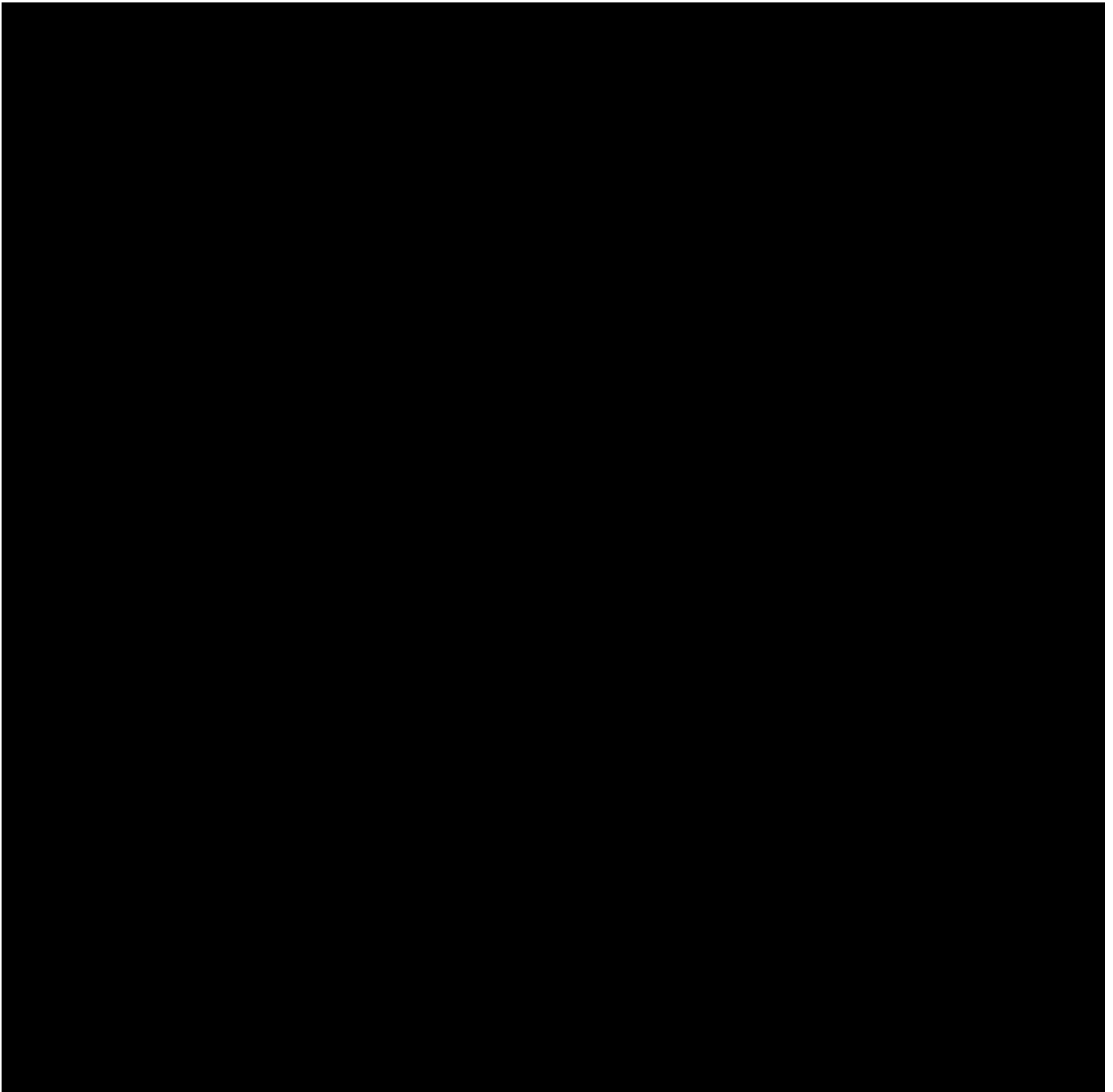
- Utilities such as heating, and cooling systems to support the chemical reactions and storage requirements.

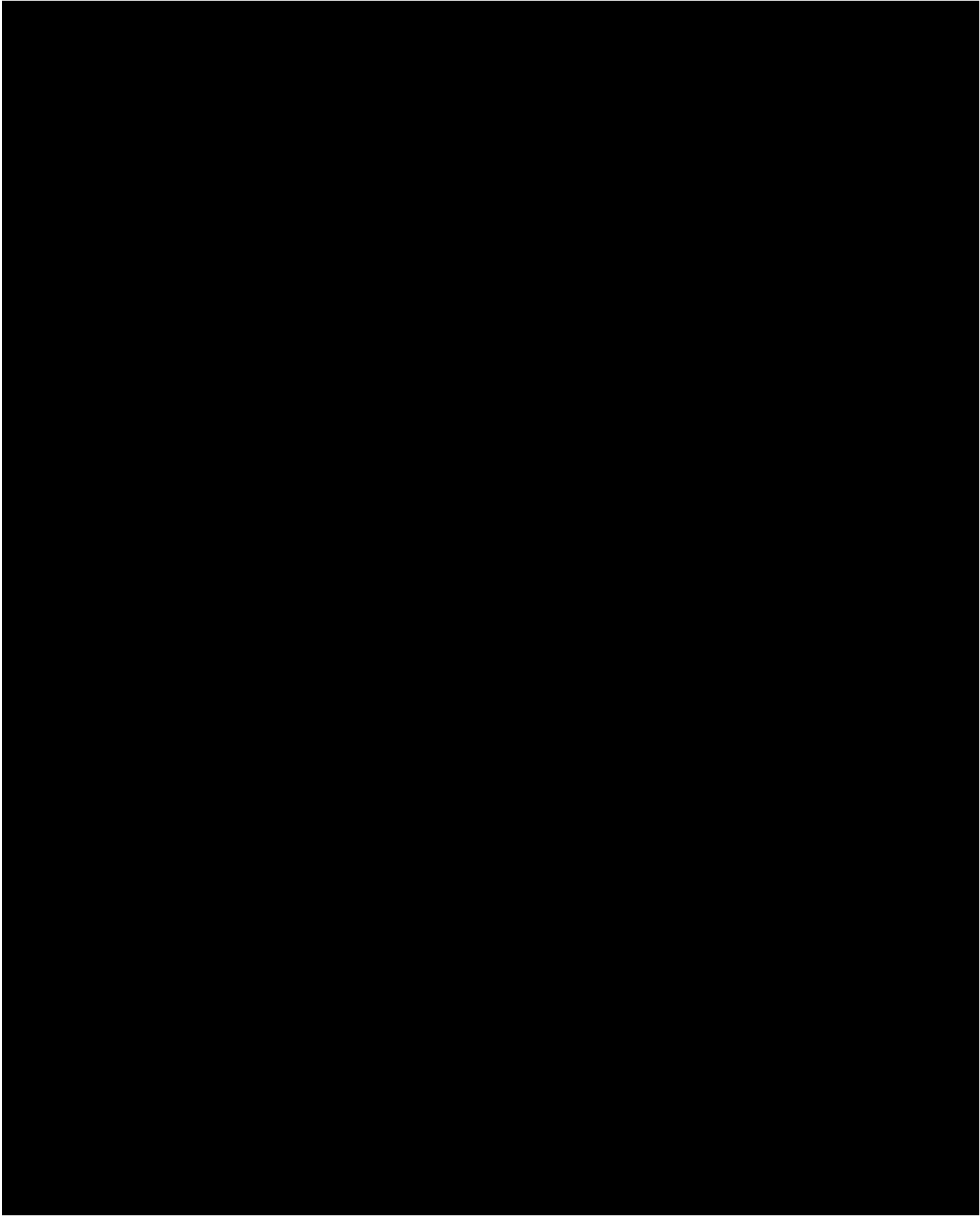
Detailed descriptions of the above proposed changes and activities are provided in the following section.

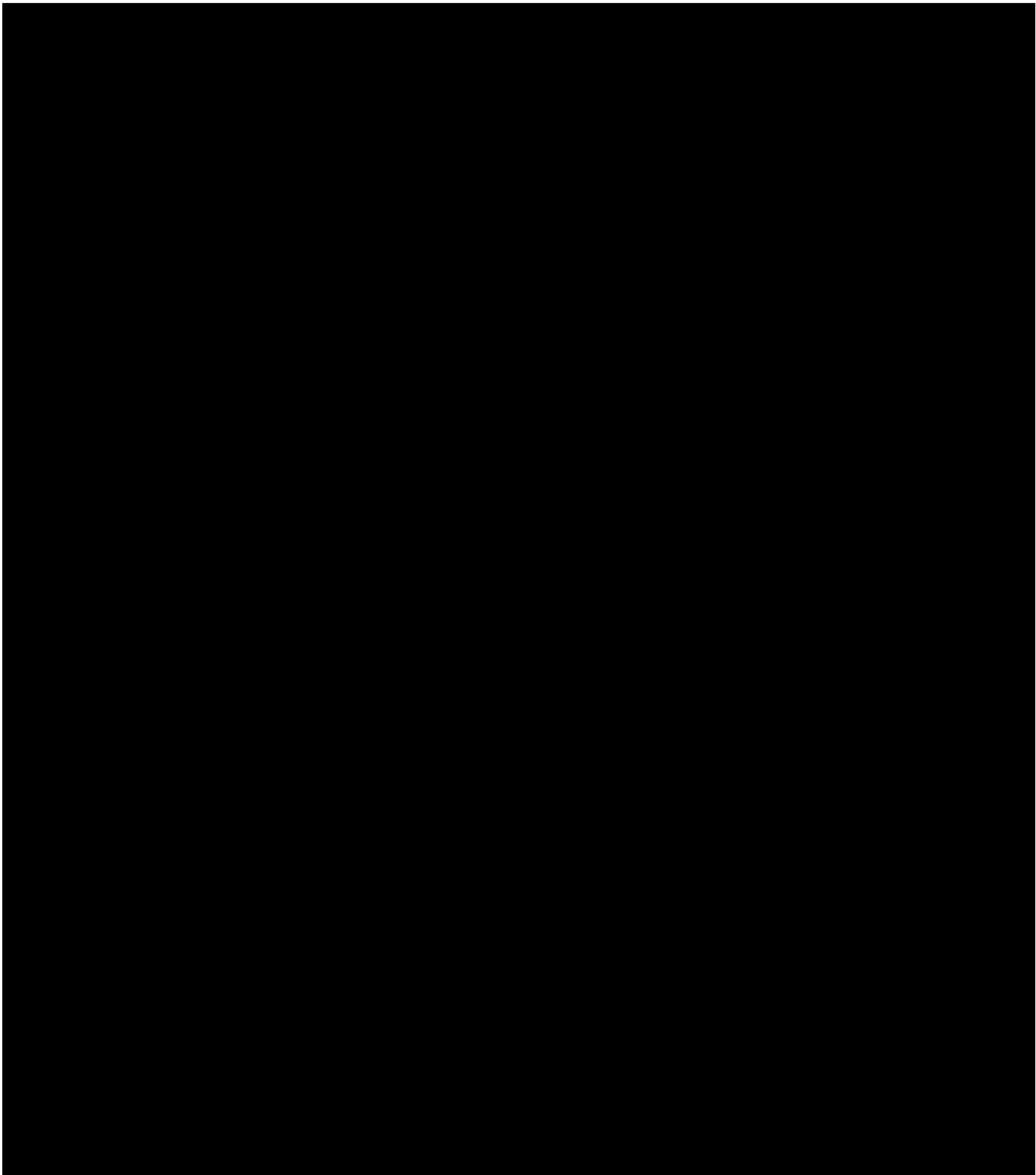
3 PROCESS DESCRIPTION

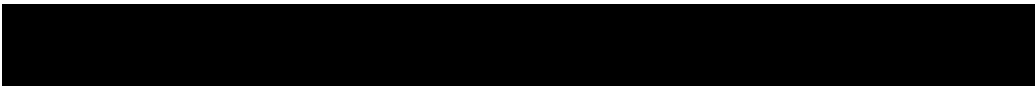
The existing processes on site will remain as currently permitted. The proposed changes do not differ from existing permitted processes, but they will involve the addition of the new process / product line which will entail additional raw materials and associated storage, new reactor vessels, weigh vessels, filtering and finishing tanks, vacuum pumps, final product storage, utilities and a vapour scrubber.

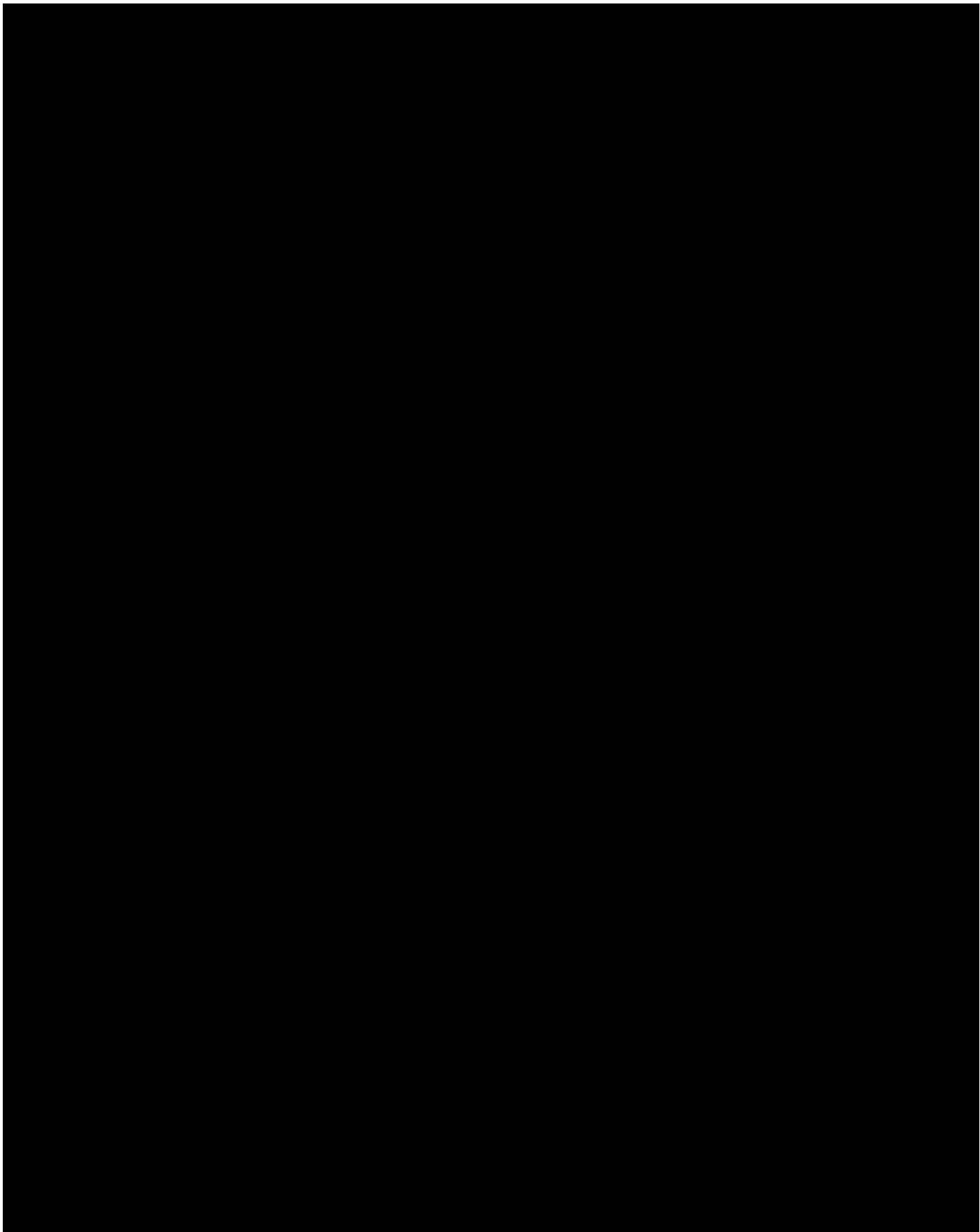
A detailed description of the proposed changes is provided below. The plant is also shown at current design locations on the layout plan in Appendix C.

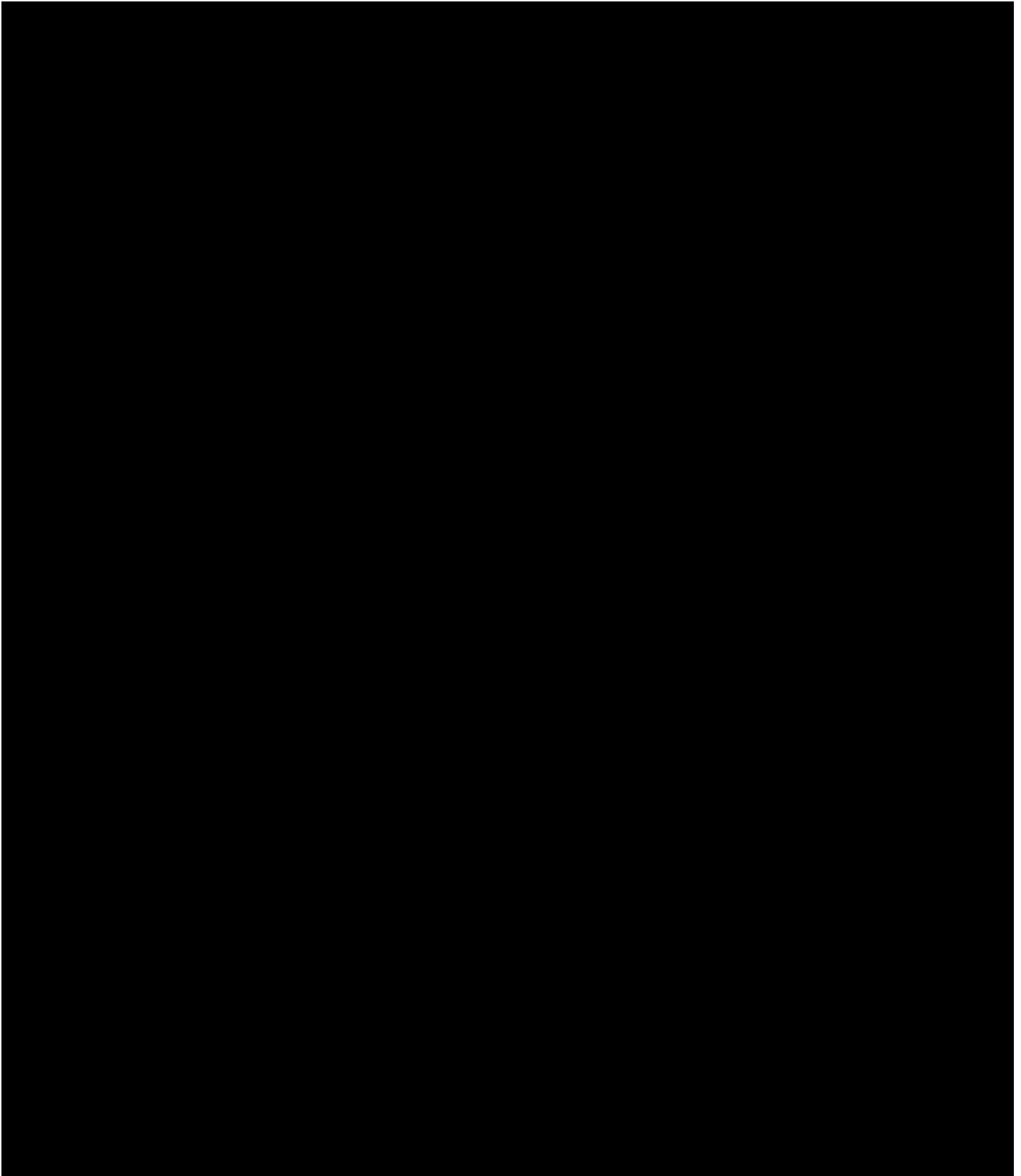












4 MANAGING YOUR ACTIVITIES

4.1 ACCIDENT MANAGEMENT

ENVIRONMENTAL MANAGEMENT SYSTEM

The effective management of environmental performance is a key technique for ensuring that all pollution prevention and control techniques are delivered reliably, monitored and measured appropriately, and on an integrated basis. The Environmental Management System (EMS) implemented at the Deeside Facility helps to maintain compliance with regulatory requirements and to understand and manage all other significant environmental impacts.

Sherwin Williams received their certification in terms of the conformance to the requirements of BS EN ISO 14001:2015 on the 29 March 2019 (certificate #042229; expiry date: 9 March 2022). Various procedures are currently implemented to cover all aspects of operations that may have an adverse impact on the environment (Table 4-1).

A BAT table supports the environmental management compliance assessment in Appendix D.

Table 4-1 – Existing Procedures currently being Implemented

Procedure Reference	Title of Procedure
DEE-PRO-003	Internal Audits
DEE-PRO-006	Document & Data Control
DEE-PRO-012	Maintenance
DEE-PRO-014	Management Review
DEE-PRO-015	Monitoring and Measuring
DEE-PRO-016	Corrective and Preventative Action
DEE-PRO-018	Management of Change
DEE-PRO-019	Training and Development
DEE-PRO-020	Escalation Management
DEE-PRO-022	Waste Management
DEE-PRO-023	Emissions to Air
DEE-PRO-025	Accident Incident and Reporting
DEE-PRO-027	Legal and IPPC Compliance and evaluation
DEE-PRO-028	Internal and External Communication
DEE-PRO-029	Aspects and Impacts
DEE-PRO-031	Contractors EHS Requirements

DEE-PRO-032	Hazards and Risk Assessments
DEE-PRO-033	Site Drainage

ENVIRONMENTAL RISK ASSESSMENT

The expansion of the manufacturing capability at Sherwin Williams, Deeside site has necessitated the requirement to review and update the environmental risk assessment. An environmental risk assessment has therefore been produced as part of the permit variation application associated with the expansion activities only (Appendix B). Key points are also described in Section 7.

MAJOR ACCIDENT PREVENTION POLICY

Sherwin Williams, Deeside site falls under the requirements of the Control of Major Accident Hazards (COMAH) Regulations and as such has produced a Major Accident Prevention Policy (MAPP) (DEE-POL-016 Deeside MAPP).

This Policy outlines the approach to be applied with the aim to ensure a high level of prevention and mitigation of any possible Major Accident Hazards (MAH) scenarios to protect and limit the consequences to man and the environment.

Procedures and management systems used for implementing the MAPP are derived from the Sherwin Williams Deeside Integrated Environmental, Safety, Health and Quality system.

Documented departmental operating procedures and management procedures, establish the methods of operating to prevent major accidents that have a safety, health and environmental impact. Changes to equipment, procedures, methods, raw materials, chemistry, physical parameters whether to manufacturing processes, equipment, organisation, procedures or people, are managed to ensure that safety, health and environmental risks are reduced or remain at an acceptable level.

Accordingly, existing procedures and management systems will be reviewed and updated as necessary to include the production of the new resin product and the associated proposed changes described in this permit variation application.

4.2 ENERGY EFFICIENCY

Section 3.6 of the 2017 environmental permit variation application for the facility provided information on energy efficiency at the installation, including demonstrating that the activities meet BAT for energy efficiency. This information has not been reproduced in this variation application as the previous BAT justifications are still valid and should be referred to.

The supply and construction is currently out to tender hence awaiting specific information on individual items, however all new plant items will be procured with regard to electrical efficiency, and will be included in the site's preventative maintenance programme.

ENERGY CONSUMPTION

The main sources of energy use on site are electricity and natural gas with a small amount of diesel fuel. Energy consumption figures by source type for 2018, 2019 and 2020 are detailed in Table 4-2.

The proposed changes on site will alter the energy use (consumption) at the Deeside site. Sherwin Williams broadly anticipate a 35-40% total increase in energy usage based on the number of new vessels with agitators, pumps, heating and cooling requirements and other peripheral plant as well as the anticipated 40-45% increase in the finish goods volume being produced. As stated above until all the plant items (particularly electrical) are fully itemised in tender returns a more accurate forecast is not possible, with the exception of heating and cooling requirements which are based on reaction requirements. Future estimated figures based on a broad assumption have been calculated based on 40% of the 2020 energy consumption figures and are reflected in Table 4-2.

EMISSIONS BENCHMARKING

Carbon dioxide emissions associated with energy consumption (at primary source) for 2018, 2019, 2020 and future estimated are presented in Table 4-3.

The following conversion factors have been used in deriving the estimates of CO₂ in Table 4-3.

- Electricity = 0.166 tonnes per MWh
- Natural Gas = 0.19 tonnes per MWh
- Gas Oil = 0.25 tonnes per MWh

These factors have been extracted from the “Environmental Permits Guidance to assess the impact of air emissions on global warming” (published 1 February 2016”).

Table 4-2 – Energy Consumption by Source Type for 2018, 2019, 2020 and Future Estimated

Energy Source	2018		2019		2020		Future Estimated (based on 40% increase)	
	Consumption (as delivered) (MWh)	Consumption (at primary source) (MWh)	Consumption (as delivered) (MWh)	Consumption (at primary source) (MWh)	Consumption (as delivered) (MWh)	Consumption (at primary source) (MWh)	Consumption (as delivered) (MWh)	Consumption (at primary source) (MWh)
Electricity from public supply ¹	2,997	7,193	2,953	7,087	2,846	6,829	3,984	9,561
Natural Gas Usage (heating and process)	2,491	2,491	2,300	2,300	3,598	3,598	5,037	5,037
Diesel Usage (includes generators and fire pumps)	35.56	35.56	39.56	39.56	37.38	37.38	52.33	52.33
TOTAL	5,524	9,720	5,293	9,427	6,481	10,464	9,073	14,650

Notes: 1: Conversion factor for delivered electricity to primary energy = 2.4

Table 4-3 – Carbon Dioxide Emissions associated with Energy Consumption

Year	Energy Source	Consumption (at primary source) (MWh)	Emissions of CO ₂ to the environment (tonnes)	Total Emissions of CO ₂ (tonnes)
2018	Electricity	7,193	1,194	1,676
	Natural Gas	2,491	473	
	Gas Oil	35.56	8.89	
2019	Electricity	7,087	1,176	1,623
	Natural Gas	2,300	437	
	Gas Oil	39.56	9.89	
2020	Electricity	6,829	1,134	1,827
	Natural Gas	3,598	684	
	Gas Oil	37.38	9.35	
Future Estimated	Electricity	9,561	1,587	2,557
	Natural Gas	5,037	957	
	Gas Oil	52.33	13.08	

SPECIFIC ENERGY CONSUMPTION

The Specific Energy Consumption (SEC), which measures the total energy use against production capacity before and after the proposed changes on site, has also been calculated and is presented in Table 4-4 below. Overall, the SEC is expected to slightly decrease compared to 2020.

Table 4-4 – Current and Future Estimated Specific Energy Consumption

Year	Energy Source	Total Production Capacity (tonnes)	Energy Consumption (at primary source) (MWh)	SEC (MWh per tonne of product)	Total SEC (MWh per tonne of product)
2018	Electricity	16,515	7,193	0.435	0.588
	Natural Gas	16,515	2,491	0.151	
	Gas Oil	16,515	35.56	0.002	
2019	Electricity	18,216	7,087	0.389	0.517
	Natural Gas	18,216	2,300	0.126	
	Gas Oil	18,216	39.56	0.002	
2020	Electricity	19,247	6,829	0.354	0.542
	Natural Gas	19,247	3,598	0.187	
	Gas Oil	19,247	37.38	0.002	
Future Estimated	Electricity	28,151	9,561	0.340	0.522
	Natural Gas	28,151	5,037	0.180	
	Gas Oil	28,151	52.33	0.002	

CORPORATE SUSTAINABILITY

Sherwin Williams has produced a 2020 Sustainability Report which relied on the results of the 2019 Materiality Assessment. Sherwin Williams are committed across the company to the following goals by 2030:

- Reduce absolute Scope 1 and 2 greenhouse gas emissions by 30%;
- Increase renewable energy to 50% of total electricity usage;
- Increase operational energy efficiency by 20%; and,
- Reduce waste disposal intensity by 25%.

Sherwin Williams has voluntarily participated in the Carbon Disclosure Project's Climate Change reporting since 2006, which includes details about greenhouse gas related risks and opportunities,

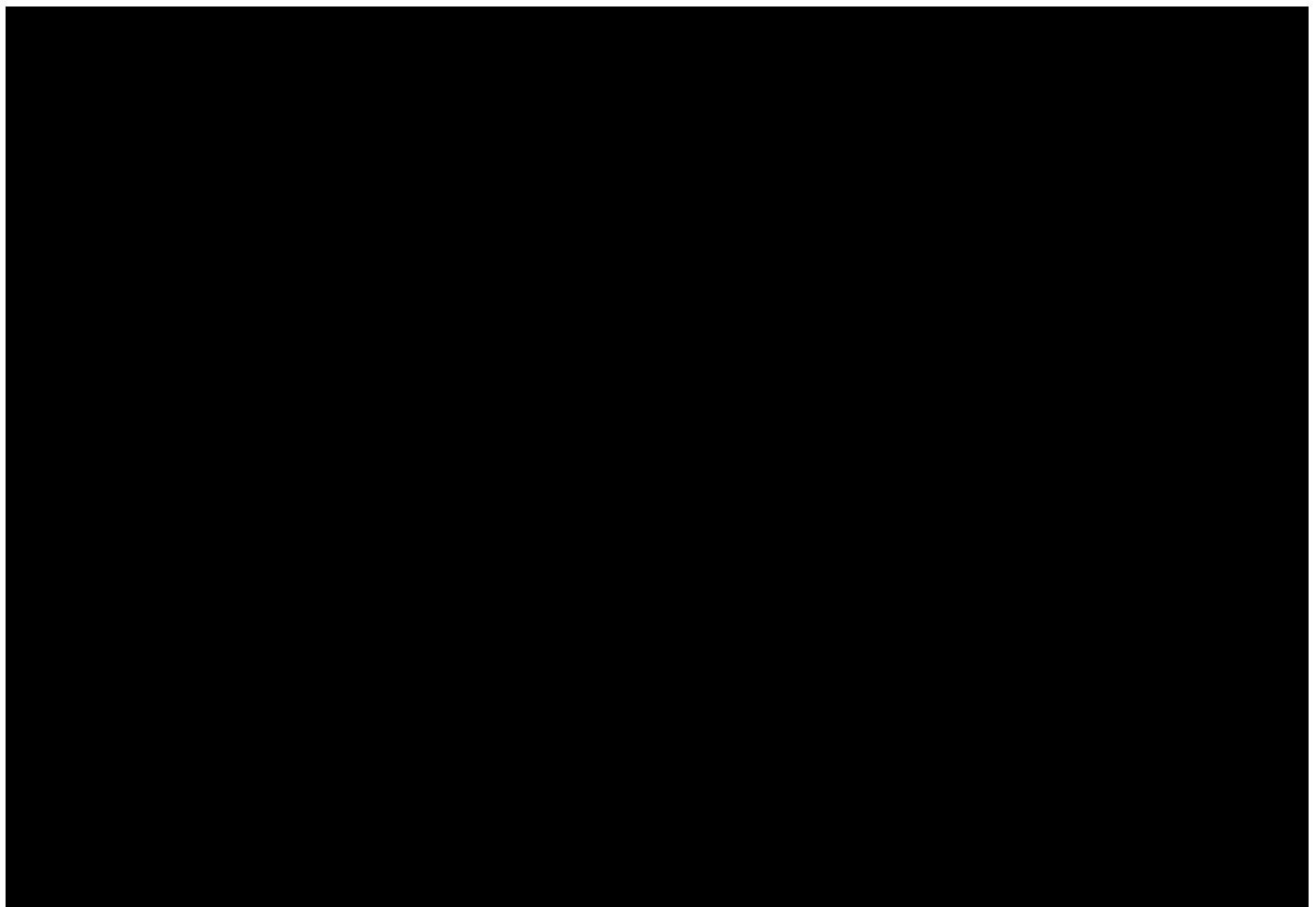
corporate governance and climate change communications. The site is also subject to a Climate Change Agreement under the Chemicals Industry Association Umbrella Agreement, facility CIA/F00321.

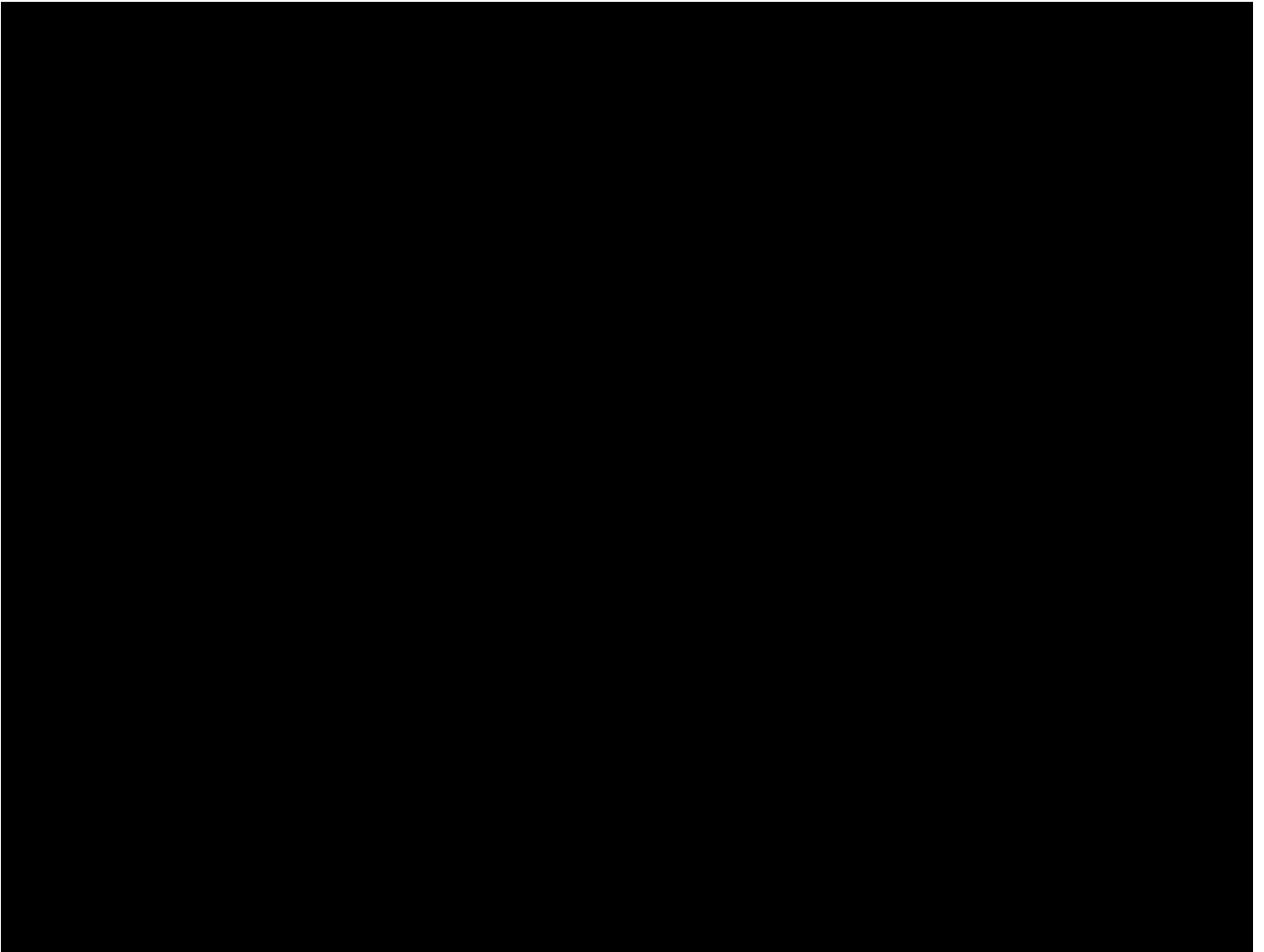
4.3 EFFICIENT USE OF RAW MATERIALS AND WATER

Section 3.3 of the 2017 environmental permit variation application provided information on the use of raw materials and water at the installation, including demonstrating that the activities meet BAT for raw materials. This information has not been reproduced in this variation application as the previous BAT justifications are still valid and should be referred to.

The proposed annual increase of production will have a corresponding increase in raw material usage for all materials involved in the new process. This section details the current (2020) annual raw material and water consumption figures at the installation and the future estimated figures once all proposed changes being applied for in this permit variation application are operational. These are included in Table 4-5 below.

Figures for raw material and water consumption were included in the 2017 environmental permit variation application (Section 4.3) and remain similar, the anticipated increases due to the new product are highlighted (these include existing materials as well as a short list of the new materials).





4.4 AVOIDANCE, RECOVERY AND DISPOSAL OF WASTES

Section 3.4 of the 2017 environmental permit variation application provided information on waste minimisation and management at the installation, including demonstrating that the activities meet BAT for waste. This information has not been reproduced in this variation application as the previous BAT justifications are still valid and should be referred to.

The proposed changes on site will, however, alter the waste generation at the installation. Figures for waste generation and disposal for 2019 and 2020 are detailed in Table 4-6.

No significant new waste streams are expected to be generated as a result of this permit variation application. The data in Table 4-6 presents a forecast based on the assumption that, following implementation of the proposed changes on site, the generation of waste will increase proportionally with the additional production capacity associated with the new product line.

Table 4-6 – Current and Future Estimated Waste Streams

Waste Type and Origin	Storage Details	Method of Transfer and Disposal	2019		2020		Future Estimated Annual Quantity
			Annual Quantity	Monthly Average Quantity	Annual	Monthly Average	
Coloured Wash Water / Other Non-hazardous liquid (kg)	Designated area of Yard		125,139	10,428	34,641	2,887	49,883
Solid and Liquid Hazardous Waste (kg)			68,379	5,698	89,047	7,421	128,228
Solid Non-hazardous Waste (kg)	Skip compactor outside main production building		595	50	7,500	625	10,800
Total Waste Water (m ³)	IBCs in designated area of Yard	Offsite treatment by waste disposal contractor	6,054	505	3,389	282	4,880
General Waste (kg)	Compactor Skip in Yard	Landfill	29,844	2,487	20,560	1,713	29,606

All data taken from Deeside ECOMET reports, and applies to whole site operations.

5 EMISSIONS AND MONITORING

5.1 POINT SOURCE EMISSIONS TO AIR

Existing point source emissions to air are detailed in the 2017 environmental permit variation application and current environmental permit (Schedule 3 Table S3.1). The pollutants of primary concern are VOCs and to a lesser extent particulates. In the existing permit, there are nine emission point references for emissions to air. These are included for reference in Table 5-1 below.

Table 5-1 – Point Source Emissions to Air

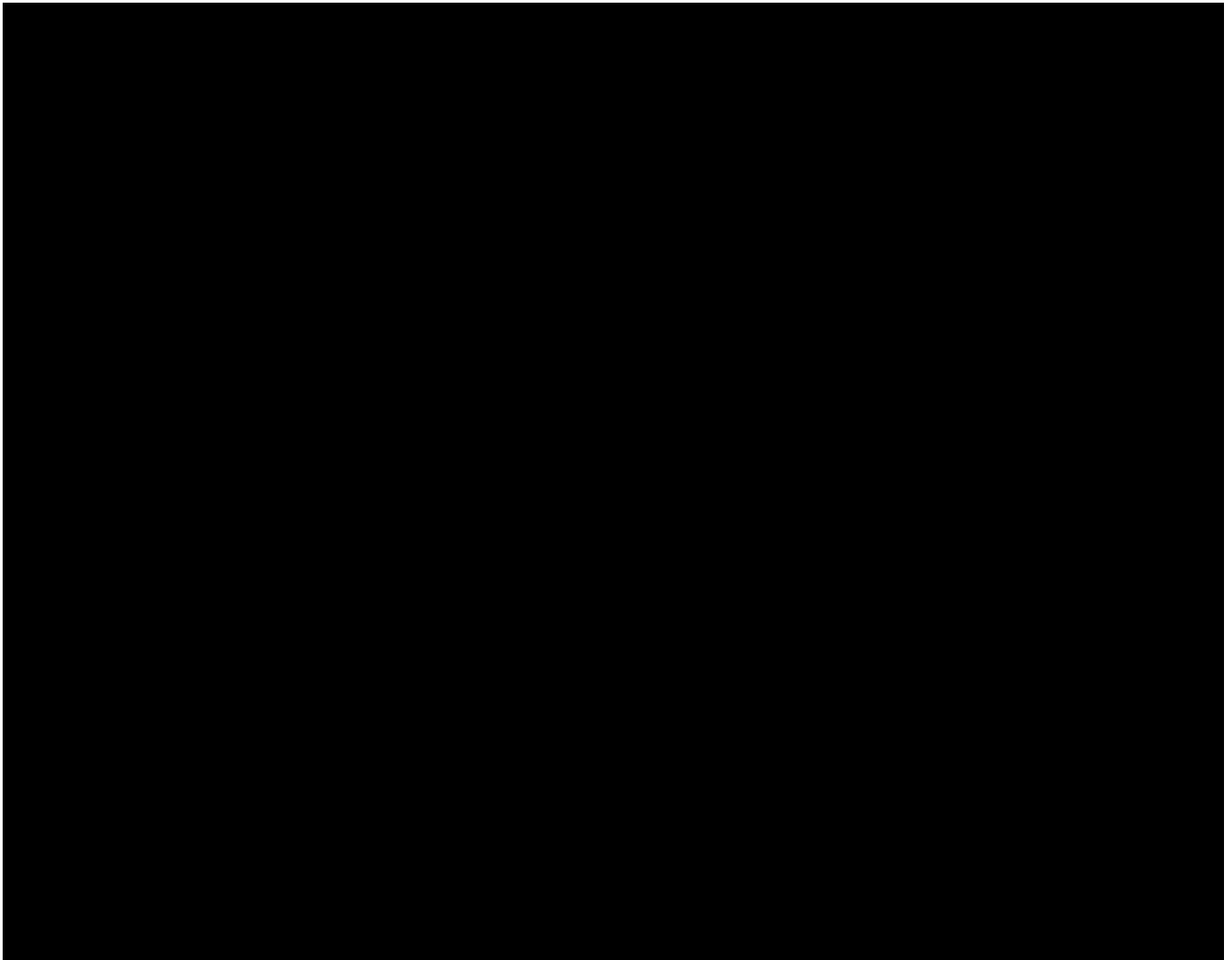
Release Point Reference	Process Source	Nature of Emissions
A1	Resin plant reactor scrubber	Total Class B VOCs as carbon Total Class A VOCs as individual VOCs
A2	Resin plant reactor dust filter	Total Class B VOCs as carbon Total Class A VOCs as individual VOCs Particulates
A3	Resin plant [REDACTED] scrubber	Total Class B VOCs as carbon Total Class A VOCs as individual VOCs
A5	Paint plant vessels	Total VOCs
A6	DCE dust filter (coatings plant)	Particulates
A7-A36	Various dust collection equipment	No parameters
A37	Coatings plant – extraction on product filling	Total VOCs
A38	Resin plant - extraction on product filling	Total Class B VOCs as carbon Total Class A VOCs as individual VOCs
A39-A45 A47-A52	Various building ventilation vents, laboratory ventilation and [REDACTED] tank, new vents see Fig 5-1	No parameters set
A46	Epoxy resin tank T-719	VOCs

A full replacement list of installation emission points is appended with the Site Plan in Appendix C.

As part of the proposed changes which formulate this permit variation, there will be one new point source emission to air from the new scrubber which will be implemented for odour and VOC abatement. The scrubber and stack is to be located within the new purpose-built bund.

It is proposed that this will constitute a main new release point reference in the permit, A4 (as no such reference point currently exists). The location of this release point (A4) is adjacent to the coatings plant, and attached to the coatings plant roof, as shown in Figure 5-1 below.

There is also a vent associated with the new resin raw material bulk storage tank. This will be also located in the new bund together with the scrubber and the storage tanks. This emission point is labelled as A46 in Figure 5-1 below.



5.2 POINT SOURCE EMISSIONS TO WATER

There will be no change to the existing point source emissions to water as set out in the current environmental permit for the facility.

5.3 POINT SOURCE EMISSIONS TO SEWER

There will be no change to the existing point source emissions to sewer as set out in the current environmental permit for the facility.

5.4 EMISSIONS OF SUBSTANCES NOT CONTROLLED BY EMISSION LIMITS

FUGITIVE EMISSIONS TO WATER

Fugitive emissions to water are reviewed under four headings as follows:

- Sub-surface structures and sumps;
- Surfacing;
- Bunds / secondary containment; and
- Storage areas for IBC's, drums etc.

SUB-SURFACE STRUCTURES AND SUMPS

Details of sub-surface structures and sumps at the site are provided in the 2017 environmental permit variation application. No new sub-surface structures will be installed as part of the changes being applied for in this environmental permit variation application.

SURFACING

Details of site surfacing are contained in the 2017 environmental permit variation application. There will be a single addition of a bund to contain the new resin raw material tank and the new resin plant vapour scrubber. No other tanks will be installed and hence there are no changes to site surfacing as a result of this environmental permit variation application.

BUNDS / SECONDARY CONTAINMENT

The 2017 permit variation application describes the fixed tanks and containment measures at the facility. Table 5-4 below details the new tanks being applied for in this environmental permit variation application along with the proposed containment measures.

Table 5-2 – Containment Measures

Tank / Equipment	Description of Containment to be Provided	Primary Containment	Secondary Containment	Tertiary Containment
Raw Material Resin	Purpose designed and engineered tank	Storage tank	Purpose built bund to CIRIA C736	Site hardstanding and kerbing
Scrubber A4	Purpose designed and engineered liquor tank and scrubber column vessel	The scrubber vessel and liquor tanks	Bund as above	Site hardstanding and kerbing

The containment measures detailed in the above table are considered appropriate to satisfy the requirements of BAT in relation to emissions of substances not controlled by emission limits. All bunds detailed in the table will be impermeable and resistant to the materials that they are storing and subject to inspection in as part of the site's planned preventative maintenance regime.

STORAGE AREAS FOR IBCS, DRUMS, BAGS ETC.

The 2017 permit variation application contain details on the storage areas for IBCs, drums, small metal containers, 1 tonne bags, 0.5 tonne bags and 25kg bags at the facility. All new raw materials will be stored in the same areas and in the warehouse, subject to the same delivery procedures and controls.

FUGITIVE EMISSIONS TO AIR

Additional potential fugitive emissions to air at the facility due to this variation will be controlled by existing techniques to minimise such emissions from raw material storage and handling in relation to the changes proposed on site and the justification of BAT. The proposed changes as part of this permit variation application may result in a marginal but as yet unquantified increase in terms of fugitive emissions to air.

5.5 ODOUR

The emissions from the additional point source A4 are described in the Odour Assessment report attached as Appendix E. Fugitive emissions will be similar in character to those already emitted and may occur from tank breathing and raw materials handling/transfers but are expected to be of very low impact off site. The primary emission of concern is [REDACTED] which can pass through the condenser more readily than the solvents used which are returned to the process. This post vapour flow will be fully treated in an appropriately specified scrubber with residual levels released to atmosphere at a suitable height to ensure dispersion to below levels which may cause a nuisance at sensitive receptor locations.

5.6 NOISE AND VIBRATION

The introduction of additional plant has been assessed in the WSP acoustics report (Preliminary Risk Assessment for Noise, 70082662 RP AC 01, September 2021) which identifies a singular existing source as dominating impact on the southern and western boundaries of the installation (Appendix F). The planned new sources include a cooling tower which is likely be installed adjacent

to the utilities building, and the reactor vapour scrubber fan. These are unlikely to increase the noise levels at the site boundary to any significant extent.

5.7 MONITORING

Monitoring of emissions to air, sewer and water currently takes place in accordance with the requirements of the site's environmental permit (Schedule 3 – Emissions and Monitoring). Installation and operation of the proposed new process will introduce a single new point source for emissions to air. Table 5-3 below shows the proposed arrangements and details for monitoring emissions from this point source, which is in line with the monitoring performed for the existing emission points on site.

There will be no changes to the monitoring arrangements for emissions to sewer or water as a result of the permit variation being applied for.

Table 5-3 - Proposed Monitoring and Emission Limit Arrangements

Emission Point Reference	Description	Parameters	Limit	Reference Period	Monitoring Frequency	Monitoring Method
A4	New resin plant reactor scrubber	Total Class B VOCs as carbon	2000g/h	1 hour	Quarterly	BS EN 13649
		Total Class A VOCs as carbon	100 g/h	1 hour	Quarterly	BS EN 13649

6 RECORDS, REPORTING AND NOTIFICATION

6.1 RECORDS, REPORTING AND NOTIFICATION

Details on the arrangements for recording, reporting and notifying NRW were included in the 2017 variation application and are defined in the current environmental permit. These will not change as a result of the permit variation being applied for.

6.2 SITE CLOSURE PLAN

The Site Closure Plan details for the facility was included in permit variation application in 2017 and will be updated in due course to reflect the proposed changes at the facility.

7 ENVIRONMENTAL RISK ASSESSMENT (IMPACTS)

7.1 INTRODUCTION AND OVERVIEW OF SECTION

Appendix B of this document contains a qualitative Environmental Risk Assessment that has been produced to accompany this permit variation application to address any risks arising from the new process and plant proposed to be installed at the site. Qualitative risk assessment tables for the facility / site as a whole were completed historically as part of the permit variation applications; these have not been repeated here.

The ERA uses the PM Projen /Sherwin-Williams HAZOP Report GB4510231-41-RP-0001, Issue A, as a starting point identifying risks (sources) and pathways of potential environmental impact, as well as ascribing management and control techniques to avoid and mitigate any risks identified.

7.2 ASSESSMENT OF EMISSIONS TO AIR

The principal route of routine operational impact will be the emissions from the scrubber via emission point A4.

The main emissions of concern are as emitted via stacks A1 and A3, consisting of a number of solvents and ethyl acrylate (EA). There is no BAT-C AEL for ethyl acrylate.

None of the new substances to be introduced have a published Environmental Assessment Level. Sherwin-Williams advise that of new substances only hydroquinone may be released (small levels of powder handling dust) all others will be consumed and retained in the new product. Concerning the current emissions, ethyl acrylate is the substance of concern as the bulk of solvents will be condensed and returned to the process.

The Environment Agency has consulted² on changes to EALs and how new EALs should be derived using one of three different methods, according to a hierarchy based on risk evaluation, this process appears not to have been concluded and hence the REACH Chemical Safety Report which should provide a human health hazard assessment in the form of Derived No Effect Levels (DNELs) for non-carcinogens or non-genotoxic carcinogens and Derived Minimal Effect Levels (DMELs) for genotoxic carcinogens.

REACH DNEL data³ has been used for comparison to emission rates for ethyl acrylate (Table 7-1).

² [EAL Consultation Document 2012 \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/60422/eal_consultation_document_2012.pdf)

³ [Brief Profile - ECHA \(europa.eu\)](https://echa.europa.eu/brief-profile)

Stack monitoring to be undertaken post commissioning will be used to assess the currently unquantifiable solvent emission.

Table 7-1 – Derived EAL

Raw Material	EC	CAS	Toxicity or risk phrases (CPL)	DNEL
Ethyl acrylate	205-438-8	140-88-5	highly flammable liquid and vapour, is harmful if swallowed, is harmful in contact with skin, causes serious eye irritation, is harmful if inhaled, causes skin irritation, may cause an allergic skin reaction and may cause respiratory irritation	OEL 21 mg/m ³ long term DNEL gen pop ⁿ inhalation long term 2.5mg/m ³ (no short term DNEL)

For comparison to the long term general population DNEL the peak process emission rate has been provided by Sherwin-Williams as 5.44kg/hr (although this only occurs for a short period), and 1600m³/hr volume flow rate, with a scrubber abatement efficiency of 99.95% resulting in a short term peak emission rate once per day of 1.7mg/m³ which is less than the long term DNEL hence the emission does not need to be considered further.

The stack and emissions parameters for the new A4 stack are detailed in Table 7-2, though note the position may vary at final design and construction stages to gain structural support from the existing building. An odour assessment has been undertaken and is attached at Appendix E to ensure appropriate level of emission and stack height is set to prevent nuisance occurring at nearby receptor locations, in combination with historical emissions data as previously modelled and submitted to the NRW.

Table 7-2 – A4 Model Parameters

Parameter	A4 New
Stack gas discharge height from ground level (m)	14.0
Stack tip diameter (m)	0.3000
Stack tip area (m ²)	0.0707
Stack gas discharge velocity (m/s)	6.23
Stack gas discharge temperature (°C)	25.0
Stack gas volumetric flow rate at actual stack conditions (m ³ /s)	0.4400
X-grid position (m)	332870
Y-grid position (m)	371060
Odour emission concentration (OU _E /m ³)	-
Odour emission rate (OU _E /s)	352.87

7.3 ASSESSMENT OF EMISSIONS OF NOISE

A Preliminary Risk Assessment (attached as Appendix F) was undertaken by WSP to determine any risk to sensitive receptors due to the proposed variation; it is concluded that noise levels at the site boundary would increase by no more than 3dB, depending on what cooling plant is installed. In the best case, there will be no increase in noise at the site boundary.

7.4 ASSESSMENT OF EMISSIONS TO WATER

There will no change in the emissions to surface water hence this section has not been completed.

APPENDICES

APPENDIX A - EPR APPLICATION FORMS

APPENDIX B - ENVIRONMENTAL RISK ASSESSMENT

APPENDIX C - SITE AND PLANT LAYOUT

APPENDIX D - BAT TABLES

APPENDIX E - ODOUR ASSESSMENT

APPENDIX F - NOISE SURVEY AND REPORT

APPENDIX G - SITE CONDITION REPORT OPERATIONAL PHASE

APPENDIX H - MATERIALS SAFETY DATA SHEETS

