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CLIMATE CHANGE RISK ASSESSMENT

Environmental and sustainability solutions provided to
PLATER CHEMICALS GROUP LTD

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1.0 INTRODUCTION

Walker Resource Management Limited (WRM) are acting consultants for Plater Chemicals Group Ltd (hereon referred to as Plater Chemicals) who have commissioned WRM to produce a Climate Change Risk Assessment (CCRA) for their Glossop site. This document is a new requirement of environmental permit holders as set out by the Environment Agency (EA) in their guidance document titled: *Develop a management system: environmental permits*. This document is written in accordance with this guidance and sets out the considerations and operational details that are relevant to the operation of Plater Chemicals' facility in Glossop. This CCRA looks to set out the nature of different climate change risks, their relevant impacts as well as mitigation measures at the site.

1.1 Site Location

Plater Chemicals Group Ltd
High Street West
Glossop
Derbyshire
SK13 8ES

1.2 Operation Location

Site Grid Reference: Easting 402439, Northing 394290

1.3 Assessment Process

Climate change means that extreme weather incidents are becoming more common and more severe. This CCRA will identify key elements of climate change that could have an impact on the site and then identify the impacts, risks, and mitigation methods of this impact of climate change. These elements include:

- Summer daily maximum temperature;
- Winter daily temperature;
- Daily extreme rainfall;
- Average winter rainfall;
- Drier summers;
- River flow; and
- Storms.

Each one of these climate change risks may have a significant impact on the site's operational and daily management, affect upstream and downstream supply chains, and have negative effects for customers as well as end-markets.

Producing this CCRA supports Plater Chemicals to:

- Be compliant with the requirements of their environmental permit.
- Reduce impact on the environment during an extreme weather event. Including the event's impact on operations, either through accidental release or abnormal operation.
- Improve resilience and business continuity by avoiding unplanned start-ups, shutdowns, and other business interruptions.

2.0 CLIMATE CHANGE RISK ASSESSMENT & MANAGEMENT

2.1 Summer Daily Maximum Temperature

This may be around 7°C higher compared to current average summer temperatures, with the potential to reach extreme temperatures as high as over 40°C with increasing frequency based on today's values.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Summer Daily Maximum Temperature					
Increase in the potential for odour generation from processing activities.	**Low**	Raw chemicals used on Site, in processing activities such as acetic acid, have the potential to generate odours. Processing activities such as the manufacturing of salt also generate odours although these odours are minimal. An increase in daily temperatures may affect the odour generation	• Carbon filters are used on chemical tanks such as acetic acid to reduce the potential for odours. • Most of production takes place within buildings. All doors and entrances are kept closed when not in use. • The vents inside the tanks are passive vents which means that air is not constantly being released to the atmosphere, rather the air is only released to the atmosphere	**Very Low**	Develop an Odour Management Plan with reference to the guidance *H4 odour management*[1]. Monitor the odour generation from raw materials and processing activities and implement further mitigation where required.

[1] Environmental permitting: H4 odour management - How to comply with your environmental permit

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Summer Daily Maximum Temperature					
		potential of raw materials and processing activities.	when the production process requires. • The potential for odour generation from raw materials stored on-Site is considered to be low.		
Increase in the potential for unstable conditions in external storage areas affecting associated tanks and vessels for the storage of raw materials and products. Overheating of vessels and pipework, requiring increased insulation and cooling. The potential increase in surface temperature of infrastructure may result in expansion and stress of plant, pipework and fittings.	**Medium**	Given the recorded on-Site temperatures up to 40˚C, an increase in summer temperatures and their frequency would likely increase the potential for unstable conditions the external storage areas.	• Inspections are undertaken during periods of hot weather of the external storage areas and the associated tanks and vessels for the storage of raw materials and products. • All of the of external pipework is insulated. Including the hot/cold water systems and the steam/condensate system.	**Low**	Undertake a survey of the external storage areas to identify potential infrastructure solutions, such as a canopy to provide shade to the tanks and vessels, and active cooling solutions to reduce to temperature of the area. Ensure all external pipework is insulated and cladded to be sufficiently protected.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Summer Daily Maximum Temperature					
Increase in energy and water consumption due to additional load on cooling systems.	**Medium**	Energy and water use is required for processing activities and the cooling systems and could increase further during hot spells. Water may be lost from the cooling system due to increased evaporation in hot weather.	• Energy used to operate the plant (electricity) is monitored in accordance with the Environmental Management Plan.	**Low**	Review and investigate to determine whether more efficient systems or processes can be installed or implemented to reduce the energy and water demand of the Site.

2.2 Winter Daily Maximum Temperature

This could be 4°C more than the current average with the potential for more extreme temperatures, both warmer and colder than present.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Winter daily temperature					
Reduced effluent plant performance in colder weather	**Medium**	Wastewater generated on-Site is treated in an effluent plant prior to discharge to sewage mains. The	• Effluent plan performance is monitored in accordance with the Environmental Management Plan.	**Low**	Investigate and assess the potential processing times for effluent associated with a reduced performance and

Climate Change Impacts	Judgement		Action		
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Winter daily temperature					
		efficiency of the plant may be reduced by colder weather. pH control of effluent treatment plant could fail due to caustic systems solidifying.	• Site services provide 24/7 coverage of the effluent treatment plant and all water systems on-Site.		develop the plant capacity to ensure the system does not get overwhelmed.
An increased risk of pipework freezing	**Low**	A lower winter temperature may cause pipework and vessels to freeze, contract and expand, which may cause damaged to the Site's infrastructure	• All external pipework is insulated. Including the hot/cold water systems and the steam/condensate system.	**Very Low**	Ensure all external pipework is insulated and cladded to be sufficiently protected.
Decreases in winter temperatures resulting in restricted access to the site, due to frozen access roads causing disruption to deliveries and site operator attendance.	**Medium**	A fall in winter daily temperatures could increase periods of ice on surrounding road networks impacting access to the Site.	• Site staff undertake gritting/salting of site owned hardstanding in anticipation of and during subzero temperatures. • Daily checks are undertaken and mitigation actions are enacted where required.	**Low**	Liaise with the local authority to ensure maintenance of the primary public access route to the site. Review the impact of icy conditions on access roads within the Accident Management Plan, and development of a contingency plan in case operators and

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Winter daily temperature					
					deliveries cannot access site on a given day. Establish procedures to monitor weather conditions and enact pre-emptive mitigation actions.

2.3 Daily Extreme Rainfall and Average Winter Rainfall

Daily rainfall intensity could increase by up to 20% on today's values and average winter rainfall may increase by over 40% on today's averages. These two weather incidents have been considered together and are presented together in the Risk Assessment given the similar impacts, risks and mitigation methods.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Daily Extreme Rainfall and Average Winter Rainfall					
Surface water flooding or river flooding of the Site.	**Low**	The Site is indicated (Long Term Flood Risk) to be at a very low risk of flooding from surface water,	A Flood Risk Assessment is in place for the Site that details the following:	**Very Low**	Update the flood action plan with reference to the guidance

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Daily Extreme Rainfall and Average Winter Rainfall					
		representing a per annum chance of flooding of less than 0.1%. The yearly chance of river flooding from Glossop Brook is considered to be low. Given the very low risk rating of flooding via from associated surface water flooding and low risk of flooding from rivers, the Site is considered to be at Low risk.	• Local containment with sumps and pumps that transfer effluent offsite. • Production buildings have drainage channels. • Drainage channels are cleaned on a regular basis. • Effluent treatment plant has a capacity of 200,000 litres. • No material stored along the site boundary.		*Preparing for flooding* [2] to include: • Risk assessment of all process equipment and services at risk from flooding; and • Protection of control and electrical systems.
There is the potential for contaminated floodwater or surface water run-off from the Site causing pollution of the Glossop Brook and surrounding area.	**Medium**	Should a flooding event occur that impacts the Site the flood water may become contaminated by chemicals stored on-Site. This contaminated water may then migrate off Site	A Flood Risk Assessment is in place for the Site that details the following: • Local containment with sumps and pumps that transfer effluent offsite. • Storage tanks are stored in bunded areas.	**Low**	Update and the flood action plan with reference to the guidance *Preparing for flooding* [2] to include: • Risk assessment of all process equipment and

[2] Preparing for flooding: a guide for regulated sites - GOV.UK

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Daily Extreme Rainfall and Average Winter Rainfall					
		and subsequently contaminate the Glossop Brook and surrounding area.	• Drain gullies are cleaned on a regular basis. • Only sealed IBC/s and drums are stored outside of buildings. • Solid raw material/product is stored in a designated warehouse. • Building roofs are routinely checked for holes/damage.		services at risk from flooding; and • Relocate storage areas to be outside of areas at risk of flooding.
Potential for drainage systems and interceptors to be overwhelmed.	**Medium**	An increase in rainfall may cause the existing drainage systems to be overwhelmed and unable to cope.	The Accident Management Plan considers the risk of blocked and damaged drains and lists associated risk control measures. The effluent treatment plant has a capacity of 200,000 litres.	**Low**	Review the Accident Management plan to further consider the impact of drainage systems becoming overwhelmed.
Access or egress from site could be affected. Impacting staff, suppliers, deliveries, removals of product, and emergency services.	**Medium**	Portions of the surrounding area and local road network, including access to the Site are indicated to be at a low risk of flooding from Glossop Brook.	• If a flood warning is given for the local area, the Environmental Manager will determine whether areas identified to be at risk need to be made safe.	**Low**	• Liaising with the local authority to ensure maintenance of the primary public access route to the site. • Review the Flood risk action plan to ensure the potential impact to

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Daily Extreme Rainfall and Average Winter Rainfall					
					Site access is considered.

2.4 Drier Summers

Summers could see potentially up to 40% less rain than now.

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Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Drier summers					
Restrictions may be placed on abstraction due to drought that may affect the availability of incoming water for use by the Site.	**Medium**	Site water is supplied by an on-Site borehole operated through an abstraction licence and mains water. The abstraction of groundwater could be restricted should the underlying aquifer be impacted.	• Borehole and mains water consumption is monitored in accordance with the Environmental Management Plan. • Volumes of on-Site groundwater abstracted may be lowered during periods of decreased production output and increased efficiency.	**Low**	Implement and maintain a Water Efficiency Management Plan to include: • Details of how to minimise the abstraction of water at the source; • A plan for rainwater harvesting to

Climate Change Impacts	Judgement		Action		
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Drier summers					
			• The Environment Agency regularly visits Site to inspect the Current Site procedures and activities. • Regular testing and inspection of Site infrastructure is undertaken to ensure compliance and efficiency.		supplement abstracted water; and • The potential for effluent reuse within Site activities and processes.

2.5 River Flow

The flow in the watercourses could be 50% more than now at its peak, and 80% less than now at its lowest.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Mitigation Opportunities
River flow					
Flooding of the Glossop Brook and associated to the east of the Site boundary.	**Medium**	The southern portion of the Site are indicated (Flood Map) to be within Flood Zone 3 and (Long Term Flood Risk) at a medium risk of flooding	A Flood Risk Assessment is in place for the Site that details the following: • No raw materials are stored along the South boundary. • No buildings are located along the South boundary.	**Low**	Update and the flood action plan with reference to the guidance *Preparing for flooding* [2] to include: • Risk assessment of all process equipment and

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Mitigation Opportunities
River flow					
		from rivers representing a per annum chance of flooding of between 1% and 3.3%. Given the potential for a 50% increase in peak water flow within watercourses, there is considered to be a medium risk to the Site from flooding from rivers.	• Local containment with sumps and pumps that transfer effluent offsite. • Option to discharge water to effluent storage tanks. • Effluent plant and transfer pumps are routinely serviced.		services at risk from flooding; and • Protection of control and electrical systems. Investigate the potential for the installation of flood defences.

2.6 Storms

Storms could see a change in frequency and intensity. The unique combination of increased wind speeds, increased rainfall, and lightning during these events provides the potential for more extreme storm impacts.

Climate Change Impacts	Judgement		Action		
Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Storms					
Storms and high winds could damage buildings and other structures with the potential to increase fugitive odour emissions.	**Medium**	Structures present on-Site including the main manufacturing units and associated ancillary structures may be vulnerable to adverse weather comprising increased wind speeds, increased rainfall and lightning events. In the event of storms and high winds, there's a risk of structural damage which could disrupt Site activities operations.	• Visual inspections are undertaken by the warehouse and engineering team and potential damages are captured as part of these planned maintenance checks. • In severe weather conditions, warnings and communications are issued depending on the risks.	**Low**	Update the Accident Management Plan to consider the potential impact to the Site and its structures from storms and high winds. Develop procedures to manage site operations and staff safety in storm events and to inspect and repair any potential damage. Assess lightning protection to site buildings.
Storms could lead to a loss of power on site caused by a lightning strike	**Medium**	The site is a large consumer of energy and therefore a loss of power caused by a lightning strike would lead to a halt in	• Lightning protection is in place on site, such as shatterproof LEDs. • In severe weather conditions, warnings and communications are issued depending on the risks.	**Low**	Assess lightning protection to site buildings and tanks to ensure the protection covers the whole of the site.

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Impact	Initial Risk	Justification of Magnitude	Current Measures on Site	Residual Risk	Potential Mitigation Opportunities
Storms					
		production/processing until the power returned.			Investigate the costs and benefits of installing back-up generators on site in case of a loss of power. Investigate attaining a service level agreement with a provider of back-up generators in an emergency situation.