HAZARD AUDIT REPORT FOR
VISY PULP AND PAPER,
1302 SNOWY MOUNTAINS HIGHWAY,
TUMUT, NSW

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1 December 2021

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Hazard Audit Report for Visy, Tumut

Acknowledgment

The author would like to thank the Visy staff who were involved with the hazard audit for their proactive and enthusiastic approach to the audit.

Disclaimer

Rev	Date	Description	Reviewed By
A	17/11/21	Draft for Comment	Visy
B	27/11/21	Final Issue	Visy
C	1/12/21	Section 2.1 Updated	Visy

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EXECUTIVE SUMMARY

This report constitutes the sixth hazard audit that has been undertaken for the Visy Pulp and Paper Mill at Tumut, NSW. The report is written in accordance with the Department of Planning's Hazard Audit Guidelines.

The scope of the audit covers a critical examination of the systems and procedures, which exist in order to operate and maintain the facility for the purpose for which it was designed. This required a review of the Visy documentation systems at the plant and records of the facility's operational history since the last hazard audit.

The following points summarise the results of this hazard audit:

- All key elements of a typical safety management system, e.g. HIPAP 9 (Ref 3), are in-place;
- The Visy safety management system includes a strong commitment to the safety and well-being of its employees, visitors and contractors;
- The hazards associated with the operations and their control measures to control the corresponding risks are identified via a number of means including risk assessments, HAZOP studies, machine guarding assessments and Job Safety Environment Analyses (JSEA); and
- Previous risk studies have shown that off-site risk is acceptable for this site.

The following recommendations were discussed during the audit and are summarised from the report:

Recommendation No. 1	Review the Australian Standards requirements for machine guarding for the wet end (head box) of paper machine VP9 as there are unguarded nip points, i.e. ensure that the necessary guards are installed.
Recommendation No. 2	Ensure all hoses used for transferring hazardous chemicals are included in the preventative maintenance system for routine integrity checks. For example, the caustic transfer hoses did not have test tags when checked.
Recommendation No. 3	All old hoses used for transferring hazardous chemicals should be disposed of to avoid these being used. For example, some of the caustic transfer hoses viewed at the caustic tank transfer area appeared to be of poor integrity, e.g. bulging in one of the hoses.
Recommendation No. 4	Ensure all tank bunds are kept free of waste material as the caustic tank bund was observed with dirt piles and

	waste materials (there is the potential for corrosion of the concrete under the materials).
Recommendation No. 5	Update drawing TUSTF00040 to show the fire water system modifications for the woodchip area, e.g. the additional hydrants, hose reels, monitors and isolation valves.
Recommendation No. 6	Perform routine maintenance, including valve opening and closing, of the stormwater retention ponds outlet valves to ensure these can be operated in an emergency, e.g. to prevent them from being seized in the one position.
Recommendation No. 7	Visy to review means for maintaining redundant equipment, e.g. the corroded base of the stairs into the former sulphuric acid bund. Typical industry practice is to have a redundant equipment register which requires routine inspections of all redundant equipment to ensure safety is not compromised.
Recommendation No. 8	Perform routine testing of all safety shower / eyewash units emergency pushbuttons including the WWTP pushbutton. This testing could be included in the Work Space Inspections.
Recommendation No. 9	Ensure that the water flow from all safety showers / eyewash units meets the Australian Standard. One suggestion during the audit was to include photographs in the relevant test procedure to provide indication of the required acceptable flow rates.
Recommendation No. 10	Identify all critical non-return valves in the process, e.g. the two on the boiler feed water pump discharge and the oxygen injection line, and include these in the preventative maintenance system for routine inspections.
Recommendation No. 11	Update the management of change procedure to include improved guidance for temporary changes, emergency changes, hazard screening checklists and pre-start safety reviews.

GLOSSARY

AGV	Automatically Guided Vehicles
AS	Australian Standard
CPR	Cardiopulmonary Resuscitation
DCS	Distributed Control System
DISPLAN	District (emergency response) Plan
DoP	Department of Planning
DoPE	Department of Planning and Environment
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
HAZOP	Hazard and Operability Study
HIPAP	Hazardous Industry Planning Advisory Paper
HMI	Human Machine Interface
HSE	Health Safety Environment
HSE UK	Health and Safety Executive United Kingdom
IBC	Intermediate Bulk Container
ISO	International Standards Organisation
JSEA	Job Safety Environmental Analysis
KPI	Key Performance Indicator
ML	Megalitre
NCG	Non-Condensable Gases
NOx	Nitrogen Oxides
P&ID	Piping and Instrumentation Drawing
PPE	Personnel Protective Equipment
PSV	Pressure Safety Valve
RCF	Recycled Fibre
SDS	Safety Data Sheet
VIE	Vacuum Insulated Expander
WWTP	Wastewater Treatment Plant

REPORT

1 INTRODUCTION AND SCOPE OF AUDIT

1.1 OBJECTIVES, REQUIREMENTS AND SCOPE

1.1.1 Audit Objectives

This report constitutes the sixth hazard audit that has been undertaken for the Visy Pulp and Paper Mill at Tumut, NSW.

The hazard audit requirement is stated as follows (Condition 16):

"Twelve months after the commencement of operations of the propose development or within such further period as the Director – General may agree, the Applicant shall carry out a comprehensive hazard audit of the proposed development and submit a report on the audit to the Director – general. Further audits will be required every three years or as may be requested by the Director – General. Hazard audits should be carried out in accordance with the Department's Hazardous Industry Planning Advisory Paper (HIPAP) No. 5, Hazard Audit Guidelines (Ref 1)."

This report is written in accordance with the Department's guidelines (Ref 1).

The fundamental objectives of the hazard audit were:

- To assess whether the operations associated with the Visy facility are being conducted and managed in a manner such that relevant process safety requirements are being met;
- To identify areas where improvements to operational and organisational safeguards are required with respect to safety, health and the environment; and
- To recommend appropriate measures to improve safety, health and environmental deficiencies in the areas identified.

As this is the sixth hazard audit, one of objectives was to review the progress / status regarding any recommendations made in the last hazard audit (Ref 2) and the corresponding follow-up actions.

The audit was conducted by Dean Shewring from Pinnacle Risk Management. The auditor approval is included in Appendix A. The audit was conducted over three days (November 9 to 11, 2021).

1.1.2 Requirements of the Audit

The audit of the facility included both the hardware and safety management systems. The term “hardware” covers the facility’s equipment, instrumentation and control systems, protection systems etc. The term “safety management systems” is used to denote people systems and people factors and covers the following items:

- Organisation (formal, emergency, tasks and roles);
- Methods and procedures;
- Knowledge and skills (operator and maintenance employee training; ability to recognise faults and take corrective action); and
- Attitudes towards tasks (reflecting whether the safety management systems are functioning effectively).

It is essential that the hardware and safety management systems complement each other. For example, elaborate control and protection systems may be built into the installation based on rigorous hazard analysis but without regular inspection and testing their performance would deteriorate so that they would be ineffective when a demand is placed upon them. The performance of the management system of safety controls is a key element in effective risk management.

1.1.3 Scope of the Audit

The scope of the audit covers a critical examination of the systems and procedures, which exist in order to operate and maintain the facility for the purpose for which it was designed. This requires a review of the documentation systems at the facility and records of the facility’s operational history since the last hazard audit. In particular, it requires a review of the degree and frequency with which operating conditions vary from the design intent.

The scope of the audit includes the following topics:

- Plant and process systems;
- Process control;
- Review of operating procedures;
- Process operator training;
- Maintenance procedures;
- Safety training of employees;
- Plant modification control;

- Testing of protection systems;
- Electrical equipment handling;
- Unusual incident reporting;
- Injury / accident reporting;
- Fire protection and training;
- Emergency procedures;
- Safety management systems;
- Security of premises; and
- Environmental protection.

1.2 METHODOLOGY

1.2.1 Basic Approach

This hazard audit has been conducted in compliance with the Department of Planning's Advisory Paper No. 5 (Ref 1).

The remit of the audit was discussed with the responsible Visy personnel prior to the audit. An outline of the scope of the audit was presented prior to the audit proper. This allowed the requirements of the audit to be canvassed within Visy which in turn allowed planning for the appropriate people to be available during the audit.

Some of the documents obtained or sighted during the audit have been listed in Appendix B.

In broad terms, the methodology used was that of conducting detailed discussions with key personnel. Several site tours were conducted. The equipment and operations associated with the facility were reviewed in detail. Personnel within a "vertical cross-section" of the operation were interviewed and/or observed.

The approach to the audit is best summarised as follows (Ref 1):

> *"Generally, checklists or scoring schemes should not be used. They are inflexible and do not facilitate evaluation. They do not question the validity of existing systems and tend to ignore interactions between various parts of the facility. They are least satisfactory when the design is new and many hazards have not been encountered before……*
>
> *In general, a more investigative approach is required. The specific method used to audit the site is left to the discretion of the auditor*

or audit team leader. The auditor may carry out the audit in different ways to evaluate different aspects of the facility's operations. The various elements of the audit may be performed at different levels of detail, depending on the reason for the audit, the nature of hazards at the facility and the scale of the development."

This approach is adopted by Pinnacle Risk Management in conducting hazard audits. Depending on the facility and the associated hazards, the depth of auditing of the required areas of operation is determined by the audit leader both prior to and during the audit. Whilst the guidelines issued by the DoP are used in determining the audit scope, the guidelines themselves are not used as a complete checklist.

1.2.2 Personnel Interviewed

The following personnel were interviewed during the hazard audit:

Matthew O'Donovan	HSE Manager
Luke Manton	Safety Coordinator
Syam Krishna	Environmental Officer
David Bruce	Project Engineer
Uday Bhagwat	Pulp Mill Manager
Ravin Dayanand	Reliability & Maintenance Manager
Altair Zolio	Area Manager-Digester & White Liquor Plant
Andrew Pringle	Reliability & Maintenance Service Manager
Brad Baker	MSD Coordinator
Fonnie Botha	Technical Manager
Carel Kruger	EIC Reliability Manager
Robert Moore	Training Coordinator
Michael Rouse	Training Officer
Carolyn Everingham	Site Administrator
Jaco Olivier	Area Manager – Chemical Recovery, Power and utilities
Peter Hawken	Finishing Specialist -Paper Machine
Don McLeod	Paper Machine Manager
Simon Vaughan	Assistant Paper Machine Manager
Rajesh Lamba	Senior Engineer (EIC)
Troy Watling	Area R&M Manager
Operators	

1.2.3 Summary and Conclusions

The following points summarise the results of this hazard audit:

- All key elements of a typical safety management system, e.g. HIPAP 9 (Ref 3), are in-place;
- The Visy safety management system includes a strong commitment to the safety and well-being of its employees, visitors and contractors;
- The hazards associated with the operations and their control measures to control the corresponding risks are identified via a number of means including risk assessments, HAZOP studies, machine guarding assessments and Job Safety Environment Analyses (JSEA); and
- Previous risk studies have shown that off-site risk is acceptable for this site.

All safety management systems need to be dynamic in nature, i.e. they need constant review and modification if necessary. One of the aims of this audit is to provide assistance in progressing improvements to the existing safety management system. The recommendations made throughout this report are included in an implementation program to monitor improvement progress (see Appendix C). This implementation program will require regular review and updating (of actions that have been completed).

2 SITE OVERVIEW

2.1 SITE LOCATION, SURROUNDING LAND USES AND LAYOUT

The plant is located approximately 7 kilometres west of Tumut in a rural environment. It is surrounded by farmland. The nearest farm house is 2 kilometres to the west. Correspondingly, the more significant risks for off-site effect on people involve odours and noise (other process safety events, e.g. radiant heat from fires, at this site are unlikely to affect people at this distance). Also, being above the valley low point, flooding of the site is unlikely.

See Figure 1 for the site location and Figure 2 for details of the site layout. There have been no major changes to the plant layout since the last hazard audit although there are additional woodchip piles to the northwest corner of the site.

During the audit, the facility layout, building design and construction, site security and utilities were reviewed and inspected. Whilst some of these site areas are discussed in more detail later in this report, no major shortcomings were found in these areas.

The main control room is elevated and located centrally within the plant. It has a concrete slab base for adequate support and protection from incidents which may occur below. During the fifth audit, a review of the possible incidents that could occur around and beneath the control room was performed. No events were identified whose risk would be unacceptable. For example, vapours releases are limited by quantity and measures such as turning off the control room air conditioning can be performed. Overspeed and catastrophic failure of a turbine beneath the control room can occur. This risk is lowered by overspeed protection and the concrete floor for the control room.

Figure 1 – Site Location

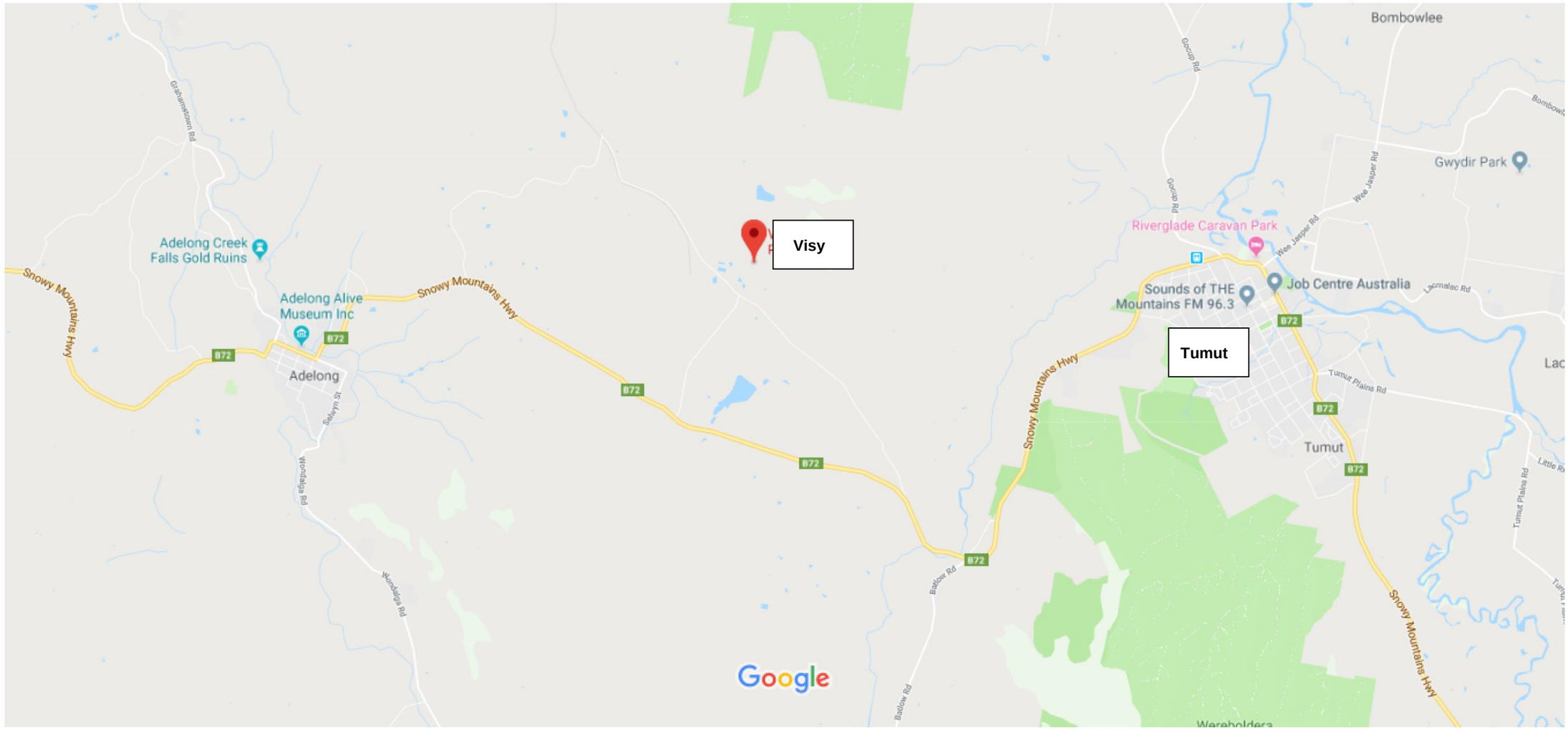
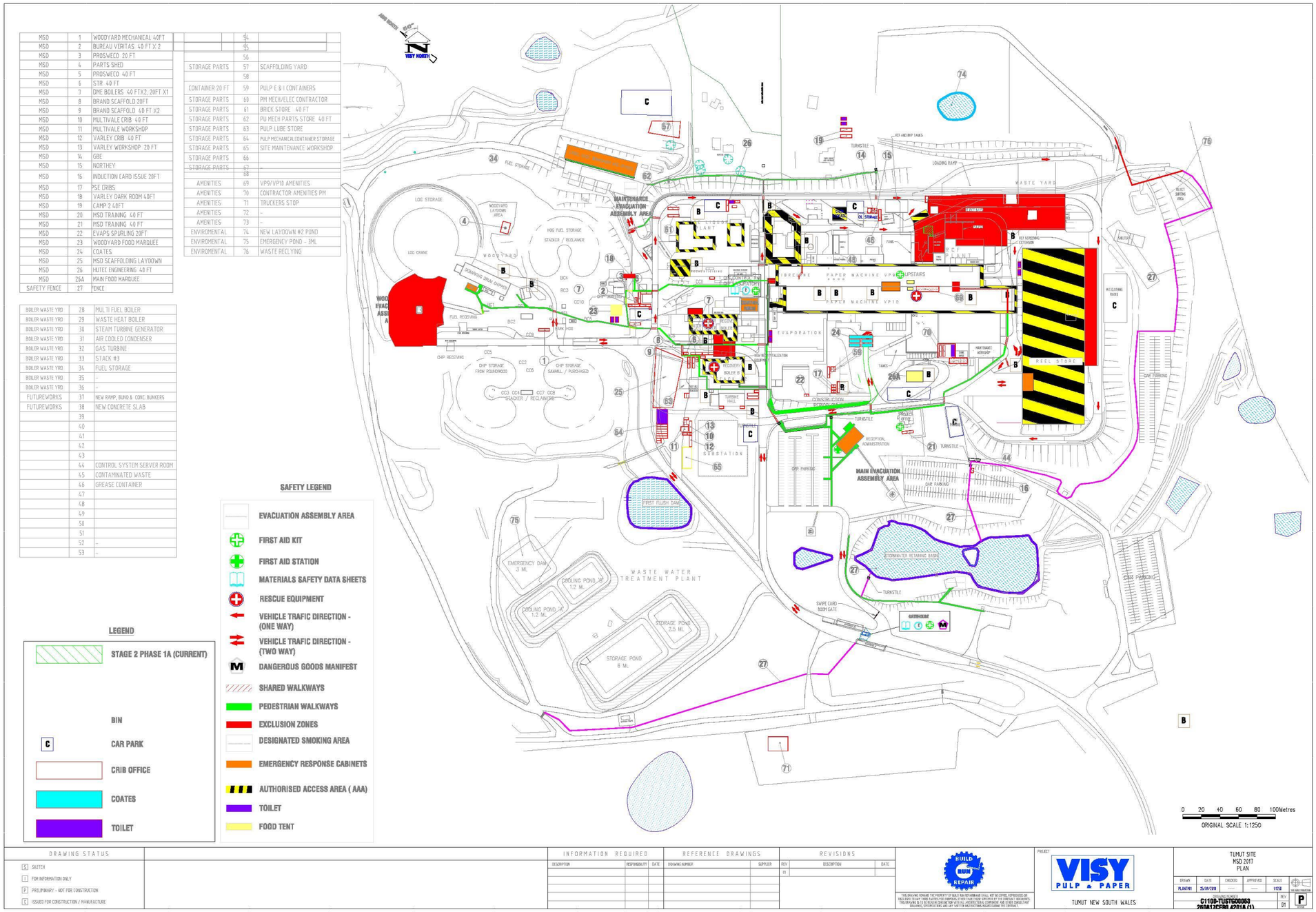


Figure 2 – Site Layout



Security of the site is achieved by a number of means including:

- Permanently manned security gate for the control of people / vehicles into and from the site;
- Full perimeter fencing (rural type and chain mesh);
- Site personnel;
- Night security patrols by operations personnel;
- Closed circuit television to the gatehouse and main control room; and
- The plant has lighting throughout the night to aid observation.

The security system for the site was observed and found to be operating as intended. Due to the COVID pandemic, Visy has implemented a screening and testing program. There has been no virus propagation throughout the site's personnel as a result of this program (this includes the additional workforce required for the last Major Shutdown).

The facility normally operates 7 days per week, 24 hours per day. All personnel gain access via the main gate (either by tapping their site access cards or by signing in as a visitor). As this gate is located away from the plant areas then it can be expected to be safe to use for people / vehicle control in plant emergencies. The swipe cards are also used for personnel accounting purposes during an emergency, i.e. there are readers at the emergency assembly areas.

There are varying numbers of personnel on site (e.g. staff, drivers, visitors etc) during normal working hours. Typically, there are approximately 300 Visy personnel on-site during normal working hours. Given the types of hazards on the site with the training programmes implemented and the protective equipment provided, e.g. fire protection systems and extinguishers, there are sufficient people available to handle a hazardous situation (note that this includes contact with emergency services as per the emergency response plan for larger events).

2.2 PROCESS DESCRIPTION

The mill produces approximately 700,000 te per year of paper using a combination of virgin material (including woodchips)and recycled waste paper and cardboard.

The main components of the mill are:

- Wood yard;
- Kraft pulp mill and recycled paper plant;
- Kraft liner paper mill;
- Water management and recycling scheme; and

- Ancillary infrastructure.

The unbleached Kraft pulp and paper manufacturing process consists of essentially the following main components:

Pulping

Woodchips are mixed with white liquor, which is an aqueous solution of sodium hydroxide and sodium sulphide, and cooked inside the digester at the fibre line. During this chemical pulping, lignin is dissolved from the cellulose fibres required for paper making to yield a liquid by-product called weak black liquor. The cellulose is formed into a slurry, which is washed and refined to produce the pulp required for the paper machine. The weak black liquor which also contains the cooking chemicals is transferred to the chemical and energy recovery process.

Recycled Fibre (RCF)

Waste paper is conveyed into a large vat called a pulper which contains water. A rotor mounted on a vertical shaft on the centroid of the vat cuts the paper into its smallest fibre, eventually turning the mixture into a pulp. The recycled pulp is forced through screens containing holes and slots of various shapes and sizes. These screens remove small contaminants such as plastic, staples and glues. The recycled pulp further undergoes cleaning, separation and refining prior to being transferred to the paper machine.

Chemical and Energy Recovery

The weak black liquor is transferred to the evaporation plant where water along with the volatile components (i.e. non-condensable gases) are evaporated using steam and electrical energy. The water collected as vapour is re-used back in the process in place of fresh water. The non-condensable gases are collected and burned in the recovery boiler. The heavy black liquor which is now over 75% solid is pumped across to the recovery boiler.

The recovery boiler is primarily a chemical recovery process unit in which organic materials in the black liquor are burned while the oxidized sulphur compounds of sodium and potassium are reduced and drained as molten smelt from the furnace bottom (chemical recovery). At the same time, the heat released is used for generation of steam for power and the process (heat recovery).

Paper Making

The resultant pulp is transferred to the headbox of the paper machine from where it is sprayed onto a continuous wide jet onto a large flat wire screen which is moving very quickly through the paper machine. On the screen, water starts to drain from the pulp and the fibres quickly begin to bond together to form a watery sheet. The sheet moves quickly through a series of felt covered press rollers where more water is squeezed from the sheet. The sheet then passes through a series of heated rollers called dryers which dry the paper. Finally, the paper is wound into a large 38 - 50 tonne jumbo roll and removed from the paper machine.

The jumbo roll is rewound and cut into smaller rolls before being transferred to the reel store ready for distribution.

Co-Generation

The power boiler is designed to generate process steam to be used by the mill and is fuelled by wood by-products, natural gas and paper machine rejects. The steam is combined with steam generated from the recovery boiler and sent to a steam turbine generator where electricity is produced and used by the respective mill operations and can be sold into the local electricity grid.

Much of the process water used by the paper making process is recycled back into the process, with the excess water being treated by the wastewater treatment plant (WWTP). The treated effluent is used to support an environmentally sustainable irrigation scheme. Direct discharge to the nearby Sandy Creek is only permitted under extremely wet conditions and after following an established protocol in accordance with the site's Environment Protection Licence, which requires obtaining written approval from the NSW EPA.

Reel Store

The reel store is the main warehouse and distribution centre for the finished paper products. The building is over 14,000 square metres in floor area and a height of 9.5 metres. The paper in the form of tightly wound reels varying in sizes from 800 mm to 3,000 mm long is transferred across from the paper machine building by an elevated conveyor system. The reels are then removed from the conveyor into storage via a self-propelled, automated guided vehicle system.

2.3 PROPERTIES OF MATERIALS

Most of the dangerous goods stored or handled at the plant are either corrosives or flammable liquids or gases. Therefore, potential losses of containment of corrosives leading to on-site injury or environmental impact are possible as well as ignition of the flammable materials. The product (paper) is a combustible solid as are the logs, woodchip and waste paper entering the facility. Liquid oxygen is stored in a two VIEs (vacuum insulated expanders). There are a number of smaller storages (e.g. intermediate Bulk Containers - IBCs) of reagents such as dyes, defoamers and dispersants. Some of the IBCs are stored in a dedicated storage shed (e.g. corrosives, combustibles and oxidisers).

3 HAZARD AUDIT OF PLANT OPERATIONS

3.1 PLANT AND EQUIPMENT

Several trips into the plant areas were made over the three days on site. The process was reviewed from the wood yard to the paper storage warehouse. This included the pulp process, the paper machines, chemical storages and the wastewater treatment plant. Generally, the physical condition of the buildings, containment systems, plant and equipment appeared sound and the site housekeeping was relatively good. There were limited signs of ageing plant problems, e.g. minor corrosion on steel work and concrete.

The changes to the plant and equipment since the previous hazard audit include:

- Installation of a sludge tank at the WWTP;
- Additional stockpile for woodchips;
- New oxygen and carbon dioxide storage tanks and associated equipment given there was a change of supplier;
- Installation of a ventilation system for the paper machine hall; and
- A Safety Upgrade Project for paper machine 10.

All the above areas were reviewed during the audit with additional assessment included throughout this report.

Checks on equipment, including valves, pumps and pipes, indicated appropriate identification by labels and signs.

Generally, for the equipment inspected, all items (including control functions) appeared to be operating satisfactorily. For selected areas of the process, the operating conditions were within the design values. It should be noted that operation outside of the design values for most parts of the process is not possible due to process control and equipment specifications (e.g. centrifugal pumps rated for less than design pressures and pressure safety valves (PSV) on the boilers).

Records of plant performance are kept within the DCS (distributed control system).

Master Piping and Instrumentation Diagrams (P&IDs) are kept within an electronic document management system. These drawings are updated on an as needs basis. The red line mark-ups are logged in the document management system for updating. In recent years, P&ID as-built checks have been performed, e.g. the digester.

Underground services drawings include fire water and electrical services.

There are pressure vessels on the site, e.g. the digester, and these are routinely inspected and tested as per AS 1210 (the Unfired Pressure Vessel standard). Some PSV test tags were reviewed during the audit and the PSVs test program found to be up-to-date.

A review of the site utilities was undertaken. Power and water have proven to be mostly reliable in supply (some blackouts experienced). Should these services fail then the process fails safe as material flow is stopped, the automatic valves close and the drives stop. For emergency power, there is a steam driven turbine which can provide approximately 60% of the power requirements (i.e. to the more critical users). For emergency instrument air, there are two instrument air compressors and a receiver for emergency shutdown air supply. Given the reviews performed, no significant hazardous scenarios were determined for loss of a utility. However, odours could be released in a shutdown if a failure of the flare system also occurs at the same time (off-site irritation effects).

Fire (break glass type), emergency stop / local isolation buttons and lanyards at several locations throughout the site were inspected and appeared to be suitably located.

Observations within the control room and discussions with various operations staff showed that they generally had an adequate level of understanding of the hazards involved and what to do in an emergency, and that the plant was operated safely.

An inspection of the warehouse used for storing the rolls of paper was undertaken. Precautions such as bollards are implemented to improve safety from a “domino effect” involving rolls of paper falling and propagating to adjacent rolls. Stacking height and aisle width was typical of such warehouses. The paper rolls are moved within the warehouse by Automatically Guided Vehicles (AGVs), i.e. these are controlled remotely by the warehouse operators. There are sensors on all sides of the AGVs to detect potential impacts that shut down the vehicle.

As pulp and paper processes involve large machines (e.g. debarking and chipping operations and the paper machines), there exists the possibility of people contacting moving parts. Machine guarding is typically used to avoid injuries. In addition to this, other control measures used at the site include restrictions on when and where people can be (e.g. log truck drivers remain in a cabin remote from the transfer of logs from their vehicles), screens (e.g. around the paper machines), signage and painted yellow and green walkways.

The plant was reviewed by the HAZOP technique when built.

There is no known asbestos on site.

Given the observations made during the plant visits, the following recommendation is made.

Recommendation No. 1 Review the Australian Standards requirements for machine guarding for the wet end (head box) of paper machine VP9 as there are unguarded nip

points, i.e. ensure that the necessary guards are installed.

3.2 LOADING AND UNLOADING OPERATIONS

Materials transported by truck into site include logs, woodchips, chemicals (both in bulk and packaged forms) and waste paper for recycling. The log trucks deliveries are more frequent than the chemical deliveries. Materials transported away from site mostly involve the finished product (i.e. rolls of paper inside large articulated semi-trailers) although there are a small number of solid waste products leaving the site by road (e.g. office and plant solid wastes).

The chemical transfer equipment was inspected. There were no signs of major leaks in the transfer areas. To date, no significant problems involving large losses of containment have been encountered with the unloading operations.

The receiving tank levels are monitored by instrumentation. There are level indictors and high level alarms installed to prevent overflows. Tank overflows are piped to bunded areas.

Unloading areas include bunding to contain spills. There are fire extinguishers and safety shower / eyewash stations installed. There are also hydrants and foam making equipment nearby for major firefighting.

Other safety features associated with the unloading bays and operations include:

- Drivers of bulk road tankers can perform emergency stops by shutting down the transfer pumps;
- An earth strap is used for the turpentine road tanker;
- There are operating procedures for the transfer operations;
- Visy specify that brake interlocks are required for all bulk chemical road tankers as a means to prevent drive-away;
- The unloading areas are bunded and drain to containment pits for treatment / disposal; and
- Drivers are inducted to the site's safety procedures.

Other materials brought into the facility includes the packaged chemicals in IBCs. These are removed via fork lift truck and placed into the desired positions. There is a Dangerous Goods storage shed for the IBCs and drums. This has been designed for hazardous areas with natural ventilation installed (open mesh door and wall sections under the roof).

The paper roll loading (product) area was observed and found to be operating safely at the time of the audit. Also, the housekeeping in this area was adequate.

All material loaded / unloaded is recorded in the Visy transport records system. A weighbridge is located adjacent to the main gate for records of weights entering / leaving the site.

Off-site transportation takes place via various transport companies. Visy personnel are available to offer any assistance for off-site emergencies if requested.

Given the observations made during the plant visits, the following recommendations are made.

Recommendation No. 2 Ensure all hoses used for transferring hazardous chemicals are included in the preventative maintenance system for routine integrity checks. For example, the caustic transfer hoses did not have test tags when checked.

Recommendation No. 3 All old hoses used for transferring hazardous chemicals should be disposed of to avoid these being used. For example, some of the caustic transfer hoses viewed at the caustic tank transfer area appeared to be of poor integrity, e.g. bulging in one of the hoses.

3.3 STORAGES

There are various types of chemicals stored in small to large volumes throughout the site. These chemicals mostly involve corrosives (e.g. caustic soda and formic acid), flammable liquids (turpentine and methanol) and non-dangerous materials. The product paper rolls are stored in the finished goods warehouse. Liquid oxygen is stored in two VIEs and liquid carbon dioxide is stored in one vessel. Dangerous Goods signage is installed at the appropriate locations.

The storage areas are generally kept in good mechanical condition. All areas where chemicals are stored are bunded to prevent groundwater contamination. Losses of containment can be either handled and/or neutralised in containment pits / bunds or held in the site catchment ponds for further treatment.

Tank levels are determined by instrumentation. There are high level alarms to help prevent tank overflow.

Packaged goods are stored in marked depot areas and in the Dangerous Goods shed. No incompatible materials were observed in the same areas.

Materials inventories are stored within a computer system which details information such as the amounts of raw materials and products stored on the facility.

The tank and roadway layout provides enough space for operation and access in an emergency.

The main potential fire risks with respect to the storage tanks are the methanol tank and the turpentine storage. As the flammable liquids' storage areas involve fixed piping and compliant tanks then the likelihood of a release is low. If such an event were to occur, hydrants and foam making equipment is available for emergency response.

Since the previous hazard audit, the roof of one black liquor tank has been replaced and the other black liquor tank is under repair. This is due to corrosion. The tanks' shells and floors have been checked and so far, no major rectification work has been required. The impact of the releases via the corroded roofs was odour emissions (with both on site and off site impacts).

Given the observations made during the plant visits, the following recommendation is made.

Recommendation No. 4 Ensure all tank bunds are kept free of waste material as the caustic tank bund was observed with dirt piles and waste materials (there is the potential for corrosion of the concrete under the materials).

3.4 PROCESS CONTROL

The operations are controlled by various computer control systems, e.g. a DCS for routine control and various local control systems (e.g. local tank level readouts for road tanker transfers and local operating consoles for the paper machines). Process control is performed via clearly represented screens at the operator interface terminals in the main control room and within the paper machine control room. The computer control systems have so far proven reliable.

The computer control systems operations include setpoints (e.g. tank levels), trips, interlocks, valve opening/closing and motor run / fault indications. A history of control operations and process alarms is available via DCS trending and printouts. To supplement the computing systems, process monitoring is also performed by operator walk-arounds.

For backup power supply in an emergency, there is a UPS for the computer control system. Manual control of the plant is also possible via the DCS.

There are a number of emergency shutdowns (machine stops) located around the facility. Upon activation, the emergency functions include shutting the appropriate valves and stopping the appropriate pumps / drives.

Observations of the computer control systems during the audit indicated that the process monitoring and control was performed well. The operating personnel involved in this audit showed a high level of understanding of how to operate the computer control system.

Any trip defeats are logged in a register for managing. Approval is required for a trip defeat.

No unsafe failure modes were determined during the audit.

3.5 FIRE SAFETY

A review of the fire prevention, detection and protection systems for the facility was conducted. The original fire prevention, detection and protection systems were reviewed in a Fire Safety Study (Ref 4). The facility's fire protection equipment has been extended since 2001 given the expansion projects. Generally, the review performed during this audit indicated that the fire protection equipment has been installed and maintained as per the requirements of the plant design intent.

Fire water is stored in a dam in the hills above the facility (dam capacity is 193 ML). Therefore, the pressure of the supply water is the static head from the dam to the facility (minus some friction losses). Water is pumped from the Tumut River to the dam when levels drop (dam water level monitoring is installed).

There are two pipes (375 mm diameter) supplying water to the facility with an interconnection between the pipes. Normally, one pipe will supply fire water; the other supplies process water. If one pipe becomes blocked or unavailable then the interconnection can be opened to maintain supply. Water supply is monitored as it is critical to both plant operation and fire safety. The water supply pipes are routinely flushed to lower the likelihood of blockages.

There are three diesel fire water pumps for boosting pressure into the supply mains (two duty pumps; one standby). The system has the capacity to meet the most hydraulically disadvantaged case. The fire water pump station is suitably located away from hazardous equipment. Also, fire brigade booster connections exist and can be used should the main supply pumps fail.

The fire water systems were inspected. The equipment has been kept in good working order. Clear signage has been installed to indicate how to manually operate the fire water system. Fire Indicator Panels (FIPs) are located at the main control room, the site gate and at the fire water pump house. Testing of the diesel pumps is performed weekly and a yearly flow test is performed.

There are a number of hydrants and fixed monitors located throughout the facility which are supplied with fire water from the pumps. Fire hoses are stored locally to the fire hydrants and are routinely inspected. Foam supplies and equipment exist throughout the facility. There are seven monitors (cannons) installed around the waste paper recycling storage area. These monitors are inspected monthly and water tested annually. Also, extinguishers are located at selected locations throughout the site.

The fire water mains include isolation valves. These are partially stroked monthly and fully stroked annually to ensure they are free to move if a pipe break occurs and isolation is required.

Fire protection for the paper end of the paper making machine is via a fixed fire water system (thermal bulb initiation). Sprinklers are also installed within the covered conveyor feeding woodchips to the process. These sprinklers are routinely cleaned to remove wood dust buildup (this could impact their operation).

The facility's fire protection equipment is maintained by the specialist subcontractors (to the requirements of AS 1851, "Maintenance of Fire Protection Equipment"). Test tags were in-place for the equipment checked during the audit.

Fire training for shift personnel occurs and includes use of fire extinguishers, fire blankets, fire hose reels, layout flat hoses and breathing apparatus use. The site also has a fire truck with in excess of 3,000 L water storage. There is currently an additional fire truck at the site (on loan from the local fire service). The emergency response team perform special routine fire training.

Fire water can be contained on-site. Note that significant quantities of contaminated fire water runoff are not expected due to most of the chemicals being corrosive, i.e. non-flammable and therefore of low fire risk. Should contaminated fire water occur, then it should be captured in either the bunded areas or the stormwater system which has ample capacity for fire water retention. The containment capacity is large (2 to 4 ML) for process reasons and hence fire water volumes are unlikely to overflow the dams. All dams are lined to prevent ground water contamination.

Generally, all fire prevention, detection and prevention systems inspected appeared to be in good condition.

Since the previous hazard audit, Visy has:

- Conduct a simulated emergency exercise with the involvement of the local fire brigade; and
- Installed further hydrants and/or monitors to provide coverage of the waste paper storage area.

The recommendation from this area of the audit is as follows.

Recommendation No. 5 Update drawing TUSTF00040 to show the fire water system modifications for the woodchip area, e.g. the additional hydrants, hose reels, monitors and isolation valves.

3.6 ENVIRONMENTAL PROTECTION

Environmental systems to reduce or eliminate contamination of air, soil, surface water and groundwater systems were evaluated.

Generally, the equipment and systems aimed at protecting the environment appeared appropriate to the types of materials handled on site, with staff showing a good understanding of the relevant environmental issues (including potential contamination of stormwater, odorous emissions, and Environment Protection Authority (EPA) licence conditions).

The site operates under an Environment Protection Licence issued by the EPA.

It is noted that the environmental protection systems were subjected to a comprehensive environmental audit in November 2020 with the results to be issued to the Government. There were no major issues found.

Liquid Waste:

Stormwater and Effluent

Stormwater catchment within the plant boundary is contained within two retention ponds prior to release to the local creek (subject to testing). The ponds can hold up to 4 ML of stormwater (e.g. including runoff from the wood yard) and are clay lined. The ponds can be isolated via gate valves should a spill occur.

Much of the process water used by the paper making process is recycled back into the process with the excess being treated by the mill's Wastewater Treatment Plant (WWTP). The WWTP also processes domestic liquid waste.

Initially, the untreated effluent flows to the cooling ponds and then to the SBR (sequence batch reactor) for treatment. The cooling ponds are HDPE (high density polyethylene) lined. Since the previous hazard audit, a sludge tank has been installed prior to the effluent entering the ponds and SBR. This is to allow sludge settling to avoid the need to manually clean the sludge from the ponds. The treated effluent then flows to the winter storage dam which is clay lined or recycled to the cooling water towers.

The treated effluent is used to support an environmentally sustainable irrigation scheme. Direct discharge to the nearby creek is only permitted under extremely wet conditions and after following an established procedure, i.e. properly notifying local authorities and the community in accordance with the mill's Operating Licence conditions. Treated effluent is tested prior to use as irrigation water, e.g. checks on phosphorous, nitrogen and zinc concentrations, pH, total dissolved solids, biological oxygen demand, sodium absorption ratio, and oils and greases.

Stormwater from some roofed areas and roadways around the perimeter of the plant can runoff to soil. Given the level of housekeeping observed during the audit, this design does not pose unacceptable environmental hazards.

There are 18 testing bores located at the farm. These bores are tested regularly for groundwater quality. An additional 30 bores were installed in 2005 / 2006. Since the last hazard audit there have been no off-specification bore test results.

Other Liquid Wastes

Hazardous wastes, e.g. oils and laboratory wastes, are collected in drums and disposed of via a licensed contractor.

Liquid turpentine produced from the process is stored in a tank. Approximately twice per month, the turpentine is unloaded from this tank and removed from site via licensed contractors.

Solid Waste

Solid wastes such as sludges from pits and general plant, workshop and office wastes are managed on an 'as needs' basis and are disposed of in accordance with EPA guidelines.

Non-hazardous wastes, e.g. fly ash and waste plastic from the recycling facility, are disposed to land fill.

Gaseous Emissions

The NCGs (non-condensable gases) produced within the process are normally burnt in the following unit operations (in order of preference):

- Recovery boiler A;
- Power boiler; and
- Flare.

That is, if there is a process upset, the NCGs can be burnt in the site flare. In the unlikely event that the flare is not available then the NCGs are vented to atmosphere. Venting of NCGs is recorded as an unusual incident. Monitoring and testing of atmospheric emissions is continuous with additional samples analysed every 3 and 12 months (e.g. metals and NOx).

The plant generates odour which can travel off-site. Odour complaint audits are conducted every three months with the results being sent to the EPA. There is an established process for handling any off-site complaints due to odour emissions. Over the last three years, off-site odour complaints have reduced (by approximately 40%). This is partly due to the roof replacement of one of the black liquor tanks.

Spill Management

Absorbent material is available at the facility.

Larger spills can be prevented from causing off-site impact by isolating the gate valve on the outlet of the stormwater retention ponds. Closing of these valves is included in the emergency procedures. Should oils pass through to the stormwater retention ponds then booms are available for containing the slick.

The recommendation from this area of the audit is as follows.

Recommendation No. 6	Perform routine maintenance, including valve opening and closing, of the stormwater retention ponds outlet valves to ensure these can be operated in an emergency, e.g. to prevent them from being seized in the one position.

4 HAZARD AUDIT OF MANAGEMENT SYSTEMS

Visy is committed to ensuring the health, safety and welfare of all of its employees, and all contractors and visitors on its sites. In order to achieve this, Visy has in place an integrated HSE (health, safety and environment) management system. The overarching document of the HSE management system is the Safety Policy, which applies across the Visy group.

Visy's HSE management system is based on a risk management approach, addressing identified risks from highest to lowest to safeguard people, the environment and assets from harmful situations. It is available electronically via the Visy Management System portal.

The site has an externally certified HSE management system. The management system is based on HSE Policies, HSE standards, supporting plans, procedures, guidelines, codes of practice / minimum standards and forms / templates.

Visy Tumut's HSE management system is externally certified against AS 45001, ISO 14001 and ISO 9001.

A critical component of the HSE Management system is to ensure that the site has effective systems, procedures and training in place to handle potential emergency situations.

Auditing of the compliance with the company requirements is achieved by a number of means including:

1) Site personnel conduct audits to check whether items such as PPE (personal protective equipment) is available and in working order;

2) Internal audits by senior Visy personnel; and

3) External audits such as hazard audits and environmental compliance auditing (i.e. independent industry reviews).

The site General Manager has responsibility for overall safety and environmental protection. There is a plant safety committee which meets every month to discuss incidents and general HSE matters. Actions from the meetings are minuted and only closed-off when all personnel involved in the process are satisfied with the outcomes. Incident investigations are performed internally and typically involve a number of people from operations.

Safe work practices and loss prevention methods include the following:

- Toolbox meetings and JSEAs (job safety environmental analyses);
- A purpose-built suite of operating procedures which include the hazards of the tasks performed;
- Use of hazardous event identification techniques such as HAZOP;

- Safety committee meetings, and;
- Compliance with the requirements of the National Pollutants Inventory regulations.

Visy hold regular community meetings to discuss plant operation and any issues.

4.1 PLANT PROCEDURES, RECORDS AND OTHER DOCUMENTATION

4.1.1 Operating Procedures

Operating procedures exist for the activities performed at this facility, e.g. the Recovery Boiler operation. The operating procedures are written by the relevant area supervisors and then reviewed by the operators. Any changes are agreed to by the appropriate senior manager (e.g. the Pulp Mill Manager).

The operating procedures include information such as hazards, PPE and tasks. Photos are included to help avoid any ambiguity when performing a task.

The digester acid wash procedure was reviewed during the audit as a follow-up to one of the previous audits recommendations, i.e.

> *Include the relevant hazards and their associated controls in the digester acid wash procedure. The hazards include hydrogen sulphide, formic acid (corrosive and flammable) and high temperatures.*

These hazards have been included in the procedure and other relevant documentation for the digester acid wash process.

Internal audits are used as checks on how well the procedures are being followed.

The procedures include actions to take in an emergency (e.g. the Recovery Boiler manual includes information on a smelt explosion and what actions to take if preliminary signs indicate that an explosion is possible). The procedures also include startup and shutdown requirements and their hazards.

Assessment of how well the requirements of the procedures are known by the plant operators is included in the operator training program. Should an incident occur where there was a breakdown in the procedures, an incident review is performed. The incident reviews assess people and activities with the objective of improvement if deficiencies are found.

Activities that do not have written procedures are reviewed for hazards by conducting a JSEA.

Discussions with operations personnel indicated good knowledge of the procedures, i.e. tasks to perform, knowledge of hazards and actions to take in an emergency.

New operators are constantly supervised until appropriate training has been received.

4.1.2 Maintenance Procedures, Permits, Testing and Records

Maintenance programs and test records are kept within a computer system (IFS) and/or in hard copy form. The mechanical engineers for the various operational areas monitor the system and records, and initiate the required maintenance activities. Root cause analysis is used to track equipment items' histories and to check for recurring causes and the reason(s) for these.

KPIs (key performance indicators) are used to track compliance with the preventative and corrective maintenance requirements.

The results of the maintenance activities are received via written reports and are analysed by the mechanical engineers to determine if any follow-up action is required. Maintenance can be performed by Visy personnel or by appropriate external contracting companies.

Maintenance frequencies were reviewed during the audit. For the selected equipment, the maintenance frequencies were typical of industry values, e.g. the log crane has both weekly inspections and three monthly mechanical checks. The preventative maintenance requirements are automatically generated from IFS.

All of the site's pressure vessels maintenance records are kept within IFS. Relief valves are included on a list and are either changed annually or Trevi tested. Test certificates are received for each relief valve following the test. Bursting discs are typically replaced every 3 to 5 years (e.g. to avoid fouling on the inside preventing operation on demand).

The installation and operation of the chloride removal plant has significantly reduced the potential for corrosion inside the recovery boiler (as per the recent inspection results).

Visy performs maintenance on the oxygen equipment downstream of the oxygen supplier's tanks and vaporiser. A Health and Safety Executive (HSE UK) oxygen hazards guideline is attached to each permit to ensure the unique oxygen hazards are known to the maintenance technicians.

For maintenance activities, a Work Permit is prepared. This includes the production and checking of a JSEA. Any special precautions, e.g. hazard mitigation, are included on the Work Permit. The person performing the task is responsible for producing the required JSEA.

Visy work supervisors locally manage the people performing the work. This person is the permit holder and JSEA reviewer. The permit issuers are the appropriately trained senior operators.

Line or equipment venting and isolation are performed by the operators prior to handover for the maintenance to begin. Isolation requirements are included in

the work permit. Operations management then issue the clearance to maintenance personnel to perform the work.

The Work Permits used at the site are as follows:

- General Work Permit;
- Hot Work Permit;
- Excavation Permit;
- High Voltage Permit; and
- Confined Space Entry Permit.

Only trained personnel can issue the work permits. At the end of each day, the permits are required to be given back to the original issuer.

Management conducts routine work permit checks to ensure the system is being used as required, e.g. correct signatures are in-place, the JSEAs are adequate and the appropriate personal protective equipment is being used.

Corrective maintenance requests can be initiated by any employee.

With the exception of simple maintenance activities, vendor manuals are used as required, e.g. the supplier's maintenance manual for the paper machine.

A lock-out / tag-out system is in place. Isolations are performed by the maintenance personnel and are checked by the operations personnel. Electrical isolations (padlocks) are applied on the switchroom isolators and circuits are tested for dead using meters.

Single line diagrams and underground services drawings are available.

All emergency stop buttons and lanyards are tested six monthly.

Low voltage equipment is isolated (locked) in the motor control centres. High voltage equipment is isolated locally and at the high voltage switch gear.

Manual racking is performed within the high voltage switchroom. To reduce the risk associated with arc flash, this activity is only conducted by trained personnel wearing appropriate PPE as per the Visy procedure.

Should replacement parts be required, materials of construction are determined by existing supplier information, by details of installed parts, specifications in the supplier's manuals or by supplier recommendations.

The contractor management procedure is typical for industry of this type. Contractor selection is performed via Pegasus, an industry electronic system for contractor management. Visy specify their requirements and these are included in the Pegasus procurement system. Inductions are both on-line and face-to-

face. If a contractor's licence has expired then their access swipe card is automatically blocked.

Hazardous area drawings have been produced for the site. The hazardous area dossier is still being finalised.

Workplace inspections are performed to ensure all plant and equipment is operating adequately and safely.

The following observations were made during the audit:

- The base of the stairs into the former sulphuric acid bund has significant corrosion;
- The emergency push button at the WWTP safety shower / eyewash unit does not appear to have been tested recently given the amount of dust and dirt accumulation;
- The water flow from the WWTP eyewash unit was not as good as other units and some of the nozzles appeared to be partially blocked; and
- Non-return valves in critical services do not appear to be routinely inspected and maintained, e.g. on the discharge of the boiler feed water pumps (these prevent reverse flow from the 110 barg boiler that could lead to catastrophic failure of the pump and overpressure of the deaerator) and the oxygen dosing system (these help to prevent reverse flow from the process into the pure oxygen system and hence the risk of oxygen fires in the piping system).

Given these observations, the following recommendations are made.

Recommendation No. 7	Visy to review means for maintaining redundant equipment, e.g. the corroded base of the stairs into the former sulphuric acid bund. Typical industry practice is to have a redundant equipment register which requires routine inspections of all redundant equipment to ensure safety is not compromised.
Recommendation No. 8	Perform routine testing of all safety shower / eyewash units emergency pushbuttons including the WWTP pushbutton. This testing could be included in the Work Space Inspections.
Recommendation No. 9	Ensure that the water flow from all safety showers / eyewash units meets the Australian Standard. One suggestion during the audit was to include photographs in the relevant test procedure to provide indication of the required acceptable flow rates.
Recommendation No. 10	Identify all critical non-return valves in the process, e.g. the two on the boiler feed water pump discharge and the oxygen injection line, and include these in the

preventative maintenance system for routine inspections.

4.1.3 Plant Modification

Changes are described on the change form, circulated for agreement and when approved, implemented as per the requirements on the form. The form has not been revised since the previous hazard audit.

As per the findings of the previous hazard audit, the modification form and procedure are relatively simple. For example, they do not include any structured, rigorous checks of what process and plant items could be affected as a result of the change, guidance for handling temporary changes and emergency changes, and how to ensure the installed change is ready for operation (e.g. a pre-start safety review). This led to the following recommendation from the previous hazard audit and correspondingly is included in this audit. Pinnacle Risk Management has provided to Visy example information to help with the recommendation follow-up, e.g. example pre-start safety reviews.

Recommendation No. 11 Update the management of change procedure to include improved guidance for temporary changes, emergency changes, hazard screening checklists and pre-start safety reviews.

One of the more significant projects since the previous hazard audit is the Winder Safety Upgrade Project for paper machine 10. As per the hazard audit guidelines (Ref 1), subsequent audits should review the changes that have occurred to a site. Correspondingly, this project was reviewed with the following observations based on discussions with operators and area managers as well as equipment inspection:

- Function testing of the safety upgrades was performed by the project contractor;
- The upgraded machine had been in operation for approximately three weeks at the time of the audit;
- The project needs to install safety signs, e.g. “Do Not Enter” signs at the pope winder access gate;
- Operators were involved in the HAZOP study but there was no evidence to confirm that they were involved in other design reviews, e.g. layout reviews;
- A revised operating procedure was not available at the time of the audit;
- The operators involved in the discussion had not received any training on the changes. This included the additions to the HMI (Human Machine Interface) control panel. This has led to the operators self-learning as well as learning from each other; and

- Based on the discussions with the operators, it appears that they are spending more time within the machine than previously, e.g. to press the newly installed reset buttons.

As recommended in the previous hazard audit, a robust management of change system including a pre-start safety review prior to operation will help to prevent the above observations such as operating equipment without an updated procedure and training of the operators. No further recommendations are made; recommendation 11 above, if implemented appropriately, will prevent these types of issues in future projects.

4.1.4 Material Safety Data Sheets

Safety Data Sheets (SDSs) hard copies are kept on-site (at the main control room, the administration building and the gatehouse). The current SDSs of plant chemicals (including dangerous goods and hazardous substances) were reviewed. The reviewed SDSs are not more than 5 years old and hence meet one of the requirements of the Workplace Hazardous Substances regulations.

4.2 OPERATOR TRAINING

Elements of the training practices have been discussed throughout this report. A summarised description of operator and safety training is given below.

Operators receive training via a number of means. These include:

- Induction training which includes hazards awareness. This includes site, process areas and unit operations specific induction training;
- On-the-job training in Visy procedures from supervisors and management;
- Chemical awareness training (e.g. review of SDSs and the hazards of hydrogen sulphide);
- External courses (e.g. firefighting), and;
- Group discussions such as tool box talks and plant meetings.

Training records (matrices) were reviewed and show such details as employee name, training program and date completed.

Training procedures are developed by the area managers and include the plant operating procedures. Process operator training is typically conducted one-on-one and is evaluated by observation from the trained assessors, completion of checklists and audits. Precautions to take and why they are required are integral to the operating procedures and the knowledge and competency tests (e.g. correct use of PPE). Non-trained personnel are not permitted to perform the relevant operations by themselves, i.e. initially a 'hands-in-pockets' approach.

If new materials are introduced to the site, a review involving SDSs is conducted to determine if any new hazards are present and, if any, what additional precautions are necessary. The latter is included in the operating procedures.

Routine safety training includes:

- Firefighting skills, e.g. annual extinguisher and fire hose training;
- Confined space rescue (every two years);
- Emergency drills;
- First aid (yearly); and
- CPR (cardiopulmonary resuscitation) (yearly).

Records are kept for each employee. There is a Contractors Induction Handbook and contractors are included in the safety training.

For each shift, there are approximately four to six people trained in first aid, firefighting and confined space rescue.

Retraining is performed for activities such as first aid, CPR and isolations (e.g. the use of red personal locks and green locks for equipment).

There are no further recommendations for this area of the audit.

4.3 EMERGENCY PLANNING

An emergency response plan (ERP) exists for the facility. It is currently planned to be updated. Copies are distributed to selected personnel.

The sites emergency response procedures are based on AS 3745-2010 (Planning for Emergencies in Facilities) and includes:

- Emergency Planning Committee;
- Principals of emergency control and response;
- An Emergency Control Organisation;
- Identified potential emergency scenarios/types;
- Initial response to emergencies:
    - Roles cards and procedures based on potential scenarios;
    - Raising alarms and response;
    - Traffic control;
    - Evacuation;
    - First aid capability;
    - Terminating an emergency;
    - Interaction with other agencies; and
    - Training.

The ERP includes events such as fires, explosions and spills. Contact numbers, e.g. police, ambulance and fire brigade, are given. The ERP acknowledges the Tumut DISPLAN.

Simulated emergency exercises are performed (at least once per year). There are approximately 20 members of the site's emergency response team. At least one of these members is trained in a scenario per month. Members of the local Rural Fire Service, and Fire and Rescue NSW branches visit site once per year for emergency preparedness.

A record of who is on the facility is kept by the security guard at the main gate (this includes employees and contractors who swipe their access cards on entry

/ exit and visitors). This provides a basis for performing a roll-call of those evacuated.

Given the site layout, there is adequate site access / egress for emergency vehicles via the main gate and perimeter road.

The emergency alarm can be activated by push button in the control room or by break glass fire buttons.

During the audit, a First Aid box and several spill response kits were inspected and found to be adequately stocked.

5 SITE HISTORY

5.1 INCIDENT HISTORY

Unusual incidents, near misses, injuries and observations (hazards, risks and safety observations) are reported via an incident report form. The incidents are entered into 'Noggin' (an electronic management system).

Incident investigations are performed internally and can involve a number of people from operations. Actions generated from the analysis of the incident are publicised, e.g. via the safety committee members and tool box talk meetings. As the actions are within Noggin then automatic notifications are sent to the responsible people re the need to address and close-out the actions. Key performance indicators are used to track the generated actions, in particular, any overdue actions.

The recorded incidents for the last three years were reviewed (i.e. the incident records since the last hazard audit). There were no major hazardous events with off-site impact recorded. Visy personnel have a strong reporting culture. Since the last hazard audit, there have been approximately 800 incidents recorded. Of these incidents, 23 were categorised as Major or Extreme (i.e. the potential consequences of the incident such as electric shocks, chemical exposure and JSEA breaches could have been major or extreme). There were no Major or Extreme environmental incidents. There was one process safety incident, i.e. a tank overflow. This was reviewed and appropriate actions have been taken, e.g. improvements in tank level monitoring and protection.

Of the 23 Major or Extreme incidents, five were associated with work at heights. Visy personnel are aware of these recurring incidents and are taking actions to lower the associated risks.

To lower the likelihood of near-misses and incidents occurring, each employee needs to perform at least two safety observations per month.

The incident reporting system is used by various people (i.e. not just the one or two more diligent employees).

5.2 PREVIOUS STUDIES

The recommendations from the last hazard audit (Ref 2) were reviewed.

In summary, all recommendations have been assessed and addressed with the exception of Recommendation 11. This recommendation has been included in this report also as Recommendation 11.

It is understood that there have been no other major projects with associated Conditions of Consent Hazard Studies in the last three years.

6 APPENDIX A – DPIE APPROVAL CORRESPONDENCE

Appendix A – DPIE Approval Correspondence

Planning, Industry & Environment

Mr Syam Krishna
Environmental Officer
Visy Pulp & Paper Tumut
1302 Snowy Mountains Highway
Tumut NSW 2720

Contact: Nicholas Hon
Phone: (02) 9274 6344
E-mail: nicholas.hon@planning.nsw.gov.au

Dear Mr Krishna

Visy Pulp & Paper Facility, Tumut (MP 06_0159) – Approval of Auditor for 2021 Hazard Audit

I refer to your request through the Department's Major Projects website, requesting the Planning Secretary's approval for Mr Dean Shewring of Pinnacle Risk Management to conduct the 2021 Hazard Audit at the above facility in accordance with Condition 3.14 of the consent.

Having considered the qualifications and experience of Mr Shewring, approval is granted for Mr Shewring to conduct the 2021 Hazard Audit in accordance with the condition.

Please ensure that the 2021 Hazard Audit is carried out in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 5, 'Hazard Audit'*.

Please note that this approval is only applicable for the 2021 Hazard Audit and further approval must be sought for any future Hazard Audit required under the consent.

Please contact Nicholas Hon if there are any queries on the above.

Yours sincerely

5 November 2021

Joanna Bakopanos
A/Director
Industry Assessments
As the Planning Secretary's delegate

7 APPENDIX B – DOCUMENTS OBTAINED OR SIGHTED

Appendix B – Documents Obtained or Sighted

Document Name / Type
Emergency Response Plan
Environmental Records
Visy Policies
Visy Management Systems Procedures
Incidents Reports
Modification Procedure
Winder Safety Upgrade HAZOP Report
Plant Operating Procedures
Digester Acid Wash Procedure
Training Records
SDSs
Single Line Diagrams
Fire Protection Drawings
Hazardous Area Drawings
Hazardous Area Dossier
Piping and Instrumentation Diagrams
Audit Records
Work Permit Forms and Procedure
Maintenance Records
JSEA Records
Major Shutdown Portal

8 APPENDIX C - VISY HAZARD AUDIT RECOMMENDATIONS IMPLEMENTATION PROGRAM

Hazard Audit Report for Visy, Tumut

Appendix C - Visy Hazard Audit Recommendations Implementation Program

Item No.	Hazard Audit Recommendation	Proposed Action	Responsibility	Target Completion Date
1	Review the Australian Standards requirements for machine guarding for the wet end (head box) of paper machine VP9 as there are unguarded nip points, i.e. ensure that the necessary guards are installed.	Undertake risk assessment in accordance with Australian standard for guarding for the Paper Machine wetend area. Create WO/CAPEX to improve the guarding where possible.	Troy Watling	31/10/2022
2	Ensure all hoses used for transferring hazardous chemicals are included in the preventative maintenance system for routine integrity checks. For example, the caustic transfer hoses did not have test tags when checked.	Create regular inspection on all chemical transfer hoses. Investigate external provider to undertake the periodic inspections.	Fonnie Botha	31/03/2022
3	All old hoses used for transferring hazardous chemicals should be disposed of to avoid these being used. For example, some of the caustic transfer hoses viewed at the caustic tank transfer area appeared to be of poor integrity, e.g. bulging in one of the hoses.	Same as item 2. Do regular inspections and ensure old hoses are not used.	Fonnie Botha	31/01/2022
4	Ensure all tank bunds are kept free of waste material as the caustic tank bund was observed with dirt piles and waste materials (there is the potential for corrosion of the concrete under the materials).	Tank bund inspections to be included as part of the routine housekeeping inspections. Have these added to the shift logs.	Syam Krishna	15/01/2022

Item No.	Hazard Audit Recommendation	Proposed Action	Responsibility	Target Completion Date
5	Update drawing TUSTF00040 to show the fire water system modifications for the woodchip area, e.g. the additional hydrants, hose reels, monitors and isolation valves.	Update the drawing reflecting the modifications.	Andrew Pringle	31/03/2022
6	Perform routine maintenance, including valve opening and closing, of the stormwater retention ponds outlet valves to ensure these can be operated in an emergency, e.g. to prevent them from being seized in the one position	Monthly checks to be done on stormwater valves to ensure they can be operated in an emergency.	Syam Krishna	31/01/2022
7	Visy to review means for maintaining redundant equipment, e.g. the corroded base of the stairs into the former sulphuric acid bund. Typical industry practice is to have a redundant equipment register which requires routine inspections of all redundant equipment to ensure safety is not compromised.	Redundant equipment registers to be developed. Also, undertake regular inspection on the equipment.	Ravin Dayanand	30/11/2022
8	Perform routine testing of all safety shower / eyewash units emergency pushbuttons including the WWTP pushbutton. This testing could be included in the Work Space Inspections	Add this to WSI monthly inspection. Update register to include emergency push buttons for safety showers.	Luke Manton	31/03/2022
9	Ensure that the water flow from all safety showers / eyewash units meets the Australian Standard. One suggestion during the audit was to include photographs in the relevant test procedure to provide indication of the required acceptable flow rates.	Set up regular inspections for site-maintenance and incorporate into Annual checks with external provider.	Luke Manton	31/03/2022

Item No.	Hazard Audit Recommendation	Proposed Action	Responsibility	Target Completion Date
10	Identify all critical non-return valves in the process, e.g. the two on the boiler feed water pump discharge and the oxygen injection line, and include these in the preventative maintenance system for routine inspections.	Annual PM to be put in IFS for maintenance.	Syed Hussain	30/06/2022
11	Update the management of change procedure to include improved guidance for temporary changes, emergency changes, hazard screening checklists and pre-start safety reviews.	This is an ongoing action from 2018. The procedure to be updated as recommended.	Andrew Pringle	30/11/2022

9 REFERENCES

1 Department of Planning NSW, *Hazardous Industry Planning Advisory Paper No. 5: Hazard Audit Guidelines,* 2011

2 Pinnacle Risk Management, *Hazard Audit Report for Visy Pulp and Paper, 1302 Snowy Mountains Highway, Tumut, NSW*, 14 January 2019

3 Planning NSW, *Hazardous Industry Planning Advisory Paper No. 9: Safety Management;* NSW Government, Sydney

4 Environmental Audits of Australia, *Fire Safety Study for Visy Pulp and Paper, Tumut Mill*, August 2001