



Application for a licence amendment

Division 3, Part V *Environmental Protection Act 1986*

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| Licence number | L8870/2014/1 |
| Licence holder | Tronox Pigment Bunbury Ltd |
| ACN | 008 683 627 |
| File number | DER2014/003202-1~4 |
| Premises | Kemerton Pigment Plant 869 Marriott Road, WELLESLEY WA 6233 |
| | Legal description - Part of Lot 1 on Plan 73196 |
| Date of report | 17/06/2024 |
| Decision | Revised licence granted |

1. Amendment description

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the existing licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is hereby given under section 59B(9) of the EP Act.

This amendment primarily relates to liquid waste acceptance and processing at the Kemerton Pigment Plant, which is subject to licence L8870/2014/1.

In completing the assessment documented in this report, the department has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

1.1 Purpose and scope of assessment

A licence amendment application was submitted by Tronox Pigment Bunbury Ltd (Tronox; licence holder) on 13 February 2024, seeking approval to increase the amount of slurry residue accepted at the Kemerton Pigment Plant (premises) and alter the way in which it is managed onsite.

A concurrent amendment application was submitted to the department on 2 February 2024, relating to changes to the ocean outfall diffuser, and changes to the licence holder and premises names. These proposed changes have been assessed separately and are therefore not included in this report.

1.2 Background

Tronox operates the Kemerton Pigment Plant, a category 31 (chemical manufacturing), category 87 (fuel burning) and category 61 (liquid waste facility) premises, within the Kemerton Industrial Park, 15 km north-east of Bunbury. It produces titanium dioxide chemicals for use in pigments, powders and catalysts. The premises has been in operation since 1989.

The premises includes a neutralisation plant to treat by-products from the pigment production process. The neutralisation plant is used to treat solid residue slurry separated from the gas stream, which mainly consists of metal chlorides, oxides, hydroxides, various silicates, unreacted ore and coke. In the process, lime is added to a series of tanks to raise the pH and precipitate the contaminants as hydroxides. The waste mixture is then sent to a clarifier where the solids settle.

Tronox also operates the Australind Finishing Plant. The slurry waste stream from the Australind and Kemerton plants is collected and stored onsite, then transported offsite via a tanker truck to the Cleanaway Dardanup Waste Facility. As the two purpose-built cells for the storage of Tronox residue at the Dardanup Waste Facility are nearing capacity, the licence holder is proposing to change from external slurry disposal to internal solid residue placement at the Tronox operated Mineral Residue Facility at Cooljarloo mine, and therefore divert material from the Dardanup Waste Facility.

2. Proposed amendments

- **Filter press plant**

In order to be able to treat mineral process waste residue onsite and convert it to a solid waste, the licence holder is proposing to install a filter press plant at the premises.

Construction and installation

A concrete hardstand is proposed to be constructed for a 35 m (length) x 7 m (width) x 16 m (height) filter press shed and filter cake storage area. Two pre-fabricated filter press units will be installed inside the filter press shed on an elevated platform. The filter cake waste will drop from directly below the elevated filter press into a waste receptacle at ground level. The filter press supporting infrastructure bund will house a filtrate tank, filtered water tank, air

compressors (for the filter squeeze, cake drying and instrument air), pumps and pipes. The area will be surrounded by a concrete bund for secondary containment. A prefabricated electrical substation will be positioned east of the filter press shed and will contain the transformer and switchgear to operate the new equipment.

A truck load-out bay is proposed to be constructed using asphalt and separated from a concrete front-end loader pad by a segregation bund. The front-end loader pad will have a concrete bund and hardstands that slope towards a drain that reports to a sump (secondary containment). Runoff and drainage from this area will be collected and recycled into the existing neutralisation plant.

An underground concrete culvert, approximately 90 m long, will be constructed to link the new filter press area with the existing slurry residue tank. This culvert will also house other piped services including filtered water.

See Figure 1 for layout of filter press plant and associated infrastructure.

Commissioning and operation

It is proposed that there will be two separate filter presses installed to allow for redundancy in the case of required maintenance. Each filter press is expected to be capable of treating 75% capacity of the wastewater effluent stream, with total capacity being 150%. The filter presses are expected to reduce the moisture content of the mineral processing residue from 85% to between 40% and 60%. This drier, lower volume filtered residue is known as filter cake.

The filter press plant will undergo commissioning to ensure that the filter cake can be classified as solid in accordance with the *Landfill Waste Classification and Waste Definitions* (DWER, 2019). Material that is not classified as solid is not able to be accepted at the Cooljarloo site. Before the plant is handed over to the operations team from the installation contractor, it will be subject to the following stages of commissioning:

- dry commissioning (running equipment with no load);
- wet commissioning phase 1 (simulating operation with water only); and
- wet commissioning phase 2 (same as phase 1, but with the addition of processing material instead of water).

If one unit is offline and the feed tanks become full then the plant will be shut down or production rates reduced so that the one operational filter press has capacity for the throughput. It is expected there will be one complete filter press operation up to every one to three hours, resulting in an estimated production capacity of approximately 35,000 tonnes per year per press. At the completion of each filter press cycle, the filter cake will fall from the machine into a concrete bunker. Several times each day, a front-end loader will collect the filter cake from the bunker and load it into a truck, ready for transport to the mineral residue facility at Tronox's Cooljarloo mine site. The treated wastewater will continue to be disposed of via the existing ocean outfall as per the current licence.

Commissioning is anticipated to be completed within 5 months.

- **Waste acceptance**

The licence already includes Category 61: liquid waste facility, being a premises on which liquid waste produced on another premises is stored, reprocessed, treated or irrigated. The approved production capacity is 600,000 tonnes of liquid waste per annual period. Category 61 was included in the licence in 2015 to authorise acceptance of up to 100,000 m³ of wastewater per annual period from the Kemerton Silicon Smelter (L6341/1988/10) and up to 500,000 m³ of TiO₂ residue leachate per annual period from the Cleanaway Banksia Road Landfill Site (L7439/1998/9).

With the installation of the filter press plant and the ability to process slurry residue at the premises, the licence holder is seeking authorisation to accept up to 5,000 m³ of slurry residue per annual period from the Australind Finishing Plant for processing. Therefore, an increase in

the Category 61 production capacity of 5,000 tonnes per annual period is required.

The Australind Finishing Plant slurry residue is proposed to arrive at the premises via a tanker truck and unloaded into the feed tank where it will be mixed with slurry residue from the Kemerton Pigment Plant to be processed through the filter press plant and disposed offsite at Tronox's Cooljarloo mine site.

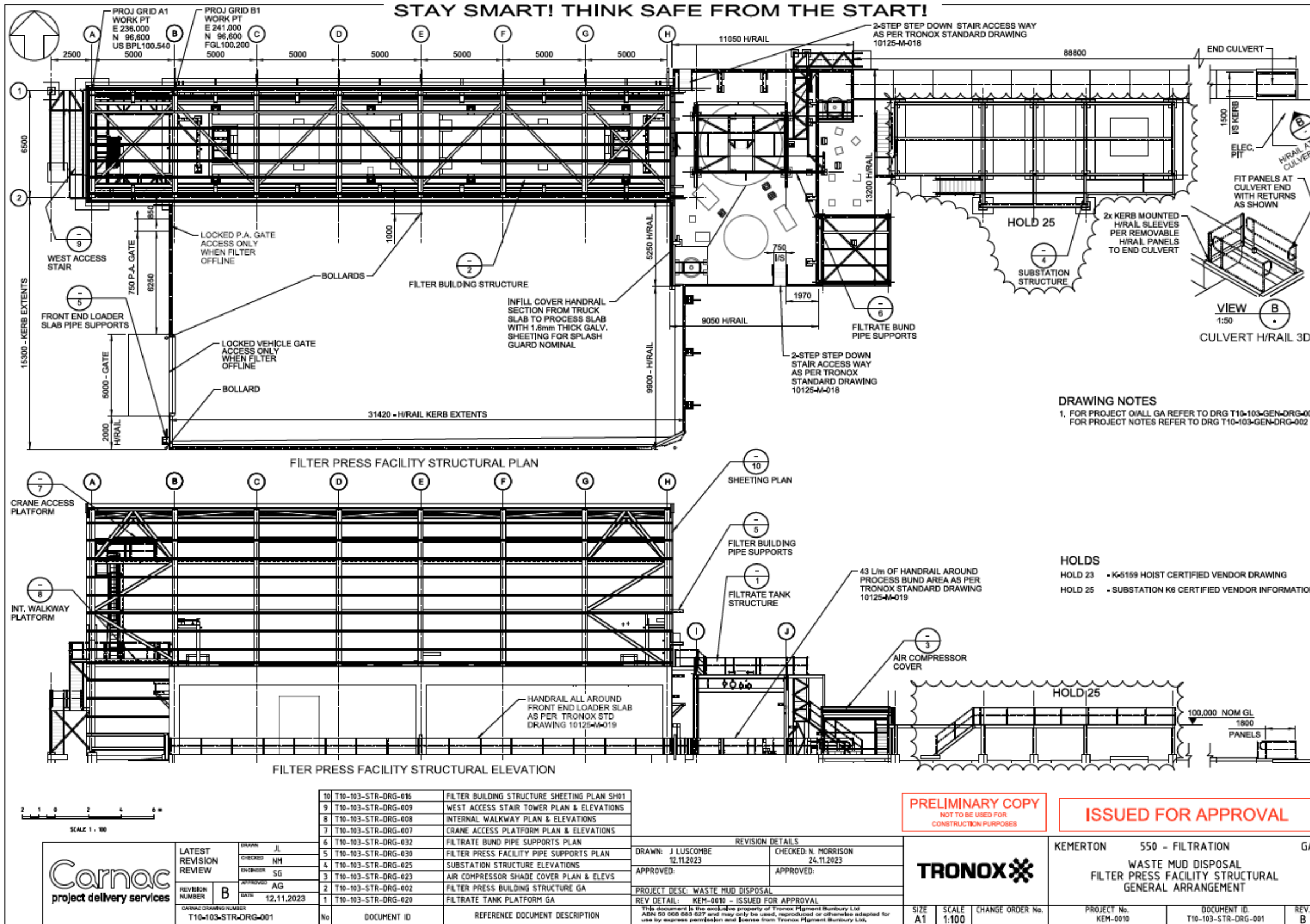


Figure 1: Filter press plant and associated infrastructure

Table 1: Proposed licence holder controls

| Emission | Sources | Potential pathways | Proposed controls |
|--|---|--|---|
| Construction | | | |
| Dust | Excavation, compaction and construction and installation works of the hardstands, filter presses and associated infrastructure (mobile plant and equipment) | Air/windborne pathway | A water cart or other dust suppression systems (e.g., sprinklers) and access to sufficient water supply will be maintained on-site. Vehicle speeds will be limited to less than 25 km/hr at the site. Dust generating construction works will be conducted between the hours of 0700 and 1900 Monday to Saturday, excluding public holidays. Site has adequate separation distance to noise sensitive premises. |
| Noise | | | Noise generating construction works will be conducted between the hours of 0600 and 1900 Monday to Saturday, excluding public holidays. Site has adequate separation distance to noise sensitive premises. |
| Operation | | | |
| Dust | Filter cake dropping from filter press into the filter cake bund | Air/windborne pathway | Filter cake is expected to have a moisture content of around 40% - 60%. Filter cake bunker has walls on three sides, assisting in preventing wind blown dust generation. Regular site inspections. Regular hose down of concrete filter cake bunker if dust generation becoming excessive. |
| | Loading treated solid residue into trucks | | Filter cake is expected to have a moisture content of around 40% - 60%. Hose fitted to front-end loader pad for regular hose down clean ups. Truck parking up area is located outside of the bunded front-end loader pad to prevent dust generation via tyre tracking. Cleaning of any spills of filter cake after each truck loading (options available include hose down draining to sump). The front-end loader is the only vehicle permitted to operate in the bunded front-end loader pad to prevent dust generation via tyre tracking. Truck parking up area cleaned regularly. |
| Process liquid waste: treated solid residue (TSR) leachate containing radionuclides and bio-accumulating metals. | Overtopping, rupture, loss of containment | Direct discharge to land and infiltration to groundwater | Front-end loader pad and filter press shed floor is: <ul style="list-style-type: none"> - bunded for secondary containment; and - sloped to a perimeter collection sump to collect run-off. Collection sump is fitted with: <ul style="list-style-type: none"> - pumps to pump back to feed tank; and - level indicators and alarms in event of overtopping. Filtrate return tank level is measured continuously with an alarm that sounds when at 90% capacity. Pipelines transferring waste are within a secondary containment culvert which directs any spills to a sump. Existing spill management procedures will be applied and spill kits readily available. |

3. Risk assessment

The table below describes the risk events associated with the amendments consistent with the *Guidance Statement: Risk Assessments* (DER 2017). The table identifies whether the risk events are acceptable and tolerated, or unacceptable and not tolerated, and the appropriate treatment and degree of regulatory control, where required.

| Risk Event | | | | Consequence rating ¹ | Likelihood rating ¹ | Risk ¹ | Reasoning | Regulatory controls |
|--|---|--|--|--|---|---|--|---|
| Source/ Activities | Potential emissions | Potential receptors, pathway and impact | Licence holder controls | | | | | |
| CONSTRUCTION AND INSTALLATION – FILTER PRESS PLANT | | | | | | | | |
| Construction and installation of the filter press (mobile plant and equipment) | Dust | Air/windborne pathway causing impacts to health and amenity of residences 3km west and 2km south-east. | A water cart or other dust suppression systems (e.g., sprinklers) and access to sufficient water supply will be maintained on-site. Vehicle speeds will be limited to less than 25 km/hr at the site. Dust generating construction works will be conducted between the hours of 0700 and 1900 Monday to Saturday, excluding public holidays. Site has adequate separation distance to dust sensitive premises. | Minor Minimal offsite impacts at a local scale | Rare Risk event may only occur in exceptional circumstances | Low Acceptable and will not be subject to controls | The delegated officer considers that there is sufficient separation distance in place from residential offsite receptors and does not reasonably foresee that dust from construction and installation works will impact on off-site human receptors. | Nil |
| | Noise | | Noise generating construction works will be conducted between the hours of 0600 and 1900 Monday to Saturday, excluding public holidays. Site has adequate separation distance to noise sensitive premises. | Slight Minimal onsite impacts | Unlikely Risk event will probably not occur in most circumstances | Low Acceptable and will not be subject to controls | The delegated officer considers that there is sufficient separation distance in place from residential offsite receptors and does not reasonably foresee that noise from construction and installation works will impact on off-site human receptors. The <i>Environmental Protection (Noise) Regulations 1997</i> apply. | Nil |
| OPERATION – FILTER PRESS PLANT | | | | | | | | |
| Filter cake dropping from filter press into the filter cake bund | Solid residue dust, containing metal hydroxides, including sodium aluminate scale | Air/windborne pathway causing impacts to health and amenity of residences 3km west and 2km south-east. | Filter cake is expected to have a moisture content of around 40% - 60%. Filter cake bunker has walls on three sides, assisting in preventing wind blown dust generation. Regular site inspections. Regular hose down of concrete filter cake bunker if dust generation becoming excessive. | Minor Minimal offsite impacts at a local scale | Unlikely Risk event will probably not occur in most circumstances | Medium Acceptable subject to regulatory controls | Given the composition of the filter cake, there is an inherent risk to human health if the residue dust from it dropping from the filter press and being loaded into trucks is not contained. The licence holder has proposed infrastructure controls including: - a three walled concrete bunker for the filter cake that drops from the filter press; and - a bunded front-end loader pad which is separate to the truck park up area to prevent dust generation from tyre tracking. | Infrastructure conditions: Works installation controls and compliance reporting requirements have been included. |
| Loading treated solid residue into trucks | | | Filter cake is expected to have a moisture content of around 40% - 60%. Hose fitted to front-end loader pad for regular hose down clean ups. Truck parking up area is located outside of the bunded front-end loader pad to prevent dust generation via tyre tracking. Cleaning of any spills of filter cake after each truck loading (options available include hose down draining to sump). The front-end loader is the only vehicle permitted to operate in the bunded front-end loader pad to prevent dust generation via tyre tracking. Truck parking up area cleaned regularly. | Minor Minimal offsite impacts at a local scale | Unlikely Risk event could occur at some time | Medium Acceptable subject to regulatory controls | Given the separation between the filter press plant and the nearest off-site receptor (2 km), the delegated officer considers the risk of impacts from solid residue dust to be acceptable provided the licence holder's infrastructure controls are implemented. Therefore, these controls have been included in the licence in conjunction with compliance reporting requirements to ensure these specifications are enforced. | |
| Overtopping, rupture, loss of containment | | | Process liquid waste- treated solid residue (TSR) leachate containing radionuclides | Direct discharge to land, infiltration to groundwater causing degradation of soils and | Front-end loader pad and filter press shed floor is: - bunded for secondary containment; - sloped to a perimeter collection sump to collect run-off; Collection sump is fitted with: | Moderate Low level offsite impacts at a local scale | Unlikely Risk event will probably not occur in most circumstances | |

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|--|--|--|--|--|--|--|---|---|
| | and bio-accumulating metals. | groundwater quality, impacting on nearby watercourses and ecosystems including Wellesley River (1.7km southeast) and a threatened ecological community (TEC) onsite, west and south of filter press. | <ul style="list-style-type: none"> - pumps to pump back to feed tank; and - level indicators and alarms in event of overtopping. <p>Filtrate return tank level is measured continuously with an alarm that sounds when at 90% capacity.</p> <p>Pipelines transferring waste are within a secondary containment culvert which directs any spills to the sump.</p> | | | | <p>infrastructure, and collection sumps to prevent the discharge of process liquid waste from the filter press plant.</p> <p>The delegated officer considers the above infrastructure controls are required to mitigate the risk of land contamination due to containment loss, therefore has imposed the licence holder's controls as infrastructure requirements in the licence.</p> <p>Additionally, the licence holder has suggested that the collection sump and filtrate return tank will be fit with indicators and alarms that will sound when liquid levels approach sump/tank capacity. This will allow operators to make necessary adjustments, including potentially stopping the filter cycle before a release of liquid waste occurs.</p> <p>The delegated officer considers these operational controls are required to mitigate the risk of land contamination due to containment loss therefore has imposed the licence holder's controls as operational requirements in the licence.</p> | Infrastructure table added to specify operational and maintenance requirements. |
| OPERATION – INCREASE IN WASTE ACCEPTANCE (CATEGORY 31) | | | | | | | | |
| Treated solid residue slurry from the Australind Finishing Plant | Process liquid waste- treated solid residue (TSR) leachate containing radionuclides and bio-accumulating metals. | The inclusion of Category 61: Liquid waste facility in the licence was assessed and approved in 2015, authorising the acceptance of up to 100,000 m ³ of wastewater per annual period from the Kemerton Silicon Smelter (L6341/1988/10) and up to 500,000 m ³ of TiO ₂ residue leachate per annual period from the Cleanaway Banksia Road Landfill Site (L7439/1998/9). The delegated officer considers that the increase of 5,000 m ³ of residue slurry acceptance per annual period will not significantly alter the risk profile of the premises and so a detailed risk assessment is not required. | | | | | Increase in assessed production limit of Category 61: Liquid waste facility to 605,000 tonnes per annual period has been included. Waste acceptance specifications have been included. | |

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Guidance Statement: Risk Assessments (DER 2017).

4. Decision

The delegated officer has completed an assessment of the application and determined to grant the licence amendment. The licence amendment will be subject to conditions consistent with the risk assessment outcomes and generally reflect the licence holder's proposed controls that were considered reasonable and adequate to manage the risk of unacceptable impacts.

4.1 Filter press plant installation and operation

The licence holder proposes to install a filter press plant to convert the current slurry process residue to a solid residue (filter cake) to then be placed in the Tronox operated Mineral Residue Facility at Tronox's Cooljarloo mine.

The key emissions associated with the installation of the filter press plant are noise and dust emissions during construction of the hardstands and installation of the filter presses and containment infrastructure. The delegated officer determined that a works approval is not required due to the minor nature of these works and the consideration that the potential risks associated are consistent with those from operational activities. Furthermore, the delegated officer has had regard to the location of the works within the context of the whole premises activities, and the distance to sensitive receptors in the decision not to apply regulatory controls to dust or noise emissions during the construction phase to the amended licence.

The key emission associated with the normal operation of the filter press plant is solid residue dust, containing metal hydroxides, including sodium aluminate scale, that has the potential to cause health and amenity impacts to nearby human receptors. The nearest off-site human receptor is 2 km from the premises. This to be a sufficient separation distance to mitigate risk, provided the delegated officer considers the proposed construction of a three-walled concrete bunker into which the filter cake will drop from the filter press, and the bunded front end loader pad provides adequate controls to mitigate dust impacting on the nearest off-site human receptor which is 2 km away. Therefore, these have been included as construction controls in the works section of the licence amendment and will need to be verified as being built to specification in mandatory compliance reporting, also required by the licence amendment.

Given the composition of the process residue and filter cake (including bioaccumulating metals), there is an inherent risk of soil and groundwater quality degradation, impacting on nearby watercourses and ecosystems in the event of loss of containment. The delegated officer considers the licence holder's infrastructure controls, including impermeable hardstands, secondary containment infrastructure, and collection sumps are required to mitigate the risk of land contamination due to containment loss, and therefore has imposed them as infrastructure requirements in the licence. Additionally, it will be a requirement of the licence to maintain adequate freeboard in the sumps and have level indicators and alarms functioning on the sumps and feed tank which will sound at 90% capacity, to mitigate risk of overflowing.

4.2 Increase in waste acceptance

The licence holder proposes to transport up to 5,000 m³ per annual period of Australind Pigment Plant slurry residue to the Kemerton Pigment Plant to be processed through the proposed filter press plant. Hence, an increase in the assessed production capacity of category 31: Liquid waste facility is required. The existing licence authorises the acceptance of up to 600,000 tonnes of liquid waste per annual period, which includes 500,000 tonnes of a similar waste (TSR leachate) from the licence holder's cell at the Banksia Road Landfill Site. The delegated officer considers the proposed increase in waste acceptance will not significantly alter the risk profile of the premises since the category was approved on the licence in 2015. Therefore, a risk assessment is not warranted. The assessed production

capacity of Category 61 and the waste acceptance specifications conditions in the licence have been amended to authorise the proposed increase.

With regard to the proposed licence holder controls, the delegated officer has determined to grant the amendment subject to regulatory conditions as outlined in Section 5.1.

4.3 Consolidation

In amending the licence, the delegated officer has also:

- updated the format and appearance of the licence;
- revised condition numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- corrected clerical mistakes and unintentional errors.

The decision report for the previous licence will remain on the DWER website for future reference and will act as a record of DWER’s decision making.

4.4 Licence holder comments on draft decision

The licence holder was provided with the draft documents on 24 May 2024. A response was received by the Department on 7 June 2024, which included an updated map of the ocean outfall pipeline and diffuser and updated information of the expected production capacity of the proposed filter press plant. These changes have been reflected in the final licence and amendment report, respectively.

5. Conclusion

Based on this assessment, it has been determined to amend the existing licence, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

The below table provides a summary of the proposed amendments and will act as a record of implemented changes. All proposed changes have been incorporated into the revised works approval as part of the amendment process.

| Condition no. | Proposed amendments |
|----------------------------|---|
| Cover page | Restructured to clearly indicate what prescribed activities have been risk assessed. Assessed production capacity of Category 61 Liquid waste facility has been amended. |
| Introduction | Deleted, consistent with current DWER template. This guidance is now available in DWER’s Guide to Licensing (June 2019). |
| Interpretation | Inserted, consistent with current DWER template. Supersedes previous conditions 1.1.3, 1.1.4 & 1.1.5. |
| History | Updated, consistent with current DWER template. |
| Conditions 1.3.1 and 1.3.2 | Updated into condition 18. Treated solid residue slurry from Australind Finishing Plant added as accepted waste. |
| - | Table 1: Infrastructure and equipment requirements table added. |
| Conditions 1.3.3 and 1.3.4 | Containment infrastructure requirements incorporated into Table 1. |
| Table 2.2.1 and 2.3.1 | Tables deleted. Table 2: Authorised discharge points, added. Incorporates all discharge points. |
| Table 2.2.3 and 2.3.3 | Tables deleted. Table 5: Management actions, added. Incorporates all management actions. |
| Conditions 3.1.1 and 3.1.2 | Deleted, redundant condition. Information has been incorporated into Tables 6, 7, 8, 9 and 10. |

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| Condition 3.2.2 | Deleted. Information incorporated into Table 6. |
| Conditions 4.1.1 – 4.1.1 | Deleted, redundant condition. Superseded by conditions 19 – 22. |
| Table 5.1 | Now Table 16. Edited to include “item” column. Edited to include Filter press plant works. |
| Condition 5.2 | Edited to allow for separate compliance reports for each new item of infrastructure in the works table. |
| Condition 5.3 | Edited to include sub-conditions (a) and (b) regarding requirements of the Environmental Compliance Report for the filter press plant. |
| Condition 5.4 | Edited for clarity on monitoring requirements being specific to item 1 Table 16. |
| Schedule 1: Maps | Figure 3: Updated map of the ocean outfall pipeline and diffuser added. |
| | Figure 5: Proposed filter press plant location, map added. |
| Schedule 2: Reporting and notification forms | Attachments Form AR1 and RATA1 added. |

Caron Goodbourn
MANAGER, PROCESS INDUSTRIES
REGULATORY SERVICES

An officer delegated by the CEO under section 20 of the EP Act

References

1. Department of Environment Regulation (DER) 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2019, *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)*, Perth, Western Australia.
3. DWER 2019, *Guideline: Decision Making*, Perth, Western Australia.
4. Tronox Pigment Bunbury Ltd 2024, *Kemerton Pigmanet Plant. L8870 Licence amendment request – filter press installation supporting document*, Kemerton, Western Australia.