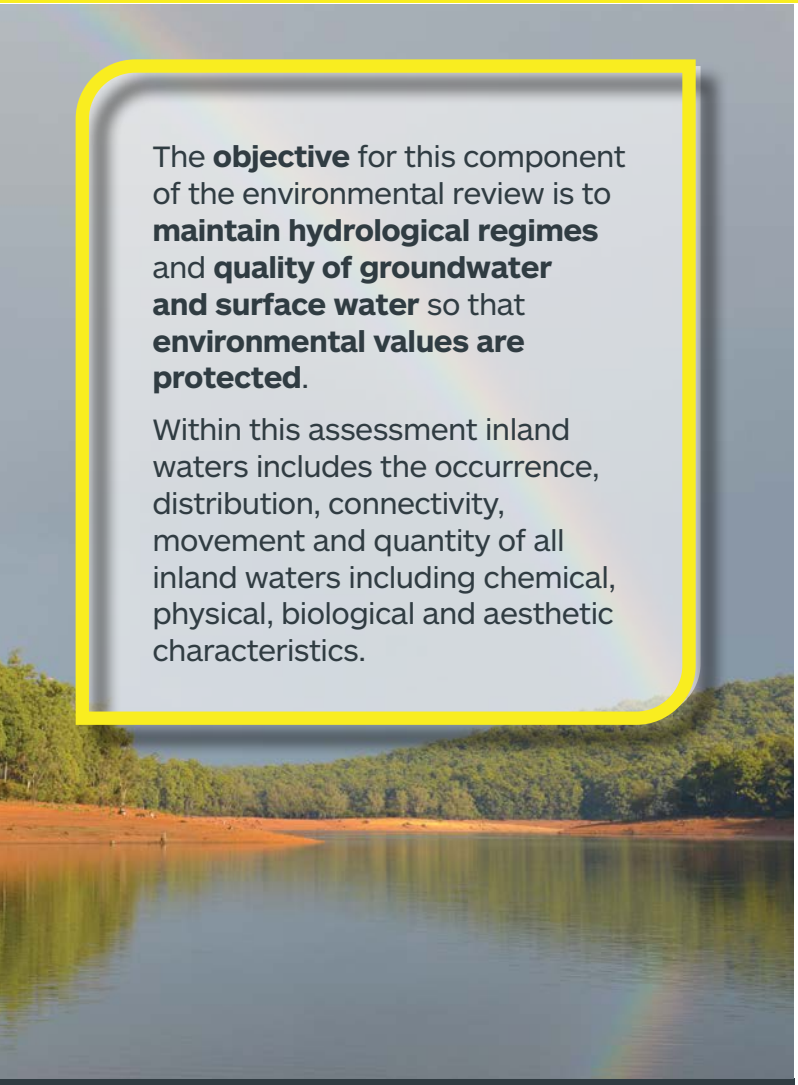
Worsley Mine Development

CONTINUING OPERATIONS

SOUTH32
Worsley Alumina

FACT SHEET – INLAND WATERS **2022**



The **objective** for this component of the environmental review is to **maintain hydrological regimes** and **quality of groundwater and surface water** so that **environmental values are protected**.

Within this assessment inland waters includes the occurrence, distribution, connectivity, movement and quantity of all inland waters including chemical, physical, biological and aesthetic characteristics.

INTRODUCTION

South32 Worsley Alumina is an integrated bauxite mining and alumina refining operation in the South West of Western Australia with a proud track record spanning more than 35 years.

The Worsley Mine Development is the next phase of bauxite mining, providing access to future reserves and resources to sustain production at our Worsley Alumina refinery near Collie.

The project is a key enabler for Worsley Alumina to continue to deliver benefits to the Peel and South West regions, and Western Australia more broadly, for many years to come.

The project is currently subject to a State and Commonwealth environmental approvals process, with a comprehensive environmental review undertaken and an eight-week public review period.

BACKGROUND

The northern portion of the Primary Assessment Area (PAA) (including the Worsley Mine Development Envelope (WMDE) and the Bauxite Transport Corridor (BTC)) of the project falls mainly within the Murray River and Tributaries Surface Water Management Area and over two Sub-areas (Hotham and Williams River).

The South Dandalup Dam Catchment Area Priority 1 (P1) and Priority 2 (P2) Public Drinking Water Supply Area (PDWSA) is located along the northern boundary of the WMDE with these catchments managed by Department of Water and Environment Regulation (DWER).

The southern portion of the PAA lies within the Collie Surface Water Management Area in the Brunswick sub-area and is entirely contained within the Augustus River catchment. The Augustus River is a key water feature within and downstream of the proposed Contingency Bauxite Mining Envelope (CBME) expansion area and is a tributary of the Brunswick River, which is used primarily for agricultural purposes. The confluence of the Augustus River with the Brunswick River is approximately 5 km downstream to the west of the CBME.

Existing groundwater monitoring information indicates declining groundwater levels that is reflective of decreasing rainfall trends observed in the region over the last few decades. Where groundwater levels are measured in mining or agricultural areas the groundwater trends observed are relatively stable. This stabilisation of groundwater levels, against a declining trend in naturally vegetated locations is considered a consequence of decreased evapotranspiration due to clearing.

The Hotham River and its tributaries support a diverse number of fish and crayfish species endemic to the southwest region of WA as well as a number of other aquatic species. The Hotham River locally and the Murray and Williams Rivers more regionally are considered important ecosystems for freshwater fish migration (Morgan and Beatty, 2004). None of the native crayfish and native fish species recorded were considered rare or restricted in distribution (GHD, 2020a). Of the fish species, Western Minnows, Pygmy Perch and Nightfish are the most abundant and widespread.

Data used to inform this assessment includes the historical groundwater and surface water monitoring databases of the Worsley Alumina BBM and Refinery, regional DWER databases and some information from the neighbouring Boddington Gold Mine.

POTENTIAL IMPACTS

Potential impacts to inland waters from the implementation of the project include:

- Changes to groundwater levels as a result of increased clearing;
- Decline of aquatic fauna from changes in flow regime and water quality;
- Deterioration or change in background water quality such as salinity due to indirect impact of mining activities;
- Changes to vegetation structure in Groundwater Dependent Ecosystems (GDEs) because of groundwater rise;
- Potential impacts on surface water and groundwater values through increased water use;
- Riverbank erosion, sedimentation, scouring of streams or release of excessively turbid water because of clearing riparian vegetation and alteration of surface water drainage patterns;
- Contamination of groundwater and/or surface water from potential acid sulfate material and contaminants during removal of soils and sediment at river crossings;
- Contamination of surface water because of spills or stormwater run-off; and
- Contamination of groundwater because of seepage of incorrectly stored chemicals.

MITIGATION

Worsley Alumina have demonstrated that impacts to Inland Waters from existing operations can be managed and mitigated through the implementation of the Worsley Water Management Plan.

Worsley Alumina will continue to employ similar management practices to manage key risks associated with the continuation of mining.

The Worsley Water Management Plan stipulates the current management strategies to manage the existing operations and outlines the conceptual continuation of these strategies into new mining areas as the project is implemented.

Worsley Alumina commits to avoid storage of chemical and hydrocarbons in the P1 and P2 PDWSA of the South Dandalup Dam Catchment Area. Furthermore, no ground disturbance shall be undertaken within that portion of the PAA that intersects the PDWSA until working arrangements are developed and agreed upon with regulators and the Water Corporation. Appropriate buffers will be applied to other waterways including a spatial separation of at least 30 m from the bank of the Augustus River and a separation distance of 50 m from the high-water mark at the Freshwater Lake.

Specific controls will be implemented for the design and construction of the river crossing infrastructure to ensure river function is not impeded. Construction of bridge works will be limited as much as practicable, to the drier months to avoid interference with surface flow and increased stream flow. Where not practicable, appropriate mitigation methods will be employed to limit potential impact.

Aquatic fauna values are not considered to be at elevated risks due to the Revised Proposal. The Carter's Freshwater Mussel has been identified in the Freshwater Lake (located at the Refinery), however, no significant impacts are expected to this species as a result of the Revised Proposal given the nature of the activities proposed in the CBME and the existing and proposed mitigation measures. To further ensure the proposal does not impact on this species, a monitoring program for the Carter's Freshwater Mussel will be developed to assess health and potential populations within the Freshwater Lake and Augustus River and an exclusion are of 50m from the high water mark of the Freshwater lake will be in place for contingency mining activities as outlined in the Worsley Alumina Protected Areas Plan.

Progressive rehabilitation and re-vegetation practices of disturbed land is an important strategy that Worsley Alumina have implemented and will continue to implement to ensure impacts to Inland Waters is minimised as a result of the continuation of mining. Successful rehabilitation can start to alleviate groundwater mounding, salinity risks, excessive erosion and stormwater run-off at the BBM. Progressive rehabilitation practices are well understood at Worsley Alumina and will continue to be refined to ensure successful outcomes are achieved.

PREDICTED OUTCOME

Worsley Alumina's robust management practices that are currently implemented for the existing operations are considered appropriate and effective for managing any potential impacts to inland waters associated with the project.

Additional clearing and development of mine pits can cause localised groundwater mounding resulting in a range of potential indirect impacts from increased salinisation, impacts to GDEs, altered stream flow and aquatic fauna characteristics. Observations of Worsley Alumina's current operations have suggested that current bauxite mining practices do not appear to cause increased salinity risks above background conditions (GHD, 2020a). Implementation of the Revised Proposal and the continuation of existing operations are expected to meet the EPA's objectives for Inland Waters with consideration of the outcomes as described related to avoidance, management and monitoring measures.

More detailed information is provided in Section 5.5 of the Environmental Review Document.

For further information please contact us on worsleyminedevelopment@south32.net or visit us at www.south32.net/worsleyminedevelopment