Pre-Mitigation Case

Notes: Pre-mitigation surface water changes

The map shows the change in surface water availability caused by the mining disturbance areas. The assessment was carried out using terrain analysis and is based on:

- No runoff occurs from mining disturbance areas
- The change of surface water availability is directly proportional to the change in catchment area
- Runoff from the upstream catchments are diverted around the disturbance areas and flow to the downstream catchments, 1km downstream of the disturbance areas

BHP Billiton Iron Ore Disturbance 30% Development Scenario
Third Party Reasonably Forseeable Disturbance
Surface Water Reduction
Low
No or unmeasurable < 5% loss of catchment
5-20% reduction
High
>20% loss of catchment

Data Sources:
DPaW Reserves (DPaW 2015); Roads (MRWA 2012) Aerial Image (BHPBIO); Third Party Disturbance digitised from Aerial Imagery (Aug - Sept 2013) and Approval Documentations up to September 2014. All other data supplied by BHPBIO (2012); Yandicoogina mining area comprises Junction Central, Junction South East, Junction South West and the proposed Oxbow, Pocket and Billiard South mining areas

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Resource Planning Hydrology
BHP BILLITON IRON ORE

Ecohydrological Change Assessment
Surface Water Change
Cumulative - 30% Development Scenario

Kilometres

Date: 15/04/2015
Prepared: J Botterill
Reviewed: J Vermaak
Rev: J

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Notes: Pre-mitigation surface water changes

The map shows the potential for ecohydrological change, which has been derived from the surface water change map #31 and the surface water sensitivity map #70, using the surface water ecohydrological change potential matrix.
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Notes: Pre-mitigation surface water changes

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Notes: Pre-mitigation surface water changes

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Pre-Mitigation Case

The map shows the potential for ecohydrological change, which has been derived from the surface water change map #32 and the surface water sensitivity map #70, using the surface water ecohydrological change potential matrix.

Notes: Pre-mitigation surface water changes

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BHP Billiton Iron Ore is currently managing surplus water through the Ophthalmia Dam MAR scheme and Marillana Creek discharge. Trial surplus water management schemes comprise groundwater injection (MAC and Jimblebar mining areas), discharge to Jimblebar Creek (Jimblebar) and pit storage (MAC).

Notes:

- ECOHYDROLOGICAL CHANGE ASSESSMENT
  Surplus Water Management (BHP Billiton Iron Ore)
  Current

- LEGEND
  - Ecotourism Study Boundary
  - Major Drainage Lines
  - Karijini National Park
  - Localities
  - Ecotourism Receptors
    - Ophthalmia Dam
    - Third party Rail Corridor
    - Great Northern Highway
    - Other Roads

- Surplus Water Management - Current
  - 1 Net water negative mining areas -- short-term surplus water management in the framework of feasible water options
  - 2 Net water positive mining areas -- ability to manage surplus water through Ophthalmia Dam MAR scheme
  - 3 Net water positive mining areas -- ability to manage surplus water through Marillana Creek discharge

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Notes:

- BHP Billiton Iron Ore is currently managing surplus water through the Ophthalmia Dam MAR scheme and Marillana Creek discharge. Trial surplus water management schemes comprise groundwater injection (MAC and Jimblebar mining areas), discharge to Jimblebar Creek (Jimblebar) and pit storage (MAC).

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ECOHYDROLOGICAL CHANGE ASSESSMENT
Surplus Water Management (BHP Billiton Iron Ore)
30% development scenario

Notes:

Continued surplus water management through Ophthalmia Dam MAR scheme and Marillana Creek discharge and other surplus water methods in line with the Feasible Water Options. BHP Billiton Iron Ore has the ability to manage surplus water from MAC through water transfers to other water negative mining areas in the Central Pilbara Region.

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Date: 7/05/2015
Prepared: T Vermaak
Reviewed: J Youngs
Revision: Rev A

Map 39
LEGEND

- Ecological Study Boundary
- Major Drainage Lines
- Minor Drainage Lines
- Ecological Receptors
- Ophthalmia Dam
- Townships
- Third Party Rail Corridor
- Great Northern Highway
- Other Roads

SURPLUS WATER MANAGEMENT - FULL DEVELOPMENT SCENARIO

1. Net water negative mining areas – short-term surplus water management in the framework of feasible water options
2. Net water positive mining areas – ability to manage surplus water through Ophthalmia Dam MAR scheme
3. Net water positive mining areas – ability to manage surplus water through Marillana Creek discharge
4. Net water positive mining areas – require long-term water management in the framework of feasible water options

Notes:
Continued surplus water management through Ophthalmia Dam MAR scheme and Marillana Creek discharge and other water surplus methods in line with the Feasible Water Options. The Marillana, Mindy and Coondiner mining areas require long-term water management in the framework of feasible water options.

ECOHYDROLOGICAL CHANGE ASSESSMENT

Surplus Water Management (BHP Billiton Iron Ore)
Full development scenario

Kilometres
Scale: 1:1,000,000

Date: 7/05/2015
Prepared: J Vermaak
Reviewed: J Youngs
Revision: Rev A

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Notes:
Kilometres
High salinity groundwater interception during dewatering at Cloudbreak and Christmas Creek Operations is managed through managed aquifer recharge (MAR).
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