



The Chandler Proposal - Surface water

Background and climate

The watercourses that occur near the proposed Chandler Facility and Apirnta Facility are dry. In fact, they remain dry for very long periods of time. This is because the proposed development footprint is located within an arid environment. Water rarely flows through the gullies and small creeks within the proposed development footprint.

The long term average annual rainfall within the proposed development footprint and vicinity is approximately 204 millimetres. The annual average evaporation is approximately 3,147 millimetres, about 15 times greater than the annual average rainfall. The low average annual rainfall and high evaporation contributes to a lack of permanent waterbodies within the proposed development footprint and vicinity. Water does flow with more regularity within the larger rivers that are much further away (25 kilometres or greater). These include the Hugh and Finke Rivers.

Surface water investigations at the proposed Chandler Facility have been undertaken over the past four years. More recently, our research has expanded to the proposed Apirnta Facility and the proposed Chandler Haul Road and Henbury Access Road. The purpose of the investigations was to describe and monitor baseline surface water within the proposed development footprint and vicinity. The only permanent waterbody within the proposed development footprint is a farm dam used for livestock watering (Halfway Dam). Halfway Dam is located within the footprint of the proposed Chandler Facility.

Where did the studies occur?

Special river surveys, water quality tests and sediment sampling was undertaken at waterbodies both within and down gradient of the proposed

Chandler Facility and Apirnta Facility. Seven sites were selected where existing surface water stations were constructed by Tellus or, where they are proposed in the near-future. These include the Finke and Hugh Rivers.



The Finke River



Halfway Dam

What did the studies look for?

Scientists walked along dry river beds to record various channel types and to characterise the gullies and creeks surrounding the proposed infrastructure.

Whenever water was present, electrical conductivity, naturally occurring heavy metals, soil moisture content, particle size distribution and total organic carbon information was collected.

The surface water quality samples were assessed against the trigger levels for freshwater aquatic ecosystem protection and primary industries livestock protection set out in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)*.



What did the studies find?

The results of water quality sampling within the proposed development footprint and wider region indicate that surface water is generally suitable for aquatic ecosystem protection, but may have adverse effects for livestock production due to the background level of nitrates and/or metals in the water.

Potential direct impacts on surface water during construction, operation, and closure and rehabilitation include those primarily associated with erosion (through exposed soils and stockpiled materials).

There would be no wide scale changes to existing hydrology for the following reasons:

- **Chandler Facility.** Surface water flowing through the proposed facility would drain towards a flat washout area to the north. The water would pond in this washout area where the majority of the water would be lost through evaporation and infiltration.

The proposed facility (including the accommodation village) and catchments upstream of the proposed facility only represent 10% of the catchment draining through the Charlotte Range towards the Hugh River and the community of Titjikala.

- **Chandler Haul Road and Apirnta Facility.** Surface water flowing across the proposed haul road and through the proposed storage and transfer facility would drain to the south-west.

Though the haul road would be less impervious than the existing track, the area would be insignificant when compared to the areas of contributing catchments.

Potential indirect impacts on surface water during construction, operation, and closure and rehabilitation include flooding and contamination of surface water from accidental spills.

What mitigation and management would occur?

Any runoff from the proposed Apirnta Facility would be collected, treated, and reused on-site for various purposes (e.g. dust suppression, vehicle washdown, ablutions).

Mitigation and management measures would be implemented to avoid or minimise potential impacts on surface water during construction, operation, and closure and rehabilitation of the Proposal. These measures would include installing erosion and sediment control measures around exposed surfaces and stockpiles; retaining large mature trees and

shrubs, where possible; and ensuring that hazardous materials (including waste brought to site) is stored within bunded areas sufficient to hold 110% of the material.

Drainage channels would be formalised to divert/convey flood flows from upstream catchments past both the proposed Chandler Facility and Apirnta Facility.

Culverts or causeways (as appropriate) would also be incorporated into the design of the proposed Henbury Access Road and Chandler Haul Road. Infrastructure would not be placed within watercourses or drainage depressions and clearing or disturbance to watercourses or drainage depressions would be avoided (where possible).



Example of small gully on the Maryvale Hills

Water Management Plan

The above mitigation and management measures (among others) would be included in a Water Management Plan that would be prepared and incorporated into the Construction Environmental Management Plan, Operational Environmental Management Plan and/or Rehabilitation Closure Plan for the Proposal.

Studies proposed for the near future

The monitoring of baseline surface water conditions will continue during the public exhibition of the EIS. Tellus is committed to continuing field investigations through the detailed design, construction, operation, and closure and rehabilitation phases of the Proposal.



Studies will continue to understand larger flow events and the potential for erosion

