



## Esperance Mineral Concentrate Enhancement Project

---

### BACKGROUND

Esperance Port has been handling bulk nickel concentrates since 1967. Much of the circuit currently used to handle the product is old and has been used for other purposes, including the loading of iron ore.

Concerns about the environmental performance of the circuit have generated the need to develop a world-class bulk sealed system for the export of nickel sulphide concentrate from Esperance Port.

A working group convened by the Office of Development Approval Coordination (ODAC) assessed all the technically feasible options for upgrading the existing circuit to manage the handling of bulk nickel concentrates at the Port. Six options were defined by the group.

The project selected includes the upgrade of existing assets to continue to handle nickel concentrates in the short term until a new storage facility and handling circuit can be built, which has a time frame of about two years.

An Alliance – known as the ESP Alliance – has been formed comprising representatives of the Esperance Port Authority and Bilfinger Berger Services (Australia) who will be responsible for delivering the project.

### OBJECTIVES OF THE ESP ALLIANCE

- Improve environmental compliance during the handling of concentrates at the Port of Esperance to meet the targets provided in the Port's Environmental License.
- Establish an alliance between the Esperance Port Authority and engineering consultant Bilfinger Berger Services to accelerate the delivery of the project and overcome high risk situations where there is time constraints that present challenges for traditional contract approaches.
- Deliver the project on time and budget.

### COMPLETED WORKS

Works undertaken by the Alliance that met the requirements of the Port's Environmental License and were completed by the 31<sup>st</sup> March 2009 deadline included:

- Air management system installed in Black Swan shed to provide negative pressure;
- Black Swan shed structure repaired;
- Concentrate conveyor galleries repaired;
- Conveyor galleries skirts, curtains and scrapers replaced on all inloading and outloading conveyors;
- Transfer towers upgraded to manage or eliminate dust emissions;
- Compliant plant and equipment operating in Black Swan shed;
- Remedial works carried out on kibble inloading infrastructure; and
- Upgrade of the dust management system on the concentrate circuit.

## OUTSTANDING WORKS

### Shiploader

The shiploader on berth two was identified as a source of dust emission during loading of nickel concentrates. To minimise or eliminate the dust escaping from this source a number of upgrades and modifications are required on the shiploader and transfer points.

Before any work can be carried out the shiploader boom needed to be strengthened.

A program was developed to change the boom connecting pins to higher strength steel using a heavy lift cranes. This work was undertaken on 7 and 8 May 2009.

### Loading Chute

Design work continues on a new dust minimising, telescopic loading chute which will replace the existing fixed chute located on the end of the boom. Detailed design work is in progress, and on completion tenders will be called for the fabrication of the chute. The chute will be fully enclosed and have a full depth into a ship's hold. The connecting pins on the boom had to be replaced before the new chute can be fitted.

### Wind Guards

Work continues on fabricating wind guards for the shiploader conveyors to ameliorate fugitive dust emissions, and these can be fitted now that the new boom pins have been installed and the boom strengthened.

**OUTLOOK:** These works are expected to be completed by the end of May.

### Conveyor Three Upgrade

Working and detailed designs have been prepared for the construction and installation of collection trays to the underside of CV 3 on berth two which will completely enclose the conveyor. In addition, a new seal belt arrangement is being designed to cover all outloading bins from CV3 to CV5 shiploader, preventing dust emissions from the CV3 gallery.

**OUTLOOK:** This work is programmed to be completed by 31 August 2009.

### New Tippler

It is proposed to standardise the transport of concentrates into the Port in 30 tonne half height, sealed containers that can be transported by both road and rail. This will replace the current use of eight tonne kibbles that arrive into the Port by rail and side tipper road trains. The new containers will be emptied at the Port in a sealed system to effectively manage dust emissions.

The works include:

- Designing, constructing and commissioning a tippler that will receive 30 tonne half height containers by both road and rail;
- Installing dust control facilities in the tippler;
- Providing a hardstand area adjacent to the tippler to store and handle containers; and
- Providing a system that will enable full containers to be unloaded from rail wagons and trucks while empties are simultaneously loaded.

Because of the complexity of this project it is likely that the tippler will be built and commissioned off site, dismantled and then assembled and recommissioned at the Port.

### **Progress to 24 April 2009**

A tippler system that can be manufactured and commissioned by 31 August 2009 has been selected and detailed designs are currently being prepared.

To prove the concept design, nickel concentrate samples will be forwarded to Tunra (The University of Newcastle Research Associates) in NSW to simulate the proposed tippler tipping device.

Samples from Xstrata have been forwarded to Tunra for testing, and are being sourced from other nickel concentrate producers.

**OUTLOOK:** The new tippler will be installed and commissioned by 31 August 2009.

### **Black Swan Shed Ventilation Upgrade**

While considerable work has been completed to improve the handling of nickel concentrates in the Black Swan storage shed to reduce nickel dust emissions, a dust and fume extraction system is to be installed on the shed.

This work will eliminate or significantly reduce fugitive dust emissions from the shed

The works include:

- Installing dust extracting measurers at identified emission points;
- Creating a negative pressure environment;
- Minimising dust flow;
- Installing new and modifying existing dust filtration equipment;
- Changing operational techniques; and
- Removing diesel fume particulates in filtration.

### **Progress to 24 April**

A ventilation engineer is developing designs for dust extraction and filter upgrade systems for the Black Swan Shed and the new purpose-built concentrate storage facility. This work will be sent out to competitive tender by 30 April 2009.

**OUTLOOK:** A new fume and dust extraction system will be installed on the Black Swan Shed by 31 August 2009.

### **New Nickel Concentrate Storage facility**

This project will deliver a new concentrate storage facility that will enable a number of customers to discharge mineral concentrates by road and rail in 30 tonne half height containers and to load the product on ships to Panamax size in all weather conditions.

The works include:

- Developing a design for an integrated storage facility that will receive, store and outload concentrates to a ship on berth two;
- Constructing the state-of-the art facility and associated conveyor systems that will eliminate fugitive dust emissions.
- Arranging the shed bay configuration to suit the in-go, out-go logistics as well as the permutations of product mix of five types of concentrate over a client base of at least seven parties.
- Installing a new shiploader.

### **Progress to 24 April 2009**

A report of the proposed works to install a new purpose-built bulk concentrate receipt, storage, transfer and ship loading facility to meet international best practise for the control of odour and dust emissions has been prepared and forwarded to the ESP Alliance.

The location, size and configuration of the infrastructure have been determined. The storage shed will be about 230 metres long by 70 metres wide, and will be able to accommodate various products from numerous customers.

**OUTLOOK:** Work on the new facility will proceed (subject to finance).