PROJECT ENGINEER’S
MONTHLY REPORT
for
SEPTEMBER 1985

C. G. ALLEN
MONTHLY REPORT
SEPTEMBER 1985

1. PROGRESS REPORT

1.1 General Notes.

The Contract for Stage 4.1 of the Project was awarded to Thiess Contractors Pty Ltd on 7 May 1985 for a value of $1,626,329. The Contract was subsequently varied to include the completion of the rehabilitation of the Copper Heap Leach Pile area. Works included in this Contract are:

- rehabilitation of Dysons Overburden Heap;
- rehabilitation of Intermediate Overburden Heap;
- rehabilitation of the Old Treatment Plant and Stockpile area;
- completion of the rehabilitation of Whites North Heap area;
- removal of Acid and Sweetwater Dam walls;
- treatment of the environs to Whites and Intermediate Overburden Heaps;
- completion of the rehabilitation of the Copper Heap Leach Pile Area; and
- rehabilitation of Borrow Areas.

The Contract completion date is 14 January 1986.

Tenders for Stage 4.2 of the Project were called 13th August 1985 and closed on 4th September 1985. The lowest tender, submitted by Thiess Contractors, was significantly above the budget amount and accordingly the scope was revised to reduce costs. The revised price was within budget and the work will be awarded to Thiess as a variation to their current Contract and will include:

- rediversion of East Finniss River;
1.2 Category A - Earthworks.

A1-3 Tailings Dam, Copper Heap Leach Pile and Dyson's Open Cut.

- Work on the Contract for the removal of the tailings and Copper Heap Leach Pile to Dyson's Open Cut was practically completed during December 1984. During March 1985 the Contractor carried out maintenance work as required by his Contract and completed mowing and fertilising of all revegetated areas.

- Subsequent to the completion of the filling of Dyson's Open Cut, a settlement crack developed in the western side of the fill.

- During September 1985, further cracking was noted and a survey is scheduled for early October 1985 to determine the extent of settlement.

- Construction of rubble drains and ripping of the area occupied by the Copper Heap Leach Pile (which was deleted from the Thiess Contract) has now been completed under a separate Contract.

- The remaining work of covering and revegetating of the Copper Heap Leach Area was part of Stage 4.2 of the Project and has been incorporated within the Contract for Stage 4.1 works.

- Construction of the pore breaking zone of the cover system is now completed and the zoned cover system is approximately 50% complete. (See photos 2 & 3.)

A4 Whites Open Cut.

- The tidying up of the surrounds to Whites Open Cut and the redversion of the East Branch of the Finniss River have been awarded to Thiess Contractors as a variation to their current Contract. The work on the surrounds to the open cut and the redversion works are to be carried out late 1985 after completion of the treatment of the water in the open cut pits.
A5 Intermediate Open Cut.

The tidying up of the surrounds to Intermediate Open Cut has been awarded to Thiess Contractors as a variation to their current Contract and is planned to be carried out during 1985.

A6 Dysons Overburden Heap.

The Contract for Stage 4.1 of the Project which includes the rehabilitation of Dysons Overburden Heap was awarded to Thiess Contractors Pty Ltd on 7 May 1985.

Reshaping and covering of the top surface of the heap is complete. Construction of the drainage system is approximately 90% complete. (See photo 4.)

A7 Whites Overburden Heap.

Revegetation of Whites Overburden Heap was completed in January 1985; slashing and fertilising of the established vegetation cover was carried out during March 1985.

Establishment of vegetation on the rock mulch batters of the heap has generally been poor, with the exception of areas where high percentages of fines are present in the mulch. The vegetation emanating from these areas appears to be establishing on the batters, giving rise to the expectation of complete cover being achieved, but over a longer time frame than previously envisaged. Advice from both the Conservation Commission and our Consultants suggests that the rock mulch batters will be stable even without a full cover of vegetation and the current lack of establishment should not give rise to concern about the longer term stability of the rehabilitation measures. (See photos 5 & 6.)

A8 Whites North Overburden Heap.

The removal of the bulk of Whites North Overburden Heap to the toe zone of Whites Heap, together with the ripping and liming of the resultant area was completed during 1983.

The covering of Whites North Overburden Heap is included in Stage 4.1 of the Project for which a Contract was awarded to Thiess Contractors on 7 May 1985.
Material has been removed from the Whites North area to form a pore breaking layer on the Copper Heap Leach Pile area and the Old Treatment Plant Area and the remaining heap will be covered during October 1985.

A9 Intermediate Overburden Heap.

The reshaping, covering, drainage and revegetation of Intermediate Overburden Heap is being carried out as part of Stage 4.1 of the Project for which a contract was awarded to Thiess Contractors on 7 May 1985.

During the last Liaison Committee meeting, the Committee considered the implications of some recent results obtained by the AAEC from their monitoring of Whites Overburden Heap on the proposed cover system for Intermediate Heap. As a result we have requested our Consultants (Cameron McNamara) to review their design of the water system as it relates to Intermediate Heap and to make recommendations accordingly. The Consultants recommended that the works be constructed as designed.

Reshaping of the heap is completed and construction of covers has commenced. (See photos 7 to 9.)

A10 Acid/Sweetwater Dams.

The rehabilitation of Acid and Sweetwater Dams is limited to the removal of the remnants of the dam walls, some improvements to the channels, liming of the worst affected areas of the stream beds and some limited revegetation. The work will be carried out as part of Stage 4.1 for which a contract was awarded on 7 May 1985.

Removal of the dam walls for fill for other parts of this stage of the Project is approximately 95% complete and tidying up of the streambeds remains to be completed.

All Other Areas.

Removal of Copper Launders and Evaporation Ponds, Reshaping of Copper Creek.

- work completed in 1984.
Snake Creek.
- revegetation of the Snake Creek uranium stockpile area was completed in 1983.

Removal of Small Stockpiles.
- The removal of small stockpiles was carried out on an opportunity basis during 1984.

Removal of Temporary Facilities.
- washdown and ablution facilities are planned for removal during 1985 as part of Stage 4.2 works.
- remaining temporary facilities will be removed at the end of the Project in 1986.

Rehabilitation of Old Treatment Plant Site and Stockpile Area.
- reshaping, covering drainage and revegetation of this area is included in Stage 4.1 of the Project for which a Contract was awarded to Thiess Contractors on 7 May 1985.
- reshaping, lime treatment and construction of the pore breaking zone of the Old Treatment Plant Area is complete and construction of the remainder of the cover system will be completed during October 1985.
- reshaping of the Old Stockpile Area is completed. (See photo 10.)

A12 Site Establishment.
- The only works remaining in this category is the rehabilitation of borrow pits which is being carried out progressively. The rehabilitation of pit 3 is included in the current Stage 4.1 Contract with Thiess Contractors and the rehabilitation of pit 5 is planned for Stage 4.2. (See photos 11 & 12.)

1.3 Category B - Construction Works.

B1 Water Treatment Plant.
- Construction of the Water Treatment Plant was completed during August of 1984. Ongoing modifications have been carried out, aimed at
improving the overall performance of the plant. As a result of these modifications the plant is now able to consistently operate at or near the design targets. Operation of the plant is dealt with under category E below.

B3 Construction Camp.

- Modification of the old ATEC facilities in Batchelor for the construction camp are now completed.

1.4 Category C - Project Management.

C2 Camp Generators.

- Two 200 kW generator sets were provided under a Contract by Elmec Pty Ltd and were installed and commissioned during June 1984.

- During subsequent operation, the generators developed overheating problems for which the manufacturer has accepted full responsibility. One set has now been overhauled and modified and was returned to site during September 1985. The second set has been removed for overhaul and will be modified before being returned to service. In the interim a standby set provided by the Department of Transport and Works has been used to operate the Water Treatment Plant.

C4 Monitoring.

- Subsequent to the March Liaison Committee meeting, the monitoring programme has been critically reviewed with a view to effecting significant cost savings. This review has been endorsed by the Commonwealth and is being implemented.

- Wet season monitoring activities including stream gauging of the East Finniss and Finniss Rivers have been completed and results are being analysed.

- The next Monitoring Committee Meeting is planned for March 1986.

C5 Engineering and Management.

- The current Consultants Commission with Dames and Moore for on site soils technology has been extended for the provision of these services for the 1985 dry season work.
1.5 Category D - Supply of Chemicals.

The final shipment of 4,902 tonnes of lime arrived in Darwin on the vessel "Pacific Swan" on 14th April 1985, bringing the total amount of lime shipped to 12,030 tonnes.

Current indications are that the total amount of lime to be used in the Water Treatment Plant will be significantly less than the Contract tonnage. Negotiations are in hand with the supplier (Asoma) to dispose of the excess lime by way of a variation to the Contract. Alternative action (should the negotiations not yield a satisfactory result) have been commenced to call public tenders for the disposal of the excess lime.

1.6 Category E - Operation of Water Treatment Plant.

The Water Treatment Plant, which was shut down for descaling and modifications during the Christmas/New Year period, recommenced operation on 15th January 1985. Subsequent to that startup, the plant has consistently maintained throughput at or close to the design targets.

Between 1st March 1985 and 3rd March 1985, the acceptance trial for the Water Treatment Plant was successfully carried out. The plant exceeded design parameters for the full 48 hour duration of the trials.

Since the plant startup in January 1985, stable stratification has been successfully established in Whites Open Cut and by the end of September 1985 the treated water layer was approximately 21 metres deep. The low pH of the treated water layer had been causing some concern and investigations have been carried out at the Department's laboratory to ascertain the underlying reasons and to determine what action should be taken to correct the pH. These investigations have shown that low pH has resulted from the initial establishment of the treated water layer when approximately two metres depth of raw water mixed with the treated water. In order to correct the situation and raise the pH of the treated water layer, lime slurry is being added to Whites open cut with the treated water. After approximately nine weeks of lime addition, the pH of the treated
water layer of Whites Open Cut has been raised from 2.9 to 5.9.

The Department's Consultants for the water treatment (MPES) have been instructed to investigate alternative methods of treating the Intermediate Open Cut with a view to effecting cost savings over processing the water through the treatment plant. That report has now been submitted and it is recommended that Intermediate Open Cut be treated in situ with the settled sediments being pumped out and removed in the Water Treatment Plant. It is planned to commence this treatment during early October.

As a result of deteriorating worker relationships and increased descaling requirements at the lower raw water intake level, it was decided to reduce the operating hours of the Water Treatment Plant from 144 per week to 120 per week by operating on a 5 day per week basis. This is being carried out as a trial only at this stage to enable an assessment of the effects on the overall performance and costs of the treatment plant. Preliminary indications suggest that it will be possible to maintain throughput at lower average costs utilising the shorter working week.
2. CONTRACT STATUS REPORT

MAJOR CONTRACTS (Works in excess of $100,000)

2.1. EARTHWORKS - CATEGORY A

2.1.1 Whites North

Contractor ROADMAKERS (NT) P/L
Awarded 15 APRIL 1983
  - Contract amount $ 197,840
  - Contract as varied $ 236,432

due date for completion 10 JUNE 1983
actual completion 10 JUNE 1983

2.1.2 Whites Heap

Contractor HENDRIE CONSTRUCTIONS
Awarded 17 AUGUST 1983
  - Contract amount $ 1,383,060
  - Contract as varied $ 1,428,755
  - Value work done up
to stage contract
cancelled $ 868,867

due date for completion 21 MARCH 1984
actual completion . Contract terminated
value Security retained . $51,500

Uncompleted works redocumented and included in Thiess Contract listed below.

2.1.3 Tailings Dam; Copper Heap Leach Pile;
Filling Dysons Open Cut

Contractor THIESS CONTRACTORS P/L
Awarded 13 APRIL 1984
  - Contract amount $ 2,651,266
  - Contract as varied $ 3,939,350.73

Contract complete

All works, with the exception of minor
revegetation works such as some seeding
were completed by 21 December 1984.

In June 1984, the Contractor submitted
claims totalling $1.94 million for
anticipated costs of removing the tailings
and subsoil to Dysons Open Cut. The
Contractor has now submitted a detailed
claim for the costs of handling the
tailings of $2,047,940. Taking account of
the provisions in the contract for these items, the nett value of his claim, in addition to the contract price, was $1,519,890.

Subsequently the Contractor was advised that the Department had assessed the reasonable value of his claim for the costs associated with the removal of tailings (including additional mobilisation and the value of the works already included in the contract sum) as $1,629,000. The Contractor has accepted this assessment and the contract is currently being finalised.

2.2 Supply and Deliver 45,000 Tonnes of Crushed Rock

Contractor ADELAIDE QUARRY INDUSTRIES LTD
Awarded 9 MARCH 1984
- Contract amount $ 537,375
- Contract as varied $ 543,534
due date for completion (as varied) 21 JUNE 1984
actual date works completed 20 JUNE 1984
Contract complete.

2.2 CONSTRUCTION WORKS - CATEGORY B

Water Treatment Plant

2.2.1 Filter Press
Contractor WILLIAM BOBY
Awarded 29/09/83
- Contract amount $ 333,745
- Contract as varied $ 361,679
due date for completion varied 8 JUNE 1984
date delivered to site 6 JUNE 1984
Contract complete.

2.2.2 Steelwork and Tanks
Contractor TRANSCON
Awarded 01/03/84
- Contract amount $ 275,795
- Contract as varied $ 435,858
Contract complete.
2.2.3 Earthwork and Concrete
Contractor FINDLAY CONSTRUCTIONS
Awarded 17/02/84
- Contract amount $ 106,529
- Contract as varied $ 134,089

due date for completion as varied 7 JUNE 1984
actual date for completion 7 JUNE 1984
Contract complete.

2.2.4 Supply, Fabrication and Installation of Mechanical Works
Contractor KILPATRICK GREEN P/L
Awarded 6 MARCH 1984
- Contract amount $ 321,288
- Contract as varied $ 325,031

due date for completion 15 JUNE 1984
actual date for completion 25 JULY 1984
Contract complete.

2.3 PROJECT MANAGEMENT - CATEGORY C
2.3.1 Generating Plant
Contractor ELMEC PTY LTD
Awarded 03/02/84
- Contract amount $ 123,154
- Contract as varied $ 123,154

due date for completion 4 MAY 1984
actual date for completion 28 JUNE 1984
Contract complete.

2.4 CHEMICALS - CATEGORY D
2.4.1 Lime
Contractor ASOMA (AUSTRALIA) PTY LTD
Awarded 30/09/84
Negotiations in hand to reduce the contract tonnage.

Contract as varied $ 2,693,503
2.5 **EARTHWORKS STAGE 4.1**

Contractor THIESS CONTRACTORS PTY LTD
Awarded 7/5/85

- Contract amount $ 1,626,329.00
- Contract as varied $ 2,702,033.25
- Major variation raised to incorporate Copper Heap Leach Pile - Stage 4.1 & 4.2 contract.

Approx. breakup of tender price against Earthworks items

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<tr>
<th>Item</th>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>A1</td>
<td>Copper Heap Leach Pile</td>
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<td>A6</td>
<td>Dysons Overburden Heap</td>
<td>$ 314,000.00</td>
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<td>A7</td>
<td>Whites Overburden Heap</td>
<td>$ 324,000.00</td>
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<td>A9</td>
<td>Intermediate Overburden Heap</td>
<td>$ 510,000.00</td>
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<td>A10</td>
<td>Acid/Sweetwater Dam</td>
<td>$ 202,000.00</td>
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<tr>
<td>All</td>
<td>Other areas</td>
<td>$ 276 329.00</td>
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<td>E</td>
<td>Operation of Water Treatment Plant - Filter Cake Disposal</td>
<td>$ 60,000.00</td>
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**TOTAL** $2,135,799.00

Payments to date $1,140,197.20

Due date for completion 14 JANUARY 1986

2.6 **STAGE 4.2 ENVIRONS OF INTERMEDIATE AND WHITES OPEN CUTS AND OTHER WORKS**

All tenders were significantly above both the tender estimate and budgetary provision of $584,000.00. Negotiations were carried out with the lowest tender, Thiess Contractors Pty Ltd, with a view to reducing the scope of the contract.

The modified Stage 4.2 works was awarded to Thiess Contractors as a variation to their contract TW 117 of 84/85, with a separate completion date of 21st February 1986.

Variation value $ 555,728.00
1985/86 Programme

Expenditure at September 1985 against the 1985/86 Programme was $1,997,759.55. Below is a summary of that expenditure and the graph following shows the actual and projected cash flows for the 1985/86 financial year compared with the actual cash flow.

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<tr>
<th>CAT.</th>
<th>ITEM</th>
<th>EXPENDITURE SEPTMBER 1985</th>
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<tr>
<td>A</td>
<td>EARTHWORKS</td>
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<tr>
<td>A1</td>
<td>Copper Heap Leach Pile</td>
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<td>A2</td>
<td>Tailings Dam</td>
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<td>A3</td>
<td>Dysons Open Cut</td>
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<td>Whites Open Cut</td>
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<td>Dysons O/B Heap</td>
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<td>Acid/Sweetwater Dam</td>
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<td>Pipeline to Whites</td>
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<td>Camp Accommodation</td>
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<td>C5</td>
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<td>TOTAL</td>
<td>$1,997,759.55</td>
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CONSULTANCY REPORT

   b) Design and Commissioning of the Water Treatment Plant - value $410,320; work completed.
   c) Water Treatment Plant Operation and Management - value $769,430; work ongoing. Estimated completion November 1985.

2. Dames and Moore.
   Commission: a) Design and Documentation of Whites and Whites North - value $174,250.43; work completed.
   b) Soil Testing - Tailings Dam and Copper Heap Leach Pile - value $226,547; estimated completion October 1985.
   c) Soil Testing - Stage 4.2; work ongoing.

3. Unisearch.
   Commission: a) Water Treatment Plant - Design study - value $39,450; work completed at $29,000.

4. Cameron McNamara.
   Commission: a) Design and Documentation of Tailings Dam, Copper Heap Leach Pile and Dysons Open Cut - value $181,528.75; work completed.
   b) Stage 2 Whites Overburden Heap - value $32,970; work completed.
   c) Measure of Whites Reshaping - value $12,122; work completed.
   d) Final Measure of Whites and Tailings Dam - value $32,282; work completed.
   e) Design and Documentation of Intermediate and Dysons Overburden Heaps - value $232,562; work ongoing.
View of the Mine Site (September 1985)
Placement of Covers on the Copper Heap Leach Pile Area

View of the Copper Heap Leach Pile Area and Whites Open Cut
Construction of the Drain at Dysons Overburden Heap
Construction of Box Culverts and End Walls at the Base of Whites Overburden Heap
View of Intermediate Overburden Heap
Placement of Covers on Intermediate Overburden Heap
Placement of Covers on the Old Treatment Plant Area
Borrow Pits

Borrow Pit 5 Showing Filter Cake Placed in the Pit