
Saltwater Intake and Pumping Station

CC:137

Address: Rossiters Point
Moonta Bay SA 5558

ASSESSMENT OF HERITAGE VALUE:

Description:

This site contains the ruins of the salt water intake for the Cementation Plant at Moonta Mines. The intake pipe runs out to sea, and is approximately a metre in diameter. The pipe is of wrought iron and constructed in riveted sections. The seaward end of the pipe has a riveted box-like enclosed intake structure made of wrought iron. There are two visible inspection points which consist of round, upright wrought iron 'collars' protruding from the main pipe. The pipe and surrounding areas have been covered with a layer of stones to reduce wave action.

On the beach there is a retaining structure constructed of hard red bricks which has a wrought iron sluice gate and slots for a similar timber sluice. To the north of this is a remnant of paved flooring. To the east of these features and at the base of the sand dune is a concrete foundation block, presumably for a pump. To the south of this is a long low brick wall constructed of white fire bricks and red bricks which may be the southern half of a boiler setting. The northern half is not visible but is probably extant beneath the existing sand dune. In this area are the bases of large circular posts set in blocks of concrete.

Statement of Heritage Value:

The plant at this site was integral to the operation of the Cementation Plant at Moonta Mines. All other elements of this plant, apart from the pipeline which runs from this site to Moonta Mines through the town, are within the Moonta Mines State Heritage Area. This site played an important part in re-treating the massive volumes of tailings in the Moonta Mines tailings heaps. It demonstrates the development of a new technology which was adapted from Spain and shows the importance of seawater in the process.

Relevant Criteria:

- (a) It demonstrates important aspects of the evolution or pattern of the State's history in being associated with the development of Moonta Mines and the exploitation of the copper resources in the Copper Triangle.
- (b) It has rare qualities that are of cultural significance in that the plant was a unique and early adaptation of an imported leaching process which allowed re-treatment of the massive volumes of tailings in the Moonta Mines tailings heaps.
- (e) It demonstrates a high degree of technical accomplishment in that it utilises an adapted technology which involved the use of sea water which had to be pumped over 4 km from this site to the mine site to recover low grades of residual copper from the tailings heaps.
- (g) It has special associations with the Wallaroo and Moonta Mining and Smelting Company and Antonio Delgado who designed and developed the cementation leaching process.

RECOMMENDATION:

It is recommended that the Rossiters Point Saltwater Intake and Pumping Station site be Provisionally Entered in the State Heritage Register.

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Criterion (g) It has special associations with the Wallaroo and Moonta Mining and Smelting Company and Antonio Delgado who designed and developed the cementation leaching process.

For convenience, the four criteria are dealt with in one account. The workings of the Moonta and Wallaroo Mines were assessed for their heritage significance in the 1980s, and the most prominent remains, including Harvey's enginehouse at Wallaroo Mines, the Wallaroo Smelter and the Yelta Smelter were entered in the State Heritage Register. Most of the mine workings and miners' housing at Moonta were included in the Moonta Mines State Heritage Area. The remains of the Saltwater Intake at Rossiters Point form a significant element of the copper mining operations which was overlooked at the time.

One of Australia's greatest copper mining districts was discovered on Yorke Peninsula in the 19th century. The Wallaroo Mining Company and the Moonta Mining Company commenced mining copper ore in 1860 and 1862 respectively, and the smelter at Wallaroo was in production soon after, forming the Copper Triangle, which was to be a prosperous industrial centre for many years. The two mines amalgamated in 1889 to form the largest mining company in Australia, the Wallaroo and Moonta Mining and Smelting Company Ltd.

At the turn of the century, the price of copper was very high, and the company turned its attention to the metal that was left in its tailings heaps. When copper ore came out of the mine it was first crushed between rolls to a fine particle size, and then treated in a variety of buddles and jigs to separate the heavy copper sulphide particles from the lighter waste rock. The copper went to Wallaroo for smelting, and the waste, called tailings (or skimps) was deposited on heaps close to the treatment plants. However, no process is perfect, and a percentage of copper was always left in the tailings. The legacy of forty years of mining was a supply of about two million tons of tailings sitting in large heaps around the mines. If these contained even as much as 1% copper, that represented tens of thousands of tons of copper metal going to waste. The company experimented with leaching processes, to extract copper from the tailings by dissolving it. The first trials produced forty tons a month. Encouraged by this result, the company obtained expert advice from overseas:

This work is now being consistently extended with a view to treating the whole of the heaps in a comprehensive manner. In order to conduct the leaching on this large scale a full supply of water is necessary, and arrangements are being made to obtain this from the sea at Moonta Bay. Here a pumping station is being fixed, and by means of a run of pipes the water will be forced to a point on the Mines, from which it will gravitate to precipitating works, which are now being constructed in the vicinity of Moonta Railway Station, under the direction of the Expert in wet Copper extraction, specially engaged from Spain. (Wallaroo & Moonta Company Annual Report 1900, p. 17)

The 'Expert' was Senor Antonio Delgado, a metallurgical engineer from the Rio Tinto copper mines of south-western Spain, where a British company had been mining on a large scale since 1872. The company had a reputation as a leader in mining technology, pioneering techniques such as open-cut

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extraction and leaching of tailings. (The Rio Tinto company was the ancestor of the modern British company RTZ and Australia's largest mining company, CRA.)

What Delgado introduced to Moonta Mines was a leaching and cementation process to dissolve the copper residue in the tailings and then recover it from solution. Sea water was pumped from Moonta Bay, some sulphuric acid - a by-product of the Wallaroo smelter - was added to make the water slightly acidic, and the brine was allowed to trickle through the tailings heaps. The copper in the heaps was mostly in the form of copper sulphide which oxidised to form copper sulphate which was soluble in water. When the sea water trickled out of the heaps, it ran through a system of channels into the cementation ponds. These were filled with pieces of scrap iron, and the copper metal precipitated out onto the iron surfaces, forming a 'cement', hence the name of the process. Ferrous sulphate was left in solution. The process was ingenious because of its very low cost in materials and labour. For very little outlay the plant was able to produce as much as a thousand tons of additional copper per year.

The cementation plant was in operation by the end of 1900. To provide the sea water, a pumping station was built at Rossiters Point on Moonta Bay. A large pipe was run 100m out to sea, and a boiler and steam engine provided power to the reciprocating pump which sent water 4km inland to the reservoir near Ryan's pumping station. The plant required some 150,000 litres of water per hour, but the water was recycled, and the pumping station only had to keep pace with evaporation and other losses. The leaching process was so successful that the company began buying the tailings of outlying mines such as Hamley and Yelta, thus consolidating all the mine waste of the district at Moonta Mines. At first the process was confined to the heaps of coarse tailings, but within a few years fine tailings, which were called slimes, were also being treated. They were spread out over large areas and ploughed to aerate them before treatment. The large expanses of what appears to be bare earth north of Moonta Mines are the abandoned slimes ponds of the cementation process.

The cementation plant outlived the Wallaroo & Moonta Company. The price of copper plunged after the First World War, and the company was wound up in 1923. Although the mines closed, a valuable asset remained in the tailings heaps, and the Moonta Copper Recovery Company was formed to operate the cementation plant. The new company replaced the old steam pumping plant at Rossiters Point with a Petters diesel engine driving a centrifugal pump.

The cementation plant went on producing copper from the tailings for twenty years after mining ended at Moonta, and provided a small source of employment in the town. Rossiters Point continued to pump sea water until the Second World War. Then in 1943 the Controller of Mineral Production rationalised Australian copper production for the war effort. The Moonta Copper Recovery Company was told to close down its operation, and the Rossiters Point pumping station was scrapped.

REFERENCES:

Jack Connell papers, State Heritage Branch (interviews with Fred Osborn and Les Martin, 1984)

Connell, J. 1985, Cementation Process of Retrieving Copper Residues from Tailings and Slimes, unpublished paper, 1985

Hancock, H. L. "The Wallaroo and Moonta Mines", *Mining and Engineering Review*, 5 June 1914, pp. 268-270

Osborn, F. 1990, *The Moonta Cementation Story*, Moonta, 1990

Schnabel, C. & Louis, H., 1898, *Handbook of Metallurgy*, Vol. 1, New York

Wallaroo & Moonta Mining & Smelting Company Annual Reports

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SITE RECORD:

FORMER NAME:	Delgado's Pumping Station
DESCRIPTION OF PLACE:	Remains of iron pipe, brick and concrete foundations on foreshore
STATEMENT OF HERITAGE VALUE:	The plant at this site was integral to the operation of the Cementation Plant at Moonta Mines. It demonstrates the development of a new technology and shows the importance of seawater in the process.
DATE OF COMPLETION:	1900

HERITAGE ACT CRITERIA:	Code:	a
	Description:	It demonstrates important aspects of the evolution or pattern of the State's history in being associated with the development of the copper resources of the Copper Triangle.
	Code:	b
	Description:	It has rare qualities in that the plant was a unique and early adaptation of an imported leaching process.
	Code:	e
	Description:	It demonstrates a high degree of technical accomplishment in that it utilises an adapted technology to recover residual copper from the tailings.
	Code:	g
	Description:	It has special associations with Moonta Mines and Antonio Delgado who developed the leaching process.
REGISTER STATUS:	Code:	n/a
	Description:	n/a
	Date:	n/a
CURRENT USE:	Description:	n/a
	Dates:	n/a
PREVIOUS USE(S):	Description:	Salt water intake plant
	Dates:	1900-1943
ARCHITECT:	Name:	Antonio Delgado
	Dates:	n/a
	Type:	n/a
BUILDER:	Name:	n/a
	Dates:	n/a
	Type:	n/a
AHC AUSTRALIAN HISTORIC THEMES:	Theme:	3 Developing local, regional and national economies
	Sub-Theme:	3.3 Exploiting natural resources

Saltwater Intake and Pumping Station**CC:137****SITE RECORD (Cont.):**

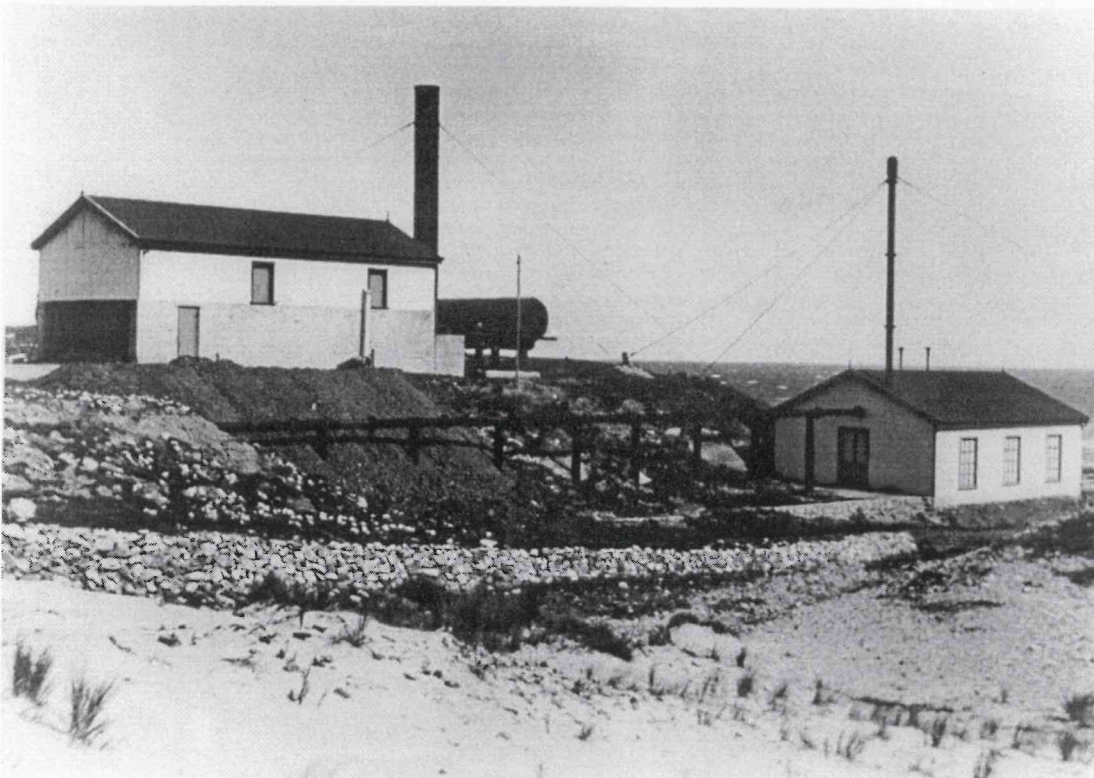
SUBJECT INDEXING:	Group:	Mining and Mineral Processing
	Significant:	Yes
	Category:	Pumping Station
	Significant:	Yes
LOCAL GOVERNMENT AREA:	Description:	District Council of the Copper Coast
LOCATION:	Unit No.:	n/a
	Street No.:	n/a
	Street Name:	n/a
	Town/Suburb:	Moonta Bay
	Post Code:	5558
	Region No.:	10
LAND DESCRIPTION:	Region Name:	Yorke Peninsula
	Title:	n/a
	Volume:	n/a
	Folio:	n/a
	Date:	n/a
	Status:	n/a
	Part:	n/a
	Parcel Type:	n/a
	Parcel No.:	n/a
	Plan Type:	n/a
	Plan No.:	n/a
	Section:	1993
	Hundred:	Wallaroo
AMG REFERENCE:	Zone:	53
	Easting:	0735900
	Northing:	6228200
	Map Sheet No.:	6429-4
	Map Scale:	1:50,000
OWNER/LESSEE:	Class:	Owner
	Type:	DC
	Description:	District Council
	Owner Name:	DC of the Copper Coast
	Address:	PO Box 6
	Town/Suburb:	Kadina
	Post Code:	5554
PHOTOGRAPH:	Film No.:	PB 01
	Neg. No.:	54-55

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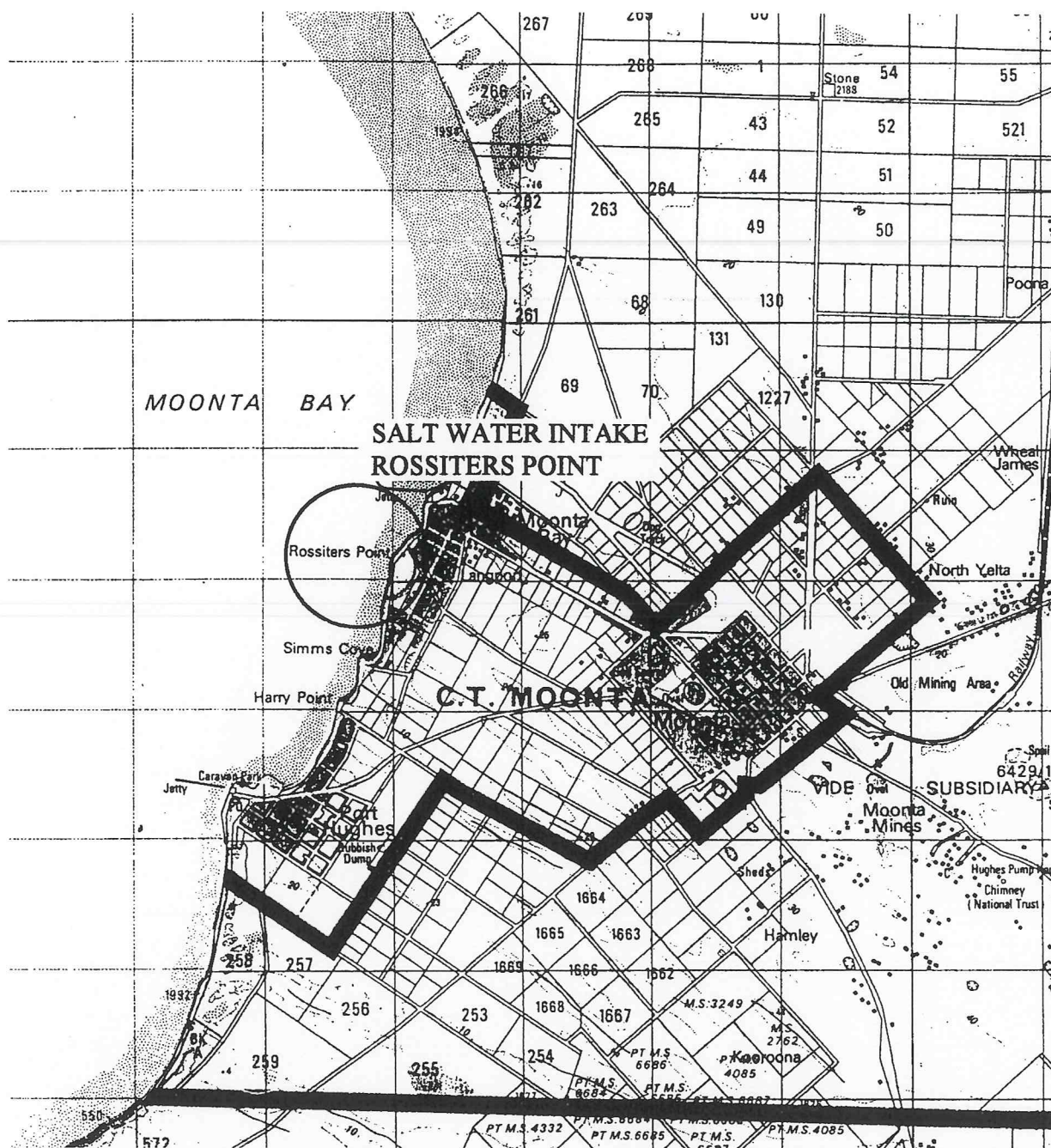
Brick, concrete and stone paved foundations on foreshore, looking south



Rossiters Point Pumping Station shortly after it was built in 1900, looking south-west
(Jim Harbison Collection, Jack Connell Papers)

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YORKE PENINSULA
HERITAGE SURVEY

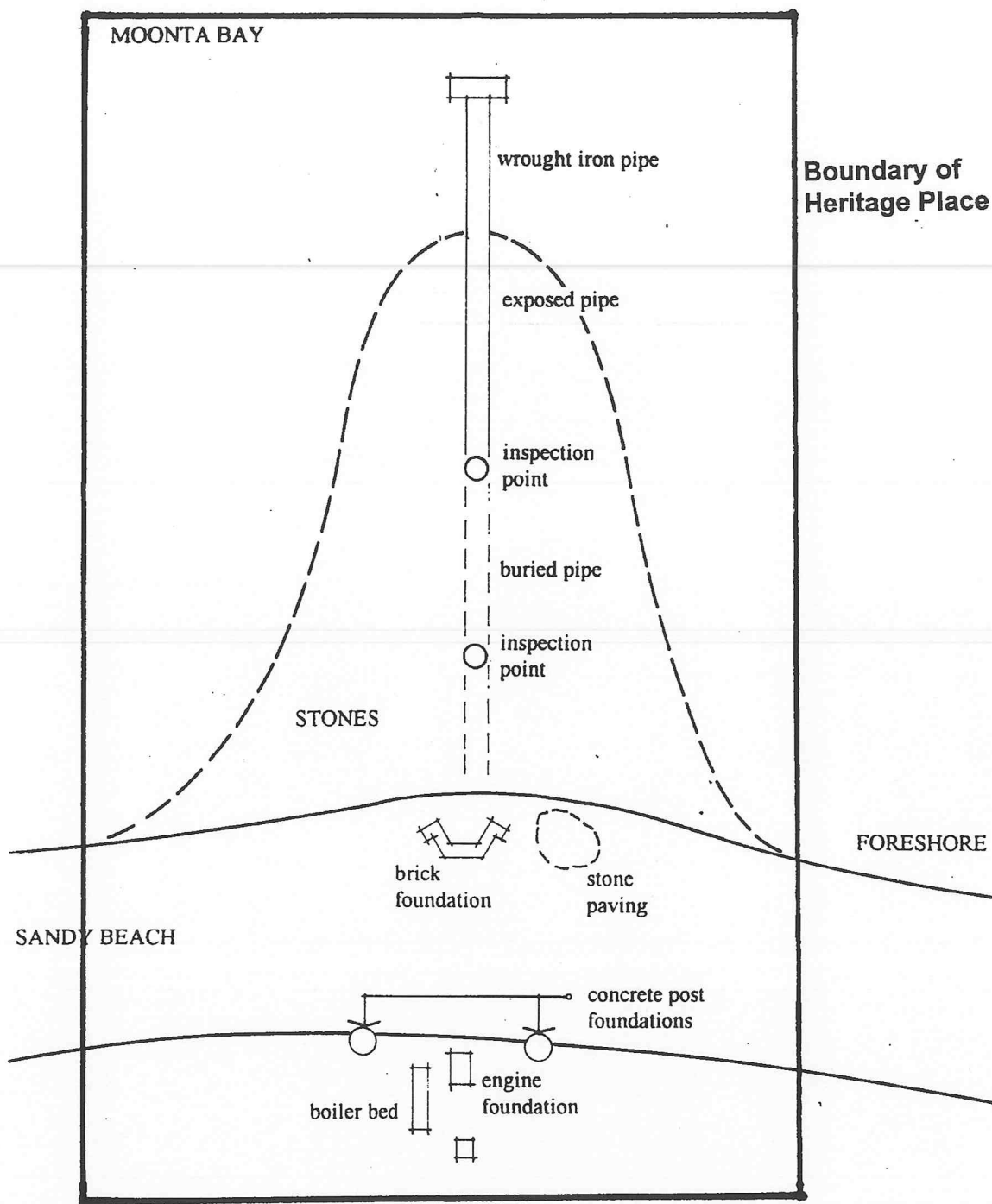
PROPOSED STATE HERITAGE PLACE
Saltwater Intake and Pumping Station
LOCATION PLAN

Scale: 1 : 50 000



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YORKE PENINSULA
HERITAGE SURVEYPROPOSED STATE HERITAGE PLACE
Saltwater Intake and Pumping Station
SITE PLAN

Scale: 1 : 2 500



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Rossiters Point Saltwater Intake, looking west

HERITAGE ASSESSMENT REPORT - UPDATE

As at 4 August 1999

DESCRIPTION OF PLACE:

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HERITAGE ACT CRITERIA:

Criterion:

a

Description:

It demonstrates important aspects of the evolution or pattern of the State's history in being associated with the development of Moonta Mines and the exploitation of the copper resources in the Copper Triangle.

HERITAGE ACT CRITERIA (Cont.):	Criterion: Description:	b It has rare qualities that are of cultural significance in that the plant was a unique and early adaptation of an imported leaching process which allowed re-treatment of the massive volumes of tailings in the Moonta Mines tailings heaps.
	Criterion: Description:	e It demonstrates a high degree of technical accomplishment in that it utilises an adapted technology which involved the use of sea water which had to be pumped over 4 km from this site to the mine site to recover low grades of residual copper from the tailings heaps.
	Criterion: Description:	g It has special associations with the Wallaroo and Moonta Mining and Smelting Company and Antonio Delgado who designed and developed the cementation leaching process.

* LAND DESCRIPTION:
*

Title Type: Fabricated Title
 Volume: 21 1100 1993
 Folio: n/a
 Lot No.: n/a
 Section: 1993
 Hundred: Wallaroo

OWNER:

Name: District Council of the Copper Coast
 Address: PO Box 6
 Town/Suburb: Kadina
 Post Code: 5554