

Photographic Archival Record

Main Conduit Water Main, Baandee

July 2022 | 22-253

element.
the art and science of place

We acknowledge the Whadjuk people of the Noongar nation as traditional owners of the land on which we live and work.

We acknowledge and respect their enduring culture, their contribution to the life of this city, and Elders, past and present.

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Issue	Date	Status	Prepared by	Approved by	Graphics	File
1	11.07.22	Draft	Alana Jennings	Flavia Kiperman	SA	D1
2	14.07.22	Final	Alana Jennings	Flavia Kiperman	SA	F1

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1. Background

1.1 Purpose

The Water Corporation is undertaking progressive upgrades to sections of the main conduit water pipeline (Mundaring – Kalgoorlie water pipeline). The Mundaring to Kalgoorlie Pipeline (Golden Pipeline) is part of the Goldfields Water Supply Scheme which is on the National Heritage List (Place ID 106007; Listed 2011). Under the *Environmental Protection and Biodoversity Conservation Act 1999* (EPBC Act), if a place on the National Heritage List and is being demolished or substantially altered, an archival record of the place must be produced.

The study area subject to this report is a 2.6km section of pipeline in the locality of Baandee. The upgrades will involve installation of a section of new underground pipe, and in accordance with the EPBC Act approval, removal of the existing section of aboveground pipe.

This Archival Record has been prepared for the Water Corporation by Element Advisory Pty Ltd (**element**) in July of 2022. A site visit was undertaken on 23rd June 2022 to photograph and record the study area.

1.2 Study Team

This report has been prepared by the following suitably qualified **element** staff members:

Name	Position
Flavia Kiperman	Director/Principal – Heritage
Alana Jennings	Senior Consultant - Heritage
Karen Huynh	Architectural Draftsperson – Heritage

1.3 Methodology

Archival records fall within one of three categories – detailed, standard or photographic. The Water Corporation required a photographic Archival Record for the study area. This report complies with the minimum requirements as set out in the 'Guide to preparing an Archival Record' issued by Department of Planning, Lands and Heritage, 2019.

A site visit was undertaken on 23 June 2022. Detailed photographs were taken of the study area, including the use of drone photography. Photographs all date from 23 June 2022 and are reproduced in this report, accompanied by a Base Plan to indicate the position from which photographs were taken.

1.4 Location of the study area

The section of main conduit (MC) to be removed is between 191.8 km and 194.4 km markers, approximately 27km east of the township of Kellerberrin, in the Shire of Merredin. The MC runs parallel to the Great Eastern Highway, on the south side of the roadway. The study area is located entirely within the Great Eastern Highway road reserve, between the bounding access roads of Baandee Road South and Southcott Road. Refer also to the Location Plan.

Description	Land ID
P Road	3169917

No certificate of title is available for this land area.

2. Location Plan



Figure 1. Location Plan (MNG with **element** overlay, 2022)

3. Base Plan

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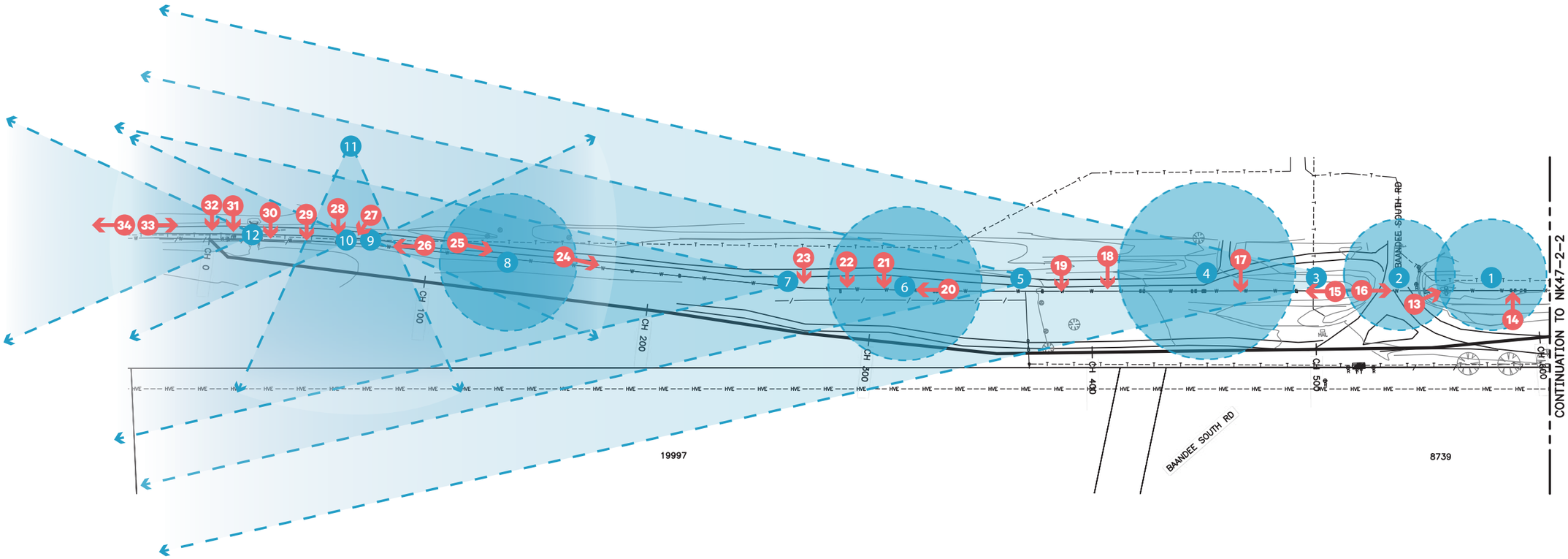
SURVEYED VEGETATION

EXISTING WATER MAIN

EXISTING BURIED TELSTRA
SERVICE OVERHEAD POWER

PHOTOGRAPHS

DRONE IMAGES



SITE PLAN
1:2000

BAANDEE
MAIN CONDUIT WATER MAIN
CH 191.8KM TO 194.4KM

DRAWING NUMBER: 001

Project:	BAANDEE ARCHIVAL RECORD	Drawing No:	001
Drawing Title:	MAIN CONDUIT WATER MAIN CH 191.8KM TO 194.4KM	Scale@A3:	1:2000
Date:	JUNE 2022	Drawn:	KH
Client:	WATER CORPORATION	Checked:	AJ
Job No:	22-253	Revision:	A

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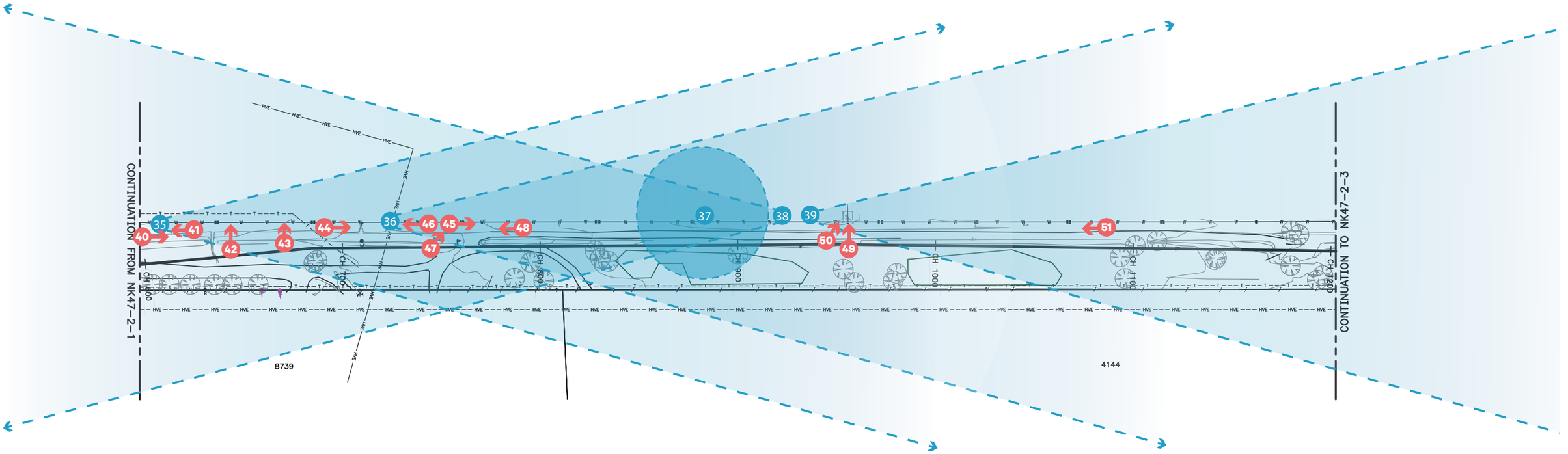
SURVEYED VEGETATION

EXISTING WATER MAIN

EXISTING BURIED TELSTRA SERVICE OVERHEAD POWER

PHOTOGRAPHS

DRONE IMAGES



SITE PLAN
1:2000

BAANDEE
MAIN CONDUIT WATER MAIN
CH 191.8KM TO 194.4KM

DRAWING NUMBER: 002

Project:	BAANDEE ARCHIVAL RECORD	Drawing No:	002
Drawing Title:	MAIN CONDUIT WATER MAIN CH 191.8KM TO 194.4KM	Scale@A3:	1:2000
Date:	JUNE 2022	Drawn:	KH
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Job No:	22-253	Revision:	A

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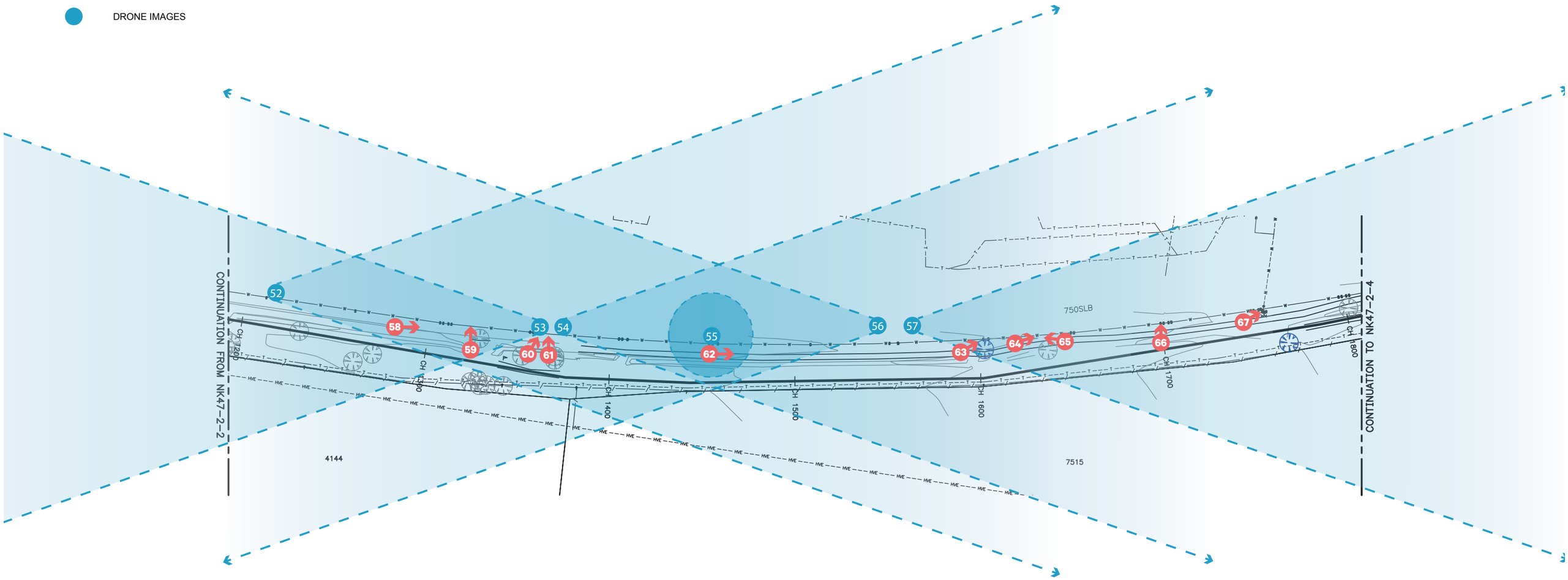
SURVEYED VEGETATION

EXISTING WATER MAIN

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PHOTOGRAPHS

DRONE IMAGES



SITE PLAN
1:2000

BAANDEE
MAIN CONDUIT WATER MAIN
CH 191.8KM TO 194.4KM

DRAWING NUMBER: 003

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Drawing Title:	MAIN CONDUIT WATER MAIN CH 191.8KM TO 194.4KM	Scale@A3:	1:2000
Date:	JUNE 2022	Drawn:	KH
Client:	WATER CORPORATION	Checked:	AJ
Job No:	22-253	Revision:	A

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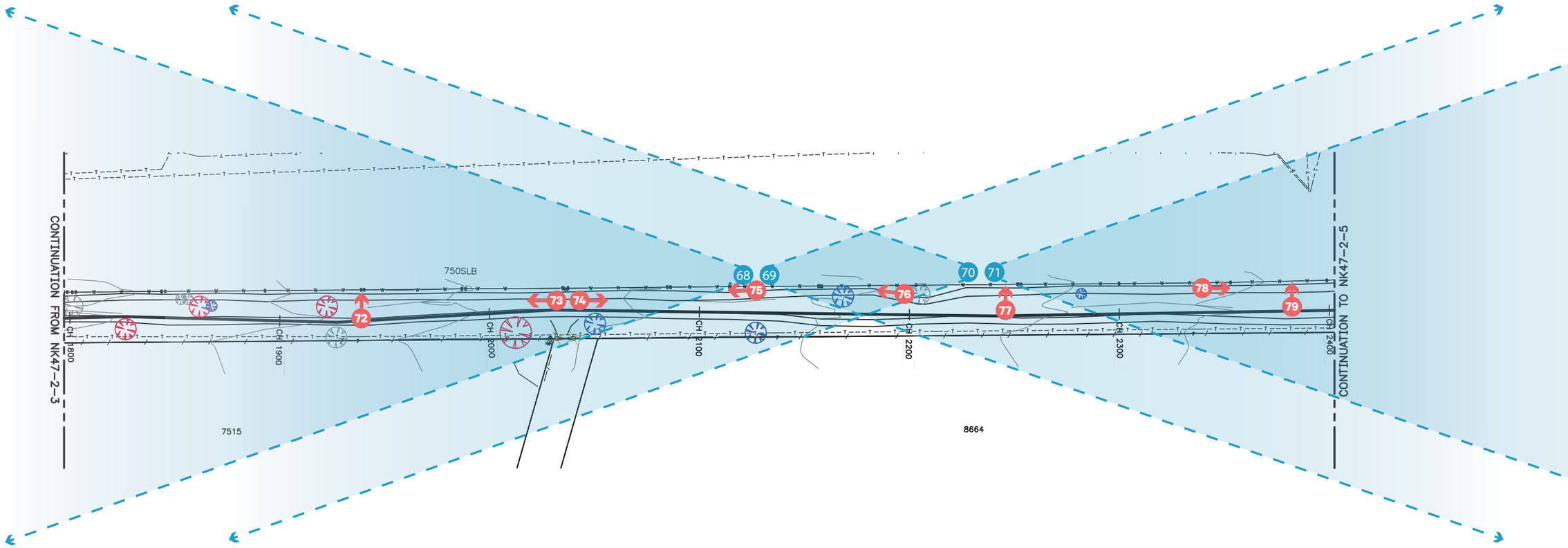
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SITE PLAN
1:2000

BAANDEE

MAIN CONDUIT WATER MAIN
CH 191.8KM TO 194.4KM

DRAWING NUMBER: 004

Project:	BAANDEE ARCHIVAL RECORD	Drawing No:	004
Drawing Title:	MAIN CONDUIT WATER MAIN CH 191.8KM TO 194.4KM	Scale@A3:	1:2000
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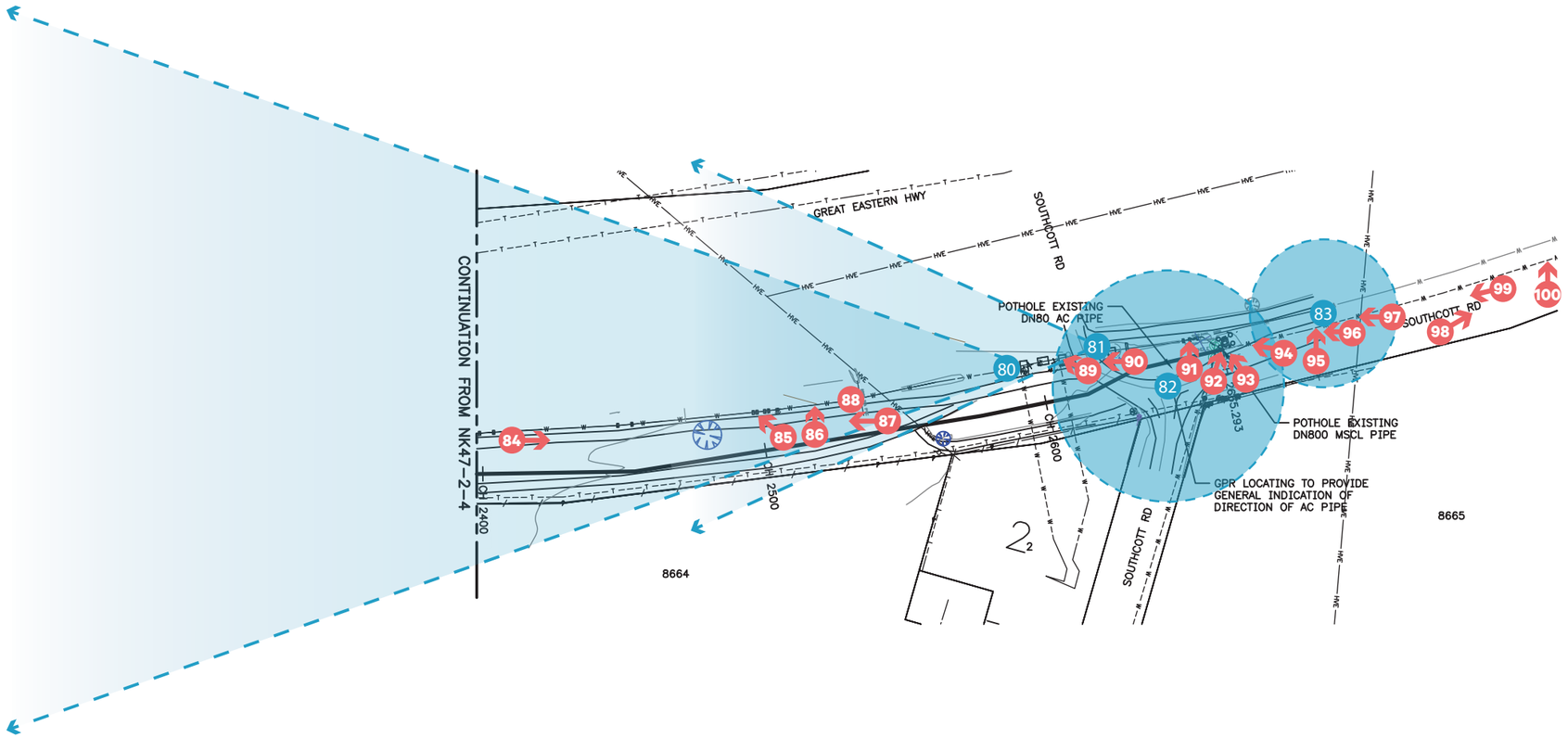
SURVEYED VEGETATION

EXISTING WATER MAIN

EXISTING BURIED TELSTRA SERVICE OVERHEAD POWER

PHOTOGRAPHS

DRONE IMAGES



SITE PLAN
1:2000

BAANDEE

MAIN CONDUIT WATER MAIN CH 191.8KM TO 194.4KM

DRAWING NUMBER: 005

Project:	BAANDEE ARCHIVAL RECORD	Drawing No:	005
Drawing Title:	MAIN CONDUIT WATER MAIN CH 191.8KM TO 194.4KM	Scale@A3:	1:2000
Date:	JUNE 2022	Drawn:	KH
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4. Brief historical overview

The MC Baandee (study area) is part of the larger 'Golden Pipeline.' An assessment for the Goldfields Water Supply Scheme, Western Australia, Mundaring to Kalgoorlie, WA, Australia was prepared for National Heritage Listing in 2011. Below is the Statement of Significance. The full document can be found at:

http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=106007

4.1 Statement of Significance

The Goldfields Water Supply Scheme incorporates the remaining elements of the Coolgardie Goldfields Water Supply Scheme, as designed by engineer Charles Yelverton O'Connor (CY O'Connor) and completed in 1903. These elements include the former steam powered pump stations (and associated receiving tanks), reservoirs, regulating tanks and over 560km of pipeline, commonly referred to as the 'main conduit'. It is significant for the economic benefits it brought to Western Australia and to the nation as a whole, for its demonstration of outstanding technological achievement for its time, and for its association with the engineer, CY O'Connor.

The Goldfields Water Supply Scheme was the impetus for agricultural expansion that was of lasting benefit to Western Australia and to Australia as a whole. Water from the pipeline became available just as the production of gold on the eastern goldfields was starting to decline, but its true value resulted from the effect that regular water supplies had in opening up the south-western agricultural area to production. As the value of gold recovered on the goldfields declined between 1905 and the 1960s, the quantity and value of wheat produced increased steadily over the same period. Today the Western Australian wheatfields are the most productive in Australia, accounting for 42% of the nation's wheat crop. Most of the WA wheat crop is produced in the areas serviced by the goldfields pipeline and its extensions, which continues to operate as a water supply scheme.

Both in the size of the project and in the use of new technology the Goldfields Water Supply Scheme was an outstanding technological achievement in the early 20th century. CY O'Connor's original scheme, known as the Coolgardie Goldfields Water Supply Scheme and consisting of the pipeline itself, the reservoirs, and the pumping stations, was regarded internationally as being the largest such engineering undertaking for its time. The amount of steel used in construction was greater than for previous large steel structures elsewhere in the world. The contracts for the supply of steel were the largest pipe contracts, and the most expensive Australian construction contracts, let to that time.

The Goldfields Water Supply Scheme (including the individual components) is of outstanding value to the nation as a representative example of early 20th century engineering in Australia. Principal characteristics of the Goldfields Water Supply Scheme include: Mundaring Weir (Dam) including the dam wall, spillway and two valve houses; Mount Charlotte Reservoir, the former pump station buildings (and receiving tanks); regulating tanks and the pipeline itself. The scheme is recognised by the American Society of Civil Engineers as an International Historic Civil Engineering Landmark.

The pipeline also made use of innovative Australian design in the locking bar pipe invented by Mephan Ferguson.

The refurbishment of the pipeline in 1933 was also a major technical development. Lifting the pipeline out of the ground and re-laying it above ground placed the Goldfields Water Supply Scheme among the world leaders in pipeline technology for the second time in less than 40 years. During this process, the forces in the continuously welded pipeline resulting from expansion and contraction were directed into reinforced concrete anchor blocks built over the pipe to prevent movement and to transfer these forces into the ground. This was the first time anywhere in the world that pipe anchorages of this type had been used to permit such a large diameter pipeline to be laid above ground.

The Goldfields Water Supply Scheme is significant for its association with the work of CY O'Connor, Engineer-in Chief of the Western Australian Public Works Department from 1891 to his death in March 1902. O'Connor was the driving force behind the construction of the Scheme, which provided great economic benefit to Australia. At the completion of the work, the Premier Sir John Forrest praised him as "the great builder of this work … to bring happiness and comfort to the people of the goldfields for all time".

5. Photographs



Image 1. Birds eye view of Baandee MC at junction with Baandee Road South (**element**, 2022)



Image 2. Birds eye view of Baandee MC above crossover with Baandee Road South (**element**, 2022)



Image 3. Aerial view of Baandee MC from Baandee Road South looking west (**element**, 2022)



Image 4. Aerial view of Baandee MC from Baandee Road South looking west (**element**, 2022)



Image 5. Aerial view of Baandee MC from Great Eastern Highway layby (**element**, 2022)



Image 6. Birds eye view of Baandee MC near Baandee Lake (**element**, 2022)



Image 7. Aerial view of Baandee MC from Great Eastern Highway layby (**element**, 2022)



Image 8. Birds eye view of Baandee MC near Baandee Lake (**element**, 2022)



Image 9. Aerial view of Baandee MC looking east towards Baandee Road South (**element**, 2022)



Image 10. Aerial view of Baandee MC looking west towards Baandee Lake (**element**, 2022)



Image 11. Aerial view of Baandee MC looking south towards Baandee Lake (**element**, 2022)



Image 12. Aerial view of Baandee MC looking west towards Baandee Lake (**element**, 2022)



Image 13. Detail of pipe bracing and trench looking north towards Great Eastern Highway (**element**, 2022)



Image 14. Pipework footings looking north towards Great Eastern Highway (**element**, 2022)



Image 15. Pipeline emerging from below crossover with Baandee Road South (**element**, 2022)



Image 16. Pipeline below crossover with Baandee Road South (**element**, 2022)



Image 17. Detail of footing support and pipe texture (**element**, 2022)



Image 18. Various stages and conditions of pipeline bracing structures (**element**, 2022)



Image 19. Detail of bracing structure and corroded steelwork (**element**, 2022)



Image 20. Bracing details and pipeline view looking south west (**element**, 2022)



Image 21. Degraded and contemporary bracing details (**element**, 2022)



Image 22. Detail of pipeline patching and joints (**element**, 2022)



Image 23. Detail of bracing and junction between varying pipeline finishes (**element**, 2022)



Image 24. Pipeline looking south east with redundant footings and bracing visible beyond (**element**, 2022)



Image 25. Detail of 192km marker looking east (**element**, 2022)



Image 26. Pipeline looking east towards Baandee Lake with redundant footings and bracing visible beyond (**element**, 2022)



Image 27. Detail of footing support and pipe texture (**element**, 2022)



Image 28. Double bracing detail (**element**, 2022)



Image 29. Blackened pipework section to the western end of the study area (**element**, 2022)



Image 30. Junction detail at change in pipework girth (**element**, 2022)



Image 31. Junction detail at change in pipework girth (**element**, 2022)



Image 32. Bracing and access details (**element**, 2022)



Image 33. Bracing and access details (**element**, 2022)



Image 34. Continuing pipeline looking west (**element**, 2022)



Image 35. Aerial view from Baandee Road South looking east (**element**, 2022)



Image 36. Aerial view from Baandee Road South looking east (**element**, 2022)



Image 37. Birds eye view of pipeline with previously removed section visible beyond (**element**, 2022)



Image 38. Aerial view of pipeline looking west towards Baandee Road South crossover (**element**, 2022)



Image 39. Aerial view of pipeline looking east towards Baandee Pumping Station (**element**, 2022)



Image 40. Detail of pipe bracing and trench looking north east towards Great Eastern Highway (**element**, 2022)



Image 41. Detail of pipe bracing and trench looking north west towards Great Eastern Highway (**element**, 2022)



Image 42. Detail markers (**element**, 2022)



Image 43. Detail marker (**element**, 2022)



Image 44. Detail of pipe patching and trench looking north east towards Great Eastern Highway (**element**, 2022)



Image 45. Detail of pipe access point (**element**, 2022)



Image 46. Outlet details (**element**, 2022)



Image 47. Detail of pipe access point (**element**, 2022)



Image 48. Detail of degraded footing structure and corroded steelwork (**element**, 2022)



Image 49. Scour valve detail (**element**, 2022)



Image 50. Scour valve detail (**element**, 2022)



Image 51. Detail of 193km marker looking west (**element**, 2022)



Image 52. Aerial view of pipeline looking east towards Baandee Pumping Station (**element**, 2022)



Image 53. Aerial view of pipeline looking west towards Baandee Lake (**element**, 2022)



Image 54. Aerial view of pipeline looking east towards Baandee Pumping Station (**element**, 2022)



Image 55. Birdseye view of pipeline noting varying periods of bracing detail (**element**, 2022)



Image 56. Aerial view of pipeline looking west towards Baandee Lake (**element**, 2022)



Image 57. Aerial view of pipeline looking east towards Baandee Pumping Station (**element**, 2022)



Image 58. Detail of pipe footings and trench looking north east towards Great Eastern Highway (**element**, 2022)

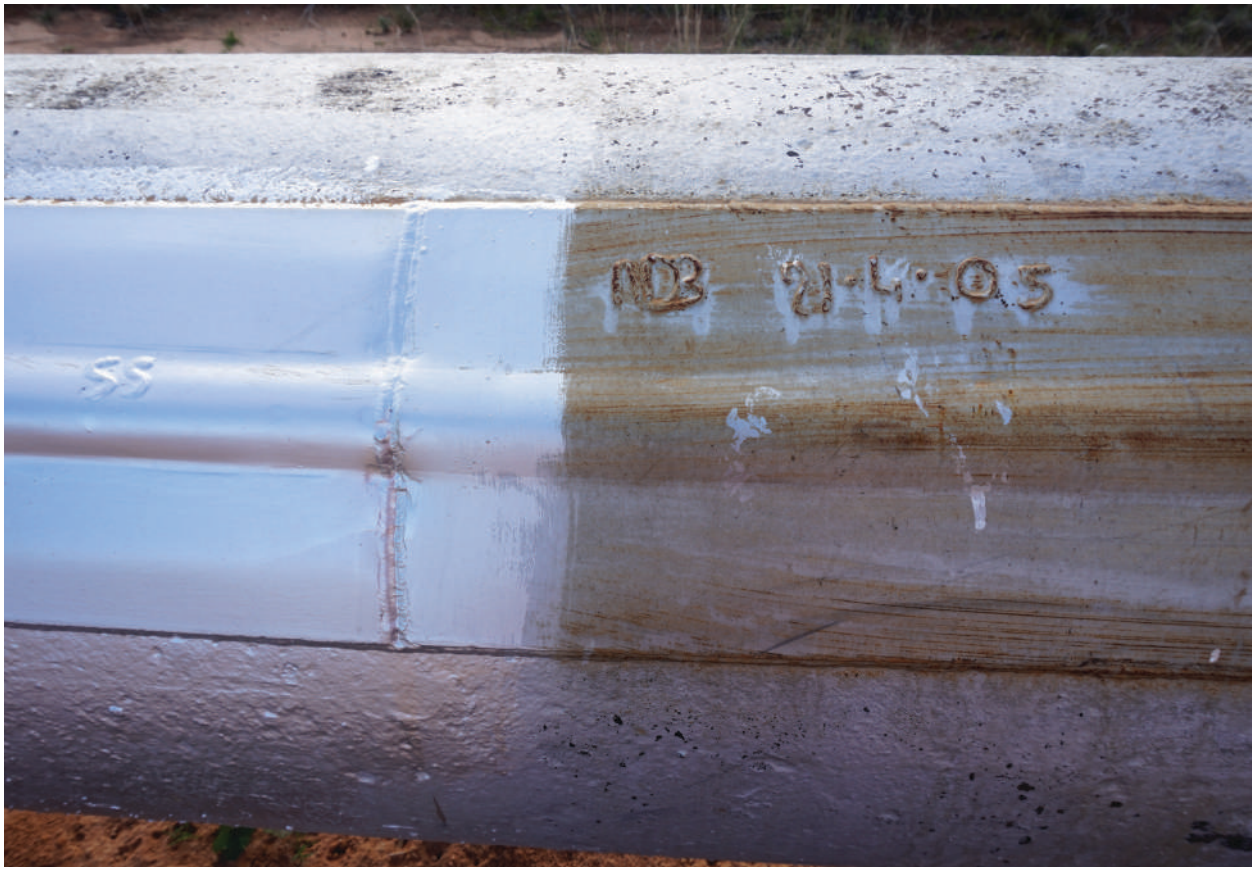


Image 59. Detail of pipeline patching and joints (**element**, 2022)



Image 60. Various stages and conditions of pipeline bracing structures (**element**, 2022)



Image 61. Various stages and conditions of pipeline bracing structures (**element**, 2022)



Image 62. Detail of pipe bracing and trench looking north east towards Great Eastern Highway (**element**, 2022)



Image 63. Detail of pipeline patching, joints and replacement bracing (**element**, 2022)



Image 64. Detail of pipeline patching, joints, early and replacement bracing (**element**, 2022)



Image 65. View of pipeline and trench looking west (**element**, 2022)



Image 66. Detail of patching, degraded bracing structure and corroded steelwork (**element**, 2022)



Image 67. Degraded and contemporary bracing details (**element**, 2022)



Image 68. Aerial view of pipeline looking west towards Baandee Lake (**element**, 2022)



Image 69. Aerial view of pipeline looking east towards Baandee Pumping Station and Southcott Road (**element**, 2022)



Image 70. Aerial view of pipeline looking west (**element**, 2022)



Image 71. Aerial view of pipeline looking east towards Baandee Pumping Station and Southcott Road (**element**, 2022)



Image 72. Outlet detail (**element**, 2022)



Image 73. View along pipeline looking west (**element**, 2022)



Image 74. View along pipeline looking east (**element**, 2022)



Image 75. Detail of 194km marker looking west with degraded bracing detail visible beyond (**element**, 2022)



Image 76. View along pipeline looking west (**element**, 2022)



Image 77. Detail markers (**element**, 2022)



Image 78. View along pipeline looking east towards Baandee Pumping Station (**element**, 2022)



Image 79. Detail of degraded bracing structure and corroded steelwork (**element**, 2022)



Image 80. Aerial view of pipeline looking west (**element**, 2022)



Image 81. Birds eye view of Baandee MC at junction with Southcott Road (**element**, 2022)



Image 82. Birds eye view of Baandee MC and Pumping Station at junction with Southcott Road (**element**, 2022)



Image 83. Birds eye view of Baandee MC noting previous replacement section of pipework (**element**, 2022)



Image 84. View along pipeline looking east towards Baandee Pumping Station (**element**, 2022)



Image 85. Detail of pipe access point (**element**, 2022)



Image 86. Detail of pipeline patching (**element**, 2022)



Image 87. View along pipeline looking west (**element**, 2022)



Image 88. Detail of pipe access point (**element**, 2022)



Image 89. Detail of pipe access pits (**element**, 2022)



Image 90. View from Southcott Road crossover towards pipeline access pits (**element**, 2022)



Image 91. Detail of pipe access point (**element**, 2022)



Image 92. Scour valve detail (**element**, 2022)



Image 93. Scour valve detail (**element**, 2022)



Image 94. Detail markers (**element**, 2022)



Image 95. Detail of pipe access point (**element**, 2022)



Image 96. Detail of previous replacement section and degraded bracing (**element**, 2022)



Image 97. Detail of degraded bracing (**element**, 2022)



Image 98. View along pipeline looking east (**element**, 2022)



Image 99. View along pipeline looking west towards Baandee Pumping Station (**element**, 2022)



Image 100. Detail of degraded bracing structure and corroded steelwork (**element**, 2022)

6. Bibliography

National Heritage List, P106007 Goldfields Water Supply Scheme. 23 June 2011.

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