HUNTER WATER
SECTION s170 REGISTER

ITEM NAME:

Hunter River Tunnel

Contents:

ITEM DETAILS

Item Name	Hunter River Tunnel
Other / Former Names	N/A
NSW SHI No.	3630118
GID	N/A
Plant No.	N/A
Local Government Area	Maitland and Port Stephens
Lot and DP	Lot 1 DP 654984 and Lot 1 DP 636662
Address	Multiple (refer to associated mapping/GIS data)
Curtilage	The curtilage of this asset is defined by its physical extent and does not correspond to associated legal allotment boundaries.

General view of the location of the Tunnel

Asset location and curtilage (red boundary) (refer to Figure 1 for additional detail)

HISTORICAL OVERVIEW

Current Use	Decommission
Former Use	Water transport
Designer / Builder	Public Works Department
Historical Notes	The Hunter River Tunnel was constructed as a part of the Chichester Dam Scheme in the early 1920s. With construction of the tunnel still incomplete in the summer of 1923-24, drought conditions forced the construction of a temporary connection. As such, two pipes were assembled in 80-foot lengths on punts and lowered to the bed of the river, where a diver coupled them together. Water from the newly constructed Chichester Dam was first delivered into the Waratah Reservoir by this system in November 1923, relieving the critical water supply position. This temporary connection stayed in use until 4th December 1924, when the whole of the 36-inch gravitation main, including the permanent Hunter River Tunnel, was completed. In April 1928, following problems with seepage into the tunnel, the Public Works Department installed an electric pumping set to dewater the tunnel. Also, during 1927-28 both pipe lines in the drive and shafts were scraped, brushed and repainted, and all ladders and platforms in both shafts were taken up, thoroughly chipped and repainted, and replaced. Consideration was also being given at this time to the installation of electric light in valve houses, shafts and drives. It was also noted in the Annual Report for 1927-28 that the pipes had been heavily rusted, and it was proving very difficult to find a paint that would stay on in the face of the very corrosive salt water that was found to be percolating through the rock from the river above. As such, continuous efforts were made to effectively protect the pipes, however by the close of the year, no solution had been found. This, along with the problem of seepage into the tunnel which required the removal of water through pumping, were problems that continued to dog the maintenance of the Hunter River Tunnel for many years. In regard to the coating of pipes, recoating of the pipes was once again carried out in 1928-29. However, in the following year it was concluded that no satisfactory coating for the pipes had been obtained, with all coatings tried having broken down under the damp conditions that prevailed in the tunnel. As such, patching of the paint coatings was once again receiving attention. The 1932-33 Annual Report reported that trouble was still being experienced in maintaining a coating that would satisfactorily prevent corrosion, and in 1934-35 the whole of the old coating on the pipes was removed and the length of pipe in the tunnel cleaned down in preparation for recoating due to deterioration. In the 1933-34 Annual Report it was noted that heavy corrosion was occurring where the seepage water from the concrete roof of the Hunter River Tunnel dripped on to the steel pipe. In response, experimental work was carried out with the object of draining this water to the side of the Tunnel. Consequently, in 1934-35 the concrete tunnel lining was injected with grout and despite results obtained not being entirely successful they were considered to be sufficiently satisfactory to warrant the work being continued. With final works carried out in 1935-36, seepage through the tunnel was declared as having been successfully dealt with. In 1933-34 a ¾ inch wash-out service was installed in the Tunnel for the purpose of washing down the pipes and floor where necessary. 1934-35 saw a substantial platform erected in the north shaft of the Hunter River Tunnel to facilitate the raising or lowering of materials. The 1947-48 Annual Report told of the replacement of defective 36-inch steel pipes in southern shaft (western side) of the Hunter River Tunnel's 36-inch Chichester pipeline. In 1950-51 the replacement of the second 36-inch vertical pipe in southern shaft was commenced and completed. The access ladders and landing to the Hunter River tunnel were replaced in 1961-62. In this same year the valve house building over the southern shaft, which had been damaged by successive floods, was demolished and replaced by a new building erected

under contract. Also in 1961-62, the twin 36-inch steel mains in the tunnel were cleaned by hand, and a cement lining applied using the "Centriline" process, also under contract.

In 1974-75 the Board approved the replacement of the twin pipes in the Hunter River Tunnel. This work was called for due to the deterioration and possibility of failure of the twin MSCL pipelines. Laid in 1920 they had deteriorated primarily due to the damp atmosphere of the tunnel. The pipes in the horizontal leg of the tunnel were replaced with fully welded 900-millimetre steel pipes in 1976, with the two bottom pipes in the vertical leg of the south shaft replaced in the winter of 1977. New ladders were also installed at this time in the south shaft.

Currently, assessments for the decommissioning of the Tunnel and the removal of both valve houses are being undertaken. The tunnel has been replaced with a new DN900 pipeline 'trenchless' crossing in a parallel alignment, with associated valves.

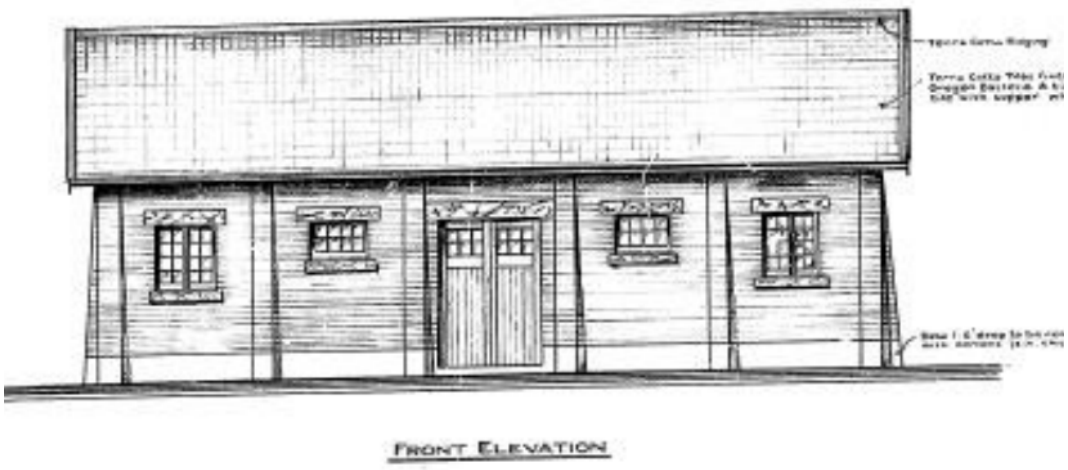

Figure 2: Front elevation of the northern valve house dated 1925
Source: Hunter Water Corporation

HERITAGE STATUS

Listing Details	☒ S170 Heritage and Conservation Register ☐ Local heritage listing ☐ State heritage listing
Conservation Management Plan	☐ N/A
Heritage Asset Action Plan	☐ N/A
Aboriginal Sites Registered within the Site	Search of the AHIMS database undertaken on 8 March 2023 for the area Latitude and Longitude from -32.7334, 151.6841 and Latitude and Longitude to -32.7244, 151.6996. Two sites were registered within the search area.
Historical Archaeological Potential	The 2023 Draft Statement of Heritage Impact prepared by Biosis for the Hunter River Tunnel states: The study area has been subject to extensive land disturbance throughout time which would have impacted the integrity of sub-surface deposits if they had been deposited from land occupation. The site has been highly disturbed by the excavation of the tunnel. The lands on which the valve houses sit are spoil from the excavation of the tunnel. Therefore, there is low archaeological potential for potentially significant archaeological deposits. This asset is therefore considered to have low historical archaeological potential.

HERITAGE SIGNIFICANCE

Level of Significance

Local

Statement of Significance

The Hunter River Tunnel is a significant component of the Chichester Scheme. The construction of a tunnel under the Hunter River represents a substantial engineering challenge, and demonstrates the ingenuity of the Hunter District Water Board.

The significance of the Tunnel is largely based on its historical and technical value rather than its physical fabric, which has been subject to replacement over time. The northern valve house (constructed in the 1920s) is aesthetically distinctive and contains original equipment that is of historical and aesthetic/technical significance. The southern valve house (constructed in the 1960s) is not of particular significance.

As a collective resource, the Tunnel and the northern valve house are important in understanding the operation of the Tunnel, with the northern valve house being the principal visible evidence of the original scheme and Tunnel operation in this location.

NSW SHR Criteria

- ☒ a) Historical
- ☐ b) Associative
- ☒ c) Aesthetic / Technical
- ☐ d) Social
- ☐ e) Research Potential (yield new information)
- ☐ f) Rare
- ☒ g) Representative

Significant Elements

- Alignment and scale of the Tunnel.
- Form, scale and design of the northern valve house including joinery, brickwork, rendered sills and lintels and brick piers, and the rhythm and proportions of fenestration.
- Remnant original equipment within the northern valve house.

DESCRIPTION

Setting

The Tunnel crosses the Hunter River in a rural area. The valve houses are located within rural properties on either side of the Tunnel.

External Appearance

The Hunter River Tunnel is concrete lined and contains two DN900 pipelines with sufficient room for personnel access. The tunnel is approximately 200 metres long and is accessed each side of the Hunter River through vertical shafts. Access ladders and platforms within the shafts were replaced in the 1970s.The cast iron pipes of the Tunnel have been progressively upgraded, however the 90-degree bends at the base of shafts have not been replaced.

Enclosed brick valve houses have been constructed on either side of the Hunter River, over each of the shafts. The southern valve house was constructed in 1961-62 to replace a previous valve house; it is of a simple and utilitarian design and construction and is not significant. The northern valve house is original to the Tunnel and dates from the mid-1920s. It is a face-brick, single-storey building that is rectangular plan and features a timber-framed gabled, king post roof clad in corrugated steel. There are timber vents to the gable ends and the walls have external engaged piers that are raked as buttresses. The piers rest on concrete footings and the floor of the building is a concrete slab. The building has windows on all sides and a central double door on the south-eastern side. Window and door joinery is timber and sills and lintels are reinforced concrete. While simple in design, the building is more decorative and more aesthetically distinctive than the southern valve house.

	The Tunnel forms part of the wider Chichester Trunk Gravitation Main (CTGM), which conveys water from Chichester Dam to the water distribution system that serves Newcastle, Lake Macquarie and the lower Hunter.
Internal Appearance	Southern Valve House: Internally, the walls are face brick and the roof panels and joists are exposed to view. Below the level of the floor are the valve chamber and the shaft. The chamber walls are parallel to the walls of the building and the shaft is diagonally oriented to the alignment of the tunnel. A timber-board floor is in place over the valve chamber whereas the shaft is not covered but access is restricted by steel railing and fencing. Northern Valve House: Internally, the walls are face brick and the roof framing is open. Below the level of the floor are the valve chamber and the shaft. The chamber walls are parallel to the walls of the building and the shaft is diagonally oriented to the alignment of the tunnel. Steel grate floors are in place over the shaft and valve chamber. Some original equipment associated with the valve system remains *in situ*.
Overall Condition	Fair.
Moveable Heritage Objects	None identified.

MANAGEMENT

Approval and Assessment Requirements	Minor or inconsequential impacts: Anything other than routine repair and maintenance must be discussed with the Environment Team to determine the level of heritage assessment required. More than minor or inconsequential impacts: As above. Additionally, consultation with the relevant local council is required. Demolition or removal from the register requires consultation with Heritage NSW and archival recording.
General / Ongoing Management	• Changes within the defined curtilage should be preceded by the appropriate level of heritage assessment and approval. Advice and/or confirmation should be sought from the Environment Team prior to undertaking any works. • Maintain overall alignment and scale of the Tunnel and the northern valve house. • Changes to fabric may be supportable if no feasible alternative is available to ensure ongoing operation and/or safety. Note: the alignment and historical value of the Tunnel is of greater significance than its physical fabric which has largely been replaced. • Replacement/removal of redundant or failing elements or equipment is acceptable to facilitate ongoing operation. Any removed original elements/equipment should preferably be salvaged for interpretive purposes. • Removal of non-significant elements (such as contemporary equipment) is supportable. Any replacements must be appropriate/sympathetic. • It is preferable that the northern valve house be retained and its significant fabric maintained appropriately.
Priority Conservation Works	• Check over timber to northern valve house and repair/replace as required. • Inspect and assess concrete slab of the northern valve house and stabilise as required.

KEY IMAGES

Image 1: Northern valve house facing southeast

Image 2: Northern valve house facing northwest

Image 3: Timber roof structure within the northern valve house

Image 4: Part of the valve system within the northern valve house

Image 5: Southern valve house

Image 6: Internal view within the southern valve house

REFERENCES

- Clem Lloyd, Patrick Troy and Shelley Schreiner 1992, For the Public Health. The Hunter District Water Board 18921992. Publisher: Longman Cheshire Pty Ltd, Melbourne.
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- John W Armstrong 1967, Pipelines and People. The History of the Hunter District Water Board Newcastle, New South Wales. Publisher: The Hunter District Water Board, Newcastle.
- Mal Hindley 1983, 'From Weirs, Dams and Sand', in Shaping the Hunter. Publisher: The Newcastle Division of the Institute of Engineers Australia, Newcastle.

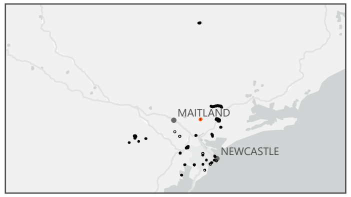
FIGURE 1

S170 Review - Heritage Curtilages

Legend

- Road
- Railway
- Lot Boundary
- Heritage Curtilages

Hunter River Tunnel



0 100

Metres

Scale 1:2,500 at A4

GDA 1994 MGA Zone 56

Image Source: ESRI Basemap (2022) **Data source:** NSW DFSI (2022)