

HUNTER WATER

SECTION s170 REGISTER



ITEM NAME:

Grahamstown Dam

Contents:



Item details



Historical Overview



Heritage Status



Heritage Significance



Description



Management



Key Images



References

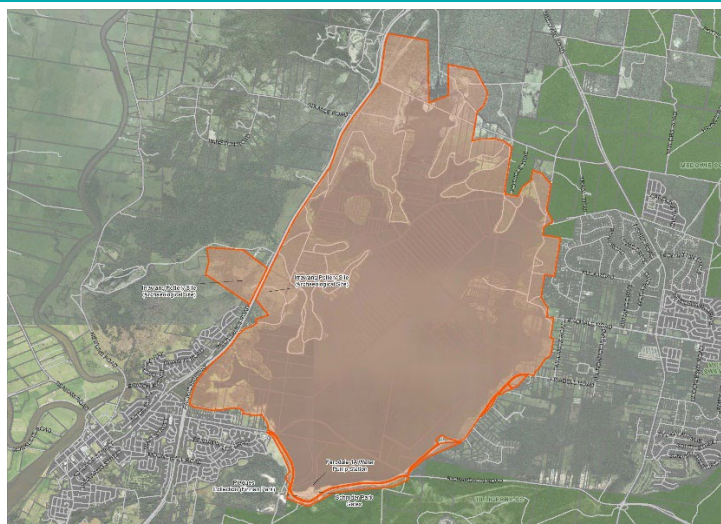
ITEM DETAILS



Item Name	Grahamstown Dam
Other / Former Names	Grahamstown Scheme
NSW SHI No.	3630054
GID	3698836
Plant No.	WH-GRA-DAM
Local Government Area	Port Stephens
Lot and DP	Multiple (refer to associated mapping/GIS data)
Address	Grahamstown Road, Medowie NSW 2318 (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 from the southern end of the Dam



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



Current Use	Water storage
Former Use	N/A
Designer / Builder	Vattenbyggnadsbyran (VBB) – Swedish Engineering Consultancy and Hunter District Water Board/ Water Conservation and Irrigation Commission

Historical Notes

After the end of World War II, the Board became preoccupied with the adequacy of their water sources. It was in March 1946 that the Board's then President, George Schroder, first raised the possibility of using the Grahamstown Moors as a possible new water source. The Grahamstown Moors had a catchment area covering more than 78 square kilometres, and for years it had been known that a large amount of water could be impounded at the site. The local catchment, however, was inadequate to cater for the demands of the region, posing a significant challenge in regards to its exploitation as a storage site.

Whilst investigations in regard to the utilisation of Grahamstown Moorlands as an auxiliary to the Tomago Water Supply Works were carried out from the late 1940s and the Board obtained 2,000 acres of the Grahamstown Moorlands in 1948, an alternative proposition of constructing a much larger dam at Tillegra was preferred. In the early 1950s it was decided by the Engineering Experts' Committee that future investigation should concentrate on Tillegra. Following a visit to Europe to attend conferences and inspect waterworks however, and in the face of growing opposition to Tillegra Dam, Schroder was able to persuade the Board to delay the Tillegra Dam and fully exploit both the Tomago sandbeds and Grahamstown catchment area. The Board subsequently commissioned the Swedish consulting engineers Vattenbyggnadsbyran to investigate.

After visiting the region early in 1953 they delivered their report in September, and with it provided their solution to the problem of the Grahamstown Moors' inadequate catchment. The scheme proposed by Vattenbyggnadsbyran provided for fresh water to be drawn from the Williams River near Seaham and conveyed by open canals and a tunnel to a storage dam constructed on the moors. The storage was to be formed by constructing an embankment across the natural depression known as the Grahamstown Moors. As the Williams River at the point of extraction was tidal, the scheme put forward by the Swedish engineers outlined the necessity of constructing a weir to form a barrage between the tidal salt water and the fresh river water.

Once collected, this fresh water would be conveyed by open canal for approximately three miles to a pumping station at Balickera (the Balickera-Grahamstown Water Pumping Station), where the water would be lifted 15 metres before gravitating towards the dam through a 1,200-metre-long tunnel cut through a high ridge between the sites. Finally, the water would feed into an outlet canal that delivered it to Grahamstown Dam. The Grahamstown Dam itself would form a large shallow storage basin with a capacity of approximately 40,000,000,000 gallons and a surface area, when full, of about 12 square miles.

In February 1955, following review, the Board's Amplification Committee broadly accepted the scheme, with construction of the Dam authorised by the Board on 5th April 1955. Construction of the scheme commenced immediately after the official construction ceremony was performed by the then Premier, Mr J Cahill, on 30th November 1957. On 9th July 1957 the Board had decided to request the Water Conservation and Irrigation Commission, in association with the Board, to design and construct the Grahamstown embankment complete, including all subsidiary embankments.

The Dam wall which impounds the water of the lake, closing in the former moors drainage canal, is 4.8 kilometres long. Its construction involved the placement of an estimated total of 2,570,000 cubic yards of fill comprising approximately 2,300,000 cubic yards of sand and 270,000 cubic yards of clay. Whilst the Grahamstown Scheme was first brought into service in 1960, utilising water from the immediate catchment area that naturally drained into the dam, it was not to be until 1964 that the scheme was finished. The construction of No. 4 embankment was completed in the year 1958-59, with all other embankments except No. 1 (at Grahamstown Road) completed by the close of the 1960-61 financial year.

Preparations of the basin included the clearing of timber and scrub and were carried out over several of years in the early 1960s. Property acquisitions were also still being carried out in the early 1960s, with approximately 75% achieved by 1960-61 (it was only in 1970-71 that the Board completed the acquisition of title to all lands within the Storage Reservoir Basin and all properties necessary to carry the deviated Pacific Highway).

In 1962 the Water Conservation and Irrigation Commission completed its work for the Board on the scheme, having completed the construction of the dam walls. In the same year, 45% higher than average rainfalls saw an abrupt rise in the level of the water in the dam, inundating surrounding areas and threatening the Pacific Highway north of Raymond Terrace. Subsequently, an emergency spillway was built at Irrawang to prevent flooding of the highway. In 1965-66 it was decided, following investigations into the top of the clay core in the embankment, that the Irrawang Spillway would be relocated to Burke's Gully under the Pacific Highway. The relocated Irrawang spillway was to consist of two vertical lift gates with a concrete lined approach and discharge canals. To allow the highway to cross the canal two bridges were provided by the Board. The gates were each 9 feet by 10 feet, the concrete canals 18 feet by 15 feet and approximately 400 feet long, and the bridges 48 feet wide.

The Grahamstown Water Supply Scheme was officially opened on 11th July 1964 by the then Premier of NSW. In the 1969-70 Annual Report it was noted that following extensive investigation tenders had been called for the sealing of part of the Grahamstown embankment using the bentonite slurry cut-off trench method, involving the excavation of a trench five feet wide down to the impervious strata. McDougall-Ireland Pty Ltd was awarded the contract for the project, and by 30th June 1970 the Company had carried out minor preliminary works. Problems related to the suitability of the backfill material were encountered in late 1971 however, resulting in the temporary suspension of works. After deciding to add 12% clay to the mixture, work was resumed until May 1972, when further problems were encountered and remedial measures once again carried out. All work on the Grahamstown Embankment was finally completed on 10th August 1973.

In 1978-79 the embankment near Campvale Pumping Station, over a length of 800 metres, was raised by 600 millimetres following damage caused by wave action, thereby raising the over height of rock protection to 1.2 metres above the designed top water level of storage. 1984-85 saw investigations into the feasibility of raising the level of Grahamstown Dam, in conjunction with the development of three major spillway options. After preliminary studies of downstream effects were made and cost estimates for the three options were prepared, new demand predictions saw the works postponed to between 1988 and 1991. In June 1992, a programme to augment the Grahamstown Dam was announced, with these works completed in December 1994.

Another programme of augmentation was carried out in the late 1990s, with the 1998-99 Annual Report stating that the corporation was carrying out work involving the construction of a new spillway and two bridges on the Pacific Highway adjoining the dam. These works would see the storage capacity of the dam increase by 50%, raising the top water level by 2.4 metres. With one of the bridges completed in 1999-2000, the entirety of the bridgework was completed in 2000-01. The Grahamstown Dam spillway and new embankment was completed in December 2005.

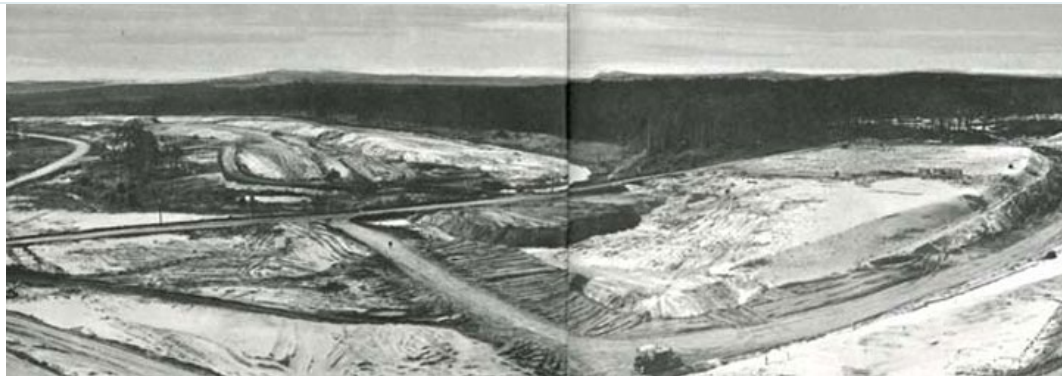


Figure 2: Grahamstown Dam – construction of the embankment

Source: John. W. Armstrong, "Pipelines and People"

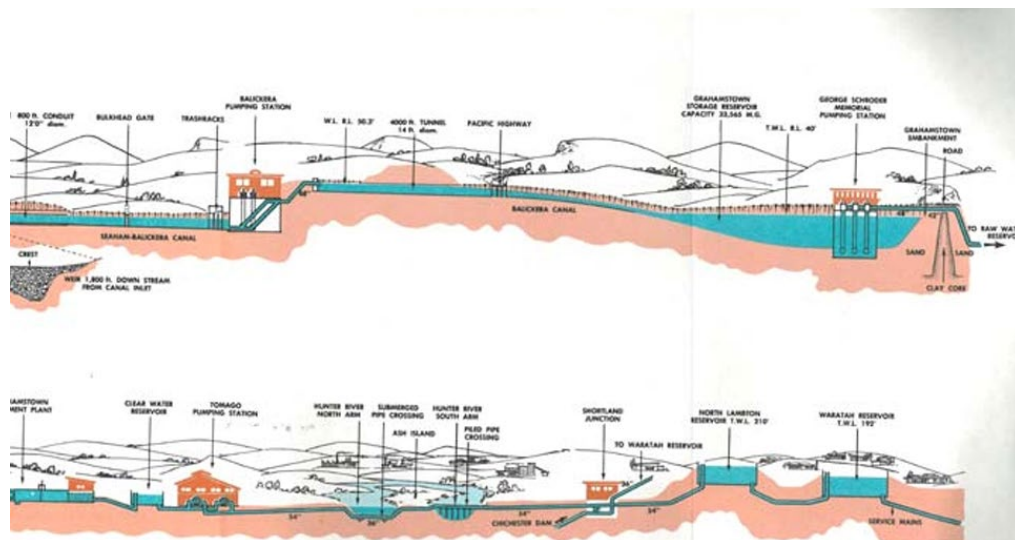


Figure 3: Grahamstown Dam System diagram

Source: Hunter District Water Board

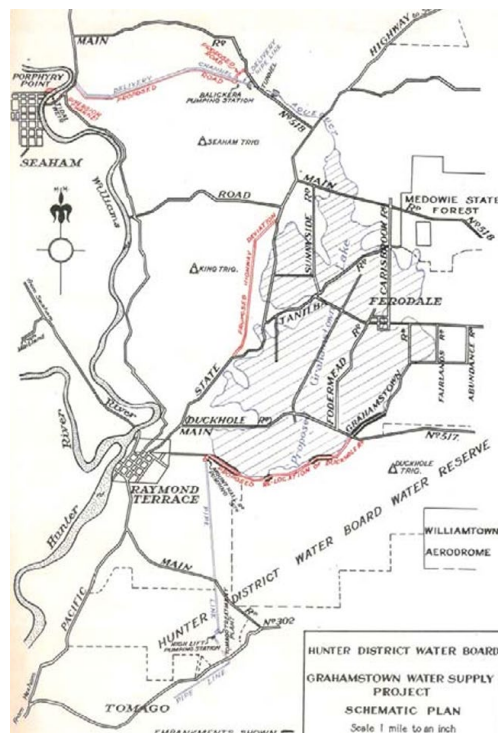


Figure 4: Grahamstown Dam/Scheme Plan

Source: Hunter District Water Board Annual Report 1954-55

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

AHIMS search undertaken on 12 July 2023 for the asset curtilage with a 50 metre buffer. Three Aboriginal sites were registered within the search area.

Historical Archaeological Potential

Not assessed.

HERITAGE SIGNIFICANCE



Level of Significance

Local

Statement of Significance

Grahamstown Dam represents the last major expansion of the Newcastle water supply system and was substantially larger than all previous schemes. Unlike many other large-scale metropolitan dams, the Grahamstown Scheme relies on a long, low earth embankment dam which enclosed the Grahamstown Moors and allowed for storage of water from the Williams River.

While somewhat modified, the Dam functions much as originally designed and supplies the bulk of the water to the Hunter Water network. The various spillways and bridges provide aesthetic and historical layers to the development, use and evolution of the Dam over time.

NSW SHR Criteria

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

Significant Elements

- The overall scale, form and configuration of the Dam including embankments.
- Ferodale 1A Water Pump Station (also known as the George Schroder Pumping Station) (**Addendum 1**).
- Schroder Park Gates (**Addendum 2**).
- Plaques Collection (Finnan Park) (**Addendum 3**).

DESCRIPTION



Setting	Large-scale Dam located on the former Grahamstown Moors, surrounded by a mixture of uncleared land and, to a lesser extent, rural properties.
External Appearance	<p>The Grahamstown Dam is a large earthen embankment style dam constructed on the former Grahamstown Moors. The entrance to the Dam is via Finnan Park, which contains some public picnic infrastructure and interpretive material.</p> <p>The Ferodale 1A Pump Station (or George Schroder Pumping Station) sits within the Dam, connected by a metal pipe bridge. Other infrastructure is located on shore, including the control room and electrical equipment (not identified to be significant). There are various bridges and spillways associated with the Dam which speak to its development and physical evolution over time; these have not been identified to be of individual heritage significance.</p>
Internal Appearance	N/A
Overall Condition	<p>Very good.</p> <p>For further information regarding the Ferodale 1A Pump Station (Addendum 1), the Schroder Park Gates (Addendum 2) and the Plaques Collection (Finnan Park) (Addendum 3), please see addendum sheets.</p>
Moveable Heritage Objects	<ul style="list-style-type: none"> None identified in association with the Dam itself. Please see Addendum 3 for further information regarding moveable heritage associated with the Plaques Collection (Finnan Park).

MANAGEMENT



Approval and Assessment Requirements	<p><u>Minor or inconsequential impacts:</u> Anything other than routine repair and maintenance must be discussed with the Environment Team to determine the level of heritage assessment required.</p> <p><u>More than minor or inconsequential impacts:</u> As above. Additionally, consultation with the relevant local council is required.</p> <p>Demolition or removal from the register requires consultation with Heritage NSW and archival recording.</p>
General / Ongoing Management	<ul style="list-style-type: none"> 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 form, shape and scale of the Dam. The introduction of new buildings or structures within the curtilage may be supportable depending on location and scale. Replacement/removal of redundant or failing elements or equipment is acceptable to facilitate ongoing operation of the Dam. Removal of non-significant elements (such as contemporary services) is supportable. Consider the preparation of a Heritage Asset Management Plan (HAMP) or Conservation Management Plan (CMP) for the entirety of Grahamstown Dam (including the Pumping Station).
Priority Conservation Works	<ul style="list-style-type: none"> None identified. See Addendums 1, 2 and 3 for information relevant to the Ferodale 1A Pump Station, Schroder Park Gates and Schroder Park Plaque Collection, respectively.



Image 1: General view of the Dam and embankments



Image 2: View of the contemporary Grahamstown spillway on the western side of the Dam



Image 3: View of a rock lined embankment with the Dam visible beyond



Image 4: Irrawang Spillway (1960s)



Image 5: Pacific Highway energy dissipator



Image 6: Pacific Highway bridge with energy dissipator at rear



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FIGURE 1

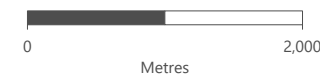
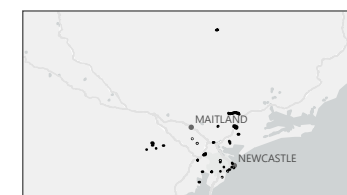
S170 Review - Heritage Curtilages

Legend

- Road
- +— Railway
- Lot Boundary
- ▭ Heritage Curtilages
- NPWS Reserve



Grahamstown Dam



Scale 1:55,000 at A4
GDA 1994 MGA Zone 56

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