INVERELL
SHIRE COUNCIL

BUSINESS PAPER

Civil and Environmental Services Committee Meeting

Wednesday, 11 March 2020

INVERELL SHIRE COUNCIL

NOTICE OF CIVIL AND ENVIRONMENTAL SERVICES COMMITTEE MEETING

6 March, 2020

A Civil and Environmental Services Committee Meeting will be held in the Committee Room, Administrative Centre, 144 Otho Street, Inverell on Wednesday, 11 March, 2020, commencing at **9.00 AM**.

Your attendance at this Civil and Environmental Services Committee Meeting would be appreciated.

Please Note: Under the provisions of the Code of Meeting Practice the proceedings of this meeting (including presentations, deputations and debate) will be webcast. An audio recording of the meeting will be uploaded on the Council's website at a later time. Your attendance at this meeting is taken as consent to the possibility that your voice may be recorded and broadcast to the public.

I would like to remind those present that an audio recording of the meeting will be uploaded on the Council's website at a later time and participants should be mindful not to make any defamatory or offensive statements.

P J HENRY PSM

GENERAL MANAGER

Agenda

Ethical Decision Making and Conflicts of Interest

A guiding checklist for Councillors, officers and community committees

Ethical decision making

- Is the decision or conduct legal?
- Is it consistent with Government policy, Council's objectives and Code of Conduct?
- What will the outcome be for you, your colleagues, the Council, anyone else?
- Does it raise a conflict of interest?
- Do you stand to gain personally at public expense?
- Can the decision be justified in terms of public interest?
- Would it withstand public scrutiny?

Conflict of interest

A conflict of interest is a clash between private interest and public duty. There are two types of conflict:

- ***Pecuniary*** – regulated by the *Local Government Act 1993* and Office of Local Government
- ***Non-pecuniary*** – regulated by Codes of Conduct and policy. ICAC, Ombudsman, Office of Local Government (advice only). If declaring a Non-Pecuniary Conflict of Interest, Councillors can choose to either disclose and vote, disclose and not vote or leave the Chamber.

The test for conflict of interest

- Is it likely I could be influenced by personal interest in carrying out my public duty?
- Would a fair and reasonable person believe I could be so influenced?
- Conflict of interest is closely tied to the layperson's definition of 'corruption' – using public office for private gain.
- Important to consider public perceptions of whether you have a conflict of interest.

Identifying problems

1st Do I have private interests affected by a matter I am officially involved in?
2nd Is my official role one of influence or perceived influence over the matter?
3rd Do my private interests conflict with my official role?

Local Government Act 1993 and Model Code of Conduct

For more detailed definitions refer to Sections 442, 448 and 459 or the *Local Government Act 1993* and Model Code of Conduct, Part 4 – conflictions of interest.

Disclosure of pecuniary interests / non-pecuniary interests

Under the provisions of Section 451(1) of the *Local Government Act 1993* (pecuniary interests) and Part 4 of the Model Code of Conduct prescribed by the Local Government (Discipline) Regulation (conflict of interests) it is necessary for you to disclose the nature of the interest when making a disclosure of a pecuniary interest or a non-pecuniary conflict of interest at a meeting.

A Declaration form should be completed and handed to the General Manager as soon as practible once the interest is identified. Declarations are made at Item 3 of the Agenda: Declarations - Pecuniary, Non-Pecuniary and Political Donation Disclosures, and prior to each Item being discussed: The Declaration Form can be downloaded at Declaration Form

Quick Reference Guide

Below is a legend that is common between the:

- Inverell Shire Council Strategic Plan;
- Inverell Shire Council Delivery Plan; and
- Inverell Shire Council Operational Plan.

1 APOLOGIES

2 CONFIRMATION OF MINUTES

RECOMMENDATION:

That the Minutes of the Civil and Environmental Services Committee Meeting held on 12 February, 2020, as circulated to members, be confirmed as a true and correct record of that meeting.

MINUTES OF INVERELL SHIRE COUNCIL
CIVIL AND ENVIRONMENTAL SERVICES COMMITTEE MEETING
HELD AT THE COMMITTEE ROOM, ADMINISTRATIVE CENTRE, 144 OTHO STREET, INVERELL
ON WEDNESDAY, 12 FEBRUARY 2020 AT 9.00 AM

PRESENT: Cr Paul Harmon (Mayor), Cr Stewart Berryman, Cr Di Baker, Cr Neil McCosker.

IN ATTENDANCE: Cr Anthony Michael (Deputy Mayor), Cr Jacki Watts, Cr Kate Dight, Cr Paul King OAM

Brett McInnes (Acting General Manager), Scott Norman (Director Corporate & Economic Services), Anthony Alliston (Manager Development Services), Justin Pay (Manager Civil Engineering) and Michael Bryant (Manager Environmental Engineering).

1 APOLOGIES

COMMITTEE RESOLUTION

Moved: Cr Stewart Berryman
Seconded: Cr Neil McCosker

That the apology received from Cr Peters be accepted and leave of absence granted.

CARRIED

2 CONFIRMATION OF MINUTES

COMMITTEE RESOLUTION

Moved: Cr Paul Harmon
Seconded: Cr Stewart Berryman

That the Minutes of the Civil and Environmental Services Committee Meeting held on 13 November, 2019, as circulated to members, be confirmed as a true and correct record of that meeting.

CARRIED

3 DISCLOSURE OF CONFLICT OF INTERESTS/PECUNIARY AND NON-PECUNIARY INTERESTS

Cr Harmon declared a pecuniary interest in Item 5.4 ‘Crown Road Request - Adjacent to Gilgai School’ on the basis there is a potential impact on the operations of the the Inverell Bus Service.

4 PUBLIC FORUM

Nil

5 DESTINATION REPORTS

5.1 PETITION / LETTER FOR DECLARATION OF CLIMATE EMERGENCY S11.8.9

COMMITTEE RESOLUTION

Moved: Cr Paul Harmon
Seconded: Cr Stewart Berryman

That the Committee recommend to Council that:

i) The report be received and noted; and

ii) The Authors of the petition be made aware of the Inverell Shire Council Environmental Sustainability Plan.

CARRIED

5.2 DRAINAGE UPGRADE - BUNDARRA ROAD ADJACENT TO RACECOURSE S28.7.18/58

COMMITTEE RESOLUTION

Moved: Cr Stewart Berryman
Seconded: Cr Paul Harmon

That the Committee recommend to Council that:

(a) The Flooding Assessment Report be received, noted and the recommendations be adopted;

(b) Detailed engineering design work be completed on the report recommendations, with the design to include: pavement reconstruction, drainage considerations and tree replacement;

(c) A future report be presented to Council providing costings for the drainage, road rehabilitation and tree replacement to allow funding allocation; and

(d) The findings of the report be presented to the management committee of the Pioneer Village for their information and action.

CARRIED

5.3 ROADS TO RECOVERY - ADDITIONAL FUNDING ALLOCATION S16.7.31/08

COMMITTEE RESOLUTION

Moved: Cr Paul Harmon
Seconded: Cr Stewart Berryman

That the Committee recommend to Council that the additional $1,402,055 Roads to Recovery funding be allocated as follows:

- *Sealed Road Heavy Patching - $500,000*
- *Concrete Culvert/Causeway replacement/upgrade - $500,000*
- *Gravel Resheeting - $402,055*

CARRIED

5.4 CROWN ROAD REQUEST - ADJACENT TO GILGAI SCHOOL S28.10.SR215

At 9:14 am, Cr Paul Harmon left the meeting, having previously declared an interest in the following item.

COMMITTEE RESOLUTION

Moved: Cr Stewart Berryman
Seconded: Cr Di Baker

That the Committee recommend to Council that the section of Crown Road as presented in Attachment 2 be transferred to Council, on the provision that:

i) Known hazards associated with trees be addressed prior to transfer;

ii) Any future upgrade of this section of road be subject to grant funding or contribution from the Department of Education;

iii) The maintenance classification of the road be Urban Minor; and

iv) Council apply for relevant grant funding in order to improve road safety at the location.

CARRIED

Cr McCosker voted against the motion on the basis there is already an approved bus stop at the location.

At 9:20 am, Cr Paul Harmon returned to the meeting.

5.5 PETITION REGARDING VEGETATION IN FRAZERS CREEK - ASHFORD VILLAGE S6.8.5/11

COMMITTEE RESOLUTION

Moved: Cr Neil McCosker
Seconded: Cr Stewart Berryman

That the Committee recommend to Council that:

i) The information be received and noted;

ii) No further action be taken; and

iii) The lead author of the petition be formally advised of Council's course of action and provided with the appropriate contact details for the Natural Resource Access Regulator (NRAR).

CARRIED

6 INFORMATION REPORTS

COMMITTEE RESOLUTION

Moved: Cr Stewart Berryman
Seconded: Cr Paul Harmon

That the information reports be received and noted.

CARRIED

6.1 CRITICAL COMMUNICATIONS ENHANCEMENT PROGRAM UPDATE S10.12.2/13

6.2 WORKS UPDATE S28.21.1/12

6.3 ASHFORD TOWN WATER SUPPLY SEVERN RIVER RAW WATER QUALITY S32.12.9

The Meeting closed at 9.34am.

3 DISCLOSURE OF CONFLICT OF INTERESTS/PECUNIARY AND NON-PECUNIARY INTERESTS

4 PUBLIC FORUM

5 DESTINATION REPORTS

5.1 LAKE INVERELL REPORT

File Number: **S7.2.17 / 20/4066**

Author: **Anthony Alliston, Manager Development Services**

SUMMARY:

This report has been prepared in response to a question without notice at the Civil and Environmental Services Committee meeting held in June 2019 in regards to the approvals needed for the removal of silt from Lake Inverell.

This report provides background on the construction of the Lake Inverell Dam and its use over time. It outlines the Plan of Management established in 1983 together with the appointment of a Management Committee to manage and control Lake Inverell Reserve as a natural environment.

The main processes for removing silt and the various considerations and drivers for removing the silt are outlined. The report explores the various approval pathways and the complex range of environmental considerations that would be required. The report establishes that the costs associated with removing silt from the lake will be significant.

The Committee is being requested to determine whether it wishes to further investigate the approvals and necessary environmental studies that would be required to allow the removal of silt from Lake Inverell.

RECOMMENDATION:

That the Committee determine if it wishes to take any further action in this matter.

COMMENTARY:

Introduction

This report has been prepared in response to a question without notice at the Civil and Environmental Services Committee meeting held in June 2019 in regards to the approvals needed for the removal of silt from Lake Inverell.

It is challenging to investigate the approvals required to remove silt from Lake Inverell in isolation as there are also a range of other factors that will influence the nature of the approvals required and the rationale behind the investigations.

This report has been structured in order to provide discussion on some of the various influencing factors that would ultimately influence Council's decision as to whether further action is undertaken to investigate the removal of silt from Lake Inverell.

Background to Siltation

Since its construction in 1940, Lake Inverell Dam has been subject to a process known as siltation. Siltation has occurred due to the build-up of sediment caused by natural processes as well as various, and sometimes poor, agricultural land use practices in the upper Macintyre River catchment over the past 80 years.

The siltation process has significantly diminished the capacity of the lake since its construction in 1940. In 2009 an inspection report from the NSW Public Works indicated that since the closure of the lake as Inverell's water supply system in 1982, the storage capacity of the lake had decreased by approximately 75%. Then in 2012 a hydrographic survey indicated that the dam had silted up to approximately 96.6% leaving a storage capacity of only 54 megalitres out of the original 1,620 megalitres capacity.

The continued siltation of the lake and its latest exposure during the unprecedented drought conditions has lead to various requests to remove the silt.

Lake Inverell Dam and Lake Inverell Reserve

Lake Inverell is located on the Macintyre River approximately 4km east of Inverell. Lake Inverell Dam was designed by Harding Frew and Van Hermet and was constructed in 1940 to supply water for the township of Inverell.

Lake Inverell has a water catchment of 607 square kilometres and a surface area of approximately 27 hectares.

Lake Inverell Dam is a concrete gravity structure approximately 11m in height, with a total crest length of approximately 252m. The dam had a storage capacity of approximately 1,620 megalitres when the dam was first constructed and supplying water to Inverell.

In 1976 following the completion of construction of Copeton Dam, and the subsequent construction of a pipeline to a water treatment plant in 1982, Inverell began to obtain its water from Copeton Dam.

Since 1982, Lake Inverell and the surrounding Lake Inverell Reserve have been used for passive recreational purposes by the general public.

"*In 1981 when it was obvious that the lake would no longer be required for town water supply, the local power boating club requested council to give permission for the lake to be used as a water ski area. When this became public a hue and cry developed which resulted in council calling a number of public meetings and eventually declaring the area a flora and fauna reserve, and formed a management committee to develop the area as a passive recreation area for the protection of the native flora and fauna, which would then be able to be used for educational and scientific purposes and at the same time permit regeneration of the area to its natural state"* (Inverell Times Friday, October 28, 1988).

Figure 1 Below shows the location of Lake Inverell Dam in relation to the Township of Inverell and **Figure 2** is an aerial photograph of the Lake. **Figure 3** shows the extent of the Lake Inverell Reserve.

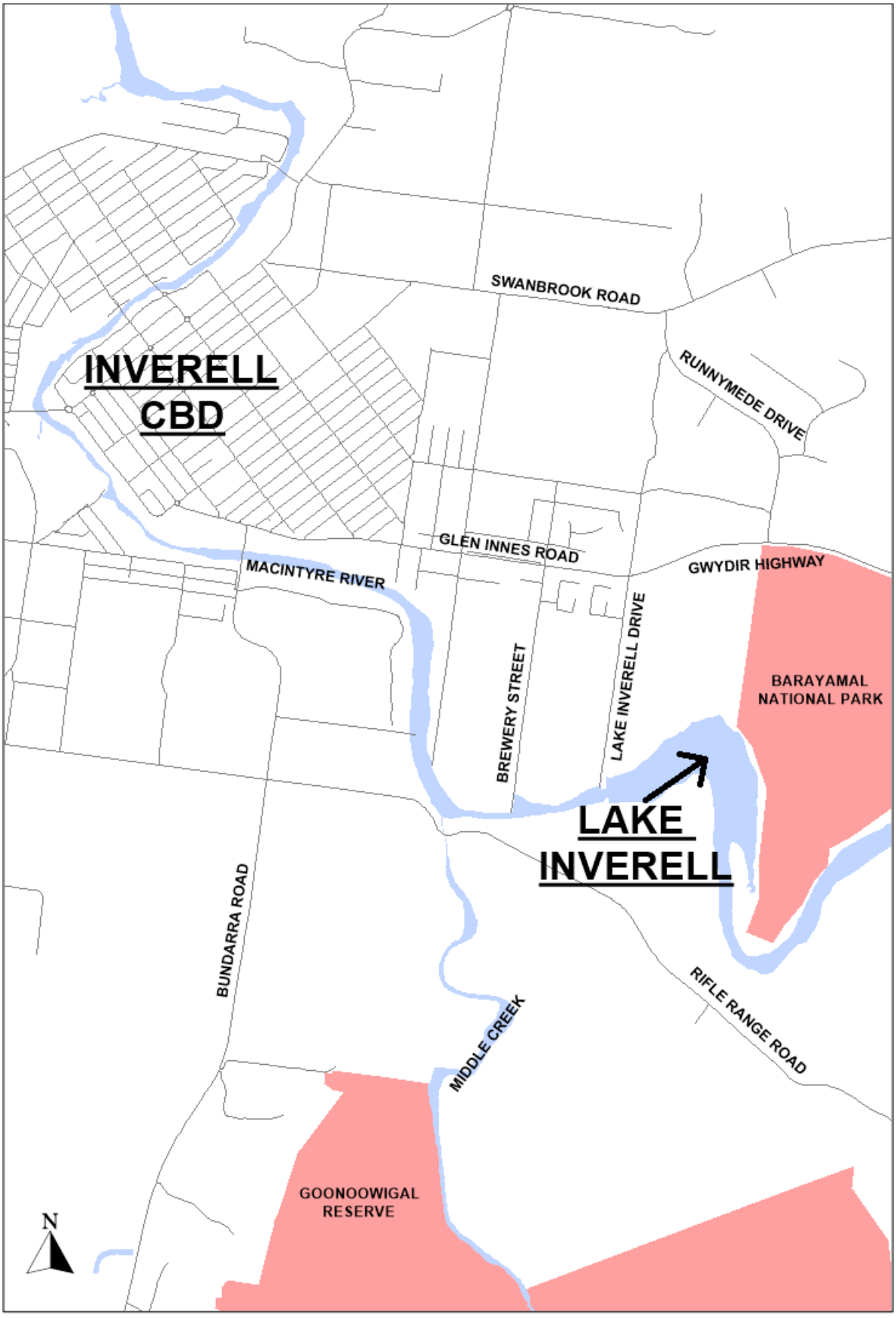


Figure 1 – Lake Inverell Location Plan

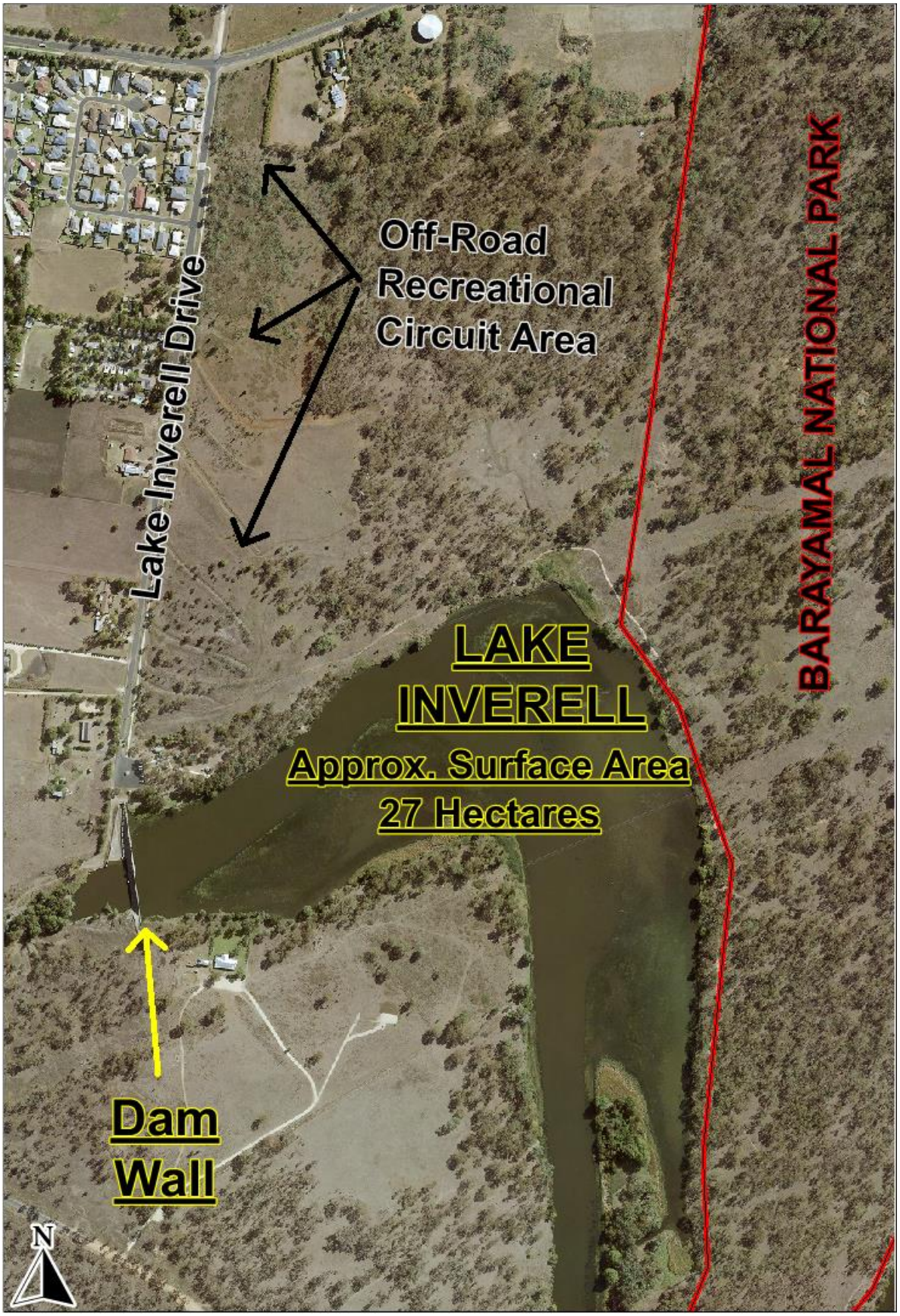


Figure 2 – Aerial Photograph of Lake Inverell

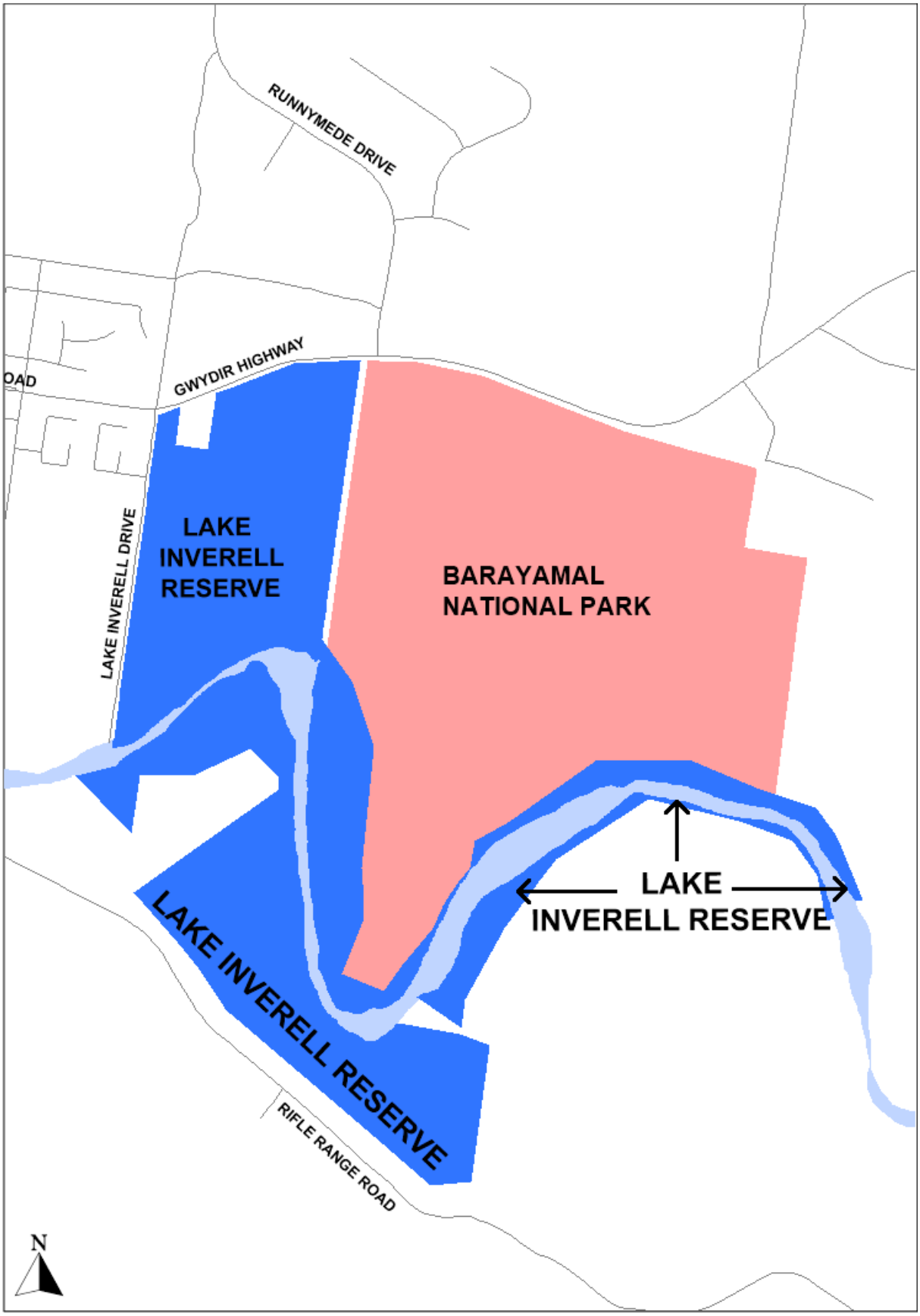


Figure 3 – Extent of Lake Inverell Reserve

Plan of Management Lake Inverell Reserve - 1983

In December 1983 Council appointed a specific Management Committee to have the care, control and management of Lake Inverell Reserve. At this time Council also adopted a Plan of Management for Lake Inverell Reserve. This Management Plan has been reviewed a number of times over the years and was last reviewed in March 2007.

The objectives of the Management Plan are:

a) *To preserve and protect scenery and natural features.*

b) *To conserve wildlife (flora and fauna).*

c) *To maintain natural environment.*

d) *To provide specific and strategically located recreational facilities for the enjoyment of the wider community.*

e) *To promote educational activities in relation to wildlife and the environment.*

f) *To encourage scientific study of the area.*

g) *To preserve the area.*

h) *To prevent any works adversely affecting natural condition of the area.*

i) *To encourage the appropriate use, understanding and enjoyment of the area by the public.*

j) *To protect the area with planned hazard reduction (Rural Fire Service) from fire and erosion.*

k) *To provide access to specific locations and facilities within the reserve for all members of the community.*

The Policy position contained within the Management Plan in regard to the use of Lake Inverell Reserve is as follows:

a) *The Dam and Council controlled lands be used for passive recreational, tourism, educational and scientific activities.*

b) *That no power boats be permitted, except for Council staff or persons authorised by Council to carry out maintenance or improvements to the area, and model boats (See Item f).*

c) *That passive recreational boats, canoes, kayaks etc be permitted on Lake Inverell in all areas (except non designated areas near dam wall).*

d) *That recreational fishing from the bank be allowed.*

e) *That stock be granted access through portions 489 and 554 only (upon approval by Council).*

f) *That the following model craft be permitted on the lake in designated areas:*

- *Model Electric Power Boats*
- *Model Sailing Boats*

g) *That motor vehicles and motor bikes be restricted to official entry roads and parking areas only.*

A copy of the Plan of Management is included in **Attachment 1**.

Since the appointment of the Management Committee and adoption of the Plan of Management in 1983, the Inverell Reserve, including the lake area, has been used for passive recreation pursuits including bird watching, walking/hiking, kayaking and canoeing, recreational fishing, and picnicking.

The infrastructure to facilitate these passive recreational pursuits include picnic shelters, walking tracks, a bird hide, toilets, a playground, BBQ's, bins and sign posts.

Lake Inverell Reserve was officially opened on 31 October, 1988 by Deputy Premier and Barwon MP Mr Wal Murray.

While the Management Committee is no longer active, the management of the reserve is now undertaken as a function of Council in accordance with the Plan of Management which is still in place under the provisions of the *Local Government Act 1993*.

Process of Removing Silt

The process of removing sediment, or silt, from waterways such as rivers and lakes can be done using a wide variety of methods. The two (2) main processes are known as hydraulic dredging and mechanical dredging.

Wet / Hydraulic Dredging

Hydraulic dredges work by sucking up a mixture of sediment and water (known as slurry) from the bottom surface and then transferring the mixture through a pipeline to another location. Wet dredges act like a giant vacuum, removing sediment. Hydraulic dredging equipment is best suited for removing fine silt, sand and dirt.

Dry or wet /Mechanical Dredging

Mechanical dredging involves the use of an excavator or another type of heavy equipment, usually situated on a barge or on the water's edge to dig out the bed of the body of water and remove the sediment. Mechanical dredging can be undertaken under both wet and dry conditions. The sediment is then hauled away for disposal or reuse. Benefits of mechanical dredging include speed, mobility, and accuracy, as well as the ability to handle larger dredge materials such as rock and other debris.

In the case of Lake Inverell mechanical dredging would be best done during extreme dry periods as recently experienced when the bottom of the dam/lake is exposed and dry. Mechanical dredging when there is water present can have significant environmental impacts such as a very high percentage of suspended sediments.

Considerations for Removing Silt

In exploring the various considerations for removal of the silt in Lake Inverell, which now equates to approximately 97% of the dams volume, there are a significant number of complex, interrelated and conflicting factors including, but by no means limited to:

- **The type of sediment** – The make-up of the sediment will dictate the best method of removing it. Hydraulic dredging is best suited for fine sediment such as sand and basalt derived silts whereas mechanical dredging is more suited to larger sediments including river stones, rocks and other debris. The type of dredging will also affect the possible environmental impacts and ultimately the costs.

- **How much sediment to remove and in what locations should sediment be removed** – Financial considerations would primarily drive this concern; however the purpose for removing the sediment will also be a factor. The depth of the dredging and the location of the dredging are also likely to be dictated by a significant range of complex community expectations and environmental considerations.

- **The end use of the sediment** – Depending on how much sediment was removed; decisions would need to be made on the end use of the material. Consideration would need to be given to storage of the material once removed. The composition would need to be considered prior to its removal as there may be some traces of contaminants such as agricultural herbicides and pesticides present. The material may not be suitable for a preferred end use. The distance of the storage location from the dam would also impact on the overall project costs.

- **When to remove the sediment** – The decision of when to remove the sediment may be a critical factor in view of the ecological significance of the various flora and fauna present at the reserve. The obvious time to remove sediment would be during a significant drought period when the lake is empty. This time has now passed with the recent rains in January and February 2020. Also, the various breeding cycles of birds, fish and mammals would all need to be considered as part of any environmental assessments and approval.

- **Community Expectations –** The community's expectation and attitudes in regard to the removal of the silt may play a significant role in the acceptance of the project. The history behind the establishment of Lake Inverell Reserve and the Plan of Management would need to be carefully considered.

The above brief summary of considerations will also be largely driven by the reasons and the possible benefits (perceived and real) for the removal of silt from the dam, which is discussed below.

Drivers for Removing the Silt

Since the construction of the Lake Inverell Dam in 1940 to now it has been established by a hydrographic survey that the dam's current water storage capacity is less than 3.4% (i.e. approximately 54 megalitres) of the original as-built capacity of 1,620 megalitres.

In 1983 it was also established, by Council, after significant community debate and input that the Lake Inverell Reserve (which includes the dam area) be set aside for a range of long-term ecological objectives and outcomes. The Lake Inverell Plan of Management is still in place under the *Local Government Act 1993.* In 2012 pursuant to Inverell's comprehensive Local Environmental Plan Lake Inverell Reserve was zoned E3 Environmental Management.

In light of the above there appears to be some views within the Inverell community that there may be some benefits to removing some of the silt from Lake Inverell. The following provides some of the possible drivers for the request to consider removing the silt from the lake.

- **Environmental benefits** – One train of thought maybe that there would be environmental benefits in restoring the lake back to how it was in 1940 and that the current situation represents a man-made unnatural environment and that by removing the sediment it would have negligible environmental impacts. On the contrary to this, over the last 80 years since the dams construction there has been a significant and documented take up of native species inhabiting and/or using the lake. For example, endangered fish species such as the Murray Cod and the Purple Spotted Gudgeon now call the lake home and any significant change or disruption such as dredging could have significant impacts.

- **Provision of additional water source** – With the recent and unprecedented drought conditions the significant amounts of sediment within the lake behind the dam wall became exposed and it was obvious that there is very little water storage capacity in the lake. No doubt dredging the lake would provide additional storage capacity. The question is what could it be economically used for?

- **Tourism and Recreational benefits** – The removal of sediment from Lake Inverell would likely have some tourism and recreational benefits. The lake may become more aesthetically pleasing, particularly during dry periods. Increasing the depth in certain areas would lead to better access and enjoyment by recreational boating such as canoes and kayaks. A greater depth and volume of water may lead to an improved fish habitat which would in turn support better recreational fishing.

- **Flood Mitigation** – The removal of silt may be thought to assist with mitigating the effects of flooding downstream for Inverell. During a significant flooding event the storage capacity of the lake even if all the silt was removed would be insignificant compared to the massive volumes of flood waters.

- **Dam Safety** – NSW Public Works was commissioned by Council in 2016 to prepare a Dam Safety Emergency Plan for Lake Inverell Dam. Public Works also undertake Dam Surveillance Inspections. The fifth Dam Surveillance Report in 2018 notes the existing siltation behind the dam and recommends investigation of the geotechnical properties of the silt. There is however no conclusions in the reporting that the silt is impacting on the dam wall integrity or safety.

Based on the above the possible community benefits of removing the silt would need to be carefully considered against the environmental impacts and the financial implications in removing the silt.

Approvals and Environmental Considerations

Due to the nature of such a project and the environmental complexities associated with dredging an aquatic environment, the possible approvals process to facilitate the dredging of Lake Inverell would be extremely difficult, time consuming, costly and risky.

Inverell Local Environmental Plan 2012

Pursuant to Inverell Local Environmental Plan 2012 (LEP) the Lake Inverell Reserve is zoned E3 Environmental Management. The principle objective of this zone is to *"protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values."*

The process of removing sediment from the lake would be defined as an *Extractive Industry*. An *Extractive Industry* is defined as *"the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating, but does not include turf farming."*

An *Extractive Industry* is not permissible in the E3 Environmental Management zone.

In order to pursue the dredging of the lake as a development under the Inverell LEP and lodge a Development Application it would be necessary to seek an amendment to the LEP and rezone the area that would allow for an *Extractive Industry*. Given the nature of the site and the Plan of Management as described above, it is considered that an amendment to the LEP would be unlikely.

State Environmental Planning Policy (Infrastructure) 2007

Clause 128 of State Environmental Planning Policy (Infrastructure) 2007 allows for waterway or foreshore management activities to be carried out by Council as *"development permitted without development consent".* The proposed development does not require consent through the Development Application process; rather a Review of Environmental Factors (REF) is required to be completed in accordance with Part 5 of the Environmental Planning and Assessment Act 1979.

Clause 128 (b), however refers to the requirement for the works *"to rehabilitate aquatic habitat or to maintain or restore environmental flows or tidal flows for ecological purposes."*

Council staff have specifically discussed this matter with Department of Primary Industries – Fisheries who have indicated that in their view the dredging of Lake Inverell is likely not to be considered as *"rehabilitation of aquatic habitat"* or the *"restoration of environmental flows".* Fisheries have indicated that they would be looking to ensure there was *"no net loss of aquatic and riparian habitats such as aquatic vegetation, reeds, gravel beds, snags etc."* Given the current "modified" natural environment of Lake Inverell, the ability to undertake any significant dredging and not give rise to a loss of aquatic or riparian habitat would be nearly impossible.

Even if Council could justify a sound position under Clause 128 (b) of State Environmental Planning Policy (Infrastructure) 2007 approval (Fisheries Permit) from DPI Fisheries under the *Fisheries Management Act 1991* would still be required. The only way to determine if a Fisheries Permit would be achievable would be to undertake significant ecological assessment in relation to the vast range of complex and interrelated environmental considerations as listed below.

Environmental Considerations

The environmental considerations associated with a project of this nature are significant, complex and would be extremely costly to undertake with no guarantee that all necessary approvals would be achievable. Following is a list of the environmental matters that would need to be considered to obtain the necessary approvals:

- Ecological considerations including birds, aquatic plant and animal species, terrestrial animals and plants;
- Aboriginal Cultural Heritage;
- Hydrological impacts including water quality, flooding impacts;
- Possible contamination / waste classification of the silt;
- Geotechnical considerations;
- Traffic impacts associated with haulage of material;
- Air quality impacts;
- Noise impacts during works;
- Construction impacts; and
- Lake Inverell Dam safety considerations.

Other Approvals

Depending on the outcome of environmental investigations and the proposed extent of dredging there would also be a range of other approvals required from other Acts including:

- *Environment Protection and Biodiversity Conservation Act 1999*;
- *National Parks and Wildlife Act 1974*;
- *Water Management Act 2000*; and
- *Roads Act 1993*.

Conclusion

Based on the above it is considered that a "rezoning" to allow dredging under the Inverell LEP would be difficult to pursue and that the environmental studies required to gain approval (Fisheries Permit) from DPI Fisheries under the *Fisheries Management Act 1991* would be costly and there would be no guarantee of success.

Estimated Costs to Remove Silt

It has been established that Lake Inverell has silted up to approximately 96.6% of its as-built capacity leaving current water storage of only 54 megalitres out of the original 1,620 megalitres. Siltation is an ongoing process and siltation will continue to occur into the future.

The cost to remove the silt from Lake Inverell can be broken up into two (2) main parts:

- The environmental investigations and approvals; and
- The costs associated with the physical dredging works.

Environmental Investigations and Approvals

The costs associated in undertaking the environmental investigations in order to determine if the necessary approvals may be granted would be significant in comparison to other projects in which Council regularly undertake such as road construction, water and sewer projects and other core functions. Due to the specialist nature of the project and the obvious complexities, it would be recommended that Council outsource this phase of the project to a specialist environmental consultancy.

A conservative estimate for a consultancy to undertake the environmental investigations including managing specialist environmental consultants, liaison with government departments, preparing detailed reports and submitting applications would be in the order of half a million dollars.

Council could spend this sort of money with no guarantee that the necessary approvals would be obtained.

Physical Dredging Works

The estimated costs of dredging are dependent on a wide variety of different, and at this stage unknown variables. When determining the cost of traditional dredging, there are four (4) main questions to answer:

- How much sediment is there to dredge?
- What is the area being dredged and where is it located?
- What is the content and condition of the material that needs to be dredged?
- Where can you put the dredged material once it's removed from the lake?

Until the completion of the environmental investigations and approvals phase these variables would be unknown and impossible to accurately quantify.

To establish an estimate of the costs associated with dredging the lake one (1) megalitre of water equates to 1,000 cubic metres of silt. The assumption is that 96.6% of the lakes capacity is silt which equates to 1,566 megalitres of water. This equates to 1.566 million cubic metres of silt.

The following **Table 1** shows some crude costing estimates to remove silt from the lake. The table shows costs based on the removal of different percentages of silt whereby 100% equates to 1.566 million cubic metres of silt. The estimated costs are also based on mechanical removal when the bed of the lake is dry; this is considered to be the most cost effective time to remove the silt. There is also an assumption that the material will not be hauled any further than Council's Waste Management Facility on Burtenshaws Road which is approximately 5km from the lake.

% of silt to be removed	Quantity or silt in cubic metres	Extraction Rate - $ per cubic metre	Estimated Cost – Dry dredging
100%	1.566 million	$15.60	$24.4 mil
75%	1.175 million	$15.60	$18.3 mil
50%	.783 million	$15.60	$12.2 mil
25%	.392 million	$15.60	$6.1 mil
10%	.157 million	$15.60	$2.4 mil
5%	.0783 million	$15.60	$1.2 mil
2%	.0313 million or 31,000	$15.60	$483,600

Table 1 – Estimate of Costs to remove silt from Lake Inverell by percentage

It can therefore be seen that the costs associated even in removing an extremely small percentage of silt from a small area of the lake is going to be significant and Council would need to weigh up these costs with a quantifiable community and environmental benefit.

CONCLUSIONS:

Based on the above considerations and drivers associated with removing the silt from Lake Inverell, it can be seen that the significant variability in regards to project costs and environmental risks would make it difficult to justify at this point.

There is a Plan of Management in place which highlights the natural, scientific and ecological importance of the Lake Inverell Reserve and the lake is zoned for Environmental Management under the Inverell LEP. In terms of the necessary environmental approvals required, these would not only be costly but also difficult to pursue and obtain.

With reference to the cost estimates, even based on a best-case scenario the costs to remove just a small amount of the silt, is significant. If an amount of silt were to be removed from the lake, that material will be replaced by other deposits of silt as the siltation process continues.

As indicated, should Council wish to pursue the dredging of Lake Inverell any further it would be appropriate to engage the services of a specialist environmental consultancy.

RISK ASSESSMENT:

Nil

POLICY IMPLICATIONS:

Nil

CHIEF FINANCIAL OFFICERS COMMENT:

Nil

LEGAL IMPLICATIONS:

Nil

ATTACHMENTS:

1. Plan of Management

INVERELL SHIRE COUNCIL

PLAN OF MANAGEMENT
LAKE INVERELL RESERVE

INVERELL SHIRE COUNCIL
PLAN OF MANAGEMENT
LAKE INVERELL RESERVE

1 ADMINISTRATION

1.1. THE AREA

a) Name — The area shall be known as the Lake Inverell Reserve.

b) Description — Parish of Inverell;
On the northern side of the Macintyre River:
Portions 185 (Property of Mr P Arnott excised),
186, 151,
The western sections of 502, 503, 507 and 505.
509 eastwards to include an old windmill trough but excluding a small western section;
a black soil area south of 509 and extending south to the lake.
Note that all of the portions above from 502 downwards are shown on some maps as portion 621 with an area of 32.81 hectares.

Portions on the southern side of the lake are:
A long strip of land north and to the east of portions 499 and 501 and
Portions 486, 487, 488, 489, 554 and
the elongated area south of the Macintyre and adjacent to portions 183 and 184.

c) Definition — The area in general refers to the Dam, the Spillway, the water behind the Dam for an ill-defined distance, the foreshores and Council owned land.

1.2 OBJECTIVES

a) To preserve and protect scenery and natural features.
b) To conserve wildlife (flora and fauna).
c) To maintain natural environment.
d) To provide specific and strategically located recreational facilities for the enjoyment of the wider community.
e) To promote educational activities in relation to wildlife and the environment.
f) To encourage scientific study of the area.
g) To preserve the area.
h) To prevent any works adversely affecting natural condition of the area.
i) To encourage the appropriate use, understanding and enjoyment of the area by the public.
j) To protect the area with planned hazard reduction (Rural Fire Service) from fire and erosion.
k) To provide access to specific locations and facilities within the reserve for all members of the community.

1.3 POLICY

a) The Dam and Council controlled lands be used for passive recreational, tourism, educational and scientific activities.
b) That no power boats be permitted, except for Council staff or persons authorised by Council to carry out maintenance or improvements to the area, and model boats (See Item e).
c) That passive recreational boats, canoes, kayaks etc be permitted on Lake Inverell in all areas (except non designated areas near dam wall).
d) That recreational fishing from the bank be allowed.
e) That stock be granted access through portions 489 and 554 only (upon approval by Council).
f) That the following model craft be permitted on the lake in designated areas:
   - Model Electric Power Boats
   - Model Sailing Boats
g) That motor vehicles and motor bikes be restricted to official entry roads and parking areas only.

2. MANAGEMENT

a) The area always be owned and controlled by the Inverell Shire Council.

b) All policies relating to the objectives and operations of the area shall be made by the Inverell Shire Council.

c) The care, control and management of the area, and the expenditure of such money as voted by Council, shall be determined by Council.

3. OPERATION

3.1 ACCESS

a) Vehicular - Public

Vehicles only be allowed on roads or parking areas constructed for the purpose and designated for public use.

b) Vehicular Maintenance

A system of maintenance tracks must be developed for the use of authorised vehicles for:

(i) Essential maintenance; and
(ii) Fire control

On the basis of the tracks being used as little as possible, subject to maintenance and fire control responsibilities.

c) Walking Paths

Walking paths to be developed, and clearly marked, to comply with objectives relating to enjoyment, education and scientific study. Vehicular maintenance tracks will be available as walking tracks, however, the public must be encouraged to use vehicular access or walking tracks to comply with objective of conservation and preservation.

3.2 FACILITIES

a) Day Visitors

i) Access Road

A point of entry shall be constructed with locking capabilities on Lake Inverell Drive at the entrance to the existing sealed car park area, together with an all weather access road to other permanent facilities.

ii) Parking Area

An all weather parking area has been provided near permanent facilities.

This is the only vehicular access available to the community.

iii) Picnic Area

Picnic areas have been constructed, one near permanent facilities and others as required, accessible by foot only.

iv) Shelter Sheds

Have been provided at specific vantage points to provide recreational shelter whilst enjoying the spectacular views.

v) Toilets

At least one set of dry composting toilets have been constructed. To provide basic amenities at Lake Inverell Reserve.

iv) Information Map

A large scale map has been erected showing:

a) Walking trails
b) Restricted areas (if any)
c) Points of interest
d) Fire trails
e) Any other facilities

vii) Be Tidy Bins

Visitors should be encouraged to take their rubbish home. However, some bins should be provided near picnic areas.

viii) Walking Tracks

Walking tracks should be provided with as little disruption to the natural surface as possible. Walking trails have been gravelled and stabilised/bitumened to provide access for all community members with a minimum of erosion etc.

iv) Sign Posts

All walking tracks should be clearly marked and at regular intervals, with directional fingerboards or indicators and, also, with various information about sights or areas along each track.

b) Overnight Visitors

i) Overnight camping not be permitted as camping and caravan facilities are available adjacent to the Lake area.

c) Accommodation

No permanent accommodation, e.g. cabins, shall be permitted. However, future provision for a caretaker should be considered.

3.3. FINANCE

a) Expenditure

The Council shall vote money for the development and operation of the area annually, following consideration of estimates prepared by the Committee.

b) Sources of Income

It would be anticipated that the following income would be used to cover expenditure on the area:

i) Rate revenue, as allocated by Council.
ii) Government Grants

- Specific grants as available
- Grants as applied

iii) Donations

a) Private, group, or specific organisation
b) Public appeal
c) Business or Company

3.4 FIRE

(a) Objective

Fire plays an important role in the ecology of the natural Australian bushland. However, the full impact of fire is not fully understood, so the overall objective will be the preservation and conservation of the area, so the primary objective will be to minimise the undesirable affects of fire on the resources of the area and the land adjoining through prevention and control of fire.

(b) Protection

i) Management Tracks

These should be developed, providing both vehicular access to fight fire and, also, as boundary control for prescribed burning.

ii) Fuel Reduction

Fire protection measures should be most extensive adjacent to adjoining land and around facilities, and prescribed burning can reduce the danger of fire by reducing fuel, and should be used as a tool, but not throughout the whole area.

In a prescribed burning programme, the following must be considered:

a) The purpose of the burn; its nature and scope;
b) The parts of the reserve area to be protected;
c) The parts of the area to be affected;
d) Development of management tracks and natural boundaries;
e) The fuel reduction required;
f) Timing, frequency and possibly research;
g) The protection of neighbouring lands.
h) Permits to burn.

iii) Control

All fire shall be considered dangerous. However, before attempts are made to extinguish the fire, the following must be considered:

a) The current season;
b) Fire rating;
c) The weather forecast;
d) The general condition (vegetation and fuel);
e) The position of the fire and danger to facilities or neighbouring lands;
f) The management objectives;
g) The resources available.

iv) Fire Plan

To enable the implementation of the objectives of prevention and control, a fire plan shall be prepared, with the assistance of the Fire Control Officer (FCO), taking into consideration:

a) The overall objectives of the area;
b) The Committee's initial limited resources;
c) The local bush fire brigades.

3.5 ENVIRONMENT

It is accepted that any work undertaken in the area will have some affect on the natural cycle and identity of the area. Therefore, it must be a management objective to ensure that development:

a) i) Is consistent with the overall plan of management.
ii) Does not cause unnecessary environment disturbance.
iii) Creates minimal environmental impact on the area and other operations within the area.
iv) Is consistent with the status of the area.

b) Is planned strategically in an environmentally sensitive manner allowing for development of recreational facilities, access tracks, car parks etc.

3.6 EROSION

Erosion is a natural process but can be accelerated by damage caused by:

a) Natural occurrence, fire or flood;
b) Management practices such as:

   i) Creation of maintenance tracks.
   ii) Uncontrolled vehicular access.
   iii) Development of access and facilities.

It therefore should be an objective to:

1) Minimise the losses caused by erosion.
2) Rehabilitate disturbed areas, including the permanent or temporary closure of vehicular or pedestrian areas or tracks.
3) Provide access tracks, community facilities, shelter sheds, sealed carparks etc in an environmentally sensitive and planned manner, minimising disturbance to the natural environment.

3.7 LAKE WATER

The water from the Lake:

a) Shall not:

   Be released into the Macintyre River except;

   i) In an emergency regarding the Dam wall;
   ii) To maintain the level of Campbell Park Weir.

b) May be used for limited recreational fishing in designated areas.

c) May be used for limited passive recreational boating (non-power assisted)

d) Should:

   i) Be used to provide water for facilities constructed within the area.
   ii) Be used for fire control.
   iii) Be used for natural breeding of fish.

3.8 NON-CONFORMING USES

Some resources within the area may have economic potential, the utilisation of which would conflict with the objectives set down for the area.

Park resources shall not be utilised unless Council is satisfied that:

a) No alternative exists; and
b) Such utilisation will not permanently affect the conservation objective.

Some of the resources are:

1. Timber

a) No commercial felling of timber within the area.
b) Firewood for public facilities may be collected from designated areas only.
c) Limited clearing may occur for:

- Clearing for provision of public facilities and roadways;

- Removal of trees considered dangerous following damage by wind, fire or vandals.

d) Clearing under powerlines will be undertaken by Country Energy as required by Regulations.

2. Minerals

There shall be no exploration, mining, fossicking, quarrying, or gravel extraction permitted within the area.

3. Grazing

In general, no grazing shall be allowed by domestic animals. Any such stock found in the area shall be impounded and released only on payment of fees.

3.9 PLANT AND ANIMALS

a) Plants - Introduced

Action be taken to remove introduced plants as resources become available, from the reserved area.

b) Plants - Noxious

It shall be an objective of Council to:

- Eradicate all noxious plants.
- Endeavour to prevent the introduction of noxious plants.
- Co-operate with adjoining landholders in the control of noxious plants.

c) Animals - Domestic

- Domestic animals (dogs, cats etc) be allowed on the reserve in a controlled and restrained manner.
- Action shall be taken as required to remove feral cats or dogs which have wandered into, or have been let loose on the area.
- Provision be made to establish a horse trail beyond the shoreline of Lake Inverell to cater for passive equine recreation.

d) Animals - Native

As it is an objective to protect fauna, no native animals shall be harmed and it shall be an offence to hunt, capture, or kill any fauna within the area, except in accordance with management objectives in relation to domestic or noxious animals by authorised personnel.

e) Animals - Noxious

Efforts to eradicate noxious animals, e.g. rabbits, shall be undertaken, in conjunction with neighbouring land holders as resources allow.

3.10 REVIEW

Council shall review the operation of the plan as required.

The Council shall review the objectives and policies at least every four years and shall review the operations annually on receipt of the estimates prepared by Council.

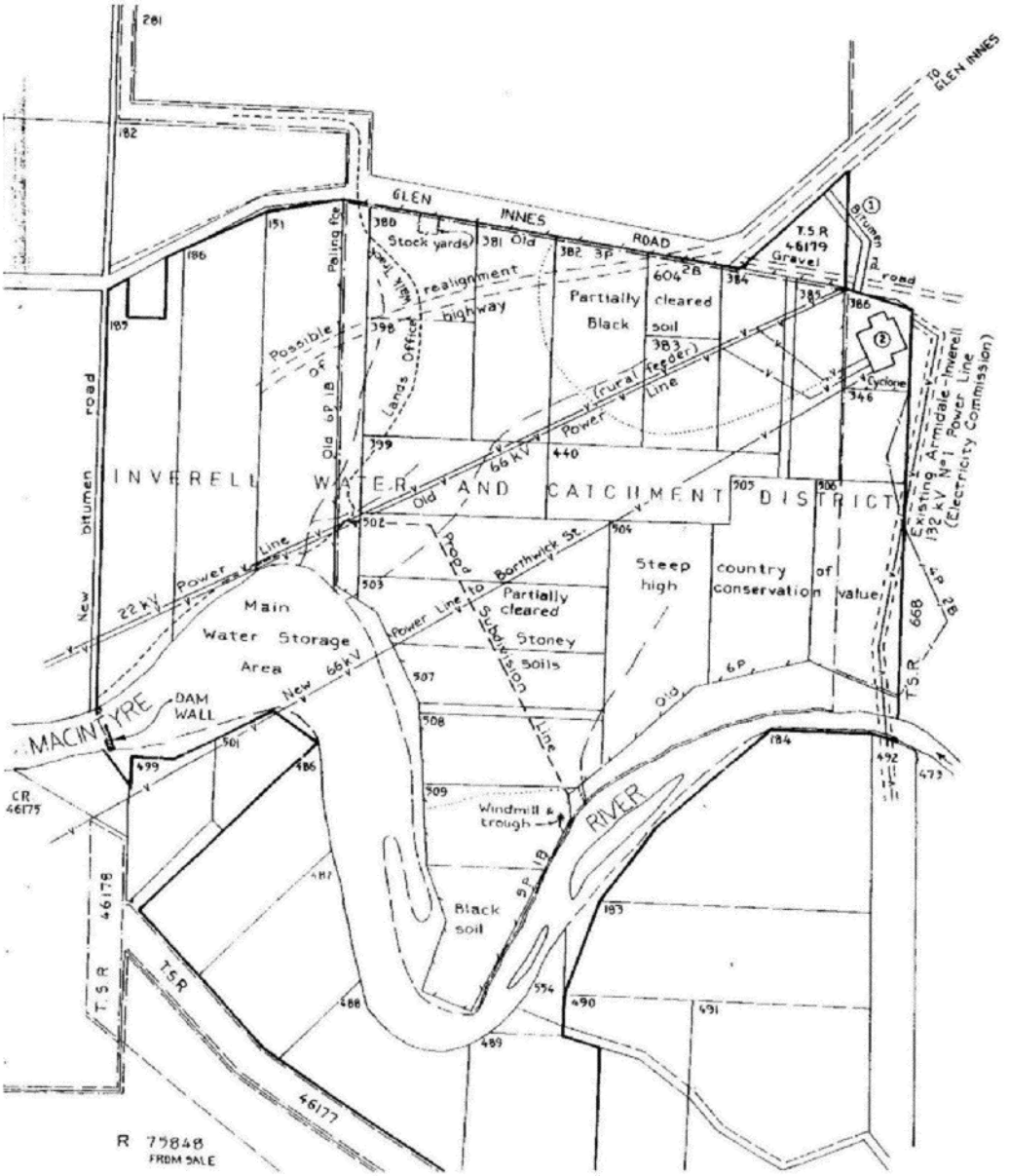
4. SCHEDULE

No: 1. Map of the Area.

INVERELL SHIRE COUNCIL
POLICY ANNEXURE 10

SCHEDULE 1

LAKE INVERELL RESERVE



Reviewed September 2001, February 2002, Reviewed March 2007 Page 10

5.2 INVERELL SEWAGE TREATMENT PLANT EFFLUENT OPTIONS

File Number: **S29.12.1 / 20/8422**

Author: **Michael Bryant, Manager Environmental Engineering**

SUMMARY:

The purpose of this report is for Council to further consider the request from Inverell Golf Club to investigate the feasibility of using treated effluent to provide a long term solution to watering of the golf course.

The report also considers other potential effluent reuse options for treated effluent from the Inverell Sewage Treatment Plant, including the operating environment and legislation associated with effluent reuse.

RECOMMENDATION:

That the Committee recommend to Council that:

1. *Inverell Sewage Treatment Plant Effluent Options report be received and noted;*
2. *The Inverell Golf Club be advised that Council has undertaken investigations into supplying treated effluent for the watering of the golf course and the proposal is not financially feasible due to the high capital and operational cost associated with pumping from the Inverell Sewage Treatment Plant to the Golf Club; and*
3. *A concept design, estimate and report be prepared for installing a chemical dosing facility at the Inverell Sewage Treatment Plant for nutrient stripping to improve the quality of treated effluent discharged into the Macintyre River and also reduce the annual EPA Load Based Licencing fees payable by Council.*

COMMENTARY:

Introduction

In August 2019 the Civil & Environmental Services Committee considered a report on the feasibility of utilising treated effluent to supplement flow in the Macintyre River from Lake Inverell Dam down through Inverell during extended dry periods when the river runs low and or ceases to flow. Supplementing flow in the river was not considered feasible due to the limited amount of treated effluent available, environmental issues associated with the elevated nutrient levels in treated effluent and the high capital and operational costs associated with the proposal. The recommendation from the Committee and subsequent resolution from the August 2019 meeting of Council (RES-115/19) is reproduced below:

1. *Council not request further investigations be undertaken into the feasibility of redirecting treated effluent from Inverell Sewage Treatment Plant to Lake Inverell Dam to supplement river flow.*

2. *That investigations be undertaken into the feasibility of redirecting treated effluent from Inverell Sewage Treatment Plant to other areas including the Inverell Golf Course, Inverell Show Ground, Riverdale Turf Farm, Inverell Race Course or alternately agricultural pursuits in close proximity to the treatment plant.*

At the December 2019 Ordinary Council Meeting Council considered a report on the impact of the severe drought on Inverell Golf Club operations. The Club's local irrigation water supply of dam water was depleted and the limited capacity bore unable to meet demand with the Club reverting to watering putting greens only using potable town water costing approximately $2,000 per month. The Club also enquired about the feasibility of utilising treated effluent for the watering of the golf

course including fairways in the longer term, recognising that there would be considerable cost associated with such a scheme. Council subsequently resolved:

> *That the reuse of treated effluent be referred to the Civil and Environmental Services Committee for consideration of the range of matters associated with this issue.*

This report provides a broad overview of the Inverell sewerage system and environmental regulations relating to treatment, reuse and disposal of treated effluent to land or water. The treatment and reuse of effluent is capital intensive involving a long term commitment to ongoing operational and maintenance costs. The report does not include cost estimates as more detailed investigations would be required using specialist external providers to prepare a report with various options.

Integrated Water Cycle Management

Integrated water cycle management will need to be taken into consideration by Council in making long term decisions. It looks at making the best use of locally available water resources to meet the current and future needs of the community in a sustainable and cost effective manner.

Sources of water may include existing town water supply, rainwater tanks, surface water, groundwater, and recycled sewage effluent. The security of the water source is an important consideration as the demand for water increases during extended drought periods associated with climate variability.

On the demand side water efficiency measures can also lead to a reduced demand for water.

Background & History of Effluent Disposal

The Inverell Sewerage Scheme was introduced in the early 1950's with the STP located downstream of the town on Delvyn Drive adjacent the Macintyre River. Secondary treated effluent passes through a series of maturation ponds before discharge to the Macintyre River.

Following a run of very dry years associated with low river flows, widespread blue green algae outbreaks and eutrophication of rivers, including fish kills in the Murray Darling Basin in the 1990's the NSW Government encouraged local water authorities to reduce point source discharges to the river system. NSW government grants were made available for some Councils to assist in introducing effluent reuse schemes to reduce river discharge.

Effluent reuse was easy to achieve on the western plains in areas such as Moree, Narrabri and Gunnedah where broad acre farmland was readily available for establishing cost effective effluent reuse farms, or simply selling treated effluent to an existing nearby large scale irrigation enterprise with Environment Protection Authority (EPA) approval. However, in the tablelands it has proved difficult to achieve 100% effluent reuse due to higher rainfall, cooler climate, limited flat areas of land for large irrigation storages and broad acre agriculture, along with the high cost of pumping treated effluent in undulating landscapes. Armidale has only been able to achieve approximately 50% effluent reuse, while Inverell has continued with 100% river discharge.

Inverell Sewerage System Operating Licence

Council has an Environment Protection Licence under the Protection of the *Environment Operations Act 1997* to operate the Inverell sewerage system including discharge of up to 1,000 ML per annum from the STP into the Macintyre River. The licence contains discharge limits on the quality of treated effluent and includes Load Based Licence (LBL) fees associated with the quality and quantity of certain characteristics of the treated effluent.

LBL was introduced by the EPA in the early 2000's to discourage the high level of nutrients associated with point source discharges to waterways. Treated effluent contains high levels of the nutrients Phosphorous and Nitrogen (phosphates) which can lead to eutrophication of rivers, particularly during low flows when there is little or no flow in the receiving waters to dilute the nutrient levels. Phosphorous has the largest impact on the receiving water and therefore targeted under LBL charging.

Samples of treated effluent are taken on a monthly basis and fees determined on a weighted average of the samples, and volume discharged over the 12-month period.

Annual LBL fees paid on discharges from the Inverell STP of about 850ML amount to around $97,000, mainly comprising phosphorous $89,000, nitrogen $3,000 and suspended solids $5,000. For the most recent EPA return from December 2018 to November 2019 with a reduced annual discharge of 600ML associated with the drought the LBL fee was $68,000.

During the recent severe extended drought with reduced infiltration into the sewerage system, limited rainfall on the STP maturation ponds and high evaporation from the ponds the daily treated effluent discharge to the river dropped to as low as 1.3 ML/day during summer.

Land Based Effluent Reuse Health & Environmental Requirements

Should Council wish to consider land based effluent reuse for irrigating passive and active recreation facilities, agriculture and horticulture enterprises, there are many issues to be assessed and taken into consideration as part of the environmental planning and assessment approval process. National, state and industry guidelines and legislation need to be complied with. Some of the issues are briefly discussed below.

Human contact by way of aerosols, ingestion, plus infections associated with body contact sports require consideration and inclusion in system designs and management plans. Body contact sport would require filtering and disinfection of treated effluent prior to irrigation. A golf course involving non body contact sport may have a lesser level of treatment, however would have buffer areas around the perimeter of irrigated areas adjacent public roads, plus exclusions of people during spray irrigation activities (mainly irrigate of a night).

Types of agricultural and horticultural crops that can be irrigated with the quality of treated effluent proposed would need to be assessed. Vegetables may not be irrigated with treated effluent whereas drip irrigation of fruit and nut trees may occur under certain conditions. Grazing of animals require withholding periods from cessation of irrigation of pastures with treated effluent.

Soil water and nutrient balances are required to establish if the irrigation activity proposed using treated effluent is sustainable over the longer term. Agricultural / horticultural land may require crop rotations to manage soil nutrient levels. Harvesting of crops and dry matter helps to export nutrients off site.

Suitability of the soil landscape for irrigation and potential for rising water table and salinity issues needs to be assessed along with ongoing monitoring.

Impact of treated effluent on surface and ground water needs to be assessed, including ongoing monitoring, including monitoring bores around the sites.

First flush runoff from irrigated site following irrigation with treated effluent needs to be addressed and managed.

Water balances including the volume of off stream storage of treated effluent required during winter and wet months for irrigation during the warmer growing periods would need to be investigated. To achieve a 100% effluent reuse scheme for Inverell, irrigation storage in the order of 300ML capacity may be required. A 300ML storage, 4m deep to minimise evaporation losses would have a footprint of approximately 8ha.

The impacts on adjoining lands and receptors need to be assessed and monitored.

Ongoing monitoring and reporting can be quite onerous and expensive, particularly with large agricultural and horticultural reuse sites.

At times, the demands of treated effluent disposal can be in conflict with normal irrigated commercial farming practices, such as crop and pasture rotations and irrigation schedules.

With the ever increasing scarcity and escalating price of high security water, recycled effluent may evolve to be a sought after source of water, particularly for high value permanent plantings.

The following section of the report provides an overview of some potential effluent reuse options for Inverell.

Recycled Effluent Offsetting Use of Town Water on Sport & Recreation Facilities

The table below summarises potential passive and active recreation areas, generally along the lower lying areas of Inverell that could potentially be irrigated with effluent treated to the required standard. The estimated annual demand for irrigation at each site is based on a total application of 600mm of irrigation per year, equating to 6ML/ha/year.

Potential Passive & Active Recreation Sites – Effluent Reuse		
Site	Area (ha)	Annual Irrigation Volume (ML)
Inverell Sporting Complex *	13.3	80
Showground	2.0	12
Racecourse – public area	1.8	11
Pioneer Village	2.0	12
Cameron Park	5.8	35
Victoria Park	2.7	16
Varley Oval	2.0	12
Rugby Ground	2.9	17
Sinclair Park	1.2	7
Kamilaroi Oval	5.7	34
Macintyre High School	2.4	15
Inverell Public School	1.4	9
Total	43.2	260

*Inverell Sporting Complex uses river water, except for when river runs dry

The Inverell Sporting Complex has a surface water licence to extract up to 200ML pa of irrigation water from the Macintyre River, which operates most of the time except for drought periods when cease to pump rules apply, and town water is used to irrigate the sporting fields.

Passive and active recreation areas have the capacity to use up to approximately 20% of treated effluent from the Inverell STP.

Offsetting town water supply usage with recycled treated effluent for irrigation of sporting facilities is an expensive exercise, particularly where the underground irrigation system is already interconnected with the town water supply system. The system would have to be augmented with both sources of water physically disconnected from each other to avoid cross contamination, along with labelling in lilac colours and ongoing operational monitoring and management plans.

The cost of providing suitable high level treated effluent for irrigation of sporting facilities could be in the order of three (3) times the cost of supplying town water, and may not be considered feasible at this point in time, particularly when Council has a very reliable town water supply.

Council has a 3,054 ML town water supply licence to draw water from Copeton Dam. Average annual water consumption for the Copeton Scheme is around 2,430ML, which includes town water currently used to irrigate passive and active recreation areas.

Inverell Golf Club Locality & Potential Irrigation Water Demand

In late January 2020 the Manager Environmental Engineering undertook a site inspection with club representatives.

The Club is located along the Bundarra Road approximately 9km south of the Inverell STP.

Key information on the golf course is summarised below:

- Eighteen (18) hole golf course, straddling the Bundarra Road, nine (9) holes each side. The course is challenging and attractive however suffers during periods of drought.
- Clubhouse and nine (9) fairways located on the eastern side of Bundarra Road.
- Remainder of fairways, irrigation storages and town water reservoir located west of Bundarra Road.

- Club has an irrigation system in place to irrigate tees and putting greens. An older system for watering fairways.
- A 200kL reservoir is located on the North West side of the site to store town water and bore water used for irrigation.
- Two (2) relatively small dams located on a local watercourse along the western side of the facility harvest and store water for irrigation purposes. There is a third adjacent off stream storage which is sometimes used to store water; however this storage tends to leak. The water is pumped from the on stream storages for irrigation.
- Two (2) shallow bores on the western side of Bundarra Road approximately 15m deep, one with a production rate of approximately 1.2L/s has been abandoned due to ingress of material impacting the pump. The remaining production bore delivers approximately 0.75L/s into the 200kL town water irrigation storage reservoir.
- Due to costs and available funds the Club has not undertaken any further ground water investigations. Subject to hydrological investigations, drilling to depths of 100m or more may be required to encounter regional fractures to provide a more reliable and productive irrigation supply. If successful a bore could provide a cost effective solution to supplementing the existing surface water supply.
- Over the past year approximately 23ML of town water was used to supplement irrigation of the tees and putting greens.
- Irrigation of tees and greens and immediate areas requires around 1.4ML/week during summer. If more generous areas around the greens were included demand would increase to 2ML/week.
- Total length of the eighteen (18) fairways is approximately 6,000m.
- Potential 30ha of fairways could be irrigated (6,000m x 50m wide), however very capital intensive and operationally expensive to establish and irrigate such large areas.
- Peak demand for water during dry periods / summer would be in the order of 30mm /week. This figure would be exceeded during severe drought periods and would have to prioritise the irrigation of tees and putting greens. Would require a detailed analysis against soil and climate data.
- Annual irrigation demand for water, say 30ha @ 6 ML/ha/pa = 180ML pa.
- Peak irrigation demand @ 30 mm/week over 30ha approximately 1.3ML/day.
- Golf Club is elevated approximately 110m higher than the Inverell STP maturation ponds.

Feasibility of Supplying Treated Effluent to Inverell Golf Club

- Site suitability for irrigation with treated effluent would be subject to favourable environmental assessment including soil, surface water and groundwater.
- Detailed water balance required to determine site water storage requirements to meet peak summer demand.
- Off stream treated effluent storage is required, to avoid contamination of local waterways. This would require detailed analysis in the overall management of treated effluent for Inverell, including the percentage of effluent being recycled, and percentage going back to the river, or other reuse sites.
- Public health issues associated with treated effluent to be addressed as part of the assessment process, including exclusion during irrigation. Further treatment of effluent may be required for a golf course.
- Environmental Impact Statement (EIS) most likely required.

- Apportionment of capital and operational costs of providing treated effluent to the golf course storage would need to be determined. The Club would have to pump from an on site irrigation storage.
- Pumping costs from the Inverell STP to the elevated golf course storage would be high, due to the pipeline distance of approximately 9km and associated friction losses plus lift of around 110m. High pressures involved would likely require a balance tank and pump station between Inverell and the golf course (similar to the Copeton town water supply to Gilgai which has balance tanks and pump stations at Cunningham Hill and Staggs Lane). It is conceivable that the capital cost alone of such a project would be in excess of $4M.
- With Inverell STP located on the northern side of Inverell there is a high cost of constructing an effluent reuse pipeline south through the Inverell built up area to the Golf Club. This could be offset if there were other sites to receive recycled effluent along the way.
- Effluent reuse scheme capital and operational cost would be used to determine the price of Council supplying treated effluent to the club.
- At present the Club has a relatively small membership and barely able to sustain $2,000 per month for town water usage during drought periods.

In summary, without undertaking any further investigations the high capital, operation and maintenance costs of treating and pumping recycled effluent from Inverell STP to the Inverell Golf Club would be very expensive, requiring a high level of underwriting by the broader community.

The golf course has the potential to utilise up to around 180ML of treated effluent annually, equating to approximately 20% of treated effluent discharged to the river at the Inverell STP.

Agricultural Effluent Reuse

An agricultural operation would have the capacity to utilise all treated effluent from the Inverell STP. In broad terms a treated effluent storage in the order of 300ML capacity would need to be constructed on site to store treated effluent during periods of low irrigation demand for utilisation during periods of high demand. The farm would comprise a suitable broad acre farming area in the order of 150ha under centre pivot irrigation, plus buffer areas around the perimeter.

The farm would ideally be located downstream of the Inverell STP on relatively flat land to minimise pumping cost in transferring effluent from the STP to the farm, and facilitating the construction of a cost effective effluent storage.

It should be noted that there is a significant amount of investigation, design and environmental assessment required to determine if a proposed site is suitable as an effluent reuse farm.

There are various options for establishing a reuse farm including involving the private sector, keeping in mind that the operation of an effluent reuse farm requires expertise in agricultural and environmental management, which is a considerable overhead on the farm operation. A few models are listed below:

1. An existing farming operation could purchase effluent at the farm gate on a unit rate per ML basis.
2. Council acquire land and set up as an effluent reuse farm and contract out the operation of the farm with the contractor responsible for the full farm operation inputs and outputs.
3. Council acquire land and establish a fully operational reuse farm and operate with Council staff.

If Council was to consider agricultural effluent reuse, it would be preferable to call expression of interests (EOI) from the private sector.

Horticultural Effluent Reuse

Investments in horticultural operations are capital intensive and require a very secure source of irrigation water, which could be provided by access to treated effluent from the Inverell STP.

Generally root crops and vegetables may not be irrigated with treated effluent, whereas drip irrigated fruit and nut trees may be with certain conditions applied.

Again this is an area where an EOI could be called from the private sector to ascertain the interest in investing in high value permanent tree / berry plantings supplied with treated effluent.

Nutrient Stripping of Treated Effluent and Discharge to River at STP Site

This would entail installing and operating a chemical dosing facility at the STP. Treated effluent would return to the river from the maturation ponds under gravity, with no need for any pumping. Capital costs would be much less than effluent reuse options.

The nutrient levels in the treated effluent could be lowered at the Inverell STP by adding a chemical dosing system to remove phosphates. Typically the chemical used is Ferrous Sulfate (pickle liquor from the steel making process) which binds up the nutrients for settlement within the maturation ponds at the STP. Detailed investigations would be required to establish the level of phosphorous removal achievable with chemical dosing, and whether it is sufficient to meet EPA receiving water objectives.

Nutrient stripping may pay for itself by way of significantly reduced EPA LBL fees, as well as reducing the impact of the Inverell STP on the Macintyre River. This option requires detailed investigation to allow Council to make informed decisions in the further consideration of effluent reuse options.

It should be noted that one of the benefits of effluent reuse for agricultural pursuits is the high level of nutrients in the water, reducing the crop fertiliser inputs. If a decision was made to pursue effluent reuse on land sometime in the future the investment in nutrient stripping may become redundant, although it could potentially be used during excessively wet periods when river discharge was required reducing the environmental impact on the river and lowering LBL fees.

Conclusion

This report provides a broad overview of the potential to reuse treated effluent from the Inverell STP which is currently discharged into the Macintyre River below Inverell, attracting annual EPA LBL fees in the range of $68,000 to $100,000.

One option investigated and considered by the Committee in 2019 was pumping treated effluent to Lake Inverell Dam to supplement the flow in the dam and Macintyre River through the town during drought periods. This option was not considered feasible due the environmental impact, insufficient volume of treated effluent and cost of implementing the scheme.

There is potential to offset potable water use by irrigating active and passive recreation areas in Inverell with recycled effluent, however the high level of treatment required, constructing recycled water distribution mains and retrofitting irrigation systems to prevent cross contamination of the town water supply would be very expensive compared to continuing with using town water. The Copeton town water supply has the capacity and spare water licence volumetric allocation to keep supplying water to passive and active recreation areas, excluding golf course fairways.

Pumping recycled water from Inverell STP to the Inverell Golf Club would be very expensive to install, operate and maintain. The system would have to be highly subsidised going forward, placing a financial burden on the sewer fund.

Agricultural and horticultural effluent reuse may offer an avenue to recycle all treated effluent from the Inverell STP, however may entail a significant capital and ongoing operation and maintenance cost to Council, leading to a steep increase in sewer rates. Council also has an ongoing sewer capital and rehabilitation works program that needs to be factored in.

This report has not attempted to place estimated cost to implement and operate effluent reuse options discussed in this report. Much more detailed analysis by consultants would be required to produce concepts and first order cost estimates. From experience elsewhere capital cost in the order of $5M upwards would not be unexpected for a partial effluent reuse scheme.

The high capital, operational and maintenance costs associated with effluent reuse options highlight the need for Council to examine the capital and ongoing operation and maintenance cost

of implementing nutrient stripping at the Inverell STP. This would provide Council with an estimated pay back period on reducing the annual LBL fees paid by Council, and whether there is a need to further explore effluent reuse at this point in time. Nutrient stripping would reduce the nutrient load on the Macintyre River improving downstream water quality.

RISK ASSESSMENT:

Risks would be assessed as part of any future more detailed investigations.

POLICY IMPLICATIONS:

Nil

CHIEF FINANCIAL OFFICERS COMMENT:

Current reserves in the sewerage funds available for capital projects are $2.4M.

LEGAL IMPLICATIONS:

Any proposed changes to discharge of treated effluent would have to be assessed and comply with the Protection of the Environment Operations Act 1997, and EPA licencing requirements.

ATTACHMENTS:

Nil

6 INFORMATION REPORTS

6.1 WORKS UPDATE

File Number: **S28.21.1/13 / 20/7681**

Author: **Justin Pay, Manager Civil Engineering**

SUMMARY:

This report is intended to keep Council updated on the capital works and maintenance programs.

COMMENTARY:

Rifle Range Road Subdivision

This project is the final stage of an industrial subdivision being undertaken by Council on Rifle Range Road, Inverell. This stage involves the construction of sewer, water, drainage and road infrastructure for up to 23 various sized industrial lots located between Rifle Range Road and Pioneer Village. The $1.475M project is being funded from the Industrial Development Internal revote and the Industrial Promotion and Assistance vote. The design for the project was completed by Local Government Engineering Services and is in accordance with relevant Austroads Design Guidelines. Earthworks for road construction, underground drainage and sewer have been completed and placement of pavement material has commenced in preparation for kerb and gutter works.

Construction of the pavement of this project was undertaken in stages, consistent with Council's standard construction technique and engineering specifications. Pavement depths of up to 600mm were required for the project given the proposed traffic composition and the underlying soil types. In order to achieve these pavement depths whilst also ensuring proper drainage, areas of existing soil were required to be removed, or "boxed out". This is a standard pavement construction technique. Some construction areas had considerable volumes of cut for pavement construction, sewer and drainage installation. This is due to the site constraints, including depth of drainage lines, depth of sewer and provision of proper road drainage in varying natural site gradients. After completion of the concrete kerb and gutter the final pavement layer will be constructed. The levels of the kerb and gutter and final pavement layer provide adequate grades on both the access and egress from Rifle Range Road for a range of heavy vehicles, including busses. The project is progressing in accordance with the original approved design.

The project has experienced minor delays as crews are also working on the Sporting Complex Upgrade project. Works have recommenced in January 2020 with the sub base layer completed and kerb and gutter construction commenced. Wet weather during the January/February period has further delayed the project. Works are expected to continue over the next six (6) weeks with a planned completion date early April 2020.

Sub base pavement material placed and compacted with Kerb and Gutter construction commenced – Rifle Range Road Industrial Subdivision

Guyra Road Pavement Rehabilitation and Widening – Slurry Gully

This project involves the widening and rehabilitation of a section of Guyra Road 66.66km to 68.58km west of Guyra at the locality known as Slurry Gully (2km west of Tingha). The project has been constructed in two (2) stages with stage one (1) (CH 67.40km to 68.58km) an 1180 metre section completed and stage two (2) (CH 66.66km to 67.40km) a 740 metre section currently under construction. Council has committed $1.41M to this project with $1.087M being funded from the Repair Program and $323K from the Block Grant.

Stage one (1) has been completed with a primer seal placed on 6 December, 2019. The site was closed down for the Christmas break with crews returning to commence stage two (2) early January 2020. Culvert upgrades are underway with a box culvert extension completed by a local concreting contractor. Earthworks commenced late January 2020 with pavement construction delayed until March due to wet weather. A primer seal for stage two (2) is planned for early April

2020 with a final seal for both stage one (1) and stage two (2) programmed for November 2020, in conjunction with the 2020/2021 Resealing Program.

Pavement Construction Commenced - Stage Two MR135 Slurry Gully

Large Box Culvert extension - Stage Two MR135 Slurry Gully

Inverell Sporting Complex Athletics Precinct Upgrade

Council has been successful in obtaining $350K from the Stronger Country Communities Fund to contribute towards the construction of a new athletics precinct at the Inverell Sporting Complex on Eucalypt Drive. Works involve the construction of a new athletics precinct and associated infrastructure with upgrades to Eucalypt Drive including drainage works and the construction of kerb and gutter. The total budget allocation for this project is $789K with the remaining $439K required for this project being revenue funded by Council.

The project has reached practical completion. Preparations for landscaping works (tree planting) are currently taking place ready for tree planting and laying turf in Autumn 2020.

The remaining works include the construction of the discus, shotput and longjump facilities on the new athletics fields and fencing around the new field. These works are due to be completed by Easter. It is intended to conduct an inspection of the works for Councillors in conjunction with the April 2020 Civil and Environmental Services Committee meeting.

Newly constructed roundabout and parking areas – Inverell Sports Complex Upgrade

Byron Street – Town Centre Renewal Plan Project – Campbell Street to Vivian Street

This project is stage two (2) of the Town Centre Renewal Plan (TCRP). This stage is located along Byron Street from Campbell Street to Vivian Street. The stage consists of the removal of eleven (11) Plane trees, planting of six (6) new Pin Oak trees in the newly constructed centre median plus six (6) Chanticleer Pear edge plantings. The existing raised crossings will also be removed and replaced with at grade level crossings. The project is estimated to cost $1.54M and is expected to take sixteen (16) weeks to complete. This follows on from Stage one (1) in Otho Street, which was completed early 2018.

The centre median is now practically complete for the entire length of the project. Staff are currently installing street furniture and paving around the locations for tree edge plantings. Traffic will reopen in both directions in the block between Otho and Vivian Streets on Friday, 6 March 2020. Asphalt works are programmed for the week commencing Monday, 16 March and tree planting is scheduled to commence on Tuesday, 24 March.

It is expected that the project will be completed and fully open to the public on Friday, 3 April 2020.

Centre Median Completed Awaiting Tree Planting – TCRP Byron Street, between Campbell and Otho Streets

Centre Median Nearing Completion – TCRP Byron Street, between Otho and Vivian Streets

Inverell Campbell Street Water Main Replacement

Works have commenced to replace the water main in Campbell Street, between Rivers and Henderson Street. The existing main in this location has reached the end of its useful life and requires replacement. The replacement main will provide better service to the existing dentist and proposed medical centre at this location. Works have been brought forward in order to minimise conflict with construction crews working on the medical centre adjacent to the site.

Water Main Replacement Commencing in Campbell Street, between Rivers and Henderson Street

Maintenance Grading

The following maintenance grading works were undertaken during February 2020.

Road Number	Road Name	Length Graded (km)
SR 63	Beaumont Road	2.43
SR 26	Camp Creek Road	14.66
SR 13	Appletree Flat Road	16
SR 33	Limestone Road	14.62
SR 28	Goat Rock Road	15.01
SR 270	Inverness Road	0.77
SR 107	Northcotts Road	1.63

SR 234	Kings Plains Road	19.90
SR 267	Spring Mountain Road	15.28
SR 268	Sturmans Road	2.56
	TOTAL	**102.86**

Reactive Spot Grading

The following reactive spot grading works were undertaken during February 2020.

Road Number	Road Name	Length Graded (km)
SR 50	Bukkulla Road	2.89
SR 51	Wells Crossing Road	6.71
	TOTAL	**9.60**

Gravel Patching

The following gravel patching works were undertaken during February 2020.

Road Number	Road Name	Area Patched (sqm)
SR 267	Spring Mountain Road	750
	TOTAL	**750**

Gravel Re-sheeting

No gravel re-sheeting works were undertaken during February 2020.

With improved climatic conditions and available water storages returning, the gravel resheeting program will re-commence in March 2020.

Other Maintenance Activities

Council's State, Regional and Local Roads, Urban and Village Street maintenance activities, such as bitumen patching, drainage and shoulder repairs as well as vegetation control, are continuing as required. Town maintenance will continue as programmed.

ATTACHMENTS:

Nil

6.2 SAPPHIRE CITY MOTOR SPORTS CLUB

File Number: **S21.8.18 / 20/8748**

Author: **Brett McInnes, Acting General Manager**

SUMMARY:

Advice has been received from the Sapphire City Motor Sports Club advising of their intention to run an event at the Graman Recreation Reserve.

COMMENTARY:

The Sapphire City Motor Sports Club Inc has written to Council advising of their intention to run an event at the Graman Recreation Reserve on Sunday 29 March, 2020.

The Club note they have placed details of the event on the noticeboard of the Graman Hotel to notify the Graman community that the event is being held.

The Club has arranged for the Westpac Rescue Helicopter Service to run a barbeque on the day. The proceeds from food and soft drink sales will be donated to the service.

An invitation is extended for Councillors and Council staff to attend the event.

ATTACHMENTS:

1. **Letter from Sapphire City Motor Sports Club Inc - Intention to Run Event at Graman Recreation Reserve - 29 March 2020**

SAPPHIRE CITY MOTOR SPORTS CLUB INC.
P.O.Box 933
Inverell NSW 2360

Ph. 0408688426

INVERELL SHIRE COUNCIL
02 MAR 2020

Mr Paul Henry
General Manager
Inverell Shire Council
144 Otho Street
INVERELL NSW 2360

2 March 2020

Dear Mr Henry,

We wish to advise Council of the Sapphire City Motor Sports Club's intention to run an event at the Graman Recreation Reserve on 29 March 2020.

We note an announcement of our intention will be placed on the Community Noticeboard at the Graman Pub to notify the Graman Community.

As a Club and we encourage community support of different services and show our support by welcoming fundraiser barbeques in conjunction with our events. At this event, the Westpac Rescue Helicopter Service will be in attendance and the proceeds from food and soft drink sales will be donated to the service.

As always, there is an open invitation for Councillors and Council Staff to attend our event.

If you have any further questions, please do not hesitate to contact the secretary, Spanner Tanner.

Kind Regards,

The Sapphire City Motor Sports Club Inc