



# Department of Primary Industries

OUT14/37925

Ms Belinda Scott  
Rail, Ports and Water  
NSW Department of Planning and Environment  
GPO Box 39  
SYDNEY NSW 2001

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Dear Ms Scott,

## **Nepean River Pump and Pipeline (SSD\_5225) Response to exhibition of Environmental Impact Statement**

I refer to letter from Lisa Mitchell dated 13 October 2014 requesting comment from the Department of Primary Industries (DPI) in respect to the above matter.

### Comment by Fisheries NSW

Fisheries NSW is responsible for ensuring that fish stocks are conserved and that there is no net loss of key fish habitat upon which they depend. To achieve this, Fisheries NSW ensures that developments comply with the requirements of the *Fisheries Management (FM) Act 1994* (namely the aquatic habitat protection and threatened species provisions in Part 7 and 7A of the Act, respectively), and the associated *Policy and Guidelines for Fish Habitat Conservation and Management (2013)*.

Fisheries NSW has reviewed the environmental impact statement and considers that impacts to the aquatic environment will be minimised and rehabilitated provided that the mitigation measures relating to 'Ecology', 'Soils and Water' and 'Hydrology' summarised in Tables 54 and 55 of the EIS are implemented. In particular:

- the proposed mesh screens are to be placed on the intake structure and the rate at which water is withdrawn is low, so that impacts through the uptake of fish are avoided.
- impacts to fish passage must be avoided by complying to cease to pump rules in the Water Sharing Plan.
- erosion and sedimentation measures are to be used during construction.
- the Aquatic Flora and Fauna Management Plan is to be implemented.

It is important that the temporary spit is fully removed from the Nepean River following construction.

For further information please contact Carla Ganassin, Fisheries Conservation Manager, (Wollongong Office) on 4254 5527 or at [carla.ganassin@dpi.nsw.gov.au](mailto:carla.ganassin@dpi.nsw.gov.au).

### Comment by NSW Office of Water

The NSW Office of Water (NOW) has reviewed the Nepean Pump and Pipeline - Environmental Impact Statement (EIS) dated 3 September 2013.

NSW Department of Primary Industries  
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Tel: 02 9338 6666 Fax: 02 9338 6970 [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au) ABN: 72 189 919 072

The Office of Water is concerned that the flow modelling is based on the assumption that the Penrith Lakes Scheme (PLS) has unlimited access to water in the Nepean River when the specified flows are exceeded. The high flow licence will specify an annual entitlement which is the maximum volume of water that can be extracted from the river in any water year. In this regard, PLDC and NOW will need to discuss and confirm the most appropriate annual entitlement for the PLS. The Department may wish to convene a meeting to discuss key issues raised in this advice.

The reference gauge for the PLS cease to take condition is the Yarramundi gauge. As such, the movement of the extraction location to below Penrith Weir does not impact on the flow at the reference gauge.

The following points also need to be addressed:

- Evidence should be provided to support the claim that water quality at the pump site has improved compared to that reported in the previous assessment.
- Required retention times to allow for water treatment in the wetlands to achieve appropriate water quality for the PLS has not been appropriately considered in setting limits on extraction volumes.
- Water quality needs to be assessed at the flows of interest (i.e. high flows not low flows) to understand required retention times in the wetlands and Quarantine Lake to achieve the desired water quality outcomes.

In order to understand the system, its impacts on the river, the pumping regime, and volumes that may be extracted, the assessments outlined above cannot be done in isolation. Wetland design is integral to understanding retention times and volumes that can be extracted in an event in order to treat the water to the appropriate standards. Without this understanding it will not be possible to determine when and how much water can be extracted in wet, dry or average years.

Additional comments on the draft EIS are provided in the table in Attachment A. If you have any questions in relation to the comments provided please contact Richard Nevill on (02) 8838 7570 or email [richard.a.nevill@dpi.nsw.gov.au](mailto:richard.a.nevill@dpi.nsw.gov.au).

#### Comment by Agriculture NSW

Agriculture NSW advise that the modelled impacts should be reviewed once more data is obtained regarding available irrigation water for the downstream users. Noting that if the Penrith Lakes Scheme operation does influence the Cease to Pump time frame i.e. comes in 2 days earlier than normal, this could impact negatively on downstream agriculture businesses.

For further information please contact Andrew Docking, Resource Management Officer (Richmond office) on 4588 2128, or: [andrew.docking@industry.nsw.gov.au](mailto:andrew.docking@industry.nsw.gov.au).

Yours sincerely



Kristian Holz  
Policy, Legislation and Innovation

**Attachment A**

**Nepean River Pump and Pipeline (SSD\_5225)**  
**Response to exhibition of EIS**  
**Additional comments by NSW Office of Water**

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v	Water quality downstream of Boundary Creek is suitable for extraction and discharge to PLS now the St Marys Water Recycling Initiative is discharging highly treated water into the Nepean River	Further evidence needs to be provided to support this statement. The focus of water quality analysis needs to be at flow rates during which water will be allowed to be extracted.
Vii, para 1	River-flat eucalypt forest strip is degraded	Further evidence needs to be provided to support the claim that the river-flat eucalypt forest (RFEF) community that will be disturbed by the Nepean River Pump and Pipeline (NRPP) is degraded.
Vii, p7	Works to be conducted outside the “fish migratory season”.	Further information should be provided on the relevant species of fish considered and their migration patterns, to better understand the impacts to be avoided.
21	Water quality data collected on a monthly basis	The summary statistics for water quality presented in Table 2 do not provide sufficient evidence to support changing the extraction point. Data from sampling conducted before the commencement of the St Marys Water Recycling Initiative is required, and comparisons made to the upstream (Penrith Weir) site. Data collected during flows between 350 – 5000 ML/d need to be used. The water quality data collected during low flows is not representative of the water that will be extracted.
29	2006 – NSW Office of Water releases a water sharing plan	This statement is incorrect. The year 2006 is the date of the <i>Metropolitan Water Plan</i> , a plan to balance water use across the Sydney Metropolitan area. This is a plan that identifies water sources, water use targets, recycling targets and so on. The <i>Water Sharing Plan for Greater Metropolitan Unregulated Rivers Water Sources</i> commenced on 1 July 2011, and is a legal document that identifies water sharing rules (e.g. pumping and trading rules and environmental water).
31 (last para)	Pumping from the Nepean even during extreme droughts would be sufficient to prevent lake drawdown	NOW modelling indicates that lake drawdown beyond identified tolerances will occur in extreme droughts, but that this can be managed with water transfers within the PLS, e.g. from the Wildlife Lake to the other lakes.
34	Scenarios tested – A5, A8 and A1	Scenario A5 (unrestricted pumping) is unrealistic as there will be a cap on extraction, in accordance with water licences held. Unrestricted pumping is not a viable option. Scenario A8 should be

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		revisited with higher flow rates if water quality analysis of high flows warrants this. In relation to scenario A1, the Quarantine Lake (QL) is now designed to be separated by a gate, and so an alternative A1 with a cap on the volumetric entitlement should be run.
35 (first para)	Pumping volumes of 4.9, 3.8 and 3.5 GL/a vs 16.4 GL/a	The proponent must consult with the Office of Water on possible volumes. There will be an entitlement on the high flow licence and so modelling should include this as a restriction. This will affect the amount of time that the lakes remain in their operational ranges. Table 5 will need to be revised.
41 (Hydraulics option)	All sites feature submergence issues associated with shallow water in low flow conditions.	Shallow water in low flows should not be an issue. “Low flows” are not specified. There will have to be at least 350 ML/d passing the pump – with extraction volumes above this. Is there a submergence issue at these flows? Flow rate at which submergence becomes an issue should be identified.
43 (s.5.1.1 2 <sup>nd</sup> para)	Removing water quality issues	This has not been shown to be the case. More information is required.
43 (s.5.1.2, 1 <sup>st</sup> para)	Wetlands design would be developed to achieve water quality criteria.	<p>Wetlands design is crucial not only to achieving water quality criteria in the PLS, but in understanding how many days' storage the wetlands and QL will be able to provide and thus how many days the pumps would be operational. These two things cannot be separated; however the EIS makes no attempt to integrate them.</p> <p>The proposed pump size and extraction volumes may achieve lake levels within operational targets, but these volumes may not be achieved in reality. Holding times in the wetlands and QL to achieve appropriate water quality may reduce the overall number of days that extraction can occur. This needs to be modelled.</p>
47 / 51 / 57	The pipeline would be buried under half a metre of suitable sand aggregate and material excavated. Tamping or rolling would consolidate the material.	The geomorphic implications of this proposal need to be explored. The preferred site is likely to be exposed to high velocities during flood flows (outer bank on the curve of the river). Burying the pipeline under poorly consolidated materials will not prevent erosion of the disturbed area during floods. Other options to prevent erosion may need to be explored.
64 (s.6.3.3, 4 <sup>th</sup> dot point)	Cumulative impacts of water management licences and approvals should be considered and minimised.	This has been done to an extent; needs to be revised based on the changed location.
64	...a new or revised extraction licence would be sought for filling and maintaining the PLS...	PLDC must discuss this with NOW. It is expected that the existing water licence entitlements would be utilised for the ongoing maintenance of the lakes scheme. Opportunities for an additional licence to fill the lakes will need to be discussed with NOW.
64 (last para)	It is anticipated that PLDC would be issued a water extraction licence under section	PLDC already holds a number of licence entitlements and no new entitlement is available for this purpose. Regardless, section 63B of the <i>Water Management Act 2000</i> applies only to the State or to

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	63B of the Water Management Act 2000 in order to meet the requirements of 1987 Deed of Agreement.	a public authority, and as such does not apply to PLDC.
68 (s.6.4.2, last para)	Water quantity – aquatic ecosystems must not be adversely affected by development.	Protection of fish passage opportunities at Bishops Bench needs to be a primary driver of the extraction rules.
73	Earthworks - The development is not located in a drinking water catchment.	The proponent should ensure it considers any impacts on water extraction at the North Richmond Water Filtration Plant.
73	Flood Planning - Would the development cause significant impacts to erosion during a flood?	See above page 47 comment. Location of the site on an outside bend may mean exposure of the disturbed, filled pipeline trench to very high velocities during a flood. Steps should be taken to mitigate the risk of erosion.
76-77 (s.6.5.2, last para)	Cease to pump rules	The Penrith Lakes Development Corporation should liaise with the NSW Office of Water to confirm details of the cease to pump rules.
105 (s.8.3.3)	Lake filling	Times should be reviewed and take into account the volume in the wetlands and the QL, and time taken to treat the water to an appropriate standard. The specified times to fill the lakes are likely to have been underestimated. Based on hydrology alone, NOW predicted that the lakes could take anywhere from 1 year 1 month for Lake A, and 1 year 2 months for Lake B in wet conditions, to 4 years 5 months (Lake A) and 6 years 6 months for Lake B. Average time to fill (i.e. in average climate conditions) was 2 years 3 months for Lake A and 3 years 1 month for Lake B.
110 (s.8.3.4, 2 <sup>nd</sup> para)	Groundwater not extracted	While there is no plan to extract water from deep aquifers on site, what provisions are made for shallow groundwater seepage into PLS? Page 118 (2 <sup>nd</sup> para) indicates that there is seepage from shallow groundwater. A licence may be required for any groundwater interception if not exempt.
111	Pumping rules	Refers to total river flows – site needs to be specified, e.g. ...when the river flow at the Yarramundi gauge exceeds 500 ML/day.
111 (s.8.3.5)	Extraction volumes	Clarification is required regarding the meaning of Table 16. For example the river flow, by definition, does not exceed the 5 <sup>th</sup> percentile for 365 days.
113	Returned Flows to the Nepean - Net river flows	This assumes that there will be an outflow to the river from PLS. This is unlikely under a regime with a volumetric cap on extractions, unless it is particularly wet and there is a lot of catchment runoff.
115	Water quality	While the authors state that total phosphorus (TP) exceeded guidelines on 36% of sampling

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		occasions and total nitrogen (TN) on 1 occasion, there is no attempt to correlate these exceedances with flow conditions. This must be done to make more sense of the data. If all exceedances occur during high flows, more may need to be done to treat the water once extracted and before discharge into PLS. When making the comment that water quality in the Nepean River has improved following the implementation of the St Marys Water Recycling Plant (Recycled Water Initiative), data from before the Recycled Water Initiative was implemented should be presented for comparison.
118 (Other Licensed Extractors - 2 <sup>nd</sup> para)	Net volumes of 2.5 GL/y (or 0.85GL/y when taking groundwater seepage into account).	This statement is misleading. During most years there will be no return flows to the Nepean River, and there is currently no allowance for return flow credits. Groundwater appears to be inconsistently included and excluded (e.g. page 110, s.8.3.4 states no groundwater is extracted).
118, (para 3)	Extraction volumes proposed are considered not to impact on other users.	Further work is required to determine potential impacts on other water users. How many other users are in this river zone and what are their entitlements? Comparing a volume of 16.4 GL/annum to the total extraction for the 1400+ licences in the Hawkesbury Lower Nepean Water Source has limited value.
118 (para 5)	The volumes sought can be accommodated within the water allocations of the WSP.	The water allocation is already 100% in this area. The <i>Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011</i> does not provide for applications generally for unregulated river access licences, including any applications by PLDC specifically for a water access licence. In addition, section 61 of the <i>Water Management Act 2000</i> only provides for applications to be made for zero share water access licences or specific purpose water access licences, so any additional volume required is unable to be granted to PLDC, above the volumetric entitlement of the existing licences already held by PLDC.
119 1 <sup>st</sup> para)	There would be no obstruction to fish passage at 170 ML/d at 7 riffles.	Obstruction occurs at Riffle 3, Bishops Bench, and will not allow upstream passage of adult Australian bass at flows less than approximately 500 ML/d. Downstream migration will be facilitated at flows down to 350 ML/d. These flow rates have been confirmed by recent work by NOW.
119, (2 <sup>nd</sup> para)	Expected outflows to the river from Main Lake A...	Main Lake A will only discharge to the river after a large flood event. Hydrological impacts from pumping will occur downstream of the pump site most of the time that the pump is operating (unlikely to be operating in a flood), and will be seen at least down to the Grose River junction, and possibly further. At flows of less than 500 ML/d, the pump may be extracting up to 20% of the river flow, which is a considerable hydrological impact. Further hydrological modelling is required to quantify this impact.
126	Mitigation measures and Conclusion	All statements in this section have been made previously and are commented on above.
190	The IEP Report indicates that during low	A groundwater licence may be required from NOW to account for this interception of groundwater if

Page no	EIS statement	Comments
(s.13.3.3 - Groundwater)	water levels, the PLS lakes act as groundwater sumps, with water flowing into the lakes from bank storage where this is not restricted by clay seals.	no exemption applies.
Appendices		
Appendix E Water Balance Report (s.3.5, page12)	The model incorporated river flow data sourced from the SCA spanning a period of almost 100 years (1909 to 2003) to ensure that water requirements for the PLS could be analysed across a range of climatic conditions, including both wet and dry periods.	<p>It is not clear what river flow data were used in this model. While the SCA models inflows and releases, this does not take other factors such as extraction and inflows downstream of the dams into account. Extraction modelling should have been based on the IQQM model prepared by NOW, which incorporates the SCA model outflows, (including environmental flow releases) and catchment inflows / extractions downstream of the SCA's dams. River flows and therefore extraction rates and timing may not reflect river conditions.</p>
Appendix E Water Balance Report (s.3.5, page12) - River Data	<p>Modelling in this report has been based on the following extraction rules from the Nepean River:</p> <ul style="list-style-type: none"> <li>• Pumping can commence from the Nepean River to the lakes when the total river flow exceeds 500 ML/day;</li> <li>• Pumping must cease when the total Nepean River flow drops below 350 ML/day.</li> </ul>	<p>For accuracy, the pumping rules should specify the reference location (in accordance with clause 57 of the Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011), as follows:</p> <p>Modelling in this report has been based on the following extraction rules from the Nepean River:</p> <ul style="list-style-type: none"> <li>• Pumping can commence from the Nepean River to the lakes when the total river flow on a rising river exceeds 500 ML/day at the Yarramundi gauge;</li> <li>• Pumping must cease when the total Nepean River flow on a falling river drops to 350 ML/day or less at the Yarramundi gauge.</li> </ul>
Appendix E Water Balance Report, p.28 Table 5-1 Time to fill	<p>The attached IQQM model result report (Attachment B, Table A1) shows the impact of annual entitlement (3.3GL) on lake filling period.</p>	The Water Balance report does not address the impact of the annual entitlement (extraction limit) of 3.3 GL per year.

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Appendix E Water Balance Report, p.31 Table 6-1	Lake A target operation level is 13.0 - 14.5 m (FSL 14.0 with 0.5 m surcharge), i.e allow -1.0 m. The IQQM modelling scenarios allow -0.5 m only. Is -1.0 m is the final target operating level range?	The modelling does not consider pumping from Lake B to A. The IQQM model scenario considers pumping from Lake B to Lake A to maintain Lake A water level within - 0.5 m. The attached IQQM modelling report (attachment B) shows the Lake A and B water levels with and without pumping from Lake B to A (Figure C2-01A to C2-01C and C2-02A to C2-02D).
Appendix E Water Balance modelling	IQQM modelling is required to protect downstream irrigation demand from Penrith lake extractions. This is not considered in Appendix E Water balance modelling	
Appendix E Water balance modelling		

## Attachment B

### Nepean River Pump and Pipeline (SSD\_5225) Response to exhibition of EIS IQQM Modelling by NSW Office of Water

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#### Scenario run no. 4

Revised model configuration:

1. Modelling period from 1/1/1915 to 31/12/2010.
2. All lakes volume, area and RL tables updated based on latest PLDC information.
3. Lake A Full supply level is 14.0 m (17690.5 ML).
4. Lake A spill level is set to 14.1 m (18009.32 ML).
5. Lake B spill level is set to 13.5 m (7110.98 ML).
6. Warragamba dam release 30 ML/d.
7. Upper Nepean dams releases on 80/20 rule.
8. Tributary flows, from 1/1/1915 to 31/12/2003 HSPF modelled inflows, from 1/1/2004 to 31/12/2010 Source modelled inflows.

#### Pumping conditions from Lake B to Lake A

1. Commence to pump from lake B to lake A: Pumping from Lake B to Lake A commence when Lake A water level at 13.6 m (-0.4 m from FSL 14.0 m) or below.
2. Cease to pump from lake B to A: Pumping from Lake B to A stops when Lake A level reach to 14.0 m.
3. Pump capacity: Two different pump capacity scenarios, 50ML/d and 10ML/d and no pumping scenario.

#### Pumping conditions from River

1. Two Commence to pump and cease to pump river flow threshold scenarios are modelled as 500 ML/d and 200 ML/d.
2. All environmental flows are protected (allowed for losses as in WSP).
3. River pumping stops when Lake A and B are full.
4. Down Stream irrigation demand is protected on top of the pumping thresholds.
5. River pump capacity is 86.4 ML.d.
6. Annual extraction limit is 3.3 GL.

#### Lakes details:

Lake	RL			Volume		Area
	Bottom Level RL m	Spill Level RL m	FSL RL m	Spill level ML	FSL Vol ML	
Quarantine Lake	6.6	15		1935		41.8
Regatta Lake	5.1	15		3476		79.52
Main Lake A	5.1	14.1	14	18009	17690	317.7
Main Lake B	5.1	13.5	13.5	7111	7111	115
Wildlife Lake	5.1	10		3710		108.2

Three main modelling Scenarios:

Scenario		CTP
Scenario A (S4a)	Most limited access (in relative terms). The model assumes that cease to pump and commence to pump is 500ML/d. Pump trigger is based on total river flows. Available flows are only those in excess of environmental flows plus a seasonal allowance for irrigation extractions. Due to the modelling complexity and the short time frame 350 ML/d commence to pump is not used in the model.	500/500
Scenario B1 (S4b1)	Least limited access scenarios: as per Scenario A, but with reduced access thresholds 200ML/d	200/200
Scenario S4E1a	River access + fixed 8ML/d ground water, No fixed River Return	500/500

The above scenarios are described in detail in the previous Penrith Lakes reports.

The following table provide the information of all modelling scenarios related to the three main scenarios.

Table 1 All Modelling Scenarios

Scenario	River Pumping		Ann Lic Vol	Lake A to B Pumping			FSL Level		Spill Level	
	Flow Th.	Lake Vol Th		Pump Cap ML/d	Lake A level Start/Stop	Lake B Level Start/Stop	Lake A	Lake B	Lake A	Lake B
S4A_P50	500/500	Lake A + B full	3.3	50	13.6/14.0	N/A	14.0	13.5	14.1	13.5
S4A_P50_1	500/500	Lake A + B full	No limit	50	13.6/14.0	N/A	14.0	13.5	14.1	13.5
S4A_P10	500/500	Lake A + B full	3.3	10	13.6/14.0	N/A	14.0	13.5	14.1	13.5
S4A_P0	500/500	Lake A + B full	3.3	No pump	N/A	N/A	14.0	13.5	14.1	13.5
S4B1_P50	200/200	Lake A + B full	3.3	No pump	N/A	N/A	14.0	13.5	14.1	13.5
S4E1_P50	500/500 (+ 8ML/d GW)	Lake A + B full	3.3	No pump	N/A	N/A	14.0	13.5	14.1	13.5

## A. Study the impact of annual entitlement on Lakes behaviour:

Scenario S4A (Most Limited Access) modelled with 3.3 GL/Yr annual entitlement and unlimited entitlement to study the impact on annual entitlement.

Following two will be considered;

- A1. Impact of annual entitlement on filling period.
- A2. Impact of annual entitlement on long term maintenance period.

A1- . Impact of annual entitlement on filling period.

Table A1 and Figures A1-01 to A1-03 shows the impact of 3.3 GL annual entitlement on filling period.

Table A1 – Impact of annual entitlement on filling period- Time to fill

Scenario	Climatic Condition	Description	Time to Fill	
			Lake A	Lake B
S4A_P50_1	Dry	Annual Entitlement - No limit	4 yrs 5 mn	4 yrs 9 mn
S4A_P50		Annual Entitlement 3.3 GL	4 yr 5 mn	6 yrs 6 mn
S4A_P50_1	Med	Annual Entitlement - No limit	1 yr 6 mn	2 yrs 3 mn
S4A_P50		Annual Entitlement 3.3 GL	2 yrs 3 mn	3 yrs 1 mn
S4A_P50_1	Wet	Annual Entitlement - No limit	0 yr 5 mn	0 yr 6 mn
S4A_P50		Annual Entitlement 3.3 GL	1 Yr 1 mn	1 Yr 2 mn

Figure A1-01. Impact of annual entitlement on filling Period- Dry Climate

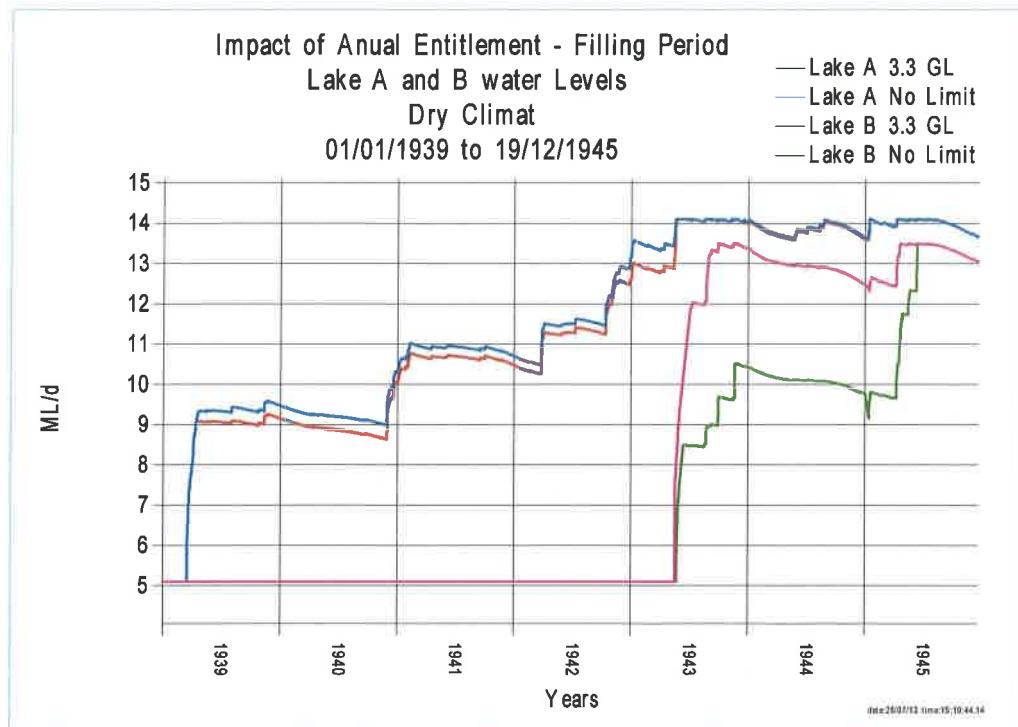


Figure A1-02. Impact of annual entitlement on filling Period- Medium Climate

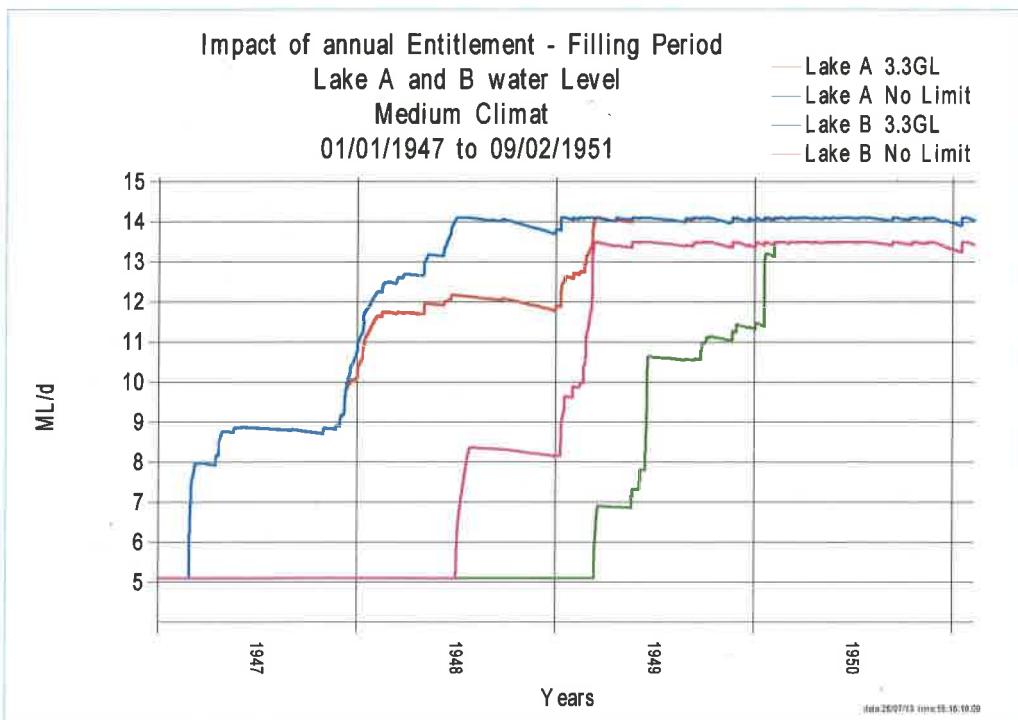
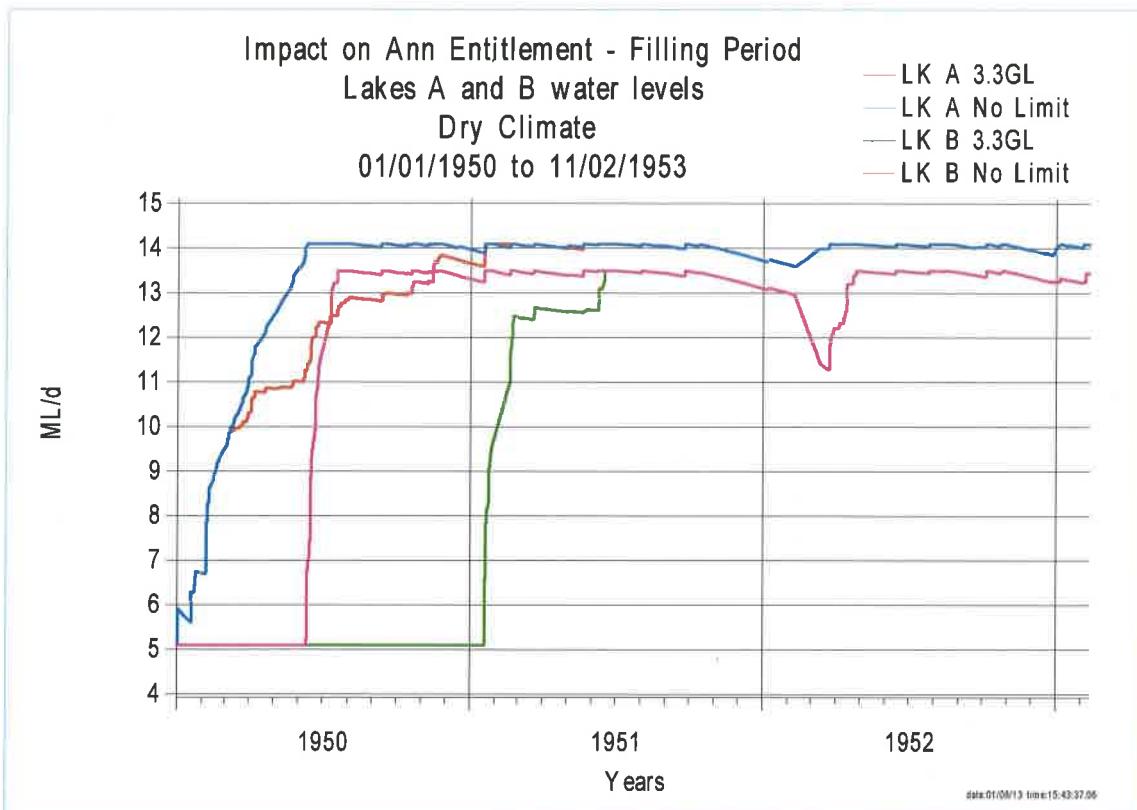


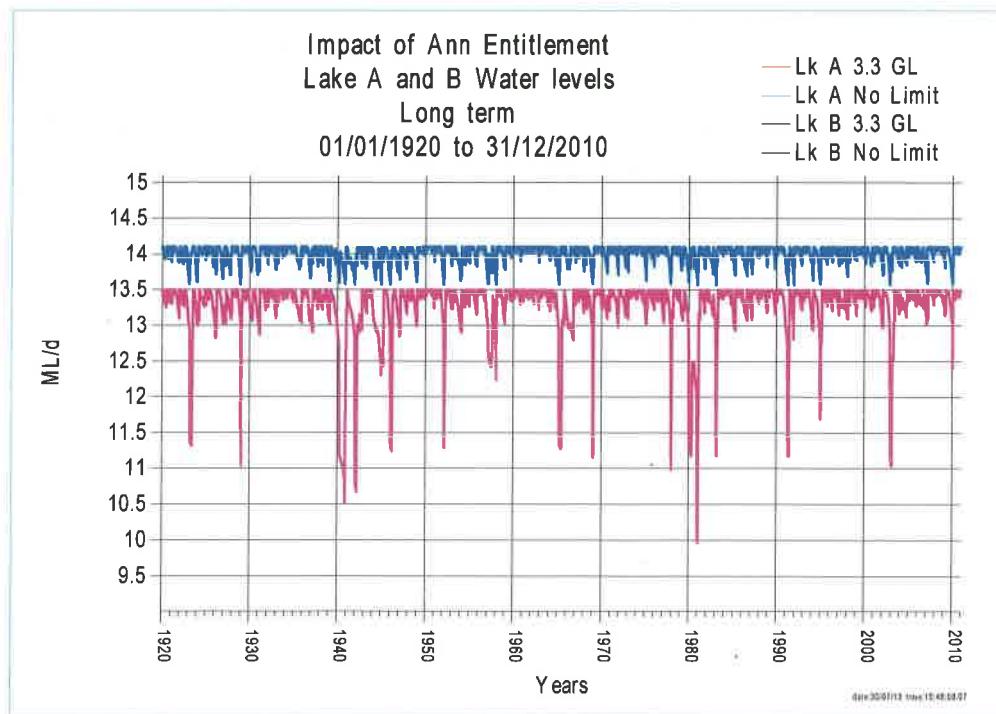
Figure A1-03. Impact of annual entitlement on filling period - Wet Climate



#### A2. Impact of annual entitlement on long term maintenance period

Figure A2-01 shows no impact of annual entitlement on lakes water levels in long term maintenance period.

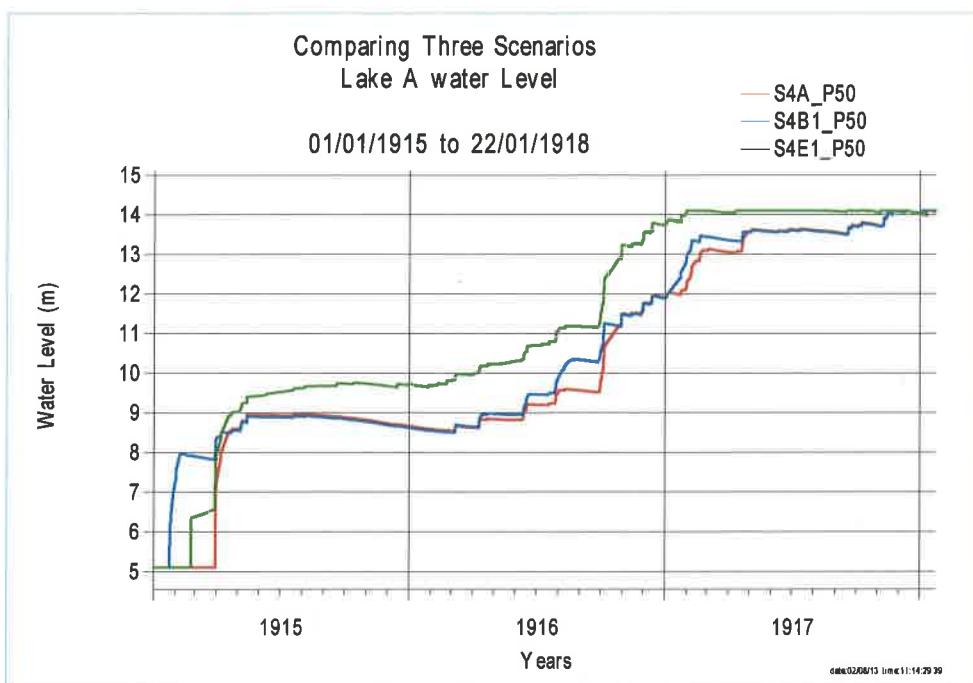
Figure A2-01. Impact of annual entitlement on long term maintenance period.



## B. Study the filling period for Three main Scenarios

Study the time to fill Lakes A and B for all above 3 main scenarios.

Figure B-01. Compare Filling period for three Scenarios



### C. Study the long term maintenance period

Study the variation water level in Lakes A and B under long term climatic variability and above pumping conditions from Lake B to A. Figure C-01 and C-02 shows the water level in Lake A and B for all three scenarios are within -0.5 m 90% of the time. Figures C-03 and C-04 show Lake B water level is below 0.5 m for more than a year for some scenarios.

Figure C-01 Comparing Three scenarios Lake A water level

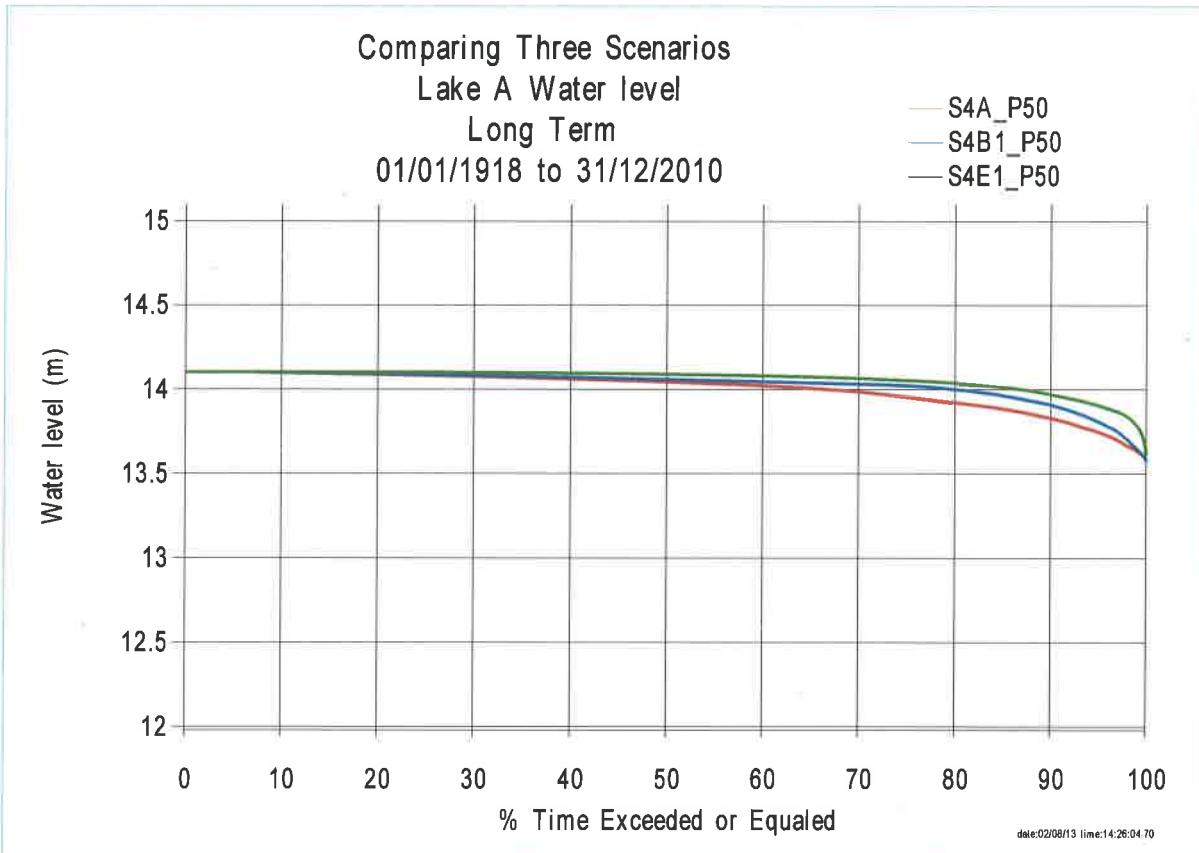


Figure C-02 Comparing Three Scenarios Lake B water Level

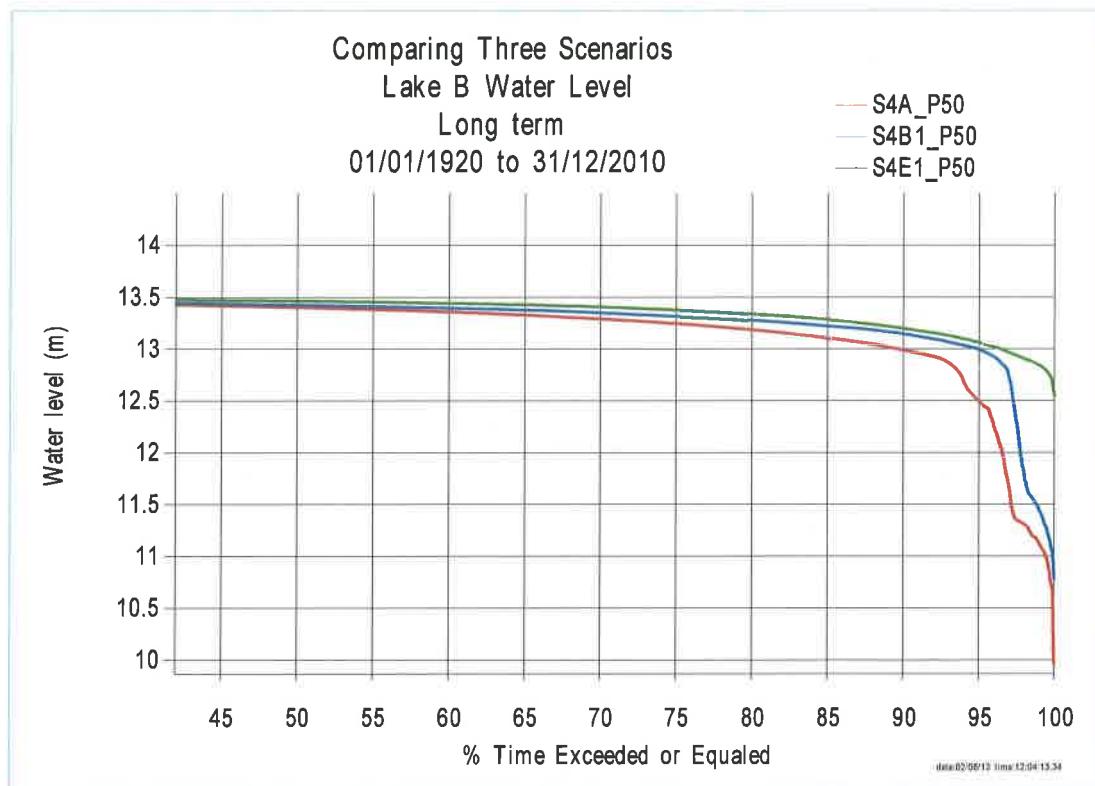


Figure C-03 Comparing Three Scenarios Lake B water Level - individual events

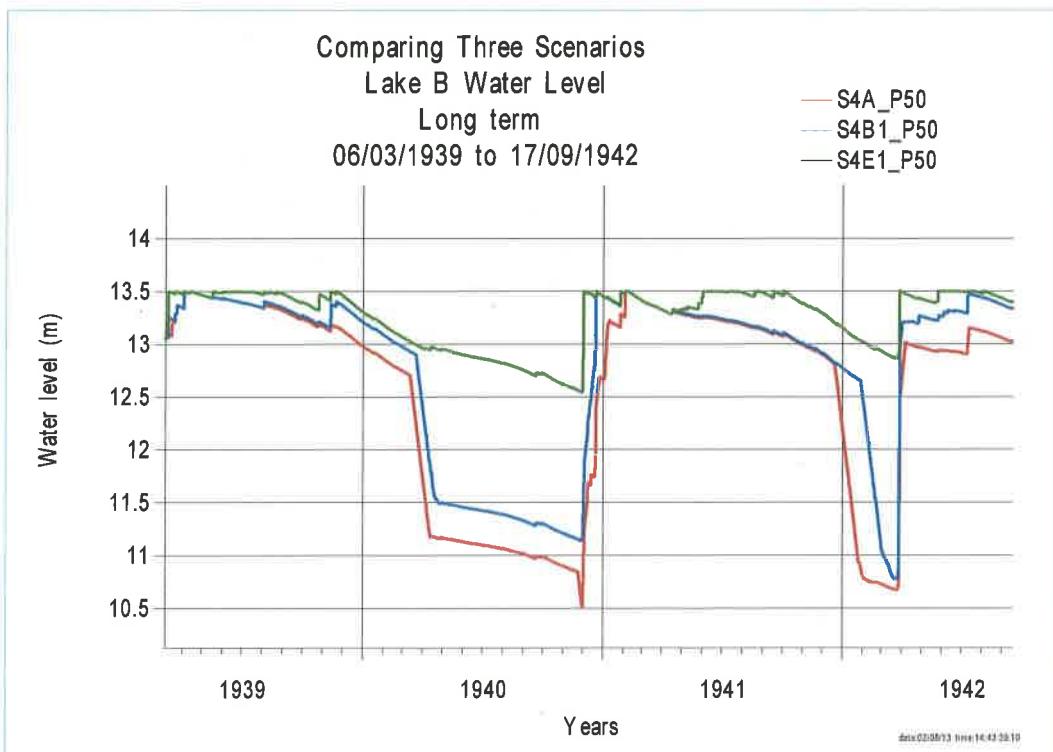
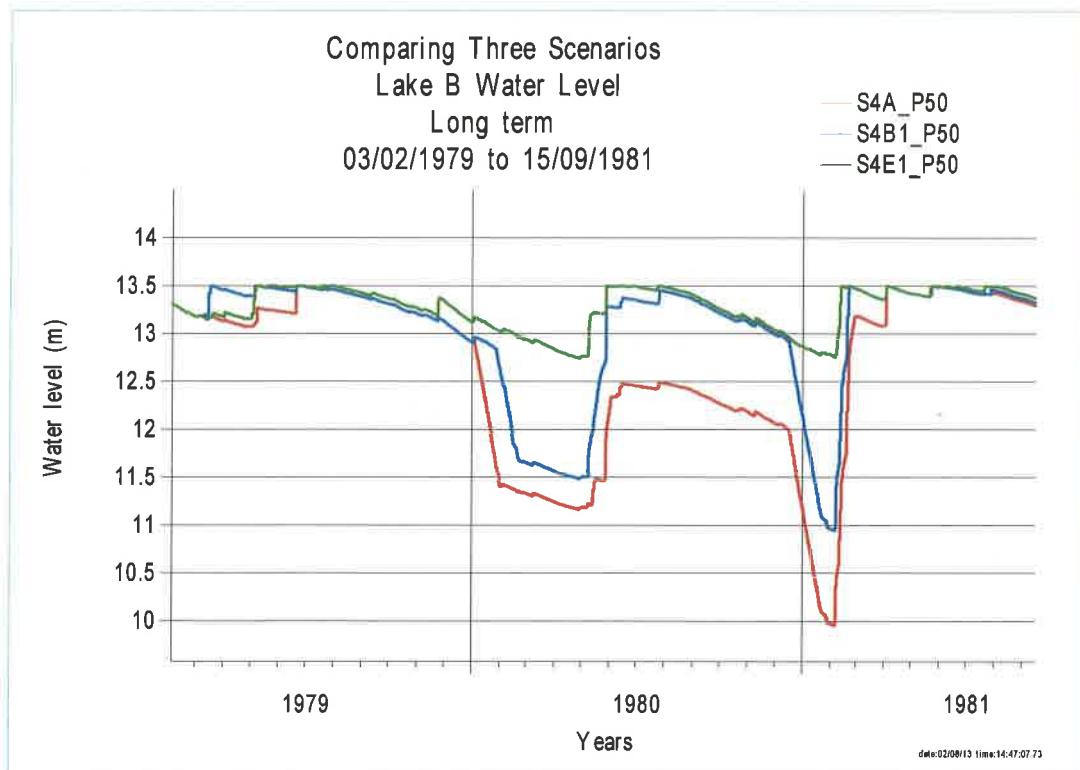


Figure C-04 Comparing Three Scenarios Lake B water Level - individual events



C2. Study the variation water level in Lakes A and B under long term climatic variability and variable pumping rates (no pumping, 10 ML/d pumping and 50 ML/d pumping) from Lake B to A.

Figures C2-01A and C2-01B show that Lake A water level is within 0.5 m even with no pumping from Lake B to A. for 90% of the time, but analysing individual events in Figure C2-01C shows no pumping conditions Lake A water level could be below 0.5 m for long period.

Figures C2-02A to C2-02D show the lake B water level with different pumping rates from Lake B to A. Figure C2-02B show even with no pumping Lake B water level is within 0.5m for about 85% of the time, but Figures C2-02C and C2-02D shows Lake B water level could be well below 0.5m for longer periods in dry weather.

Figure C2-01A Lake A water level with different pumping rates

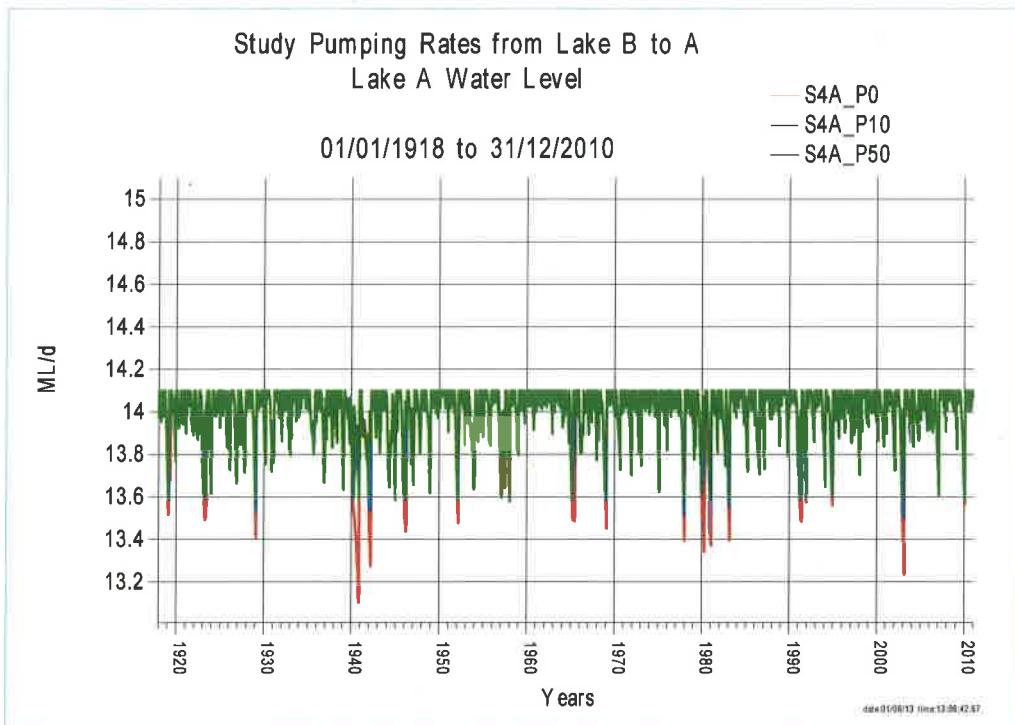


Figure C2-01B Lake A water level with different pumping rates

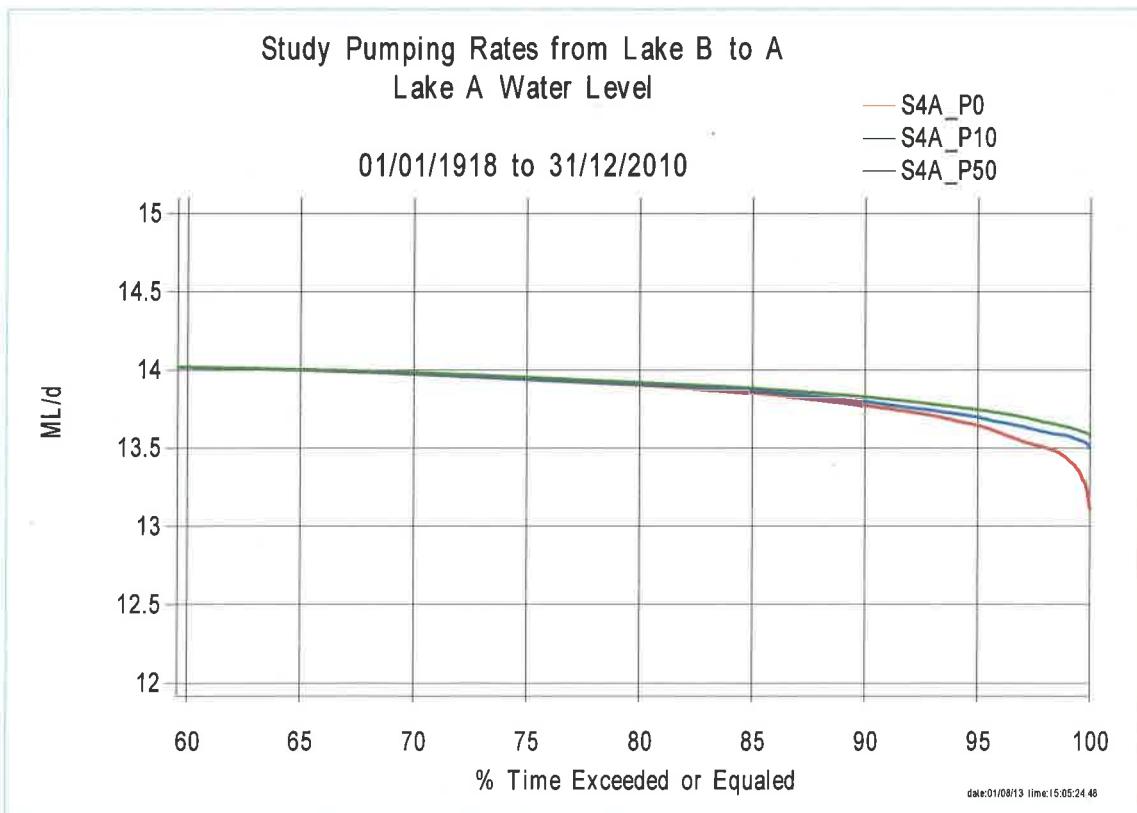


Figure C2-01C Lake A water level with different pumping rates – dry event

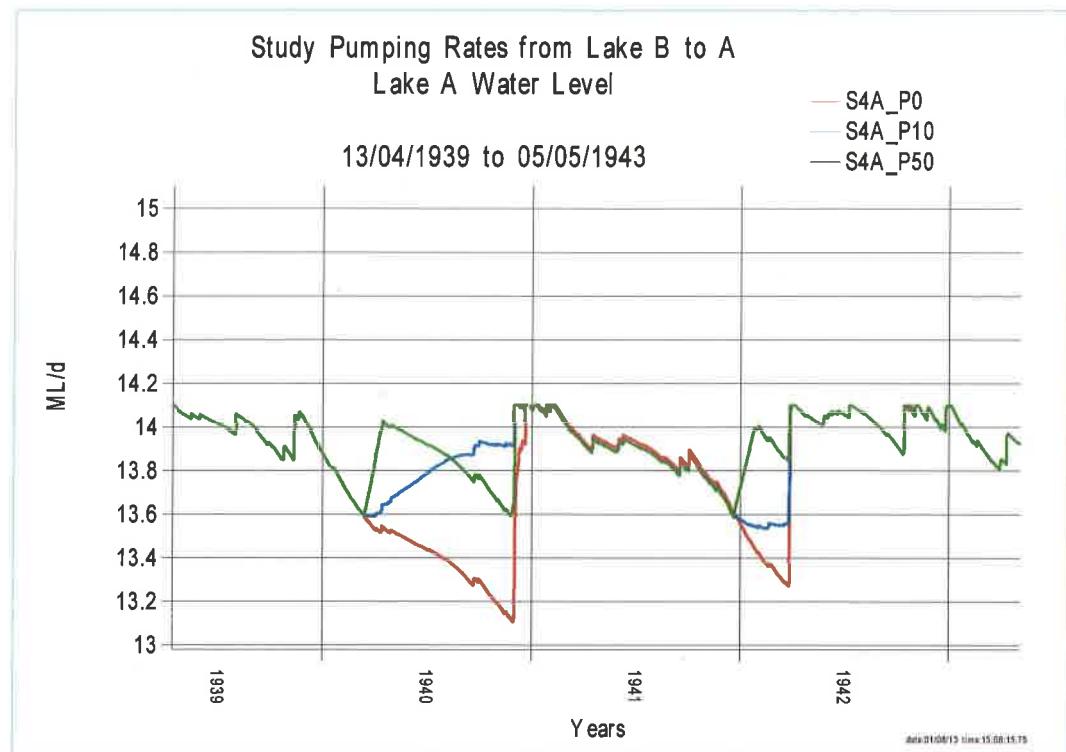


Figure C2-02A Lake B water Level with different pumping rates

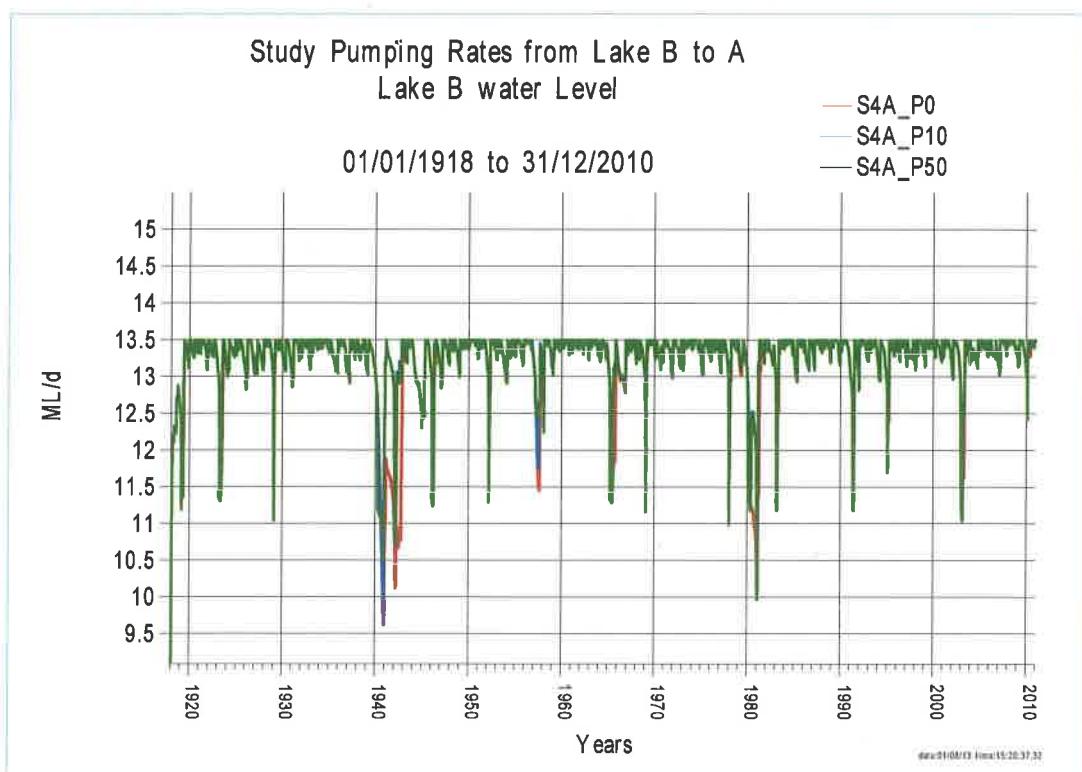


Figure C2-02B Lake B water Level with different pumping rates

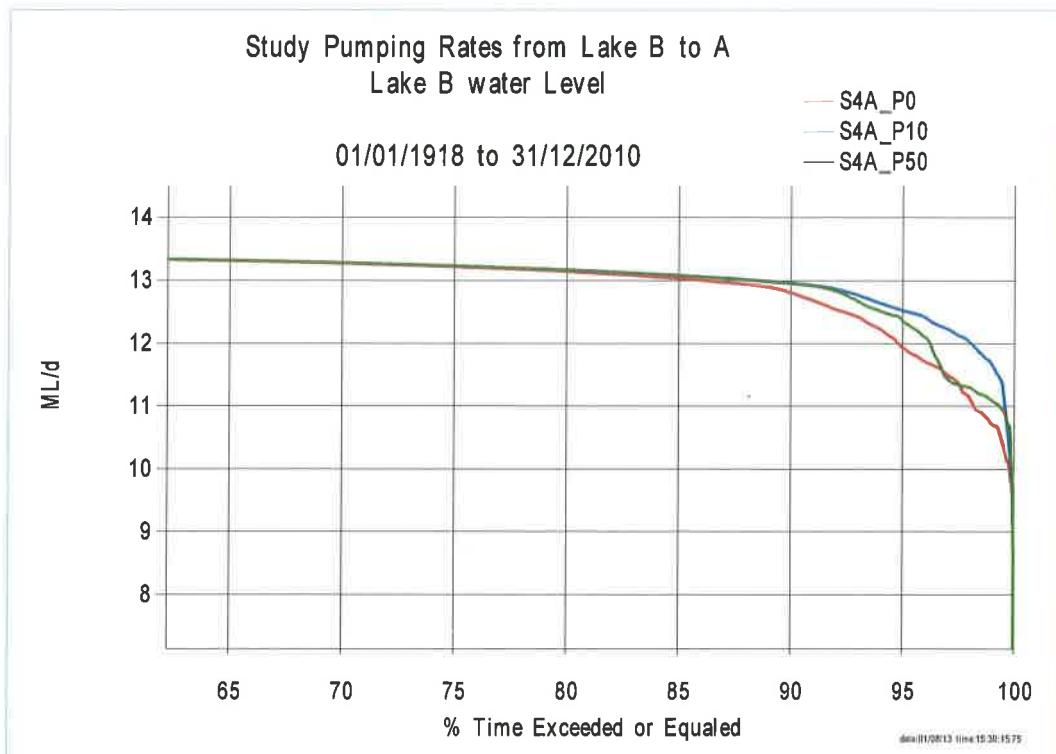


Figure C2-02C Lake B water Level with different pumping rates – Dry Event

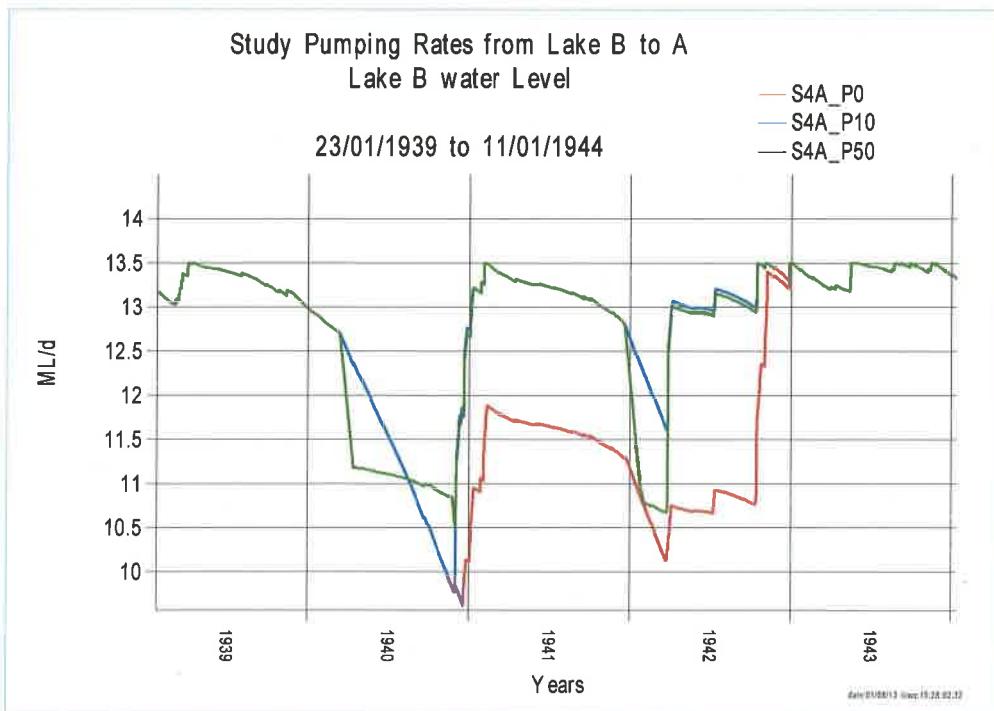
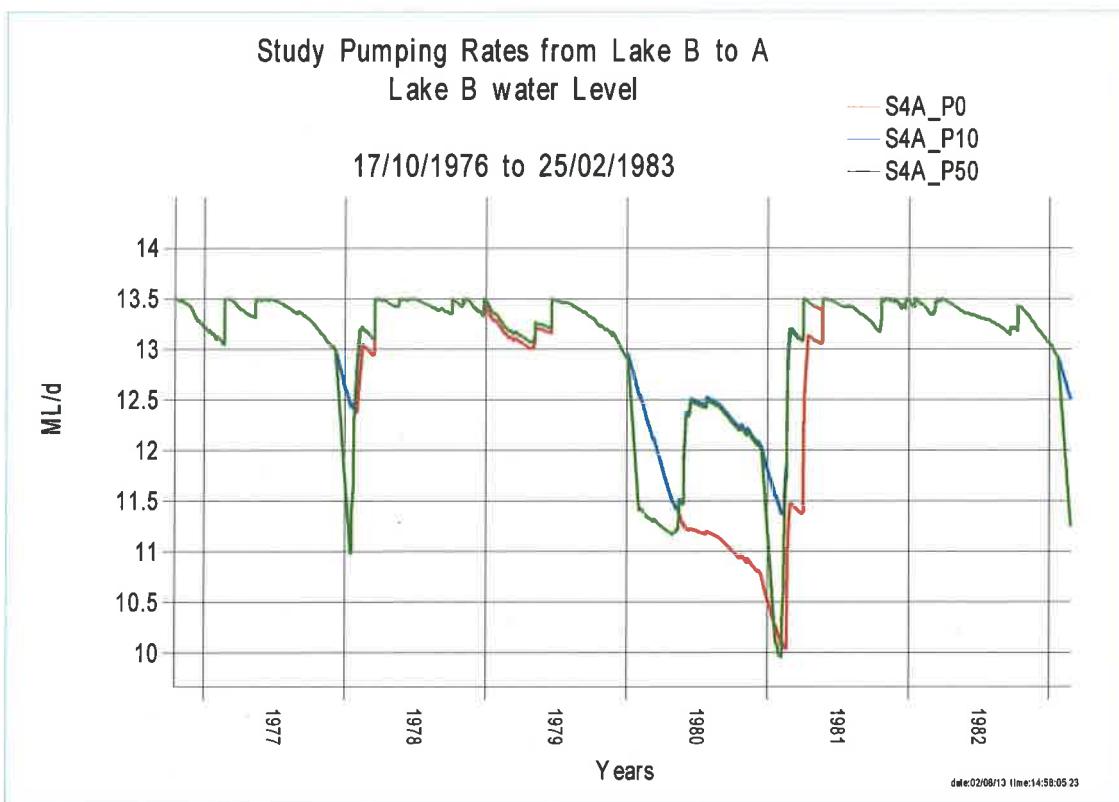


Figure C2-02D Lake B water Level with different pumping rates – Dry Event



**End Attachment B**