



RESOURCE CONSULTANTS

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THE ICs INTERNATIONAL BRISBANE AREA AQUA PARK PROPOSAL

SUMMARY:

This proposal investigates the concept of converting most of the flood plain at Oxley Creek into a freshwater AQUA PARK. It is submitted to the Queensland Government, Office of Urban Management, in response to their request for public contribution to the recently released *Draft South East Queensland Regional Plan*.

If excavated to the limit of the “2 meter flood line,” (refer attached map) or roughly equivalent to the 5 metres AHD contour line, the lake would cover about seven square kilometers, approximately the size of Sydney Harbour visible eastwards from the SH Bridge. A much larger lake would exist if extended to the 5m flood line.

The completed lake would provide Brisbane City with iconic wide sheets of fresh water, and remove a problematic perennial area of flooding and largely regarded as “no-mans’-land”.

This project could be self funding, depending on the cost of resumptions and relocations.

INTRODUCTION:

The Oxley Creek flood plain, by definition, is subject to regular flooding due to storm rains, and through general inundation by flooding of the Brisbane River to the 2m flood gauge at the city center (SMA 1975 flood map). Whilst Wivenhoe Dam has eliminated minor flooding of the River, a large flood is well overdue, being some 30years since the 1974 flood. Construction of the Lake would eliminate local flooding and alleviate major flooding up to the 1974 level.

The new lake would be large enough to provide "harbour view" vistas and allow for major aquatic events such as sailing for larger boats, "tideless" rowing competitions etc., house boat moorings, environmental refuges, and various water display features. There would be permanent employment opportunities created.

If the lake was maintained as freshwater by the provision of a Lock (**LOCKLEA**) near the mouth of Oxley Creek, a source of fresh water of about 60 Gl. per year would become available.

The sale of water-front blocks, boat moorings, and extractive materials, especially sand, should largely finance the cost of resuming land and the relocation of roads and properties.

CONSTRUCTION DETAILS

1) LAKE PERIMETER:

From constraints of available data, the boundary of the lake in this exercise is taken at the 5m AHD contour line. This is approx. equal to the 2m flood line. The 5m AHD contour gives a lake area of about 7.0km². The 2m flood line is the limit of flooding when the River rises 2m at the city flood gauge

2) AREA OF LAKE LOCHLEA:

At the 5m contour line the area is about 7.0 km² including some of the Brisbane and Oxley golf courses, and several small playing fields. An additional 1.0km² could be added by excavating the low-lying partly mined tongue of land between Oxley and Blunder creeks. It is considered the optimal area of the lake would be between six and eight square kilometers.

3) SURFACE LEVEL OF LAKE:

The surface level of the lake is adopted as that of the mean water level of the Brisbane River at the mouth of Oxley Creek. This is taken on verbal advice to be about 0.5m AHD at the 38km river distance. A lock and discharge gate would maintain the lake water level at this height.

4) Water Depth of Lake:

It is proposed to dredge the lake bottom to a minimum depth of -5.0m AHD, with steep banks at the 5m contour below water and a graded or beveled berm above water. At the assumed MWL of 0.5m AHD the depth of the lake becomes 5.5m.

5) WATER VOLUMES AND FLOW DETAILS:

Volume of lake $7.0\text{km} \times 5.5\text{m} = 38 \text{ Gl.}$

Catchment of Oxley Creek 260 km^2

Rainfall $1200\text{mm}/\text{year}$

Runoff $300\text{mm}/\text{year}$ or 25% of rainfall

Rain collection $260\text{km}^2 \times 300\text{mm} = 78 \text{ Gl./year}$, less evaporation

Evaporation $7.0\text{km}^2 \times 1.4\text{m}/\text{year}$ (Nth Pine Dam) = 10 Gl./year

Net retention in lake -- 68 Gl./year

Thus water available for operation of the lock, irrigation of the foreshore, sale to Brisbane Water, etc. is 68 Gl./year

6) AQUA PARK SHORELINE:

The shoreline length of the lake depends on the amount of smoothing carried out. It is considered by the proponents that a WIDE expanse of water is preferable to so-called canal development. (i.e. a Sydney Harbour lake rather than a Gold Coast Waterway)

Possibly "canal" developments could be carried out at the upper reaches of Oxley, Stable Swamp, and Blunder Creeks.

The shoreline would comprise about 24 km for the main lake and a further 6-8 km for the creeks.

7) COMPLETED ASPECT OF THE AQUA PARK:

The complete lake would have wide expanses (up to 2km) of open water, bordered by a grassed and treed reserve shoreline of 20m to 50m.

Low or judiciously placed waterfront housing would permit water views for existing houses back up to 1km or more from the shoreline. The lake should be visible from the existing suburbs on the 25m ridges to the west, east and south of the lake.

Small weirs may be required on Oxley and Blunder creeks to prevent silt inflow into the lake. A waterfall feature of 5m drop, could possibly be included in the weir on Oxley Creek near Algester.

A small island could be "left" or built up at the center of the widest expanse of lake, south of Brisbane Markets, and would be about 1km distant from the shoreline in all directions.

8) FINANCIAL DETAILS:

8.1 Costs:

The main cost is considered to be land resumption. The following figures are preliminary estimates and will need confirming.

8.1.1) Resumptions

Area under consideration 7.0 km² – 700 hectares

Assume 300 hectare government land @ \$0.5 million/ha -- \$150 million

Assume 400 hectares other land @ \$1.0 million/ha --\$400 million

Resumption costs -- \$550 million

8.1.2) Excavation costs

Considered as volume below lake level, and volume to the 5m contour level.

Below lake level 7.0km x 5.0m - 35 Mm³

Cost @ \$3.5/m³ – \$120 million

Above lake level 7.0km² x 3.5m --25Mm³

Cost @ \$3.00/m³ -- \$75 million

Cost of excavations -- \$200 million

8.1.3) Cost of Lock,

Outflow regulation etc. \$50 million

8.1.4) Cost of relocations

Relocation of Govt. Departments, depots etc., private warehouses, BCC properties, playgrounds, etc.

Guesstimate – \$160 million

8.1.5) Cost of realignment

Roads, bridges, sewerage, power, some rail. Guesstimate – \$100 million

8.1.6) Cost of shoreline

Stabilisation of shoreline with fill from excavation – \$20 million

8.1.7) Costs of weirs, a waterfall feature

Guesstimate – \$50 million

Total costs involved = \$1130 million

8.2 Revenues

8.2.1) *Value of Extractive Materials*

Total volume of material (from 8.1.2) – 60 Mm³

Assume 84% sand, silt, and gravel: volume excavated – 50 Mm³

Assume 25% silt, 25% sand, 50% gravel, rock @ 1.8 -2.0 tonnes/m³

Value of silt 22 Mt @ \$10.00 – \$220 million

Value of sand 25 Mt @ \$15 – \$370 million

Value of gravel, etc. 45Mt @ \$4.00 – \$180 million

Approx. total value of extractives – \$770 million

Less the quantity used to build up foreshore 5.0 Mt @ \$4.0 – \$20 million

Net value – \$750 million

8.2.2) *Sale of waterfront, other blocks, and moorings*

The main lake shoreline is about 24km long, with a 20m-50m grassed/treed reserve.

Consider waterfront blocks of 25m width provides for 960 blocks.

Allow 84% of the foreshore for blocks – 800 blocks

Blocks “one back” from shore, 50m wide provides for 400 blocks

Additional “water view” blocks guess – 100blocks.

At the extremities of the inflowing creeks there is an additional 8 km of water frontage to lake level water. However, most of this is privately owned property, and including places like Brisbane and Oxley golf courses, and public parks.

Considering only about 6km along Oxley and Blunder creeks, an additional 200 larger blocks could be included.

Value of block estimates:

Waterfront main lake 800 @ \$0.5 M -- \$400million

One back main lake 400 @ \$0.5 M -- \$200 million

Waterfront creek blocks 200 @ \$0.4 M -- \$80 million

Water view blocks – 100 @ \$0.2 M --- \$20 million

(These figures allow for sewerage, roads, water etc. costs)

Net value of blocks – \$700 million

8.2.3) *Value of fresh water*

The freshwater Aqua Park would intercept an average of about 78 Gl. annually of runoff from Oxley Creek. Allowing for evaporation and seepage of 10 Gl. would provide a net retention of 68 Gl. /year.

Assuming some 8 Gl. is used to water the grassy foreshore reserve and nearby council parks, about 60 Gl./year could be added to the BCC reticulation system.

Value @ \$0.25 per kl. – \$15 million per year

(Cost to ratepayers is \$60 million less treatment costs of about \$10 million)

Value of water – \$15 million to \$50 million per year

8.2.4) Value of Rates.

Extra house blocks total 1500. Relocated businesses would pay rates elsewhere.

Rates: 1200 @ \$3000 – \$3.6 million

300 @ \$2000 – \$0.6 million

Extra rates would be about \$4.2 million per year

8.2.5) Tourism, Fishing, Aquatic Sports, Boutique Aquiculture, etc. Endless possibilities . . .

The useable water, rates, tourism etc. would have a yearly value of at least \$20 million.

The NPV for this annual \$20 million is considered to be about \$150 million at the start of construction.

Approx. total NPV revenue involved – \$1600 million

9) Financial Summary

Costs (2005\$ millions)

Resumptions \$550

Excavation \$200

Locks, etc. \$50

Relocations \$160

Realignments \$100

Shoreline \$20

Weirs, waterfalls \$50

Total – \$1130

Revenues

Land sales \$700

Extractives \$750

Water, tourism, fishing, etc. \$150

Total – \$1600

References

- 1) Snowy Mountains Authority.1975 Report on 1974 Brisbane Flood
- 2) Sunmap 1:25000 Topographic Image Maps Mt Gravatt Darra
- 3) NatMap Brisbane 1:250 000 series.

CONCLUSION

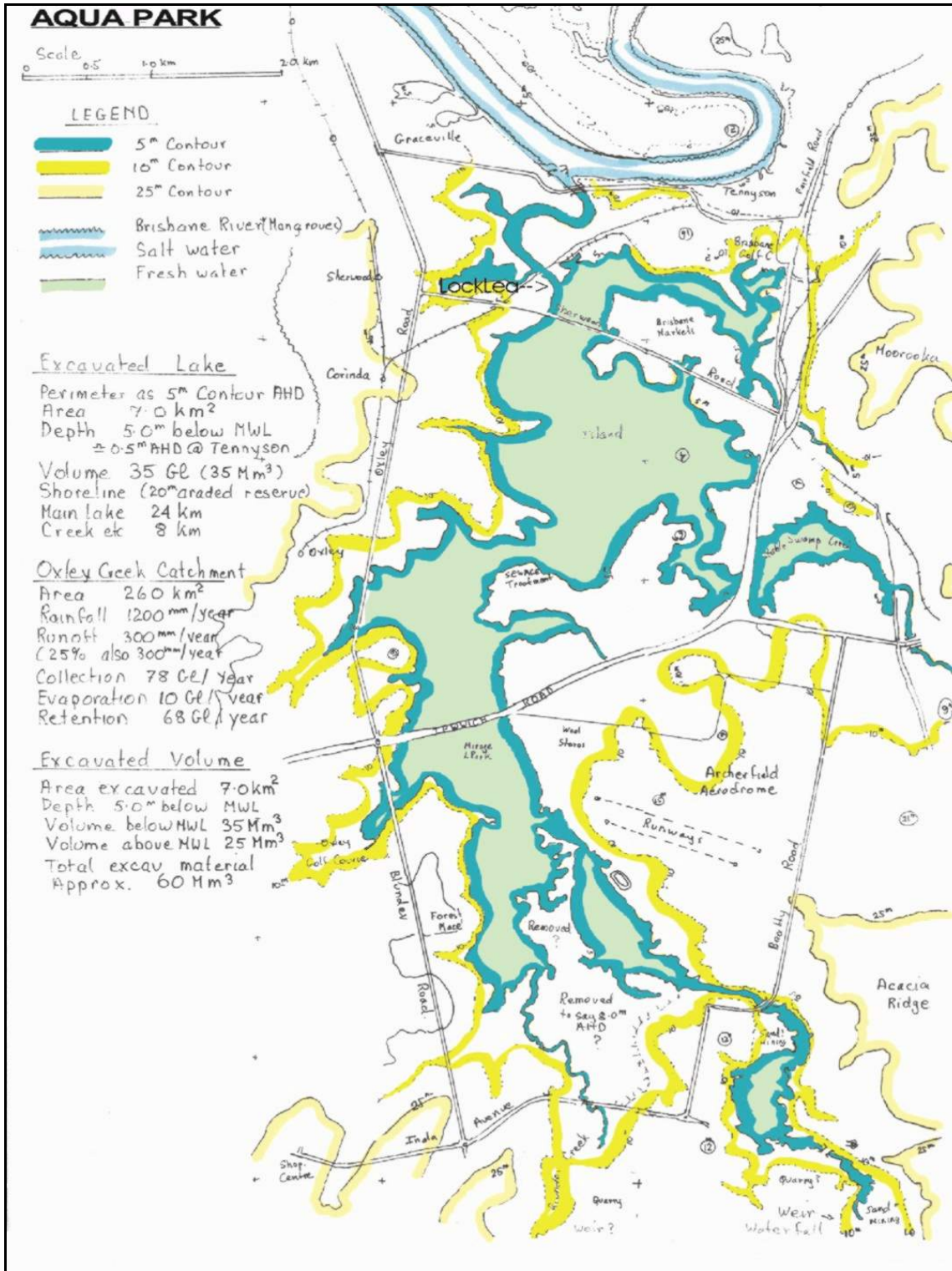
A large freshwater lake close to the City Centre would be a major addition to the scenic attraction of Brisbane and would rapidly gain iconic status.

It could be considered as an enormous botanic garden complete with lake, islands and waterfall, greatly enhancing the lifestyle of all city residents.

The lake would serve as a recreation area for locals, tourists and international sporting events.

The project would remove a regular flooding problem, and be part of a plan to prepare Brisbane for the next major flood - reportedly well overdue.

The Aqua Park Project could be largely self funding, given goodwill and cooperation between Brisbane City Council, State Government, and private interests within the affected area,.



**ICs INTERNATIONAL PROPOSAL
 THE BRISBANE AQUA PARK**