Samson Brook Redevelopment Scheme

Water Corporation

Report and Recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1055
July 2002

ISBN. 0 7307 6689 6
ISSN. 1030 - 0120
Assessment No. 1441

Contents

Page

1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal by the Water Corporation (WC) to construct a pipe head dam and related infrastructure on Samson Brook. The pipe head dam and related infrastructure will be used to divert stream flow from Samson Brook to the Integrated Water Supply System (IWSS). The IWSS supplies water to the Perth, Mandurah and the Goldfields and Agricultural Water Supply Scheme.

The WC advised the EPA of the proposal on 12 November 2001 and indicated it would seek an Environmental Protection Statement (EPS) level of assessment. Based on the preliminary information provided, the EPA considered that while the proposal had the potential to have an effect on the environment, the proposal could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in *The West Australian* newspaper on Monday, 14 January 2002 that, subject to the preparation of a suitable EPS document, the EPA intended to set the level of assessment at EPS.

The proponent has prepared the EPS document (Welker, 2002), which accompanies this report. An electronic copy of the EPS is available for examination on the EPA's website: www.epa.wa.gov.au and hard copies at its office at: Department of Environmental Protection Library Information Centre, 141 St Georges Terrace, Perth.

The EPA considers that the proposal described in the EPS documentation can be managed in an acceptable manner subject to the recommended conditions, procedures and proponent's commitments to the proposal being made legally binding.

The EPA has therefore determined under Section 40 (1) of the *Environmental Protection Act 1986* that the level of assessment for the proposal is EPS, and this report provides the EPA's advice and recommendations in accordance with Section 44 (1).

2. The proposal

The proposal is described in detail in Section 1 of the proponent's "Samson Brook Redevelopment Scheme, Environmental Protection Statement" document (Welker, 2002).

The Samson Brook Redevelopment Scheme is a key element of the WC's drought recovery plan. Redevelopment of this source will allow unallocated water resources in the Samson Catchment to be diverted for public water supply. The proposal being assessed is for the diversion of 8 Gigalitres a year (on average) (GL/yr), the construction of a pipe head dam and related infrastructure.

It is the EPA's understanding that the proposed pipe head dam and related infrastructure has the capacity to divert and treat additional water beyond the 8 GL/yr (on average), which the WC is seeking approval for. The actual volume of additional water available for future diversion at the pipe head dam will depend upon successful trading of water entitlements with the South West Irrigation Management Co-operative Ltd (SWIMCo) and the volume of water required to be released to maintain the ecological and social values of Samson Brook downstream of the pipe head dam.

The EPA notes at this stage however, that the WC is seeking an allocation of 8GL/yr (on average) from Water and Rivers Commission (WRC) and the WC's environmental assessment was based on diverting 8 GL/yr (on average) from Samson Brook.

The key components of this proposal are:

- a pipe head dam on Samson Brook;
- the diversion of 8 GL/yr (on average) from the Samson Brook to the IWSS;
- initially chlorination, buffering and fluoridation and then full treatment facilities in the long term;
- construction of temporary access roads from Scarp Road;
- a permanent access road from Weir Road to the proposed pipe head dam and treatment plant; and
- a 12.9 kilometre (km), 1.0 metre diameter pipeline from the proposed pipe head dam to the Stirling Trunk Main.

Figure 1 shows the location of Samson Brook redevelopment proposal

Figure 2 shows the location of pipeline route options and access routes

The main characteristics of the proposal are summarised in Table 1 below.

Table 1. Key characteristics of the proposal

Characteristic	Pipe head 150 m site
Diversion of water from Samson Brook	8 giga litres a year on average (diverted in accordance with the Operating Strategy as approved by the WRC).
Pipe head dam	
Wall height (metres)	20
Location (kilometres from South Western Highway)	Approximately 4.3.
Description	Concrete gravity dam.
Width of Spillway	60 metres wide.
Top water level (metres AHD)	147.5
Storage volume (million litres)	300
Offtake	Piped
Vegetation disturbance (hectares)	Approximately 7 by inundation and construction of the pipe head. Approximately 7.3 of dieback free vegetation potentially impacted by construction. Approximately 600 metres of riparian vegetation will be inundated.
Access roads	
Length (kilometres)	Temporary access road to pipe head: approx 2.6. Permanent access road to pipe head: approx 4.5. Permanent access road to water treatment facility: approx 1.6.
Width of disturbance (metres)	Temporary access track 7.
Vegetation disturbance (hectares)	Temporary access road 0.9, minimal disturbance by permanent access road.
Pipeline	
Length (kilometres)	12.9
Diameter (metres)	0.9 – 1.0
Capacity (million litres per day)	125
Route	Along permanent access track on Lot 6, through cleared agricultural land, crossing Samson Brook and South West Highway. Along James Rd, Fawcett Rd and then Buller Rd, crossing South West Railway on James Rd. (See Figure 1).
Width of disturbance (metres)	10 –25 approx. 10 in areas of native vegetation.
Vegetation disturbance (hectares)	Approximately 0.6 in forested areas on Lot 6. Approximately 0.65 to the west of South West Highway.
Water treatment plant	
Description	Chemical dosing plant – chlorination, fluoridation and stabilisation.
Area disturbed (hectares)	1.5
Vegetation disturbance	Cleared agricultural land.
Environmental Mitigation /Benefits	
Rehabilitation (hectares)	A total of 16.5, comprising: • 6 outside the riparian zone; • 1 of riparian and other vegetation; • 7.3 of dieback free vegetation potentially impacted by construction; • 0.65 of vegetation impacted by pipeline construction; and • 1.5 contingency.
Conservation Covenant	Introduction of a conservation covenant on part of the Samson Brook catchment on Lot 6 to protect ecological values.
Mature Trees	Replacement of mature individual trees removed on the pipeline route with 2 juvenile trees of the same species.
Fencing	Repairing, or where necessary replacing fencing around Lot 6.
Feral Animal Control	The implementation of a feral animal control program in co-operation with Department of Conservation and Land Management.
Nesting Boxes	Installation of cockatoo nesting boxes on Lot 6.
Recreation	Development of a Recreation and Tourism Master Plan for the Waroona area.

Figure 1: Location of Samson Brook Redevelopment Proposal

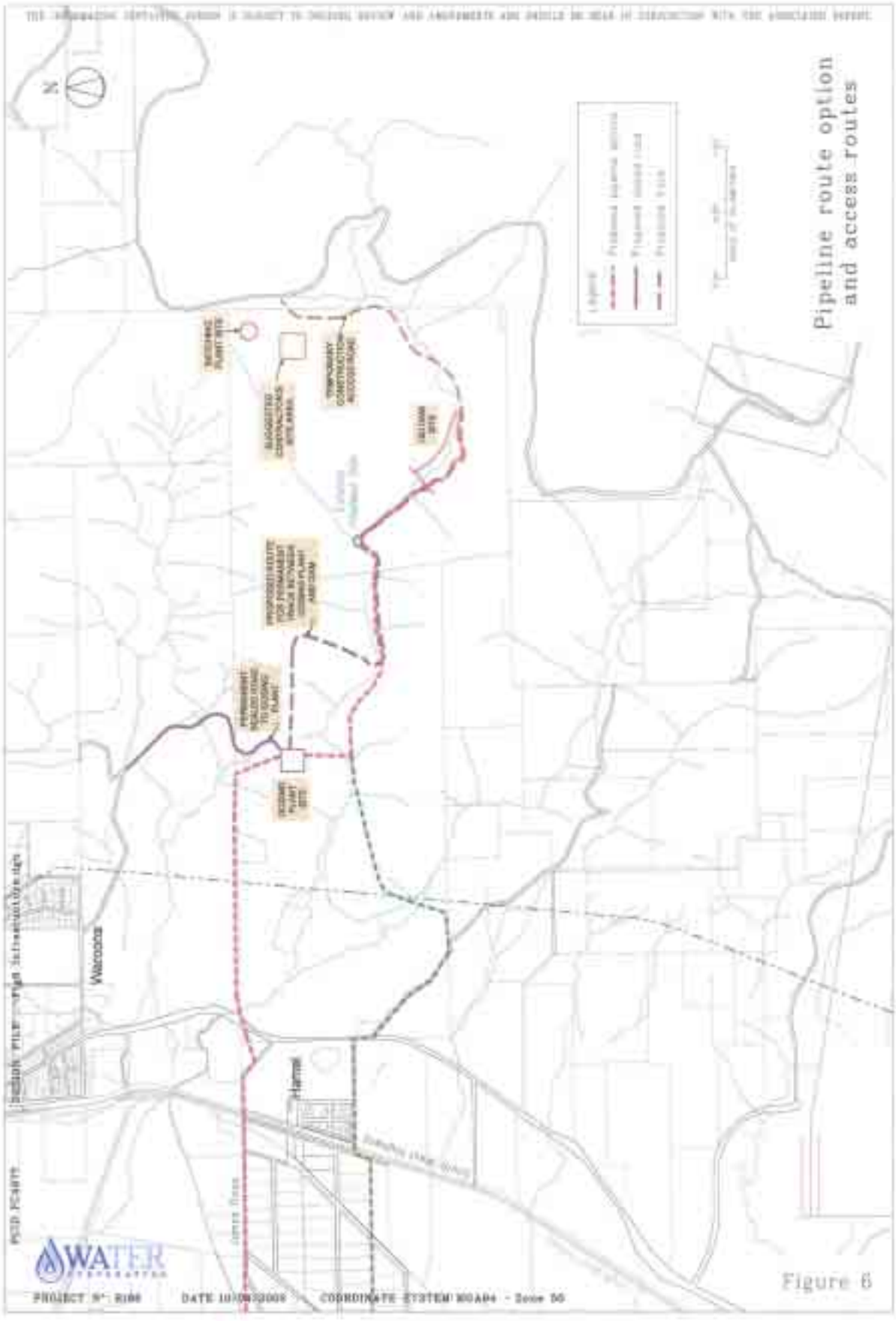

Figure 2: Location of pipeline route options and access routes

3. Consultation

During the preparation of the EPS, the proponent has undertaken consultation with government agencies and key stakeholders with a direct interest in the project. Consultation was also undertaken with the local community via meetings with affected landowners, community open evenings, mail outs, surveys and press releases made to the local paper inviting comment. The organisations consulted, the comments received and the proponent's responses to the comments are included in Section 2 and Appendix 3 of the EPS (Welker, 2002). Appendix 3 of this report contains a table summarising the issues raised during the proponent's consultation programme and the proponent's responses to the issues raised.

The EPS described the following environmental outcomes as a result of the consultation programme:

- allowing the north eastern tributary of Samson Brook to remain unregulated, to provide a linkage between the forested upland catchments and the plain;
- committing to environmental mitigation measures in relation to the impact of the construction of the proposal on flora and fauna;
- participation in feral animal control programmes on Lot 6 in consultation with Department of Conservation and Land Management (CALM);
- proposing a pipe head dam location that removes the need for a pumping station (and subsequent greenhouse gas emissions) and avoids impacts on Christmas Trees which are sites of Aboriginal Heritage significance; and
- discussion with local landowners and Landcare groups and obtaining their agreement on the location of access tracks, the chemical dosing plant and the pipeline to minimise disruption to landuse and ecological values.

4. Relevant environmental factors

The summary of the environmental factors/issues identified by the proponent and their proposed management is outlined in the 'Summary of environmental issues, potential impacts and their management' in the EPS document (pages xi-xiv, Welker, 2002).

In the EPA's opinion the following are the environmental factors relevant to the proposal:

a) Flora and vegetation – clearing, inundation and disturbance to allow for the pipe head dam, pipeline construction and other associated activities; and

b) Water courses and surface water quantity - impoundment and diversion causing changes to the natural or existing water flow regimes.

4.1 Flora and vegetation

The EPA's environmental objectives for this factor are to:

i) protect Declared Rare and Priority Flora, consistent with the provisions of the *Wildlife Conservation Act 1950*; and

ii) maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.

The proponent's assessment of the proposal's impacts on flora and vegetation is documented in section 7 of the EPS document (Welker, 2002).

Flora surveys undertaken within and adjacent to proposed areas of impact have not identified Declared Rare Flora (DRF) species gazetted under the *Wildlife Conservation Act (1950)* or priority flora species as defined by CALM. However, due to the timing of the flora surveys (December 2001 and January 2002), it is unlikely that spring flowering species were detectable at the time. Further flora survey work in the coming spring would ensure a wider coverage of the annual species. The commitment to undertake a spring survey is provided for in WC's commitment 1 (section 18 of the EPS) and this will be required to be fulfilled prior to construction occurring. Should species of DRF of priority flora be detected, WC has committed to prepare and implement a Flora Protection Plan to the requirements of CALM.

The construction of the pipe head dam, access tracks, pipeline and the inundation from the creation of a reservoir will result in the permanent loss of 8.3 hectares (ha) of native vegetation on Lot 6 which in itself has a total area of 400 ha. The proposal will also result in the temporary disturbance of up to 0.9 ha. This loss includes up to 600 metres of locally significant stream zone vegetation of Samson Brook and will in turn lead to a loss of terrestrial and aquatic fauna habitat.

The vegetation to be lost by this proposal has been examined against the EPA's Position Statement No.2 *Environmental Protection of Native Vegetation in Western Australia* (EPA, 2002) which outlines the EPA's expectations for proposals that involve a clearing component. It is the EPA's view that the proposal meets the elements detailed in Section 4.3, "*Clearing in other areas of Western Australia*". The EPA considers the proponent has been able to meet the elements by demonstrating through its environmental investigations that, the vegetation complex proposed to be affected by this proposal (Helena Complex) is well represented in secure conservation reserves. In addition, the Helena Complex retains high proportions of its original (pre-European) coverage. As a result, the Helena Complex will not be significantly affected by this proposal.

The impacts on flora and vegetation for this proposal are primarily determined by the extent of the proposal's 'footprint' from clearing, which the WC has minimised by confining construction activities to within the proposed inundation area and a cleared area in the northeastern corner of Lot 6. The risk of construction activities indirectly impacting on further areas of vegetation through the spread of dieback, weeds, fire ignition and excessive dust emissions will therefore require management. To minimise offsite impacts during construction, the WC intends to develop and implement environmental management plans to ensure the 'footprint' of the proposal is adhered to and that offsite impacts are minimised.

The WC has given a commitment to implement environmental management measures through the development of a Construction Environmental Management System (CEMS) (commitment 1). The CEMS will be required to be satisfactorily completed prior to construction occurring.

The WC has proposed an environmental mitigation programme in relation to the vegetation and fauna habitats that will be impacted by the proposal. Details of the mitigation measures are described in section 7.5.4 of the EPS. The main elements of WC's mitigation programme consists of rehabilitating 16.5 ha of degraded areas on Lot 6, introducing a conservation covenant and repairing and installing fences to assist in controlling stock access. In summary, the mitigation programme provides for the ecological values of Lot 6 (which has an area in excess of that disturbed by the proposal) to be enhanced and secured by a conservation covenant and also provides for the ongoing management of the area.

Having particular regard for the:

- small area of vegetation to be lost (8.3 hectares);
- vegetation complex proposed to be impacted (Helena Complex) is well represented in secure conservation reserves;
- management measures proposed to minimise the risk of further losses of vegetation; and
- WC's proposed environmental mitigation programme,

it is the EPA's opinion that proposal can be managed to meet the EPA's objective for this factor.

4.2 Water courses and surface water quantity

The EPA's environmental objectives for this factor are to:

i) maintain the integrity, functions and environmental values of water courses; and

ii) maintain surface water quantity so that existing and potential uses including ecosystem maintenance, are provided.

Samson Brook is currently regulated by controlled releases from the existing Samson Dam. The release of irrigation water from Samson Dam in summer and autumn months has given rise to a modified seasonal flow regime in Samson Brook.

The proposed pipe head dam will 'capture' winter overflows from the existing Samson Dam and runoff from the catchment between the existing dam and the proposed pipe head dam. This proposal to divert 8 GL/yr (on average) of water from the proposed pipe head dam to the IWSS will substantially reduce the winter flow regime downstream. Mean annual stream flow below the proposed pipe head dam would be reduced from 16.9 GL/yr to 8.9 GL/yr.

Following the implementation of this proposal, Samson Brook below the pipe head dam will experience a reversed flow regime. Higher flows will occur during summer as it delivers irrigation water, and lower flows will occur in winter as the pipe head dam diverts water to the IWSS. Changes to flow regimes in this way have the potential to affect the aquatic ecology of Samson Brook.

The WRC in the Harvey Basin Surface Water Allocation Plan (WRC, 1998) examined, in some detail, the allocation of water within the Harvey Basin for consumptive and other uses. The WRC's objective for regulated tributaries of the Harvey River, including Samson Brook, is for streams to be quarantined from development until Environmental Water Requirements (EWRs) are determined and Environmental Water Provisions (EWPs) have been established for these streams.

The general approach to establishing EWPs within a water allocation context is provided for in WRC's Environmental Water Provisions Policy – Statewide Policy No. 5 (WRC, 2000). WC's intention to proceed with the Samson Brook Redevelopment proposal has triggered the process to determine EWRs and EWPs for Samson Brook consistent with the WRC's policy.

A study of the EWRs for Samson Brook is documented in Streamtec Report ST 02/02 (2002). EWRs were assessed for Samson Brook from the existing Samson Dam to its confluence with the Harvey River (Streamtec, 2002). The EWR study identified key ecological values of the river ecosystem for four sections or 'nodes' and determined their respective monthly water requirements to maintain those values. The monthly flows required for each node are summarised in Table 20 of Streamtec (2002).

The process for establishing EWPs, based in part on the findings of the Samson Brook EWR study, is documented in Appendix 1 of the EPS document (Welker, 2002a). A summary of the EWPs for the four nodes is provided in Table 10 of Appendix 1.

EWRs proposed by Streamtec (2002) for areas immediately upstream and downstream (nodes 1 and 2) of the proposed pipe head dam were translated directly into EWPs by the WRC (Welker, 2002) to maintain the existing ecological values of the brook in the forested upland reaches. The EWPs also includes provision of water for social water requirements (aesthetics, recreational, domestic water consumption and stock watering).

The lower reaches (nodes 3 and 4) are highly modified from the natural state. Node 4 is essentially an artificial drain running through cleared agricultural area for a substantial portion of its length and, therefore, has limited ecological values. Interim EWPs have been proposed for nodes 3 and 4 given the likelihood that water trading and/or changes to the current distribution methods may be introduced in the new future.

The EPA notes there are discrepancies between the interim EWPs and EWRs for nodes 3 and 4 for certain ecological values. The discrepancies are discussed in detail in sections 7 and 8 of Appendix 1 of the EPS. The discrepancies are mainly due to the highly modified (artificial drains) and degraded ecological condition of the lower reaches of the brook and the limited environmental and social benefits of providing substantial flows. However, with restoration these areas could be enhanced. In the absence of a restoration plan the ecological risks of not delivering the full EWRs for nodes 3 and 4 are considered to be low.

The EPA understands that any reduction in summer irrigation flows, associated with water trading and/or changes to the current distribution methods, will require additional EWP evaluation to be undertaken. This is particularly relevant for nodes 2, 3 and 4. Final EWPs would need to be considered in the context of proposed water trading and a restoration plan for the lower reaches. Final EWPs proposed by WC require the approval of the WRC.

The WRC has endorsed the EWP report (Appendix 1 of the EPS). Decisions on EWPs are given legal effect by the WRC through the issuing of a surface water licence under the *Rights in Water and Irrigation Act 1914 (RiWIA)*. The surface water licence would refer to an operating strategy which would specify any rules, conditions, or constraints applying to the use of the water sources. EWPs will be reflected as constraints in the operating strategy and the operating strategy becomes a condition of the water licence.

WC has committed to monitoring the physical, hydrological and biological variables downstream of the pipe head dam to verify any impacts on ecological values and provide feedback into the refinement of EWPs. The monitoring programme will be described in the operating strategy and will be a condition of WRC's allocation licence issued to WC.

Having particular regard for:

- WC's studies to identify the ecological values and EWRs of Samson Brook;
- WRC's water allocation planning process to establish the EWPs to maintain the identified ecological values;
- WRC's assessment and agreement on the proposed EWPs;
- the highly modified and degraded condition of nodes 3 and 4, where in the absence of a restoration plan, the ecological risk of not meeting the full EWRs is considered to be low;
- the proponent's proposed monitoring programme to verify the ecological impacts of the proposal on downstream aquatic ecology; and
- the ability of the WRC to approve and enforce the EWPs through a water licence under the *RiWIA* and refine the EWPs based on the results of WC's monitoring,

it is the EPA's opinion that the environmental values of Samson Brook will not be unduly compromised by this proposal.

5. Conclusions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The vegetation that will be lost by this proposal has been examined against the EPA's Position Statement No.2 *Environmental Protection of Native Vegetation in Western Australia* which outlines the EPA's expectations for proposals that involve a clearing component. It is the EPA's view that the proposal meets the elements detailed in Section 4.3, "*Clearing in other areas of Western Australia*".

The EPA notes the relatively small area of vegetation to be lost (8.3 ha), and the demonstration in the EPS document that the vegetation complex proposed to be impacted (Helena Complex) is well represented in secure conservation reserves. In addition management plans have been proposed to minimise the risk of further losses and to ensure impacts are confined within the boundaries of the proposal. The WC's proposed environmental mitigation programme provides for the enhancement of the ecological values of the Lot 6, where the proposal will be constructed.

The environmental impacts of diverting 8 GL/yr (on average) from Samson Brook is considered to be acceptable taking into account the WRC's assessment of the EWPs and the ability of the WRC to enforce the EWPs through a water licence under the *RiWIA* and refine the EWPs based on the results of WC's monitoring.

With regard to the potential for the WC to secure additional water through water trading, the EPA is mindful of the provisions of the *RiWIA* and WRC's Environmental Water Provisions Policy (WRC, 2000) that can provide for the consideration of the ecological and social impacts of diverting more water in the future. Accordingly, the EPA has recommended a procedure (Appendix 2) and has provided advice in Section 6 as to how additional water beyond the 8 GL/yr (on average) may be considered. The EPA is satisfied that the abovementioned provides a process whereby the ecological and social acceptability of additional water is considered by WRC and, if required, the proposal to divert the additional water can be referred to the EPA.

6. Other advice

The new *RiWIA*, as substantially amended by the *Rights in Water and Irrigation Amendment Act 2000*, provides that entitlements to take water under a licence may be traded. The WRC's Statewide Policy Transferable Water Entitlements for Western Australia establishes a set of principles that guides the WRC in making decisions on applications to trade entitlements. This includes the setting of EWPs to cover the total diversion. All trades require the approval of the WRC. Where unacceptable ecological or social impacts are considered likely to occur as a result of a proposed trade, the WRC will either refuse the application or refer the matter to the EPA for separate assessment.

This proposal is for the diversion of 8 GL/yr (on average) from the Samson Brook to the IWSS. The EPA is aware of the WC's intention to negotiate with the SWIMCo to secure additional water. The water allocated to SWIMCo is currently released from the Samson Dam during the summer period for the purpose of irrigation supply. This flow enters the irrigation channels from Samson Brook downstream of the proposed pipe head dam.

Should a water trading scenario or modified distribution regime be introduced, additional EWP studies would be required to address the implications of reduced flows. The review of the EWPs, which considers social and ecological impacts, will be considered as part of the application for trade.

As there is limited information available regarding environmental and social impacts of taking additional water from Samson Brook during summer, the EPA is not in a position to endorse any water allocation volume above the 8 GL/yr (on average), at this time.

It is the EPA's understanding that the Samson Brook pipe head dam and related infrastructure has the capacity to divert and treat the additional water that WC is seeking to secure. Therefore, no changes would be required to that aspect of the proposal if additional diversion were achieved.

Where the WC negotiates access to the additional water and the WRC has prepared a revised EWP for Samson Brook, the further involvement of the EPA should be consistent with the WRC's EWP Policy and the procedures recommended in Appendix 2.

7. Recommendations

The EPA considers that the proponent has demonstrated, in the EPS document, that the proposal can be managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that the proposal being assessed is for the Samson Brook Redevelopment Scheme, which includes the construction of pipe head dam and related infrastructure and the diversion of 8 GL/yr (on average) of water from Samson Brook to the IWSS.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 4.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the recommended conditions and proponent commitments as set out in Appendix 2.
4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.
5. That the Minister notes the Other Advice in Section 6 regarding the potential diversion of any additional water.

Appendix 1

References

EPA (2000) *Environmental Protection of Native Vegetation in Western Australia: Clearing of native vegetation with particular reference to the agricultural area*, Environmental Protection Authority Position Statement No. 2.

Welker (2002) *Samson Brook Redevelopment Scheme – Environmental Protection Statement*. Unpublished report prepared for Water Corporation, May 2002.

Welker (2002a) *Samson Brook Redevelopment Scheme – Environmental Water Provisions*. Unpublished report prepared for Water Corporation, May 2002.

Streamtec (2002) *Ecological Water Requirements of Samson brook Dam to the Confluence with the Harvey River*. Unpublished Report for the Water Corporation, January 2002.

Water & Rivers Commission (2000) *Environmental Water Provisions Policy for Western Australia*. Waters and Rivers Commission, Statewide Policy No. 5.

Appendix 2

Recommended Environmental Conditions

and Proponent's Commitments

RECOMMENDED CONDITIONS AND PROCEDURES

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

SAMSON BROOK REDEVELOPMENT SCHEME
EAST OF THE TOWN OF WAROONA

Proposal: The construction and operation of a pipe-head dam, water treatment plant and 12 kilometre water pipeline from the pipe-head dam to the Stirling Trunk Main in order to utilise water from Samson Brook for the Integrated Water Supply System, as documented in schedule 1 of this statement.

Proponent: Water Corporation

Proponent Address: 629 Newcastle St, LEEDERVILLE WA 6007

Assessment Number: 1441

Report of the Environmental Protection Authority: Bulletin 1055

The proposal referred to above may be implemented subject to the following conditions and procedures:

Procedural conditions

1 Implementation and Changes

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of the conditions in this statement.

3 Proponent Nomination and Contact Details

3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposal has been substantially commenced.

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment and Heritage, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

- the environmental factors of the proposal have not changed significantly;
- new, significant, environmental issues have not arisen; and
- all relevant government authorities have been consulted.

Note: The Minister for the Environment and Heritage may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program in consultation with and submit compliance reports to the Department of Environmental Protection which address:

- the implementation of the proposal as defined in schedule 1 of this statement;
- evidence of compliance with the conditions and commitments; and
- the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement. Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

5-2 The proponent shall submit a performance review report every five years after the start of operations phase to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority, which addresses:

- the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;

- the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;

- significant improvements gained in environmental management, including the use of external peer reviews;

- stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and

- the proposed environmental targets over the next five years, including improvements in technology and management processes.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority", the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

3 The Water and Rivers Commission will ensure that the proponent releases sufficient water to meet the Environmental Water Provisions of Samson Brook through the licence required to divert water from Samson Brook.

4 Additional water beyond the 8 Gigalitres of water per year (on average) referred to in schedule 1, may be transferred to the Integrated Water Supply Scheme subject to the following:

- undertaking further Environmental Water Provision studies of Samson Brook beyond the pipe-head dam;
- demonstrating the environmental acceptability of transferring additional water;
- meeting the requirements of the Water and Rivers Commission; and
- advice from the Environmental Protection Authority to the Minister for the Environment and Heritage.

Notes

1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

Schedule 1

The Proposal (Assessment No. 1441)

The proposal is to construct and operate a new pipe-head dam, water treatment plant and a 12.9 kilometre water pipeline from the pipe head dam to the Stirling Trunk Main in order to utilise water from Samson Brook for the Integrated Water Supply System, as specified in the key proposal characteristics table below.

The location of the Samson Brook Redevelopment Scheme is shown in Figure 1 (attached).

The key characteristics of the proposal are summarised in Table 1 below.

Table 1: Summary of key proposal characteristics

Key characteristics of the proposal

Characteristic	Pipe head 150 m site
Diversion of water from Samson Brook	8 giga litres a year on average (diverted in accordance with the Operating Strategy as approved by the Water and Rivers Commission). Variable, subject to meeting the requirements of Procedure 4.
Pipe head dam	
Wall height (metres)	20
Location (kilometres from South Western Highway)	Approximately 4.3.
Description	Concrete gravity dam.
Width of Spillway	60 metres wide.
Top water level (metres AHD)	147.5
Storage volume (million litres)	300
Offtake	Piped
Vegetation disturbance (hectares)	Approximately 7 by inundation and construction of the pipe head. Approximately 7.3 of dieback-free vegetation potentially impacted by construction. Approximately 600 metres of riparian vegetation will be inundated.
Access roads	
Length (kilometres)	Temporary access road to pipe head: approx 2.6. Permanent access road to pipe head: approx 4.5. Permanent access road to water treatment facility: approx 1.6.
Width of disturbance (metres)	Temporary access track 7.
Vegetation disturbance (hectares)	Temporary access road 0.9, minimal disturbance by permanent access road.
Pipeline	
Length (kilometres)	12.9
Diameter (metres)	0.9 – 1.0
Capacity (million litres per day)	125
Route	Along permanent access track on Lot 6, through cleared agricultural land, crossing Samson Brook and South West Highway. Along James Rd, Fawcett Rd and then Buller Rd, crossing South West Railway on James Rd. (See Figure 1).
Width of disturbance (metres)	10 –25 approx. 10 in areas of native vegetation.
Vegetation disturbance (hectares)	Approximately 0.6 in forested areas on Lot 6. Approximately 0.65 to the west of South West Highway.
Water treatment plant	
Description	Chemical dosing plant – chlorination, fluoridation and stabilisation.
Area disturbed (hectares)	1.5
Vegetation disturbance	Cleared agricultural land.
Environmental Mitigation /Benefits	
Rehabilitation (hectares)	A total of 16.5, comprising: • 6 outside the riparian zone; • 1 of riparian and other vegetation; • 7.3 of dieback-free vegetation potentially impacted by construction; • 0.65 of vegetation impacted by pipeline construction; and • 1.5 contingency.
Conservation Covenant	Introduction of a conservation covenant on part of the Samson Brook catchment on Lot 6 to protect ecological values.
Mature Trees	Replacement of mature individual trees removed on the pipeline route with 2 juvenile trees of the same species.
Fencing	Repairing, or where necessary replacing fencing around Lot 6.
Feral Animal Control	The implementation of a feral animal control program in co-operation with Department of Conservation and Land Management.
Nesting Boxes	Installation of cockatoo nesting boxes on Lot 6.
Recreation	Development of a Recreation and Tourism Master Plan for the Waroona area.

Figure 1: Location of Samson Brook Redevelopment Scheme

Schedule 2

Proponent's Environmental Management Commitments

28 May 2002

SAMSON BROOK REDEVELOPMENT SCHEME

(Assessment No. 1441)

Water Corporation

Table 1: Environmental Management Commitments – Samson Brook Redevelopment Scheme (Assessment No. 1441)

No	Topic	Action	Objective	Timing	Advice
1	Construction Environmental Management Programme (CEMP)	Prepare a Construction Environmental Management Programme which addresses the following: • Flora, weed and dieback management; • Declared Rare and Priority Flora species Survey; • Declared Rare and Priority Flora Protection (if required); • Faunal Management; • Dust Management; • Noise and Vibration Management including monitoring of blast noise from pipeline and dam construction; • Construction of coffer dams above and below the construction site; • Water Quality Management including monitoring of water quality in Samson Brook downstream of the pipehead dam; • Traffic Management; and • Protection of Aboriginal Heritage Sites (see commitment 5)	To minimise the potential for environmental impacts resulting from construction	Prior to construction	Shire of Waroona WRC CALM
2	CEMP	Implement the measures in the CEMP	Achieve the objectives of Commitment 1	During the construction of the pipehead dam and the pipeline	Shire of Waroona WRC CALM
3	Environmental Mitigation Programme (EMP)	Prepare an Environmental Mitigation Programme which addresses the following: • Lodgement of a conservation covenant on catchment of Samson Brook within Lot 6; • Rehabilitation of an equivalent area impacted by inundation, potential dieback infection and construction access track; • Rehabilitation of riparian vegetation on Lot 6; • Rehabilitation of an equivalent area as cleared during the construction of the pipeline; • Development of rehabilitation completion criteria; • Monitoring against agreed completion criteria; • Assist in the removal of weed tree species and transplant grass trees as necessary; • Compensate for the removal of mature trees during pipeline construction by planting two juvenile trees for each mature tree removed; • Repair, and if required replace, fencing around Lot 6; • Erection of cockatoo nesting boxes on Lot 6; and • Involvement in CALM feral animal control program.	Mitigate the permanent environmental impacts of the Redevelopment	Prior to construction	CALM Harvey Restoration Trust Harvey Land Conservation District Committee Landowners
4	EMP	Implement the measures in the EMP	Achieve the objectives of Commitment 3	During and after the construction period as required	CALM Harvey Restoration Trust Harvey Land Conservation District Committee Landowners
5	Aboriginal Heritage Site Management Plan (AHSMP)	Prepare an Aboriginal Heritage Site Management Plan which includes the following measures: • A detailed Aboriginal heritage survey over the Samson Brook redevelopment area; • Significant Site Management Plan if sites of importance are located in consultation with the local Aboriginal community; and • Consultation with the local Aboriginal community.	To protect Aboriginal Heritage Sites and address heritage issues	Prior to construction	Department of Indigenous Affairs Local Aboriginal Groups
6	AHSMP	Implement the measures in the ASHMP	Achieve the objectives of Commitment 5	Before and during the construction period	Department of Indigenous Affairs Local Aboriginal Groups

Appendix 3

Issues raised during the community consultation programme and the proponent's responses

ISSUES RAISED DURING COMMUNITY CONSULTATION AND PROPONENT RESPONSES

Stakeholder	Issue raised	Response
General Waroona community	Water for future needs in the local community.	The Water and Rivers Commission is responsible for the sustainable allocation of the State's water resources. As part of the allocation process, the Commission takes into consideration environmental water provisions, local needs and future development needs in the area. At the community open evening on the 22nd January 2002, representatives from WRC and SWI made presentations on allocation issues from a regulatory and irrigators perspective.
	Waroona is paying for the inefficient use of water in Perth.	The Water Corporation has a program aimed at increasing the efficiency of water use in metropolitan homes and long term targets for reduced per capita consumption. The city is growing; therefore it follows that it will need more water, even if water use efficiency is improved.
	Alternative sources: • Kimberley • Murray River • Woodman Point	It is not a cost-effective solution to providing water – it would cost between $10 and $15 billion or $5 per kL. The water from the Murray is not good quality potable water. The water that is disposed to sea at Woodman Point is treated wastewater, which is unsuitable for potable supply. The Corporation is, however, pursuing projects relating to the industrial use of this water. Reuse of treated wastewater (for compatible uses) is strongly supported by the Corporation. In the South West Region, these uses include irrigation of golf courses and woodlots.
	Pipeline – reinstatement of land.	Full rehabilitation of disturbed areas and landowners can subsequently use the land for above surface activity.
	Pipeline - Landcare measures during construction.	There will be ongoing consultation with landowners and landcare groups.
	Redevelopment of Samson alone won't solve the problems in Perth, especially if the drought continues.	Redevelopment of Samson is only one aspect of the Water Corporation's drought response strategy.

Stakeholder	Issue raised	Response
	Trout fishing and marroning after redevelopment.	Fishing and marroning will be prohibited in the area upstream of the new pipe head dam. Mitigation measures have been suggested in the Water Source Protection Plan for Samson Brook catchment. Trout fishing downstream of the proposed pipe head dam will not be impacted by the Water Source Protection Plan. Access to the brook in this vicinity will be subject to landowner consent (as per the current situation).
	Munda Biddi mountain bike trail – Waroona Loop.	The trail will still be constructed, but provisions should be made so that there is no access to the water.
	Public access to the wall of the main Samson Dam for recreation.	Access to the wall of the main dam will not be permitted. The presence of people in the vicinity of the reservoir presents a water quality risk due to the absence of public toilet facilities.
	Protection of the Waroona Town Water Supply during construction of the proposed pipe head dam & associated works.	The off take for the Waroona and Hamel Town Water Supply will be relocated. A temporary cofferdam will be established upstream of the construction site.
	People with “local knowledge” working on proposal.	Regional staff from government agencies are involved. Local businesses can potentially become involved in the developmental stages.
	Local membership of Stakeholder Liaison Group	The membership of this group was necessarily wide, and included 7 local representatives (Mr Kevin O’Connor, Cr Kris Annane/Cr Hull, Mr Vernon Pitter, Ms Sharon Piscioneri, Mr Joe Walley, Mr Doug Perrett, Ms Kim Wilson).
	Water quality and analysis	The Water Corporation is required to carry out water quality monitoring as a part of their operating licence. Additionally, SWIMCo is in its second year of an intensive water quality monitoring program and Alcoa also have a water quality monitoring program in the catchment.
	Radioactive emissions from Alcoa getting into water supply.	Water Corporation monitoring results indicate that radioactive elements and heavy metals in the water at Samson Brook are well below drinking water guideline values and do not represent a hazard to public health.
	Alcoa’s rehabilitation practices. Newly planted forest uses more water than mature forest.	This issue has been referred to the Mine Management Planning Liaison Group for discussion at their next meeting (scheduled for October 2002). Attendees of the May community evening were offered the opportunity to attend a tour of Alcoa’s Willowdale mining and rehabilitation operation in the Samson Brook catchment.
	Dam type.	The dam will be a concrete gravity dam.

Stakeholder	Issue raised	Response
	Damage to the newly restored Buller Road.	There would be three pipeline crossings only, so three scars left by the pipeline.
	Dust from heavy vehicle movements along Buller & James Rd during pipeline construction.	Dust is not anticipated to be a problem along these roads. They are sealed roads and there is thus very little potential for dust generation due to heavy vehicle movements. The Corporation will work closely with landowners, and will take necessary measures to ensure that dust is managed appropriately. If required, water tankers will be brought in to water the roads.
	Noisy scrub birds.	The fauna survey of the property where the dam will be located stated that the site is not suitable habitat for the Noisy Scrub-bird because there is not enough dense vegetation (Hart Simpson & Associates, 2001).
	Noisy scrub birds – impact of blasting	It is not expected that any blasting at the site will impact on the Noisy scrub bird. Most native birds can adapt to an increase in noise. Alcoa's mining operations, which include blasting, have been carried out in proximity to Noisy Scrub Bird release sites, with the birds persisting in the area (Hart, R and Dunks. A. 2002, pers. comm. 27 June).
EPA	Dam site with FSL at 180 m AHD is above Seymour Falls.	This site was not investigated further..
Alcoa World Alumina, Australia	Applications for water allocation by industry or agriculture are unlikely to be successful if they are against the people's water supply.	Water is allocated by the Water and Rivers Commission – the Water Corporation does not make these decisions.
	Alcoa has Surface Water Licenses for the Wagerup Refinery in the Samson Brook South Drain	The Water and Rivers Commission have advised that the majority of the Wagerup refinery allocation is sourced from Black Tom Brook and the unnamed tributary immediately north of this and therefore is not impacted by the Samson Brook Redevelopment Proposal. Alcoa's allocation from the Samson South Drain expires prior to implementation of the Samson Brook Redevelopment Proposal, and Alcoa have advised that this allocation is not at issue here.
	Alcoa's Surface Water Operating Strategy documents the need to maintain flows down Samson North Drain to meet EWRs for the section of the Samson North drain below Alcoa's property to the Harvey River.	EWRs for the Samson North Drain, developed by Streamtec 2001, have been taken into consideration in the development of EWPs between the Samson Dam and the Harvey River. The EWRs that were identified in 2001, and are referred to in Alcoa's Surface Water Operating Strategy, will be replaced by the EWPs in this document.
Conservation Council of WA	Conservation Covenant for Lot 6.	The Water Corporation will address this after the land transfer is finalised.

Stakeholder	Issue raised	Response
	Fauna access around inundation area. Riparian corridor for bandicoot migration.	Although no definite evidence was found that the Southern Brown Bandicoot is still present along Samson Brook, it may well still occur nearby and could be present at times in small numbers. The strip of dense vegetation along the brook is very narrow and is not continuous. It never exceeds 20 m and probably averages only 5 m. In total the habitat quality is only moderate.
	Orchids were not flowering during December flora survey.	Noted. An additional flora survey will be taken prior to construction.
	Revegetation demonstration area along McKnoe and Drakes Brook for dairy farmers.	Raised as part of the Environmental Water Provisions Desired Future State process. There is potential for the Harvey River Restoration Trust funds to be used in this area.
	Impact on vegetation of dam further upstream.	This impact would be both from the pipeline construction, dam construction site and access roads, and have been taken into consideration when reaching the preferred dam site option.
Crossing the Boundaries	Money spent for a week's worth of water for Perth – cultural change in water use needed.	The Water Corporation has a program aimed at increasing the efficiency of water use in metropolitan homes already. Developing water sources does cost a lot of money.
	Mitigation: fencing Samson Brook to protect vegetation.	Raised as part of the Environmental Water Provisions Desired Future State process. There is potential for the Harvey River Restoration Trust funds to be used in this area.
	Environmental impacts of pipeline and dam should be considered equally.	They have both been considered and will be addressed.
	Pipeline route and disturbance of vegetation.	Design of route has minimised vegetation disturbance. Disturbed areas will be rehabilitated. Water Corporation walked the route of the pipeline along Buller Road with Crossing the Boundaries (on behalf landcare community) to identify route of least impact to roadside vegetation. Mitigation package includes translocating grass trees impacted by pipeline construction.
	Scarp Road closure.	Scarp Road will not be closed. Measures will be taken to prevent contamination of Samson Brook by activity along Scarp Road.
	Jarrah forest recreational value.	Recreation in Samson Brook catchment will be prohibited (except along the Munda Biddi Trail), but there are no plans to develop Drakes Brook Dam or Waroona Dam for supply. Scarp Road will remain open and provides for a scenic drive.

Stakeholder	Issue raised	Response
	Tapping into new supply by landowners.	The Corporation held a meeting of landowners potentially impacted by the pipeline route on 17th December 2001. Indicative costs for connection to a poly pipe water supply were provided to meeting attendees, and the forum was used to gauge the level of interest amongst landowners in connecting to such a water supply. Whilst the Corporation has not yet reached a final determination on this issue, it is likely that a poly pipe (water supply) will be provided along the James Rd section of the pipeline route. It was noted that a year-round supply could not be guaranteed, even if a poly pipe were to be provided.
	Community unfamiliar with EPS process.	There has been regular community consultation to familiarise the community with the EPS process.
Shire of Waroona	Quality of road reinstatement along Buller Road.	The pipeline alignment minimises road disturbance such that only three crossings are necessary.
	Mitigation measures: • Tourism Recreation Plan for Waroona. • Survey and gazette Scarp Road.	The Corporation has considered the potential mitigation measures raised during the consultation process and has committed to the development of a recreation plan for the Waroona/Drakes brook system.
	Effect of SWIMCo's piped irrigation system on ecology.	Addressed via compliance requirement for the Environmental Water Provisions.
	The Samson Brook Redevelopment Scheme is just a bandaid.	The Samson Brook scheme is not designed to be a bandaid, but a component of the integrated supply system. Previously, development was timetabled for 2007, although this has been brought forward, as one part of the drought response program.
Health Department of WA	Flow rates and holding times of reservoir.	Will be addressed in the Water Corporation Operating Strategy.
	Barriers to pollution in the system.	Will be addressed in the Water Corporation Operating Strategy.
Recfishwest	Secondary treatment in the future.	Allowance has been made for a water treatment plant in the design.

Stakeholder	Issue raised	Response
	Mitigation measures at Harvey are not being implemented. Concern that this will happen at Samson.	The Corporation has committed to contribute to the development of a recreation plan, which will identify opportunities for enhancement of recreational facilities outside of the Samson Brook catchment area. Funding and responsibilities for implementation of enhanced recreation facilities will be formalised in a "Memorandum of Understanding" between the Shire of Waroona and the Water Corporation. The Corporation's project manager has been involved in the stakeholder consultation process for: • Environmental impact assessment; • Determination of Environmental Water Provisions; and • Water Source Protection Planning. This has ensured that the project team is familiar with the issues & concerns associated with each process, the mitigation measures agreed, and the Corporation's responsibility to deliver mitigation measures.
Aboriginal community	Safeguard rivers for future generations.	Determination of the Environmental Water Provisions for the system ensures that the ecological, social and economic values are addressed.
Stakeholder Liaison Group	Unnatural flows down Samson Brook.	Flows during summer would be mitigation flows to compensate for the sedimented pools.
	Upstream and downstream fish populations.	These populations are genetically distinct.
SWIC	Waroona Dam - other groups (not only SWI) should be recognised as beneficiaries of dam safety works	Relates to dam safety remedial works and these negotiations are considered separately.
Department of Fisheries, Recfishwest and the WA Trout and Freshwater Fishing Association	Concern that the Water Corporation is gradually encroaching on all of their fishing resources.	Consultation of offset package.
	Loss of recreational fishing and marroning amenity. Offsets: • Destocking marron in drinking water supply dams. • Limit trout and marron season to the time when the least demand is placed on Samson Dam for drinking water supply. • Fish grid on spillway at Drakes Brook Weir to prevent fish going over the spillway. • Fund the cost of stocking trout in available dams in Waroona/Harvey area. • Construct habitat enhancement at Waroona Dam.	These issues have been acknowledged in the Water Source Protection Plan for Samson Brook catchment. Suggestions for offsets have been made in this WSPP. The Water Corporation is waiting for fish grid designs from the Fisheries Department. This will be considered in the context of dam safety.

Stakeholder	Issue raised	Response
	Risk of contamination from fishing vs Alcoa's mining activity.	Alcoa has an undertaking with the State Government to protect water resources in all of the catchment areas in which it operates, or has operated. Therefore, mining in this catchment is a managed risk.
General Waroona Community/ Shire of Waroona.	Spraying of weeds on the dam property.	The Declared plants have been identified and should it be that the Water Corporation include the Corvaia property in the redevelopment, we will ensure that management of Gomphocarpus fruticosus and Solanum linnaenum is carried out according to the provisions of the Agriculture and Related Resources Protection Act
	Concern that allocation for irrigation will be lost.	The Water Corporation's proposal does not impact on SWIC's licensed allocation. The project will create opportunities for water allocations licences to be traded. The water allocation and trading process is managed by the Water and Rivers Commission, and any trading of licences is a consultative process where both parties must agree.
	Supply to Waroona change as a result of redevelopment.	The offtake will move to the new pipe head dam location. The amount of water allocated to the Waroona Town Water Supply Scheme will remain unchanged. The water will receive the same treatment at the same location as the Perth water.
	Same level of water restrictions for Waroona as Perth when Samson goes on line.	A capacity sharing model (like that used for Harris) will be used, where water is reserved for local needs. The town be subject to water restrictions only if Waroona water use approaches or exceeds its allocation.
General Waroona Community/ Crossing the Boundaries	Repair of Waroona Dam.	This is in the process of being repaired. It was drained because an investigation of lower parts of the dam was required. It is scheduled to be repaired in October 2002. Community impacts will be assessed and offsets will be developed.
	Waroona community respects Samson Brook and acts to ensure the water quality. Contamination by non community members. Apparent inconsistency in permitted catchment uses between country water supply catchments and metropolitan water supply catchments.	Currently the catchment is gazetted under the Country Areas Water Supply Act, 1914, which prohibits pollution, but does not specifically exclude fishing from the catchment. Fishing and marroning activities do pose a risk to water quality, and are prohibited under the Metropolitan Water Supply, Sewerage and Drainage Act, 1947.
Conservation Council of WA/ Crossing the Boundaries	Loss of significant vegetation on McClure Road by pipeline disturbance.	The preferred route is to the north, so there will be no disturbance to this vegetation.

Stakeholder	Issue raised	Response
Crossing the Boundaries/ Recfishwest.	New Pipe head dam would intercept fallen leaves, therefore carbon transport downstream. The north-eastern tributary is important to downstream ecology and should not be captured by the dam.	The importance of carbon transport is recognised. To allow this to still occur to some extent, the dam will be situated upstream of the north-eastern tributary.
	Fishladders.	There is no need for a fishladder at the new pipe head dam. This is because the upstream and downstream fish populations are genetically distinct as obstacles in Samson Brook prevent fish migration.
Alcoa World Alumina, Australia/ Health Department of WA	The impact of this development on the Peel Harvey Estuary is not covered in the EWR.	The impact is discussed in the Environmental Protection Statement. Flows into the Peel Harvey will not be altered from the pre-European flow regime. Additionally, whilst diversion of this “hills water” reduces the volume of high quality water flowing through to the Peel-Harvey Estuary, reduction of flow through the drainage channels of the Swan Coastal Plain increases the opportunity for on-site metabolism of nutrients sourced from agricultural land-uses.
Alcoa World Alumina, Australia/ Shire of Waroona	Resource will become inaccessible for future development.	Other resources such as Drakes Brook and Waroona Dams are not planned for water supply, so will still be accessible.