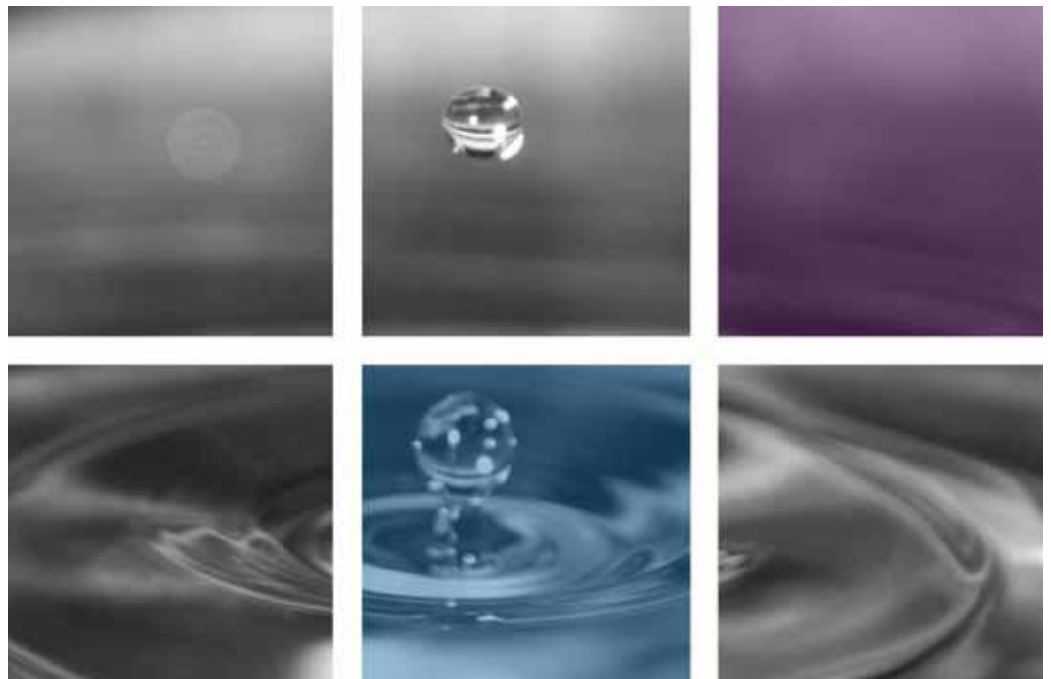




SUGARLOAF PIPELINE PROJECT

HYDROLOGY, WATER RESOURCES AND WATERWAY
CROSSINGS IMPACT ASSESSMENT

FEBRUARY 2008





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Glossary

Term	Definition
aggradation	The process of raising the bed level of a stream through deposition of sediment
alluvial	Consisting of sediment deposited by flowing water, in a riverbed, flood plain, or delta
bedrock	Exposed solid rock that underlies loose material, such as soil, sand, clay, or gravel
degradation	A decline or lowering of the condition/quality, of the stream or floodplain
erosion	Gradual wearing and abrasion of material by natural processes, involving mainly water as transporting agent
geomorphology	The science concerned with the form of the land surface and the processes which create it
headcut	Sudden change in slope in a channel associated with headward (upstream) erosion processes. In this study defined as vertical or near vertical drop in channel elevation greater than 300mm
incision	Lowering of a waterway's bed level
reach	A segment of a waterway
riparian	Of, on, or relating to the banks of a natural water course.
bench	A relatively flat tabular surface, between the current streambed and the floodplain, separated by a steep slope.



Limitations

This Report:

- has been prepared by Melbourne Water, GHD Pty Ltd, Sinclair Knight Merz Pty Ltd, and John Holland, the participants in the Sugarloaf Pipeline Alliance (the 'Alliance');
- has been based on information provided up to 8 February 2008;
- has been produced as part of the Sugarloaf Pipeline Project Impact Assessment report and is for the purpose of identifying preferred pipeline corridors and associated management and mitigation measures for the Sugarloaf Pipeline Project;

This Report should not be altered, amended or abbreviated, issued in part or issued incomplete in any matter whatsoever without prior checking and approval by the Sugarloaf Pipeline Alliance. The Alliance expressly disclaims responsibility for any liability which may arise from the issue of this Report in part or incomplete or its modification in any way whatsoever.

Through the fieldwork component of the project most of the waterways in the study area were inspected from road reserve only. No inspection either upstream or downstream has been undertaken due to access limitations. Of the 187 waterway crossing locations identified, 144 have been inspected.

Further field investigations are required to clarify the extent of identified unstable waterways as well as those sites that could not be accessed as part of the initial field inspections.

The impacts of the recent drought were clearly evident and there is a risk that the true condition of the waterways is artificially masked by the grass cover that was present at the time of inspection. The drought which has extended over the last decade is widely considered to be the driest on record and caused river flows and reservoir levels to be at all time lows.

Risks of a sudden wet onset:

With a lack of vegetation covering the catchment, there is a high risk of major erosion occurring in the event of high intensity storms. Impacts of this occurring include:

- Increased runoff rates due to reduced infiltration rates and poor vegetative cover
- Exacerbated soil and sheet erosion on the steeper valley slopes
- Exacerbated stream bank erosion
- Exacerbated gully erosion due to rapid runoff and loss of vegetation cover
- Loss of instream vegetation
- Poor water quality due to increase turbidity and sediment loads
- Potential algal blooms



At the time of compiling this report, slow but steady rains have been received across the catchment over a period of recent months. As a result, the vast majority of the catchment appears to have established a grass cover thereby providing some resistance to potentially damaging rain events. However, while this is an improved situation, the catchments' waterways remain at risk from impacts of erosion processes.

The opinions conclusions and any recommendations in this Report are based on assumptions made by the Alliance when undertaking services and preparing this report (assumptions), including (but not limited to):

- The information provided by the (Asset/representative) being true and accurate in all respects and containing no material errors or omissions. Further Melbourne Water has acknowledged that the Alliance may rely on the provided information in relation to the preparation of the Report;
- All documents and records examined by the Alliance are genuine, complete and up to date;
- All factual matters stated in any document are true and correct;
- All employees of the Melbourne Water who are aware of any information which has not otherwise been specifically made known to the Alliance and which could affect the correctness of the opinions expressed in the report, have communicated that information to the Alliance;
- The Alliance acknowledges that they are making an independent assessment of the information and that we will, to the extent that we are reasonably able to do so, carry out our own investigation and analyses in relation to the Information;
- An understanding that the Alliance is not responsible for any qualitative or quantitative errors in its report resulting from errors in the material provided by Statutory Authorities or Melbourne Water; and
- The Alliance expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with any of the Assumptions being incorrect.

The Sugarloaf Pipeline Alliance has prepared this report on the basis of information provided in person or in reports or publications by a range of publishers and community based sources which have not been verified or checked independently by the Sugarloaf Pipeline Alliance.

The Alliance owns all copyright in the Report and in all documents provided by the Alliance in connection with this report and accepts no obligation to update the Report for events subsequent to the date that the report was signed.



Executive Summary

The Sugarloaf Pipeline Project involves the construction of a pipeline system, which will enable water to be diverted from the Goulburn River near Yea, to Sugarloaf Reservoir within the Melbourne Water Supply System. The pipeline is due to be operational by February 2010.

This report provides information on the hydrological issues relating to water resources and waterways as a result of the construction and operation of the project. It summarises the findings of fieldwork associated with inspection of potential waterway crossing locations and a desktop review of readily available hydrological and water resources information. The information contained within this report includes the statutory planning processes required for this project based on consultation with Goulburn-Broken Catchment Management Authority (GBCMA), Melbourne Water (on behalf of Port Phillip and Westernport CMA) and Goulburn-Murray Water.

Objective of the Study

The overall objective of this study is to:

- Undertake an assessment of waterway and floodplain management issues and impacts relevant to this project within the Goulburn/Yea and Yarra River Catchments; and
- Provide an overview of the likely issues that will be encountered with waterway crossings, the process that will need to be followed in order to obtain the appropriate permits and the general requirements for inclusion in the forthcoming detailed design phase.

Legislative Requirements

The following legislative requirements will need to be followed in order to obtain the appropriate approval and general requirements for inclusion in the design and construction phase of the project:

Goulburn (Eildon-Goulburn) Bulk Entitlement

As part of this project, the Goulburn Bulk Entitlement will need to be revised prior to any diversions to Melbourne taking place. The form of the legal vehicle used to allocate water to Melbourne from the Goulburn River would need to be agreed with the Department of Sustainability and Environment (DSE). Discussions between DSE and Melbourne Water are currently progressing to determine the form and details of the Bulk Entitlement.

Heritage Rivers Act 1992

There may be other specific requirements for the diversion under the *Heritage Rivers Act 1992*. Melbourne Water is currently liaising with authorities to determine the requirements under this Act.

Works on Waterways Approval

Approval will need to be sought from both Goulburn Broken CMA and Melbourne Water (on behalf of Port Phillip and Westernport CMA) for works on waterways for all locations where the pipeline intersects a 'designated waterway'.



Land Subject to Inundation Overlay (LSIO)

The *Water Act 1988* (Section 206(3), Division 4 of Part 10) requires permission to be sought from council or other public statutory bodies for development to occur within a zone that has been defined as an LSIO (Land Subject to Inundation Overlay) zone.

Environment Protection Act 1970: SEPP (Waters of Victoria)

The Waters of Victoria SEPP contains guidelines to prevent any water discharge or pollution into waterways. As part of phase two of the project it is recommended that the SEPP be reviewed and appropriate management actions incorporated into the design.

Environmental Guidelines for Major Construction Sites, EPA

These guidelines provide general information on how to avoid and minimise environmental impact from construction activities. The guidelines are not prescriptive however they do provide parameters for design and monitoring.

Bunding Guidelines, Publication 347, EPA, 1992.

These guidelines specifically apply to above ground storage and transfer areas used for refuelling during construction. The guidelines recommend design options for bund construction, storage, and stormwater control to ensure that there is adequate secondary containment to prevent any environmental pollution should a liquid be spilt on site.

Construction Techniques for Sediment Pollution Control, Publication 275, Environment Protection Authority Victoria, May 1991.

These guidelines provide recommendations on structures and strategies which reduce sediment export from construction sites preventing contamination of aquatic environments.

Existing Conditions

The Goulburn River is regulated by releases from Lake Eildon. Releases are made for purposes of:

- maintaining minimum flow requirements along the Goulburn River;
- diversion at Goulburn Weir for irrigation supplies;
- supply to private diverters and urban water users;
- environmental flow releases for Living Murray Initiative and Snowy Initiative;
- supply of inter-valley trade to the River Murray; and
- flood pre-releases and hydro-electric releases. The river from Eildon to Goulburn Weir also receives unregulated inflows.

Within the study area there are approximately 187 waterway crossing locations defined as points where the pipeline corridors being considered intersect with mapped waterways. These waterways range from small unnamed drainage lines to larger named waterways such as the Yea River. Site inspections were carried out to assess the condition of the various waterways that could potentially be crossed by the pipeline. In total 144 of 187 waterway crossings were assessed in the field. A