Cardno
Shaping the Future

Austral & Leppington North Precincts
Riparian Corridor and Flooding Assessment

Main Report

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Cover Image: Open eucalypt woodland within Austral Precinct (November 2010)

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1 Introduction

In 2005 the NSW Government identified two regions, one in Sydney's northwest and one in Sydney's southwest, of largely undeveloped land as the potential location for development of new communities. Combined these two growth areas are capable of accommodating 500,000 people and have been named the North West Growth Centre and the South West Growth Centre respectively. Each growth centre is divided into a number of Precincts that will drive the staged development of each Growth Centre.

In order to prioritise and facilitate the development of the Precincts within the Growth Centres the NSW Government passed *State Environmental Planning Policy (Sydney Region Growth Centres)* 2006 (referred to as 'Growth Centres SEPP'). The Growth Centres SEPP primarily expedites the Precinct planning and rezoning processes that most developments are required to undergo in accordance with the *Environmental Planning and Assessment Act 1979 (EP&A Act)*. The Growth Centres SEPP establishes the planning rules and objectives for the Growth Centres.

Each Precinct is required to undergo a Precinct Planning Process which brings together State Government agencies and local councils to coordinate the provision of infrastructure and social services within each of the precincts. Integral to this stage is the assessment of appropriate land use options within each of the Precincts (e.g. key transport routes, residential housing, commercial areas, biodiversity conservation). As such the Precinct Planning Process involves detailed investigations into environmental constraints which will help determine the development potential within the precincts. The need to conserve and enhance biodiversity and existing environmental values is a stated aim of the Growth Centres SEPP. The Precinct Planning Process is integral to the control and management of development to ensure these aims are met. This Flooding and Riparian Assessment considers the flood risk, provides a stormwater management strategy and establish riparian corridors within the Austral and Leppington North Precincts.

By identifying and planning around constraints at a Precinct level, the need for further assessments at the Development Application (DA) stage is significantly reduced. Relevant regulatory bodies are able to confer approval in principle to the Precinct Plan, removing the need for further assessment to be undertaken at a later date. For example, in terms of ecological studies, the Precinct Planning Process removes the requirement for assessment of potential threatened species impacts at the DA stage in certified lands.

Ultimately the constraints identified within a Precinct are combined to prepare an Indicative Layout Plan, which is placed on public exhibition along with supporting documents (the Precinct Planning Package). Following receipt of submissions, the Minister for Planning and Infrastructure may approve the Precinct Planning Package and rezoning of the land within the Precinct where appropriate. Following rezoning, Development Applications may then be lodged.

This Flooding and Riparian Assessment has been undertaken as part of the Precinct Planning Process for the Austral and Leppington North Precincts, within the South West Growth Centre.

1.1 The Study Area

The precincts of Austral and Leppington North (the "Site") are located in the south west of Sydney within the Cumberland Plain and cover an area of just approximately 20.3km^2. The site extends approximately 8km in a north–south direction and up to approximately 3.3km in an east west direction.

Both suburbs are typified by rural residential housing with small scale agriculture (predominantly vegetable crops and chicken farms). A small number of light industrial and commercial areas occur within each precinct. The Austral Precinct has an area of approximately 9.30 km^2 and is expected to accommodate around 8,000 dwellings and 22,000 residents.

The Leppington North Precinct (located immediately south of Austral Precinct, has an area of approximately 11 km^2 and is expected to accommodate around 12,000 dwellings and 30,000 residents. The location of these two Precincts is illustrated in **Figure 1.1.**

Aerial imagery indicates that approximately 85% of the land area encompassed by Austral and Leppington North has been cleared of native vegetation to permit development.

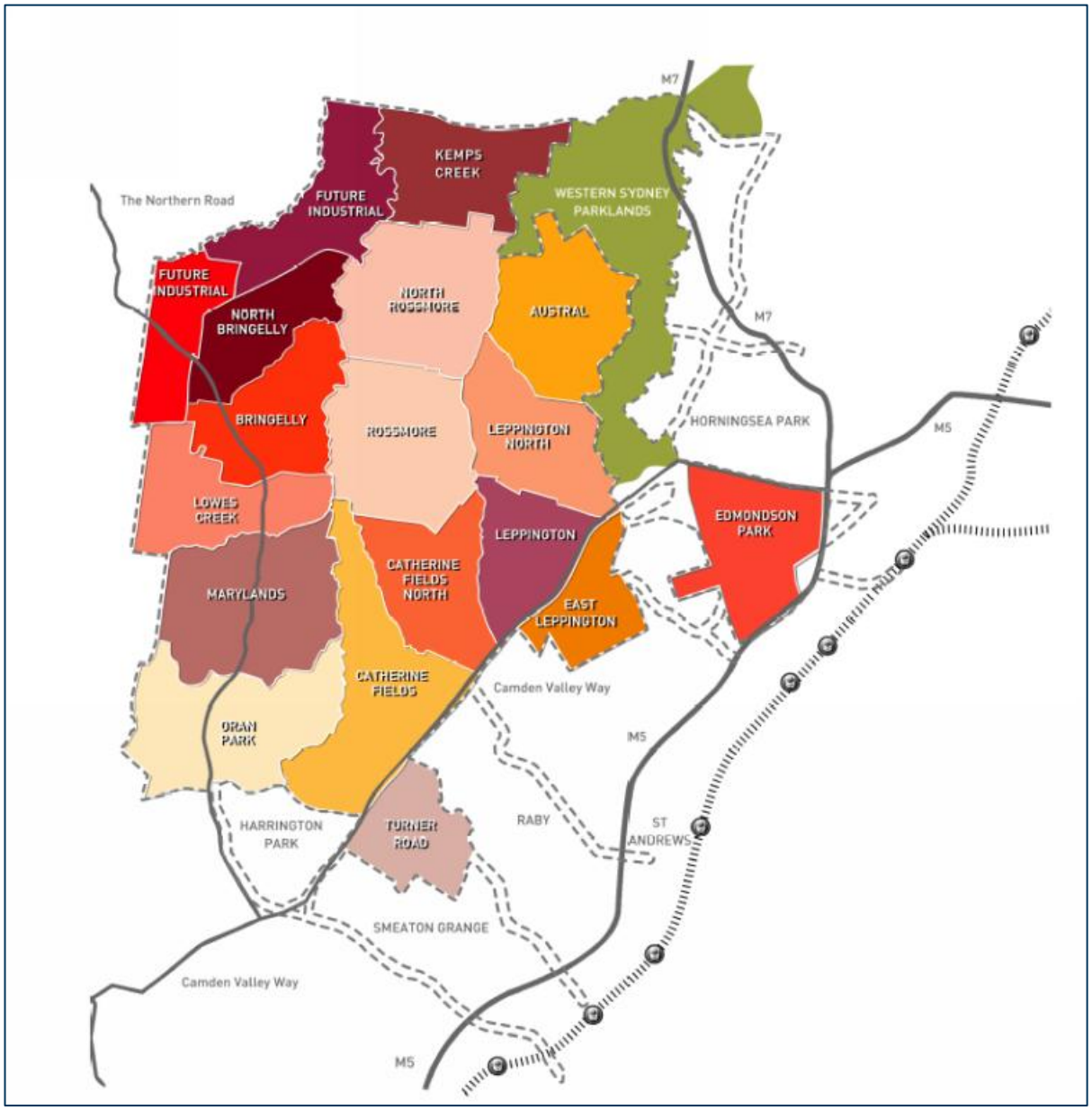

Figure 1.1 Location of Southwest Growth Centres (NSW Department of Planning % Infrastructure, 2010)

Kemps Creek flows north along the western boundary of both Austral and North Leppington (see **Figure 1.2**). Kemps Creek is a fourth order (Category 3) stream and is fed by a number of tributaries including Bonds Creek (the lower reaches of which are identified as Category 3, the upper reaches as Category 2) and Scalabrini Creek. The precincts are bordered to the east by the Sydney Water Supply Canal and to the north by the Kemps Creek Nature Reserve and Western Sydney Parklands. The southern extent of the Leppington North precinct extends approximately 500m south of Bringelly Road.

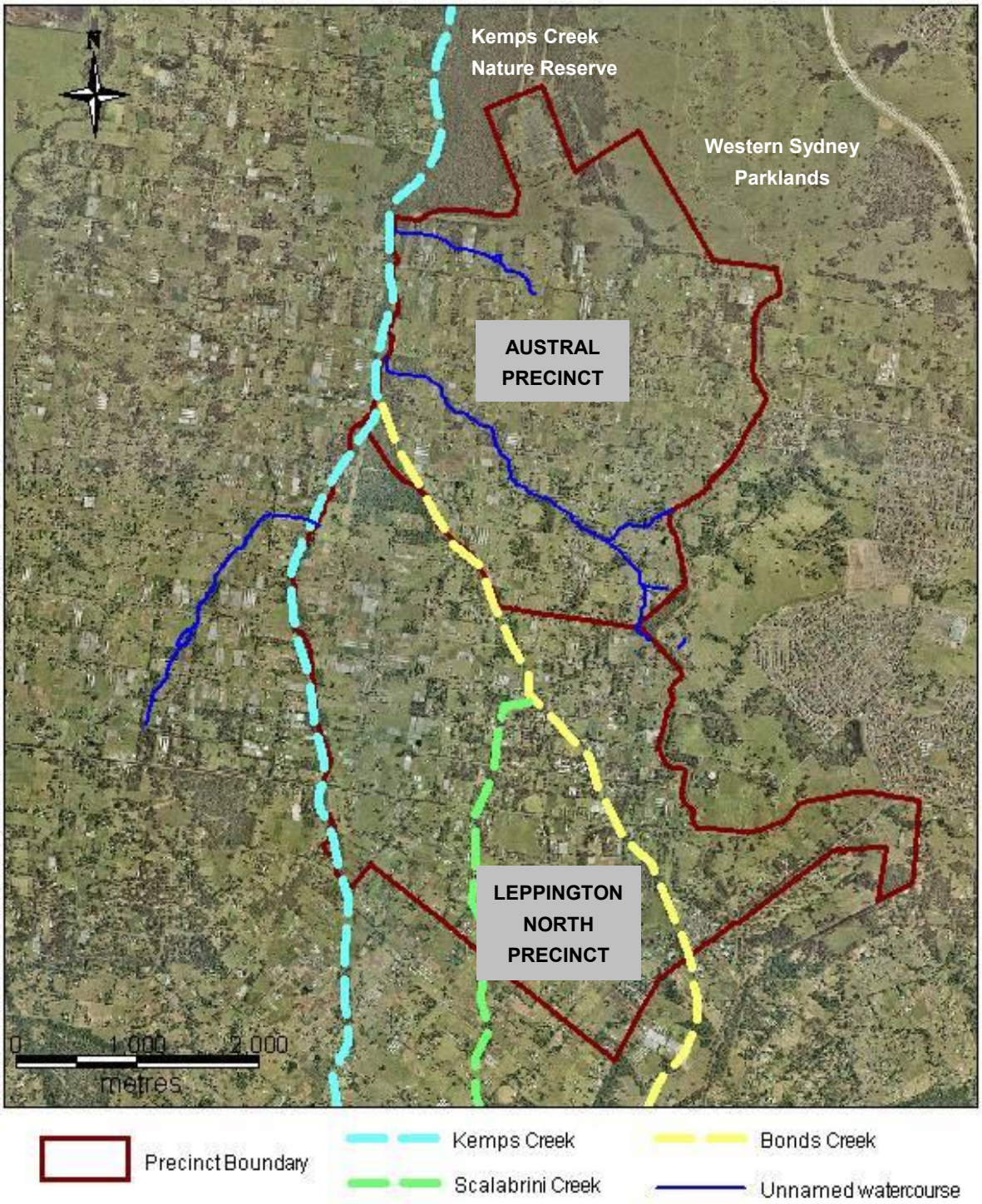

Figure 1.2 Major Watercourses within the Study Area

1.1.1 Topography

The terrain falls from south to north with elevations ranging from 102m AHD near Byron Road in the south to 54m AHD in the north adjacent to the Trans Grid Kemps Creek Sub-station. The landscape is characterised by low hills with hill slopes of up to 4% and generally less than 2.5%.

Kemps Creek which forms the western boundary of the Site has an average gradient of 0.4% past the Site as does Bonds Creek which bi-sects the Site. The tributary streams have average gradients generally within the range of 1.6% to 2.4%.

1.1.2 Soils

The study area is primarily underlain by the Blacktown Soil Landscape Group which comprise shallow to moderately deep red and brown podzolic soils over Wianamatta Group shales. Such soils are typically of low fertility, poor drainage, and are frequently vegetated with tall open-forest dry schlerophyll eucalypt woodland. The soils surrounding the creek lines within the site are composed of soils from the South Creek Soil Landscape Group and are typically deep layered sediments over bedrock. These soils have a significant erosion hazard.

On the eastern boundary of the Site the soils transition to the Luddenham Soil Landscape Group, reflecting the increase in elevation and number of hills and ridges. Luddenham Soils are typically associated with wet sclerophyll forest (Penrith Soil Landscape Series Sheet (1:100,000) (Hazelton *et al*. 1989).

1.1.3 Riparian Vegetation

Vegetation along the streams varies from grasses only to narrow discontinuous bands of woody plants that include some native species [Casuarina sp.). Some areas of open woodland exist along Kemps Creek and Bonds Creek but are generally setback from the creek bank to accommodate unsealed vehicular access tracks.

1.1.4 Condition of the Watercourses

Apart from Kemps Creek and some of the minor first order streams within bushland reserves all of the watercourses have been highly modified to suit agricultural activities and in some cases subsequent urban development. Typically the watercourses have been excavated and/or re-aligned [straightened] to form trapezoidal channels that are aligned with cadastral boundaries or otherwise adjusted to suit farm fencing by creating regular shaped paddocks.

Moderate erosion of the banks has and is continuing to occur. Typically the erosion is occurring as general attrition of the largely un-vegetated or poorly vegetated creek banks with occasional areas of more severe erosion which is often associated with fallen trees, confluence areas with tributary creeks, and points of access / creek crossings.

Natural geomorphic features were absent and were mostly limited to in-stream sediment deposits some of which were supporting aquatic vegetation which included weed species. Shade trees lining the creek banks were limited in extent throughout the Site.

Urban litter was observed along many of the creeks and the rubbish included old motor vehicle bodies. Animal carcasses were also present in some locations.

There are several large rectangular culvert / bridge crossings along Bonds Creek but the majority of creek crossings are pipe culverts. Several of the culverts are inappropriately aligned with the upstream creek in order to minimise culvert lengths under roads, and dense vegetation and flood debris has collected at numerous other culverts and thereby reducing their hydraulic efficiency.

No structural checks were made of the culverts or bridges except where significant scour was noted.

1.2 Previous Studies

A number of studies are overviewed in chronological order as follows:

Perrens Consultants (2003) "Austral Floodplain Risk Management Study & Plan", report Version 5.0, prepared for Liverpool City Council, September, pp 76 + Apps.

> As described by Perrens Consultants, 2003*, the Austral Floodplain Risk Management Study was concerned with those parts of the catchment of Kemps Creek upstream of Elizabeth Drive which lie within the Liverpool City Council (LCC) area. The two main streams, Kemps Creek and Bonds Creek, rise in low foothills south of Cowpasture Road and flow in a northerly direction towards Elizabeth Drive (***Figure 1.3***). The catchment is elongated, having a length of 12 km and an average width of 4 km, giving a total drainage area above Elizabeth Drive of about 4,900 ha of which 3,200 ha lies within the study area.*
>
> *Downstream of the steeper portion of the catchment on the northern side of Bringelly Road, the stream bed flattens from 1% to around 0.5% gradient. Major flows are conveyed along the drainage network as a wide expanse of slowly moving water, with most of the discharge conveyed on the floodplain.*
>
> *There are several significant unnamed tributaries of the two main streams, which together drain about 30% of the total catchment upstream of Elizabeth Drive. The major tributaries were denoted Tributaries 1, 2 and 3 on* **Figure 1.3.**
>
> - *Tributary 1, also known locally as Scalabrini Creek, joins the west bank of Bonds Creek near Seventh Avenue and has a total catchment area of 577 ha.*
> - *Tributary 2 drains the eastern part of the catchment including the village of Austral, and joins the east bank of Kemps Creek at Fifteenth Avenue just downstream of the junction of Bonds and Kemps Creeks. It has a catchment area of 324 ha.*
> - *Tributary 3 drains the north-east part of the catchment and joins the east bank of Kemps Creek near Elizabeth Drive. It has a catchment area of 721 ha.*
>
> *Bonds Creek (including Tributary 1) has a catchment area of 1,909 ha at its junction with Kemps Creek.*

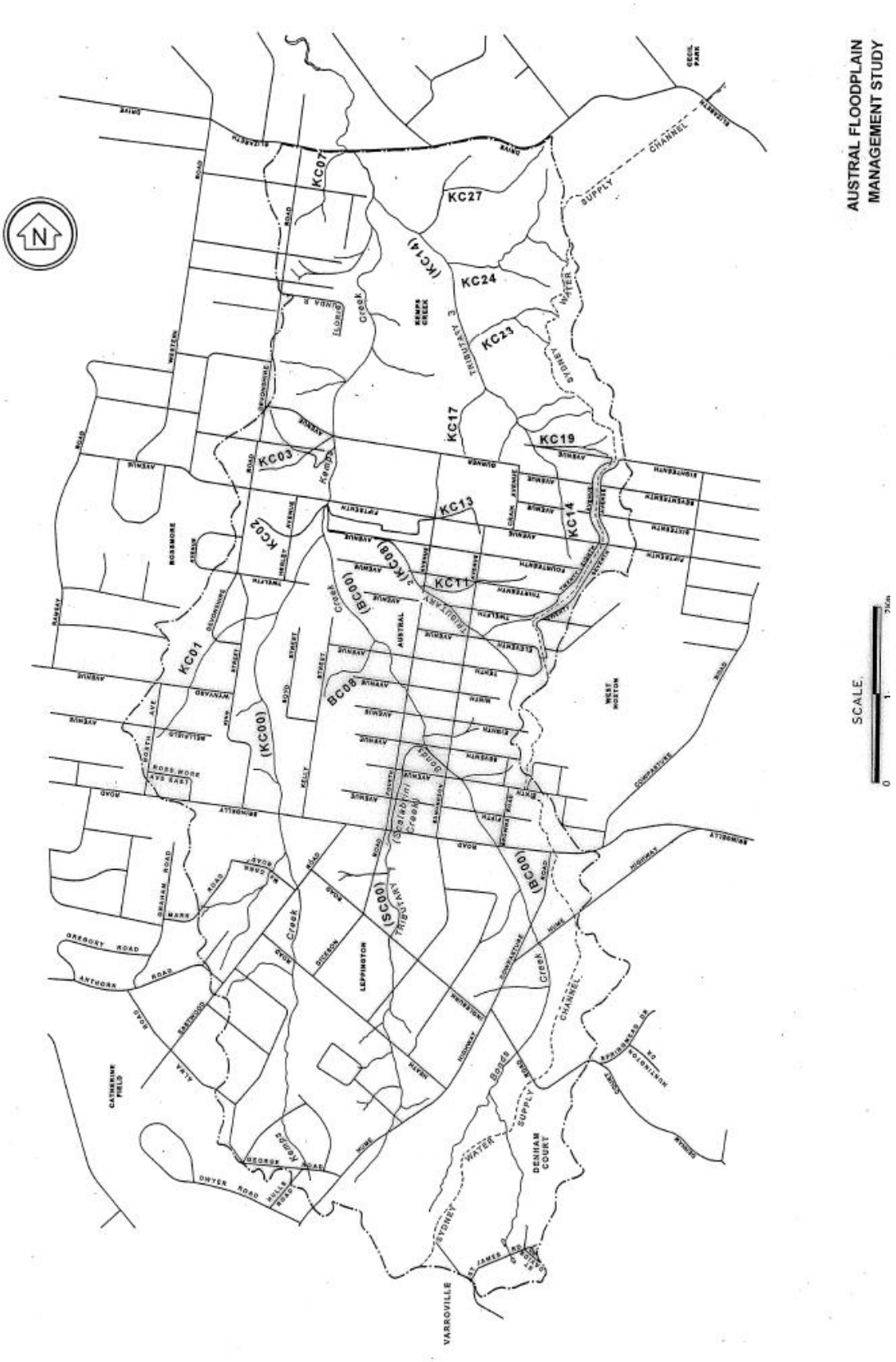

Figure 1.3 Catchment Plan (after Perrens Consultants, 2003)

The drainage channels in the Austral - Kemps Creek area are indistinct and of low capacity except in sections that have been excavated to achieve a local reduction in flood levels.

Examples of creek excavation are found on Bonds Creek between Bringelly Road and Ninth Avenue, and Tributary 1 between Sixth and Seventh Avenues.

The streams flow through a semi-rural setting although urbanisation has increased in recent years. Drainage problems are experienced in several residential centres which have encroached onto the floodplain, several examples of which are given below. These problems are attributable to:

- *limited hydraulic capacity in the creek channels;*
- *inadequate hydraulic capacity at culverts and bridges;*
- *filling activities on the floodplain.*

At Eighth Avenue, several houses have been constructed on low ground on the east bank of Bonds Creek downstream of the bridge. The bridge structure has been raised above the level of the approach road. This has resulted in surcharges of the creek being directed over the road and toward the houses. In major flooding it is expected that above floor inundation would occur.

Residential properties along Kemps Creek at Twelfth Avenue and Gurner Avenue are flooded in small flood events. The channel downstream of Twelfth Avenue is small and has extensive weed growth.

Properties between Fifth Avenue and the excavated channel in Scalabrini Creek are frequently inundated. The creek waterway area in this reach is smaller than the waterway area of the excavated channel. An inspection of this channel indicated that most of the flows bypass the creek and the excavated channel altogether and run along Fourth Avenue.

The intersection of Twelfth Avenue and Fourth Avenue on Tributary 2 is flooded regularly. Photographs from the past show the intersection and properties extensively inundated. The stream capacity appears to be reduced due to the sudden bend of the creek at the corner of this intersection.

In the Scalabrini Village on Bonds Creek downstream of Sixth Avenue, flooding occurs for small storm events. Flooding problems commence at around the 1 year ARI flood. They result from inadequacies in the local trunk drainage system, coupled with coincident backwater flooding from the creek.

There has been considerable earthworks activity within the catchment which has been undertaken to control water in some way, including:

- *construction of dams to store water for irrigation and watering of domestic stock;*
- *filling of land to reduce the impact of flooding;*
- *construction of channels or banks to help drainage escape or to divert the flow of water;*
- *enlarging the creek channel to reduce flood levels.*

Some of these activities have been carried out by Council in a planned and coordinated manner. A large number of these earthworks activities appear, however, to have been carried out without proper planning and in an ad-hoc manner by landholders themselves. Because of the ad-hoc nature of these activities, their effect has been to alter the direction of flow, impede the passage of flow over the floodplain or otherwise disturb the natural drainage system in the area. As a result there is considerable concern within the area about the effects of unplanned earthworks on flooding.

Locations where earth-filling works have been carried out are situated in Kemps Creek and Tributary 2. The presence of fill in the creek bed of Kemps Creek between Gurner Avenue and Elizabeth Drive reduces the hydraulic capacity of the stream. Earth fill has also been placed immediately downstream of Fourth Avenue on Tributary 2. The presence of fill on the floodplain further exacerbates flooding by reducing the area available for flow and flood storage, thus raising flood levels. In some instances it may be more cost effective for Council to remove landfill rather than to provide mitigation measures or commence litigation.

Hydrologic and Hydraulic Modelling

Flood flows, water surface profiles and the extent of flooding have been estimated using computer models for a range of average recurrence intervals (ARI). The RAFTS and HEC-2 computer programs were adopted for the hydrologic and hydraulic modelling respectively.

The RAFTS model, used to calculate flood flows, requires the sub-division of the study catchment along interior watershed lines and assignment of catchment storage to the sub-catchments within the system. Sub-catchment slopes were derived from inspection of 1:10,000 and 1:4,000 orthophotomaps. The percentage of impervious area for each sub-catchment was also measured from the orthophotomaps and confirmed by site inspection. Initial and continuing losses for the 100 year ARI and probable maximum flood (PMF) were adopted from DWR (1990). Losses were obtained from Walsh et al (1991) for the lesser storm events. The approach for calibrating the model was to compare results achieved in previous studies. In addition, a sensitivity analysis was undertaken to test the parameters adopted. The hydrologic modelling for storms of 1, 5, 20, 100 years ARI and the PMF is described in detail in Appendix A of Perrens Consultants, 2003.

Flood levels, velocities and the extent of flooding have been defined using a one-dimensional steady state backwater computer model, based on the HEC-2 program (Hydrologic Engineering Centre, 1991). HEC-2 is a computer based application of the standard step method and uses the Manning equation to compute friction head loss between cross sections. Full details of the hydraulic modelling are contained in Appendix B of Perrens Consultants, 2003.

The topographic data needed for the HEC-2 model was obtained by photogrammetric methods from a set of low level aerial photographs taken especially for this study. These photographs were also used to prepare a set of detailed maps of the study area at a scale of 1:2000 with contour spacing of 1.0 m. For reference purposes, the cross sections used in the HEC-2 model were designated with a simple code which designated the creek and the branch of that creek, and were then numbered with the cross sections sequentially running upstream.

For example, as shown on **Figure 1.3***, the main arm of Kemps Creek is designated KC00 and four branches which drain the western side of the catchment are denoted KC01, KC02, KC03 and KC07.*

Characteristics of Flooding

General

The hydrologic and hydraulic modelling of the catchment shows a number of characteristics which are symptomatic of the flooding and drainage problems facing the area:

- *About 30% of the study area comprises naturally flood prone land. The term "flood prone" land applies to land inundated by the PMF.*
- *The creek channels generally have a small hydraulic capacity and in many areas the creek will overflow in a storm with an ARI of about 1 year. Therefore "flooding", as indicated by water flowing outside a defined watercourse, can be expected to occur frequently in the area.*
- *Flooding of road crossings is a common occurrence. There are 33 road bridges or culverts in the study area. Of these, 15 appear to have inadequate hydraulic capacity to carry the 1 year ARI flood and a further 10 have inadequate capacity to carry the 2 year ARI flood.*
- *The main floodplain of Kemps Creek, Bonds Creek and the major tributaries is relatively flat. Once a flood has broken out of the channel the flow will tend to extend across the width of the floodplain as shallow low velocity flow.*
- *The width of the floodplain provides flow capacity which allows larger flood flows to be carried with moderate increases in flood depth. Thus, in most of the main floodplain areas, the difference between the flood level for a 5 year ARI flood and a 100 year ARI flood is of the order of 0.5 m.*
- *The extra area affected by the more rare floods is relatively small compared to the area affected by relatively frequent floods as summarised in Table 2.1 below.*

Table 1.1 Area Inundated by Flooding

Flood Frequency ARI (years)	***Area Inundated (ha)***
1	*240*
5	*510*
20	*650*
100	*750*
PMF	*1,080*

Kemps Creek Main Arm and Branches

A large flood prone area exists upstream of Elizabeth Drive where Tributary 3 joins. Flows greater than 1 year ARI surcharge the channel and begin to fill the floodplain. Progressively larger areas of land are flooded up to the 100 year event, but there is comparatively little increase in the area flooded for larger floods. There is generally a range of only 1 m between 1 and 100 year ARI flows. The PMF profile is about 1 m higher still.

However, because of the shape of the floodplain there is a comparatively narrow strip averaging about 50 m on the western side of the floodplain between these two flood events. Because of the flat topography on the eastern side of Kemps Creek between Gurner Avenue and Elizabeth Drive, the extent of the PMF is as much as 200 m greater than the 100 year ARI flood.

There are several crossings which significantly restrict flow and cause ponding upstream. Elizabeth Drive, Fifteenth Avenue and Bringelly Road bridges have the highest hydrologic capacities but cause a significant afflux particularly for major flood events. At the 100 year ARI flood, for example, there is a 200 mm head difference across Elizabeth Drive, 300 mm at Fifteenth Avenue and 500 mm at Bringelly Road. Within the backwater influence of the bridge embankments, flow velocities are reduced. Culverts at Twelfth Avenue have a low hydrologic capacity and are overtopped by a 1 year ARI flood.

Average bed slopes of the four tributaries draining the western side of the catchment range between 0.7 and 1.5%, considerably steeper than in the main streams occupying the floodplain. Typically, backwater effects from Kemps Creek extend up a tributary for 100 - 200 m from the confluence. Above the zone of influence of main stream flooding, the water surface profiles tend to converge showing only around 0.5 to 1 m range between 1 and 100 year ARI floods. Apart from the Devonshire Road crossing of Branch KC01, which has a 20 year hydraulic capacity, all of the crossings are overtopped by minor floods of the order of 1 to 2 year ARI.

Bonds Creek Main Arm and Branches

The reach modelled on Bonds Creek extends over 6 km from the junction with Kemps Creek to Denham Court Road. Flows are generally contained within the creek or its immediate overbank areas up to the 1 year ARI, but larger flows spread out over a floodplain which is several hundred metres wide at the 100 year level of flooding. The channel is steeper than Kemps Creek and this results in generally higher flow velocities which average around 1.8 m/s. In the constricted areas near bridges velocities are considerably higher.

Nine bridges and culverts are located on the main waterways in this area. Road crossings generally have a hydrologic capacity around 2 years ARI except for Bringelly Road and Cowpasture Road which have a 10 year capacity. For the 20 year flood the head drop across these two structures amounts to 600 mm and 1.3 m respectively. Afflux caused by the lower level crossings is less because the roads are overtopped by even minor flooding, thereby providing a large increase in hydraulic capacity for a comparatively small increase in upstream flood level.

Tributary 1 (Scalabrini Creek)

This tributary joins Bonds Creek upstream of Seventh Avenue and extends upstream for approximately 1,200 m to Bringelly Road. The HEC-2 model cross sections were located so that the recently excavated channel downstream of Fifth Avenue was accurately modelled. The Fifth Avenue crossing has a waterway area of only 0.4 m2 and a corresponding hydrologic capacity of less than 1 year ARI.

The backwater influence of Bonds Creek extends for about 400 m upstream of the confluence. Within this reach, the range between 1 and 100 year ARI peak flood levels is approximately 1.5 m with a further 800 mm rise to the PMF. Flow velocities are around 1 m/s in the channel and 0.3 m/s on the floodplain.

Above the influence of the backwater, flow velocities increase to over 2 m/s in the channel and are dependent on the bed slope which averages about 0.55%. Between Fifth and Sixth Avenues there is a sudden drop in bed levels of around 2 m with the upstream bed acting as a hydraulic control where critical depths occur. However upstream of this point the bed slope flattens to an average gradient of 0.28 % for the remaining 550 m to Bringelly Road and velocities reduce to 1 - 1.5 m/s in the channel.

Tributary 2 and Branches

Tributary 2 joins the right bank of Kemps Creek just downstream of Fourteenth Avenue. Backwaters from Kemps Creek influence flood levels for a distance of 500 m upstream of the junction. Above this point the average bed slope over the remaining 2.6 km to Tenth Avenue is around 0.8% and the water surface profiles converge with a range of 0.5 m between the 1 and 100 year ARI.

The waterway opening at Fourth Avenue was assumed ineffective for flow although the hydraulic effect of the road, which acts as a broad crested weir, was incorporated in the model. The five crossings included in the Tributary 2 model all have a low hydrologic capacity.

Tributary 3 and Branches

Tributary 3 joins Kemps Creek 500 m upstream of Elizabeth Drive and extends over 5 km from the junction to Fourteenth Avenue. For the first 3 km above the junction with Kemps Creek, the bed slope averages about 0.57%. Backwater influences from Kemps Creek extend about 700 m upstream. Above this point, there is a range of about 1 m between the 1 year and 100 year ARI flood levels and a further 1 m to the PMF. As with the other major streams, flows above 1 year ARI spread out over the floodplain. Flow velocities in the channel at the 100 year ARI level are generally less than 1 m/s, and 0.5 m/s on the floodplain.

Upstream of Eighteenth Avenue the bed slope increases, averaging 1% in the remaining 2 km to Fourteenth Avenue, which is the upstream limit of modelling. Channel velocities generally increase to 1.5 - 2 m/s except in the ponds upstream of road crossings. The water surface profiles converge and have a range of less than 0.5 m between the 1 and 100 year ARI. There are five culverts in this reach all of which have a hydrologic capacity no greater than 1 year ARI.

Parsons Brinckerhoff (2010) "South West Rail Link Glenfield to Leppington Rail Line, Environmental Assessment Technical Paper 3 Hydrology, Prepared by WMAwater for Transport Infrastructure Development Corporation, 64 pp.

As described by WMAwater, 2010*, the proposed South West Rail Link (SWRL) will provide an important public transport link for proposed new residential areas in the south west of Sydney (see* **Figure 1.4***).*

The SWRL is being delivered as a two-stage process, comprising:

- *Glenfield Transport Interchange - delivery of all components associated with the Stage A and Stage B1 works as defined in the Concept Plan, as well as additional early works approved under Part 5 of the EP&A Act (in separate Review of Environmental Factors reports)*
- *Glenfield to Leppington Rail Line - delivery of all components associated with the Stage B2 works.*

The hydrology study forms part of the Environmental Assessment (EA) which has been prepared to satisfy the assessment and project approval requirements for the SWRL Stage B2 works (which are hereafter referred to as the 'Glenfield to Leppington Rail Line' or `the project') under Part 3A of the Environmental Planning and Assessment Act (EP&A) 1979.

Objectives

The key purpose of the investigation was to identify potential hydrologic impacts associated with the proposed Glenfield to Leppington Rail Line and to recommend mitigation measures to inform detailed design.
The types of hydrologic impacts considered include environmental issues (such as impacts on fish and fauna passage, water quality and changes in flow regime), flood impacts (such as changes in peak flows, flood levels, velocities and hazards) and flood risk to existing and proposed infrastructure.

Study Area

The proposed Glenfield to Leppington Rail Line crosses the Bunbury Curran Creek floodplain as well as the upper tributaries of Cabramatta, Bonds and Kemps Creeks. The proposed Edmondson Park Station is to be located between Maxwells Creek and one of its tributaries (Maxwells Creek is a tributary to Cabramatta Creek). Leppington Station would be sited between Bonds and Scalabrini Creeks (a tributary of Bonds Creek).

The catchment areas upstream of the Glenfield to Leppington Rail Line are varied in respect of their size and degree of urbanisation. The catchments considered in this assessment range in size from around 3 hectares up to areas of approximately 750 hectares (Figure 2). For the most part, the catchments consist of cleared pastoral or naturally vegetated lands. Some areas are relatively open and consist of rural-residential or relatively low density development, while others have minimal development and are heavily vegetated. Future development is expected to significantly alter the nature of the catchments, particularly in the vicinity of the Edmondson Park and Leppington town centres.

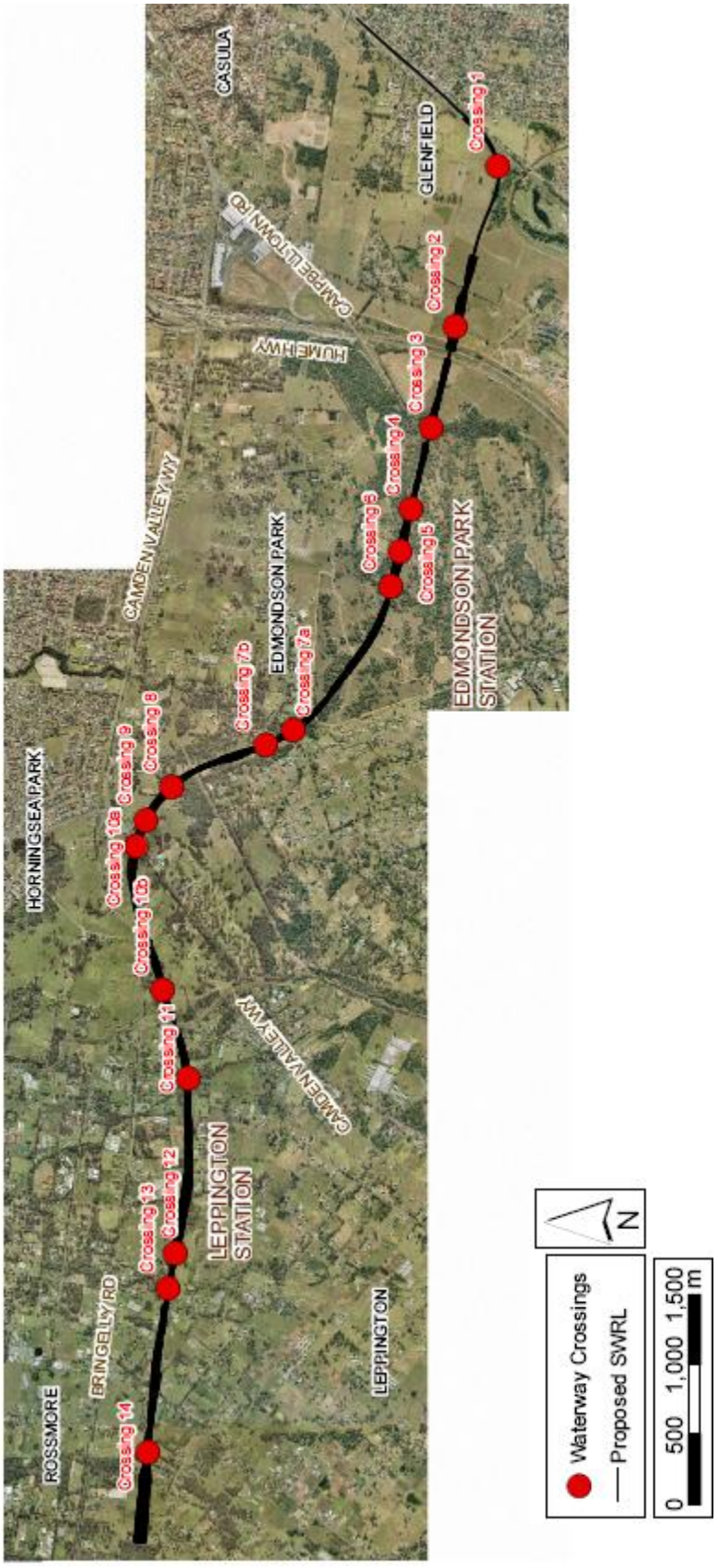

Figure 1.4 Alignment of SWRL and Location of Proposed Crossings (after WMAwater, 2010)

Future land use planning associated with the South West Growth Centre (SWGC) was considered in the investigation. For Edmondson Park, information on proposed future land use

was sourced from the Edmondson Park Precinct Development Control Plan. This information was used to establish the flood models (both hydrologic and hydraulic models) to represent both pre- and post- Glenfield to Leppington Rail Line development conditions. Future land use planning was also taken into consideration in the assessment of riparian corridors, blockage potential at the waterway crossings and the consequences of flood impacts.

For Leppington, no proposed land use information was available for the wider catchment. In the absence of land use planning information, design parameters similar to those adopted for the Edmondson Park assessment were adopted at Leppington within the hydrologic models (defining the conversion of rainfall to runoff from the catchment). Hydraulic model layouts, consideration of riparian significance and blockage potential of waterway crossings were based on existing conditions.

Hydrologic related issues were broadly divided into environmental requirements and flood related issues (including flood impacts and risks).

Environmental Considerations

The assessment of environmental requirements for the waterway crossings considered the relevant guidelines for the passage of fish and fauna, the significance of the riparian habitat present (including the former Department of Water and Energy's (now the Department of Environment, Climate Change and Water) (DECCW) stream classification) and included consultation with the Department of Primary Industries (DPI) and DECCW. Recommendations were provided on waterway crossing treatments that are compatible with the significance of the riparian corridor at each crossing. In locations where culverts are to be implemented, appropriate measures should be incorporated into the design to promote fish and fauna passage. These types of measures including setting the culvert inverts lower than the creek invert would minimise any vertical barriers and make provision for a natural bed for the base of the culvert. In the case of multiple cells, a lower central cell should be provided for low flows, whilst still allowing for dry fauna passage through the higher cells.

The proposed Glenfield to Leppington Rail Line has the potential to impact on water quality during both the construction and operational phases of the project. To this end, the potential for erosion and sedimentation from cuttings, embankments and scouring downstream of culverts as well as polluted runoff due to oils, greases and gross litter, etc. would need to be controlled in accordance with all statutory and environmental protection requirements. Minimum environmental management requirements would need to include appropriate erosion and sediment control measures in accordance with Managing Urban Stormwater: Soils and Construction, Edmondson Park Precinct DCP (Reference 1) and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). The appropriate water quality treatment measures are to be incorporated into the detailed drainage design.

Flood Impact and Risk

The flood assessments undertaken for the study were based on the Glenfield to Leppington Rail Line Concept Design prepared by Aurecon AECOM Joint Venture (TIDC's technical advisor). The assessment analysed flood risk and impacts, the outcomes of which were used to determine the size of proposed waterway crossings and other significant watercourse works/modifications. The design criteria adopted for the assessment is based on appropriate design standards and objectives and considered the consequences of waterway blockage by flood debris, the effects of climate change and the potential impacts on existing and future development. The design standard adopted for the sizing of waterway crossings was based on the 1 % Annual Exceedance Probability (AEP) (1 in 100 year) design storm event. This was considered appropriate in general circumstances, although design decisions also need to consider the flood risks arising from any failure of the drainage system (where "failure" could mean, for example, system capacity is exceeded due to the volume of floodwaters, blockage by debris, or a combination of both).

A number of locations were identified where there is the potential for significant flood risks in storms larger than the 1 % AEP (1 in 100 year) event and/or overflows due to a substantial amount of culvert blockage. This is especially relevant to the area at and around the proposed Edmondson Park Station (Crossings 4 to 6).

Flood risks were also identified at proposed electrical substations, proposed stations and commuter carparks, in addition to potential site compounds, stockpile sites and construction access roads.

Climate Change Impacts

Work by Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Bureau of Meteorology (BOM) on climate change impacts is currently in its infancy and is an active area of research. However, general trends from research to date indicate that there is a potential for climate change to result in more intense rainfall during extreme storm events. Consequently, climate change impacts could potentially increase the likelihood of flows in excess of the design standard.

Locations where climate change impacts have been identified as a potential flood risk are also locations where there is a risk of culvert blockage. At these locations the assessment process has involved consideration of both blockage and climate change risks. However, risk and impacts of blockage are significantly greater than those due to climate change. Therefore, additional culvert capacity that has been provided at critical locations to allow for blockage should also accommodate potential increased flood risk due to climate change.

The proposed crossings that are located within the Austral and Leppington North Precincts (as defined by the extended precinct boundaries) include Crossings, 8, 9, 10a, 10b, 11,12, 13 and 14 (refer **Figure 1.4**). These crossings are discussed by WMAwater, 2010 as follows.

> *CH. 47.500 drains a relatively small catchment that largely runs parallel to the rail alignment. In this location the existing watercourse would need to be diverted to run along the base of the embankment. It is recommended that provision be made to convey flows up to the 1 % AEP (1 in 100 year) design storm along the rail corridor to discharge at Crossing 8. The partial diversion is not expected to have a significant effect either on peak flows or the existing flow regime.*
>
> *In the vicinity of Crossings 8, 9 and 10a there are localised areas where the proposed rail embankment encroaches on the existing floodplain, restricting the conveyance of floodwaters and creating impacts on adjacent areas. During future design stages it would be necessary to make provision in the design of drainage works to provide for the conveyance of floodwaters along the rail corridor to manage impacts on adjacent properties. This may require widening of the rail corridor.*
>
> *Crossing 10a is located where the rail alignment crosses Camden Valley Way. The existing watercourse runs along the proposed location for the rail embankment. Consequently, it would be necessary to realign the existing watercourse downstream of Crossing 10a to run along the base of the rail embankment to Crossing 9. This would result in flood impacts on the property immediately downstream of Crossing 10a. However, it is understood that this property is to be acquired and would become open space in future land use planning for the area. Therefore, flood impacts are considered acceptable for the proposed land use. Crossing 10b is located to the east of Crossing 11 and the Sydney Water Upper Canal. This crossing drains a small catchment and the design can be fully addressed in future design stages. Diversion of this crossing through to Crossing 11 is not recommended as flows would likely impact on the Sydney Water Upper Canal.*
>
> *The Sydney Water Upper Canal, supplying water to Prospect Reservoir, crosses the rail alignment approximately 200 m west of Crossing 10b. Provision would need to be made in the detailed design to divert all track drainage away from the canal. A suitable design standard for track drainage in the vicinity of the canal should be adopted in consultation with the Sydney Catchment Authority.*
>
> *Crossing 11 is located on Bonds Creek. While this crossing is largely conventional, it drains a sizable catchment (781 Ha). A bridge would be preferable to a series of culverts as it would be less susceptible to blockage as well as providing a more environmentally appropriate solution. However, the final design should also be guided by proposed land use upstream (and therefore the potential for generation of blockage material). The nature of proposed land use upstream is currently subject to the final masterplan for the Leppington town centre, however planning to date indicates that the creek corridor would remain in its natural state, maintaining the crossings susceptibility to blockage. Due to the broad nature of the floodplain at this location a combination of bridge over the main creek with culverts to convey flows from the overbank areas is likely to be the most cost effective solution whilst also addressing the various flood and environmental related requirements.*
>
> *Leppington Station is located between Crossings 11 and 12. While the station is located in a*

cutting, it is situated outside the floodplain and any flood risk can therefore be managed through appropriate drainage design at the detailed design stage.

Crossing 12 drains a relatively small catchment that largely runs parallel to the rail alignment. Part of the proposed rail embankment sits over the existing watercourse. In this location the existing watercourse would need to be diverted to run along the base of the embankment. It is recommended that provision be made to convey flows up to 1 % AEP (1 in 100 year) design storm along the rail corridor to discharge at Crossing 13. The partial diversion is not expected to have a significant effect either on peak flows or the existing flow regime.
Crossings 13 and 14 are located on Scalabrini and Kemps Creeks respectively. Detailed flood modelling was undertaken at these crossings to define flood behaviour and assess flood impacts. Both of these crossings drain large catchment areas and therefore bridges are recommended in preference of a series of box culverts to minimise the potential for blockage and maintain riparian connectivity. However, the final design should also be guided by the proposed land use upstream which is subject to the final masterplan for the Leppington release area. Flood modelling has been undertaken to provide a preliminary assessment of the required bridge span between abutments. Pier arrangements and channel works would need to be confirmed through hydraulic assessment in future design stages.

A train stabling facility is proposed to the west of Crossing 14. This facility poses a footprint of approximately 3.7 hectares. Hydrologic modelling shows that the facility would have negligible impact on peaks flows in Kemps Creek. However, mitigation measures would be required to control pollutants entering the downstream creek and scouring at drainage outlets.

General Findings and Recommendations

Preliminary sizings were developed for waterway crossings where culverts are proposed such that flood impacts are generally negligible or manageable for events up to and including the 1 % AEP (1 in 100 year) storm.

At all the waterway crossings where hydraulic modelling was undertaken, the results (for an unblocked waterway crossing) indicate that for flood events up to and including the 1 % AEP (1 in 100 year) event any adverse flood level impacts upstream of the waterway crossings would generally be contained within the rail corridor. Any adverse impacts on adjacent land could be managed in the design of inlet treatments and surface drains in the future design stages. The design and extent of this drainage would need to be confirmed through flood modelling in future design stages. Future design of inlet works should also include a refinement of the preliminary culvert sizings presented in this 2010 assessment.

For crossings that are proposed to be bridged (Crossings 7a, 11, 13 and 14), further hydraulic assessment would be required in future design stages to guide channel works upstream and downstream of the crossing and final pier and span arrangements. There are some areas, particularly in the vicinity of Crossings 8, 9 and 10a where the proposed rail embankment encroaches on the existing floodplain, restricting the conveyance of floodwaters and creating impacts on adjacent areas. During future design stages it would be necessary to provide adequate drainage works such as diversion drains to provide for the conveyance of floodwaters along the rail corridor to manage adverse flood impacts on adjacent properties.

The design of these diversion drains would need to be confirmed through detailed flood

modelling and may require local widening of the rail embankment to accommodate such works.

The analysis indicates that flood behaviour at many of the proposed waterway crossings is sensitive to blockage. Consequently, an assessment has been made of the potential for blockage (based on the nature of the upstream catchment and proposed land use) and consequences of blockage. Where appropriate, mitigation measures have been proposed to reduce the potential for blockage at each location. Such measures include the provision of debris control structures at the inlet, providing additional waterway area (eg. additional culverts) to allow for blockage, or adopting a bridge structure in lieu of culverts.

As discussed by Perrens Consultants, 2003, previous flood studies have been carried out for the South Creek catchment and its tributaries by the former Department of Water Resources (DWR) and various consultants.

DWR produced the South Creek Flood Study Report in July 1990 (DWR, 1990). The hydrologic component of that study was carried out using the RAFTS rainfall/runoff package. The hydrologic model was calibrated using data from floods that occurred in 1986 and 1988. In constructing their RAFTS model, DWR measured subcatchment areas and slopes from 1:10,000 and 1:4,000 scale orthophotomaps. Cross sections along Kemps Creek, which had been surveyed for a previous DWR flood study (DWR, 1985), were used in the channel routing component of RAFTS.

Subsequently, Willing and Partners, produced the South Creek Floodplain Management Study for DWR (DWR, 1991). This investigation used flows generated from DWR's RAFTS model as input to two hydraulic models. The two models were set up using MIKE-11, an unsteady flow model, and HEC-2, a steady state model. MIKE-11 was used to model flood behaviour in South Creek and the lower reaches of Ropes Creek, Kemps Creek and Badgerys Creek. HEC-2 was used on other tributaries, including Kemps Creek upstream of Elizabeth Drive. Bonds Creek was not modelled.

In 1994, Kinhill Engineers Pty Ltd prepared a Floodplain Management Study for Overett and Victor Avenues for Liverpool City Council (LCC, 1994). The objective of that study was to investigate and develop measures to mitigate flooding of South Creek. The study was based on the DWR's MIKE-11 model. The area investigated for that study does not form part of the present study area. The Kinhill study did, however, provide useful background information to the 2003 Austral Floodplain Management Study (Perrens Consultants, 2003).

Prior to these studies, the Austral Drainage Study was prepared by D.J. Dwyer and Associates Pty Ltd for Liverpool City Council in 1979 (LCC, 1979). However, that study pre-dated the current version of Australian Rainfall and Runoff first released in 1987 and is largely superseded with regard to design storm hyetographs (Perrens Consultants, 2003). In addition, the major channel improvements which were recommended were not implemented.

1.3 This Study

As part of the assessment of the provision of water cycle management services to the two Precincts flooding and ecology studies have been undertaken based on Ecologically Sustainable Design (ESD) principles:

- that are acceptable to the NSW Office of Water, Sydney Water and Council, and which contributes to relevant water quality and ecological objectives;
- that meet identified stormwater targets contained within the Growth Centres Development Code and Council's relevant guidelines;
- that are consistent with Biodiversity Certification and Relevant Biodiversity Measures and protects existing ecological diversity and promotes retention of natural habitat;
- that effectively and efficiently manages stormwater quality and quantity within the catchment;
- which meet potable water supply conservation targets and identifies sustainable integrated options for water supply, wastewater and stormwater servicing;
- which optirnise the land take to implement the above strategies with consideration for integration with urban design, salinity risk and riparian corridor protection measures; and
- which addresses local and regional flood risk management impacts.

The information supplied by various stakeholders is listed in **Appendix A**.

The assessment of Riparian Corridors is described in **Section 2**. Site inspection photographs are collated in **Appendix B**.

The hydrology assessment is described in **Section 3** and **Appendix C**.

The assessment of hydraulics is described in **Section 4** and **Appendix D**.

2 Riparian Corridors

2.1 Context

Controlled activities carried out in, on or under waterfront land are regulated by the *Water Management Act 2000* (WMA). The NSW Office of Water (NOW), part of the Department of Energy, Climate Change, and Water [DECCW], is required to assess the impact of a controlled activity to ensure that minimal harm will be done to any waterfront land that is within 40 metres from a river, lake or estuary. This means that a controlled activity approval must be obtained from the Department prior to carrying out a controlled activity.

Riparian corridors form a transition zone between terrestrial and aquatic environments and perform a range of important environmental functions which include, inter alia, reduced risk of stream erosion, trapping sediment, and pollutants from adjacent landuse, provide wildlife corridors, and allow for conveyance of flood flows and control the direction of flood flows.

The protection or restoration of vegetated riparian areas is important to maintain or improve the geomorphic form and ecological functions of watercourses through a range of hydrologic conditions in normal seasons and also in extreme events.

When determining an appropriate width for a riparian corridor and how much riparian vegetation should be protected or re-established on a site, the following three riparian corridor zones are considered.

1. A Core Riparian Zone (CRZ) is the land contained within and adjacent to the channel. The intent is to ensure that the CRZ remains, or becomes vegetated, with fully structured native vegetation (including groundcovers, shrubs and trees). The width of the CRZ from the banks of the stream is determined by assessing the importance and riparian functionality of the watercourse, and the merits of the site and long-term use of the land. Infrastructure such as roads, drainage, stormwater structures, services, etc. are not normally allowed within the CRZ.
2. A Vegetated Buffer (VB) protects the environmental integrity of the CRZ from weed invasion, micro-climate changes, litter, trampling and pollution. Infrastructure such as roads, drainage, stormwater structures, services, etc. within the VB should be minimised. The recommended width of the VB is 10 metres but this depends on merit issues.
3. An Asset Protection Zone (APZ) is a requirement of the NSW Rural Fire Service and is designed to protect assets (houses, buildings, etc.) from potential bushfire damage. The APZ is measured from the asset to the outer edge of the vegetated buffer (VB). The APZ should contain cleared land which means that it cannot be part of the CRZ or VB. The APZ must not result in clearing of the CRZ or VB. Infrastructure such as roads, drainage, stormwater structures, services, can be located within APZs.

The final CRZ width is determined after a merit assessment of the site and consideration of any impacts of the proposed activity. CRZ widths are measured from the top of the highest bank and on both sides of the watercourse and normally vary according to the order of the watercourse as defined by the Strahler method or the Riparian Corridor Management Strategy (RCMS).

The stream order described in **Table 2.1** is similar, but are not to be confused with, the definitions of three categories that define environmental objectives under the RCMS. These objectives are described in Table 2.2.

Table 2.1 Recommended CRZ widths as defined by the Strahler Method

Types of Watercourse	CRZ Width (M)
Any first order watercourse and where there is a defined channel where water flows intermittently	10
Any permanently flowing first order watercourse, or Any second order watercourse, and Where there is a defined channel where water flows intermittently or permanently	20
Any third order watercourse or greater watercourse and where there is a defined channel where water flows intermittently or permanently. Includes estuaries, wetlands and any parts of rivers influenced by tidal waters.	20 ~ 40

Table 2.2 RCMS Stream Category

Stream Category	Environmental Objective	CRZ Width (m)	VB Width (m)
1	Environmental Corridor – Connection of key destinations for riparian connectivity to assist with retention and movement of aquatic and terrestrial flora and fauna. Significant remnant of native vegetation, defined as greater than 6ha, are often triggers for an environmental corridor. Other aquatic features that are considered significant include chain of ponds, wetlands, salt marsh, back swamps, vegetation of state/regional significance and threatened species.	40	10
2	Terrestrial and Aquatic Habitat – A waterway of lesser value to a category 1 stream. Notwithstanding the CRZ is to permit refuge and habitat for native flora and fauna.	20	10
3	Bank Stability and Water Quality – This category generally applies to first order streams according to the Strahler method and are commonly degraded tributaries that hold limited potential to support flora and fauna.	10	0

Source: *Riparian Corridor Management Strategy*, Department of Water and Energy 2004

NOW conducted a site investigation and undertook a preliminary categorisation of streams for the study area to assist with the Riparian Assessment. The documentation included a letter with an attached map indicating preliminary stream categories, locations where further investigations were required and mapped blue lines that are not regarded as rivers.

2.2 Methodology

2.2.1 Study Inputs

The following data sources were used in the assessment (refer **Appendix A**):

- GIS layers supplied by NSW DoP including aerial photography, cadastre, roads, non-certified land, land use, flood extents;
- Stream location and category GIS layers provided by NOW;
- ALS supplied by NSW DoP; and
- Preliminary watercourse assessment undertaken by NOW dated 7th July 2010 (refer **Appendix B**)

2.2.2 Stream Category

A combination of visual, topographic survey, geospatial, ecological and literature reference methods were employed for the riparian assessment. The approach to identifying the stream categories is outlined as follows:

1. Review of preliminary stream category mapping by NOW;
2. Geospatial mapping of the study area using stream category layers provided by NOW;
3. Site inspection that included photograph, stream index proforma completion, GPS survey and hand sketches;
4. Topographic analysis using ALS and GPS survey undertaken on-site to re-align centre lines of the streams;
5. Preliminary stream order identification using Strahler method;
6. Geospatial mapping to identify key destinations and significant vegetation;
7. Identification of stream categories using the RCMS;
8. Presentation of preliminary stream categories to NOW; and
9. Revise stream categories according to response from NOW.

2.2.3 Riparian Corridor Delineation

In order to delineate the riparian corridor it was necessary to identify the top of the highest bank that could be used as a basis to offset the riparian corridor boundaries. Due to the size of the study area and limitations on access to private properties there was not sufficient resources available to identify the top of bank by ground survey.

The methodology to identify the “top of bank” was as follows:

1. Create a terrain model using the ALS;
2. Map the slope of the terrain using different colours to identify zones of various slopes;
3. Digitise a line along the interface between the floodplain and stream channels. This was identified as a clear difference in the slope shades indicating a sharp change in slope that would occur from the floodplain to a channel;
4. Verify the location of the digitised line by visual assessment of aerial photography;
5. Undertake ground survey with GPS in areas where the resolution of the terrain model could not identify a stream and at selected road crossing to identify the top of bank;
6. Verify the location of top of bank with GPS survey undertaken in the field.

In general the above methodology was easy to apply the identification of Category 1 and some Category 2 streams. In many cases the resolution of the ALS was insufficient to identify local changes in slope in the smaller streams. In addition, it was not possible to survey these streams by GPS due to access restrictions as the majority of these streams flow through private property. In cases where the top of bank could not be identified using the methodology described above a generic width for the stream was applied by offsetting the stream centreline on both sides. The widths chosen reflect on-site measurements undertaken with the GPS and range finders as summarised in **Table 2.3.**

Table 2.3 Generic Stream Width by Stream Category

Stream Category	Width Measured (m)	Generic Width (m)
1	6-22	20
2	5-12	10
3	3-5	5

Digital layers for the top of bank were supplied to NSW DoP in the form of GIS layers. The scale of the map of the riparian corridors is too great to show the top of bank. Therefore we provide a typical detailed plan indicating the top of bank, riparian corridor and stream category in **Figure 2.1**.

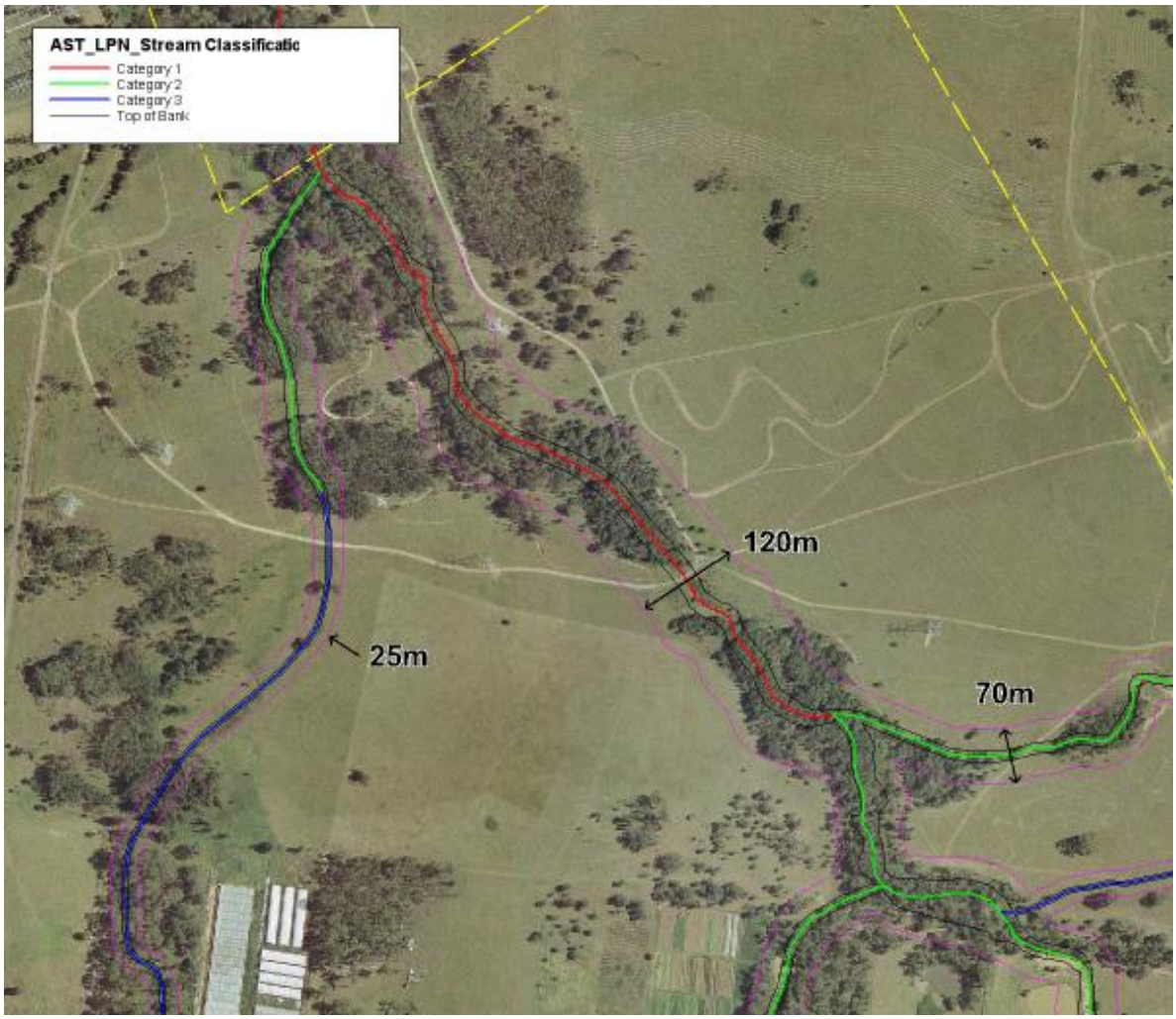

Figure 2.1: Top of Bank and Riparian Corridor Delineation

2.3 Results

Streams are categorised as shown in **Figure 2.2** with details included in **Table 2.4**.

Table 2.4 Stream Category Schedule

ID	Category		Comments
	NOW	Cardno	
Kemps Ck	1	1	Excavated earth channel, 6-16m wide and up to 3m deep, fill from creek excavation dumped on banks. Negligible in-stream habitat with weed invasion and minor erosion. High category riparian vegetation (Alluvial and shale plains woodland) remains along length of the creek with some instances of clearing (15th Ave). Some permanent dry-weather flows observed with pools and reworking of sediment in-stream observed
Bonds Ck	1	1	Excavated earth channel, 8-22m wide and up to 3m deep, fill from creek excavation dumped on banks. Numerous crossing exist that could limit the potential for connectivity. High category riparian vegetation (Alluvial and shale plains woodland) remains at the downstream end with some remnants upstream.
Scalibrini Ck	2	2	Excavated earth channel with some sharp bends and straight segments at the downstream end and higher sinuosity further upstream. High modification has occurred by filling, diversion and dams. Limited opportunity exists for high flora and fauna habitat.
1-8			Outside of Study Area
9	1	NR	This stream is more of a flood channel approx 5m wide. Flow from the catchment is spread across the floodplain rather than concentrated in a channel. Thus this stream is not regarded as a river.
10	2 & INV	3 & NR	The investigation of the upstream reach of this stream indicated that the channel had been filled and no longer exists. The initiation of a channel begins where the identification of a category 3 stream begins that has a catchment of 15ha. No significant flora, fauna or geomorphic units exist.
11	INV	3	The investigation indicated that the channel had been filled and no longer exists. The catchment for this stream is 15ha and there is a 3.5ha stand of med priority vegetation (Shale plain woodlands) at the upstream end.
12	INV	3	The investigation indicated that the channel had been filled and no longer exists. The catchment for this stream is 21ha and there is a 5.2ha stand of med priority vegetation (Shale plain woodlands) at the upstream end.
13	INV	NR	No evidence of a stream was found through site inspection or by interrogation of the terrain model. Not regarded as a river.
14	INV	NR	No evidence of a stream connecting to Kemps Creek was found through site inspection however some form of channel exists upstream that has been diverted and filled with 2 farm dams. Not regarded as a river.
15	Half 2 half 3	Half 2 half 3	Discontinuous channel 2-3m wide by 0.5m deep with 2.6ha of high category vegetation (Shale plain woodlands) in the mid reaches. Not regarded as a defined channel or of high ecological value.
16	Half 2 half 3	Half 2 half 3	Modified stream as a result of farm dam and general fill/rubbish dumping. Bank stability and erosion control required only.
17	INV	3	Discontinuous channel 2-3m wide by 0.5m deep that has no connection with dam upstream. Not regarded as a defined channel or of high ecological value. Sydney water canal crossing in headwaters.

ID	Category		Comments
	NOW	Cardno	
18	INV	2	Continuous channel 5-8m wide and up to 1.5m deep with some reworking taking place in the form of head-cut and bank scour. A stream corridor greater than a category 3 is required to ensure stream stability.
19	INV	1	Discontinuous channel 3-5m wide and up to 1m deep with permanent water flow and significant high category vegetation (Alluvial Woodland). An environmental corridor is required to conserve flora and maintain connectivity.
20	Half 1 half 3	3 in the precinct	Modified stream as a result of filling by electric sub-station. Bank stability and erosion control required only
21	2	2	Modified stream as a result of filling by rural residential properties, 5-10 wide and up to 1m deep. Some med category vegetation exists (Alluvial and Shale plain woodlands)
22	3	3	Channelised stream 3-5m wide and 0.5-1m deep. Channel completely filled upstream of 15th Ave. Not regarded as a river upstream.
23	3	3	Modified stream as a result of filling by rural residential properties, 2-3m wide and up to 0.5m deep. Some med category vegetation exists (Shale plain woodlands).
24	3	3	Wide shallow channel, much like a grass swale, bank stability required only.
25	3	3	Channelised stream ~3m wide by 0.5-1m deep. Some med category vegetation exists. Sydney water canal crossing in headwaters.
26	1	2	This stream has significant stands of high category vegetation at the headwaters and at the end of the stream. However the stand at the headwaters has connectivity to the Western Sydney Parklands to the east and the stand at the base is connected to Kemps and Bonds creeks. Other vegetation along the stream is <3ha stands of med category or <4ha stands of high category veg.
27	1	3	For similar reasons given in stream #26 this is not considered to require an environmental corridor. Bank stability required only.
28	NR	NR	Not regarded as a river
29	3	3	Degraded tributary to stream #26 with a single 4ha stand of existing high category vegetation upstream.
30	3	NR	The stream shown on the topographic map is not clearly defined in aerial photography or in terrain model. Site inspection identified dams with excavated channels and no defined waterway.
31	3	3	Channelised stream 2-3m wide and 0.5-1m deep. Limited existing vegetation exists, predominantly cleared.
32	3	3	Undefined channel with farm dams on-line. Some medium priority vegetation exists.
33	NR	NR	Not regarded as a river
34	3	3	Channelised stream 2-3m wide and 0.5-1m deep. Approx 12.5ha of medium category vegetation exists (shale plains woodland) on the mid to upper reaches.
35	3	3	Channelised stream 1-2m wide and 0.5m deep that his highly modified. Limited vegetation exists (Shale hills woodland), predominantly cleared and modified through rural residential development.

ID	Category		Comments
	NOW	Cardno	
36	1	1	Channelised upper reach of Kemps Creek 4-6m wide and up to 2m deep. No significant vegetation existing within 500m upstream of the study area boundary and the stream is predominantly cleared and highly modified with intermittent flow.
37	1	1	Channelised upper reach of Kemps Creek 2-4m wide and up to 1m deep. Significant vegetation exists that requires connection to the Kemps Creek corridor.
38	2	2	Degraded waterway 1-3m wide and 0.5m deep confined within broad valley floor with some medium category vegetation and high weed invasion. Intermittent flow observed.
39	2	3	Small tributary within confined valley that will be impacted by the proposed railway. Small stand of high category vegetation (Shale hills woodland) that will be cleared in light of the railway.
40	2	3	Small tributary within confined valley
41	2	3	Channelised drain for rural residential properties with 4ha med category vegetation (Shale hills woodland) that is not categorized and will be cleared.
42	2	2	Cleared stream running through cemetery and rural residential properties with several large dams. Vegetation exists that requires connectivity.
43	2	2	Cleared stream running through cemetery and rural residential properties with several large dams. Vegetation exists in the headwaters only and is well clear of the study area.

INV – Stream marked for further investigation by NOW

NR – Stream not regarded as a river

2.4 Discussion

The agricultural land use, flood control and infrastructure development within the study area has disturbed the area and the degradation of nearly all vegetative communities and riparian systems has been the result. Anthropogenic activity such as land clearing, major earthworks (cut and fill), creek excavation and stream crossings are the major causes. The presence of weeds, isolation of vegetation patches and lack of significant diversity within the majority of sites has led to a generally low ecological value across the site.

The aquatic ecology of the creek systems is highly disturbed and in poor condition. Minimal aquatic fauna was recorded during site testing that revealed only 8 fish species, 3 of which were pests (Cardno 2011). Permanent water flow and in-stream pools were observed in Kemps, Bonds Creek and stream #19. Water quality was generally poor with high concentration of suspended sediments and the presence of minor algal blooms at some locations. The creek banks were generally eroded, steep and devoid of understorey vegetation lack complex structure or habitat.

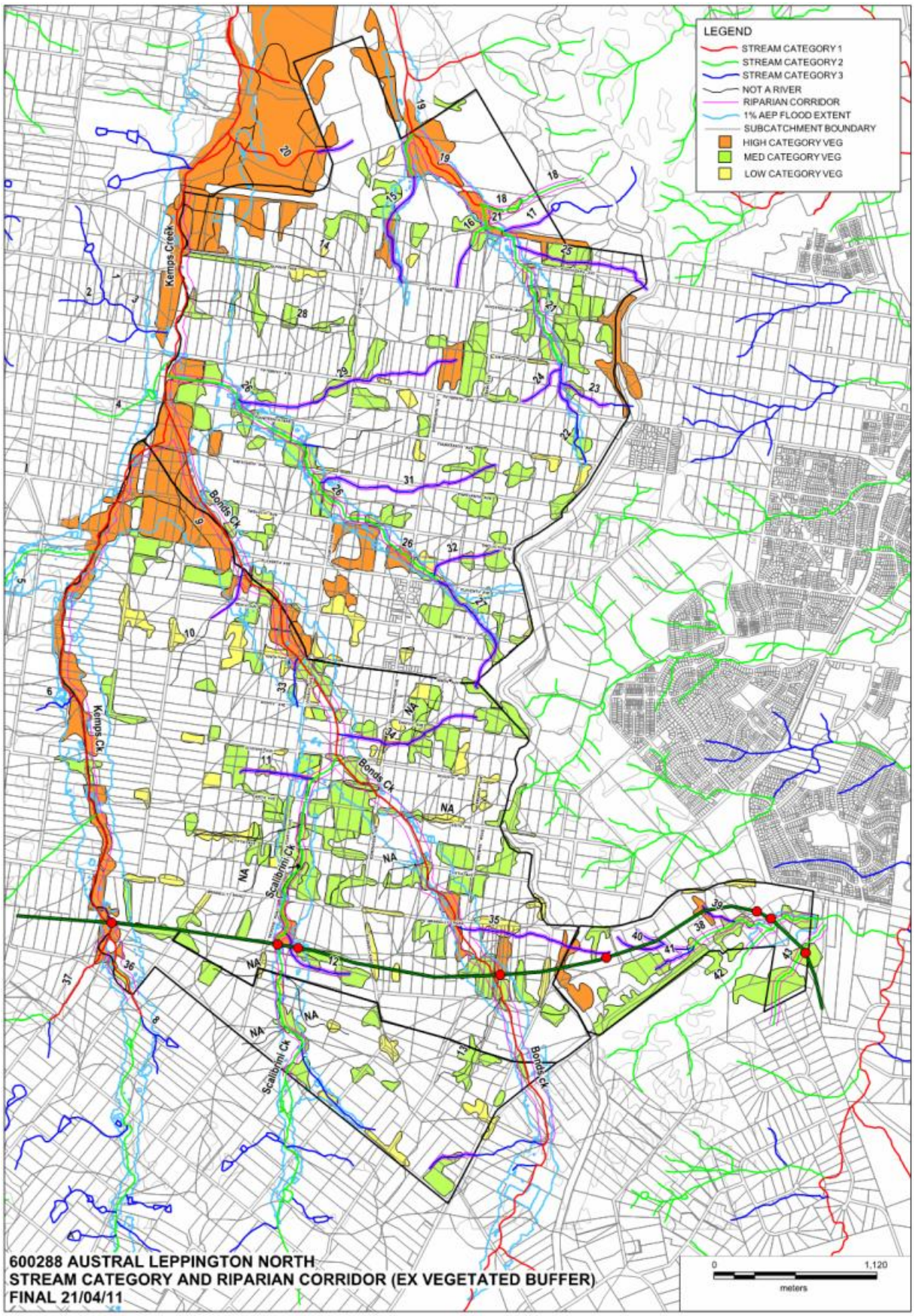

Figure 2.2: Stream Categories

The topography of the study area is low relief and includes low rise plains with inset channels. As a result the flow behaviour is defined by the capacity of the channel being less than the 1 year ARI, numerous creek crossings and the broad expanse of the floodplain. Flows in excess of channel capacity spread out across the flood plain with flow widths of up to 300m in the 1year ARI on Kemps and Bonds Creek. There have been efforts to increase the capacity of the channel, as observed in Kemps Creek and Bonds Creek, however the capacity is the 1 year ARI at best. As a result the majority of the streams exhibit limited in-stream variation with minimal reworking of stream bed and banks. Therefore streams are currently stable for the most part that would allow success of rehabilitation techniques. Opportunities for rehabilitation include water quality control, removal of unnecessary crossings and establishment of riparian corridors.

The riparian corridors are recognised as the primary opportunity to both preserve the existing vegetation and to improve the aquatic and terrestrial habitat. Riparian corridors contain much of the higher quality vegetation and act as the primary wildlife corridors within the Precincts. The inclusion of Environmental Corridors on Kemps, Bonds Creek and Stream # 19 will conserve high quality vegetation and permit vegetation associations to increase with the assistance of water quality control (WSUD) and bush regeneration.

Active bush regeneration is recommended following establishment of the riparian corridors in order to increase the quality of the corridor. Ongoing regeneration activity during the vegetation establishment period will assist in sustaining the riparian corridor. Improvement of the in-stream environment will naturally follow as water quality and vegetation associations improve, they will in-turn provide natural variations of in-stream activity. The inclusion of understorey vegetation, large woody debris and fauna will transform the streams from their static degraded condition to a naturally active stream that provides opportunity for the return of aquatic habitat and geomorphic features.

Terrestrial and Aquatic Habitat corridors have been proposed on category 2 streams, namely Scalibrini Creek and Stream #26 that traverse a large portion of the precinct. These streams are of a slightly lesser value than the Environmental Corridors.

The streams both support a lesser area of high quality vegetation and are associated with smaller catchments being tributaries to Kemps Creek (#26) and Bonds Creek (Scalibrini Ck). The corridor widths proposed are sufficient in providing adequate stability for the creek banks and encourage vegetation associations and improvement of in-stream habitat.

Numerous Category 3 streams are included across the study area for smaller tributaries to the aforementioned streams. These streams are currently highly degraded and have, for the most part, been completely diverted, channelized and used as landfill in some cases. Corridors for these streams have been proposed to ensure bank stability and erosion control.

Various other streams that were identified on the topographic maps have been regarded as not a river and eliminated. This has been undertaken through liaison with NOW.

3 Hydrology

3.1 Aims

The aims of hydrological analyses were to

- Assemble an **xprafts** rainfall/runoff model of the catchment draining through the Austral and Leppington North Precincts;
- Estimate catchment runoff under existing catchment conditions as a benchmark for comparison with proposed development conditions for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events;
- Estimate catchment runoff under proposed Development conditions ascertain the impacts of the proposed development for the 2 yr ARI and 100 yr ARI events;
- Assess the impact of 10%, 20% and 30% increases in 100 yr ARI rainfall on runoff under Development Conditions and
- Size regional detention structure(s) to reduce as far as possible the 2 yr ARI and 100 yr ARI peak flow downstream of the proposed development areas to no greater than peak flows under Existing Conditions.
- Assess the ramifications of climate change on the volumetric requirement for structural flood risk management measures.

The hydrological analyses of the Austral and Leppington North Precincts are described in detail in **Appendix C**.

3.2 Rainfall-Runoff Modelling

The **xprafts** rainfall/runoff package has been adopted previously for hydrological analyses in the South Creek and Eastern Creek catchments. The **xprafts** rainfall/runoff package was also adopted for this study.

The catchment model and parameters are outlined in **Appendix C.2**

3.3 Existing Conditions

Perrens Consultants, 2003 did not report any historical events within the study catchment that could be used to calibrate the hydrological model. Instead the 2003 model relied upon rainfall loss values and model parameters reported in preceding studies of the South Creek catchment. Sensitivity tests were also undertaken.

Consequently the **xprafts** rainfall/runoff model which was assembled of the catchment draining through the Austral and Leppington North Precincts was tested against peak flows reported at selected locations as reported by Perrens Consultants, 2003.

Twelve reference locations were selected as identified in **Figure C.1**.

The 100 yr ARI peak flows estimated in the 2003 study and the 2011 study at the reference locations for storm burst durations of 6, 9, 12 and 18 hours duration are compared in **Table 3.1**. The 1 yr ARI, 5 yr ARI and 100 yr ARI peak flows estimated in the 2003 study and the 2011 study at the reference locations are compared in **Table 3.2**.

Table 3.1 Comparison of 100 Year ARI Peak Flows for 6, 9, 12 and 18 hour Storm Durations at Selected Locations

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Duration							
			6 hour		9 hour		12 hour		18 hour	
			2003	2011	2003	2011	2003	2011	2003	2011
BC1	**Bonds Creek** - Denham Court Road	1.04	28	28	36	36	34	34	24	29
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	41	44	54	57	51	52	35	43
BC3	**Bonds Creek** - Bringelly Road	1.10a	56	53	71	68	63	61	42	53
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	63	59	79	75	70	67	50	59
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	101	103	124	129	109	113	81	101
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	115	115	140	140	128	127	95	114
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	65	66	83	83	73	73	51	64
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	180	180	221	219	196	197	145	179
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	204	205	246	246	243 ?	230	169	211
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	36	37	44	47	39	42	29	35
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	26	25	28	32	26	30	22	23
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	25	23	24	25	22	25	19	20

Peak Flow (m3/s)

Table 3.2 Comparison of 1 yr ARI, 5 yr ARI 100 Year ARI Peak Flows at Selected Locations

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Peak Flow (m3/s)							
			1 yr ARI			5 yr ARI			100 yr ARI	
			2003	2011		2003	2011		2003	2011
				9 hour	12 hour		9 hour	12 hour		9 hour
BC1	**Bonds Creek** - Denham Court Road	1.04	5	2.4	4.2	13	12.6	14.4	36	36.4
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	7	4.0	7.0	20	20.3	22.3	54	56.9
BC3	**Bonds Creek** - Bringelly Road	1.10a	9	5.0	8.9	26	24.9	27.3	71	68.3
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9	5.7	10.1	29	27.9	30.5	79	75.3
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	15	9.8	17.4	46	48.6	51.7	124	128.6
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	17	11.0	19.2	54	53.5	56.7	140	140.3
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	10	5.9	10.5	31	30.7	33.0	83	82.8
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	26	17.2	29.8	84	83.7	89.1	221	218.9
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	29	19.8	33.9	95	94.7	100.9	246	245.9
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	6	3.3	6.0	18	17.5	18.6	44	46.8
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	5	2.4	4.1	14	12.2	12.0	28	31.9
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5	2.4	4.1	13	11.6	8.9	24	25.1

Peak Flow (m3/s)

While it was noted that the rounding of the 2003 results meant that a precise comparison could not be undertaken with the 2011 estimates it was concluded that very good agreement was achieved in the 1 yr ARI, 5 yr ARI and 100 yr ARI events and that the 2001 catchment model was suitable for the estimation of hydrographs within the study catchment.

The **xprafts** model was then run to estimate the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF design flood events. These hydrographs were in turn exported to the TUFLOW floodplain model. The subcatchment layout and node locations and names for the hydrological model without basins are given in **Figure C.2**.

The estimated peak flows at all locations within the study catchment are summarised in **Appendix C**.

The estimated peak flows at all locations within the study catchment for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF design floods are summarised in **Table 3.3**

3.4 Developed Conditions

Under Developed Conditions the land outside the 100 yr ARI flood extent was assumed on average to achieve the levels of imperviousness given in **Table C.5.**

Two development scenarios were assessed as follows:

Scenario A Development	All land within the Austral and Leppington North Precincts outside the 100 yr ARI flood extent only was developed. The external catchment areas upstream and to the west of the Precincts remained as under existing conditions
Scenario B Development	All land within the Austral and Leppington North Precincts outside the 100 yr ARI flood extent was developed as was the external catchment areas upstream and to the west of the Precincts ie. a scenario which represents the possible cumulative development within the catchment.

The estimated peak flows at all locations within the study catchment under Scenario A development and Scenario B development for the 2 yr ARI and 100 yr ARI events are summarised in **Appendix C**.

The estimated peak flows at the reference locations within the study catchment under Scenario A development are summarised in **Tables C.12A** and **C.12B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at the reference locations within the study catchment under Scenario B development are summarised in **Tables C.13A** and **C.13B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

Table 3.3 Estimated 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF Peak Flows (m3/s) under Existing Conditions at All Locations

Node	ARI (years)															
	1yr		2yr		5yr		20yr		100yr		200yr		500yr		PMF	
	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur
E17a	0.4	12hr	0.5	12hr	1.0	9hr	1.8	9hr	2.3	12hr	2.4	9hr	2.7	9hr	16.6	1hr
E17b	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.1	12hr	2.2	9hr	2.5	9hr	15.4	1hr
Dummy57	0.7	12hr	0.9	12hr	1.9	9hr	3.4	9hr	4.5	12hr	4.5	9hr	5.2	9hr	31.9	1hr
E17c	1.5	12hr	2.1	12hr	4.1	9hr	7.3	9hr	9.9	9hr	10.2	9hr	11.7	9hr	70.3	1hr
E17d	0.4	12hr	0.6	12hr	1.1	9hr	2.1	9hr	2.7	12hr	2.8	9hr	3.2	9hr	19.5	1hr
E9	0.5	12hr	0.6	12hr	1.4	9hr	2.2	12hr	2.8	12hr	2.8	12hr	3.3	2hr	20.8	45min
E10	0.4	12hr	0.6	12hr	1.1	9hr	2.1	9hr	2.8	12hr	2.9	9hr	3.3	9hr	19.6	1hr
E3	0.7	12hr	0.9	12hr	2.1	9hr	3.4	9hr	4.5	12hr	4.4	12hr	5.1	12hr	32.2	45min
E2	0.4	12hr	0.5	12hr	1.1	9hr	1.8	12hr	2.3	12hr	2.3	12hr	2.7	2hr	16.8	45min
E1	0.3	12hr	0.4	12hr	1.0	9hr	1.6	12hr	2.0	12hr	2.0	12hr	2.4	2hr	14.7	45min
Dummy56	0.7	12hr	0.9	12hr	2.1	9hr	3.4	12hr	4.4	12hr	4.3	12hr	5.0	2hr	31.5	45min
Dummy30	1.4	12hr	1.9	12hr	4.2	9hr	6.6	9hr	8.5	12hr	8.4	9hr	9.8	2hr	62.1	1hr
E5	2.1	12hr	2.9	12hr	6.1	9hr	10.3	9hr	13.1	12hr	13.5	9hr	15.4	9hr	96.8	1hr
E6a	0.3	12hr	0.4	12hr	1.0	9hr	1.7	9hr	2.2	12hr	2.1	12hr	2.4	12hr	15.3	1hr
E6b	0.3	12hr	0.5	12hr	1.0	9hr	1.7	9hr	2.2	12hr	2.2	12hr	2.5	12hr	15.8	1hr
Dummy31	2.8	12hr	3.8	12hr	7.9	9hr	13.4	9hr	17.1	9hr	17.7	9hr	20.2	9hr	125.3	1hr
E8a	0.2	12hr	0.3	12hr	0.5	9hr	0.9	9hr	1.2	12hr	1.2	12hr	1.4	12hr	8.7	1hr
E7a	0.2	12hr	0.3	12hr	0.6	9hr	1.0	12hr	1.2	12hr	1.2	12hr	1.4	2hr	9.0	45min
E7b	0.7	12hr	0.9	12hr	1.9	9hr	3.1	9hr	4.1	12hr	4.0	12hr	4.6	12hr	29.6	45min
E8c	0.9	12hr	1.1	12hr	2.5	9hr	4.2	9hr	5.4	12hr	5.3	9hr	6.1	9hr	39.0	1hr
E8b	0.3	12hr	0.4	12hr	0.8	9hr	1.5	9hr	2.0	12hr	2.0	9hr	2.3	9hr	14.1	1hr
Dummy32	4.1	12hr	5.6	12hr	11.6	9hr	19.8	9hr	25.1	9hr	26.0	9hr	29.7	9hr	182.0	1hr
E11a	4.4	12hr	5.9	12hr	12.3	9hr	20.8	9hr	26.4	9hr	27.4	9hr	31.2	9hr	189.8	1hr
E11b	5.4	12hr	7.3	12hr	15.0	9hr	25.6	9hr	32.6	9hr	33.8	9hr	38.6	9hr	229.9	1hr
E13	0.9	12hr	1.2	12hr	2.5	9hr	4.3	9hr	5.6	12hr	5.5	9hr	6.3	6hr	40.3	1hr
E12	0.4	12hr	0.5	12hr	1.1	9hr	1.7	12hr	2.1	12hr	2.1	4.5hr	2.6	4.5hr	16.0	30min
E14	0.3	12hr	0.3	12hr	0.8	9hr	1.2	12hr	1.6	12hr	1.6	12hr	1.8	2hr	11.6	45min
E15b	0.1	12hr	0.2	12hr	0.4	9hr	0.6	12hr	0.8	12hr	0.8	12hr	0.9	2hr	5.8	45min
E15a	0.2	12hr	0.2	12hr	0.4	9hr	0.7	12hr	0.9	12hr	0.9	12hr	1.1	2hr	6.7	45min
Dummy29	0.5	12hr	0.7	12hr	1.5	9hr	2.5	12hr	3.2	12hr	3.2	12hr	3.7	2hr	23.2	45min
E16a	0.9	12hr	1.3	12hr	2.5	9hr	4.5	9hr	6.0	12hr	6.2	9hr	7.1	9hr	42.8	1hr
E16b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.5	12hr	0.5	9hr	0.6	9hr	3.8	1hr
Dummy28	7.4	12hr	10.1	12hr	20.6	9hr	35.0	9hr	44.9	9hr	46.5	9hr	53.1	9hr	300.4	1hr
Dummy33	9.3	12hr	12.8	12hr	25.7	9hr	43.8	9hr	56.3	9hr	58.4	9hr	66.7	9hr	372.4	1.5hr
SE5	0.4	12hr	0.6	12hr	1.2	9hr	2.1	9hr	2.8	12hr	2.7	9hr	3.1	12hr	19.6	1hr
SE1	0.5	30min	0.6	30min	0.8	30min	1.3	12hr	1.7	12hr	1.7	12hr	2.0	12hr	11.6	1hr
SE2	0.7	12hr	1.0	12hr	2.1	9hr	3.7	9hr	4.8	12hr	4.8	9hr	5.5	9hr	34.5	1hr
SE3	0.9	12hr	1.3	12hr	2.4	9hr	4.4	9hr	6.3	9hr	6.6	9hr	7.6	9hr	44.1	1.5hr
SE6a	1.1	12hr	1.7	12hr	3.1	9hr	5.5	9hr	7.9	9hr	8.2	9hr	9.5	9hr	55.1	1.5hr
Dummy58	2.1	12hr	3.0	12hr	5.6	9hr	10.1	9hr	13.9	9hr	14.4	9hr	16.6	9hr	95.7	1hr
SE6b	2.7	12hr	3.9	12hr	7.4	9hr	13.3	9hr	18.5	9hr	19.2	9hr	22.0	9hr	126.1	1hr
SE_out	2.7	12hr	3.9	12hr	7.4	9hr	13.3	9hr	18.5	9hr	19.2	9hr	22.0	9hr	126.1	1hr
33.01a	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.1	12hr	2.1	9hr	2.4	9hr	14.9	1hr
33.01b	0.4	12hr	0.6	12hr	1.2	9hr	2.0	9hr	2.7	12hr	2.7	12hr	3.0	12hr	18.9	1hr
32.01	0.3	12hr	0.4	12hr	0.8	9hr	1.3	9hr	1.8	12hr	1.7	9hr	2.0	12hr	12.5	1hr
32.02	0.7	12hr	1.1	12hr	2.3	12hr	3.6	9hr	5.7	9hr	6.0	9hr	7.2	9hr	39.0	2hr
1.26	0.3	18hr	0.4	12hr	0.9	12hr	1.5	9hr	2.3	9hr	2.4	9hr	2.8	9hr	16.3	2hr
31.03	0.2	18hr	0.3	18hr	0.6	12hr	0.9	12hr	1.5	9hr	1.5	9hr	1.8	9hr	10.3	2.5hr
30.01	0.3	12hr	0.5	12hr	1.0	9hr	1.7	9hr	2.5	9hr	2.6	9hr	3.0	9hr	17.5	1.5hr
30.02	0.8	12hr	1.3	12hr	2.3	12hr	4.2	9hr	6.3	9hr	6.5	9hr	7.6	9hr	44.0	1.5hr
1.25b	0.9	12hr	1.4	12hr	2.6	12hr	4.7	9hr	7.0	9hr	7.3	9hr	8.5	9hr	49.2	1.5hr
1.25a	0.1	18hr	0.2	18hr	0.5	18hr	0.8	12hr	1.2	9hr	1.2	9hr	1.5	9hr	8.4	2.5hr
31.01b	0.1	12hr	0.1	12hr	0.3	9hr	0.4	12hr	0.5	12hr	0.5	12hr	0.6	2hr	3.9	45min
31.01a	0.2	12hr	0.2	12hr	0.5	9hr	0.8	9hr	1.1	12hr	1.1	12hr	1.2	12hr	7.7	1hr
Dummy55	0.3	12hr	0.3	12hr	0.7	9hr	1.2	9hr	1.6	12hr	1.6	12hr	1.8	12hr	11.5	45min
31.02	0.5	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.3	9hr	3.4	9hr	3.9	9hr	22.8	1hr
25.06a	0.2	12hr	0.3	12hr	0.6	12hr	1.0	9hr	1.5	9hr	1.5	9hr	1.8	9hr	10.2	1.5hr
25.06b	0.3	12hr	0.4	12hr	0.8	9hr	1.5	9hr	2.1	9hr	2.2	9hr	2.6	9hr	14.7	1.5hr
25.06c	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.6	12hr	0.6	12hr	0.6	12hr	4.1	1hr
25.03c	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.9	9hr	0.9	9hr	1.1	9hr	6.2	1.5hr
25.03b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.6	12hr	0.6	9hr	0.7	9hr	4.3	1hr
25.01	0.2	12hr	0.4	12hr	0.7	9hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.7	1.5hr
27.01	0.5	12hr	0.7	12hr	1.4	9hr	2.5	9hr	3.5	9hr	3.7	9hr	4.2	9hr	23.6	1.5hr
25.03a	0.6	12hr	0.9	12hr	1.6	9hr	2.9	9hr	4.1	9hr	4.3	9hr	4.9	9hr	27.7	1.5hr
26.01a	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.7	9hr	1.9	9hr	11.1	1.5hr
26.01b	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.9	9hr	2.0	9hr	2.3	9hr	13.1	1.5hr
Dummy47	0.5	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.5	9hr	3.7	9hr	4.2	9hr	24.2	1.5hr
25.02	0.8	12hr	1.2	12hr	2.3	9hr	4.1	9hr	6.0	9hr	6.3	9hr	7.2	9hr	42.1	1.5hr
Dummy48	1.3	12hr	2.1	12hr	3.8	9hr	6.9	9hr	10.1	9hr	10.5	9hr	12.1	9hr	69.7	1.5hr
Dummy22	1.5	12hr	2.4	12hr	4.4	9hr	8.0	9hr	11.5	9hr	12.0	9hr	13.8	9hr	79.1	1.5hr
25.04b	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.1	9hr	1.1	9hr	1.3	9hr	7.7	1.5hr
25.04a	0.2	18hr	0.3	12hr	0.6	12hr	1.0	9hr	1.5	9hr	1.6	9hr	1.8	9hr	10.4	1.5hr
Dummy23	1.9	12hr	2.9	12hr	5.4	9hr	9.7	9hr	14.0	9hr	14.6	9hr	16.8	9hr	96.2	1.5hr
25.05a	0.1	12hr	0.2	12hr	0.4	12hr	0.7	9hr	1.0	9hr	1.1	9hr	1.2	9hr	7.0	1.5hr
25.05b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.7	9hr	0.7	9hr	0.8	9hr	4.6	1.5hr
28.01	0.5	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.4	9hr	3.6	9hr	4.1	9hr	24.2	1.5hr
28.02	0.7	12hr	1.2	12hr	2.2	9hr	4.0	9hr	5.9	9hr	6.2	9hr	7.1	9hr	41.5	1.5hr
Dummy24	2.8	12hr	4.4	12hr	8.2	9hr	14.8	9hr	21.4	9hr	22.2	9hr	25.6	9hr	146.4	1.5hr
Dummy25	3.1	12hr	4.9	12hr	9.1	9hr	16.5	9hr	23.7	9hr	24.6	9hr	28.3	9hr	161.4	1.5hr
25.07b	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.8	12hr	0.8	9hr	0.9	9hr	5.5	1hr
29.01	0.5	12hr	0.8	12hr	1.5	9hr	2.7	9hr	4.0	9hr	4.2	9hr	4.9	9hr	28.2	1.5hr
29.02	0.9	12hr	1.4	12hr	2.6	12hr	4.6	9hr	6.9	9hr	7.2	9hr	8.4	9hr	48.5	1.5hr
25.07a	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.0	12hr	1.1	9hr	1.2	9hr	7.1	1.5hr
Dummy26	4.1	12hr	6.7	12hr	12.2	9hr	22.2	9hr	31.9	9hr	33.2	9hr	38.2	9hr	214.7	1.5hr
1.22b	0.1	30min	0.1	30min	0.3	18hr	0.5	12hr	0.8	12hr	0.8	12hr	0.9	12hr	5.5	4hr
1.20a	0.1	12hr	0.2	12hr	0.3	9hr	0.5	9hr	0.8	9hr	0.8	9hr	0.9	9hr	5.4	1.5hr
1.20b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.6	12hr	0.6	9hr	0.7	9hr	3.9	1.5hr
1.21	0.5	18hr	0.8	12hr	1.5	12hr	2.6	9hr	3.9	9hr	4.1	9hr	4.8	9hr	27.5	2hr
24.01	0.3	12hr	0.5	12hr	0.9	9hr	1.7	9hr	2.5	9hr	2.6	9hr	3.0	9hr	17.6	1.5hr
24.02	0.7	18hr	1.2	12hr	2.2	12hr	3.9	9hr	5.8	9hr	6.1	9hr	7.1	9hr	41.1	1.5hr
24.03	1.1	18hr	1.8	12hr	3.3	12hr	5.9	9hr	8.7	9hr	9.1	9hr	10.5	9hr	59.7	1.5hr
24.04	1.3	12hr	2.2	12hr	4.1	12hr	7.2	9hr	10.6	9hr	11.1	9hr	12.8	9hr	71.0	2hr
24.05	1.7	12hr	2.7	12hr	5.0	12hr	8.9	9hr	13.1	9hr	13.6	9hr	15.7	9hr	85.5	2hr
24.06	1.9	12hr	3.2	12hr	6.0	12hr	10.7	9hr	15.7	9hr	16.3	9hr	18.8	9hr	102.5	2hr
17.14b	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.6	9hr	1.9	9hr	10.8	1.5hr
17.14a	0.3	12hr	0.6	12hr	1.1	9hr	2.0	9hr	2.9	9hr	3.0	9hr	3.4	9hr	20.3	1.5hr
17.13	0.2	18hr	0.3	12hr	0.6	12hr	1.0	9hr	1.5	9hr	1.6	9hr	1.9	9hr	10.9	2hr
23.01	0.2	18hr	0.3	12hr	0.7	12hr	1.1	9hr	1.7	9hr	1.8	9hr	2.1	9hr	11.9	2hr
20.01	0.4	12hr	0.6	12hr	1.1	9hr	2.0	9hr	2.8	9hr	2.9	9hr	3.4	9hr	19.8	1.5hr
17.10a	0.2	18hr	0.3	12hr	0.5	12hr	0.9	9hr	1.3	9hr	1.4	9hr	1.6	9hr	9.1	1.5hr
17.10b	0.2	18hr	0.4	12hr	0.7	12hr	1.2	9hr	1.9	9hr	2.0	9hr	2.3	9hr	13.3	2hr
17.09	0.3	18hr	0.5	18hr	1.0	12hr	1.6	9hr	2.4	9hr	2.5	9hr	2.9	9hr	17.1	2hr
17.08c	0.2	12hr	0.4	12hr	0.6	9hr	1.2	9hr	1.7	9hr	1.8	9hr	2.1	9hr	11.8	1.5hr
17.08d	0.0	12hr	0.0	12hr	0.1	9hr	0.1	9hr	0.1	12hr	0.1	12hr	0.1	12hr	0.9	45min
18.01	0.5	12hr	0.8	12hr	1.4	9hr	2.6	9hr	3.7	9hr	3.8	9hr	4.4	9hr	25.7	1.5hr
18.02	0.8	12hr	1.2	12hr	2.2	9hr	4.0	9hr	5.8	9hr	6.0	9hr	6.9	9hr	39.9	1.5hr
17.08b	0.2	12hr	0.2	12hr	0.4	9hr	0.8	9hr	1.1	9hr	1.2	9hr	1.3	9hr	7.9	1hr
17.08a	0.2	12hr	0.4	12hr	0.7	9hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.5	1.5hr
17.01	0.3	12hr	0.5	12hr	0.9	9hr	1.7	9hr	2.3	12hr	2.3	9hr	2.7	9hr	15.9	1hr
17.02	0.8	12hr	1.3	12hr	2.4	9hr	4.3	9hr	6.4	9hr	6.6	9hr	7.7	9hr	44.6	1.5hr
17.03	1.6	18hr	2.7	12hr	5.2	12hr	8.9	9hr	13.5	9hr	14.1	9hr	16.5	9hr	93.6	1.5hr
17.04	2.5	18hr	4.0	12hr	7.8	12hr	13.2	9hr	20.1	9hr	20.9	9hr	24.5	9hr	138.6	2hr
17.06	3.2	18hr	5.1	12hr	10.2	12hr	17.0	9hr	26.0	9hr	27.2	9hr	31.8	9hr	179.8	2hr
17.07	3.7	18hr	6.0	12hr	11.9	12hr	19.9	9hr	30.3	9hr	31.6	9hr	36.9	9hr	206.7	2hr
Dummy18	4.7	18hr	7.5	12hr	14.8	12hr	24.6	9hr	37.5	9hr	39.1	9hr	45.7	9hr	249.4	2hr
Dummy19	4.9	18hr	7.9	12hr	15.4	12hr	25.6	9hr	39.0	9hr	40.7	9hr	47.4	9hr	257.3	2hr
Dummy36	5.1	18hr	8.3	12hr	16.3	12hr	27.1	9hr	41.3	9hr	43.1	9hr	50.3	9hr	271.7	2hr
21.01	0.4	18hr	0.7	18hr	1.4	12hr	2.3	12hr	3.5	9hr	3.7	9hr	4.3	9hr	25.0	2hr
Dummy37	5.5	18hr	8.9	12hr	17.7	12hr	29.3	9hr	44.8	9hr	46.8	9hr	54.5	9hr	294.2	2hr
Dummy20	6.2	18hr	10.0	12hr	19.8	12hr	32.8	9hr	50.0	9hr	52.1	9hr	60.8	9hr	323.5	2hr
22.01	0.5	18hr	0.8	12hr	1.6	12hr	2.7	9hr	4.0	9hr	4.2	9hr	5.0	9hr	28.6	2hr
17.11	0.1	18hr	0.2	12hr	0.4	12hr	0.8	9hr	1.2	9hr	1.2	9hr	1.4	9hr	8.2	2hr
Dummy34	6.8	18hr	11.0	12hr	21.7	12hr	36.0	9hr	54.8	9hr	57.1	9hr	66.5	9hr	349.3	2hr
17.12	0.3	18hr	0.5	12hr	1.0	12hr	1.7	9hr	2.5	9hr	2.6	9hr	3.1	9hr	17.8	2hr
Dummy54	7.1	18hr	11.4	12hr	22.6	12hr	37.5	9hr	57.0	9hr	59.5	9hr	69.2	9hr	360.2	2hr
Dummy38	7.3	18hr	11.7	12hr	23.2	12hr	38.5	9hr	58.5	9hr	61.0	9hr	70.9	9hr	367.3	2hr

Table 3.3 Estimated 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF Peak Flows (m3/s) under Existing Conditions at All Locations

Node	ARI (years)															
	1yr		2yr		5yr		20yr		100yr		200yr		500yr		PMF	
	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur
Dummy35	7.5	18hr	12.0	12hr	23.7	12hr	39.4	9hr	59.9	9hr	62.4	9hr	72.5	9hr	373.9	2hr
Dummy21	8.0	18hr	12.7	12hr	24.9	12hr	41.5	9hr	62.9	9hr	65.6	9hr	76.2	9hr	388.7	2.5hr
17.15a	0.2	12hr	0.3	12hr	0.6	9hr	1.2	9hr	1.7	9hr	1.8	9hr	2.1	9hr	12.0	1.5hr
Dummy39	8.2	18hr	13.0	12hr	25.4	12hr	42.2	9hr	64.0	9hr	66.7	9hr	77.6	9hr	393.7	2.5hr
SU3	0.2	18hr	0.3	12hr	0.7	12hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.5	2hr
Dummy40	10.3	18hr	16.1	12hr	31.6	12hr	52.6	9hr	79.4	9hr	82.8	9hr	96.0	9hr	481.0	2.5hr
17.15b	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.9	9hr	0.9	9hr	1.1	9hr	6.2	1hr
Dummy41	10.3	18hr	16.3	12hr	31.9	12hr	52.9	9hr	79.9	9hr	83.2	9hr	96.5	9hr	483.1	2.5hr
17.16	10.7	18hr	16.9	12hr	33.0	12hr	54.9	9hr	82.8	9hr	86.3	9hr	100.1	9hr	497.3	2.5hr
1.18	0.2	18hr	0.3	18hr	0.8	12hr	1.2	12hr	1.9	9hr	2.0	9hr	2.3	9hr	13.2	2hr
16.01	0.2	12hr	0.2	12hr	0.4	9hr	0.8	9hr	1.1	12hr	1.1	9hr	1.2	9hr	7.5	1hr
15.02	0.4	12hr	0.6	12hr	1.3	12hr	2.0	12hr	3.2	9hr	3.3	9hr	3.9	9hr	22.0	2hr
15.01	0.3	18hr	0.5	12hr	0.9	12hr	1.5	9hr	2.4	9hr	2.5	9hr	2.9	9hr	16.8	2hr
14.01	0.5	12hr	0.8	12hr	1.5	9hr	2.7	9hr	4.0	9hr	4.1	9hr	4.8	9hr	27.8	1.5hr
1.17a	0.8	12hr	1.3	12hr	2.4	9hr	4.2	9hr	6.2	9hr	6.5	9hr	7.5	9hr	43.6	1.5hr
1.17b	0.2	12hr	0.3	12hr	0.5	9hr	0.8	9hr	1.2	9hr	1.3	9hr	1.5	9hr	8.5	1.5hr
1.16	0.4	12hr	0.5	12hr	1.1	9hr	2.0	9hr	2.7	12hr	2.7	9hr	3.1	9hr	18.8	1hr
1.14	0.1	30min	0.1	18hr	0.2	18hr	0.4	18hr	0.7	12hr	0.7	12hr	0.8	12hr	4.5	4hr
12.02b	0.0	12hr	0.1	12hr	0.1	9hr	0.2	9hr	0.3	12hr	0.3	9hr	0.3	9hr	2.2	1hr
12.02a	0.2	12hr	0.3	12hr	0.5	9hr	1.0	9hr	1.4	9hr	1.5	9hr	1.7	9hr	9.8	1.5hr
11.01	0.4	12hr	0.5	12hr	1.0	9hr	1.8	9hr	2.3	12hr	2.3	9hr	2.6	9hr	16.5	1hr
10.01	0.4	12hr	0.5	12hr	1.1	9hr	1.9	9hr	2.5	12hr	2.5	9hr	2.8	12hr	18.0	1hr
10.02a	0.7	12hr	1.0	12hr	2.0	9hr	3.6	9hr	4.6	12hr	4.7	9hr	5.4	9hr	33.4	1hr
1.13b	0.3	12hr	0.4	12hr	0.8	9hr	1.4	9hr	2.1	9hr	2.1	9hr	2.4	9hr	14.1	1.5hr
1.13a	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.6	9hr	1.9	9hr	11.0	1.5hr
1.12a	0.4	12hr	0.5	12hr	1.0	9hr	1.8	9hr	2.4	12hr	2.4	9hr	2.8	9hr	16.9	1hr
5.01	0.2	18hr	0.2	12hr	0.5	12hr	0.8	9hr	1.3	9hr	1.3	9hr	1.6	9hr	8.9	2hr
1.11a	0.2	12hr	0.2	12hr	0.4	9hr	0.8	9hr	1.0	12hr	1.0	9hr	1.2	12hr	7.3	1hr
1.11b	0.3	12hr	0.4	12hr	0.8	9hr	1.5	9hr	2.1	12hr	2.1	9hr	2.4	9hr	14.6	1hr
1.09b	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.7	12hr	0.7	9hr	0.8	9hr	5.2	1hr
1.09c	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.7	12hr	1.8	9hr	2.0	9hr	12.5	1hr
4.01	0.2	12hr	0.3	12hr	0.7	9hr	1.1	9hr	1.5	12hr	1.5	12hr	1.7	12hr	10.8	45min
4.02	0.6	12hr	0.9	12hr	1.7	9hr	3.1	9hr	4.1	12hr	4.2	9hr	4.8	9hr	29.3	1hr
1.06a	0.4	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.5	9hr	3.6	9hr	4.2	9hr	24.4	1.5hr
1.01	1.1	18hr	1.8	12hr	3.7	12hr	6.0	9hr	9.3	9hr	9.7	9hr	11.4	9hr	65.6	2hr
1.02	2.0	18hr	3.3	12hr	6.4	12hr	10.6	9hr	16.3	9hr	17.0	9hr	19.9	9hr	111.2	2hr
2.01	1.6	18hr	2.6	18hr	5.5	12hr	8.8	12hr	13.6	9hr	14.2	9hr	16.8	9hr	95.4	2hr
1.03	3.8	18hr	6.1	12hr	12.6	12hr	20.3	9hr	31.7	9hr	33.2	9hr	39.1	9hr	218.1	2hr
1.04	4.4	18hr	7.1	12hr	14.4	12hr	23.3	9hr	36.4	9hr	38.1	9hr	44.8	9hr	246.1	2hr
1.05	5.3	18hr	8.7	12hr	17.3	12hr	28.2	9hr	43.8	9hr	45.8	9hr	53.6	9hr	289.4	2hr
1.06b	6.0	18hr	9.8	12hr	19.3	12hr	31.8	9hr	48.9	9hr	51.1	9hr	59.8	9hr	318.8	2hr
Dummy1	6.4	18hr	10.4	12hr	20.5	12hr	33.9	9hr	52.1	9hr	54.4	9hr	63.6	9hr	335.9	2hr
1.07a	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.6	9hr	1.9	9hr	10.9	1.5hr
1.07b	0.5	12hr	0.8	12hr	1.5	12hr	2.7	9hr	3.9	9hr	4.1	9hr	4.9	9hr	27.9	1.5hr
Dummy2	7.1	18hr	11.4	12hr	22.3	12hr	37.1	9hr	56.9	9hr	59.4	9hr	69.3	9hr	360.3	2hr
1.08a	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.8	9hr	1.9	9hr	2.1	9hr	12.4	1hr
1.08b	0.4	12hr	0.5	12hr	1.0	9hr	1.9	9hr	2.5	9hr	2.6	9hr	3.0	9hr	17.7	1hr
Dummy3	7.5	18hr	12.1	12hr	23.5	12hr	39.1	9hr	59.9	9hr	62.5	9hr	72.8	9hr	374.2	2hr
3.01	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.1	12hr	2.0	12hr	2.3	12hr	14.7	1hr
1.09a	0.4	12hr	0.5	12hr	1.2	9hr	2.0	9hr	2.6	12hr	2.6	9hr	3.0	9hr	18.8	1hr
Dummy60	7.7	18hr	12.4	12hr	0.0	30min	40.0	9hr	61.4	9hr	64.1	9hr	74.5	9hr	381.6	2hr
Dummy4	8.3	12hr	13.2	12hr	25.9	12hr	42.6	9hr	65.1	9hr	67.9	9hr	78.8	9hr	398.8	2hr
SU2	0.3	12hr	0.5	12hr	0.9	9hr	1.7	9hr	2.4	9hr	2.5	9hr	2.9	9hr	16.8	1.5hr
1.10b	0.5	12hr	0.7	12hr	1.4	9hr	2.5	9hr	3.5	9hr	3.7	9hr	4.2	9hr	24.2	1hr
Dummy42	8.7	12hr	13.8	12hr	27.0	12hr	44.3	9hr	67.5	9hr	70.4	9hr	81.7	9hr	411.5	2.5hr
1.10a	8.9	12hr	14.0	12hr	27.3	12hr	44.8	9hr	68.3	9hr	71.2	9hr	82.6	9hr	415.4	2.5hr
Dummy6	9.1	12hr	14.4	12hr	28.1	12hr	45.9	9hr	69.8	9hr	72.8	9hr	84.4	9hr	423.0	2.5hr
1.12c	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.8	12hr	1.8	9hr	2.1	9hr	12.6	1hr
1.12b	10.1	12hr	15.8	12hr	30.5	12hr	49.8	9hr	75.3	9hr	78.5	9hr	91.3	9hr	451.3	2.5hr
Dummy7	10.4	12hr	16.3	12hr	31.3	12hr	51.1	9hr	77.2	9hr	80.5	9hr	93.6	9hr	458.4	2.5hr
10.02b	0.1	12hr	0.1	12hr	0.2	9hr	0.3	12hr	0.4	12hr	0.4	12hr	0.5	2hr	3.2	45min
7.07a	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	0.9	12hr	1.0	9hr	1.1	9hr	6.6	1hr
7.01	0.3	12hr	0.5	12hr	0.9	9hr	1.6	9hr	2.2	9hr	2.3	9hr	2.6	9hr	15.5	1hr
7.02	0.9	12hr	1.6	12hr	2.9	12hr	5.0	9hr	7.6	9hr	7.9	9hr	9.1	9hr	52.5	1.5hr
7.03	1.7	12hr	2.8	12hr	5.1	9hr	9.0	9hr	13.4	9hr	14.0	9hr	16.2	9hr	93.1	1.5hr
7.04	2.1	18hr	3.4	12hr	6.4	12hr	11.2	9hr	16.7	9hr	17.3	9hr	20.1	9hr	114.9	1.5hr
7.05	2.8	18hr	4.5	12hr	8.4	12hr	14.8	9hr	22.0	9hr	22.9	9hr	26.5	9hr	148.4	1.5hr
7.06	3.1	18hr	5.0	12hr	9.5	12hr	16.6	9hr	24.7	9hr	25.7	9hr	29.8	9hr	166.4	2hr
8.01	0.5	12hr	0.8	12hr	1.6	12hr	2.7	9hr	4.1	9hr	4.3	9hr	5.1	9hr	28.8	1.5hr
7.07b	3.7	18hr	6.1	12hr	11.5	12hr	20.1	9hr	29.9	9hr	31.1	9hr	35.9	9hr	199.7	2hr
Dummy12	3.8	18hr	6.2	12hr	11.8	12hr	20.5	9hr	30.6	9hr	31.8	9hr	36.8	9hr	204.0	2hr
7.08b	0.2	12hr	0.4	12hr	0.7	12hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.7	1.5hr
7.08a	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.0	9hr	1.1	9hr	1.2	9hr	7.2	1.5hr
7.09a	0.2	12hr	0.4	12hr	0.6	9hr	1.2	9hr	1.7	9hr	1.8	9hr	2.1	9hr	11.9	1.5hr
Dummy11	4.3	18hr	7.1	12hr	13.4	12hr	23.2	9hr	34.5	9hr	35.9	9hr	41.5	9hr	226.9	2hr
7.09c	0.3	12hr	0.4	12hr	0.8	9hr	1.4	9hr	2.1	9hr	2.2	9hr	2.5	9hr	14.7	1.5hr
7.09b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.5	12hr	0.5	9hr	0.6	9hr	3.8	1hr
Dummy43	4.6	18hr	7.5	12hr	14.3	12hr	24.7	9hr	36.7	9hr	38.1	9hr	44.0	9hr	239.2	2hr
7.10a	0.2	18hr	0.2	18hr	0.5	12hr	0.9	9hr	1.3	9hr	1.4	9hr	1.6	9hr	9.5	2hr
7.10b	0.1	18hr	0.2	12hr	0.4	12hr	0.7	9hr	1.1	9hr	1.1	9hr	1.3	9hr	7.7	2hr
Dummy9	4.9	18hr	8.0	12hr	15.2	12hr	26.2	9hr	39.0	9hr	40.6	9hr	46.8	9hr	253.7	2hr
9.01	0.3	12hr	0.3	12hr	0.7	9hr	1.3	9hr	1.7	12hr	1.7	9hr	1.9	9hr	11.9	1hr
9.02b	0.4	12hr	0.6	12hr	1.2	9hr	2.1	9hr	2.8	12hr	2.9	9hr	3.4	9hr	20.4	1hr
9.02a	0.3	12hr	0.5	12hr	0.8	9hr	1.5	9hr	2.2	9hr	2.3	9hr	2.7	9hr	15.6	1.5hr
Dummy59	0.7	12hr	1.1	12hr	1.9	9hr	3.6	9hr	5.1	9hr	5.3	9hr	6.0	9hr	35.0	1hr
Dummy8	5.5	12hr	8.8	12hr	16.8	12hr	28.7	9hr	42.6	9hr	44.3	9hr	51.2	9hr	272.9	2hr
7.12	0.4	18hr	0.6	18hr	1.2	12hr	2.0	12hr	3.0	9hr	3.2	9hr	3.7	9hr	21.7	2hr
7.11a	0.2	12hr	0.3	12hr	0.7	9hr	1.2	9hr	1.6	12hr	1.7	9hr	2.0	9hr	11.7	1hr
7.11b	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.2	12hr	2.2	9hr	2.6	9hr	15.5	1hr
Dummy10	6.0	18hr	9.7	12hr	18.6	12hr	31.5	9hr	46.8	9hr	48.8	9hr	56.4	9hr	296.8	2hr
12.01a	6.2	18hr	10.0	12hr	19.2	12hr	32.5	9hr	48.3	9hr	50.3	9hr	58.2	9hr	303.6	2hr
Dummy13	17.0	18hr	26.8	12hr	50.5	12hr	84.0	9hr	125.9	9hr	131.1	9hr	151.9	9hr	744.1	2.5hr
12.01b	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.0	12hr	1.0	9hr	1.1	9hr	6.9	1hr
Dummy44	17.1	18hr	26.9	12hr	50.7	12hr	84.2	9hr	126.3	9hr	131.5	9hr	152.4	9hr	745.6	2.5hr
Dummy14	17.4	18hr	27.5	12hr	51.7	12hr	85.6	9hr	128.6	9hr	133.9	9hr	155.2	9hr	756.4	2.5hr
1.15	0.5	12hr	0.8	12hr	1.4	9hr	2.5	9hr	3.6	9hr	3.7	9hr	4.3	9hr	25.0	1.5hr
Dummy45	17.8	18hr	27.9	12hr	52.4	12hr	86.7	9hr	130.3	9hr	135.7	9hr	157.2	9hr	761.9	2.5hr
Dummy15	18.7	18hr	29.1	12hr	54.5	12hr	89.9	9hr	135.3	9hr	140.8	9hr	162.9	9hr	777.2	2.5hr
Dummy46	18.9	18hr	29.5	12hr	55.2	12hr	91.0	9hr	136.8	9hr	142.4	9hr	164.7	9hr	782.9	3hr
Dummy16	19.4	18hr	30.2	12hr	56.7	12hr	93.4	9hr	140.3	9hr	146.0	9hr	168.8	9hr	797.2	3hr
Dummy17	30.5	18hr	47.0	12hr	89.1	12hr	146.5	9hr	218.9	9hr	228.0	9hr	264.2	9hr	1247.2	3hr
1.22a	0.3	30min	0.3	30min	0.5	18hr	0.9	18hr	1.4	12hr	1.4	12hr	1.6	12hr	9.4	4hr
1.23	0.2	18hr	0.3	12hr	0.6	12hr	1.0	9hr	1.6	9hr	1.6	9hr	2.0	9hr	11.0	2hr
Dummy27	34.1	18hr	52.2	18hr	98.7	12hr	160.7	9hr	240.8	9hr	250.7	9hr	290.1	9hr	1356.3	4hr
1.24	0.1	18hr	0.2	18hr	0.5	18hr	0.8	12hr	1.2	12hr	1.3	9hr	1.5	9hr	8.6	2.5hr
Dummy49	34.2	18hr	52.4	18hr	99.1	12hr	161.2	9hr	241.6	9hr	251.6	9hr	291.1	9hr	1360.6	4hr
Dummy50	34.5	18hr	52.9	18hr	100.0	18hr	162.2	9hr	243.1	9hr	253.1	9hr	292.9	9hr	1366.4	4hr
Dummy51	35.0	18hr	53.6	18hr	101.5	18hr	163.6	9hr	245.3	9hr	255.4	9hr	295.4	9hr	1374.1	4hr
Dummy52	35.2	18hr	53.8	18hr	101.9	18hr	164.0	9hr	245.9	9hr	256.0	9hr	296.1	9hr	1376.3	4hr
Dummy53	35.8	18hr	54.7	18hr	103.8	18hr	165.9	9hr	248.7	9hr	258.9	9hr	299.4	9hr	1384.5	4hr
1.27	36.5	18hr	55.7	18hr	105.9	18hr	168.0	9hr	251.9	9hr	262.2	9hr	303.1	9hr	1393.1	4hr
E18	0.7	30min	0.9	30min	1.4	12hr	2.5	9hr	3.7	12hr	3.8	9hr	4.4	9hr	25.2	1.5hr
1.28	37.0	18hr	56.4	18hr	107.2	18hr	169.0	9hr	253.5	9hr	263.9	9hr	305.1	9hr	1396.6	4hr
Out	39.9	18hr	60.4	18hr	116.7	18hr	175.6	9hr	271.5	12hr	275.3	9hr	318.5	9hr	1419.0	5hr

Table 3.4 Impact of Scenario A Development on 2 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.6	1.6	2.9	2.9	4.9	4.9	7.1	7.1	7.0	7.0
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	0.7	5.1	0.7	4.7	0.6	4.5	0.4	3.2	2.7	2.8	4.7	4.6	8.0	7.9	11.4	11.2	11.2	11.1
BC3	**Bonds Creek** - Bringelly Road	1.10a	0.7	15.5	0.8	16.8	0.8	17.0	0.6	13.8	3.5	12.3	6.0	10.4	10.0	9.5	14.0	13.1	13.8	13.3
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	0.7	17.5	0.9	20.6	0.9	19.7	0.8	16.7	4.0	16.0	6.8	13.6	11.4	12.4	15.8	14.5	15.4	14.7
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	1.3	29.5	1.6	36.0	1.9	39.0	1.8	34.3	6.8	30.8	11.6	29.1	19.7	27.5	27.5	26.0	26.8	26.1
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	1.3	29.5	1.6	36.1	2.0	41.2	2.0	37.6	7.6	34.1	12.8	32.0	21.9	31.4	30.2	29.9	29.8	29.3
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	0.8	8.5	1.0	9.3	1.2	9.3	1.1	7.9	4.0	7.0	7.0	6.9	12.0	11.9	16.9	16.5	16.8	16.6
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	1.9	30.1	2.4	38.0	3.0	44.9	2.9	42.1	11.7	38.1	19.9	36.1	34.2	39.4	47.0	46.3	46.8	46.7
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	2.4	30.5	3.1	38.3	3.3	48.0	3.6	48.1	13.5	45.5	22.7	42.8	39.1	47.7	53.0	53.4	53.8	53.9
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	0.8	15.5	0.9	18.5	1.0	18.5	0.9	15.3	2.3	14.7	4.0	12.8	6.8	11.5	9.7	11.4	9.5	9.9
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	1.6	19.3	1.8	21.9	1.8	22.3	1.4	18.6	1.6	16.3	2.8	14.3	4.7	12.7	6.7	12.0	6.3	9.3
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	1.3	15.7	1.3	14.9	1.2	13.9	1.0	10.8	1.9	9.8	2.8	7.6	4.6	6.7	5.6	7.0	4.5	4.9

Critical Duration - Existing Conditions

Critical Duration - Scenario A Development Conditions

Table 3.5 Impact of Scenario A Development on 100 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	3.8	3.8	10.9	10.9	20.8	20.8	25.2	25.2	26.6	26.6	28.1	28.1	36.4	36.4	33.7	33.7	28.7	28.7
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	6.3	11.3	18.1	17.5	33.0	31.9	39.8	39.0	41.4	40.9	43.7	43.3	56.9	56.1	52.1	50.8	43.3	43.1
BC3	**Bonds Creek** - Bringelly Road	1.10a	8.6	34.7	22.9	37.3	39.5	38.9	47.6	44.1	50.1	48.9	52.8	51.6	68.3	64.8	61.2	56.5	52.6	52.1
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9.8	41.1	25.4	47.6	43.8	47.7	52.4	47.4	56.0	53.8	59.1	56.8	75.3	69.9	66.6	65.6	58.9	59.1
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	16.3	69.3	42.2	87.3	74.5	96.9	90.3	85.4	96.7	90.7	103.2	97.4	128.6	115.8	112.7	114.1	100.8	104.4
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	17.9	70.6	45.3	90.8	80.1	109.4	97.6	101.1	106.4	97.9	114.6	107.7	140.3	124.7	126.8	127.9	113.8	116.9
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	9.4	22.1	26.1	28.7	47.7	45.6	57.8	56.3	62.0	61.2	65.8	65.1	82.8	80.8	72.7	69.4	63.8	64.1
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	27.0	79.4	69.1	114.3	124.5	148.7	152.8	143.6	168.4	161.4	180.5	172.2	218.9	209.0	196.6	196.1	179.4	183.7
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	30.2	82.3	76.7	121.6	137.1	170.5	169.1	173.6	190.6	181.7	205.3	194.3	245.9	236.8	229.6	223.8	210.7	214.0
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	5.5	35.4	15.3	42.8	27.8	43.5	33.6	35.2	35.2	34.7	37.3	35.3	46.8	43.5	42.0	43.5	34.7	36.9
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	4.5	43.4	11.0	49.7	20.5	52.0	23.6	42.4	23.9	38.5	25.5	35.4	31.9	38.4	29.9	39.9	23.1	30.2
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5.2	34.2	14.0	32.3	19.9	33.5	19.8	24.4	18.7	24.3	23.0	24.5	25.1	26.1	25.0	28.8	20.0	21.9

Critical Duration - Existing Conditions

Critical Duration - Scenario A Development Conditions

Table 3.6 Impact of Scenario B Development on 2 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	0.0	40.1	0.0	41.7	0.0	43.2	0.3	33.4	1.6	29.0	2.9	24.5	4.9	21.8	7.1	20.8	7.0	15.5
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	0.7	42.1	0.7	46.9	0.6	49.4	0.4	40.5	2.7	34.1	4.7	31.1	8.0	29.1	11.4	25.0	11.2	21.3
BC3	**Bonds Creek** - Bringelly Road	1.10a	0.7	42.5	0.8	47.8	0.8	52.6	0.6	44.6	3.5	37.7	6.0	34.6	10.0	33.0	14.0	27.0	13.8	23.2
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	0.7	42.5	0.9	47.8	0.9	53.6	0.8	46.5	4.0	39.6	6.8	36.1	11.4	35.1	15.8	27.5	15.4	24.1
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	1.3	44.5	1.6	52.9	1.9	63.9	1.8	62.2	6.8	58.0	11.6	54.3	19.7	52.6	27.5	43.8	26.8	35.4
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	1.3	44.5	1.6	52.9	2.0	63.9	2.0	63.3	7.6	60.7	12.8	57.0	21.9	55.7	30.2	45.6	29.8	40.2
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	0.8	29.4	1.0	37.1	1.2	44.4	1.1	43.0	4.0	38.5	7.0	37.5	12.0	34.9	16.9	30.6	16.8	24.5
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	1.9	64.3	2.4	77.3	3.0	91.2	2.9	88.9	11.7	88.7	19.9	88.0	34.2	82.3	47.0	67.9	46.8	62.5
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	2.4	64.3	3.1	77.3	3.3	93.0	3.6	94.1	13.5	96.4	22.7	95.2	39.1	90.4	53.0	76.6	53.8	72.7
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	0.8	21.5	0.9	25.3	1.0	28.5	0.9	26.0	2.3	24.1	4.0	22.6	6.8	20.8	9.7	18.1	9.5	15.1
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	1.6	19.3	1.8	21.9	1.8	22.3	1.4	18.6	1.6	16.3	2.8	14.3	4.7	12.7	6.7	12.0	6.3	9.3
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	1.3	15.7	1.3	14.9	1.2	13.9	1.0	10.8	1.9	9.8	2.8	7.6	4.6	6.7	5.6	7.0	4.5	4.9

Critical Duration - Existing Conditions

Critical Duration - Scenario B Development Conditions

Table 3.7 Impact of Scenario B Development on 100 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	3.8	91.8	10.9	97.6	20.8	100.8	25.2	75.2	26.6	67.3	28.1	58.7	36.4	57.7	33.7	59.0	28.7	43.6
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	6.3	97.2	18.1	113.2	33.0	121.1	39.8	96.8	41.4	84.7	43.7	81.5	56.9	83.6	52.1	78.1	43.3	64.1
BC3	**Bonds Creek** - Bringelly Road	1.10a	8.6	99.2	22.9	117.3	39.5	133.0	47.6	110.6	50.1	96.6	52.8	93.7	68.3	95.1	61.2	85.8	52.6	72.4
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9.8	99.9	25.4	119.1	43.8	139.1	52.4	119.2	56.0	105.2	59.1	100.9	75.3	102.2	66.6	89.4	58.9	77.7
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	16.3	107.4	42.2	138.5	74.5	178.5	90.3	172.9	96.7	158.2	103.2	156.4	128.6	159.1	112.7	142.4	100.8	120.4
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	17.9	108.4	45.3	140.4	80.1	182.3	97.6	181.7	106.4	172.4	114.6	169.8	140.3	169.6	126.8	153.7	113.8	136.6
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	9.4	69.4	26.1	86.9	47.7	115.9	57.8	111.0	62.0	100.8	65.8	100.6	82.8	102.6	72.7	94.4	63.8	76.8
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	27.0	151.7	69.1	194.0	124.5	249.5	152.8	254.2	168.4	252.9	180.5	250.6	218.9	253.2	196.6	229.0	179.4	202.9
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	30.2	154.1	76.7	200.1	137.1	265.0	169.1	272.8	190.6	282.1	205.3	281.9	245.9	280.6	229.6	258.3	210.7	239.1
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	5.5	50.4	15.3	60.9	27.8	71.3	33.6	63.8	35.2	58.9	37.3	58.1	46.8	60.1	42.0	54.9	34.7	45.5
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	4.5	43.4	11.0	49.7	20.5	52.0	23.6	42.4	23.9	38.5	25.5	35.4	31.9	38.4	29.9	39.9	23.1	30.2
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5.2	34.2	14.0	32.3	19.9	33.5	19.8	24.4	18.7	24.3	23.0	24.5	25.1	26.1	25.0	28.8	20.0	21.9

Critical Duration - Existing Conditions

Critical Duration - Scenario B Development Conditions

It was concluded from the results at the reference locations that:

- The impact of Scenario A development is generally to increase peak flows while reducing the critical storm duration to between 30 minutes to 2 hours depending on location on the Tributaries in a 2 yr ARI event although the critical storm duration in reaches of Kemps Creek and Bonds Creek that receive runoff from the upstream catchment remains similar to the critical storm duration under existing conditions ie. 9 – 18 hours.
- The impact of Scenario A development is generally to increase peak flows while reducing the critical storm duration to between 30 minutes to 2 hours depending on location on the Tributaries in a 100 yr ARI event;
- In contrast Scenario A development maintains the critical storm duration in Kemps Creek and Bonds Creek at 9 hours and slightly decreases the peak 100 yr ARI flows (due to timing effects).
- This suggests that a basin strategy under Scenario A development should target the frequent storm events up to say 5 yr ARI rather than targeting the full range of storm events up to the 100 yr ARI event;
- The impact of Scenario B development is to increase peak flows while reducing the critical storm duration typically to 2 hours in a 2 yr ARI event.
- Similarly the impact of Scenario B development is to increase peak flows while reducing the critical storm duration typically to 2 hours in a 100 yr ARI event.

The impact of Scenario A and Scenario B development on peak flows and the critical storm burst duration at all locations is summarised in **Table C.14**. Under Scenario A development the 50%tile increase in 2 yr ARI and 100 yr ARI peak flows is 90% and 6% respectively while under Scenario B development the 50%tile increase in 2 yr ARI and 100 yr ARI peak flows is 334% and 104% respectively. Therefore it can be seen that the cumulative impact of development within the catchment, including areas upstream of the precinct, is far greater than the impacts of urbanisation to peak flows within the precincts alone.

3.5 Basin Options

A hydrological assessment of possible basin options was undertaken and the assessment aimed to reduce, as far as possible, the 2 yr ARI and 100 yr ARI peak flows downstream of the proposed development areas to no greater than peak flows under Existing Conditions.

Initially 35 possible basin sites were identified and initially assessed. While initial consideration was given to locating basins both on tributary and main streams the potential sites were reviewed iteratively in relation to a number of issues including:

- Stakeholder views on the merits of siting basins on Category 1 and/or Category 2 streams;
- The location of High Category Vegetation; and
- The 100 yr ARI flood extent ie. basins were located on the edges of the 100 yr ARI flood extent to minimise the potential drowning of basin outlets which in turn could cause basins to spill.

This led to five basin sites being eliminated from the final adopted sites. The process by which the basin volumes were determined and the multi-level outlets were sized is described in **Appendix C.5**. The basin locations are identified in **Figure 3.1** while the properties of the concept regional basins are given in **Table 3.8**.

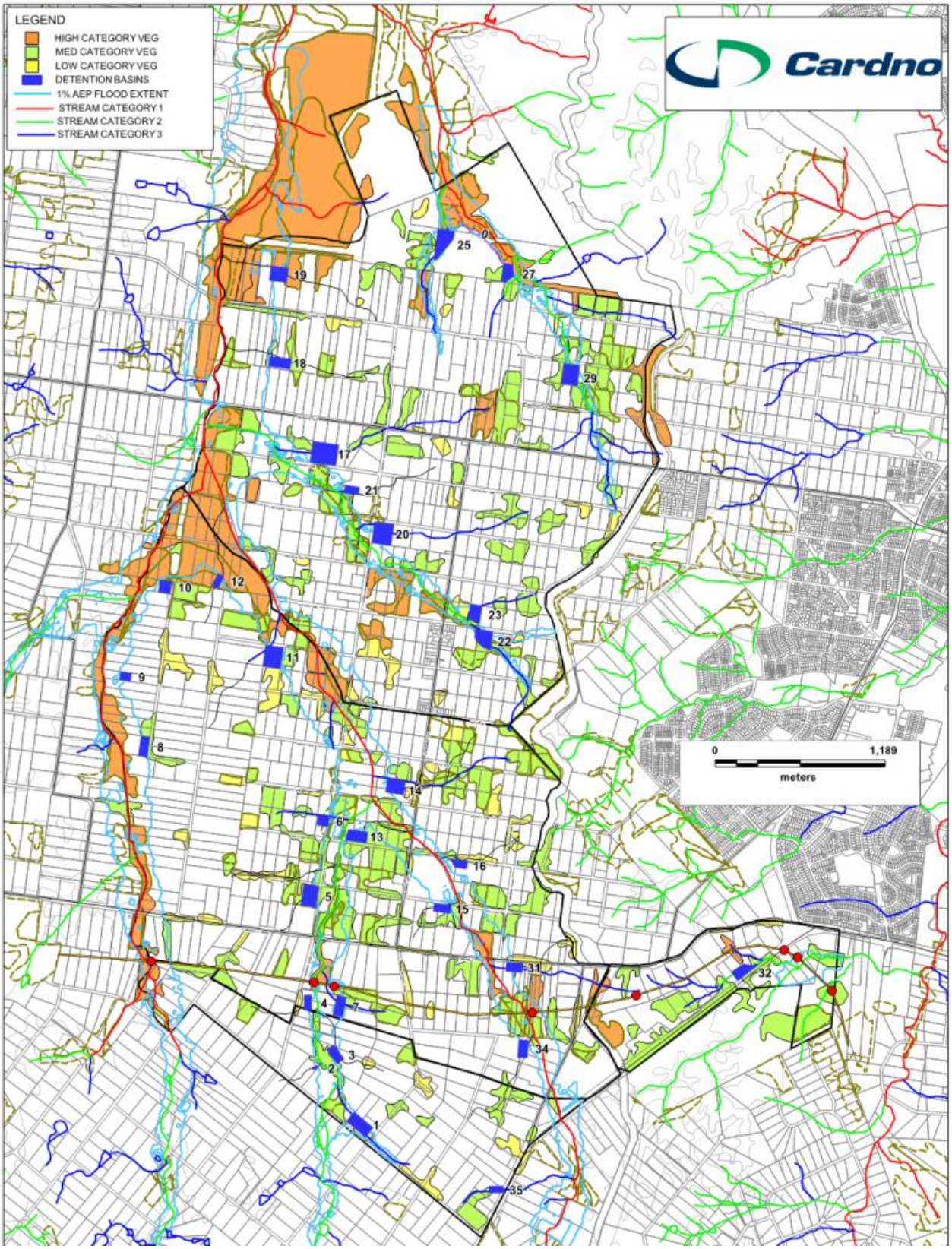

Figure 3.1: Basin Locations

Table 3.8 Properties of Regional Basins located with the Austral and Leppington North Precincts

Basin ID	Basin Node	Catchment Area (ha)	Basin Area (m2)	Basin / Catchment Area	100 yr ARI Ave Basin Depth (m)	Indicative Unit Vol (m3/ha)	2yr ARI Outlet Width (m)	100yr ARI Total Outlet Width (m)
1	8.01	46.54	15,231	3.3%	1.51	494	0.81	2.36
2	7.07a	8.65	846	1.0%	1.35	132	0.49	0.49
3	7.08b	19.24	7,927	4.1%	1.44	593	0.42	1.35
4	7.09a	17.05	5,992	3.5%	1.39	489	0.46	1.24
5	Dummy59	48.91	16,347	3.3%	1.36	455	1.07	3.57
6	7.11a	14.81	5,103	3.4%	1.25	431	0.5	1.36
7	7.09c	21.59	9,844	4.6%	1.37	625	0.5	1.69
8	17.12	29.61	8,505	2.9%	1.51	434	0.61	1.42
9	17.14a	30.93	5,246	1.7%	1.62	275	0.74	1.18
10	17.15a	17.78	4,371	2.5%	1.52	374	0.46	0.98
11	1.17a	65.30	15,491	2.4%	1.62	384	1.14	2.79
12	15.02	43.64	4,690	1.1%	1.69	182	0.71	1.29
13	7.12	41.12	10,847	2.6%	1.61	425	0.64	1.55
14	10.02a	39.27	12,416	3.2%	1.26	398	1.06	3.59
15	1.12a	20.90	7,336	3.5%	1.28	449	0.61	1.99
16	1.12c	15.87	4,608	2.9%	1.45	421	0.45	1.23
17	29.02	77.34	21,966	2.8%	1.61	457	1.16	3.47
18	31.02	31.60	7,266	2.3%	1.48	340	0.71	1.95
19	32.02	73.39	13,927	1.9%	1.72	326	1.03	2.31
20	28.02	63.68	17,901	2.8%	1.59	447	1.04	3.06
21	25.06a	15.06	5,310	3.5%	1.40	495	0.41	1.04
22	25.02	61.89	11,294	1.8%	1.44	263	1.42	2.73
23	25.03a	39.93	5,120	1.3%	1.48	190	1.02	1.85
24								
25	E16a	54.45	13,576	2.5%	1.38	345	1.24	3.73
26								
27	E10	26.11	8,713	3.3%	1.34	445	0.7	1.94
28								
29	E5	110.82	16,614	1.5%	1.40	209	3.28	6.03
30								
31	1.10b	33.95	7,843	2.3%	1.35	312	0.69	3.64
32	SE2	39.51	13,196	3.3%	1.18	393	1.19	4.03
33								
34	1.09a	21.29	8,867	4.2%	1.19	494	0.65	2.89
35	1.06a	36.76	6,992	1.9%	1.60	305	0.83	1.45

It should be noted that Basin 7 and Basin 32 are located immediately upstream of the South Western Rail Link (SWRL) and there may be an opportunity to utilise the railway embankment and to modify SWRL Crossings 12 and 10a to match the performance of the two basins.

As previously concluded development of the subcatchments upstream of the Precincts and west of Kemps Creek would increase peak flows in the major watercourses including Kemps Creek, Bonds Creek and Scalarbini Creek.

Consequently two forms of retardation of flows from these external subcatchments were considered.

Drawing on the approach adopted for sizing of basins within the Precincts, five regional basins sites were identified in the downstream reach of Bonds Creek (Basin O1) and Scalarbini Creek (Basin O2), Kemps Creek (Basin O3) and two western tributaries of Kemps Creek (Basins O4 and O5). The location of these basins is given in **Figure C.6**. These concept basins are intended to represent the application of a retardation policy similar to that proposed for the two Precincts to land outside the Precincts that may also be developed. It should be noted that the basins external to the precincts are

not part of the Austral Leppington North ILP, but have been included to replicate likely development scenarios within the catchment.

The concept basin sizes for external areas are summarised in **Table 3.9**:

Table 3.9 Concept Sizes of External Regional Basins

Basin ID	Basin Node Name	2 yr ARI		100 yr ARI		
		Volume (ML)	Outlet Width (m)	Volume (ML)	Area (ha)	Total Outlet Width (m)
O1	1.06b	137	5.6	301	20	22.6
O2	7.06	57	2.2	106	7	9.45
O3	Dummy18	96	3.9	195	13	15
O4	24.06	35	1.55	64	4	5.55
O5	1.25b	16	0.88	31	2	2.58

At the same time there are also a number of local subcatchments on the left bank of Kemps Creek that drain into the creek. Rather than attempt to size small concept basins for each individual subcatchment a procedure was developed that modified the runoff response from each subcatchment in a manner that represented the application of an OSD policy within each subcatchment. The procedure was based on determining the adjustment in subcatchment vector average slope for the developed subcatchment that gave peak runoff from the subcatchment that was comparable to the peak runoff under Existing Conditions.

The estimated peak flows at all locations within the study catchment under Scenario A development with Precinct basins and under Scenario B development with Precinct basins and five external basins and/or OSD on other external small subcatchments are summarised in **Appendix C.5**.

The estimated peak flows at the reference locations within the study catchment under all scenarios assessed for the 2 yr ARI and 100 yr ARI events are summarised in **Tables 3.10** and **3.11** respectively.

It should be noted that Location BC1 is upstream of the concept external Basin O1 consequently the estimated peak flows does not change under the various scenarios.

It was concluded from the results at the reference locations that:

- The impact of the regional Precinct basins under Scenario B development on 2 yr ARI peak flows is to limit any increases in peak flows to less than 10%.
- In the case of Location KC2 it is evident that the application of OSD on local subcatchments on the left bank of Kemps Creek would reduce the impact on 2 yr ARI peak flows;
- It is likely that OSD would need to be applied to local subcatchments draining to Tributary 2 and Tributary 3 that are not serviced by regional basins to manage impacts on 2 yr ARI flows;
- The impact of the regional Precinct basins under Scenario B development on 100 yr ARI peak flows is to limit any increases in peak flows to less than 2%;
- It is possible that additional OSD to manage impacts on 100 yr ARI flows may not be needed although the need or otherwise for additional OSD in a 100 yr ARI event may need to be reviewed based on consideration of additional reference locations with Tributary 2 and Tributary 3.

Table 3.10 Impact of Development and Basins on 2 yr ARI Peak Flows

Location ID (see Fig C.1)	Location Name	2011 Node Name (see Fig C.2)	2 yr ARI Peak Flow (m3/s)									
			Existing	Scenario A Dev		Scenario B Dev		Dev A + Basins		Dev B + Basins		Dev B + Basins + OSD	
			Flow	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff
BC1	**Bonds Creek** - Denham Court Road	1.04	7.1	7.1	0.0%	43.2	505.6%	7.1	0.0%	43.2	505.6%	43.2	505.6%
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	11.4	11.2	-2.3%	49.4	332.8%	11.4	-0.4%	11.8	3.4%	11.8	3.4%
BC3	**Bonds Creek** - Bringelly Road	1.10a	14.0	17.0	20.9%	52.6	275.2%	13.7	-2.6%	14.1	0.8%	14.1	0.8%
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	15.8	20.6	30.2%	53.6	238.9%	16.1	1.9%	16.1	1.9%	16.1	1.9%
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	27.5	39.0	42.0%	63.9	132.4%	26.7	-2.9%	28.2	2.7%	28.3	2.8%
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	30.2	41.2	36.5%	63.9	111.7%	29.6	-2.0%	32.0	5.9%	32.0	6.1%
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	16.9	16.6	-1.3%	44.4	163.6%	17.0	0.7%	24.9	47.5%	17.9	6.2%
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	47.0	46.7	-0.6%	91.2	94.1%	47.1	0.2%	50.6	7.6%	50.4	7.3%
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	53.8	53.9	0.1%	96.4	79.1%	54.6	1.5%	59.2	10.1%	59.1	9.8%
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	9.7	18.5	90.8%	28.5	194.3%	9.7	0.4%	10.3	6.4%	10.3	6.6%
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	6.7	22.3	235.0%	22.3	235.0%	7.5	12.3%	7.5	12.3%	7.5	12.3%
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5.6	15.7	182.6%	15.7	182.6%	8.9	59.4%	8.9	59.4%	8.9	59.4%

Table 3.11 Impact of Development and Basins on 100 yr ARI Peak Flows

Location ID (see Fig C.1)	Location Name	2011 Node Name (see Fig C.2)	100 yr ARI Peak Flow (m3/s) and Critical Storm Burst Duration									
			Existing	Scenario A Dev		Scenario B Dev		Dev A + Basins		Dev B + Basins		B + Basins + External OSD	
			Flow	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff
BC1	**Bonds Creek** - Denham Court Road	1.04	36.4	36.4	0.0%	100.8	176.9%	36.4	0.0%	100.8	176.9%	100.8	176.9%
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	56.9	56.1	-1.5%	121.1	112.9%	56.5	-0.7%	56.4	-0.9%	56.4	-0.9%
BC3	**Bonds Creek** - Bringelly Road	1.10a	68.3	64.8	-5.1%	133.0	94.8%	66.2	-3.1%	65.9	-3.5%	65.9	-3.5%
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	75.3	69.9	-7.1%	139.1	84.9%	72.1	-4.1%	71.9	-4.5%	71.9	-4.5%
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	128.6	115.8	-9.9%	178.5	38.8%	122.2	-5.0%	121.5	-5.6%	121.5	-5.6%
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	140.3	127.9	-8.8%	182.3	30.0%	131.8	-6.1%	130.8	-6.7%	130.8	-6.7%
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	82.8	80.8	-2.5%	115.9	39.9%	82.0	-1.1%	76.0	-8.2%	76.8	-7.3%
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	218.9	209.0	-4.5%	249.5	14.0%	211.7	-3.3%	201.6	-7.9%	202.6	-7.5%
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	245.9	236.8	-3.7%	282.1	14.7%	238.4	-3.0%	228.9	-6.9%	230.0	-6.5%
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	46.8	43.5	-7.1%	71.3	52.3%	45.4	-3.1%	46.3	-1.3%	46.3	-1.3%
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	31.9	52.0	63.1%	52.0	63.1%	32.2	1.1%	32.2	1.1%	32.2	1.1%
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	25.1	34.2	36.3%	34.2	36.3%	25.4	1.3%	25.4	1.3%	25.4	1.3%

An assessment of the impact of 10%, 20% and 30% increases in 100 yr ARI rainfall on runoff under Development Conditions and the ramifications of climate change on the volumetric requirement for basins was also assessed.

The estimated increases in basin volumes to reduce 100 yr ARI peak flows under climate change to peak flows under Existing Conditions are plotted in **Appendix C**.

For planning purposes it was estimated that the required increase in basin volume that would be required to mitigate a 10%, 20% or 30% increase in 100 yr ARI rainfall would be a 1.24, 1.60 or 1.94 times the proposed basin volume under current rainfall intensities.

3.6 On-Site Detention for Lots

An alternative to regional basins is the implementation of On-Site Detention (OSD) to manage sub-catchment runoff. OSD was investigated as an option to manage post-development flows on a lot basis in locations such as the proposed commercial area of the Leppington Town Centre. This would reduce to the volume of regional or sub-regional basins for each respective sub-catchment because OSD tanks would reduce flows from lots to pre-development levels. The regional or sub-regional basins would manage runoff from road reserves and open space. In order to provide guidance for proposed development a typical sub-catchment in the Leppington Town Centre area that will be developed for future commercial uses has been investigatied.

A local **xp_rafts** model was assembled for Sub-catchment 7.09c that drains to Basin No. 7. The model is described in detail in **Appendix C**. The existing impervious area for this catchment is 2.1% representing a typical value for the land use in the precinct.

The following assumptions were made for the lot based OSD for commercial areas:

1. 80% of total sub-catchment is private land
2. 20% of total sub-catchment is in the public domain (comprising road reserves, open space, etc)
3. All land use was assumed to be 90% impervious.

As indicated in **Table 3.12** it was found from the assessment that the post-development flow from the public domain exceeded the pre-development flow for the total sub-catchment. Hence the lot based OSD is not able to fully compensate for runoff from the public domain. Therefore lot based OSD systems would need to be coupled with downstream basins to fully manage post-development flows.

Table 3.12: 100 year ARI peak flows for Sub-catchment 7.09c

Total catchment Pre-Development Flow (m^3/s)	Post Development Flow from Lots (m^3/s)	Post-Development Flow from the Public Domain (m^3/s)
0.43	3.10	0.93

The sub-regional basin was re-sized to accept un-retarded flows from the public domain and retarded flows from lots as shown schematically in **Figure 3.2**.

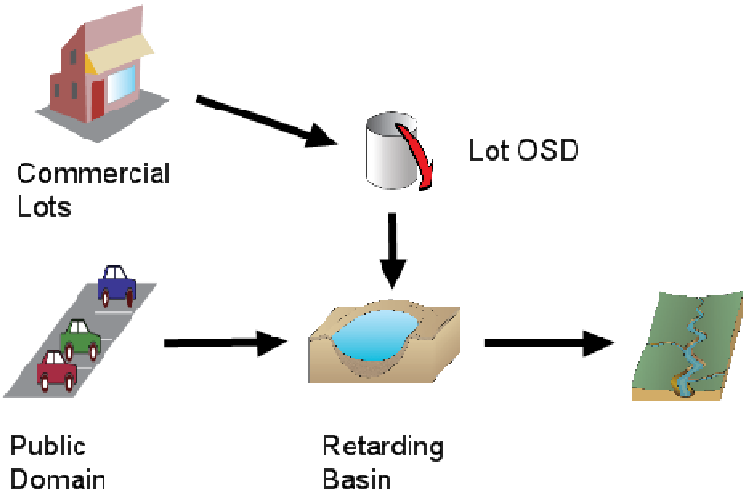

Figure 3.2: Lot based OSD Schematic Layout

Similar storage and discharge relationship assumptions were used to those adopted for the regional and sub-regional basins. A preliminary assessment of the Permissible Site Discharge (PSD) and Site Storage Requirement (SSR) provisions for commercial lots that can be used as a guide for concept design and section 94 costing is given in **Table 3.13.** It is recommended that more detailed modelling of lot based OSD be undertaken to determine appropriate values for development controls if the imperviousness of lots is substantially lower than 90%.

Table 3.13: Provisional requirements for Lot based OSD in the Town Centre

Land use	2 year ARI		100 year ARI	
	PSD (L/s/ha)	**SSR** ($m^{3/}$ha)	**PSD** (L/s/ha)	**SSR** (m^3/ha)
Commercial Lots	28 (C)	350 (C)	100 (C)	630 (C)
Public Domain	22 (LP)	532 (P)	78 (LP)	959 (P)

Key: C = Commercial lot area, P – Public domain area, LP = Commercial lot area + Public domain area

The previously estimated volume of Basin No. 7 was 13,500 $m^{3.}$ This would be reduced to a volume of 4,143 m^3 in combination with 10,891m^3 of storage installed in commercial lots.

It is concluded from the modelling that was undertaken that the size of the regional or sub-regional basins can be reduced significantly if lot based OSD is installed as part of commercial development but that the overall storage requirement for the sub-catchment is increased because of the reduced efficiency of OSD and a basin in series (refer **Table 3.14**). This approach could be applied to all commercial/light industrial land uses in the precincts.

Table 3.14: Comparison of Basin and OSD Storage Volumes

Scenario	Basin Storage Required (m^3)	Lot based OSD Storage Required (m^3)	Total Storage Requirement
Sub-regional Basin only	13,500		13,500
Lot based OSD + Sub-regional basin	4,143	10,891	15,034

4 Hydraulics

4.1 Aims

The aims of hydraulic analyses were to

- Using supplied detailed survey and/or ALS data and any available data on existing road crossings, assemble an TUFLOW model of the major watercourse(s) draining the Austral and Leppington North Precincts;
- Run the calibrated TUFLOW model for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF critical duration events under current landuse and estimate the flood levels, flood extents, flood velocities and flood hazards;
- Modify the TUFLOW model to represent a development scenario that includes regional basins and run to estimate impacts in the 2 yr ARI and 100 yr ARI floods.

4.2 Previous Hydraulic Modelling

As discussed by Perrens Consultants, 2003, previous flood studies have been carried out for the South Creek catchment and its tributaries by the former Department of Water Resources (DWR) and various consultants.

The DWR as part of its South Creek Flood Study (DWR, 1990) computed water surface profiles on Kemps Creek and other major tributary streams in the South Creek catchment using a steady state backwater analysis based on the HEC-2 program. The HEC-2 model extended from Elizabeth Drive to a point 1 km upstream of Heath Road and was based on a total of 43 cross sections over this reach.

Documented historic flood levels on Kemps Creek are scarce. Historic flood level information is concentrated along the main stream (South Creek). Accordingly, design roughness values on Kemps Creek were mainly based on experience. Estimated flood levels and velocities for the 100 year ARI event were presented in the DWR report.

In 2003 Perrens Consultants calculated water surface profiles for all major watercourses and tributaries within the Austral study area. Series of HEC-2 models were assembled individually for the main watercourses and each tributary.

Perrens Consultants, 2003 reported the establishment of these models as follows:

> *Model cross sections for the present investigation were initially obtained from the results of the photogrammetric survey of the study area as tabulations of easting, northing and level for each point on the section. They were converted into tables of elevations and offset distances across the section and then into HEC-2 format using the HEC-2 editor.*
>
> *No quantitative data on historic flooding which could be used for model calibration were uncovered for Bonds Creek or the tributary streams during the process of community consultation. As mentioned, some limited data on Kemps Creek had been collected by DWR in their flood study (DWR, 1990) and it is understood that these were incorporated in their calibrated model of that stream.*

The HEC-2 model of Kemps Creek developed for the present investigation comprised DWR sections as well as sections derived from the photogrammetric survey as described above. DWR's roughness values were reviewed during site inspections of the study area and amended where considered appropriate.

Roughness values for Bonds Creek and the remaining drainage lines were initially estimated during site inspections carried out for the present study, and a series of model runs was also carried out to test the sensitivity of results to variations in model parameters.

In general, it was found that model results were not particularly sensitive to variations in roughness. The results presented in later sections are based on a "best estimate" of roughness.

It is noted that HEC-2 cross sections were obtained from the results of the photogrammetric survey of the study area as tabulations of easting, northing and level for each point on the section. It is unclear if this source photogrammetric survey is currently available to allow comparisons with ALS data and 0.5 m contour levels supplied by stakeholders.

4.3 Hydraulic Modelling

In view of the availability of ALS survey data for the study area, the approach that was adopted was to assemble a 1D/2D flood routing model of the existing watercourses and floodplain using TUFLOW.

The modelling approach and parameters are described in **Appendix D.3**.

Preliminary modelling of the 100 yr ARI event was undertaken with inflows to the TUFLOW model located on the centre-line of the major watercourses and distributed along lateral tributaries (refer **Figure D.3**). This approach gave flood extents not only for the main watercourses but also the lateral tributaries. On some lateral tributaries it would appear that the ALS data and/or contour data was unable to define a local watercourse and consequently the flood was estimated to spill across the floodplain. However it is intended that regional retarding basins be constructed in the downstream reach of lateral tributaries to mitigate the impact of planned development and that works would be undertaken on the lateral tributary to direct all local flows up to the 100 yr ARI event into a basin.

Consequently a second approach was trialled where the inflows from lateral tributaries were also input on the centre-line of major watercourses. The resulting flood extent was termed the mainstream flood extent (see **Figure D.3**). This flood extent also guided the downstream limit of any retarding basin to avoid any potential drowning of a basin outlet during major floods.

This second approach was adopted for all subsequent modelling.

The downstream boundary was located well downstream of the Precinct boundary so that any downstream boundary effects would have minimal impact on estimated flood levels within the Precincts. The downstream boundary condition adopted in the TUFLOW model for all the design runs was a free outfall condition.

4.4 Existing Conditions

Preliminary modelling of the 2 hour and 9 hour storm bursts for the 2 yr ARI and 100 yr ARI events was undertaken to assess the critical storm burst duration for flood levels. It was found under Existing Conditions that the 9 hour storm was the critical storm for Kemps Creek, Bonds Creek and the tributary creeks. Consequently all design runs up to the 500 yr ARI event were undertaken for the 9 hour storm burst.

Similarly the 1.5 hour and 2 hour PMP storms were also modelled. It was found that 2 hour PMP event gave the peak PMF levels.

The TUFLOW model was run for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events under Existing Conditions.

4.4.1 Results

The estimated peak flood depths for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.4** to **D.11**.

The estimated peak flood depths for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.12** to **D.19**.

The estimated peak velocity x depth for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.20** to **D.27**.

The estimated flood hazard for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.28** to **D.35**.

The flood extents for the 2 yr ARI, 100 yr ARI and PMF are given in **Figure 4.1**.

4.4.1 Road Crossings

There are 29 hydraulic structures located within the current study area. These crossings are detailed in **Table D.1**.

A comparison of the 1 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI and PMF flood levels at crossings estimated in the 2003 study and the current study is given in **Table D.2**.

The estimated 1 yr ARI, 2 yr ARI, 5 yr ARI and 20 yr ARI flood levels, velocities and velocity x depths at crossings are given in **Table D.3** while the estimated 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF flood levels, velocities and velocity x depths at crossings are given in **Table D.4**. Particular attention was taken in estimation of the 500 yr ARI result at the road crossings in order to identify safe evacuation routes. An assessment was made at each of the crossings to determine if the road can be crossed according to the criteria in **Section D.4.3**. Results of this assessment are given in **Table D.5** and the likely evacuation routes are displayed in **Figure 4.6**. It is indicated that there is evacuation routes available from all parts of the precincts via the specific crossings shown. Improvements to the evacuation route may be achieved by upgrading road crossings that are currently unsafe to cross. Examples include Edmondson Ave crossing over Bonds Creek and the Bringelly Road crossing over Scalibrini Creek. It should be noted that the accuracy of the results is dependent on the input data to the hydraulic model.

It is noted from **Table D.1** that the invert levels of crossings based on the ALS data can vary between ±0.7 m in comparison with invert levels reported in the 2003 study. Similarly there are significant

differences in the estimated flood levels at crossings which can range from -0.5 m to +1.45 m (in the 2 yr ARI event). It is considered that these significant differences could be due to:

- The ALS data and/or contour data in reaches beyond the supplied ALS data are not accurately delineating watercourses and in particular channel invert levels;
- In areas of dense vegetation the ALS data is misreporting the true ground level – this phenomenon has been previously encountered on a floodplain in the Wyong Shire where in areas of dense low vegetation field survey disclosed ground levels up to 1 m lower than represented by the ALS data;
- The adopted spatial distribution of roughness may be less detailed than adopted in the 2003 HEC-2 model; and/or
- The discharges adopted in the 2003 HEC-2 model differ from the discharges calculated in the 2D floodplain model due to hydraulic routing (which is not included in the HEC-2 model).

To establish if the first two factors may be significant, cross sections extracted from the merged ALS data and contour levels were compared with cross sections from the HEC-2 models at selected locations immediately upstream of five crossings. The five locations which were selected were:

- Kemps Creek upstream of Bringelly Road
- Bonds Creek upstream of Eighth Avenue
- Bonds Creek upstream of Tenth Avenue
- Tributary 2 upstream of Edmondson Avenue
- Tributary 3 upstream of Fourteenth Avenue

It should be noted that the comparison is based on extracting a cross section along the best estimate of the location and alignment of the HEC-2 cross section (in the absence of any geo-referenced data on the HEC-2 cross sections).

Theses cross sections are compared in **Figure D.38**.

It was concluded from the comparison of cross sections that the significant differences in the estimated flood levels at crossings could be due to:

- the ALS data which has not accurately defined watercourses and in particular channel invert levels which can be up to 1.5 m lower than indicated by the ALS data; and
- In areas of dense vegetation the ALS data is misreporting the true ground level with floodplain levels estimated to be up to 0.5 m higher than adopted in the 2003 study.;

The effect of the better defining watercourses would be to increase the estimated capacity of existing watercourses which would reduce the estimate flood levels and flood extents in frequent storm events (1-2 yr ARI). If the ALS data is misreporting ground levels in areas of dense vegetation then the effect of lowering the ground levels would be to reduce estimated flood levels in major storms (eg. > 5 yr ARI) in reaches that are not subject to backwater from road crossings ie. reaches where road crossings are not locally controlling flood levels. It is possible however that the estimated flood extents in major storms would remain similar to current estimated extents.

4.5 Developed Conditions

The TUFLOW model was also run with hydrographs exported from the **xprafts** model for the case of Scenario B development with Precinct basins and five external basins and OSD on other external small subcatchments.

The developed condition model was run for the 2 yr ARI and 100 yr ARI events.

The differences between the 2 yr ARI and 100 yr ARI flood levels estimated under Developed and Existing Conditions are presented in **Figures 4.2** and **4.3** respectively.

The differences between the 2 yr ARI and 100 yr ARI flood velocities estimated under Developed and Existing Conditions are presented in **Figures 4.4** and **4.5** respectively.

It is concluded from these comparisons that:

- Differences in 2 yr ARI flood levels are greatest downstream of Tenth Avenue on Bonds Creek and in Kemps Creek downstream of the Bonds Creek confluence. This may be due to uncontrolled runoff from local catchments between Bonds Creek and Tributary 2 downstream of Fourth Avenue.
- The differences in 2 yr ARI flood levels elsewhere are minor except in some channelised sections of Bonds Creek and Tributary 1;
- It is likely that either OSD would need to be applied to local subcatchments draining to Bonds Creek, Tributary 2 and Tributary 3 that are not serviced by regional basins to manage impacts on 2 yr ARI flows or the size of upstream basins would need to be increased to compensate for local subcatchments draining to Bonds Creek, Tributary 2 and Tributary 3 that are not serviced by regional basins;
- The great majority of differences in 100 yr ARI flood levels is a small reduction with small increases occurring in Tributary 3 and the upper reach of Kemps Creek;
- The differences in 2 yr ARI velocities display a similar spatial trend to the differences in 2 yr ARI flood levels; and
- The differences in 100 yr ARI velocities display a similar spatial trend to the differences in 100 yr ARI flood levels.
- It is possible that additional OSD to manage impacts on 100 yr ARI flows may not be needed except possibly in the Tributary 3 sub-catchment.

Further assessment of developed conditions was undertaken by replicating likely areas of fill within the floodplain for urban development. There is opportunity to fill in the floodplain without adverse affect to flooding as the width of the flood extents are broad with extensive shallow depths on the periphery. Parts of the floodplain had the terrain artificially raised 0.2m above the flood level to replicate filling to achieve suitable flood free foundations for development. A full description of the process and results is included in **Appendix D**. A summary of the findings is provided below:

- Limited localised impacts to the 100 year ARI water levels were observed for the fill areas located on Bonds and Scalibrini Creeks
- Nil water level impacts were observed in reaches of the creeks up and down stream
- The extent of fill should be limited to areas where the 100 year ARI depth is between 0.2-0.3m
- Filling in the floodplain is generally a feasible option to increase the urban development area for parts of the floodplain

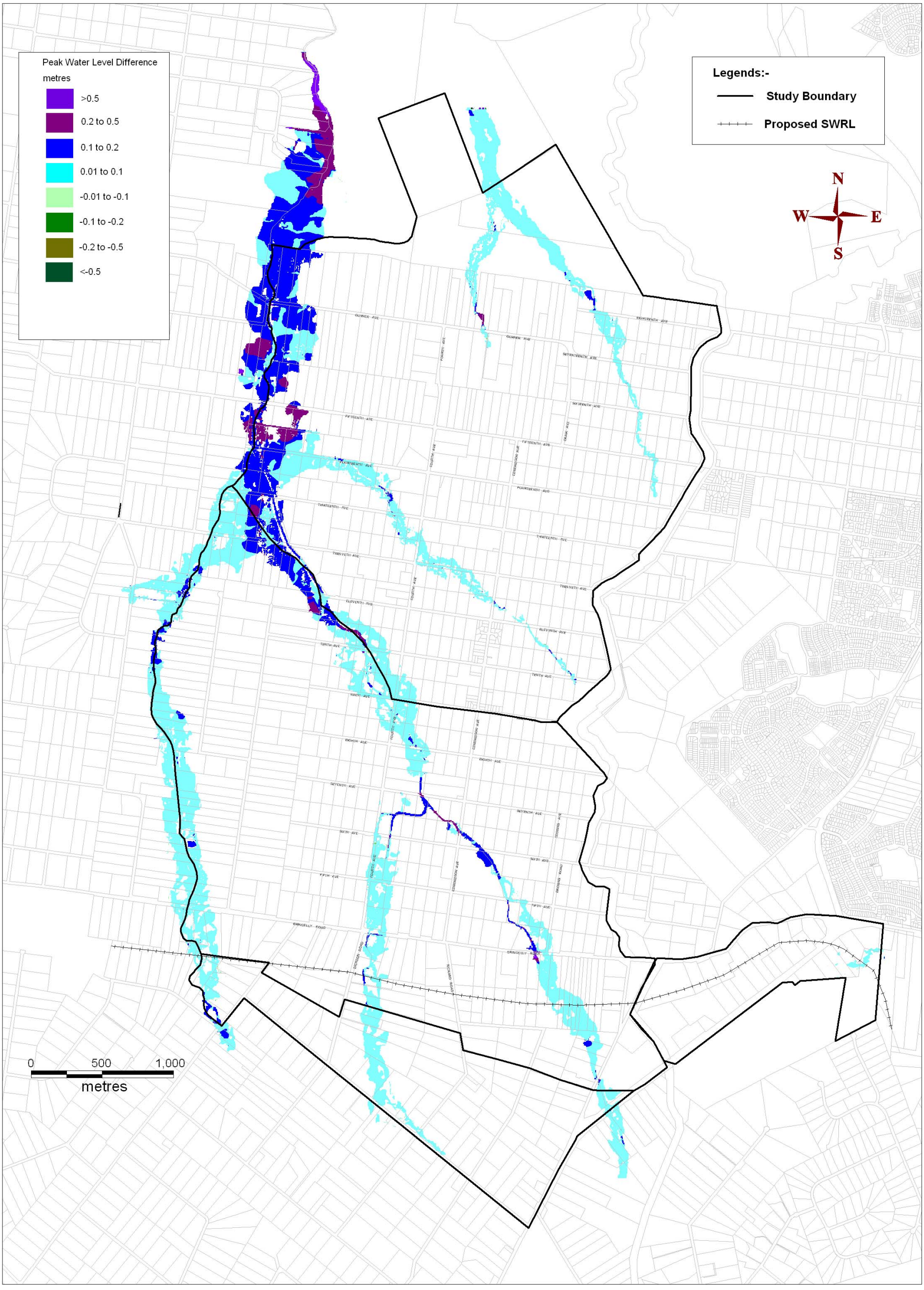

Figure 4.2 2 yr ARI Flood Level Differences (Scenario B development + Basins + OSD - Existing Conditions)

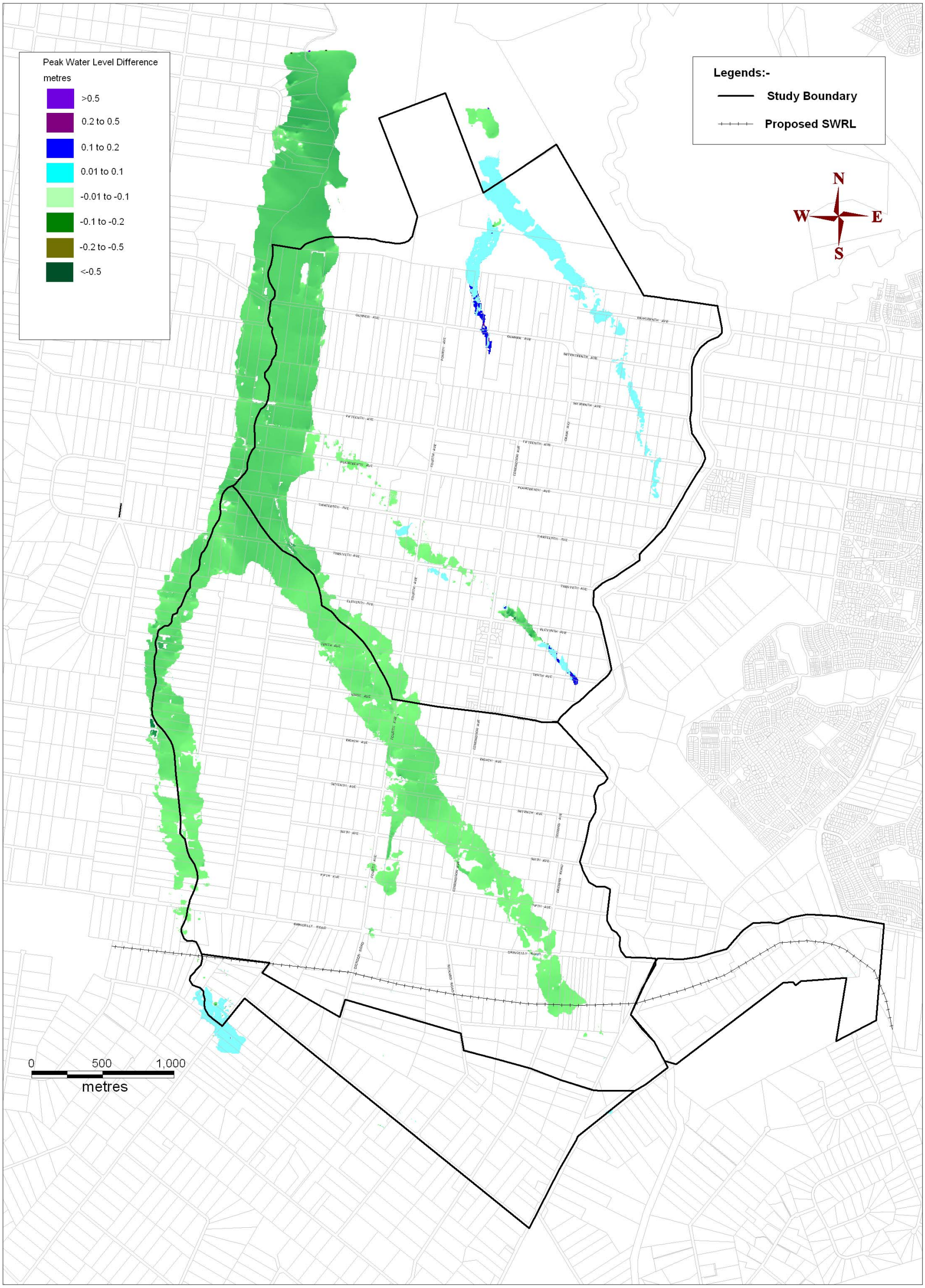

Figure 4.3 100 yr ARI Flood Level Differences (Scenario B development + Basins + OSD - Existing Conditions)

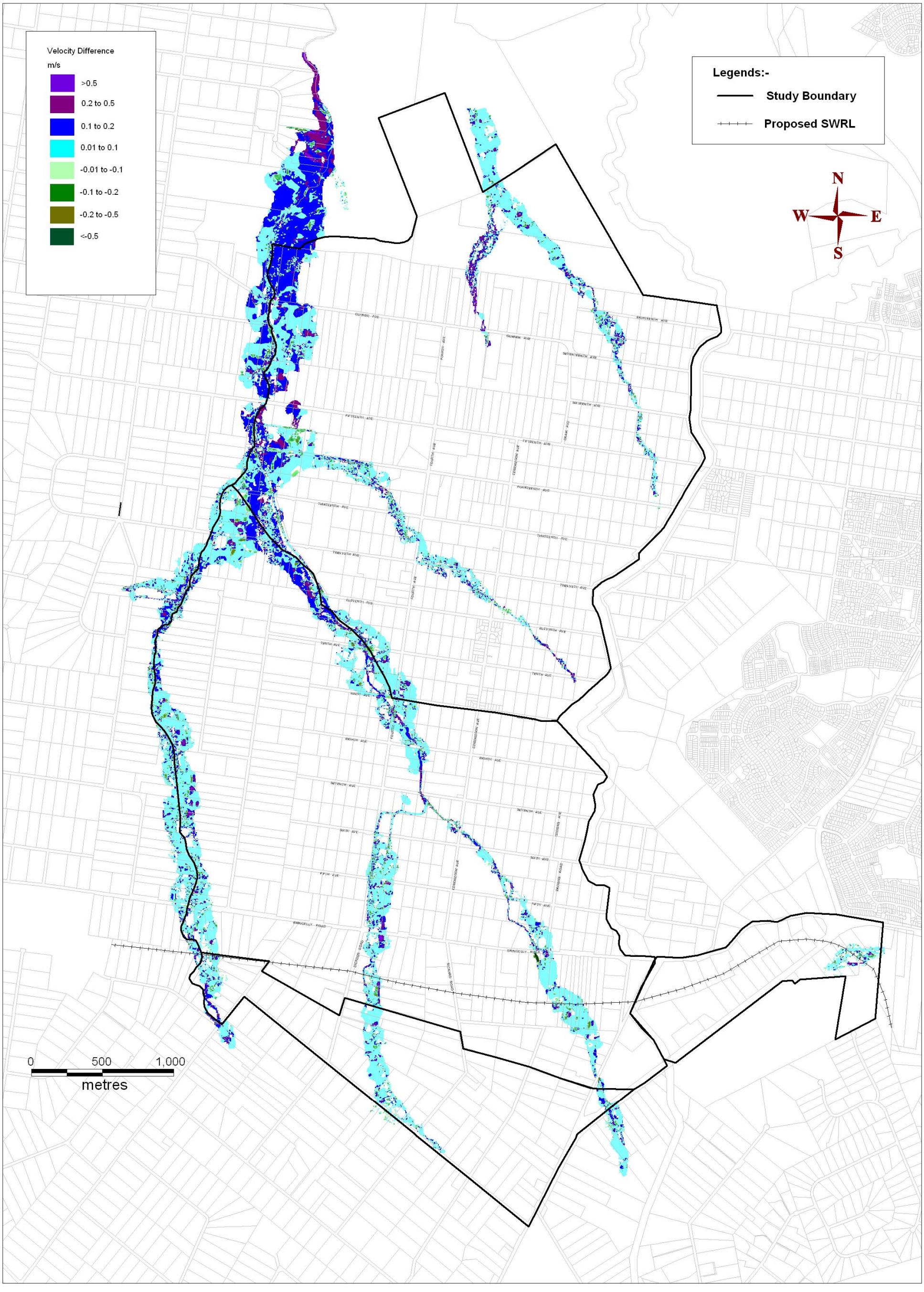

Figure 4.4 2 yr ARI Flood Velocity Differences (Scenario B development + Basins + OSD - Existing Conditions)

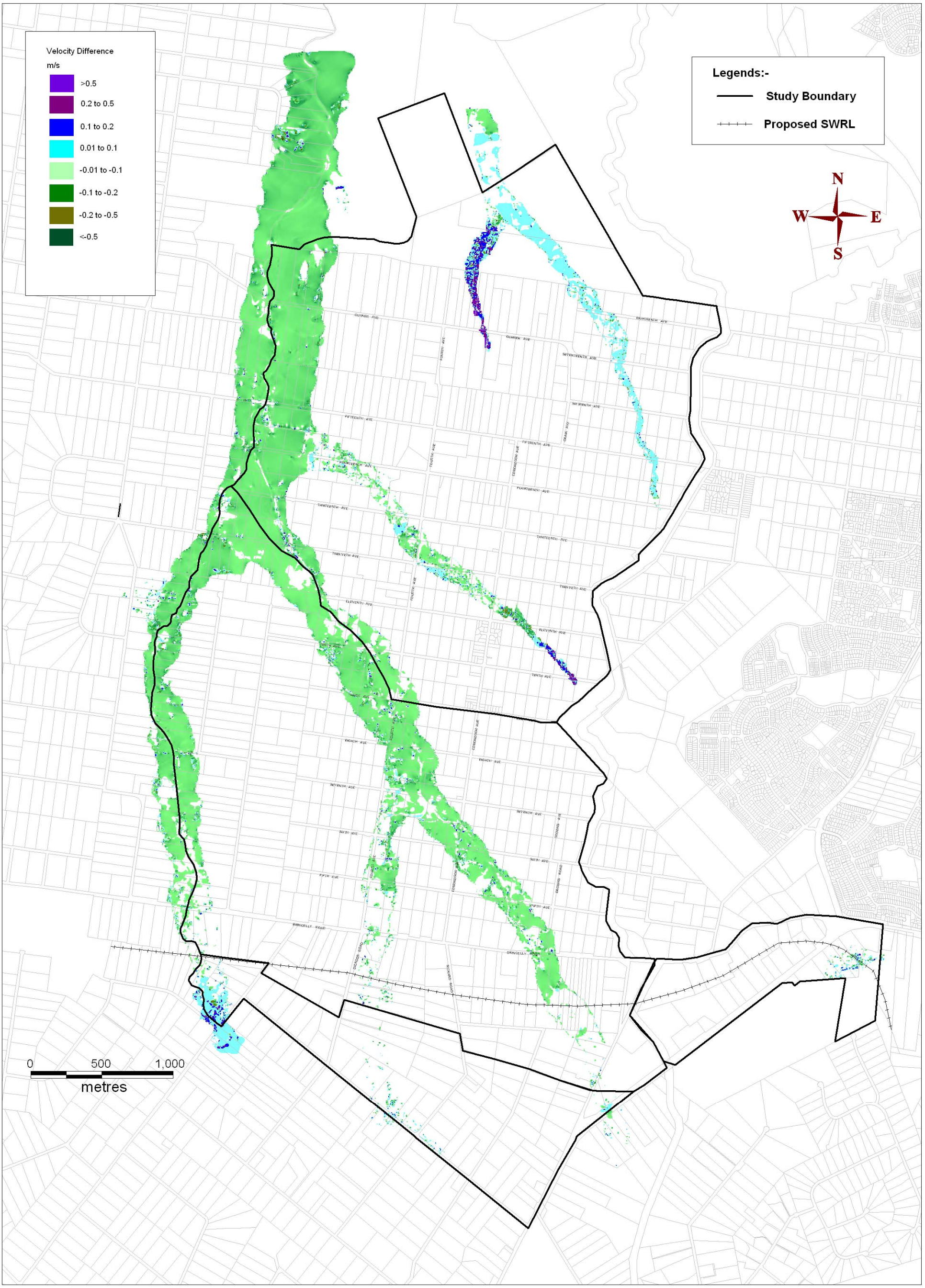

Figure 4.5 100 yr ARI Flood Velocity Differences (Scenario B development + Basins + OSD - Existing Conditions)

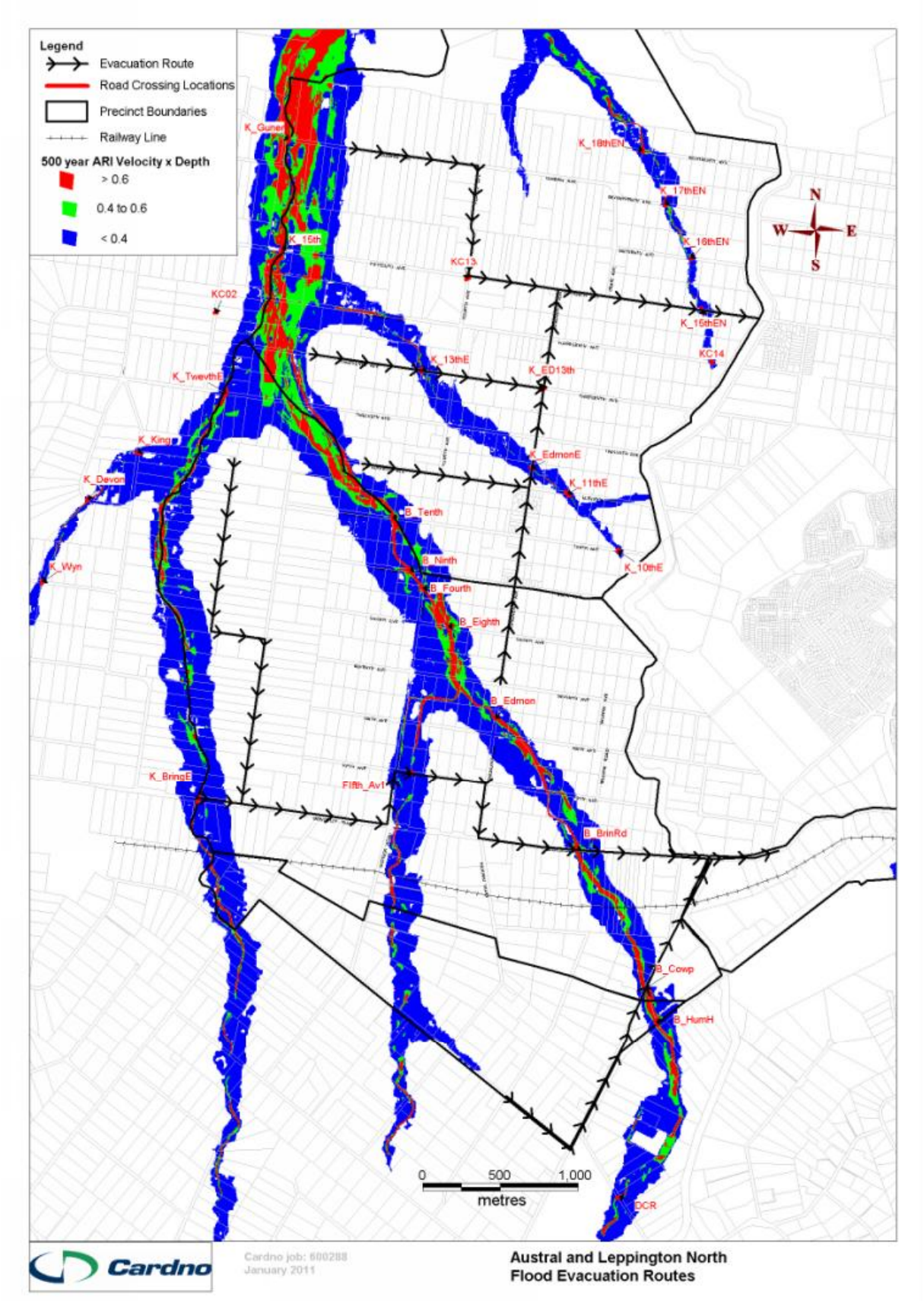

Figure 4.6: Flood evacuation routes in the 500 year ARI

5 Conclusions

This Flooding and Riparian Assessment has been undertaken as part of the Precinct Planning Process for the Austral and Leppington North Precincts, within the South West Growth Centre. The Austral Precinct has an area of approximately 9.30 km^2 and is expected to accommodate around 8,000 dwellings and 22,000 residents.

The Leppington North Precinct (located immediately south of Austral Precinct, has an area of approximately 11 km^2 and is expected to accommodate around 12,000 dwellings and 30,000 residents.

5.1 Riparian Corridors

Riparian corridors form a transition zone between terrestrial and aquatic environments and perform a range of important environmental functions which include, inter alia, reduced risk of stream erosion, trapping sediment, and pollutants from adjacent landuse, provide wildlife corridors, and allow for conveyance of flood flows and control the direction of flood flows.

NOW conducted a site investigation and undertook a preliminary categorisation of streams for the study area to assist with the Riparian Assessment. The documentation included a letter with an attached map indicating preliminary stream categories, locations where further investigations were required and mapped blue lines that are not regarded as rivers

A combination of visual, topographic survey, geospatial, ecological and literature reference methods were employed for the riparian assessment. These methods were discussed with NOW and preliminary stream categories have been reviewed with changes and comments included in the final categorisation. Copies of the correspondence relating to the above is included in **Appendix B**)

In order to delineate the riparian corridor it was necessary to identify the top of the highest bank that could be used as a basis to offset the riparian corridor boundaries.

The riparian assessment led to the identification of Category 1, 2 and 3 streams across the Precincts. Numerous Category 3 streams are included across the study area for smaller tributaries to the aforementioned streams. These streams are currently highly degraded and have, for the most part, been completely diverted, channelized and used as landfill in some cases. Corridors for these streams have been proposed to ensure bank stability and erosion control. Channelisation of the category 3 streams has been investigated further in the Water Cycle Management report (Cardno 2011). Numerous natural channel shapes have been proposed for various streams depending on the hydraulic capacity, creek bank stability and longitudinal slope. The channel shapes replicate natural topographic conditions for perennial streams by providing a narrow channel inset within a broad floodplain. A minimum corridor width of 25m has been observed as described in **Section 2.2.3.**

Various other streams that were identified on the topographic maps have been regarded as not a river and eliminated. This has been undertaken through liaison with NOW.

5.2 Hydrology

The **xprafts** rainfall/runoff package has been adopted previously for hydrological analyses in the South Creek and Eastern Creek catchments. The **xprafts** rainfall/runoff package was also adopted for this study.

The rainfall/runoff model which was assembled of the catchment draining through the Austral and Leppington North Precincts was tested against peak flows reported at twelve selected locations as reported by Perrens Consultants, 2003.

While it was noted that the rounding of the 2003 results meant that a precise comparison could not be undertaken with the 2011 estimates it was concluded that very good agreement was achieved in the 1 yr ARI, 5 yr ARI and 100 yr ARI events and that the 2001 catchment model was suitable for the estimation of hydrographs within the study catchment.

The **xprafts** model was then run to estimate the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF design flood events. These hydrographs were in turn exported to the TUFLOW floodplain model.

Two development scenarios were assessed as follows:

Scenario A Development	All land within the Austral and Leppington North Precincts outside the 100 yr ARI flood extent only was developed. The external catchment areas upstream and to the west of the Precincts remained as under existing conditions.
Scenario B Development	All land within the Austral and Leppington North Precincts outside the 100 yr ARI flood extent was developed as was the external catchment areas upstream and to the west of the Precincts.

It was concluded from a comparison of the results at the reference locations that:

- The impact of Scenario A development is generally to increase peak flows while reducing the critical storm duration to between 30 minutes to 2 hours within the Tributaries in a 2 yr ARI event although the critical storm duration in reaches of Kemps Creek and Bonds Creek that receive runoff from the upstream catchment remains similar to the critical storm duration under existing conditions ie. 9 – 18 hours.
- The impact of Scenario A development is generally to increase peak flows while reducing the critical storm duration to between 30 minutes to 2 hours within the Tributaries in a 100 yr ARI event;
- In contrast Scenario A development maintains the critical storm duration in Kemps Creek and Bonds Creek at 9 hours and slightly decreases the peak 100 yr ARI flows (due to timing effects).
- This suggests that a basin strategy under Scenario A development should target the frequent storm events up to say 5 yr ARI rather than targeting the full range of storm events up to the 100 yr ARI event;

- The impact of Scenario B development is to increase peak flows while reducing the critical storm duration typically to 2 hours in a 2 yr ARI event.
- Similarly the impact of Scenario B development is to increase peak flows while reducing the critical storm duration typically to 2 hours in a 100 yr ARI event

A hydrological assessment of possible basin options to reduce as far as possible the 2 yr ARI and 100 yr ARI peak flows downstream of the proposed development areas to no greater than peak flows under Existing Conditions was undertaken.

Thirty regional basin sites located with the Precincts were identified and assessed. Each basin was sized to limit 2 yr ARI and 100 yr ARI peak flows to levels no greater than under Existing Conditions. This required the sizing and multi-level outlets for each basin.

It should be noted that Basin 7 and Basin 32 are located immediately upstream of the South West Rail Link (SWRL) and there may be alternative configurations to these basins to align with SWRL Crossings 12 and 10a.

As previously concluded development of the subcatchments upstream of the Precincts and west of Kemps Creek would increase peak flows in the major watercourses including Kemps Creek, Bonds Creek and Scalarbini Creek. Consequently two forms of retardation of flows from these external subcatchments were also considered.

Five regional basins sites were identified in the downstream reach of Bonds Creek (Basin O1) and Scalabrini Creek (Basin O2), Kemps Creek (Basin O3) and two western tributaries of Kemps Creek (Basins O4 and O5). These basins were sized using the procedure for sizing regional basins within the Precincts.

At the same time there are also a number of local subcatchments on the left bank of Kemps Creek that drain into the creek. Rather than attempt to size small concept basins for each individual subcatchment a procedure was developed that modified the runoff response from each subcatchment in a manner that represented the application of an OSD policy within each subcatchment.

It was concluded from a comparison of the results at the reference locations that:

- The impact of the regional Precinct basins under Scenario B development on 2 yr ARI peak flows is to limit any increases in peak flows to less than 10%;
- In the case of Location KC2 it is evident that the application of OSD on local subcatchments on the left bank of Kemps Creek would reduce the impact on 2 yr ARI peak flows;
- It is likely that OSD would need to be applied to local subcatchments draining to Tributary 2 and Tributary 3 that are not serviced by regional basins to manage impacts on 2 yr ARI flows;
- The impact of the regional Precinct basins under Scenario B development on 100 yr ARI peak flows is to limit any increases in peak flows to less than 2%;
- It is possible that additional OSD to manage impacts on 100 yr ARI flows may not be needed although the need or otherwise for additional OSD in a 100 yr ARI event may need to be reviewed based on consideration of additional reference locations with Tributary 2 and Tributary 3.

Based on the above, it is considered that the external catchments to the precincts will be appropriately managed by OSD. Further detailed assessment of the catchments upstream will be undertaken when the planning process commences for these areas.

For planning purposes it was also estimated that the required increase in basin volume that would be required to mitigate a 10%, 20% or 30% increase in 100 yr ARI rainfall under future climate change would be a 1.24, 1.60 or 1.94 times the proposed basin volume under current rainfall intensities.

It was also concluded that the size of regional or sub-regional basins can be reduced significantly if lot based OSD is installed as part of commercial development but that the overall storage requirement for the sub-catchment is increased because of the reduced efficiency. The reduction is a result of lot based OSD and a retarding basin configured in series i.e. flows attenuated by the lot based OSD then flows onto the retarding basin to be attenuated further.

5.3 Flooding

In view of the availability of ALS survey data for the study area, the approach that was adopted was to assemble a 1D/2D flood routing model of the existing watercourses and floodplain using TUFLOW.

The adopted approach for locating inflows from lateral tributaries was to input these inflows on the centre-line of major watercourses. The resulting flood extent was termed the mainstream flood extent. This flood extent guided the downstream limit of any retarding basin to avoid any potential drowning of a basin outlet during major floods.

Preliminary modelling of the 2 hour and 9 hour storm bursts for the 2 yr ARI and 100 yr ARI events was undertaken to assess the critical storm burst duration for flood levels. It was found that under Existing Conditions that that the 9 hour storm was the critical storm for Kemps Creek, Bonds Creek and the tributary creeks. Consequently all design runs up to the 500 yr ARI event were undertaken for the 9 hour storm burst. Similarly the 1.5 hour and 2 hour PMP storms were also modelled. It was found that 2 hour PMP event gave the peak PMF levels.

The TUFLOW model was run for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events under Existing Conditions.

A comparison of the 1 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI and PMF flood levels at 29 crossings estimated in the 2003 study and the current study was also undertaken.

It was concluded from a comparison of five cross sections from the 2003 study with cross sections extracted from the ALS data that the significant differences in the estimated flood levels at crossings could be due to

- the ALS data which has not accurately defined watercourses and in particular channel invert levels which can be up to 1.5 m lower than indicated by the ALS data; and
- In areas of dense vegetation the ALS data is misreporting the true ground level with floodplain levels estimated to be up to 0.5 m higher than adopted in the 2003 study.

The effect of the better defining watercourses would be to increase the estimated capacity of existing watercourses which would reduce the estimate flood levels and flood extents in frequent storm events (1-2 yr ARI). If the ALS data is misreporting ground levels in areas of dense vegetation then the effect of lowering the ground levels would be to reduce estimated flood levels in major storms (eg. > 5 yr ARI) in reaches that are not subject to backwater from road crossings ie. reaches where road

crossings are not locally controlling flood levels. It is likely however that the estimated flood extents in major storms would remain similar to current estimated extents.

The TUFLOW model was also run with hydrographs exported from the **xprafts** model for the case of Scenario B development with Precinct basins and five external basins and OSD on other external small subcatchments.

The developed condition model was run for the 2 yr ARI and 100 yr ARI events.

It is concluded from the comparison of flood levels and velocities under developed and Existing Conditions that:

- Differences in 2 yr ARI flood levels are greatest downstream of Tenth Avenue on Bonds Creek and in Kemps Creek downstream of the Bonds Creek confluence. This may be due to uncontrolled runoff from local catchments between Bonds Creek and Tributary 2 downstream of Fourth Avenue;
- The differences in 2 yr ARI flood levels elsewhere are minor except in some channelised sections of Bonds Creek and Tributary 1;
- It is likely that either OSD would need to be applied to local subcatchments draining to Bonds Creek, Tributary 2 and Tributary 3 that are not serviced by regional basins to manage impacts on 2 yr ARI flows or the size of upstream basins would need to be increased to compensate for local subcatchments draining to Bonds Creek, Tributary 2 and Tributary 3 that are not serviced by regional basins;
- The great majority of differences in 100 yr ARI flood levels is a small reduction with small increases occurring in Tributary 3 and the upper reach of Kemps Creek;
- The differences in 2 yr ARI velocities display a similar spatial trend to the differences in 2 yr ARI flood levels; and
- The differences in 100 yr ARI velocities display a similar spatial trend to the differences in 100 yr ARI flood levels.
- It is possible that additional OSD to manage impacts on 100 yr ARI flows may not be needed except possibly in the Tributary 3 subcatchment.

6 Qualification

It is important to recognise that any modelling studies provide only an estimate of the predicted flood levels, flows, pollutant loads and/or treatment efficiencies. Although these estimates are based on the best data available at the time of writing, new data obtained in the future may lead to a revision of the estimates.

7 References

Department of Water Resources (1991). South Creek Floodplain Management Study. Report prepared by Willing and Partners

DJ Dwyer and Associates (1979). *Austral Drainage Study*. Report prepared for Liverpool City

Department of Water Resources (1990). *Flood Study Report - South Creek*.

Department of Water Resources (1991). *South Creek Floodplain Management Study*.

Perrens Consultants (2003) "Austral Floodplain Risk Management Study & Plan", report Version 5.0, prepared for Liverpool City Council, September, pp 76 + Apps.

Parsons Brinckerhoff (2010) "South West Rail Link Glenfield to Leppington Rail Line, Environmental Assessment Technical Paper 3 Hydrology, Prepared by WMAwater for Transport Infrastructure Development Corporation, 64 pp.

Walsh, M.A, Pilgrim, D.H and Cordery, I (1991), "Initial Losses for Design Flood Estimation in New South Wales". *Proceedings*, International Hydrology and Water Resources Symposium, 1991, IEAust. Natl. Conf. Pub. No. 91/19, 2-4 October, Perth

Appendix A

Available Information

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
06-Jun-10	Ast_Aerial	Drawing of aerial view of Austral	PDF
06-Jun-10	Ast_Contour	Drawing of Austral contour lines	PDF
06-Jun-10	boundaryreview_austral	Drawing of Austral precinct boundary	PDF
06-Jun-10	boundaryreview_leppingtonnorth	Drawing of Leppington North precinct boundary	PDF
06-Jun-10	http___maps.google.com	Google Maps image of Austral/Leppington area	PDF
06-Jun-10	LPN_Aerial	Drawing of aerial view of Leppington North	PDF
06-Jun-10	LPN_Contour	Drawing of Leppington North contour lines	PDF
11-Jun-10	2mContours.dwg	Base maps for study area	DWG File
11-Jun-10	AST_LPN.ecw	Base maps for study area	ECW File
11-Jun-10	AST_LPN.ers	Base maps for study area	ERS File
11-Jun-10	BoundaryExtension.dwg	Base maps for study area	DWG File
11-Jun-10	Cadastre.dwg	Base maps for study area	DWG File
11-Jun-10	CertifiedLand.dwg	Base maps for study area	DWG File
11-Jun-10	Drainage.dxf	Base maps for study area	DXF File
11-Jun-10	ExistingNativeVeg.dwg	Base maps for study area	DWG File
11-Jun-10	FloodProneLand.dwg	Base maps for study area	DWG File
11-Jun-10	MajorRoads.dwg	Base maps for study area	DWG File
11-Jun-10	NonCertifiedLand.dwg	Base maps for study area	DWG File
11-Jun-10	PrecinctBdy.dwg	Base maps for study area	DWG File
11-Jun-10	PrecinctExtension.dwg	Base maps for study area	DWG File
11-Jun-10	StreamClassification.dwg	Base maps for study area	DWG File
11-Jun-10	StreetCentrelines.dwg	Base maps for study area	DWG File
11-Jun-10	WesternSydneyParklands.dwg	Base maps for study area	DWG File
09-Jul-10	2297	Watercourse Categories of Austral and Leppington North Growth Centre Areas	PDF
09-Jul-10	Riparian assessment-Austral and Leppington north-Jul10	Letter accompanying above PDF regarding Watercourse Categories of Austral and Leppington North	.doc
12-Jul-10	Water Quality Modelling Technical Note 061106	Interim Recommended Parameters for Stormwater Modelling - North-West and South-West Growth Centres	.doc
13-Jul-10	Austral Precinct - Precinct boundary addition	Drawing denoting addition of area to Austral boundary	PDF
13-Jul-10	Leppington North Precinct boundary - former WS parklands	Drawing denoting addition of area to Leppington North boundary	PDF
13-Jul-10	Leppington North Precinct boundary amendment	Drawing denoting addition of area to Leppington North boundary as recommended by Dept of Planning	PDF
15-Jul-10	Questions from Cardno re WSUD strategy_DoP responses	Cardno Questions re WSUD strategy development, and DoP responses	.doc
19-Jul-10	10027 SK01_Vision	Vision' for Leppington Town Centre	PDF
19-Jul-10	10027 SK02_ Aerial Photo	Aerial photo of Leppington	PDF
19-Jul-10	10027 SK03_ Natural Features	Drawing of natural features of Leppington (i.e. Riparian Corridors)	PDF
19-Jul-10	10027 SK04_ Man made Features	Drawing of man-made features of Leppington (i.e. bridges)	PDF
19-Jul-10	10027 SK05_Constraints	Leppington Town Centre development constraints	PDF
19-Jul-10	10027 SK06_ Dynamic Constraints	Drawing of dynamic constraints of Leppington (i.e. Memorial Park to be retained)	PDF
19-Jul-10	10027 SK07_Opportunities	Leppington Town Centre development opportunites	PDF
19-Jul-10	10027 SK08_ Dynamic Opportunities	Drawing of dynamic opportunites (i.e. potential iconic element in town centre)	PDF
19-Jul-10	10027 SK09_ Leppington Station	Drawing of Leppington Station Plan, including 3D Plan view and section	PDF
19-Jul-10	10027 SK10_ Typical Cross Sections	Drawing of Principal Arterial and Transit Boulevard cross sections	PDF
19-Jul-10	SMM - SWGC Road Networks Report DRAFT 03 -	RTA - Draft South West Growth Centre Road Network Strategy	PDF
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19-Jul-10	Volume 1	South West Rail Line Glenfield to Leppington Rail Line Project Approval Environmental Assessment	PDF
19-Jul-10	Volume 2a	South West Rail Line Glenfield to Leppington rail line - Environmental Assessment Volume 2a - Technical Reports 1 to 2	PDF
19-Jul-10	Volume 2b	South West Rail Line Glenfield to Leppington rail line - Environmental Assessment Volume 2b - Technical Reports 3 to 7	PDF
22-Jul-10	003 Environmental Assessment - Volume 1 - Chapter 04 (Part 1)	South West Rail Link Glenfield to Leppington Rail Line Project Approval Environmental Assessment - Chapter 4: Review of receiving environment	PDF
22-Jul-10	023 Environmental Assessment - Volume 1 - Chapters 07 to 14	South West Rail Link Glenfield to Leppington Rail Line Project Approval Environmental Assessment - Chapter 7 to 14	PDF
22-Jul-10	100721_MAP_Aust and Lep Nth surveys_EH	Western Sydney Parklands and Austral; South West Growth Centre - Catherine Fields North, Leppington, East Leppington, & Leppington North	PDF
23-Jul-10	ReadMe	Document stating the data below comes with a DVD	.doc
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23-Jul-10	2mContours.dwg	Base maps for study area	DWG File
23-Jul-10	Austral.bak	Base maps for study area	BAK File
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	Base Maps - GIS Files		
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Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

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23-Jul-10	AST_LPN_ExistingNativeVeg_0510.sbn	Base maps for study area	SBN File
23-Jul-10	AST_LPN_ExistingNativeVeg_0510.sbx	Base maps for study area	SBX File
23-Jul-10	AST_LPN_ExistingNativeVeg_0510.shp	Base maps for study area	SHP File
23-Jul-10	AST_LPN_ExistingNativeVeg_0510.shp	Base maps for study area	XML Document
23-Jul-10	AST_LPN_ExistingNativeVeg_0510.shx	Base maps for study area	SHX File
23-Jul-10	AST_LPN_FloodProneLand_0510.dbf	Base maps for study area	DBF File
23-Jul-10	AST_LPN_FloodProneLand_0510.prj	Base maps for study area	Text Document
23-Jul-10	AST_LPN_FloodProneLand_0510.sbn	Base maps for study area	SBN File
23-Jul-10	AST_LPN_FloodProneLand_0510.sbx	Base maps for study area	SBX File
23-Jul-10	AST_LPN_FloodProneLand_0510.shp	Base maps for study area	SHP File
23-Jul-10	AST_LPN_FloodProneLand_0510.shp	Base maps for study area	XML Document
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23-Jul-10	AST_LPN_MajorRoads_0510.dbf	Base maps for study area	DBF File
23-Jul-10	AST_LPN_MajorRoads_0510.prj	Base maps for study area	Text Document
23-Jul-10	AST_LPN_MajorRoads_0510.sbn	Base maps for study area	SBN File
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23-Jul-10	AST_LPN_NonCertifiedLand_0510.dbf	Base maps for study area	DBF File
23-Jul-10	AST_LPN_NonCertifiedLand_0510.prj	Base maps for study area	Text Document
23-Jul-10	AST_LPN_NonCertifiedLand_0510.sbn	Base maps for study area	SBN File
23-Jul-10	AST_LPN_NonCertifiedLand_0510.sbx	Base maps for study area	SBX File
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23-Jul-10	AST_LPN_PrecinctBoundaries_0510.dbf	Base maps for study area	DBF File
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	CM+ Opps and Cons Mapping		
23-Jul-10	10027 SK01_Vision	Vision' for Leppington Town Centre	PDF
23-Jul-10	10027 SK02_ Aerial Photo	Aerial photo of Leppington	PDF
23-Jul-10	10027 SK03_ Natural Features	Drawing of natural features of Leppington (i.e. Riparian Corridors)	PDF
23-Jul-10	10027 SK04_ Man made Features	Drawing of man-made features of Leppington (i.e. bridges)	PDF
23-Jul-10	10027 SK05_Constraints	Leppington Town Centre development constraints	PDF
23-Jul-10	10027 SK06_ Dynamic Constraints	Drawing of dynamic constraints of Leppington (i.e. Memorial Park to be retained)	PDF
23-Jul-10	10027 SK07_Opportunities	Leppington Town Centre development opportunites	PDF
23-Jul-10	10027 SK08_ Dynamic Opportunities	Drawing of dynamic opportunites (i.e. potential iconic element in town centre)	PDF
23-Jul-10	10027 SK09_ Leppington Station	Drawing of Leppington Station Plan, including 3D Plan view and section	PDF
23-Jul-10	10027 SK10_ Typical Cross Sections	Drawing of Principal Arterial and Transit Boulevard cross sections	PDF
	Riparian Corridors		
23-Jul-10	2215		PDF
23-Jul-10	AST_LPN_StreamClassification_Map_0610	Stream Classification Map	PDF
23-Jul-10	Leppington Base Plan Extent	Leppington Town Centre Master Plan - Base Plan	PDF
	RTA Access Strategy		
23-Jul-10	SMM - SWGC Road Networks Report DRAFT 03 -	RTA - Draft South West Growth Centre Road Network Strategy	PDF
	SWRL EA		
23-Jul-10	Volume 1	South West Rail Line Glenfield to Leppington Rail Line Project Approval Environmental Assessment	PDF
23-Jul-10	Volume 2a	South West Rail Line Glenfield to Leppington rail line - Environmental Assessment Volume 2a - Technical Reports 1 to 2	PDF
23-Jul-10	Volume 2b	South West Rail Line Glenfield to Leppington rail line - Environmental Assessment Volume 2b - Technical Reports 3 to 7	PDF
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24-Jul-10	Cross11.O02		O02 File
24-Jul-10	Cross11.O03		O03 File
24-Jul-10	Cross11.O04		O04 File
24-Jul-10	Cross11.O05		O05 File
24-Jul-10	Cross11.O06		O06 File
24-Jul-10	Cross11.O07		O07 File
24-Jul-10	Cross11.O08		O08 File

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Date	Product	Description	Format
24-Jul-10	Cross11.O09		O09 File
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24-Jul-10	Cross11.p07		P07 File
24-Jul-10	Cross11.p08		P08 File
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24-Jul-10	Cross13.f02		F02 File
24-Jul-10	Cross13.f03		F03 File
24-Jul-10	Cross13.g01		G01 File
24-Jul-10	Cross13.g07		G07 File
24-Jul-10	Cross13.O01		O01 File
24-Jul-10	Cross13.O02		O02 File
24-Jul-10	Cross13.O03		O03 File
24-Jul-10	Cross13.O04		O04 File
24-Jul-10	Cross13.O05		O05 File
24-Jul-10	Cross13.O06		O06 File
24-Jul-10	Cross13.O07		O07 File
24-Jul-10	Cross13.O08		O08 File
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24-Jul-10	Cross13.p01		P01 File
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24-Jul-10	Cross14.O03		O3 File
24-Jul-10	Cross14.O04		O4 File
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Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

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30-Jul-10	Liverpool City Council Responses	Liverpool CC responses to Cardno queries	.doc
30-Jul-10	Questions from Cardno re WSUDstrategy_DoP responses	Questions from Cardno re WSUD strategy development, DoP responses and LCC comments	.doc
6-Aug-10	AST_LPN_OwnerConsent_0710	Austral & Leppington North Precints - Landowner Consents Response	PDF
6-Aug-10	map_leasesaerial	Lease Manager	PDF
6-Aug-10	SW_NonCertifiedLands_Owners_0610	South West Growth Centre - Subject property location	PDF
11-Aug-10	Access List	Details of Property Owners and Access information	.xls
11-Aug-10	ALS Tile Sheet	Austral & Leppington North Precincts - ALS Coverage 2008 Tile Layout	PDF
11-Aug-10	AST_LPN_OwnerConsent_0810	Map of Landowner consents	PDF
16-Aug-10	Letter of intro - Cardno - 20100816	Letter to residents notifying them of entering of property	.doc
	2010 08 19 ALS data Liverpool and Camden\ALS and Contours\Camden Council		
19-Aug-10	ALS2008 0.5M.dbf		DBF File
19-Aug-10	ALS2008 0.5M.prj		Text Document
19-Aug-10	ALS2008 0.5M.shp		SHP File
19-Aug-10	ALS2008 0.5M.shx		SHX File
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19-Aug-10	ALS2008_Austral.dbf		DBF File
19-Aug-10	ALS2008_Austral.shp		SHP File
19-Aug-10	ALS2008_Austral.shp		XML Document

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
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19-Aug-10	KEMPUY5%.INP		INP File
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19-Aug-10	FLODWAY3		DAT File
19-Aug-10	KC14		DAT File
19-Aug-10	PARMS.DFT		DFT File
19-Aug-10	PLOT2.DFT		DFT File

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
19-Aug-10	REDMANN2		DAT File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC14		
19-Aug-10	CHIMP13		DAT File
19-Aug-10	KC14		DAT File
19-Aug-10	PROKC145.GRF		GRF File
19-Aug-10	VEL		DAT File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC17		
19-Aug-10	FLDWAY17		DAT File
19-Aug-10	KC17		DAT File
19-Aug-10	PROKC17S.GRF		GRF File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC19		
19-Aug-10	KC19		DAT File
19-Aug-10	PROKC19S.GRF		GRF File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC23		
19-Aug-10	KC23		DAT File
19-Aug-10	PROKC23S.GRF		GRF File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC24		
19-Aug-10	KC24		DAT File
19-Aug-10	PROKC24S.GRF		GRF File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC27		
19-Aug-10	KC27		DAT File
19-Aug-10	PROKC27S.GRF		GRF File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC081113\HEC-RAS		
19-Aug-10	H2DEBUG.OUT		OUT File
19-Aug-10	KC08		DAT File
19-Aug-10	KC08		Text Document
19-Aug-10	KC08.F01		F01 File
19-Aug-10	KC08.G01		G01 File
19-Aug-10	KC08.O01		O01 File
19-Aug-10	KC08.P01		P01 File
19-Aug-10	KC08.PRJ		Text Document
19-Aug-10	KC08.R01		R01 File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\KC081113\OPTION		
19-Aug-10	BRIDGE4		DAT File
19-Aug-10	CHIMP4		DAT File
19-Aug-10	CHIMP5		DAT File
19-Aug-10	FLODWAY5		DAT File
19-Aug-10	KC081113		DAT File
19-Aug-10	PARMS.DFT		DFT File
19-Aug-10	REDMANN4		DAT File
19-Aug-10	TAPE7		File
19-Aug-10	TAPE10		File
19-Aug-10	TAPE16		File
19-Aug-10	TAPE96		File
19-Aug-10	ZZ008624		File
19-Aug-10	ZZA08624		File
19-Aug-10	ZZB08624		File
19-Aug-10	ZZC08624		File
19-Aug-10	ZZD08624		File
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19-Aug-10	KC08		DAT File
19-Aug-10	KC0811		DAT File
19-Aug-10	KC0813		DAT File
19-Aug-10	PROKC08S.GRF		GRF File
19-Aug-10	PROKC11S.GRF		GRF File
19-Aug-10	PROKC13S.GRF		GRF File
19-Aug-10	TEMP		File
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19-Aug-10	BONDS		DAT File
19-Aug-10	BONDS		Text Document
19-Aug-10	BONDS.F01		F01 File
19-Aug-10	BONDS.G01		G01 File
19-Aug-10	BONDS.O01		O01 File
19-Aug-10	BONDS.P01		P01 File
19-Aug-10	BONDS.PRJ		Text Document
19-Aug-10	BONDS.R01		R01 File
19-Aug-10	ELIZ		Text Document
19-Aug-10	ELIZ.F01		F01 File
19-Aug-10	ELIZ.G01		G01 File
19-Aug-10	ELIZ.O01		O01 File
19-Aug-10	ELIZ.P01		P01 File
19-Aug-10	ELIZ.PRJ		Text Document
19-Aug-10	KEMPS		DAT File
19-Aug-10	KEMPS		Text Document
19-Aug-10	KEMPS6		DAT File
19-Aug-10	KEMPS.F01		F01 File
19-Aug-10	KEMPS.G01		G01 File
19-Aug-10	KEMPS.O01		O01 File
19-Aug-10	KEMPS.P01		P01 File
19-Aug-10	KEMPS.PRJ		Text Document
19-Aug-10	KEMPS.R01		R01 File
19-Aug-10	PARMS.DFT		DFT File
19-Aug-10	PARMS.DFT		DAT File
19-Aug-10	SCALIB		Text Document
19-Aug-10	SCALIB.F01		F01 File
19-Aug-10	SCALIB.G01		G01 File
19-Aug-10	SCALIB.O01		O01 File
19-Aug-10	SCALIB.P01		P01 File
19-Aug-10	SCALIB.PRJ		Text Document
19-Aug-10	SCALIB.R01		R01 File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\LINKED		
19-Aug-10	BONDS2		DAT File
19-Aug-10	FLDHOUSE		DAT File
19-Aug-10	HKC00		DAT File
19-Aug-10	KEMPS12		DAT File
19-Aug-10	KEMPS12.OUT		OUT File
19-Aug-10	KEMPS12.T95		T95 File
19-Aug-10	PARMS.DFT		DFT File
19-Aug-10	PLOT2.DFT		DFT File
19-Aug-10	README		File
19-Aug-10	SCALABR1		DAT File
19-Aug-10	SECT		.doc
19-Aug-10	TEMP		File
19-Aug-10	TEMP2		File
19-Aug-10	TEMP3		File
19-Aug-10	VEL		DAT File
19-Aug-10	VEL		WK4 File
19-Aug-10	ZZ002278		File
19-Aug-10	ZZA02278		File
19-Aug-10	ZZB02278		File
19-Aug-10	ZZC02278		File
19-Aug-10	ZZD02278		File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\OPTIONS		
19-Aug-10	BRIDGE1		DAT File
19-Aug-10	BRIDGE11		DAT File
19-Aug-10	BRIDGE12		DAT File
19-Aug-10	BRIDGE13		DAT File
19-Aug-10	CHECK		DAT File
19-Aug-10	CHIM12		DAT File
19-Aug-10	CHIM12TH		DAT File
19-Aug-10	CHIMP1		DAT File
19-Aug-10	CHIMP2		DAT File
19-Aug-10	CHIMP11		DAT File
19-Aug-10	CHIMP13		DAT File
19-Aug-10	PARMS.DFT		DFT File
19-Aug-10	PLOT2.DFT		DFT File

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
19-Aug-10	README		File
19-Aug-10	REDMAN11		DAT File
19-Aug-10	REDMAN12		DAT File
19-Aug-10	REDMAN13		DAT File
19-Aug-10	REDMAN21		DAT File
19-Aug-10	REDMAN31		DAT File
19-Aug-10	REDMAN41		DAT File
19-Aug-10	REDMAN42		DAT File
19-Aug-10	REDMAN43		DAT File
19-Aug-10	SCALABR1		DAT File
19-Aug-10	TEMP		DAT File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\HEC2\SC00		
19-Aug-10	HSC00		DAT File
19-Aug-10	PROSCALI.GRF		GRF File
19-Aug-10	PROSCSEC.GRF		GRF File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\RAFTS\LMCE\BASINS		
19-Aug-10	100Y3BAS		DAT File
19-Aug-10	BAS5YR		DAT File
19-Aug-10	BAS100YR		DAT File
19-Aug-10	EXIST		DAT File
19-Aug-10	IL30EX		DAT File
19-Aug-10	IL40EX		DAT File
19-Aug-10	IL45EX		DAT File
19-Aug-10	SCOTT		File
19-Aug-10	SCOTT		DAT File
19-Aug-10	TEST		DAT File
19-Aug-10	TEST1		File
19-Aug-10	TEST1		DAT File
19-Aug-10	TEST2		File
19-Aug-10	TEST2		DAT File
19-Aug-10	TEST3		File
19-Aug-10	TEST3		DAT File
19-Aug-10	TEST4		File
19-Aug-10	TEST4		DAT File
19-Aug-10	TEST5		DAT File
19-Aug-10	TEST6		DAT File
19-Aug-10	TEST7		DAT File
19-Aug-10	TEST9		DAT File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\RAFTS\LMCE\RESULTS		
19-Aug-10	2HR-PMF.OUT		OUT File
19-Aug-10	3HR-PMF.OUT		OUT File
19-Aug-10	4HR-PMF.OUT		OUT File
19-Aug-10	6HR-100.OUT		OUT File
19-Aug-10	6HR-PMF.OUT		OUT File
19-Aug-10	9HR-5YR.OUT		OUT File
19-Aug-10	9HR-20YR.OUT		OUT File
19-Aug-10	9HR-100.OUT		OUT File
19-Aug-10	12HR-1YR.OUT		OUT File
19-Aug-10	12HR-5YR.OUT		OUT File
19-Aug-10	12HR-20Y.OUT		OUT File
19-Aug-10	12HR-100.OUT		OUT File
19-Aug-10	18HR-1YR.OUT		OUT File
19-Aug-10	18HR-5YR.OUT		OUT File
19-Aug-10	24HR-1YR.OUT		OUT File
19-Aug-10	45HR-100.OUT		OUT File
19-Aug-10	FLOWS		WK4 File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\RAFTS\LMCE\TEMP		
19-Aug-10	2HR-PMF.PRN		PRN File
19-Aug-10	3HR-PMF.PRN		PRN File
19-Aug-10	4HR-PMF.PRN		PRN File
19-Aug-10	6HR-100.PRN		PRN File
19-Aug-10	6HR-PMF.PRN		PRN File
19-Aug-10	9HR-5YR.PRN		PRN File
19-Aug-10	9HR-20YR.PRN		PRN File
19-Aug-10	9HR-100.PRN		PRN File
19-Aug-10	12HR-1YR.PRN		PRN File
19-Aug-10	12HR-5YR.PRN		PRN File
19-Aug-10	12HR-20Y.PRN		PRN File
19-Aug-10	12HR-100.PRN		PRN File
19-Aug-10	18HR-1YR.PRN		PRN File
19-Aug-10	18HR-5YR.PRN		PRN File
19-Aug-10	24HR-1YR.PRN		PRN File
19-Aug-10	45HR-100.PRN		PRN File
19-Aug-10	EXIST		DAT File
19-Aug-10	EXISTPMF		DAT File
19-Aug-10	IL40EX		DAT File
19-Aug-10	IL45EX		DAT File
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19-Aug-10	3LIV100		DAT File
19-Aug-10	3LIV100.OUT		OUT File
19-Aug-10	3LIVER5		DAT File
19-Aug-10	3URB100		DAT File
19-Aug-10	3URB100.OUT		OUT File
19-Aug-10	6LIV100		DAT File
19-Aug-10	6LIV100.OUT		OUT File
19-Aug-10	6LIVER5		DAT File
19-Aug-10	6LIVER5.OUT		OUT File
19-Aug-10	6URB5		DAT File
19-Aug-10	6URB5.OUT		OUT File
19-Aug-10	6URB100		DAT File
19-Aug-10	6URB100.OUT		OUT File
19-Aug-10	9LIV100		DAT File
19-Aug-10	9LIV100.OUT		OUT File
19-Aug-10	9LIVER5		DAT File
19-Aug-10	9LIVER5.OUT		OUT File
19-Aug-10	9URB5		DAT File
19-Aug-10	9URB5.OUT		OUT File
19-Aug-10	9URB100		DAT File
19-Aug-10	9URB100.OUT		OUT File
19-Aug-10	12LIV100		DAT File
19-Aug-10	12LIV100.OUT		OUT File
19-Aug-10	12LIVER5		DAT File
19-Aug-10	12LIVER5.OUT		OUT File
19-Aug-10	12URB5		DAT File
19-Aug-10	12URB5.OUT		OUT File
19-Aug-10	12URB100		DAT File
19-Aug-10	12URB100.OUT		OUT File
19-Aug-10	18LIVER5		DAT File
19-Aug-10	18LIVER5.OUT		OUT File
19-Aug-10	18URB5		DAT File
19-Aug-10	18URB5.OUT		OUT File
19-Aug-10	45LIV100		DAT File
19-Aug-10	45LIV100.OUT		OUT File
19-Aug-10	45LIVER5		DAT File
19-Aug-10	45URB5		DAT File
19-Aug-10	45URB100		DAT File
19-Aug-10	45URB100.OUT		OUT File
19-Aug-10	EXIST		DAT File
19-Aug-10	EXIST.OUT		OUT File
19-Aug-10	IL45EX		DAT File
19-Aug-10	LOT		WK4 File
19-Aug-10	LOT1		WK4 File
19-Aug-10	LOT2		WK4 File
19-Aug-10	LOT3		WK4 File
19-Aug-10	LOT4		WK4 File
19-Aug-10	URB100		DAT File

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Date	Product	Description	Format
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\RAFTS\LMCE		
19-Aug-10	CL2EX		DAT File
19-Aug-10	COURSE		DAT File
19-Aug-10	DWRPAR		DAT File
19-Aug-10	EXIST		DAT File
19-Aug-10	EXISTPMF		DAT File
19-Aug-10	IL30EX		DAT File
19-Aug-10	IL40EX		DAT File
19-Aug-10	IL45EX		DAT File
19-Aug-10	README		File
19-Aug-10	VARBX-EX		DAT File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\Austral Flood Study Modelling data\NC407\WORK\RAFTS		
19-Aug-10	AEP.FMT		FMT File
19-Aug-10	AEP.GRF		GRF File
19-Aug-10	AEP.WK1		WK1 File
19-Aug-10	EXIST1		DAT File
19-Aug-10	EXIST2		DAT File
19-Aug-10	EXIST3		DAT File
19-Aug-10	L1		Text Document
19-Aug-10	LINK		WK4 File
19-Aug-10	LINK1		.doc
19-Aug-10	LINK1		WK4 File
19-Aug-10	LINK1.FMT		FMT File
19-Aug-10	LINK1.WK1		WK1 File
19-Aug-10	LINK1.WP5		WP5 File
19-Aug-10	LINK2		WK4 File
19-Aug-10	LINK3		WK4 File
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models\South Ck Thompson Creek Mike 11 data files\Table of which files to use		
19-Aug-10	J1184-FRDec04-AppE-M11files	Table of MIKE-11 model files used in the current study for existing conditions	PDF
	2010 08 19 Liverpool Council Flood Studies\Liverpool Council Flood Models		
19-Aug-10	Austral_Floodplain Risk Management Study & Plan_September 2004	Austral FPRMS&P by Perrens Consultants	PDF
19-Aug-10	SouthCreek Floodplain Risk Management Study & Plan -Dec 2004-Vol1	South Creek FPRMS&P vol 1 (Study Report and Recommended Plan) by Bewsher Consulting	PDF
19-Aug-10	SouthCreek Floodplain Risk Management Study & Pplan -Dec 2004-Vol2	South Creek FPRMS&P vol 2 (Town Planning Issues) by Bewsher Consulting	PDF
	Layers		
3-Sep-10	LCC_flood.dbf		DBF File
3-Sep-10	LCC_flood.prj		Text Document
3-Sep-10	LCC_flood.sbn		SBN File
3-Sep-10	LCC_flood.sbx		SBX File
3-Sep-10	LCC_flood.shp		SHP File
3-Sep-10	LCC_flood.shp		XML Document
3-Sep-10	LCC_flood.shx		SHX File
	S94 Costings		
3-Sep-10	8634 - Oran park Turner Road -Cost Analysis	Spreadsheet containing items excluded from S94 Plan and costings	.xl
3-Sep-10	76836.2006 Rider HuntIndicativeBudget Estimate for Section 94 Contributions Plan for Liver	Indicative Budget Estimate for Section 94 Contributions Plan by Rider Hunt	PDF
3-Sep-10	optr adopted S94 plan withappendix 27 Feb 2008	Oran Park and Turner Road Precincts Section 94 Contributions Plan by WT Partnership	PDF
14-Sep-10	20100914 Access List	Speadsheet containing the details of the access status of properties in the study area, including contact details for each	.xl
14-Sep-10	AST_LPN_OwnerConsent_0910	Map showing land owner consent status	PDF
14-Sep-10	AST_LPN_OwnerConsents_0910.dbf		DBF File
14-Sep-10	AST_LPN_OwnerConsents_0910.prj		Text Document
14-Sep-10	AST_LPN_OwnerConsents_0910.sbn		SBN File
14-Sep-10	AST_LPN_OwnerConsents_0910.sbx		SBX File
14-Sep-10	AST_LPN_OwnerConsents_0910.shp		SHP File
14-Sep-10	AST_LPN_OwnerConsents_0910.shx		SHX File
	2010 09 15 Contour Files\15631A_2010088_NSW_DoP\Contours_05m_SHP\Metadata\Stylesheet_Files		
15-Sep-10	Header1_1	Logo AAM HATCH	JPEG
15-Sep-10	Header1_2	Logo AAM HATCH	GIF Image
15-Sep-10	Header1_BG		GIF Image
15-Sep-10	ISO_19139		XSL Stylesheet
	2010 09 15 Contour Files\15631A_2010088_NSW_DoP\Contours_05m_SHP\Metadata		
15-Sep-10	SY2946242_05mCTR08_shp		XML Document
15-Sep-10	SY2946244_05mCTR08_shp		XML Document
15-Sep-10	SY2966240_05mCTR08_shp		XML Document
15-Sep-10	SY2966242_05mCTR08_shp		XML Document
15-Sep-10	SY2966244_05mCTR08_shp		XML Document
15-Sep-10	SY2966246_05mCTR08_shp		XML Document
15-Sep-10	SY2986240_05mCTR08_shp		XML Document
15-Sep-10	SY2986242_05mCTR08_shp		XML Document
15-Sep-10	SY2986244_05mCTR08_shp		XML Document
15-Sep-10	SY2986246_05mCTR08_shp		XML Document
15-Sep-10	SY3006240_05mCTR08_shp		XML Document
	2010 09 15 Contour Files\15631A_2010088_NSW_DoP\Contours_05m_SHP		
15-Sep-10	SY2946242_05mCTR08.dbf		DBF File
15-Sep-10	SY2946242_05mCTR08.prj		Text Document
15-Sep-10	SY2946242_05mCTR08.shp		SHP File
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15-Sep-10	SY2946244_05mCTR08.dbf		DBF File
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15-Sep-10	SY2946244_05mCTR08.sbx		SBX File
15-Sep-10	SY2946244_05mCTR08.shp		SHP File
15-Sep-10	SY2946244_05mCTR08.shx		SHX File
15-Sep-10	SY2966240_05mCTR08.dbf		DBF File
15-Sep-10	SY2966240_05mCTR08.prj		Text Document
15-Sep-10	SY2966240_05mCTR08.shp		SHP File
15-Sep-10	SY2966240_05mCTR08.shx		SHX File
15-Sep-10	SY2966242_05mCTR08.dbf		DBF File
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15-Sep-10	SY2966242_05mCTR08.shp		SHP File
15-Sep-10	SY2966242_05mCTR08.shx		SHX File
15-Sep-10	SY2966244_05mCTR08.dbf		DBF File
15-Sep-10	SY2966244_05mCTR08.prj		Text Document
15-Sep-10	SY2966244_05mCTR08.shp		SHP File
15-Sep-10	SY2966244_05mCTR08.shx		SHX File
15-Sep-10	SY2966246_05mCTR08.dbf		DBF File
15-Sep-10	SY2966246_05mCTR08.prj		Text Document
15-Sep-10	SY2966246_05mCTR08.shp		SHP File
15-Sep-10	SY2966246_05mCTR08.shx		SHX File
15-Sep-10	SY2986240_05mCTR08.dbf		DBF File
15-Sep-10	SY2986240_05mCTR08.prj		Text Document
15-Sep-10	SY2986240_05mCTR08.shp		SHP File
15-Sep-10	SY2986240_05mCTR08.shx		SHX File
15-Sep-10	SY2986242_05mCTR08.dbf		DBF File
15-Sep-10	SY2986242_05mCTR08.prj		Text Document
15-Sep-10	SY2986242_05mCTR08.shp		SHP File
15-Sep-10	SY2986242_05mCTR08.shx		SHX File
15-Sep-10	SY2986244_05mCTR08.dbf		DBF File
15-Sep-10	SY2986244_05mCTR08.prj		Text Document
15-Sep-10	SY2986244_05mCTR08.shp		SHP File
15-Sep-10	SY2986244_05mCTR08.shx		SHX File
15-Sep-10	SY2986246_05mCTR08.dbf		DBF File
15-Sep-10	SY2986246_05mCTR08.prj		Text Document
15-Sep-10	SY2986246_05mCTR08.shp		SHP File
15-Sep-10	SY2986246_05mCTR08.shx		SHX File
15-Sep-10	SY3006240_05mCTR08.dbf		DBF File
15-Sep-10	SY3006240_05mCTR08.prj		Text Document
15-Sep-10	SY3006240_05mCTR08.sbn		SBN File
15-Sep-10	SY3006240_05mCTR08.sbx		SBX File
15-Sep-10	SY3006240_05mCTR08.shp		SHP File
15-Sep-10	SY3006240_05mCTR08.shx		SHX File
	2010 09 15 Contour Files\15631A_2010088_NSW_DoP\Licence_Agreement		
15-Sep-10	15631A_2010088_NSW_DoP_LicenseAgreement	Standard Data User License Agreement	PDF
	2010 09 23 WMA\Kemps_Bonds\DATA\aerial_photo		
23-Sep-10	Camden_Mosaic_2		Mapinfo table

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
23-Sep-10	Camden_Mosaic_2.ecw		ECW File
	2010 09 23 WMA\Kemps_Bonds\DATA\ALS\camden_tiles_asc.zip		
23-Sep-10	131 ASC files		ASC Files
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\CADLT		
23-Sep-10	AUSTRAL2.DWG		DWG File
23-Sep-10	AUSTRAL.DWG		
23-Sep-10	CULVERT.DWG		
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\EN1%		
23-Sep-10	KEMPS.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\EN2%		
23-Sep-10	KEMPS.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\EN5%		
23-Sep-10	KEMPS.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\FLDWAY		
23-Sep-10	KEMPS1.OUT		OUT File
23-Sep-10	KEMPS2.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\INP		
23-Sep-10	KEMPPMF.INP		INP File
23-Sep-10	KEMPS1.INP		INP File
23-Sep-10	KEMPS2.INP		INP File
23-Sep-10	KEMPS.INP		INP File
23-Sep-10	KEMPUN1%.INP		INP File
23-Sep-10	KEMPUN2%.INP		INP File
23-Sep-10	KEMPUN5%.INP		INP File
23-Sep-10	KEMPUY1%.INP		INP File
23-Sep-10	KEMPUY2%.INP		INP File
23-Sep-10	KEMPUY5%.INP		INP File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\PMF		
23-Sep-10	KEMPPMF.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\README		
23-Sep-10	READ.ME		ME File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\UN1%		
23-Sep-10	KEMPUN1%.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\UN2%		
23-Sep-10	KEMPUN2%.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\UN5%		
23-Sep-10	KEMPUN5%.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\UY1%		
23-Sep-10	KEMPUY1%.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\UY2%		
23-Sep-10	KEMPUY2%.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\HEC\UY5%		
23-Sep-10	KEMPUY5%.OUT		OUT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\LMCE		
23-Sep-10	KEMPPMF		DAT File
23-Sep-10	KEMPPMF.OUT		OUT File
23-Sep-10	KEMPPMF.T95		T95 File
23-Sep-10	PARMS.DFT		DFT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS		
23-Sep-10	README		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\PMF		
23-Sep-10	TRIBPMF3.AAA		AAA File
23-Sep-10	TRIBPMF3.BBB		BBB File
23-Sep-10	TRIBPMF3.CCC		CCC File
23-Sep-10	TRIBPMF3.LOC		LOC File
23-Sep-10	TRIBPMF3.OUT		OUT File
23-Sep-10	TRIBPMF3.TOT		TOT File
23-Sep-10	TRIBPMF6.AAA		AAA File
23-Sep-10	TRIBPMF6.BBB		BBB File
23-Sep-10	TRIBPMF6.CCC		CCC File
23-Sep-10	TRIBPMF6.LOC		LOC File
23-Sep-10	TRIBPMF6.OUT		OUT File
23-Sep-10	TRIBPMF6.TOT		TOT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIB9HR		
23-Sep-10	EXIST1		DAT File
23-Sep-10	QS		DAT File
23-Sep-10	TDF5722		File
23-Sep-10	TEMP1		File
23-Sep-10	TRIBEN1		Text Document
23-Sep-10	TRIBEN1%		Text Document
23-Sep-10	TRIBEN1%.9HD		9HD File
23-Sep-10	TRIBEN1%.OUT		OUT File
23-Sep-10	TRIBEN2%		Text Document
23-Sep-10	TRIBEN2%.9HD		9HD File
23-Sep-10	TRIBEN5%		Text Document
23-Sep-10	TRIBEN5%.9HD		9HD File
23-Sep-10	TRIBUN1%		Text Document
23-Sep-10	TRIBUN1%.9HD		9HD File
23-Sep-10	TRIBUN1%.OUT		Text Document
23-Sep-10	TRIBUN2%		9HD File
23-Sep-10	TRIBUN2%.9HD		Text Document
23-Sep-10	TRIBUN5%		9HD File
23-Sep-10	TRIBUN5%.9HD		Text Document
23-Sep-10	TRIBUY1%		9HD File
23-Sep-10	TRIBUY1%.9HD		Text Document
23-Sep-10	TRIBUY1%.OUT		9HD File
23-Sep-10	TRIBUY2%		Text Document
23-Sep-10	TRIBUY2%.9HD		9HD File
23-Sep-10	TRIBUY5%		Text Document
23-Sep-10	TRIBUY5%.9HD		9HD File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIB40HR		
23-Sep-10	TEMP		File
23-Sep-10	TRIBEN1%		DAT File
23-Sep-10	TRIBEN1%		Text Document
23-Sep-10	TRIBEN5%		DAT File
23-Sep-10	TRIBEN5%		Text Document
23-Sep-10	TRIBUN1%		DAT File
23-Sep-10	TRIBUN1%		Text Document
23-Sep-10	TRIBUN2%		DAT File
23-Sep-10	TRIBUN2%		Text Document
23-Sep-10	TRIBUN5%		DAT File
23-Sep-10	TRIBUN5%		Text Document
23-Sep-10	TRIBUY1%		DAT File
23-Sep-10	TRIBUY1%		Text Document
23-Sep-10	TRIBUY2%		DAT File
23-Sep-10	TRIBUY2%		Text Document
23-Sep-10	TRIBUY5%		DAT File
23-Sep-10	TRIBUY5%		Text Document
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBEN		
23-Sep-10	TRIBEN1%.AAA		AAA File
23-Sep-10	TRIBEN1%.BBB		BBB File
23-Sep-10	TRIBEN1%.CCC		CCC File
23-Sep-10	TRIBEN1%.LOC		LOC File
23-Sep-10	TRIBEN1%.OUT		OUT File
23-Sep-10	TRIBEN1%.TOT		TOT File
23-Sep-10	TRIBEN2%.AAA		AAA File
23-Sep-10	TRIBEN2%.BBB		BBB File
23-Sep-10	TRIBEN2%.CCC		CCC File
23-Sep-10	TRIBEN2%.LOC		LOC File
23-Sep-10	TRIBEN2%.OUT		OUT File
23-Sep-10	TRIBEN2%.TOT		TOT File
23-Sep-10	TRIBEN5%.AAA		AAA File
23-Sep-10	TRIBEN5%.BBB		BBB File
23-Sep-10	TRIBEN5%.CCC		CCC File
23-Sep-10	TRIBEN5%.LOC		LOC File
23-Sep-10	TRIBEN5%.OUT		OUT File

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Date	Product	Description	Format
23-Sep-10	TRIBEN5%.TOT		TOT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBEN9H		
23-Sep-10	TRIBEN1%.9HO		9HO File
23-Sep-10	TRIBEN1%.9HT		9HT File
23-Sep-10	TRIBEN1%.AAA		AAA File
23-Sep-10	TRIBEN1%.BBB		BBB File
23-Sep-10	TRIBEN2%.9HO		9HO File
23-Sep-10	TRIBEN2%.9HT		9HT File
23-Sep-10	TRIBEN2%.AAA		AAA File
23-Sep-10	TRIBEN2%.BBB		BBB File
23-Sep-10	TRIBEN5%.9HO		9HO File
23-Sep-10	TRIBEN5%.9HT		9HT File
23-Sep-10	TRIBEN5%.AAA		AAA File
23-Sep-10	TRIBEN5%.BBB		BBB File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBPMF		
23-Sep-10	TEMP		File
23-Sep-10	TRIBPMF		DAT File
23-Sep-10	TRIBPMF		Text document
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBUN		
23-Sep-10	TRIBUN1%.LOC		LOC File
23-Sep-10	TRIBUN1%.OUT		OUT File
23-Sep-10	TRIBUN1%.TOT		TOT File
23-Sep-10	TRIBUN2%.LOC		LOC File
23-Sep-10	TRIBUN2%.OUT		OUT File
23-Sep-10	TRIBUN2%.TOT		TOT File
23-Sep-10	TRIBUN5%.LOC		LOC File
23-Sep-10	TRIBUN5%.OUT		OUT File
23-Sep-10	TRIBUN5%.TOT		TOT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBUN9H		
23-Sep-10	AL		DAT File
23-Sep-10	TRIBUN1%.9HO		9HO File
23-Sep-10	TRIBUN1%.9HT		9HT File
23-Sep-10	TRIBUN2%.9HO		9HO File
23-Sep-10	TRIBUN2%.9HT		9HT File
23-Sep-10	TRIBUN5%.9HO		9HO File
23-Sep-10	TRIBUN5%.9HT		9HT File
23-Sep-10	UN1%9.TEM		TEM File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBUY		
23-Sep-10	TRIBUY1%.LOC		LOC File
23-Sep-10	TRIBUY1%.OUT		OUT File
23-Sep-10	TRIBUY1%.TOT		TOT File
23-Sep-10	TRIBUY2%.LOC		LOC File
23-Sep-10	TRIBUY2%.OUT		OUT File
23-Sep-10	TRIBUY2%.TOT		TOT File
23-Sep-10	TRIBUY5%.LOC		LOC File
23-Sep-10	TRIBUY5%.OUT		OUT File
23-Sep-10	TRIBUY5%.TOT		TOT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\TRIBUY9H		
23-Sep-10	TRIBUY1%.9HO		9HO File
23-Sep-10	TRIBUY1%.9HT		9HT File
23-Sep-10	TRIBUY2%.9HO		9HO File
23-Sep-10	TRIBUY2%.9HT		9HT File
23-Sep-10	TRIBUY5%.9HO		9HO File
23-Sep-10	TRIBUY5%.9HT		9HT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\DWR\RAFTS\WERRINGT		
23-Sep-10	WER2H-2%.OUT		OUT File
23-Sep-10	WER2H-2%.TOT		TOT File
23-Sep-10	WER2H-5%.OUT		OUT File
23-Sep-10	WER2H-5%.TOT		TOT File
23-Sep-10	WER40H-2.%OU		%OU File
23-Sep-10	WER40H-2.%TO		%TO File
23-Sep-10	WER40H-5.%OU		%OU File
23-Sep-10	WER40H-5.%TO		%TO File
23-Sep-10	WERPMF.TOT		TOT File
23-Sep-10	WERRING.2H		2H File
23-Sep-10	WERRING.9H		9H File
23-Sep-10	WERRING.40H		40H File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2		
23-Sep-10	CHAINAGE		WK4 File
23-Sep-10	DAMAGE.FMT		FMT File
23-Sep-10	DAMAGE.WK1		WK1 File
23-Sep-10	HKC00		DAT File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	PLOT2.DFT		DFT File
23-Sep-10	PROFBAK.FMT		FMT File
23-Sep-10	PROFBAK.WK1		WK1 File
23-Sep-10	PROFILE.FMT		FMT File
23-Sep-10	PROFILE.WK1		WK1 File
23-Sep-10	PRONAME.FMT		FMT File
23-Sep-10	PRONAME.WK1		WK1 File
23-Sep-10	PROREP		WK4 File
23-Sep-10	README		File
23-Sep-10	SECNO.FMT		FMT File
23-Sep-10	SECNO.WK1		WK1 File
23-Sep-10	SECNOBAK.FMT		FMT File
23-Sep-10	SECNOBAK.WK1		WK1 File
23-Sep-10	TEMP		WK4 File
23-Sep-10	VELOCITY.FMT		FMT File
23-Sep-10	VELOCITY.WK1		WK1 File
23-Sep-10	VELREP		WK4 File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\BC00		
23-Sep-10	BC803051.PRN		PRN File
23-Sep-10	BC803051.WK1		WK1 File
23-Sep-10	BC804052.FMT		FMT File
23-Sep-10	BC804052.PRN		PRN File
23-Sep-10	BC804052.WK1		WK1 File
23-Sep-10	BC805053.FMT		FMT File
23-Sep-10	BC805053.WK1		WK1 File
23-Sep-10	BC806054		WK4 File
23-Sep-10	BC806054.PRN		PRN File
23-Sep-10	BC-NO53		DAT File
23-Sep-10	BONDS		DAT File
23-Sep-10	PROBCSEC.GRF		GRF File
23-Sep-10	PROBONDS.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\BC08		
23-Sep-10	BC08		DAT File
23-Sep-10	PROBC08S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\FLAREA		
23-Sep-10	ABC08		DAT File
23-Sep-10	AKC01		DAT File
23-Sep-10	AKC02		DAT File
23-Sep-10	AKC03		DAT File
23-Sep-10	AKC07		DAT File
23-Sep-10	AKC14		DAT File
23-Sep-10	AKC17		DAT File
23-Sep-10	AKC19		DAT File
23-Sep-10	AKC23		DAT File
23-Sep-10	AKC24		DAT File
23-Sep-10	AKC27		DAT File
23-Sep-10	AKC81113		DAT File
23-Sep-10	BC08		DAT File
23-Sep-10	FLAREA1		DAT File
23-Sep-10	KC01		DAT File
23-Sep-10	KC02		DAT File
23-Sep-10	KC03		DAT File
23-Sep-10	KC07		DAT File

Date	Product	Description	Format
23-Sep-10	KC14		DAT File
23-Sep-10	KC17		DAT File
23-Sep-10	KC19		DAT File
23-Sep-10	KC23		DAT File
23-Sep-10	KC24		DAT File
23-Sep-10	KC27		DAT File
23-Sep-10	KC81113		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\FLOODWAY		
23-Sep-10	FLDWAY02		DAT File
23-Sep-10	FLDWAY03		DAT File
23-Sep-10	FLDWAY07		DAT File
23-Sep-10	FLDWAY08		DAT File
23-Sep-10	FLDWAY17		DAT File
23-Sep-10	FLDWAY19		DAT File
23-Sep-10	FLDWAY20		DAT File
23-Sep-10	FLDWAY21		DAT File
23-Sep-10	FLDWAY23		DAT File
23-Sep-10	FLDWAY24		DAT File
23-Sep-10	FLDWAY27		DAT File
23-Sep-10	FLDWAY30		DAT File
23-Sep-10	FLDWAY40		DAT File
23-Sep-10	FLDWAY50		DAT File
23-Sep-10	FLDWAY51		DAT File
23-Sep-10	FLDWAY52		DAT File
23-Sep-10	FLODWAY1		DAT File
23-Sep-10	FLODWAY1		Text document
23-Sep-10	FLODWAY2		DAT File
23-Sep-10	FLODWAY3		DAT File
23-Sep-10	FLODWAY4		DAT File
23-Sep-10	FLODWAY5		DAT File
23-Sep-10	README		File
23-Sep-10	schema		Configuration Settings
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\HECRAS		
23-Sep-10	BONDS		Text document
23-Sep-10	BONDS1.F01		F01 File
23-Sep-10	BONDS1.F02		F02 File
23-Sep-10	BONDS1.G01		G01 File
23-Sep-10	BONDS1.G02		G02 File
23-Sep-10	BONDS1.P01		P01 File
23-Sep-10	BONDS1.P02		P02 File
23-Sep-10	BONDS1.PRJ		Text document
23-Sep-10	BONDS.F01		F01 File
23-Sep-10	BONDS.F02		F02 File
23-Sep-10	BONDS.G01		G01 File
23-Sep-10	BONDS.G02		G02 File
23-Sep-10	BONDS.O01		O01 File
23-Sep-10	BONDS.P01		P01 File
23-Sep-10	BONDS.PRJ		Text document
23-Sep-10	BONDS.R01		R01 File
23-Sep-10	FLDHOUSE		DAT File
23-Sep-10	FLDHOUSE.F01		F01 File
23-Sep-10	FLDHOUSE.G01		G01 File
23-Sep-10	FLDHOUSE.P01		P01 File
23-Sep-10	FLDHOUSE.PRJ		Text document
23-Sep-10	H2DEBUG.OUT		OUT File
23-Sep-10	KEMPS		Text document
23-Sep-10	KEMPS12		DAT File
23-Sep-10	KEMPS12.F01		F01 File
23-Sep-10	KEMPS12.G01		G01 File
23-Sep-10	KEMPS12.P01		P01 File
23-Sep-10	KEMPS12.PRJ		Text document
23-Sep-10	KEMPS.F01		F01 File
23-Sep-10	KEMPS.G01		G01 File
23-Sep-10	KEMPS.O01		O01 File
23-Sep-10	KEMPS.P01		P01 File
23-Sep-10	KEMPS.PRJ		Text document
23-Sep-10	KEMPS.R01		R01 File
23-Sep-10	LINKED.F01		F01 File
23-Sep-10	LINKED.F02		F02 File
23-Sep-10	LINKED.F03		F03 File
23-Sep-10	LINKED.G01		G01 File
23-Sep-10	LINKED.G02		G02 File
23-Sep-10	LINKED.G03		G03 File
23-Sep-10	TEMP.F01		F01 File
23-Sep-10	TEMP.F02		F02 File
23-Sep-10	TEMP.G01		G01 File
23-Sep-10	TEMP.G02		G02 File
23-Sep-10	TEMP.PRJ		Text document
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC00		
23-Sep-10	350603		WK4 File
23-Sep-10	IQQM.MNU		Text Document
23-Sep-10	KC14BC59		WK4 File
23-Sep-10	KC14BC59.PRN		PRN File
23-Sep-10	KC15BC60		WK4 File
23-Sep-10	KC15BC60.PRN		PRN File
23-Sep-10	KEMPS		DAT File
23-Sep-10	KEMPS.OUT		OUT File
23-Sep-10	KEMPS.T95		T95 File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	PROKCSEC.GRF		GRF File
23-Sep-10	PROKEMPS.GRF		GRF File
23-Sep-10	TAPE7		File
23-Sep-10	TAPE10		File
23-Sep-10	TAPE16		File
23-Sep-10	TAPE95		File
23-Sep-10	TAPE96		File
23-Sep-10	ZZ002278		File
23-Sep-10	ZZA02278		File
23-Sep-10	ZZB02278		File
23-Sep-10	ZZC02278		File
23-Sep-10	ZZD02278		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC01\OPTION		
23-Sep-10	BRIDGE3		DAT File
23-Sep-10	KC01		DAT File
23-Sep-10	REDMANN3		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC01		
23-Sep-10	KC01		DAT File
23-Sep-10	PROKC01S.GRF		GRF File
23-Sep-10	TEMP		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC02		
23-Sep-10	KC02		DAT File
23-Sep-10	PROKC02S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC03		
23-Sep-10	KC03		DAT File
23-Sep-10	PROKC03S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC07		
23-Sep-10	KC07		DAT File
23-Sep-10	PROKC07S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC08		
23-Sep-10	PROKC08S.GRF		GRF File
23-Sep-10	README		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC11		
23-Sep-10	HKC11A		WK4 File
23-Sep-10	HKC11A.FMT		FMT File
23-Sep-10	HKC11A.WK1		WK1 File
23-Sep-10	README		File

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Date	Product	Description	Format
23-Sep-10	SPECIAL		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC13		
23-Sep-10	KC13		DAT File
23-Sep-10	README		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC14		
23-Sep-10	CHIMP13		DAT File
23-Sep-10	KC14		DAT File
23-Sep-10	PROKC14S.GRF		GRF File
23-Sep-10	VEL		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC14\HEC-RAS		
23-Sep-10	KC14		DAT File
23-Sep-10	KC14		Text Document
23-Sep-10	KC14.F01		F01 File
23-Sep-10	KC14.G01		G01 File
23-Sep-10	KC14.O01		O01 File
23-Sep-10	KC14.P01		P01 File
23-Sep-10	KC14.PRJ		Text Document
23-Sep-10	KC14.R01		R01 File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC14\OPTION		
23-Sep-10	BRIDGE2		DAT File
23-Sep-10	FLODWAY3		DAT File
23-Sep-10	KC14		DAT File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	PLOT2.DFT		DFT File
23-Sep-10	REDMANN2		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC17		
23-Sep-10	FLDWAY17		DAT File
23-Sep-10	KC17		DAT File
23-Sep-10	PROKC17S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC19		
23-Sep-10	KC19		DAT File
23-Sep-10	PROKC19S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC23		
23-Sep-10	KC23		DAT File
23-Sep-10	PROKC23S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC24		
23-Sep-10	KC24		DAT File
23-Sep-10	PROKC24S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC27		
23-Sep-10	KC27		DAT File
23-Sep-10	PROKC27S.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC081113		
23-Sep-10	KC08		DAT File
23-Sep-10	KC0811		DAT File
23-Sep-10	KC0813		DAT File
23-Sep-10	PROKC08S.GRF		GRF File
23-Sep-10	PROKC11S.GRF		GRF File
23-Sep-10	PROKC13S.GRF		GRF File
23-Sep-10	TEMP		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC081113\HEC-RAS		
23-Sep-10	H2DEBUG.OUT		OUT File
23-Sep-10	KC08		DAT File
23-Sep-10	KC08		Text Document
23-Sep-10	KC08.F01		F01 File
23-Sep-10	KC08.G01		G01 File
23-Sep-10	KC08.O01		O01 File
23-Sep-10	KC08.P01		P01 File
23-Sep-10	KC08.PRJ		Text Document
23-Sep-10	KC08.R01		R01 File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\KC081113\OPTION		
23-Sep-10	BRIDGE4		DAT File
23-Sep-10	CHIMP4		DAT File
23-Sep-10	CHIMP5		DAT File
23-Sep-10	FLODWAY5		DAT File
23-Sep-10	KC081113		DAT File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	REDMANN4		DAT File
23-Sep-10	TAPE7		File
23-Sep-10	TAPE10		File
23-Sep-10	TAPE16		File
23-Sep-10	TAPE96		File
23-Sep-10	ZZ008624		File
23-Sep-10	ZZA08624		File
23-Sep-10	ZZB08624		File
23-Sep-10	ZZC08624		File
23-Sep-10	ZZD08624		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\LINKED\HEC-RAS		
23-Sep-10	BONDS		DAT File
23-Sep-10	BONDS		Text Document
23-Sep-10	BONDS.F01		F01 File
23-Sep-10	BONDS.G01		G01 File
23-Sep-10	BONDS.O01		O01 File
23-Sep-10	BONDS.P01		P01 File
23-Sep-10	BONDS.PRJ		Text Document
23-Sep-10	BONDS.R01		R01 File
23-Sep-10	ELIZ		Text Document
23-Sep-10	ELIZ.F01		F01 File
23-Sep-10	ELIZ.G01		G01 File
23-Sep-10	ELIZ.O01		O01 File
23-Sep-10	ELIZ.P01		P01 File
23-Sep-10	ELIZ.PRJ		Text Document
23-Sep-10	KEMPS		DAT File
23-Sep-10	KEMPS		Text Document
23-Sep-10	KEMPS.F01		F01 File
23-Sep-10	KEMPS.G01		G01 File
23-Sep-10	KEMPS.O01		O01 File
23-Sep-10	KEMPS.P01		P01 File
23-Sep-10	KEMPS.PRJ		Text Document
23-Sep-10	KEMPS.R01		R01 File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	SCALIB		DAT File
23-Sep-10	SCALIB		Text Document
23-Sep-10	SCALIB.F01		F01 File
23-Sep-10	SCALIB.G01		G01 File
23-Sep-10	SCALIB.O01		O01 File
23-Sep-10	SCALIB.P01		P01 File
23-Sep-10	SCALIB.PRJ		Text Document
23-Sep-10	SCALIB.R01		R01 File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\LINKED		
23-Sep-10	BONDS2		DAT File
23-Sep-10	FLDHOUSE		DAT File
23-Sep-10	HKC00		DAT File
23-Sep-10	KEMPS12		DAT File
23-Sep-10	KEMPS12.OUT		OUT File
23-Sep-10	KEMPS12.T95		T95 File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	PLOT2.DFT		DFT File
23-Sep-10	README		File
23-Sep-10	SCALABR1		DAT File
23-Sep-10	SECT	Cross sections	Word Document
23-Sep-10	TAPE7		File
23-Sep-10	TAPE10		File
23-Sep-10	TAPE16		File
23-Sep-10	TAPE95		File
23-Sep-10	TAPE96		File
23-Sep-10	TEMP		File

Date	Product	Description	Format
23-Sep-10	TEMP2		File
23-Sep-10	TEMP3		File
23-Sep-10	VEL		DAT File
23-Sep-10	VEL		WK4 File
23-Sep-10	ZZ002278		File
23-Sep-10	ZZA02278		File
23-Sep-10	ZZB02278		File
23-Sep-10	ZZC02278		File
23-Sep-10	ZZD02278		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\OPTIONS		
23-Sep-10	BRIDGE1		DAT File
23-Sep-10	BRIDGE11		DAT File
23-Sep-10	BRIDGE12		DAT File
23-Sep-10	BRIDGE13		DAT File
23-Sep-10	CHECK		DAT File
23-Sep-10	CHIM12		DAT File
23-Sep-10	CHIM12TH		DAT File
23-Sep-10	CHIMP1		DAT File
23-Sep-10	CHIMP2		DAT File
23-Sep-10	CHIMP11		DAT File
23-Sep-10	CHIMP13		DAT File
23-Sep-10	PARMS.DFT		DFT File
23-Sep-10	PLOT2.DFT		DFT File
23-Sep-10	README		File
23-Sep-10	REDMAN11		DAT File
23-Sep-10	REDMAN12		DAT File
23-Sep-10	REDMAN13		DAT File
23-Sep-10	REDMAN21		DAT File
23-Sep-10	REDMAN31		DAT File
23-Sep-10	REDMAN41		DAT File
23-Sep-10	REDMAN42		DAT File
23-Sep-10	REDMAN43		DAT File
23-Sep-10	SCALABR1		DAT File
23-Sep-10	TEMP		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\HEC2\SC00		
23-Sep-10	HSC00		DAT File
23-Sep-10	PROSCALI.GRF		GRF File
23-Sep-10	PROSCSEC.GRF		GRF File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\RAFTS\LMCE\BASINS		
23-Sep-10	100Y3BAS		DAT File
23-Sep-10	BAS5YR		DAT File
23-Sep-10	BAS100YR		DAT File
23-Sep-10	EXIST		DAT File
23-Sep-10	IL30EX		DAT File
23-Sep-10	IL40EX		DAT File
23-Sep-10	IL45EX		DAT File
23-Sep-10	SCOTT		File
23-Sep-10	SCOTT		DAT File
23-Sep-10	TEST		DAT File
23-Sep-10	TEST1		File
23-Sep-10	TEST1		DAT File
23-Sep-10	TEST2		File
23-Sep-10	TEST2		DAT File
23-Sep-10	TEST3		File
23-Sep-10	TEST3		DAT File
23-Sep-10	TEST4		File
23-Sep-10	TEST4		DAT File
23-Sep-10	TEST5		DAT File
23-Sep-10	TEST6		DAT File
23-Sep-10	TEST7		DAT File
23-Sep-10	TEST9		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\RAFTS\LMCE\RESULTS		
23-Sep-10	2HR-PMF.OUT		OUT File
23-Sep-10	3HR-PMF.OUT		OUT File
23-Sep-10	4HR-PMF.OUT		OUT File
23-Sep-10	6HR-100.OUT		OUT File
23-Sep-10	6HR-PMF.OUT		OUT File
23-Sep-10	9HR-5YR.OUT		OUT File
23-Sep-10	9HR-20YR.OUT		OUT File
23-Sep-10	9HR-100.OUT		OUT File
23-Sep-10	12HR-1YR.OUT		OUT File
23-Sep-10	12HR-5YR.OUT		OUT File
23-Sep-10	12HR-20Y.OUT		OUT File
23-Sep-10	12HR-100.OUT		OUT File
23-Sep-10	18HR-1YR.OUT		OUT File
23-Sep-10	18HR-5YR.OUT		OUT File
23-Sep-10	24HR-1YR.OUT		OUT File
23-Sep-10	45HR-100.OUT		OUT File
23-Sep-10	FLOWS		WK4 File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\RAFTS\LMCE\TEMP		
23-Sep-10	2HR-PMF.PRN		PRN File
23-Sep-10	3HR-PMF.PRN		PRN File
23-Sep-10	4HR-PMF.PRN		PRN File
23-Sep-10	6HR-100.PRN		PRN File
23-Sep-10	6HR-PMF.PRN		PRN File
23-Sep-10	9HR-5YR.PRN		PRN File
23-Sep-10	9HR-20YR.PRN		PRN File
23-Sep-10	9HR-100.PRN		PRN File
23-Sep-10	12HR-1YR.PRN		PRN File
23-Sep-10	12HR-5YR.PRN		PRN File
23-Sep-10	12HR-20YR.PRN		PRN File
23-Sep-10	12HR-100.PRN		PRN File
23-Sep-10	18HR-1YR.PRN		PRN File
23-Sep-10	18HR-5YR.PRN		PRN File
23-Sep-10	24HR-1YR.PRN		PRN File
23-Sep-10	45HR-100.PRN		PRN File
23-Sep-10	EXIST		DAT File
23-Sep-10	EXISTPMF		DAT File
23-Sep-10	IL40EX		DAT File
23-Sep-10	IL45EX		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\RAFTS\LMCE\URBAN		
23-Sep-10	3LIV100		DAT File
23-Sep-10	3LIV100.OUT		OUT File
23-Sep-10	3LIVER5		DAT File
23-Sep-10	3URB100		DAT File
23-Sep-10	3URB100.OUT		OUT File
23-Sep-10	6LIV100		DAT File
23-Sep-10	6LIV100.OUT		OUT File
23-Sep-10	6LIVER5		DAT File
23-Sep-10	6LIVER5.OUT		OUT File
23-Sep-10	6URB5		DAT File
23-Sep-10	6URB5.OUT		OUT File
23-Sep-10	6URB100		DAT File
23-Sep-10	6URB100.OUT		OUT File
23-Sep-10	9LIV100		DAT File
23-Sep-10	9LIV100.OUT		OUT File
23-Sep-10	9LIVER5		DAT File
23-Sep-10	9LIVER5.OUT		OUT File
23-Sep-10	9URB5		DAT File
23-Sep-10	9URB5.OUT		OUT File
23-Sep-10	9URB100		DAT File
23-Sep-10	9URB100.OUT		OUT File
23-Sep-10	12LIV100		DAT File
23-Sep-10	12LIV100.OUT		OUT File
23-Sep-10	12LIVER5		DAT File
23-Sep-10	12LIVER5.OUT		OUT File

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Date	Product	Description	Format
23-Sep-10	12URB5		DAT File
23-Sep-10	12URB5.OUT		OUT File
23-Sep-10	12URB100		DAT File
23-Sep-10	12URB100.OUT		OUT File
23-Sep-10	18LIVER5		DAT File
23-Sep-10	18LIVER5.OUT		OUT File
23-Sep-10	18URB5		DAT File
23-Sep-10	18URB5.OUT		OUT File
23-Sep-10	45LIV100		DAT File
23-Sep-10	45LIV100.OUT		OUT File
23-Sep-10	45LIVER5		DAT File
23-Sep-10	45URB5		DAT File
23-Sep-10	45URB100		DAT File
23-Sep-10	45URB100.OUT		OUT File
23-Sep-10	EXIST		DAT File
23-Sep-10	EXIST.OUT		OUT File
23-Sep-10	IL45EX		DAT File
23-Sep-10	LOT		WK4 File
23-Sep-10	LOT1		WK4 File
23-Sep-10	LOT2		WK4 File
23-Sep-10	LOT3		WK4 File
23-Sep-10	LOT4		WK4 File
23-Sep-10	URB100		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\RAFTS\LMCE		
23-Sep-10	CL2EX		DAT File
23-Sep-10	COURSE		DAT File
23-Sep-10	DWRPAR		DAT File
23-Sep-10	EXIST		DAT File
23-Sep-10	EXISTPMF		DAT File
23-Sep-10	IL30EX		DAT File
23-Sep-10	IL40EX		DAT File
23-Sep-10	IL45EX		DAT File
23-Sep-10	README		File
23-Sep-10	VARBX-EX		DAT File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\RAFTS		
23-Sep-10	AEP.FMT		FMT File
23-Sep-10	AEP.GRF		GRF File
23-Sep-10	AEP.WK1		WK1 File
23-Sep-10	EXIST1		DAT File
23-Sep-10	EXIST2		DAT File
23-Sep-10	EXIST3		DAT File
23-Sep-10	L1		Text document
23-Sep-10	LINK		WK4 File
23-Sep-10	LINK1	Sub-Area Characteristics of Hydrologic Model	Word document
23-Sep-10	LINK1		WK4 File
23-Sep-10	LINK1.FMT		FMT File
23-Sep-10	LINK1.WK1		WK1 File
23-Sep-10	LINK1.WP5		WP5 File
23-Sep-10	LINK2		WK4 File
23-Sep-10	LINK3		WK4 File
23-Sep-10	schema		Configuration Settings
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\SURVEY\BONDS		
23-Sep-10	BC00		WK4 File
23-Sep-10	BC00-1		WK4 File
23-Sep-10	BC00-2		WK4 File
23-Sep-10	BC00.FMB		FMB File
23-Sep-10	BC00.FMT		FMT File
23-Sep-10	BC00.PRN		PRN File
23-Sep-10	BC00.WK1		WK1 File
23-Sep-10	BC01		WK4 File
23-Sep-10	BC01.FMT		FMT File
23-Sep-10	BC0001.GRF		GRF File
23-Sep-10	BC01.PRN		PRN File
23-Sep-10	BC01.WK1		WK1 File
23-Sep-10	BC02		WK4 File
23-Sep-10	BC02.FMT		FMT File
23-Sep-10	BC0002.GRF		GRF File
23-Sep-10	BC02.PRN		PRN File
23-Sep-10	BC02.WK1		WK1 File
23-Sep-10	BC03		DAT File
23-Sep-10	BC03		WK4 File
23-Sep-10	BC03.FMT		FMT File
23-Sep-10	BC0003.GRF		GRF File
23-Sep-10	BC03.PRN		PRN File
23-Sep-10	BC03.WK1		WK1 File
23-Sep-10	BC04		WK4 File
23-Sep-10	BC04.FMT		FMT File
23-Sep-10	BC0004.GRF		GRF File
23-Sep-10	BC04.PRN		PRN File
23-Sep-10	BC04.WK1		WK1 File
23-Sep-10	BC05		WK4 File
23-Sep-10	BC05.FMT		FMT File
23-Sep-10	BC0005.GRF		GRF File
23-Sep-10	BC05.PRN		PRN File
23-Sep-10	BC05.WK1		WK1 File
23-Sep-10	BC06		WK4 File
23-Sep-10	BC06.FMT		FMT File
23-Sep-10	BC0006.GRF		GRF File
23-Sep-10	BC06.PRN		PRN File
23-Sep-10	BC06.WK1		WK1 File
23-Sep-10	BC07		WK4 File
23-Sep-10	BC07.FMT		FMT File
23-Sep-10	BC0007.GRF		GRF File
23-Sep-10	BC07.PRN		PRN File
23-Sep-10	BC07.WK1		WK1 File
23-Sep-10	BC08		WK4 File
23-Sep-10	BC08-1		WK4 File
23-Sep-10	BC08.FMB		FMB File
23-Sep-10	BC08.FMT		FMT File
23-Sep-10	BC0008.GRF		GRF File
23-Sep-10	BC08.PRN		PRN File
23-Sep-10	BC08.WK1		WK1 File
23-Sep-10	BC0009.GRF		GRF File
23-Sep-10	BC0010.GRF		GRF File
23-Sep-10	BC0011.GRF		GRF File
23-Sep-10	BC0012.GRF		GRF File
23-Sep-10	BC0013.GRF		GRF File
23-Sep-10	BC0014.GRF		GRF File
23-Sep-10	BC0015.GRF		GRF File
23-Sep-10	BC0016.GRF		GRF File
23-Sep-10	BC0017.GRF		GRF File
23-Sep-10	BC0018.GRF		GRF File
23-Sep-10	BC0019.GRF		GRF File
23-Sep-10	BC0020.GRF		GRF File
23-Sep-10	BC0021.GRF		GRF File
23-Sep-10	BC0022.GRF		GRF File
23-Sep-10	BC0023.GRF		GRF File
23-Sep-10	BC0024.GRF		GRF File
23-Sep-10	BC0025.GRF		GRF File
23-Sep-10	BC0026.GRF		GRF File
23-Sep-10	BC0027.GRF		GRF File
23-Sep-10	BC0028.GRF		GRF File
23-Sep-10	BC0029.GRF		GRF File
23-Sep-10	BC0030.GRF		GRF File
23-Sep-10	BC0031.GRF		GRF File
23-Sep-10	BC0032.GRF		GRF File

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Date	Product	Description	Format
23-Sep-10	BC0033.GRF		GRF File
23-Sep-10	BC0034.GRF		GRF File
23-Sep-10	BC0035.GRF		GRF File
23-Sep-10	BC0036.GRF		GRF File
23-Sep-10	BC0037.GRF		GRF File
23-Sep-10	BC0038.GRF		GRF File
23-Sep-10	BC0039.GRF		GRF File
23-Sep-10	BC0040.GRF		GRF File
23-Sep-10	BC0041.GRF		GRF File
23-Sep-10	BC0042.GRF		GRF File
23-Sep-10	BC0043.GRF		GRF File
23-Sep-10	BC0044.GRF		GRF File
23-Sep-10	BC0045.GRF		GRF File
23-Sep-10	BC0046.GRF		GRF File
23-Sep-10	BC0047.GRF		GRF File
23-Sep-10	BC0048.GRF		GRF File
23-Sep-10	BC0049.GRF		GRF File
23-Sep-10	BC0050.GRF		GRF File
23-Sep-10	BC0051.GRF		GRF File
23-Sep-10	BC0052.GRF		GRF File
23-Sep-10	BC0053.GRF		GRF File
23-Sep-10	BC0054.GRF		GRF File
23-Sep-10	BC0055.GRF		GRF File
23-Sep-10	BC0056.GRF		GRF File
23-Sep-10	BC0057.GRF		GRF File
23-Sep-10	BC0058.GRF		GRF File
23-Sep-10	BC0059.GRF		GRF File
23-Sep-10	BC0060.GRF		GRF File
23-Sep-10	BC0060.PRN		PRN File
23-Sep-10	BC0061.GRF		GRF File
23-Sep-10	BC0101.GRF		GRF File
23-Sep-10	BC0102.GRF		GRF File
23-Sep-10	BC0103.GRF		GRF File
23-Sep-10	BC0104.GRF		GRF File
23-Sep-10	BC0105.GRF		GRF File
23-Sep-10	BC0201.GRF		GRF File
23-Sep-10	BC0202.GRF		GRF File
23-Sep-10	BC0301.GRF		GRF File
23-Sep-10	BC0302.GRF		GRF File
23-Sep-10	BC0401.GRF		GRF File
23-Sep-10	BC0402.GRF		GRF File
23-Sep-10	BC0403.GRF		GRF File
23-Sep-10	BC0404.GRF		GRF File
23-Sep-10	BC0405.GRF		GRF File
23-Sep-10	BC0501.GRF		GRF File
23-Sep-10	BC0502.GRF		GRF File
23-Sep-10	BC0601.GRF		GRF File
23-Sep-10	BC0602.GRF		GRF File
23-Sep-10	BC0603.GRF		GRF File
23-Sep-10	BC0604.GRF		GRF File
23-Sep-10	BC0701.GRF		GRF File
23-Sep-10	BC0702.GRF		GRF File
23-Sep-10	BC0703.GRF		GRF File
23-Sep-10	BC0704.GRF		GRF File
23-Sep-10	BC0801.GRF		GRF File
23-Sep-10	BC0802.GRF		GRF File
23-Sep-10	BC0803.GRF		GRF File
23-Sep-10	BC0804.GRF		GRF File
23-Sep-10	BC0805.GRF		GRF File
23-Sep-10	BC0806.GRF		GRF File
23-Sep-10	BC0807.GRF		GRF File
23-Sep-10	BC803051.FMT		FMT File
23-Sep-10	BC804052.FMT		FMT File
23-Sep-10	BC805053.FMT		FMT File
23-Sep-10	BCSHT1		WK4 File
23-Sep-10	BCSHT2.PRN		PRN File
23-Sep-10	BCWS		WK4 File
23-Sep-10	BCWSR		WK4 File
23-Sep-10	HBC00		DAT File
23-Sep-10	HBC00		WK4 File
23-Sep-10	HBC00.PRN		PRN File
23-Sep-10	HBC01		DAT File
23-Sep-10	HBC01		WK4 File
23-Sep-10	HBC01.PRN		PRN File
23-Sep-10	HBC02		DAT File
23-Sep-10	HBC02		WK4 File
23-Sep-10	HBC02.PRN		PRN File
23-Sep-10	HBC03		DAT File
23-Sep-10	HBC03		WK4 File
23-Sep-10	HBC03.PRN		PRN File
23-Sep-10	HBC04		DAT File
23-Sep-10	HBC04		WK4 File
23-Sep-10	HBC04.PRN		PRN File
23-Sep-10	HBC05		DAT File
23-Sep-10	HBC05		WK4 File
23-Sep-10	HBC05.PRN		PRN File
23-Sep-10	HBC06		DAT File
23-Sep-10	HBC06		WK4 File
23-Sep-10	HBC06.PRN		PRN File
23-Sep-10	HBC07		DAT File
23-Sep-10	HBC07		WK4 File
23-Sep-10	HBC07.PRN		PRN File
23-Sep-10	HBC08		DAT File
23-Sep-10	HBC08		WK4 File
23-Sep-10	HBC08.PRN		PRN File
23-Sep-10	HBC08.PRR		PRR File
23-Sep-10	SC00-1		WK4 File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\SURVEY\SCALIB		
23-Sep-10	HSC00		DAT File
23-Sep-10	HSC00		WK4 File
23-Sep-10	HSC00.PRN		PRN File
23-Sep-10	SC00		WK4 File
23-Sep-10	SC00-1		WK4 File
23-Sep-10	SC00.FMB		FMB File
23-Sep-10	SC00.FMT		FMT File
23-Sep-10	SC00.PRN		PRN File
23-Sep-10	SC00.WK1		WK1 File
23-Sep-10	SC0001.GRF		GRF File
23-Sep-10	SC0002.GRF		GRF File
23-Sep-10	SC0003.GRF		GRF File
23-Sep-10	SC0004.GRF		GRF File
23-Sep-10	SC0005.GRF		GRF File
23-Sep-10	SC0006.GRF		GRF File
23-Sep-10	SC0007.GRF		GRF File
23-Sep-10	SC0008.GRF		GRF File
23-Sep-10	SC0009.GRF		GRF File
23-Sep-10	SC0010.GRF		GRF File
23-Sep-10	SC0011.GRF		GRF File
23-Sep-10	SC0012.GRF		GRF File
23-Sep-10	SC0013.GRF		GRF File
23-Sep-10	SC0014.GRF		GRF File
23-Sep-10	SC0015.GRF		GRF File
23-Sep-10	TEMP1		File
	2010 09 23 WMA\Kemps_Bonds\DATA\austral floodplain risk mgt study and plan 2003\Austral Files from LMCE Archives\SURVEY		
23-Sep-10	21		File
23-Sep-10	31		File

Date	Product	Description	Format
23-Sep-10	37		File
23-Sep-10	38		File
23-Sep-10	40		File
23-Sep-10	45		File
23-Sep-10	46		File
23-Sep-10	8171109		WK4 File
23-Sep-10	8181110		WK4 File
23-Sep-10	8191111		WK4 File
23-Sep-10	14212003.FMT		FMT File
23-Sep-10	14212003.WK1		WK1 File
23-Sep-10	14281703.FMT		FMT File
23-Sep-10	14281703.WK1		WK1 File
23-Sep-10	14332405.FMT		FMT File
23-Sep-10	14332405.WK1		WK1 File
23-Sep-10	BC0059.PRN		PRN File
23-Sep-10	EXAMPLE		WK4 File
23-Sep-10	EXAMPLE.FMT		FMT File
23-Sep-10	EXAMPLE.WK1		WK1 File
23-Sep-10	HKC00		WK4 File
23-Sep-10	HKC00.PRN		PRN File
23-Sep-10	HKC01		DAT File
23-Sep-10	HKC01		WK4 File
23-Sep-10	HKC01.PRN		PRN File
23-Sep-10	HKC02		DAT File
23-Sep-10	HKC02.PRN		PRN File
23-Sep-10	HKC03		DAT File
23-Sep-10	HKC03		WK4 File
23-Sep-10	HKC03.PRN		PRN File
23-Sep-10	HKC04		DAT File
23-Sep-10	HKC04		WK4 File
23-Sep-10	HKC04.PRN		PRN File
23-Sep-10	HKC05		DAT File
23-Sep-10	HKC05		WK4 File
23-Sep-10	HKC05.PRN		PRN File
23-Sep-10	HKC06		DAT File
23-Sep-10	HKC06		WK4 File
23-Sep-10	HKC06.PRN		PRN File
23-Sep-10	HKC07		DAT File
23-Sep-10	HKC07		WK4 File
23-Sep-10	HKC07.PRN		PRN File
23-Sep-10	HKC08		DAT File
23-Sep-10	HKC08		WK4 File
23-Sep-10	HKC08.PRN		PRN File
23-Sep-10	HKC09		DAT File
23-Sep-10	HKC09		WK4 File
23-Sep-10	HKC09.PRN		PRN File
23-Sep-10	HKC10		DAT File
23-Sep-10	HKC10		WK4 File
23-Sep-10	HKC10.PRN		PRN File
23-Sep-10	HKC11		DAT File
23-Sep-10	HKC11		WK4 File
23-Sep-10	HKC11.PRN		PRN File
23-Sep-10	HKC11A		WK4 File
23-Sep-10	HKC12		DAT File
23-Sep-10	HKC12		WK4 File
23-Sep-10	HKC12.PRN		PRN File
23-Sep-10	HKC13		DAT File
23-Sep-10	HKC13		WK4 File
23-Sep-10	HKC13.PRN		PRN File
23-Sep-10	HKC14		DAT File
23-Sep-10	HKC14		WK4 File
23-Sep-10	HKC14.PRN		PRN File
23-Sep-10	HKC15		DAT File
23-Sep-10	HKC15		WK4 File
23-Sep-10	HKC15.PRN		PRN File
23-Sep-10	HKC16		DAT File
23-Sep-10	HKC16		WK4 File
23-Sep-10	HKC16.PRN		PRN File
23-Sep-10	HKC17		DAT File
23-Sep-10	HKC17		WK4 File
23-Sep-10	HKC17.PRN		PRN File
23-Sep-10	HKC18		DAT File
23-Sep-10	HKC18		WK4 File
23-Sep-10	HKC18.PRN		PRN File
23-Sep-10	HKC19		DAT File
23-Sep-10	HKC19		WK4 File
23-Sep-10	HKC19.PRN		PRN File
23-Sep-10	HKC20		DAT File
23-Sep-10	HKC20		WK4 File
23-Sep-10	HKC20.PRN		PRN File
23-Sep-10	HKC21		DAT File
23-Sep-10	HKC21		WK4 File
23-Sep-10	HKC21.PRN		PRN File
23-Sep-10	HKC22		DAT File
23-Sep-10	HKC22		WK4 File
23-Sep-10	HKC22.PRN		PRN File
23-Sep-10	HKC23		DAT File
23-Sep-10	HKC23		WK4 File
23-Sep-10	HKC23.PRN		PRN File
23-Sep-10	HKC24		DAT File
23-Sep-10	HKC24.PRN		PRN File
23-Sep-10	HKC27		DAT File
23-Sep-10	HKC27.PRN		PRN File
23-Sep-10	HKC28		DAT File
23-Sep-10	HKC28.PRN		PRN File
23-Sep-10	HKC29		DAT File
23-Sep-10	HKC29.PRN		PRN File
23-Sep-10	HKC30		DAT File
23-Sep-10	HKC30.PRN		PRN File
23-Sep-10	JUNK		DAT File
23-Sep-10	JUNK1.FMB		FMB File
23-Sep-10	JUNK1.FMT		FMT File
23-Sep-10	JUNK1.WK1		WK1 File
23-Sep-10	JUNK.PRN		PRN File
23-Sep-10	KC00		WK4 File
23-Sep-10	KC00-1		WK4 File
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23-Sep-10	KC00.FMT		FMT File
23-Sep-10	KC00.PRN		PRN File
23-Sep-10	KC00.WK1		WK1 File
23-Sep-10	KC01		WK4 File
23-Sep-10	KC01-1		WK4 File
23-Sep-10	KC01.FMB		FMB File
23-Sep-10	KC01.FMT		FMT File
23-Sep-10	KC0001.GRF		GRF File
23-Sep-10	KC01.PRN		PRN File
23-Sep-10	KC01.WK1		WK1 File
23-Sep-10	KC02		WK4 File
23-Sep-10	KC02-01		WK4 File
23-Sep-10	KC02.FMT		FMT File
23-Sep-10	KC0002.GRF		GRF File
23-Sep-10	KC02.PRN		PRN File
23-Sep-10	KC02.WK1		WK1 File
23-Sep-10	KC03		WK4 File
23-Sep-10	KC03-1		WK4 File
23-Sep-10	KC03.FMB		FMB File

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Date	Product	Description	Format
23-Sep-10	KC03.FMT		FMT File
23-Sep-10	KC0003.GRF		GRF File
23-Sep-10	KC03.PRN		PRN File
23-Sep-10	KC03.WK1		WK1 File
23-Sep-10	KC04		WK4 File
23-Sep-10	KC04.FMT		FMT File
23-Sep-10	KC0004.GRF		GRF File
23-Sep-10	KC04.PRN		PRN File
23-Sep-10	KC04.WK1		WK1 File
23-Sep-10	KC05		WK4 File
23-Sep-10	KC05.FMB		FMB File
23-Sep-10	KC05.FMT		FMT File
23-Sep-10	KC0005.GRF		GRF File
23-Sep-10	KC05.PRN		PRN File
23-Sep-10	KC05.WK1		WK1 File
23-Sep-10	KC06		WK4 File
23-Sep-10	KC06-1		WK4 File
23-Sep-10	KC06.FMT		FMT File
23-Sep-10	KC0006.GRF		GRF File
23-Sep-10	KC06.PRN		PRN File
23-Sep-10	KC06.WK1		WK1 File
23-Sep-10	KC07		WK4 File
23-Sep-10	KC07-1		WK4 File
23-Sep-10	KC07.FMT		FMT File
23-Sep-10	KC0007.GRF		GRF File
23-Sep-10	KC07.PRN		PRN File
23-Sep-10	KC07.WK1		WK1 File
23-Sep-10	KC08		WK4 File
23-Sep-10	KC08-1		WK4 File
23-Sep-10	KC08.FMB		FMB File
23-Sep-10	KC08.FMT		FMT File
23-Sep-10	KC0008.GRF		GRF File
23-Sep-10	KC08.PRN		PRN File
23-Sep-10	KC08.WK1		WK1 File
23-Sep-10	KC09		WK4 File
23-Sep-10	KC09.FMT		FMT File
23-Sep-10	KC0009.GRF		GRF File
23-Sep-10	KC09.PRN		PRN File
23-Sep-10	KC09.WK1		WK1 File
23-Sep-10	KC10		WK4 File
23-Sep-10	KC10.FMT		FMT File
23-Sep-10	KC0010.GRF		GRF File
23-Sep-10	KC10.PRN		PRN File
23-Sep-10	KC10.WK1		WK1 File
23-Sep-10	KC11		WK4 File
23-Sep-10	KC11-1		WK4 File
23-Sep-10	KC11.FMT		FMT File
23-Sep-10	KC0011.GRF		GRF File
23-Sep-10	KC11.PRN		PRN File
23-Sep-10	KC11.WK1		WK1 File
23-Sep-10	KC12		WK4 File
23-Sep-10	KC12.FMB		FMB File
23-Sep-10	KC12.FMT		FMT File
23-Sep-10	KC0012.GRF		GRF File
23-Sep-10	KC12.PRN		PRN File
23-Sep-10	KC12.WK1		WK1 File
23-Sep-10	KC13		WK4 File
23-Sep-10	KC13-1		WK4 File
23-Sep-10	KC13.FMT		FMT File
23-Sep-10	KC0013.GRF		GRF File
23-Sep-10	KC13.PRN		PRN File
23-Sep-10	KC13.WK1		WK1 File
23-Sep-10	KC14		WK4 File
23-Sep-10	KC14-1		WK4 File
23-Sep-10	KC14.FMB		FMB File
23-Sep-10	KC14.FMT		FMT File
23-Sep-10	KC0014.GRF		GRF File
23-Sep-10	KC14.PRN		PRN File
23-Sep-10	KC14.WK1		WK1 File
23-Sep-10	KC15		WK4 File
23-Sep-10	KC15.FMT		FMT File
23-Sep-10	KC0015.GRF		GRF File
23-Sep-10	KC15.PRN		PRN File
23-Sep-10	KC15.WK1		WK1 File
23-Sep-10	KC16		WK4 File
23-Sep-10	KC16.FMB		FMB File
23-Sep-10	KC16.FMT		FMT File
23-Sep-10	KC0016.GRF		GRF File
23-Sep-10	KC16.PRN		PRN File
23-Sep-10	KC16.WK1		WK1 File
23-Sep-10	KC17		DAT File
23-Sep-10	KC17		WK4 File
23-Sep-10	KC17-1		WK4 File
23-Sep-10	KC17.FMT		FMT File
23-Sep-10	KC0017.GRF		GRF File
23-Sep-10	KC17.PRN		PRN File
23-Sep-10	KC17.WK1		WK1 File
23-Sep-10	KC18		WK4 File
23-Sep-10	KC18.FMT		FMT File
23-Sep-10	KC0018.GRF		GRF File
23-Sep-10	KC18.PRN		PRN File
23-Sep-10	KC18.WK1		WK1 File
23-Sep-10	KC19		WK4 File
23-Sep-10	KC19-1		WK4 File
23-Sep-10	KC19.FMT		FMT File
23-Sep-10	KC0019.GRF		GRF File
23-Sep-10	KC19.PRN		PRN File
23-Sep-10	KC19.WK1		WK1 File
23-Sep-10	KC20		WK4 File
23-Sep-10	KC20.FMT		FMT File
23-Sep-10	KC0020.GRF		GRF File
23-Sep-10	KC20.PRN		PRN File
23-Sep-10	KC20.WK1		WK1 File
23-Sep-10	KC21		WK4 File
23-Sep-10	KC21.FMT		FMT File
23-Sep-10	KC0021.GRF		GRF File
23-Sep-10	KC21.PRN		PRN File
23-Sep-10	KC21.WK1		WK1 File
23-Sep-10	KC22		WK4 File
23-Sep-10	KC22.FMT		FMT File
23-Sep-10	KC0022.GRF		GRF File
23-Sep-10	KC22.PRN		PRN File
23-Sep-10	KC22.WK1		WK1 File
23-Sep-10	KC23		WK4 File
23-Sep-10	KC23-1		WK4 File
23-Sep-10	KC23.FMT		FMT File
23-Sep-10	KC0023.GRF		GRF File
23-Sep-10	KC23.PRN		PRN File
23-Sep-10	KC23.WK1		WK1 File
23-Sep-10	KC24		WK4 File
23-Sep-10	KC24-1		WK4 File
23-Sep-10	KC24.FMB		FMB File
23-Sep-10	KC24.FMT		FMT File
23-Sep-10	KC0024.GRF		GRF File
23-Sep-10	KC24.PRN		PRN File
23-Sep-10	KC24.WK1		WK1 File

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Date	Product	Description	Format
23-Sep-10	KC25		WK4 File
23-Sep-10	KC25.FMT		FMT File
23-Sep-10	KC0025.GRF		GRF File
23-Sep-10	KC25.PRN		PRN File
23-Sep-10	KC25.WK1		WK1 File
23-Sep-10	KC0026.GRF		GRF File
23-Sep-10	KC26.PRN		PRN File
23-Sep-10	KC27		WK4 File
23-Sep-10	KC27-1		WK4 File
23-Sep-10	KC27.FMB		FMB File
23-Sep-10	KC27.FMT		FMT File
23-Sep-10	KC0027.GRF		GRF File
23-Sep-10	KC27.PRN		PRN File
23-Sep-10	KC27.WK1		WK1 File
23-Sep-10	KC28		WK4 File
23-Sep-10	KC28.FMT		FMT File
23-Sep-10	KC0028.GRF		GRF File
23-Sep-10	KC28.PRN		PRN File
23-Sep-10	KC28.WK1		WK1 File
23-Sep-10	KC29		WK4 File
23-Sep-10	KC29.FMT		FMT File
23-Sep-10	KC0029.GRF		GRF File
23-Sep-10	KC29.PRN		PRN File
23-Sep-10	KC29.WK1		WK1 File
23-Sep-10	KC30		WK4 File
23-Sep-10	KC30.FMB		FMB File
23-Sep-10	KC30.FMT		FMT File
23-Sep-10	KC0030.GRF		GRF File
23-Sep-10	KC30.PRN		PRN File
23-Sep-10	KC30.WK1		WK1 File
23-Sep-10	KC0031.GRF		GRF File
23-Sep-10	KC0032.GRF		GRF File
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23-Sep-10	KC0112.GRF		GRF File
23-Sep-10	KC0113.GRF		GRF File
23-Sep-10	KC0114.GRF		GRF File
23-Sep-10	KC0115.GRF		GRF File
23-Sep-10	KC0116.GRF		GRF File
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23-Sep-10	KC0201.GRF		GRF File
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23-Sep-10	KC0203.GRF		GRF File
23-Sep-10	KC0204.GRF		GRF File
23-Sep-10	KC0205.GRF		GRF File
23-Sep-10	KC0206.GRF		GRF File
23-Sep-10	KC0301.GRF		GRF File
23-Sep-10	KC0302.GRF		GRF File
23-Sep-10	KC0303.GRF		GRF File
23-Sep-10	KC0304.GRF		GRF File
23-Sep-10	KC0401.GRF		GRF File
23-Sep-10	KC0402.GRF		GRF File
23-Sep-10	KC0403.GRF		GRF File
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23-Sep-10	KC0502.GRF		GRF File
23-Sep-10	KC0503.GRF		GRF File
23-Sep-10	KC0601.GRF		GRF File
23-Sep-10	KC0602.GRF		GRF File
23-Sep-10	KC0603.GRF		GRF File
23-Sep-10	KC0604.GRF		GRF File
23-Sep-10	KC0701.GRF		GRF File
23-Sep-10	KC0702.GRF		GRF File
23-Sep-10	KC0703.GRF		GRF File
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23-Sep-10	KC0801.GRF		GRF File
23-Sep-10	KC0802.GRF		GRF File
23-Sep-10	KC0803.GRF		GRF File
23-Sep-10	KC0804.GRF		GRF File
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23-Sep-10	KC0807.GRF		GRF File
23-Sep-10	KC0808.GRF		GRF File
23-Sep-10	KC0809.GRF		GRF File
23-Sep-10	KC0810.GRF		GRF File
23-Sep-10	KC0811.GRF		GRF File
23-Sep-10	KC0812.GRF		GRF File
23-Sep-10	KC0813.GRF		GRF File
23-Sep-10	KC0814.GRF		GRF File
23-Sep-10	KC0815.GRF		GRF File
23-Sep-10	KC0816.GRF		GRF File
23-Sep-10	KC0817.GRF		GRF File
23-Sep-10	KC0818.GRF		GRF File
23-Sep-10	KC0819.GRF		GRF File
23-Sep-10	KC0820.GRF		GRF File
23-Sep-10	KC0821.GRF		GRF File
23-Sep-10	KC0822.GRF		GRF File
23-Sep-10	KC0823.GRF		GRF File
23-Sep-10	KC0824.GRF		GRF File
23-Sep-10	KC0825.GRF		GRF File
23-Sep-10	KC0826.GRF		GRF File
23-Sep-10	KC0827.GRF		GRF File
23-Sep-10	KC0828.GRF		GRF File
23-Sep-10	KC0829.GRF		GRF File
23-Sep-10	KC0830.GRF		GRF File
23-Sep-10	KC0831.GRF		GRF File
23-Sep-10	KC0901.GRF		GRF File
23-Sep-10	KC0902.GRF		GRF File
23-Sep-10	KC0903.GRF		GRF File
23-Sep-10	KC0904.GRF		GRF File
23-Sep-10	KC1001.GRF		GRF File
23-Sep-10	KC1101.GRF		GRF File
23-Sep-10	KC1102.GRF		GRF File
23-Sep-10	KC1102B.GRF		GRF File

Date	Product	Description	Format
23-Sep-10	KC1103.GRF		GRF File
23-Sep-10	KC1103B.GRF		GRF File
23-Sep-10	KC1104.GRF		GRF File
23-Sep-10	KC1104B.GRF		GRF File
23-Sep-10	KC1105.GRF		GRF File
23-Sep-10	KC1105B.GRF		GRF File
23-Sep-10	KC1106.GRF		GRF File
23-Sep-10	KC1106B.GRF		GRF File
23-Sep-10	KC1107.GRF		GRF File
23-Sep-10	KC1107B.GRF		GRF File
23-Sep-10	KC1108.GRF		GRF File
23-Sep-10	KC1109.GRF		GRF File
23-Sep-10	KC1110.GRF		GRF File
23-Sep-10	KC1111.GRF		GRF File
23-Sep-10	KC1112.GRF		GRF File
23-Sep-10	KC1201.GRF		GRF File
23-Sep-10	KC1202.GRF		GRF File
23-Sep-10	KC1203.GRF		GRF File
23-Sep-10	KC1204.GRF		GRF File
23-Sep-10	KC1301.GRF		GRF File
23-Sep-10	KC1302.GRF		GRF File
23-Sep-10	KC1303.GRF		GRF File
23-Sep-10	KC1304.GRF		GRF File
23-Sep-10	KC1305.GRF		GRF File
23-Sep-10	KC1306.GRF		GRF File
23-Sep-10	KC1307.GRF		GRF File
23-Sep-10	KC1308.GRF		GRF File
23-Sep-10	KC1309.GRF		GRF File
23-Sep-10	KC1310.GRF		GRF File
23-Sep-10	KC1314.GRF		GRF File
23-Sep-10	KC1401.GRF		GRF File
23-Sep-10	KC1402.GRF		GRF File
23-Sep-10	KC1403.GRF		GRF File
23-Sep-10	KC1404.GRF		GRF File
23-Sep-10	KC1405.GRF		GRF File
23-Sep-10	KC1406.GRF		GRF File
23-Sep-10	KC1407.GRF		GRF File
23-Sep-10	KC1408.GRF		GRF File
23-Sep-10	KC1409.GRF		GRF File
23-Sep-10	KC1410.GRF		GRF File
23-Sep-10	KC1411.GRF		GRF File
23-Sep-10	KC1412.GRF		GRF File
23-Sep-10	KC1413.GRF		GRF File
23-Sep-10	KC1414.GRF		GRF File
23-Sep-10	KC1415.GRF		GRF File
23-Sep-10	KC1416.GRF		GRF File
23-Sep-10	KC1417.GRF		GRF File
23-Sep-10	KC1418.GRF		GRF File
23-Sep-10	KC1419.GRF		GRF File
23-Sep-10	KC1420.GRF		GRF File
23-Sep-10	KC1421.GRF		GRF File
23-Sep-10	KC1422.GRF		GRF File
23-Sep-10	KC1423.GRF		GRF File
23-Sep-10	KC1424.GRF		GRF File
23-Sep-10	KC1425.GRF		GRF File
23-Sep-10	KC1426.GRF		GRF File
23-Sep-10	KC1427.GRF		GRF File
23-Sep-10	KC1428.GRF		GRF File
23-Sep-10	KC1429.GRF		GRF File
23-Sep-10	KC1430.GRF		GRF File
23-Sep-10	KC1431.GRF		GRF File
23-Sep-10	KC1432.GRF		GRF File
23-Sep-10	KC1433.GRF		GRF File
23-Sep-10	KC1434.GRF		GRF File
23-Sep-10	KC1435.GRF		GRF File
23-Sep-10	KC1436.GRF		GRF File
23-Sep-10	KC1501.GRF		GRF File
23-Sep-10	KC1502.GRF		GRF File
23-Sep-10	KC1503.GRF		GRF File
23-Sep-10	KC1504.GRF		GRF File
23-Sep-10	KC1505.GRF		GRF File
23-Sep-10	KC1601.GRF		GRF File
23-Sep-10	KC1602.GRF		GRF File
23-Sep-10	KC1701.GRF		GRF File
23-Sep-10	KC1702.GRF		GRF File
23-Sep-10	KC1703.GRF		GRF File
23-Sep-10	KC1801.GRF		GRF File
23-Sep-10	KC1802.GRF		GRF File
23-Sep-10	KC1901.GRF		GRF File
23-Sep-10	KC1902.GRF		GRF File
23-Sep-10	KC2001.GRF		GRF File
23-Sep-10	KC2002GRF		GRF File
23-Sep-10	KC2003.GRF		GRF File
23-Sep-10	KC2101.GRF		GRF File
23-Sep-10	KC2102.GRF		GRF File
23-Sep-10	KC2201.GRF		GRF File
23-Sep-10	KC2202.GRF		GRF File
23-Sep-10	KC2203.GRF		GRF File
23-Sep-10	KC2301.GRF		GRF File
23-Sep-10	KC2302.GRF		GRF File
23-Sep-10	KC2401.GRF		GRF File
23-Sep-10	KC2402.GRF		GRF File
23-Sep-10	KC2403.GRF		GRF File
23-Sep-10	KC2404.GRF		GRF File
23-Sep-10	KC2405.GRF		GRF File
23-Sep-10	KC2501.GRF		GRF File
23-Sep-10	KC2502.GRF		GRF File
23-Sep-10	KC2701.GRF		GRF File
23-Sep-10	KC2702.GRF		GRF File
23-Sep-10	KC2703.GRF		GRF File
23-Sep-10	KC2704.GRF		GRF File
23-Sep-10	KC2705.GRF		GRF File
23-Sep-10	KC2706.GRF		GRF File
23-Sep-10	KC2707.GRF		GRF File
23-Sep-10	KC2708.GRF		GRF File
23-Sep-10	KC2801.GRF		GRF File
23-Sep-10	KC2901.GRF		GRF File
23-Sep-10	KC3001.GRF		GRF File
23-Sep-10	KC3002.GRF		GRF File
23-Sep-10	KCO7.PRN		PRN File
23-Sep-10	KEMPS.INP		INP File
23-Sep-10	M11PLOT		Application
23-Sep-10	SCALLI.PRN		PRN File
23-Sep-10	SECTIONS		WK4 File
23-Sep-10	SECTIONS.FMB		FMB File
23-Sep-10	SECTIONS.FMT		FMT File
23-Sep-10	SECTIONS.PRN		PRN File
23-Sep-10	TEMP		File
23-Sep-10	TEMP.FMT		FMT File
23-Sep-10	TEMP.WK1		WK1 File
	2010 09 23 WMA\Kemps_Bonds\DATA\BOM_Daily_rainfall		
23-Sep-10	DC02D_Data_066190_27472415135347		Text Document
23-Sep-10	DC02D_Data_067015_27472415135347		Text Document
23-Sep-10	DC02D_Data_067061_27472415135347		Text Document
23-Sep-10	DC02D_Data_067108_27472415135347		Text Document
23-Sep-10	DC02D_Data_068007_27472415135347		Text Document

Date	Product	Description	Format
23-Sep-10	DC02D_Data_068052_27472415135347		Text Document
23-Sep-10	DC02D_Data_068122_27472415135347		Text Document
23-Sep-10	DC02D_Data_068125_27472415135347		Text Document
23-Sep-10	DC02D_Data_068159_27472415135347		Text Document
23-Sep-10	DC02D_Data_068160_27472415135347		Text Document
23-Sep-10	DC02D_Data_068192_27472415135347		Text Document
23-Sep-10	DC02D_Data_068200_27472415135347		Text Document
23-Sep-10	DC02D_Data_068216_27472415135347		Text Document
23-Sep-10	DC02D_Data_068231_27472415135347		Text Document
23-Sep-10	DC02D_Data_068250_27472415135347		Text Document
23-Sep-10	DC02D_Data_068254_27472415135347		Text Document
23-Sep-10	DC02D_Data_068257_27472415135347		Text Document
23-Sep-10	DC02D_Notes_27472415135347		Text Document
23-Sep-10	DC02D_StnDet_27472415135347		Text Document
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\BC		
23-Sep-10	SC1_03.bnd11		BND11 File
23-Sep-10	SC5_03.bnd11		BND11 File
23-Sep-10	SC5_hotstart.bnd11		BND11 File
23-Sep-10	SC20_03.bnd11		BND11 File
23-Sep-10	SC50_03.bnd11		BND11 File
23-Sep-10	SC100_03.bnd11		BND11 File
23-Sep-10	SCpmf_03.bnd11		BND11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Cross Section		
23-Sep-10	SC_FRMS_03_Exg_1to1h.xns11		XNS11 File
23-Sep-10	SC_FRMS_03_Exg_pmf.xns11		XNS11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydraulic Parameter		
23-Sep-10	SC_FRMS_03_Exg_1to1h.HD11		HD11 File
23-Sep-10	SC_FRMS_03_Exg_PMF.HD11		HD11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\Hstart		
23-Sep-10	6B-Q.dfs0		DFS0 File
23-Sep-10	7C-Q.dfs0		DFS0 File
23-Sep-10	7D-Q.dfs0		DFS0 File
23-Sep-10	8A-Q.dfs0		DFS0 File
23-Sep-10	8-Q.dfs0		DFS0 File
23-Sep-10	9-Q.dfs0		DFS0 File
23-Sep-10	DSWL5-H.dfs0		DFS0 File
23-Sep-10	OVERETT A-Q.dfs0		DFS0 File
23-Sep-10	OVERETT B-Q.dfs0		DFS0 File
23-Sep-10	THOMPS-Q.dfs0		DFS0 File
23-Sep-10	USQ5-Q.dfs0		DFS0 File
23-Sep-10	USQ900-5-Q.dfs0		DFS0 File
23-Sep-10	weir_p		File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC5REV\Old_Mike11_files		
23-Sep-10	BBASE000.BBF		BBF File
23-Sep-10	BBASE001.BBF		BBF File
23-Sep-10	BBASE002.BBF		BBF File
23-Sep-10	BBASE003.BBF		BBF File
23-Sep-10	BBASE004.BBF		BBF File
23-Sep-10	BBASE005.BBF		BBF File
23-Sep-10	BBASE006.BBF		BBF File
23-Sep-10	BBASE007.BBF		BBF File
23-Sep-10	BBASE008.BBF		BBF File
23-Sep-10	BBASE009.BBF		BBF File
23-Sep-10	BBASE010.BBF		BBF File
23-Sep-10	HD_MODEL.BBR		BBR File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC5REV		
23-Sep-10	6B-Q.dfs0		DFS0 File
23-Sep-10	7C-Q.dfs0		DFS0 File
23-Sep-10	7D-Q.dfs0		DFS0 File
23-Sep-10	8A-Q.dfs0		DFS0 File
23-Sep-10	8-Q.dfs0		DFS0 File
23-Sep-10	9-Q.dfs0		DFS0 File
23-Sep-10	DSWL5-H.dfs0		DFS0 File
23-Sep-10	M11Inp.Tmp		TMP File
23-Sep-10	OVERETT A-Q.dfs0		DFS0 File
23-Sep-10	OVERETT B-Q.dfs0		DFS0 File
23-Sep-10	THOMPS-Q.dfs0		DFS0 File
23-Sep-10	USQ5-Q.dfs0		DFS0 File
23-Sep-10	USQ900-5-Q.dfs0		DFS0 File
23-Sep-10	weir_p		File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC20\Old_Mike11_files		
23-Sep-10	BBASE000.BBF		BBF File
23-Sep-10	BBASE001.BBF		BBF File
23-Sep-10	BBASE002.BBF		BBF File
23-Sep-10	BBASE030.BBF		BBF File
23-Sep-10	BBASE031.BBF		BBF File
23-Sep-10	BBASE032.BBF		BBF File
23-Sep-10	BBASE033.BBF		BBF File
23-Sep-10	BBASE034.BBF		BBF File
23-Sep-10	BBASE046.BBF		BBF File
23-Sep-10	BBASE048.BBF		BBF File
23-Sep-10	BBASE049.BBF		BBF File
23-Sep-10	HD_MODEL.BBR		BBR File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC20		
23-Sep-10	6B-Q.dfs0		DFS0 File
23-Sep-10	7C-Q.dfs0		DFS0 File
23-Sep-10	7D-Q.dfs0		DFS0 File
23-Sep-10	8A-Q.dfs0		DFS0 File
23-Sep-10	8-Q.dfs0		DFS0 File
23-Sep-10	9-Q.dfs0		DFS0 File
23-Sep-10	DSWL20-H.dfs0		DFS0 File
23-Sep-10	M11Inp.Tmp		TMP File
23-Sep-10	OVERETT A-Q.dfs0		DFS0 File
23-Sep-10	OVERETT B-Q.dfs0		DFS0 File
23-Sep-10	THOMPS-Q.dfs0		DFS0 File
23-Sep-10	USQ20-Q.dfs0		DFS0 File
23-Sep-10	USQ900-20-Q.dfs0		DFS0 File
23-Sep-10	weir_p		File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC50\Old_Mike11_files		
23-Sep-10	BBASE000.BBF		BBF File
23-Sep-10	BBASE001.BBF		BBF File
23-Sep-10	BBASE002.BBF		BBF File
23-Sep-10	BBASE022.BBF		BBF File
23-Sep-10	BBASE031.BBF		BBF File
23-Sep-10	BBASE032.BBF		BBF File
23-Sep-10	BBASE033.BBF		BBF File
23-Sep-10	BBASE034.BBF		BBF File
23-Sep-10	BBASE035.BBF		BBF File
23-Sep-10	BBASE046.BBF		BBF File
23-Sep-10	BBASE049.BBF		BBF File
23-Sep-10	HD_MODEL.BBR		BBR File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC50		
23-Sep-10	6B-Q.dfs0		DFS0 File
23-Sep-10	7C-Q.dfs0		DFS0 File
23-Sep-10	7D-Q.dfs0		DFS0 File
23-Sep-10	8A-Q.dfs0		DFS0 File
23-Sep-10	8-Q.dfs0		DFS0 File
23-Sep-10	9-Q.dfs0		DFS0 File
23-Sep-10	DSWL50-H.dfs0		DFS0 File
23-Sep-10	M11Inp.Tmp		TMP File
23-Sep-10	OVERETT A-Q.dfs0		DFS0 File
23-Sep-10	OVERETT B-Q.dfs0		DFS0 File
23-Sep-10	THOMPS-Q.dfs0		DFS0 File
23-Sep-10	USQ50-Q.dfs0		DFS0 File
23-Sep-10	USQ900-Q.dfs0		DFS0 File
23-Sep-10	weir_p		File

Date	Product	Description	Format
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC100\Old_Mike11_files		
23-Sep-10	BBASE000.BBF		BBF File
23-Sep-10	BBASE001.BBF		BBF File
23-Sep-10	BBASE002.BBF		BBF File
23-Sep-10	BBASE006.BBF		BBF File
23-Sep-10	BBASE007.BBF		BBF File
23-Sep-10	BBASE008.BBF		BBF File
23-Sep-10	BBASE009.BBF		BBF File
23-Sep-10	BBASE010.BBF		BBF File
23-Sep-10	BBASE011.BBF		BBF File
23-Sep-10	BBASE040.BBF		BBF File
23-Sep-10	BBASE041.BBF		BBF File
23-Sep-10	HD_MODEL.BBR		BBR File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC100\Original		
23-Sep-10	Copy of US100-Q.dfs0		DFSO File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KC100		
23-Sep-10	6B-Q.dfs0		DFS0 File
23-Sep-10	7C-Q.dfs0		DFS0 File
23-Sep-10	7D-Q.dfs0		DFS0 File
23-Sep-10	8A-Q.dfs0		DFS0 File
23-Sep-10	8-Q.dfs0		DFS0 File
23-Sep-10	9-Q.dfs0		DFS0 File
23-Sep-10	DSWL100-H.dfs0		DFS0 File
23-Sep-10	M11Inp.Tmp		TMP File
23-Sep-10	OVERETT A-Q.dfs0		DFS0 File
23-Sep-10	OVERETT B-Q.dfs0		DFS0 File
23-Sep-10	THOMPS-Q.dfs0		DFS0 File
23-Sep-10	US100-Q.dfs0		DFS0 File
23-Sep-10	US900-Q.dfs0		DFS0 File
23-Sep-10	weir_p		File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KCPMF\Old_Mike11_files		
23-Sep-10	BBASE008.BBF		BBF File
23-Sep-10	BBASE018.BBF		BBF File
23-Sep-10	BBASE027.BBF		BBF File
23-Sep-10	BBASE031.BBF		BBF File
23-Sep-10	BBASE037.BBF		BBF File
23-Sep-10	BBASE046.BBF		BBF File
23-Sep-10	BBASE049.BBF		BBF File
23-Sep-10	BBASE050.BBF		BBF File
23-Sep-10	HD_MODEL.BBR		BBR File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Hydrograghs\KCPMF		
23-Sep-10	6B-Q.dfs0		DFS0 File
23-Sep-10	7C-Q.dfs0		DFS0 File
23-Sep-10	7D-Q.dfs0		DFS0 File
23-Sep-10	8-Q.dfs0		DFS0 File
23-Sep-10	9-Q.dfs0		DFS0 File
23-Sep-10	DSWLPMF6-H.dfs0		DFS0 File
23-Sep-10	THOMPS-Q.dfs0		DFS0 File
23-Sep-10	USQ-900-PMF6-Q.dfs0		DFS0 File
23-Sep-10	USQPMF6-Q.dfs0		DFS0 File
23-Sep-10	weir_p		File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Mike_ini		
23-Sep-10	Mike11		Configuration Settings
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Network		
23-Sep-10	SC_FRMS_03_Exg_1to1h.nwk11		NWK11 File
23-Sep-10	SC_FRMS_03_Exg_pmf.nwk11		NWK11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Results\Extended_hotstart		
23-Sep-10	SC_FRMS_EXG_HOTSTART.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_HOTSTARTHDAdd.RES11		RES11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Results		
23-Sep-10	SC_FRMS_03_EXG_PMF.RES11		RES11 File
23-Sep-10	SC_FRMS_03_EXG_PMFHDAdd.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_1H.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_1HHDAdd.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_5.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_5HDAdd.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_20.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_20HDAdd.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_50.RES11		RES11 File
23-Sep-10	SC_FRMS_EXG_50HDAdd.RES11		RES11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Extd_Mike11_for_LCC_2004\Simulation		
23-Sep-10	SC_FRMS_03_Exg_1h.sim11		SIM11 File
23-Sep-10	SC_FRMS_03_Exg_5.sim11		SIM11 File
23-Sep-10	SC_FRMS_03_Exg_20.sim11		SIM11 File
23-Sep-10	SC_FRMS_03_Exg_50.sim12		SIM11 File
23-Sep-10	SC_FRMS_03_Exg_pmf.sim13		SIM11 File
23-Sep-10	SC_FRMS_03_hotstart.sim11		SIM11 File
	2010 09 23 WMA\Kemps_Bonds\DATA\Sydney_water		
23-Sep-10	1988_Raindata		Text Document
23-Sep-10	212320_01		Text Document
23-Sep-10	212320_02		Text Document
23-Sep-10	rainfall	Rainfall data	Excel spreadsheet
	2010 09 23 WMA\Kemps_Bonds\RAFTS\Kemps_Bonds		
23-Sep-10	Kemps_Bonds02		DAT File
23-Sep-10	Kemps_Bonds02.out		OUT File
23-Sep-10	Kemps_Bonds02.sy1		SY1 File
23-Sep-10	Kemps_Bonds02.sy2		SY2 File
23-Sep-10	Kemps_Bonds02.xp		XP File
23-Sep-10	Kemps_Bonds_base		Bitmap Image
23-Sep-10	Kemps_Bonds_base		Text Document
23-Sep-10	Kemps_Bonds_base.XPX		XPX File
23-Sep-10	Kemps_Bonds_cc10		DAT File
23-Sep-10	Kemps_Bonds_cc10.loc		LOC File
23-Sep-10	Kemps_Bonds_cc10.out		OUT File
23-Sep-10	Kemps_Bonds_cc10.sy1		SY1 File
23-Sep-10	Kemps_Bonds_cc10.sy2		SY2 File
23-Sep-10	Kemps_Bonds_cc10.tot		TOT File
23-Sep-10	Kemps_Bonds_cc10.xp		XP File
23-Sep-10	Kemps_Bonds_cc20		DAT File
23-Sep-10	Kemps_Bonds_cc20.loc		LOC File
23-Sep-10	Kemps_Bonds_cc20.out		OUT File
23-Sep-10	Kemps_Bonds_cc20.sy1		SY1 File
23-Sep-10	Kemps_Bonds_cc20.sy2		SY2 File
23-Sep-10	Kemps_Bonds_cc20.tot		TOT File
23-Sep-10	Kemps_Bonds_cc20.xp		XP File
23-Sep-10	Kemps_Bonds_design		File
23-Sep-10	Kemps_Bonds_design		Excel spreadsheet
23-Sep-10	Kemps_Bonds_design		DAT File
23-Sep-10	Kemps_Bonds_design.loc		LOC File
23-Sep-10	Kemps_Bonds_design.out		OUT File
23-Sep-10	Kemps_Bonds_design.sy1		SY1 File
23-Sep-10	Kemps_Bonds_design.sy2		SY2 File
23-Sep-10	Kemps_Bonds_design.tot		TOT File
23-Sep-10	Kemps_Bonds_design.xp		XP File
23-Sep-10	Kemps_Bonds_hydlosses_A		DAT File
23-Sep-10	Kemps_Bonds_hydlosses_A.loc		LOC File
23-Sep-10	Kemps_Bonds_hydlosses_A.out		OUT File
23-Sep-10	Kemps_Bonds_hydlosses_A.sy1		SY1 File
23-Sep-10	Kemps_Bonds_hydlosses_A.sy2		SY2 File
23-Sep-10	Kemps_Bonds_hydlosses_A.tot		TOT File
23-Sep-10	Kemps_Bonds_hydlosses_A.xp		XP File
23-Sep-10	Kemps_Bonds_hydlosses_B		DAT File
23-Sep-10	Kemps_Bonds_hydlosses_B.loc		LOC File
23-Sep-10	Kemps_Bonds_hydlosses_B.out		OUT File
23-Sep-10	Kemps_Bonds_hydlosses_B.sy1		SY1 File
23-Sep-10	Kemps_Bonds_hydlosses_B.sy2		SY2 File

Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_hydlosses_B.tot		TOT File
23-Sep-10	Kemps_Bonds_hydlosses_B.xp		XP File
23-Sep-10	Kemps_Bonds_imp_inc5		DAT File
23-Sep-10	Kemps_Bonds_imp_inc5.loc		LOC File
23-Sep-10	Kemps_Bonds_imp_inc5.out		OUT File
23-Sep-10	Kemps_Bonds_imp_inc5.sy1		SY1 File
23-Sep-10	Kemps_Bonds_imp_inc5.sy2		SY2 File
23-Sep-10	Kemps_Bonds_imp_inc5.tot		TOT File
23-Sep-10	Kemps_Bonds_imp_inc5.xp		XP File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\bc_dbase		
23-Sep-10	IFD_table_from_BOM	Intensity-Frequency-Duration Table	PDF
23-Sep-10	K02Oy2h		Excel Comma Separated Values File
23-Sep-10	K050y2h		Excel Comma Separated Values File
23-Sep-10	K100y1_5h		Excel Comma Separated Values File
23-Sep-10	K100y1h		Excel Comma Separated Values File
23-Sep-10	K100y2h		Excel Comma Separated Values File
23-Sep-10	K100y2h_cc10		Excel Comma Separated Values File
23-Sep-10	K100y2h_cc20		Excel Comma Separated Values File
23-Sep-10	K100y2h_ds_dec		Excel Comma Separated Values File
23-Sep-10	K100y2h_ds_inc		Excel Comma Separated Values File
23-Sep-10	K100y2h_hydloss_A		Excel Comma Separated Values File
23-Sep-10	K100y2h_hydloss_B		Excel Comma Separated Values File
23-Sep-10	K100y2h_imp_inc5		Excel Comma Separated Values File
23-Sep-10	K100y3h		Excel Comma Separated Values File
23-Sep-10	K100y4_5h		Excel Comma Separated Values File
23-Sep-10	K100y6h		Excel Comma Separated Values File
23-Sep-10	K100y9h		Excel Comma Separated Values File
23-Sep-10	K100y12h		Excel Comma Separated Values File
23-Sep-10	K100y36h		Excel Comma Separated Values File
23-Sep-10	K200y2h		Excel Comma Separated Values File
23-Sep-10	K500y2h		Excel Comma Separated Values File
23-Sep-10	KempsCk_bc_dbase		Excel Comma Separated Values File
23-Sep-10	KempsCk_bc_dbase		Excel spreadsheet
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\model\mi		
23-Sep-10	1d_bc_kempsbonds		MIDI Sequence
23-Sep-10	1d_bc_kempsbonds		MapInfo MIF File
23-Sep-10	1d_nwk_kempsbonds		MIDI Sequence
23-Sep-10	1d_nwk_kempsbonds		MapInfo MIF File
23-Sep-10	1d_nwk_kempsbonds_blockm50		MIDI Sequence
23-Sep-10	1d_nwk_kempsbonds_blockm50		MapInfo MIF File
23-Sep-10	1d_nwk_kempsbonds_blockp50		MIDI Sequence
23-Sep-10	1d_nwk_kempsbonds_blockp50		MapInfo MIF File
23-Sep-10	1d_nwk_kempsbonds_energyloss_dec50		MIDI Sequence
23-Sep-10	1d_nwk_kempsbonds_energyloss_dec50		MapInfo MIF File
23-Sep-10	1d_nwk_kempsbonds_energyloss_inc50		MIDI Sequence
23-Sep-10	1d_nwk_kempsbonds_energyloss_inc50		MapInfo MIF File
23-Sep-10	2d_iwl_kempsbonds		MIDI Sequence
23-Sep-10	2d_iwl_kempsbonds		MapInfo MIF File
23-Sep-10	2d_loc_kemps		MIDI Sequence
23-Sep-10	2d_loc_kemps		MapInfo MIF File
23-Sep-10	2d_mat_kempsbonds		MIDI Sequence
23-Sep-10	2d_mat_kempsbonds		MapInfo MIF File
23-Sep-10	2d_po_kempsbonds		MIDI Sequence
23-Sep-10	2d_po_kempsbonds		MapInfo MIF File
23-Sep-10	2d_sa_kemps		MIDI Sequence
23-Sep-10	2d_sa_kemps		MapInfo MIF File
23-Sep-10	2d_zln_brklines_culv_kempsbonds		MIDI Sequence
23-Sep-10	2d_zln_brklines_culv_kempsbonds		MapInfo MIF File
23-Sep-10	2d_zln_levees_kempsbonds		MIDI Sequence
23-Sep-10	2d_zln_levees_kempsbonds		MapInfo MIF File
23-Sep-10	2d_zpt_KempsBonds_10m		MIDI Sequence
23-Sep-10	2d_zpt_KempsBonds_10m		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\model		
23-Sep-10	Kemps_Bonds.tbc		TBC File
23-Sep-10	Kemps_Bonds.tgc		TGC File
23-Sep-10	materials.tmf		TMF File
23-Sep-10	materials_dec25.tmf		TMF File
23-Sep-10	materials_inc25.tmf		TMF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D020y2h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01		Access Table
23-Sep-10	Kemps_Bonds_D020y2h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D020y2h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D020y2h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D020y2h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D020y2h_01_F		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D020y2h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D020y2h_01_q		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D020y2h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D020y2h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D020y2h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D020y2h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D050y2h_01		
23-Sep-10	Header		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y1_5h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y1_5h_01.2dm		2DM File

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Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y1_5h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y1_5h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TS		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TS		MapInfo Table
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1_5h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y1_5h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y1h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y1h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y1h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y1h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y1h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_TS		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y1h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y1h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_TS		MapInfo Table
23-Sep-10	Kemps_Bonds_D100y1h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_01_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y1h_02		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02		Access Table
23-Sep-10	Kemps_Bonds_D100y1h_02.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y1h_02.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y1h_02.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y1h_02.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_d		DAT File

Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y1h_02_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1h_02_h		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_02_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1h_02_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y1h_02_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_02_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_V		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_02_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_02_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y1h_02_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y1h_02_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y1h_02_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y1h_02_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_01_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_block_dec50_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_V_g005_Max.asc		ASC File

Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_block_inc50_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_cc10_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc10_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_cc20_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_mmQ		MIDI Sequence

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Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_cc20_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_ds_dec_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_ds_inc_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSL		MIDI Sequence

Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_energyloss_dec50_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_energyloss_inc50_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_hydloss_A_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01.eof		EOF File

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Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_hydloss_B_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_imp_inc5_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_MB2D		Excel Comma Separated Values File

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Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_n_dec_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_dec_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y2h_n_inc_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01		Access Table
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_F		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_q		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y2h_n_inc_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File

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Date	Product	Description	Format
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y3h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y3h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y3h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y3h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y3h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y3h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y3h_01_h		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_h_g005_Max.asc		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y3h_01_MB2D		DAT File
23-Sep-10	Kemps_Bonds_D100y3h_01_PO		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_Times		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y3h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y3h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y3h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y3h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y3h_01_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y3h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y4_5h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y4_5h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y4_5h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y4_5h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y4_5h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y4_5h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y6h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y6h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y6h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y6h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y6h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D100y6h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y6h_01_h		DAT File

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Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y6h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y6h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y6h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D100y6h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D100y6h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D100y6h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y6h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y6h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y6h_01_Z1		DAT File
23-Sep-10	Kemps_Bonds_D100y6h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y9h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y9h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y9h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y9h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y9h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y9h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y9h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y9h_01_TS		DAT File
23-Sep-10	Kemps_Bonds_D100y9h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y9h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y9h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_TS		MapInfo Table
23-Sep-10	Kemps_Bonds_D100y9h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y9h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y9h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y9h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y12h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y12h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y12h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y12h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y12h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y12h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y12h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y12h_01_TS		DAT File
23-Sep-10	Kemps_Bonds_D100y12h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y12h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y12h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_TS		MapInfo Table
23-Sep-10	Kemps_Bonds_D100y12h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y12h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y12h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y12h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D100y36h_01		
23-Sep-10	Header		MapInfo MIF File

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D100y36h_01		Access Table
23-Sep-10	Kemps_Bonds_D100y36h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D100y36h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y36h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D100y36h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y36h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y36h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D100y36h_01_TS		DAT File
23-Sep-10	Kemps_Bonds_D100y36h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y36h_01_TS		MapInfo Table File
23-Sep-10	Kemps_Bonds_D100y36h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_TS		MapInfo Table
23-Sep-10	Kemps_Bonds_D100y36h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D100y36h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D100y36h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D100y36h_01_Z1_g005_Max.asc		ASC File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D200y2h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01		Access Table
23-Sep-10	Kemps_Bonds_D200y2h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D200y2h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D200y2h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D200y2h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D200y2h_01_F		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D200y2h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_MB2D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D200y2h_01_q		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D200y2h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D200y2h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D200y2h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D200y2h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\results\Kemps_Bonds_D500y2h_01		
23-Sep-10	Header		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01		Access Table
23-Sep-10	Kemps_Bonds_D500y2h_01.2dm		2DM File
23-Sep-10	Kemps_Bonds_D500y2h_01.ALL.sup		SUP File
23-Sep-10	Kemps_Bonds_D500y2h_01.eof		EOF File
23-Sep-10	Kemps_Bonds_D500y2h_01.hV.sup		SUP File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_ccA		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_ccA		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_H		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_mmH		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_mmH		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_mmQ		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_mmQ		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_mmV		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_mmV		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_Q		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_1d_V		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_d		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_d_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D500y2h_01_F		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_h		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_h_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D500y2h_01_MB		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_MB1		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_MB1D		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_MB2D		Excel Comma Separated Values File

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
23-Sep-10	Kemps_Bonds_D500y2h_01_PO		Excel Comma Separated Values File
23-Sep-10	Kemps_Bonds_D500y2h_01_q		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_Times		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_TS		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_TS		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_TSF		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_TSF		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_TSL		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_TSL		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_TSMB		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_TSMB		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_TSMB1d2d		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_TSMB1d2d		MapInfo MIF File
23-Sep-10	Kemps_Bonds_D500y2h_01_V		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_V(maxmax)		DAT File
23-Sep-10	Kemps_Bonds_D500y2h_01_V_g005_Max.asc		ASC File
23-Sep-10	Kemps_Bonds_D500y2h_01_V_Max(v)		MIDI Sequence
23-Sep-10	Kemps_Bonds_D500y2h_01_V_Max(v)		MapInfo MIF File
23-Sep-10	Max_V		DAT File
23-Sep-10	Max_V(v)		MIDI Sequence
23-Sep-10	Max_V(v)		MapInfo MIF File
23-Sep-10	Max_V_g005.asc		ASC File
23-Sep-10	Projection		MIDI Sequence
23-Sep-10	Projection		MapInfo MIF File
	2010 09 23 WMA\Kemps_Bonds\TUFLOW\runs		
23-Sep-10	kemps_bonds.ecf		ECF File
23-Sep-10	kemps_bonds_blockm50.ecf		ECF File
23-Sep-10	kemps_bonds_blockp50.ecf		ECF File
23-Sep-10	Kemps_Bonds_D050y2h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y1_5h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y1h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_block_dec50.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_block_inc50.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_cc10.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_cc20.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_dec.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_ds_inc.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_dec50.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_energyloss_inc50.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_A.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_hydloss_B.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_imp_inc5.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_n_dec.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y2h_n_inc.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y3h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y4_5h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y6h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y9h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y12h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D100y36h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D200y2h.tcf		TCF File
23-Sep-10	Kemps_Bonds_D500y2h.tcf		TCF File
23-Sep-10	kemps_bonds_energyloss_dec50.ecf		ECF File
23-Sep-10	kemps_bonds_energyloss_inc50.ecf		ECF File
	2010 10 14 NSW_Planning		
14-Oct-10	CD_from_MatthewCooper	Scan of Letter and CD	PDF
14-Oct-10	CD_received	Scan of CD	PDF
	2010 10 14 NSW_Planning\CM+ - Town Centre Masterplanning\CM+ Opps and Cons Mapping		
14-Oct-10	10027 SK01_Vision	Vision' for Leppington Town Centre	JPEG
14-Oct-10	10027 SK02_ Aerial Photo	Aerial photo of Leppington Town Centre	JPEG
14-Oct-10	10027 SK03_ Natural Features	Natural features of Leppington Town Centre	JPEG
14-Oct-10	10027 SK04_ Man made Features	Man made features of Leppington Town Centre	JPEG
14-Oct-10	10027 SK05_Constraints	Constraints for Leppington TC developments	JPEG
14-Oct-10	10027 SK06_ Dynamic Constraints	Dynamic Constraints for LTC	JPEG
14-Oct-10	10027 SK07_Opportunities	Opportunities for LTC	JPEG
14-Oct-10	10027 SK08_ Dynamic Opportunities	Dynamic Opportunites for LTC	JPEG
14-Oct-10	10027 SK09_ Leppington Station	Leppington Station	JPEG
14-Oct-10	10027 SK10_ Typical Cross Sections	Typical cross sections	JPEG
	2010 10 14 NSW_Planning\CM+ - Town Centre Masterplanning\Early Structure Planning		
14-Oct-10	10027 SK11_Indicative Town Centre Road Structure Plan	Indicative Town Centre Road Structure Plan	PDF
14-Oct-10	10027 SK12_Developable Areas	Developable Areas	PDF
14-Oct-10	10027 SK13_Planning Background	Planning Background	PDF
14-Oct-10	10027 SK14_ RTA TC Road Network + Cross Sections	RTA TC Road Network + Cross Sections	PDF
14-Oct-10	10027 SK15_Enterprise Zone Precedents Study	Enterprise Zone Precedents Study	PDF
14-Oct-10	10027 SK16_Existing Road Infrastrucutre	Existing Road Infrastrucutre	PDF
	2010 10 14 NSW_Planning\CM+ - Town Centre Masterplanning\Structure Planning		
14-Oct-10	10027 SK17_Option 2 Northwest Civic +Education Precinct	Option 2 Northwest Civic +Education Precinct	PDF
14-Oct-10	10027 SK18_10027 SK18_Option 1 Southeast Civic+Education Precinct	Option 1 Southeast Civic+Education Precinct	PDF
14-Oct-10	10027 SK19_Option 3 Southwest Civic+Education Precinct	Option 3 Southwest Civic+Education Precinct	PDF
14-Oct-10	100721 100721 Leppington Town Centre Land Use Schedule	100721 Leppington Town Centre Land Use Schedule	Excel Spreadsheet
	2010 10 14 NSW_Planning\CM+ - Town Centre Masterplanning		
14-Oct-10	100910_Land Use Study Report	Land Use Study Report	PDF
14-Oct-10	100910_Traffic and Transport Considerations Report	Traffic and Transport Considerations Report	PDF
14-Oct-10	100924_Workshop 1 Presentation	Workshop 1 Presentation	PDF
	2010 10 14 NSW_Planning\COX Overall Masterplan\Overall Masterplan		
14-Oct-10	01 Site Analysis Summary	Site Analysis Summary	PDF
14-Oct-10	02 Aerial	Aerial	PDF
14-Oct-10	03 Site Area and Boundary Extensions	Site Area and Boundary Extensions	PDF
14-Oct-10	04 Topography	Topography	PDF
14-Oct-10	05 Riparian Classification	Riparian Classification	PDF
14-Oct-10	06 Flood Prone Land	Flood Prone Land	PDF
14-Oct-10	07 Slope Analysis	Slope Analysis	PDF
14-Oct-10	08_09 Non Certified Lands & Native Vegetation	Non Certified Lands & Native Vegetation	PDF
14-Oct-10	10 Existing Zoning & LGA Boundary	Existing Zoning & LGA Boundary	PDF
14-Oct-10	11 Land Use	Land Use	PDF
14-Oct-10	12 Easements & Substation	Easements & Substation	PDF
14-Oct-10	13 Major Roads & Crossings	Major Roads & Crossings	PDF
14-Oct-10	14 Public Transport	Public Transport	PDF
14-Oct-10	15 Centres	Centres	PDF
14-Oct-10	Site Analysis_COX_Oculus	Site Analysis by COX Oculus	PDF
14-Oct-10	Site Analysis_COX_Oculus_Reduced	Site Analysis by COX Oculus - reduced file size	PDF
	2010 10 22 Workshop Plans_Sketches		
22-Oct-10	1 Site Analysis 22.10.10	Site Analysis Summary	PDF
22-Oct-10	2 Preliminary M'plan 22.10.10	Preliminary Masterplan Study	PDF
22-Oct-10	3 Bus Catchment 22.10.10	Bus Routes and Catchment	PDF
22-Oct-10	PhotoSheet_Parks&Centres	Photos of Parks and Centres	PDF
22-Oct-10	PhotoSheet_Riparian	Photos Riparian	PDF
	2010 11 05 Basin Locations		
5-Nov-10	600288-SK01(A)	Preliminary Basin Locations	PDF
	2010 11 08 DoP Comments on Basin Locations		
8-Nov-10	Document	DoP Comments on Basin Locations	PDF
	2010 11 11 LCC Comments		
11-Nov-10	Austral	Concerns with Masterplan	PDF
11-Nov-10	cox bus routes proposal	COX bus routes proposal	PDF
11-Nov-10	LCC bus routes proposal	LCC bus routes proposal	PDF
11-Nov-10	LCC bus routes proposalcopy	LCC concentrated bus network	PDF
	2010 11 22 DoP ILP Options		
22-Nov-10	1 Existing Roads	Existing roads outside flood extent and riparian zones	PDF
22-Nov-10	2 Roads on Open Space	New roads fronting open space (flood extent and riparian)	PDF
22-Nov-10	3 Neighbourhoods	Precints/neighborhoods defined by open space+major roads	PDF
22-Nov-10	4 Structure Plan Option 1	Structure Plan - Option 1	PDF
22-Nov-10	5 Structure Plan Option 2	Structure Plan - Option 2	PDF
22-Nov-10	6 AustralLeppington -Areas_101118	Areas	PDF
22-Nov-10	7 Social InfrastructureTable	Social Infrastructure Table	PDF
22-Nov-10	8 Constraints Analysis A1	Constraints Analysis	PDF

Project 600288 Austral and Leppington North Flooding Assessment & Riparian Study

Date	Product	Description	Format
22-Nov-10	9 Developed Plan Option 2A1	Developed Structure Plan - Option 2	PDF
	2010 11 26 From Alex Black		
26-Nov-10	600288-Basins.dwg		DWG File
26-Nov-10	600288-SK01(A) 2004.dwg		DWG File
26-Nov-10	Subcatchments_per Basins		Excel spreadsheet
	2010 11 26 ILP Options		
26-Nov-10	Austral Leppington Structure PlanOption2_reduced	Structure Plan - Option 2	PDF
	2010 12 03 Advice from NOW RE stream category\Fwd Re Austral and Leppington North Precincts Meeting todiscuss stream categorisation and basin locations_files		
3-Dec-10	colorschememapping		XML Document
3-Dec-10	filelist		XML Document
3-Dec-10	themedata		MS Office Theme
	2010 12 03 Advice from NOW RE stream category		
3-Dec-10	Fwd Re Austral and Leppington North Precincts Meeting todiscuss stream categorisation and basin locations		HTML Document
	2010 12 06 GN on ILP Options		
6-Dec-10	SAuSyd03MPR10120618230	Structure Plan Options 1 & 2 with mark ups	PDF
	2010 12 06 Updated Basin Locations		
6-Dec-10	600288-SK01(B)	Preliminary Basin Locations	PDF
	2010 12 14 Flood Extent Dwg\600288-SK01(B).zip\Xrefs		
14-Dec-10	X-Precinct Bdy.dwg		DWG File
14-Dec-10	X-Waterways_Basins.dwg		DWG File
	2010 12 14 Flood Extent Dwg\600288-SK01(B).zip\PlotCfgs		
14-Dec-10	Lvl03MPR_KONC652A3 Colour.pc3		PC3 File
	2010 12 14 Flood Extent Dwg\600288-SK01(B).zip\2010 06 11 ALN Map Files		
14-Dec-10	MajorRoads.dwg		DWG File
	2010 12 14 Flood Extent Dwg\600288-SK01(B).zip		
14-Dec-10	600288-SK01(B)		Text Document
14-Dec-10	600288-SK01(B).dwg		DWG File
	2010 12 15 LCC Comments		
15-Dec-10	ILP Options Workshop LCC Comments	ILP Options Workshop LCC Comments	Word Document

Appendix B

Photographs & Riparian Corridor Correspondence

Stream #19 - Looking Upstream from the vicinity of the precinct boundary

Stream #19 – Algal bloom in scour pool

Stream #18 - Looking Upstream at the formation of a head cut

Stream # 21 - Looking Downstream from 17th Avenue crossing

Stream # 21 - Looking Upstream from 17th Avenue crossing

Stream # 23 - Looking Downstream from 28th Avenue

Kemps Creek - Looking Upstream of confluence with Stream #26

Kemps Creek - Looking Downstream at 15th Avenue bridge crossing

Bonds Creek - looking upstream at 9th Avenue crossing

Bonds Creek – Looking upstream from 9th Avenue crossing

Bonds Creek – Looking upstream from 14th Avenue

Bonds Creek – Looking upstream from 10th Avenue

Stream # 38 – Looking downstream from top of the catchment down to Camden Valley Way

Office of the Hawkesbury-Nepean

Contact: Greg Brady
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Email: greg.brady@ohn.nsw.gov.au

Precinct Project Officer
Strategies & Land Release
Department of Planning
PO Box 1457
Parramatta NSW 2124

Our ref:
File No:
Your Ref:

Attention: Paul Robilliard

7 July 2010

Dear Sir

Subject: Assessment of Watercourses within the Austral and Leppington North Release areas in the South West Growth Centre

Ground truthing of watercourses to determine their categories in the Austral and Leppington North release areas was conducted over the last two weeks. Previously DoP was given a desk-top assessment of the watercourse categories over the whole South West Growth Centres area.

The attached map is now the best available information for the subject release areas.

The assessment was done using the Riparian Corridor Management Study methodology.

The assessment was able to be done with a reasonable degree of certainty due to the large numbers of roads in the two areas that cross the watercourses. However there are still a small number of watercourses that require further assessment by an actual walk-over inspection. These blue lines are circled in red and numbered. The table below gives an expected outcome of these inspections, (after reference to the aerial photography from April this year).

In general the ground truthing, in comparison to the desk-top assessment, has found:

- Fewer watercourses, (as some of to the blue lines on the 1:25,000 Liverpool topographic map, 9030-II-S are not considered to be watercourses). Therefore the blue lines highlighted in yellow (by this methodology) can be used for basins if required.
- No extra watercourses were found. This has occurred in previous release areas where areas not indicated as blue lines on the topographic map were assessed to be watercourses.
- Several watercourses, including Scalabrini Creek, have been relocated in most, or parts, of their lengths. These have been approximately located on the map. The relocation particularly of Scalabrini Creek is of concern. The constructed

sharp bends should be removed to enable better flood flows and prevent the inevitable flood breakouts that will occur in that area resulting from the creek wanting to realign itself in the future.

Some assessment was done outside the two release areas, particularly for all the tributaries of Kemps Creek for future simplicity.

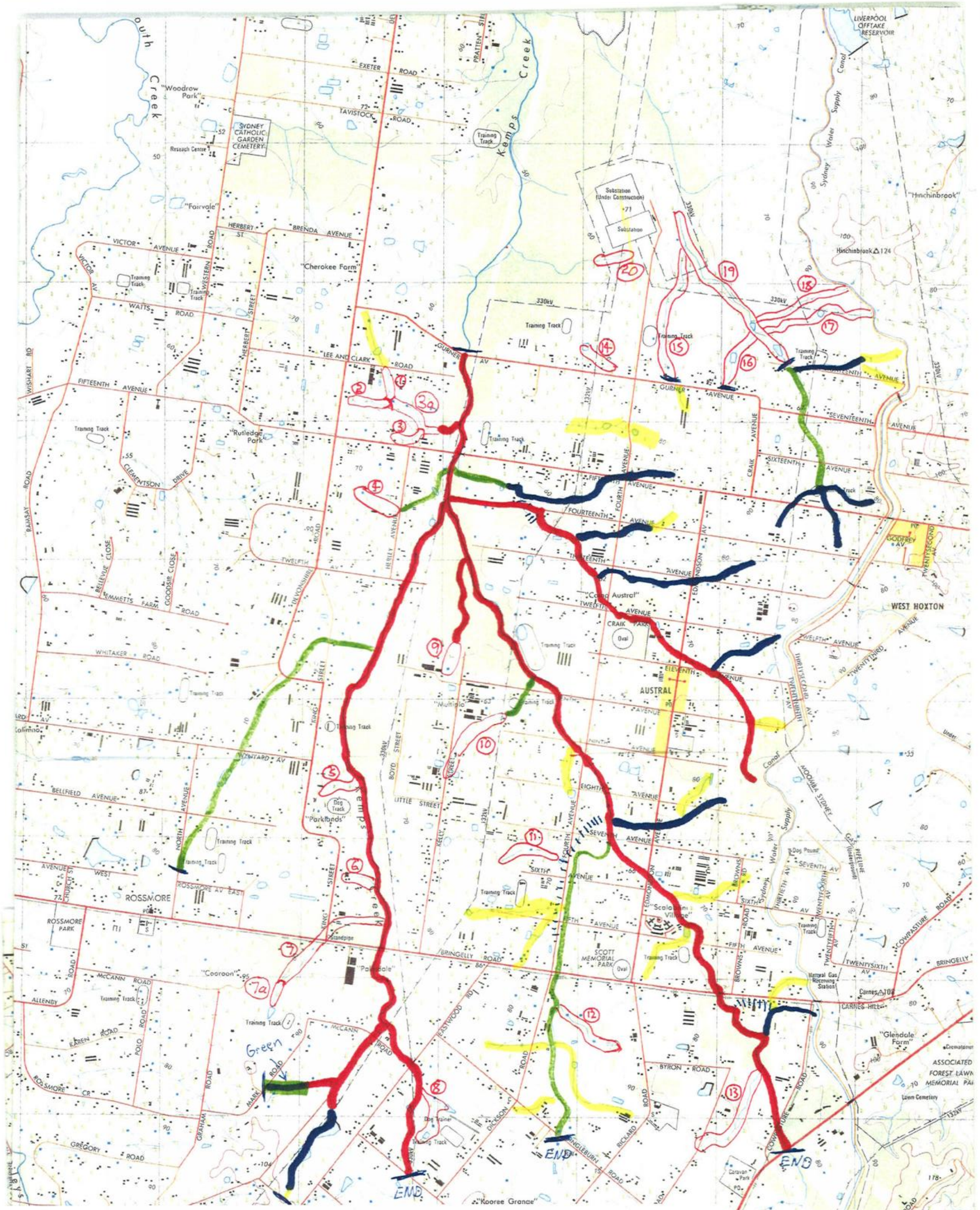
Please contact me to discuss the findings by your consultants in relation to this table. I can be available to participate in any inspection. A final categorisation of all watercourses can then be done.

Watercourse number	Likely outcome	Watercourse number	Likely outcome
1	Not a watercourse	10	Category 3
2	Not a watercourse	11	Not a watercourse
3	Not a watercourse	12	Not a watercourse
3a	Not a watercourse	13	Not a watercourse
4	Category 3	14	Not a watercourse
5	Half not a watercourse Half category 3	15	Top half Category 2 Bottom half Category 1
6	Category 3	16	Above dam Category 3. Below dam Category 1
7	Category 1	17	Category 3
7a	Category 3	18	Category 1 or 2 (depending upon linkage to the Regional Park)
8	Category 3	19	Category 1
9	Not a watercourse	20	Not a watercourse

It is anticipated that Box Hill and Schofields release areas will be assessed within the next two to four weeks.
I trust that these comments are of assistance. Should you require clarification on any of these comments, please contact me.

Yours sincerely

Greg Brady
Instream Development Officer
Office of Hawkesbury Nepean



Watercourse Categories of Austral and Leppington North Growth Centre areas.

Category 1 (40 core riparian plus 10 vegetated buffer each side of top-of-bank)

Category 2 (20 core riparian plus 10 vegetated buffer each side of top-of-bank)

Category 3 (10 core riparian each side of top-of-bank)

Blue line regarded as not a river

Blue line that needs further investigation

(base map 1:25,000 Liverpool topographic map, 9030-II-S)

Our Ref: Meeting Notes 9th Dec 2010

Contact: Nathan Evans

Paul Robilliard
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Dear Paul

RE: MEETING WITH NATIONAL OFFICE OF WATER (NOW) NOTES FROM 9TH DECEMBER 2010

The meeting held at NOW Penrith office was held on 9th of December and in attendance was Cardno, NSW Department of Planning, Liverpool City Council, NOW and Camden Council. The following is a summary of the discussion held during the meeting:

NOW

- The preliminary categorisation was completed using the principles of the Riparian Corridor Management Strategy (RCMS). This method is considered the most appropriate in allocating suitable categories for a river based on a number of criteria. It favours both environmental and development objectives by allocating high value to areas of significant ecological value and low value or none at all for areas that would not be considered a River (even though represented as a blue line on a topographic map).
- Site and desktop investigations were undertaken to assist the department and consultants with the categorisation of the streams within the study area.
- The tributary associated with Basin 34 is not considered a river and can be removed from the riparian corridor allocation
- Maps indicating the riparian corridor should also display sub-catchment boundaries
- The alignment of Scalibrini Creek requires adjustment where the S bend occurs slightly upstream of its confluence with Bonds Creek. The 2 sharp bends are unstable and redirection of flow to a more natural flowpath is advised. This can be done to complement the relocation of Basin 13 adjacent to the realignment.
- The allocation of category 2 for the stream that runs in parallel Bonds Creek on the north side was originally disputed until finally agreed as a result of discussion with Cardno as summarised below.
- Basin 25 needs to be relocated in light of existing vegetation
- Water quality controls must be located outside of the Core Riparian Zone

Cardno

- Flood extents are generally broader than the extent of the riparian corridor and as such the categorisation becomes irrelevant in most cases. However it is noted that the categorisation is essential for long-term riparian habitat outcomes.
- Existing streams are highly modified and in poor condition. The only part of the study area containing reasonable quality streams is that in the north east adjacent to the electricity sub-station.
- Water quantity control basins are located on-line for category 3 streams and offline for all others. The size of the basins is quite large at present and amalgamation of basins is not considered to be appropriate.
- The basins are currently shown as nominal rectangular area with an average depth of 1.2m to achieve the required detention volume.
- Water quality will be managed by bio-filters in the base of the water quantity control basins
- The location of the basins shown on the map is due to be relocated in light of adjusted stream locations
- The stream that runs in parallel to Bonds Creek is associated with significant vegetation both at the top of and bottom of the stream. The vegetation at the bottom of the stream has linkages through the category 1 streams of Kemps and Bonds Creeks. The vegetation at the top of the stream has sufficient linkages with existing vegetation with the adjacent Western Sydney Parklands. As such a habitat corridor that would be provided by a category 1 stream connecting the significant vegetation along this stream is not necessary. The stream is categorised as category 2 downstream of Edmondson Avenue and Category 3 upstream of Basin 22 (located on-line).
- A summary of the rationale for the stream categorisation will be given in a report that discusses application of the RCMS and information gathered during site inspections.

NSW Dept of Planning

- Raised concerns of how the floodplain will be owned/managed as there will be a considerable amount of privately owned land in the floodplain that will be of little value to developers and as such it is likely that parcels will remain as existing within the floodplain whilst development will occur on higher ground. What will result is fragmentation of the area. Further consideration of how ownership and maintenance of the floodplain is required.
- Although the flood extents exceed the riparian corridor there is factors such as the width of road crossings that can be reduced for streams that do not require a category of one such as that in parallel to Bonds Creek on the northern side if categories are revised to provide a narrower corridor.

Liverpool Council

- Basins should be located adjacent to roads for ease in maintenance
- A plan was requested indicating the basin footprints overlaid on an aerial photograph
- Amalgamation of basins was requested to reduce the total number of basins. This was not supported by Cardno.
- Some issues with biofilters were experienced in recently urban applications

Camden Council

- Basins shall be configured to reduced the number of lots affected by the basin footprint

Yours faithfully

Nathan Evans

20 January 2011

for **Cardno (NSW/ACT) Pty Ltd**

Office of the Hawkesbury-Nepean

Contact: Greg Brady
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Our ref:
File No:
Your Ref:

Precinct Planner
Strategies and Land Release
Department of Planning
PO Box 39
SYDNEY NSW 2001

Attention: Matthew Cooper

24 March 2011

Dear Sir

Subject: Austral and Leppington North

Draft Planning Documents-15 February 2011

I refer to your request for making comments to the above document set after the meeting of 1st March 2011.

Only matters relating to riparian areas, flooding and basins were looked at in any detail.

The second draft ILP appears to have addressed a significant portion of our issues that were raised, and the opportunities to meet and discuss these matters have been very productive.

However despite the draft ILP, the Zoning Map when it is produced, (which is the actual legal instrument for land use), must be consistent with the intent of the non-binding ILP. This has already been an issue in other precincts and to date has still to be resolved in a satisfactory manner. Some of this is further highlighted in the comments below.

The following are general and specific comments.

(1). The final zoning and development control mechanisms for protecting watercourses and their associated riparian vegetation must be consistent and workable.

(1a). This is an issue for all the release areas, not just this one, and there needs to be considerable thought of how to actually protect all vegetation, that the intent of the Biodiversity Certification requires, and retain and improve riparian vegetation of all the watercourses agreed to be retained, as they all flow into in the Hawkesbury Nepean River.

This is highlighted from the experience within the Oran Park Precinct, where an inappropriate zoning situation occurred. Significant parts of the agreed riparian area were zoned for urban use and now those lands are urban, despite the agreement to protect and rehabilitate the negotiated riparian corridor.

(1b). Relying on the good will of owners to retain or establish riparian vegetation in perpetuity is also problematic and unworkable. Experience regularly demonstrates that when management (or owners) change, any current good intent can be over-turned immediately. Zoning riparian areas as SP2 for example affords no protection for riparian vegetation, nor protection of the creek, as (by implication) the owners of this land could

remove all the vegetation, could concrete-line the whole creek and could place on-line basins anywhere within the riparian areas as soon as the area has been rezoned.

In the case of this ILP (second draft), there are significant lengths of watercourses with adjacent activity open space areas and by implication they may be zoned as a single unit. There must be a planning and functional way of differentiating each open space use to ensure riparian and watercourse protection.

(1c). There must be legally-binding mechanisms for protecting the riparian land and identified vegetation (and their footprint area) at this zoning planning level, mechanisms within the supporting DCP and it is suggested that a new version of the Tree Preservation Order (TPO) to address the retaining and establishing of riparian vegetation (and possibly called a Vegetation Preservation Order) as it should protect all native vegetation in that vegetated community, not just the large trees as with the TPO.

(1d). It is also of great concern about the proposal for the continuation of rural zoning within the extensive flood areas. Although in theory this appears to be a good balance to address the safety and asset protection issues due to flooding, the current actual rural land use (RU4 Rural Small Holdings) demonstrates that it is an existing extremely bad outcome for the environment and particularly the river health of the adjacent creeks and also the Hawkesbury Nepean River. The current land uses adjacent to the creeks in many locations are third world at the best, where significant and unacceptable levels of nutrients would be entering the watercourses.

Vegetated riparian areas are the most cost-effective and minimal active-management method of maintaining and improving overall river health of the Hawkesbury Nepean River in the long term and also ensuring greater viability of linked retained vegetated areas.

(1e). To minimise these continuing unacceptable impacts, the riparian areas, particularly where this rural zoning may continue, should be zoned E2 to enable protection of all waterways and improve the overall health of the Hawkesbury Nepean River. The E2 will also give better certainty of protection of the vegetation that overlaps with the vegetation that needs to be protected due to the Biocertification for the Growth Centres.

(2). It is not possible to determine if the suggested generic riparian widths (refer to **Table 2.3** *Generic Stream Width Width by Stream Category*) for each category of watercourse have been achieved, as shown in the draft ILP. The concept of a generic width of top of bank is supported as it makes it easier to make all measurements from centre thread of the watercourse, (which most planners appear to be more comfortable with).

This makes the full width of any riparian area the following.

- Category 1 is 60m each side from centre thread of the watercourse
- Category 2 is 35m each side of centre thread of the watercourse and
- Category 3 is 12.5m each side of centre thread of the watercourse.

The issue is to have a means of ensuring that the riparian widths are actually achieved to avoid the issue raised in (1a) above and mapped appropriately.

(3). **Table 2.4** *Stream Category Schedule* shows Cardno's preferred categories and comments relative to NOW. Of the 42/43 identified waterways, there is agreement on over 80% of them. The table below is addressing where there are still differences. The most significant difference relates to ID 36 which is actually a section of Kemps Creek. This must remain a category 1. Further all the vegetation referred to in comments in the table is also parts of the vegetation that should be protected by the Biocertification.

ID	NOW updated category	Cardno category	NOW comment
15	Half 2 half 3	3	The description given by Cardno would still indicate a river and aerial view would indicate a cat 2 within the contiguous vegetation with creek No 19
16	Half 2 half 3	3	The description given by Cardno would still indicate a river and aerial view would indicate a cat 2 within the contiguous vegetation with creek No 19
20	Within parkland cat 1	3	Within the adjacent parkland it needs to be a cat 1 to reflect the significant vegetation connectivity
36	1	2	This is still Kemps Creek and must be a cat 1
39	2	3	The vegetation makes it a cat 2
41	2	3	The vegetation makes it a cat 2
42	2	3	The vegetation connectivity makes it a cat 2
43	2	none	This watercourse has been missed. Located within medium category vegetation, south east of watercourse 42

(4). Due to the significant APZ width for schools (and aged care facilities etc), these should not be located next to any riparian areas, as it is not possible for the current level of planning to ensure that future buildings within the sites will not be located where a conflict will occur.

(5). Pathways etc should be generally outside the core riparian and vegetated buffer of the riparian areas, except for crossings. Flooding widths are significantly wider within the precincts than any of the riparian areas and there is no need for these areas to be compromised by paths or other urban support structures or facilities.

(6). The basin locations all appear to be consistent with negotiations and are outside the 1:100 year flood areas of the major creeks and tributaries. These basins need to be “dry” basins without permanent water and naturalised within the basins so they can function as part of any adjacent riparian area.

If there is a desire to retain water for use from these structures, this will make them much larger (either in land take and/or depth) to the minimum needed for flood detention, and under current policy the owner of these structures will then need to have them licensed under the Water Management Act 2000.

If you have any queries regarding this matter contact Greg Brady.

Yours sincerely

Greg Brady
Instream Development Officer
Office of Hawkesbury Nepean

Appendix C

Hydrology

C Hydrology

C.1 Aims

The aims of hydrological analyses were to

- Assemble an **xprafts** rainfall/runoff model of the catchment draining through the Austral and Leppington North Precincts;
- Estimate catchment runoff under existing catchment conditions as a benchmark for comparison with proposed development conditions for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events;
- Estimate catchment runoff under proposed Development conditions ascertain the impacts of the proposed development for the 2 yr ARI and 100 yr ARI events;
- Assess the impact of 10%, 20% and 30% increases in 100 yr ARI rainfall on runoff under Development Conditions and
- Size regional detention structure(s) to reduce as far as possible the 2 yr ARI and 100 yr ARI peak flow downstream of the proposed development areas to no greater than peak flows under Existing Conditions.
- Assess the ramifications of climate change on the volumetric requirement for structural flood risk management measures.

C.2 Rainfall-Runoff Modelling

The **xprafts** rainfall/runoff package has been adopted previously for hydrological analyses in the South Creek and Eastern Creek catchments. The **xprafts** rainfall/runoff package was also adopted for this study.

Design Storm Bursts

To maintain consistency with the 2003 hydrological model assembled by Perrens Consultants the average rainfall intensities reported in the 2003 study were adopted as summarised in table C.1.

Table C.1 Average Rainfall Intensities for Design Storm Events (after Perrens Consultants, 2003)

ARI (years)	Storm Duration (hrs)							
	2	3	4	4.5	6	9	12	18
1	15.2	12.0	-	9.1	8.0	6.2	5.2	4.0
5	25.7	20.2	-	15.9	13.3	10.5	8.8	7.0
20	33.9	26.6	-	20.8	17.5	13.8	11.6	9.2
100	44.8	35.1	-	27.4	23.0	17.5	15.3	12.1
PMP	184.0	138.0	116.0	-	88.0	-	-	-

However other storm durations including 30 minute and 1 hour and other ARIs including 2 yr ARI, 200 yr ARI and 500 yr ARI were also assessed. For these other events IFD data was generated based on the method outlined in Australian Rainfall and Runoff (Engineers Australia, 1999). The IFD coefficients utilised are shown in **Table C.2**.

Table C.2 Design IFD Parameters

Parameter	Value
2 Year ARI 1 hour Intensity	30.04 mm/hr
2 Year ARI 12 hour Intensity	6.22 mm/hr
2 Year ARI 72 hour Intensity	1.89 mm/hr
50 Year ARI 1 hour Intensity	59.63 mm/hr
50 Year ARI 12 hour Intensity	12.22 mm/hr
50 Year ARI 72 hour Intensity	3.97 mm/hr
Location Skew	0.01
F2	4.3
F50	15.80

The synthetic design storms were assumed to be uniformly distributed across the catchments. Considering the size of the study catchments an areal reduction factor was not applied.

The 15 minute, 30 minute, 45 minute, 1 hour, 1.5 hour, 2.5 hour and 5 hour PMP rainfall intensities were estimated using Bulletin 53 released by the Bureau of Meteorology

Rainfall Losses

As discussed by Perrens Consultants, 2003, rainfall losses adopted by DWR for the assessment of the 100 year ARI flows were as follows:

Initial Loss (IL)	34 mm
Continuing Loss (CL)	1 mm/h

and those for the PMF were as follows:

Initial Loss (IL)	0 mm
Continuing Loss (CL)	1 mm/h

Initial and continuing losses have been investigated by Walsh et al, (1991), who concluded that design losses were a function of flood frequency. Recommended values are given for use with a non-linear runoff routing model with continuing loss set at 2.5 mm/h. Initial loss values increase from 50 mm at the 2 year ARI to a maximum of 60 mm at 10 year ARI and then reduce to 40 mm for the 100 year ARI event.

For the 2003 investigation initial loss values were adopted which conformed with this trend. They are shown on **Table C.2**. The sensitivity of model results to variations in initial and continuing losses is discussed in Section A4 of Perrens Consultants, 2003.

Table C.3
Design Values of Initial Loss (after Perrens Consultants, 2003)

ARI (years)	Initial Loss (mm)
1	40
5	45
20	45
100	34

The adopted values for rainfall initial and continuing losses were based on the values adopted by Perrens Consultants, 2003 as given in **Table C.4.**

Table C.4
Adopted Design Values of Initial Loss

ARI (years)	Initial Loss (mm)	Continuing Loss (mm/h)
1	40	1
2	42	1
5	45	1
20	45	1
100	34	1
200	34	1
500	34	1
PMF	0	1

Catchment discretisation

Initially the catchment was subdivided into subcatchments the order of 10 ha to 30 ha. This was undertaken using the CatchmentSIM program. Based upon a digital terrain model (DTM) generated for the catchment, CatchmentSIM would delineate the catchment boundary from a given location in the DTM. DTM was created using 0.5m contour.

The subcatchments identified by CatchmentSIM were reviewed and adjusted if need to overcome any local anomalies. Likewise a number of subcatchments were further divided to several subcatchments to facilitate the aggregation of local subcatchments draining to potential basins sites.

In 2011 the study catchment was subdivided into 181 subcatchments in comparison with the 2003 model which was based on 107 subcatchments.

Imperviousness

The area of impervious and pervious surfaces within each subcatchment under Existing Conditions was based on the values reported by Perrens Consultants, 2003.

Under Developed Conditions the land outside the 100 yr ARI flood extent was assumed on average to achieve the levels of imperviousness given in **Table C.5.**

Table C.5
Adopted Landuse Imperviousness

Landuse	Imperviousness
Residential	70%
Light Industrial	80%
High Density Residential	90%
Town Centre	90%

Vector Average Slope

The vector average slope for each subcatchment was determined using CatchmentSIM.

Surface Roughness

For each subcatchment, a surface roughness was entered for each surface type. The adopted surface roughness values were 0.025 for impervious surfaces and ranged from 0.04 to 0.05 for pervious area.

Hydrograph Routing

Simple lagging of hydrographs was adopted for the drainage lines. The time of travel (or lag) for each reach (link) was calculated as the length of the reach divided by an average velocity of flow of 1 m/s.

BX Value (Global Storage Factor)

Perrens Consultants, 2003, reviewed the DWR's RAFTS model parameters and concluded that previous investigations for South Creek indicated that a value of BX equal to 1.3 was appropriate for that catchment and this value was adopted for the 2003 investigation. There was no information to indicate that any other value would be preferable consequently this value was also adopted for this assessment.

C.3 Existing Conditions

Perrens Consultants, 2003 did not report any historical events within the study catchment that could be used to calibrate the hydrological model. Instead the 2003 model relied upon rainfall loss values and model parameters reported in preceding studies of the South Creek catchment. Sensitivity tests were also undertaken.

Consequently the **xprafts** rainfall/runoff model which was assembled of the catchment draining through the Austral and Leppington North Precincts was tested against peak flows reported at selected locations as reported by Perrens Consultants, 2003.

Twelve reference locations were selected as identified in **Figure C.1**.

The 100 yr ARI peak flows estimated in the 2003 study and the 2011 study at the reference locations for storm burst durations of 6, 9, 12 and 18 hours duration are compared in **Table C.6**.

The 1 yr ARI, 5 yr ARI and 100 yr ARI peak flows estimated in the 2003 study and the 2011 study at the reference locations are compared in **Table C.7**.

While it was noted that the rounding of the 2003 results meant that a precise comparison could not be undertaken with the 2011 estimates it was concluded that very good agreement was achieved in the 1 yr ARI, 5 yr ARI and 100 yr ARI events and that the 2001 catchment model was suitable for the estimation of hydrographs within the study catchment.

The **xprafts** model was then run to estimate the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF design flood events. These hydrographs were in turn exported to the TUFLOW floodplain model. The subcatchment layout and node locations and names for the hydrological model without basins are given in **Figure C.2**.

The estimated peak flows at all locations within the study catchment are summarised in **Tables C.8A** to **C.8H** for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations and the PMF 15 minute, 30 minute, 45 minute, 1 hour, 1.5 hour, 2 hour, 2.5 hour, 3 hour, 4 hour, 5 hour and 6 hour design flood events respectively.

The estimated peak flows at all locations within the study catchment for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF design floods are summarised in **Table C.9**

C.4 Developed Conditions

Under Developed Conditions the land outside the 100 yr ARI flood extent was assumed on average to achieve the levels of imperviousness given in **Table C.5.**

Two development scenarios were assessed as follows:

Scenario A Development	All land within the Austral and Leppington North Precincts outside the 100 yr ARI flood extent only was developed. The external catchment areas upstream and to the west of the Precincts remained as under existing conditions
Scenario B Development	All land within the Austral and Leppington North Precincts outside the 100 yr ARI flood extent was developed as was the external catchment areas upstream and to the west of the Precincts

Table C.6 Comparison of 100 Year ARI Peak Flows for 6, 9, 12 and 18 hour Storm Durations at Selected Locations

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Duration							
			6 hour		9 hour		12 hour		18 hour	
			2003	2011	2003	2011	2003	2011	2003	2011
BC1	**Bonds Creek** - Denham Court Road	1.04	28	28	36	36	34	34	24	29
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	41	44	54	57	51	52	35	43
BC3	**Bonds Creek** - Bringelly Road	1.10a	56	53	71	68	63	61	42	53
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	63	59	79	75	70	67	50	59
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	101	103	124	129	109	113	81	101
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	115	115	140	140	128	127	95	114
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	65	66	83	83	73	73	51	64
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	180	180	221	219	196	197	145	179
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	204	205	246	246	243 ?	230	169	211
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	36	37	44	47	39	42	29	35
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	26	25	28	32	26	30	22	23
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	25	23	24	25	22	25	19	20
							Peak Flow (m3/s)			

Table C.7 Comparison of 1 yr ARI, 5 yr ARI 100 Year ARI Peak Flows at Selected Locations

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Peak Flow (m3/s)							
			1 yr ARI			5 yr ARI			100 yr ARI	
			2003	2011		2003	2011		2003	2011
				9 hour	12 hour		9 hour	12 hour		9 hour
BC1	**Bonds Creek** - Denham Court Road	1.04	5	2.4	4.2	13	12.6	14.4	36	36.4
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	7	4.0	7.0	20	20.3	22.3	54	56.9
BC3	**Bonds Creek** - Bringelly Road	1.10a	9	5.0	8.9	26	24.9	27.3	71	68.3
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9	5.7	10.1	29	27.9	30.5	79	75.3
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	15	9.8	17.4	46	48.6	51.7	124	128.6
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	17	11.0	19.2	54	53.5	56.7	140	140.3
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	10	5.9	10.5	31	30.7	33.0	83	82.8
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	26	17.2	29.8	84	83.7	89.1	221	218.9
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	29	19.8	33.9	95	94.7	100.9	246	245.9
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	6	3.3	6.0	18	17.5	18.6	44	46.8
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	5	2.4	4.1	14	12.2	12.0	28	31.9
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5	2.4	4.1	13	11.6	8.9	24	25.1
							Peak Flow (m3/s)			

The estimated peak flows at all locations within the study catchment under Scenario A development are summarised in **Tables C.10A** and **C.10B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at all locations within the study catchment under Scenario B development are summarised in **Tables C.11A** and **C.11B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at the reference locations within the study catchment under Scenario A development are summarised in **Tables C.12A** and **C.12B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at the reference locations within the study catchment under Scenario B development are summarised in **Tables C.13A** and **C.13B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The impact of Scenario A and Scenario B development on peak flows and the critical storm burst duration at all locations is summarised in **Table C.14**.

C.5 Basin Options

A hydrological assessment of possible basin options to reduce as far as possible the 2 yr ARI and 100 yr ARI peak flows downstream of the proposed development areas to no greater than peak flows under Existing Conditions was undertaken.

C.5.1 Scenario A Development

Initially 35 possible basin sites were identified and initially assessed. While initial consideration was given to locating basins both on tributary and main streams the potential sites were reviewed iteratively in relation to a number of issues including:

- Stakeholder views on the merits of siting basins on Category 1 and/or Category 2 streams;
- The location of High Category Vegetation; and
- The 100 yr ARI flood extent ie. basins were located on the edges of the 100 yr ARI flood extent to minimise the potential drowning of basin outlets which in turn could cause basins to spill.

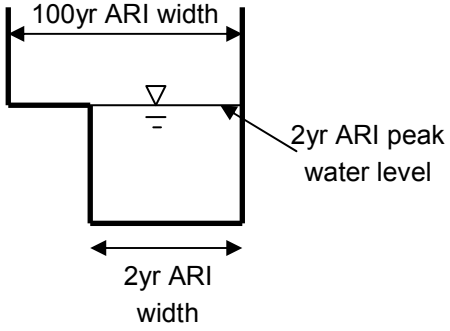
This led to five basin sites being eliminated from the final adopted sites.

Basins were also sized in an iterative process as outlined below:

Initially the indicative volume of each basin was estimated using a spreadsheet procedure as follows:

- The 2 yr ARI and 100 yr ARI peak flows under Existing Conditions were identified at a basin site;
- The 2 yr ARI and 100 yr ARI hydrographs for the **2 hour storm** duration under Developed Conditions were exported at a given basin site and imported into a spreadsheet;
- Based on the property of basins that the peak outflow from a basin coincides with the falling limb of the inflow hydrograph and assuming that the discharge hydrograph for the basin was linear up to the peak outflow, the basin storage volume required for a 2 yr ARI event was determined by calculating the volume between the 2yr ARI hydrograph under developed conditions and the assumed linear outflow hydrograph (refer to **Figure C.3**);
- Based on the estimated 2yr ARI basin volume and the target 100yr ARI outflow a similar approach was used approximate the 100yr ARI discharge relationship;
- The basin volume required for the 100 yr ARI event was then determined by calculating the volume between the 100yr ARI 2 hour duration hydrograph and the assumed discharge hydrograph (refer to **Figure C.4**). The initial area of each basin was calculated by assuming that each basin is a rectangular prism with an average water depth of 1.2 m.

The next step was to estimate the required size of a multi-level outlet to meet the target 2 yr ARI and 100 yr ARI peak outflows for each basin. The adopted form of this outlet is as follows:



An **xpswmm1D** hydraulic model of each basin outlet was developed to determine the stage-discharge relationship for the multi-level outlet for each basin. The **xpswmm1D** model consisted of a basin node, discharging into two 15 m long rectangular open channels (with a bed slope of 0.5%, a roughness value of 0.018, an entrance loss coefficient of 0.5 and an exit loss coefficient of 1.0) which represented the multi-level slot outlet. The slot outlet discharged into a concept 50 m long rectangular outlet channel, with a slope of 0.5%, and a roughness value of 0.045 and a width at least twice as large as the multi-level outlet width. To ensure the basin outflow results from the **xpswmm1D** and **xprafts** models matched some of the Routing Control Parameters in the **xpswmm1D** model were also adjusted (with an Under-Relaxation Parameter of 1 and a Time Weighting Factor of 1 being used).

The basins were then added to the **xprafts** hydrological model of Developed Conditions and run. While the basins met the targets in a 2 hour storm burst event it was found that the peak outflows in longer duration events exceeded the peak flows under Existing Conditions.

Consequently the area of all of the basins (except Basin 12) were increased by 15% and the limitation on the peak average basin depth in a 100 yr ARI event was removed.

In the case of Basin 12 increasing its area by 15% did not give satisfactory results as the basin water level depth for a 100 yr ARI event would be around 2.3 m. To overcome this, Basin 12 was resized using the procedure outlined above with the 2yr ARI 2hr duration and 100yr ARI 12hr duration post development hydrographs. This resulted in a 97.5% increase in the basin area.

The width of the 2 yr ARI outlet and then the width of the 100 yr ARI outlet were selected to restrict the peak outflow to the target pre-development levels.

All basins were re-assessed using the **xpswmm1D** model with models analysing the 2 yr ARI 9hr duration hydrograph to size the 2 yr ARI outlet and the 100 yr ARI 12 hour duration hydrograph to size the 100 yr outlet. However, for Basins 12, 22 and 31 the 2 yr outlet was sized using the 2 yr ARI 2 hour duration hydrograph to achieve results closer to the pre-development conditions.

The properties of the concept regional basins are given in **Table C.15**.

The **xprafts** hydrological model of Developed Conditions was updated and re-run.

The subcatchment layout and node locations and names for the hydrological model with basins are given in **Figure C.5**. The basin locations are identified in **Figure C.6.**

The estimated performance of the basins under Scenario A development in the 2 yr ARI and 100 yr ARI events are summarised in **Tables C.16** and **C.17** respectively.

C.5.2 Scenario B Development

As previously concluded development of the subcatchments upstream of the Precincts and west of Kemps Creek would increase peak flows in the major watercourses including Kemps Creek, Bonds Creek and Scalarbini Creek.

Consequently two forms of retardation of flows from these external subcatchments were considered.

Drawing on the approach adopted for sizing of basins within the Precincts, five regional basins sites were identified in the downstream reach of Bonds Creek (Basin O1) and Scalarbini Creek (Basin O2), Kemps Creek (Basin O3) and two western tributaries of Kemps Creek (Basins O4 and O5). The location of these basins is given in **Figure C.6**. These concept basins are intended to represent the application of a retardation policy similar to that proposed for the two Precincts to land outside the Precincts that may also be developed. The concept basin sizes are as follows:

Basin ID	Basin Node Name	2 yr ARI		100 yr ARI		
		Volume (ML)	Outlet Width (m)	Volume (ML)	Area (ha)	Total Outlet Width (m)
O1	1.06b	137	5.6	301	20	22.6
O2	7.06	57	2.2	106	7	9.45
O3	Dummy18	96	3.9	195	13	15
O4	24.06	35	1.55	64	4	5.55
O5	1.25b	16	0.88	31	2	2.58

At the same time there are also a number of local subcatchments on the left bank of Kemps Creek that drain into the creek. Rather than attempt to size small concept basins for each individual subcatchment a procedure was developed that modified the runoff response from each subcatchment in a manner that represented the application of an OSD policy within each subcatchment. The procedure was based on determining the adjustment in subcatchment vector average slope for the developed subcatchment that gave peak runoff from the subcatchment that was comparable to the peak runoff under Existing Conditions.

C.5.3 Overall Performance of Basins

The estimated peak flows at all locations within the study catchment under Scenario A development with Precinct basins are summarised in **Tables C.18A** and **C.18B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at all locations within the study catchment under Scenario B development with Precinct basins and five external basins are summarised in **Tables C.19A** and **C.19B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at all locations within the study catchment under Scenario B development with Precinct basins and five external basins and OSD on other external small subcatchments are summarised in **Tables C.20A** and **C.20B** for the 2 yr ARI and 100 yr ARI events for the 30 minutes, 1 hour, 2 hour, 3 hour, 4.5 hour, 6 hour, 9 hour, 12 hour and 18 hour storm burst durations respectively.

The estimated peak flows at the reference locations within the study catchment under all scenarios assessed are summarised in **Tables C.21** for the 2 yr ARI event. The 2 yr ARI critical storm burst durations for all scenarios assessed are summarised in **Tables C.22**.
The estimated peak flows at the reference locations within the study catchment under all scenarios assessed are summarised in **Tables C.23** for the 100 yr ARI event. The 100 yr ARI critical storm burst durations for all scenarios assessed are summarised in **Tables C.24**.

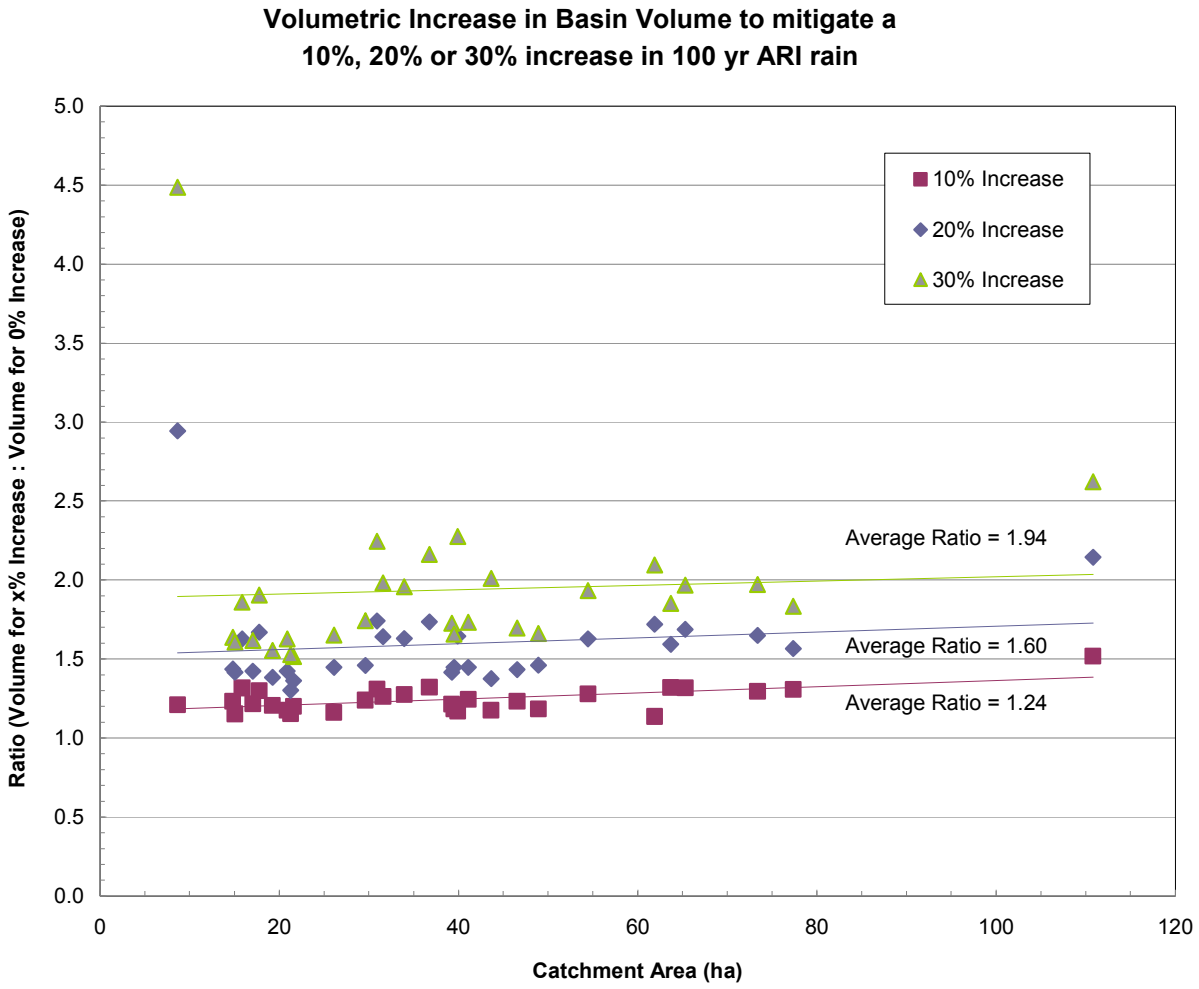
It should be noted that Location BC1 is upstream of the concept external Basin O1 consequently the estimated peak flows does not change under the various scenarios.

C.5.4 Climate Change

An assessment of the impact of 10%, 20% and 30% increases in 100 yr ARI rainfall on runoff under Development Conditions and the ramifications of climate change on the volumetric requirement for basins was also assessed.

The estimated increases in basin volumes to reduce 100 yr ARI peak flows under climate change to peak flows under Existing Conditions are plotted in the Figure below.

It can be seen from the Figure that there is a week trend of ratio of volume increase with catchment area. For planning purposes it was estimated that the required increase in basin volume that would be required to mitigate a 10%, 20% or 30% increase in 100 yr ARI rainfall would be a 1.24, 1.60 or 1.94 times the proposed basin volume under current rainfall intensities.



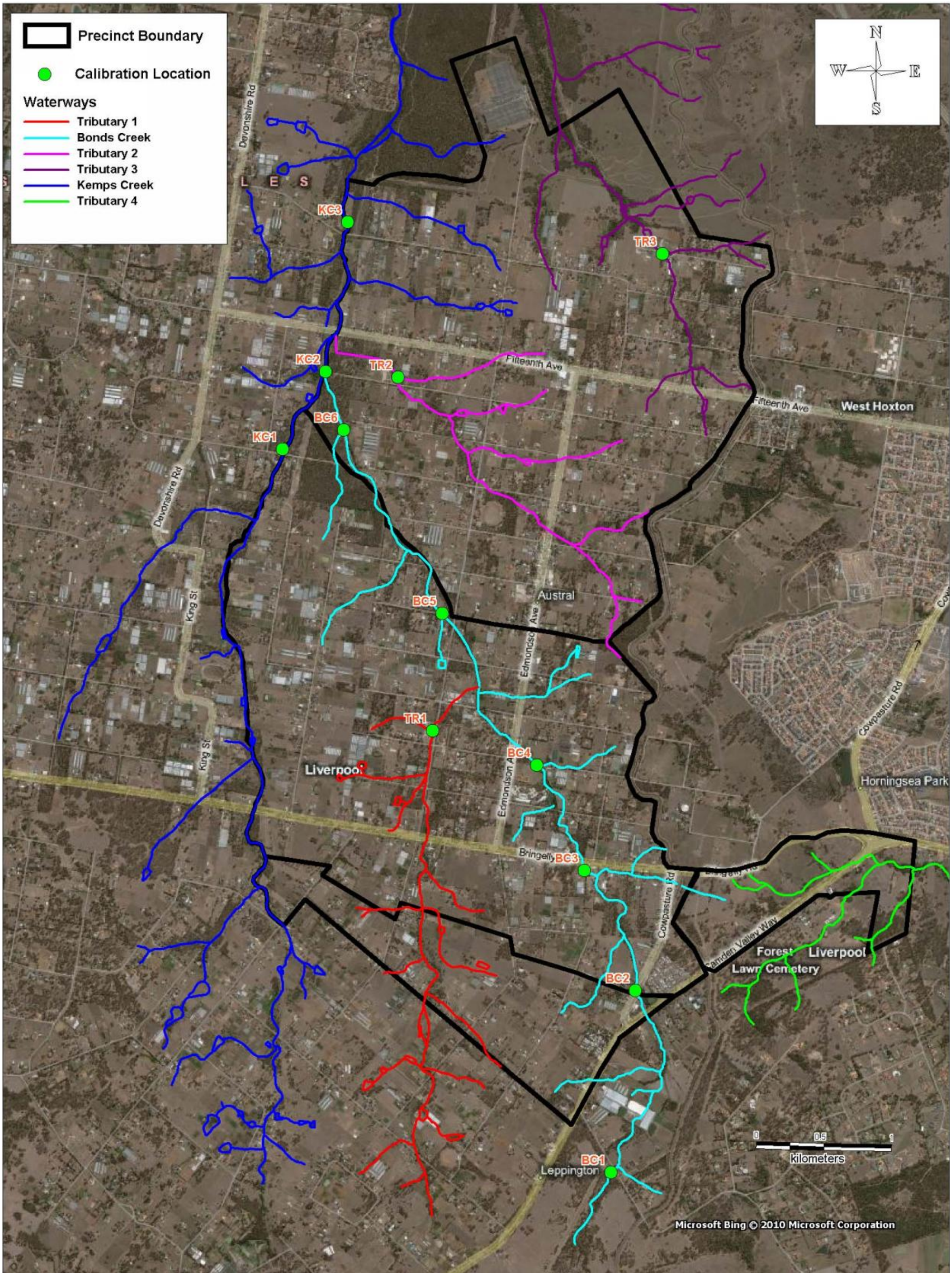


Figure C.1 Hydrological Reference Locations

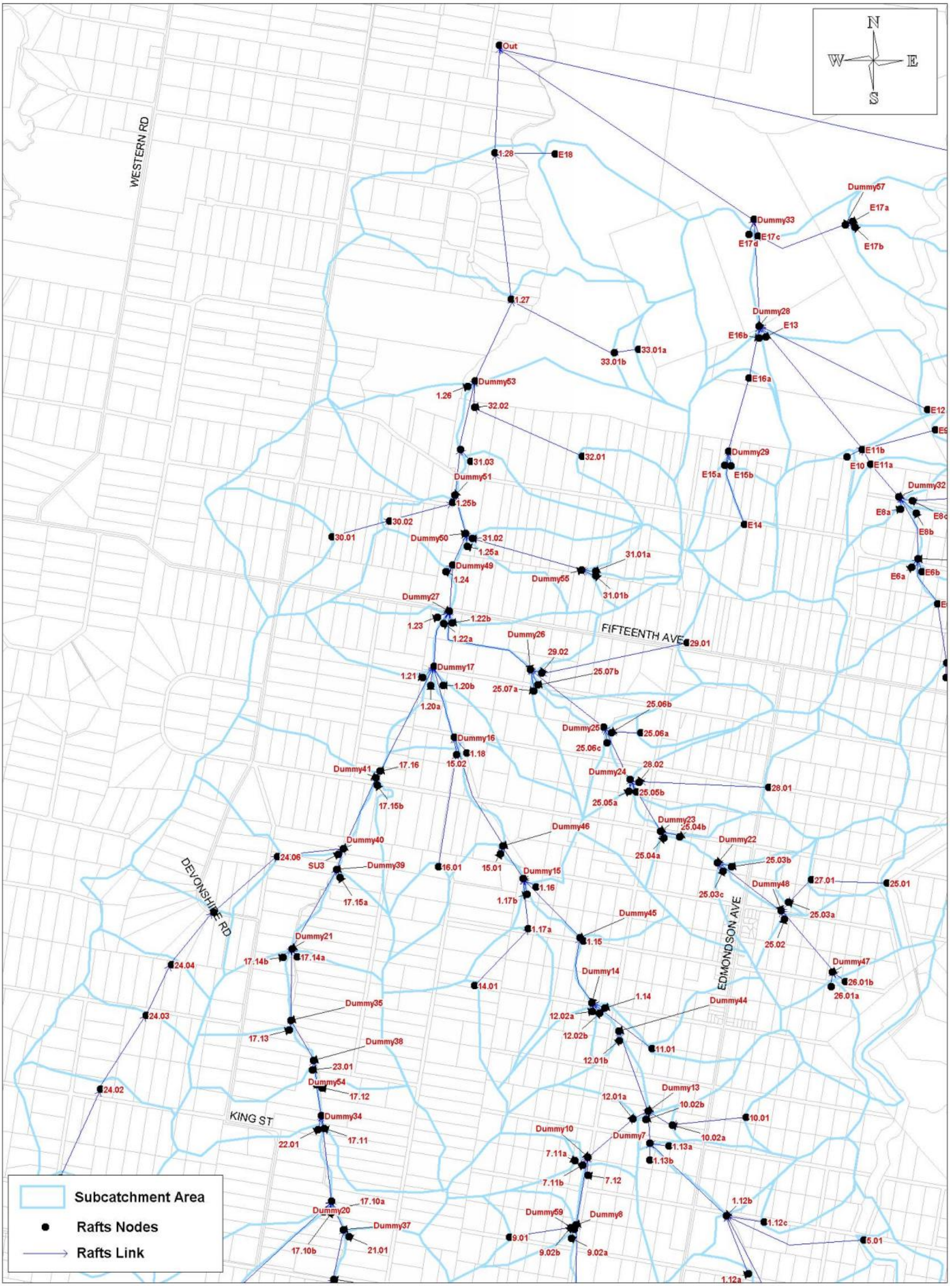


Figure C.2A Subcatchment Boundaries and Node Locations

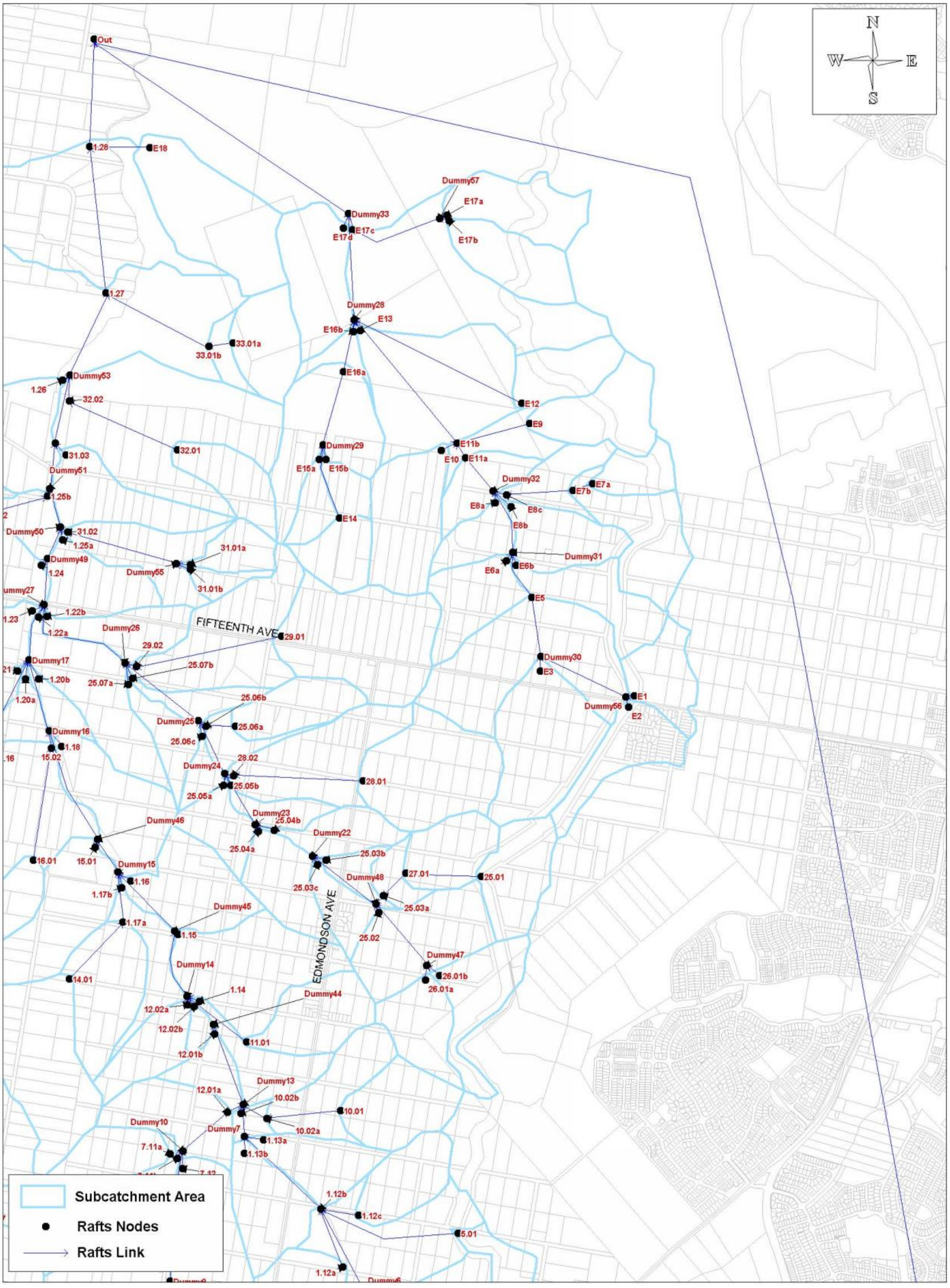


Figure C.2B Subcatchment Boundaries and Node Locations

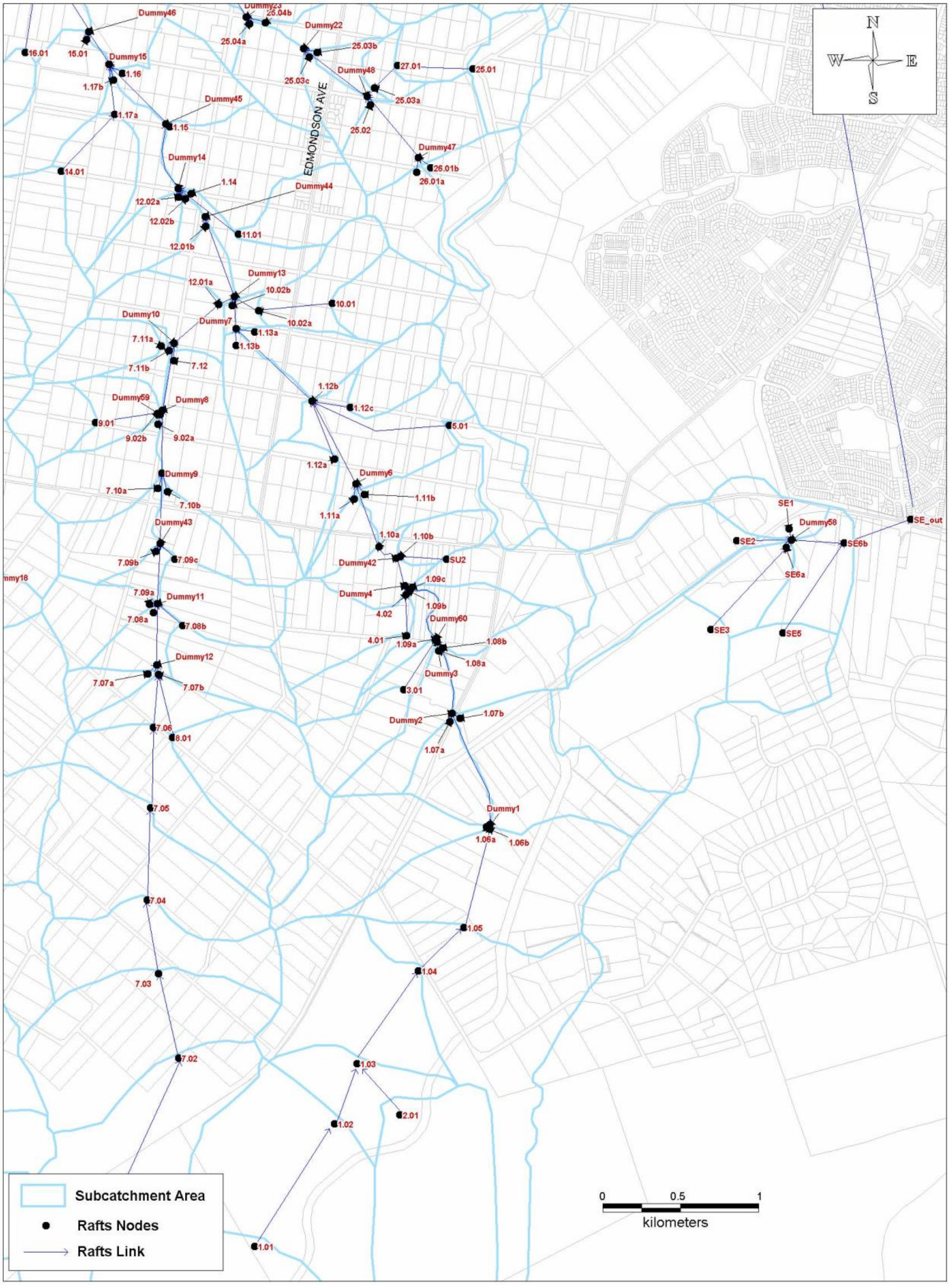


Figure C.2C Subcatchment Boundaries and Node Locations

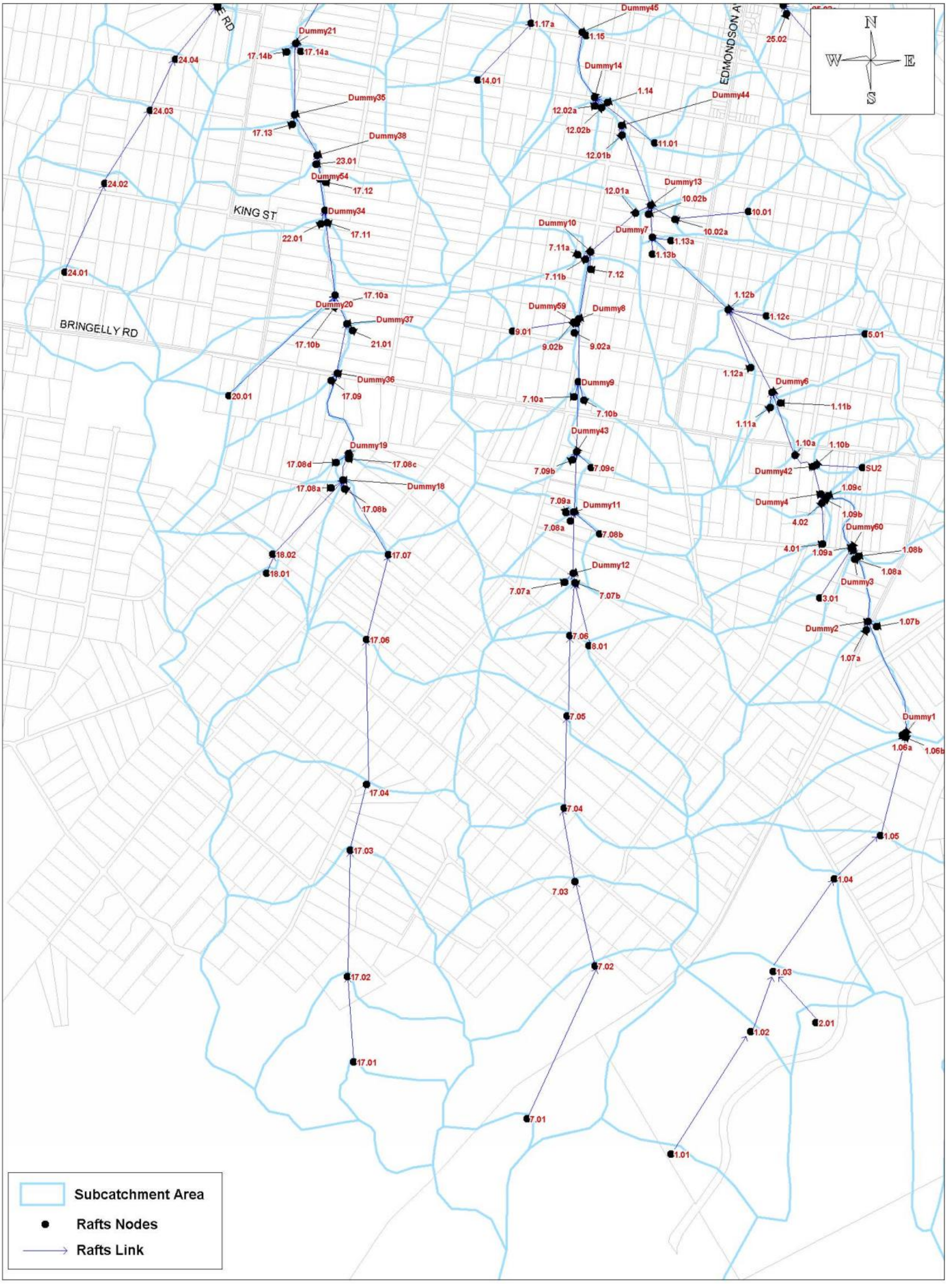


Figure C.2D Subcatchment Boundaries and Node Locations

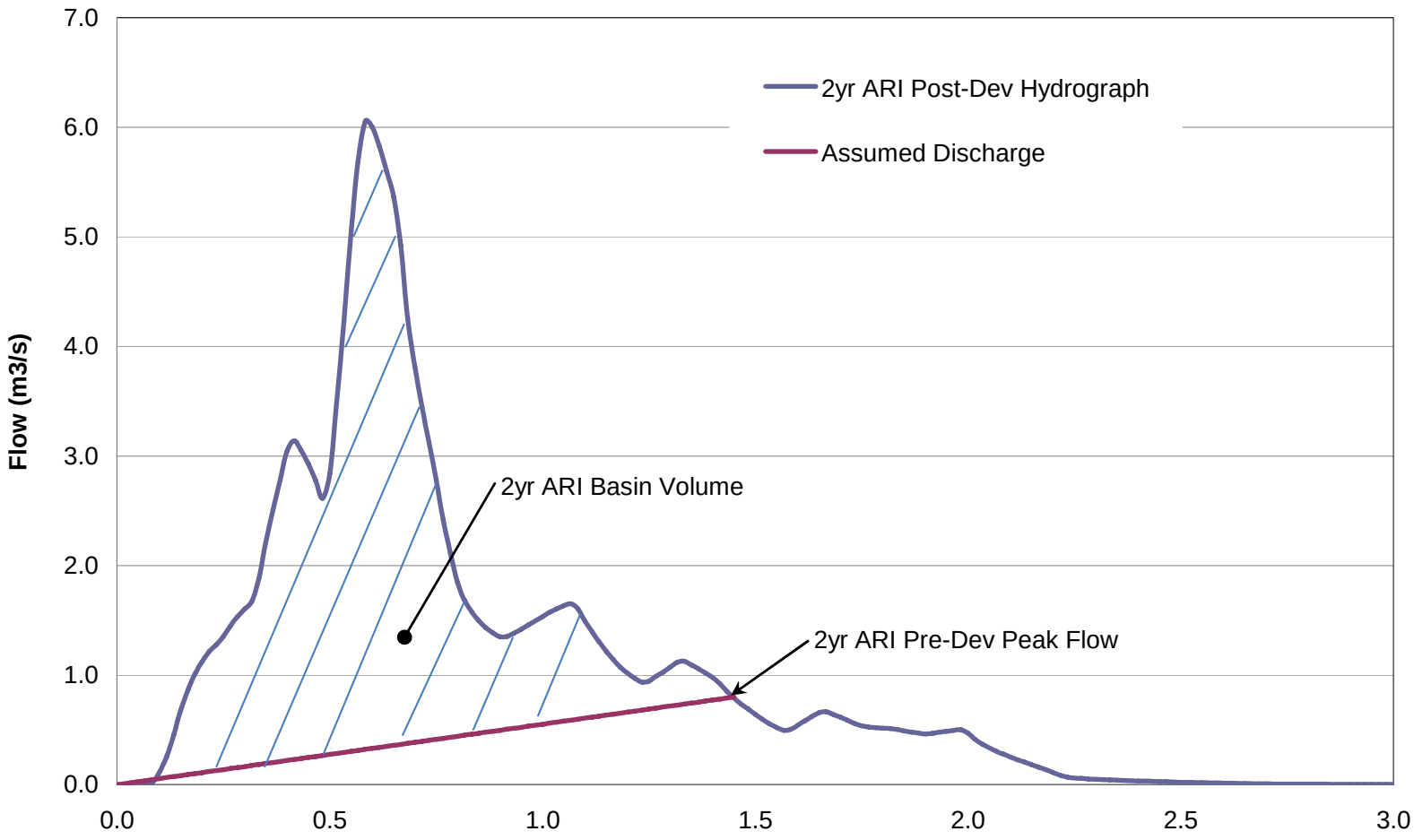


Figure C.3 Estimation of Required 2 yr ARI Basin Volume

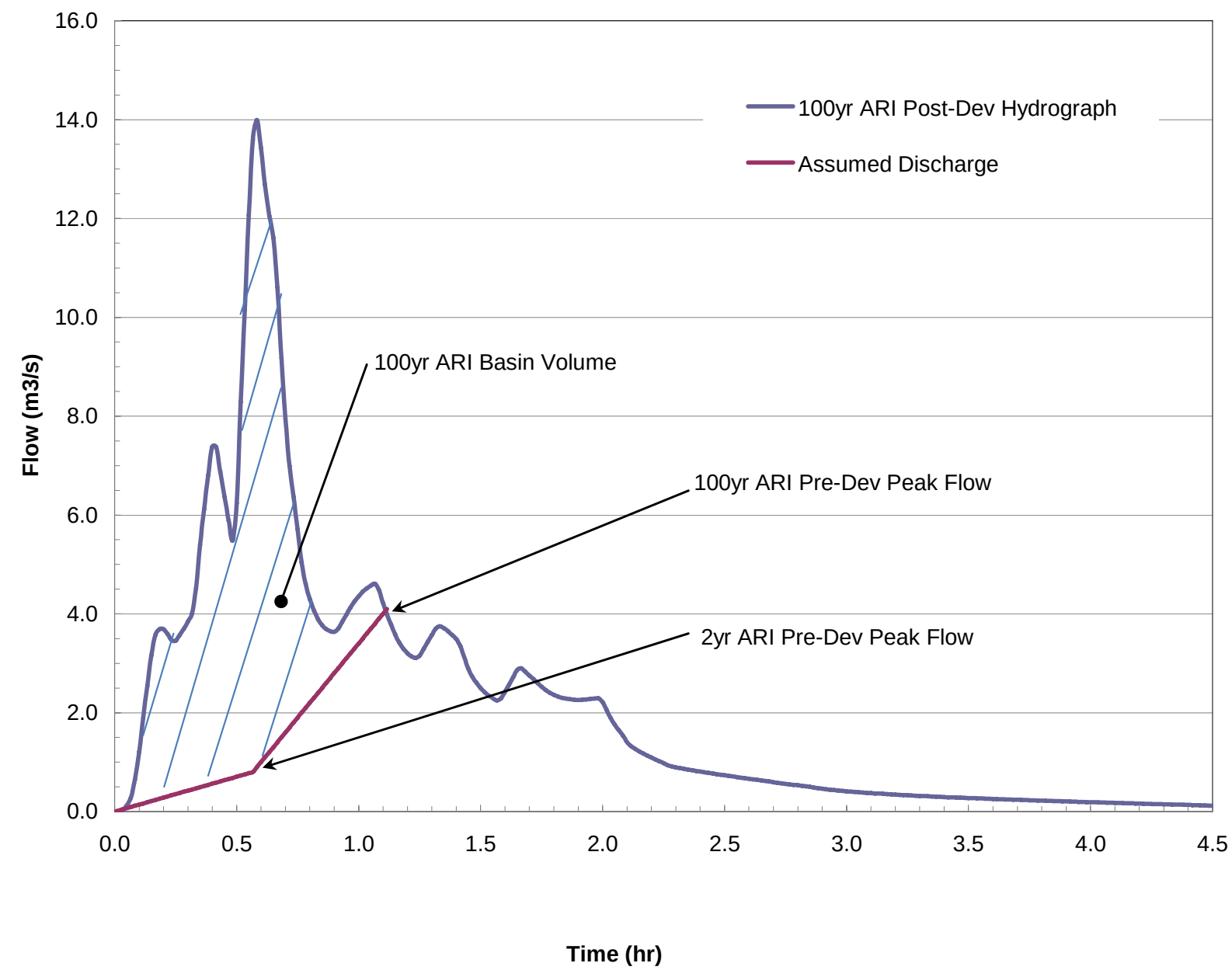


Figure C.4 Estimation of Required 100 yr ARI Basin Volume

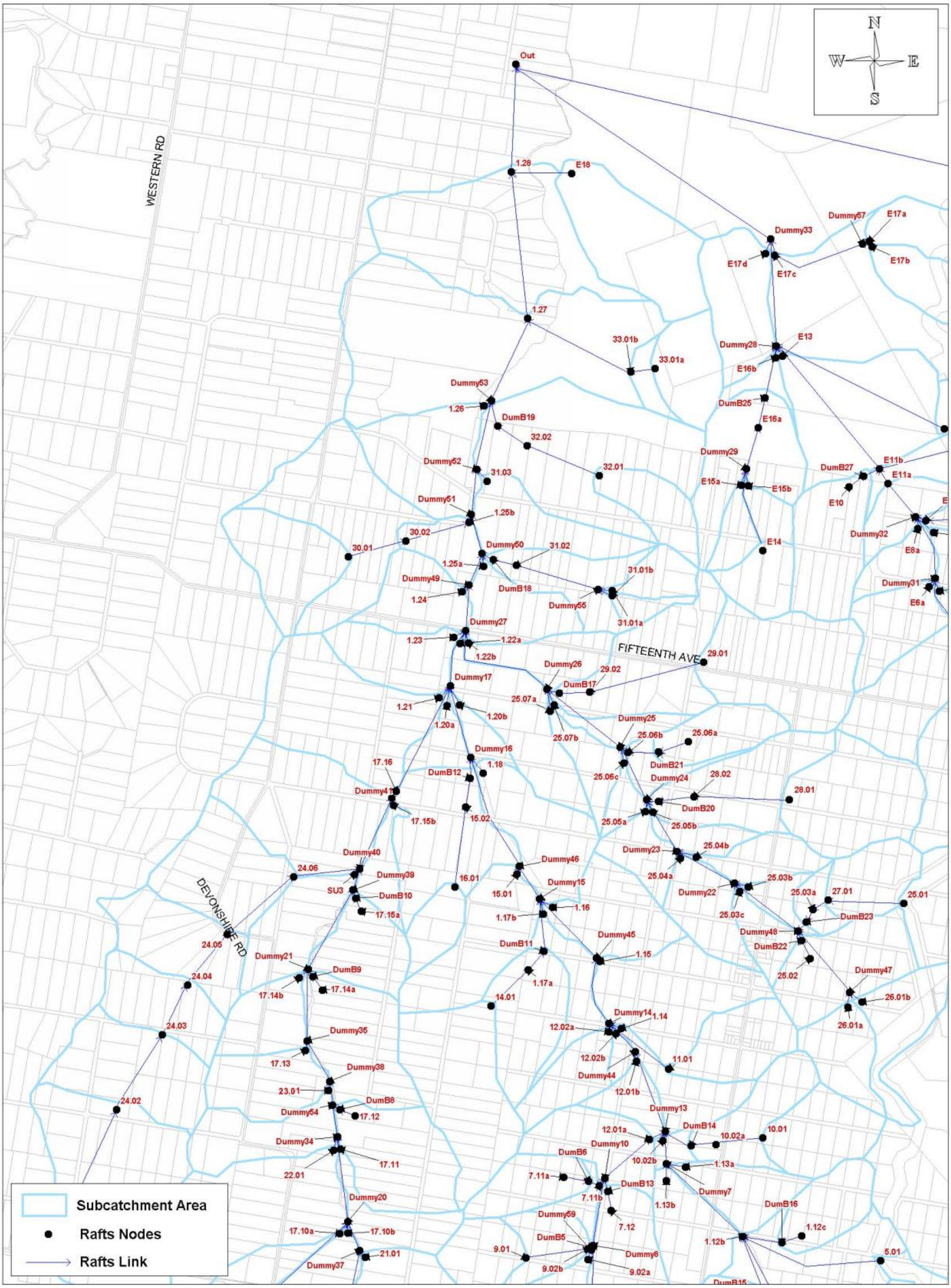


Figure C.5A Subcatchment Boundaries and Node Locations with Basins

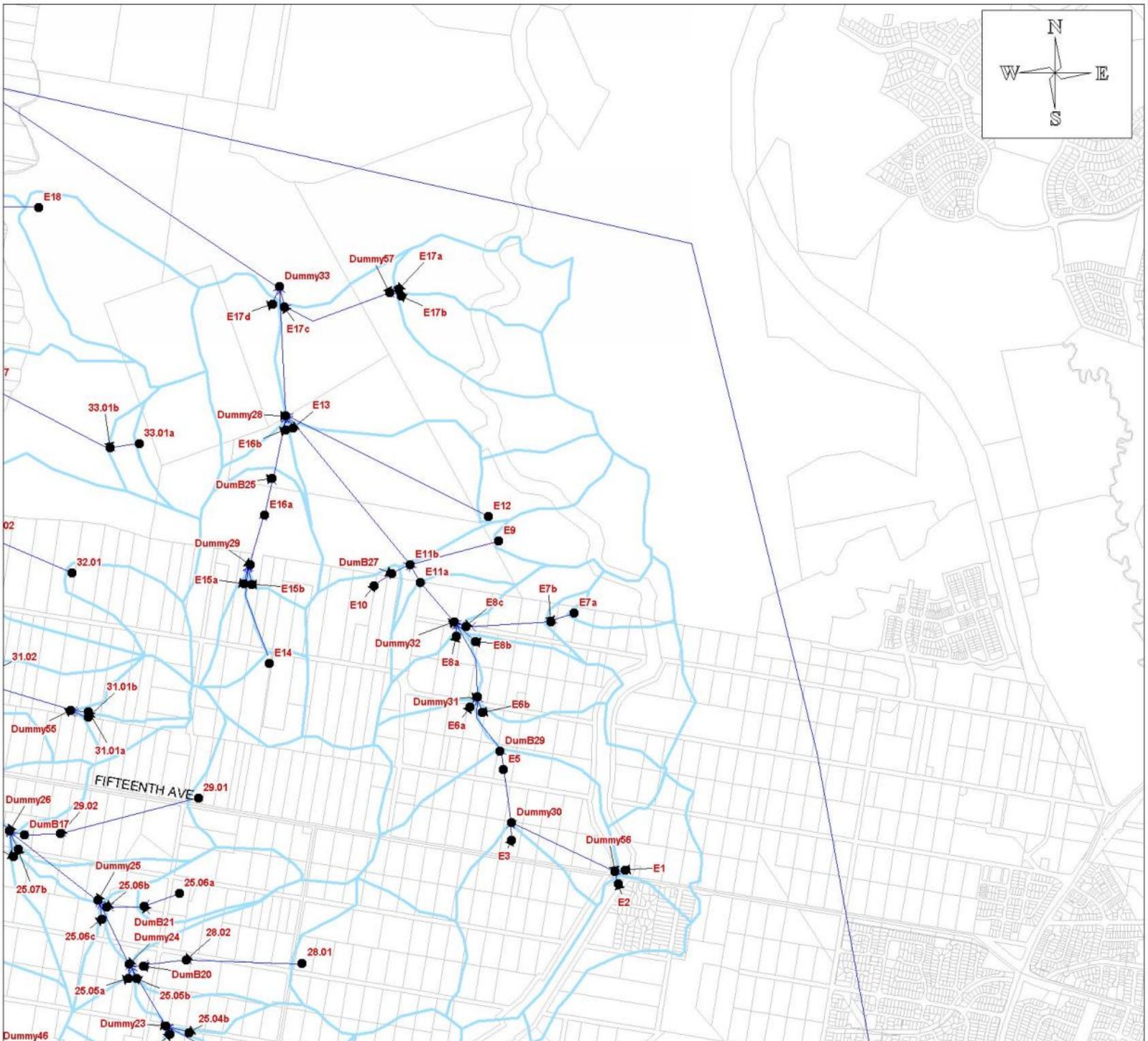


Figure C.5B Subcatchment Boundaries and Node Locations with Basins

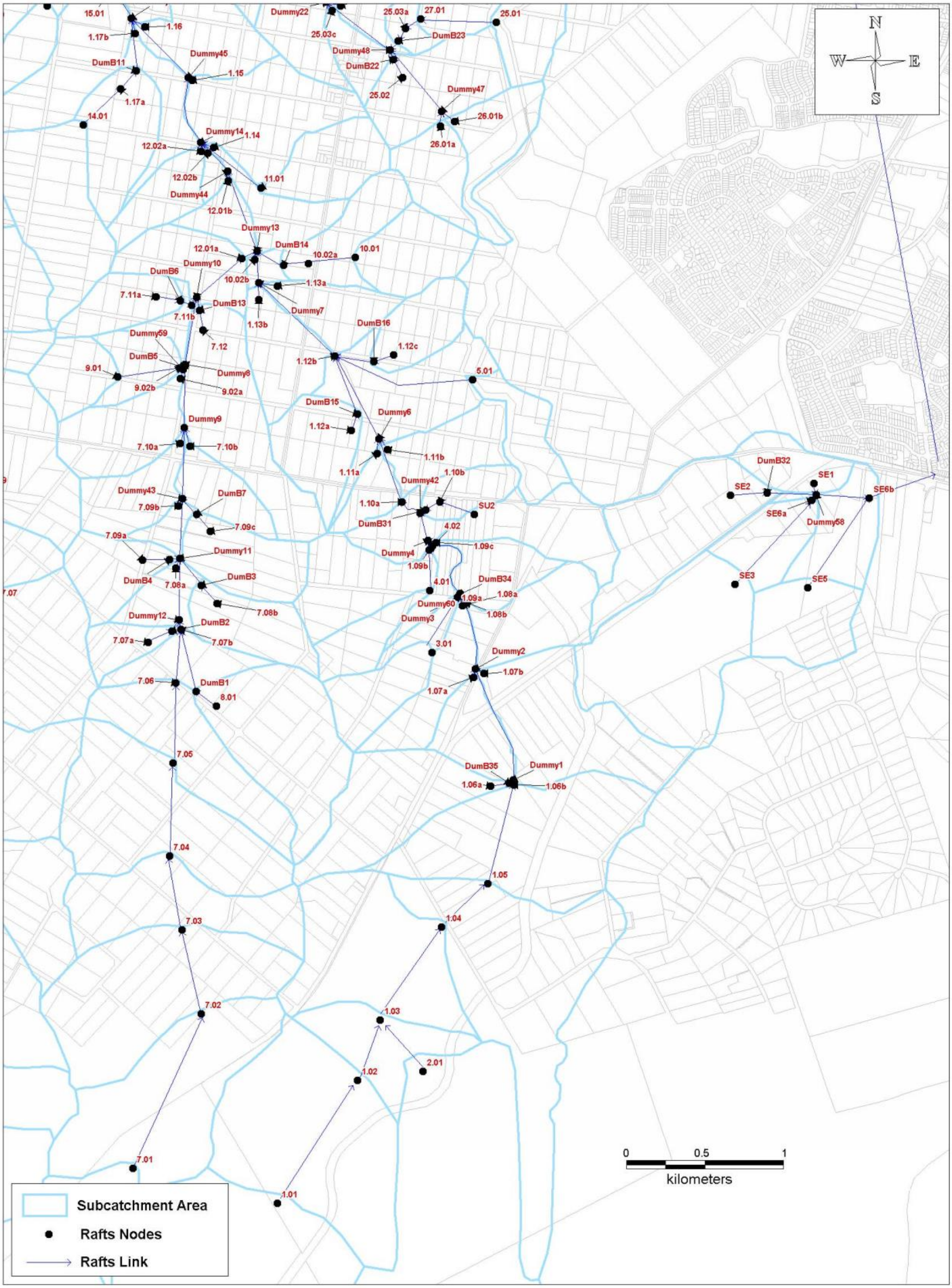


Figure C.5C Subcatchment Boundaries and Node Locations with Basins

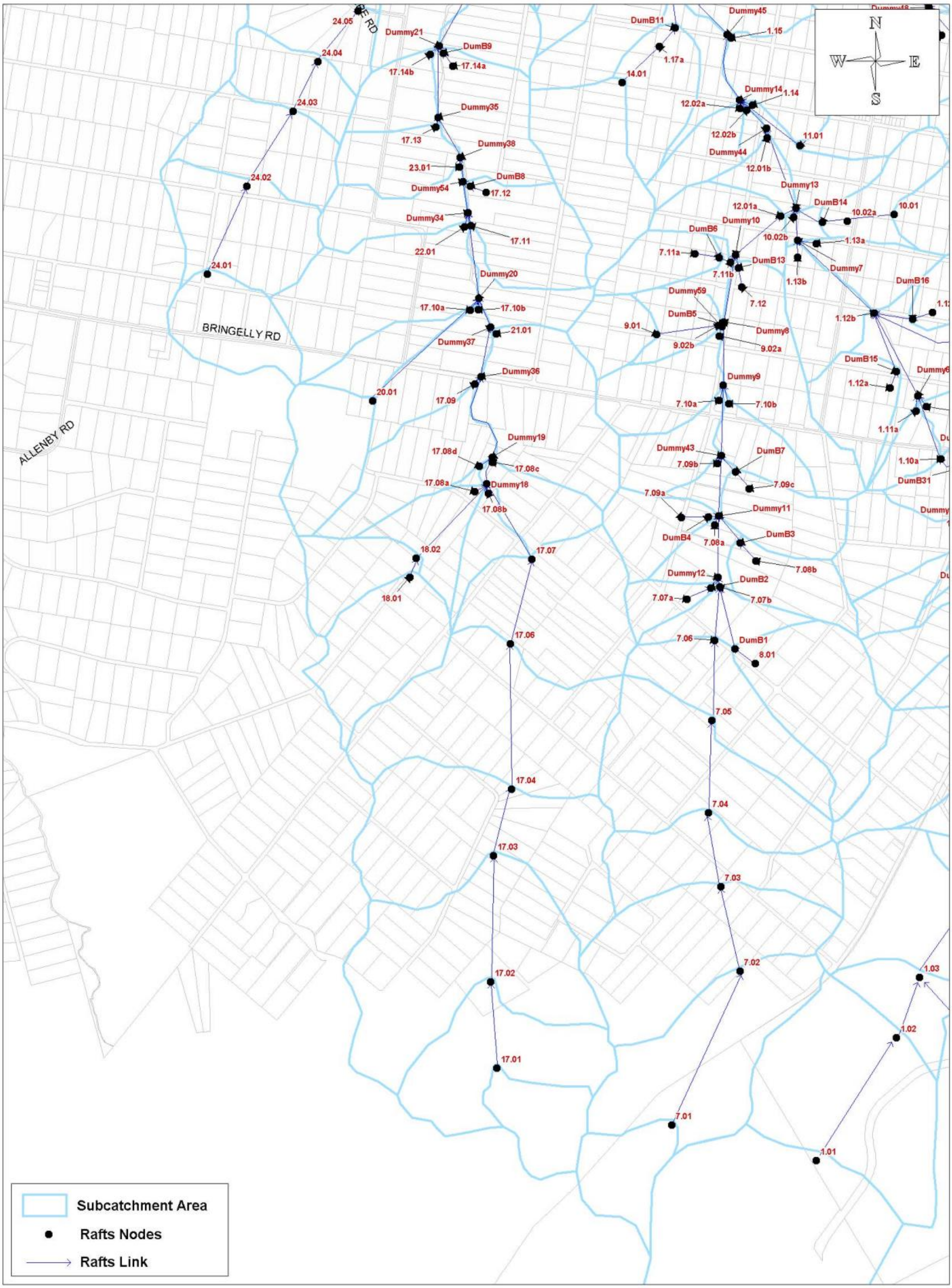


Figure C.5D Subcatchment Boundaries and Node Locations with Basins

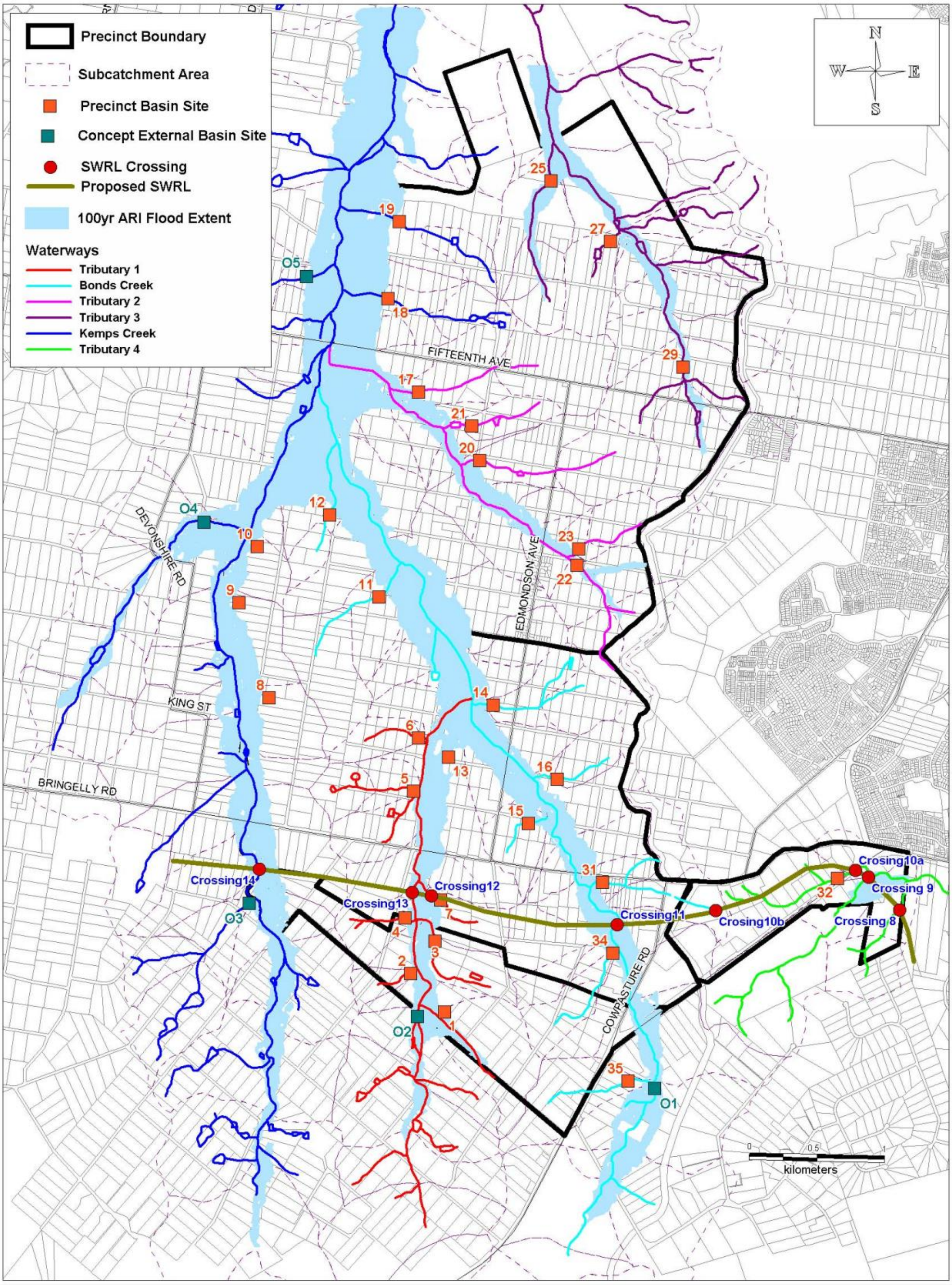


Figure C.6 Basin Locations

Table C.8A Estimated 1 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.4	12hr
E17b	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
Dummy57	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	0.6	0.7	12hr
E17c	0.2	0.2	0.2	0.1	0.1	0.4	0.8	1.5	1.3	1.5	12hr
E17d	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4	0.4	0.4	12hr
E9	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.5	12hr
E10	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.4	0.4	12hr
E3	0.3	0.3	0.3	0.1	0.1	0.2	0.4	0.7	0.6	0.7	12hr
E2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
E1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	12hr
Dummy56	0.3	0.3	0.3	0.1	0.1	0.2	0.4	0.7	0.5	0.7	12hr
Dummy30	0.4	0.4	0.4	0.3	0.3	0.4	0.9	1.4	1.1	1.4	12hr
E5	0.5	0.6	0.6	0.4	0.4	0.6	1.2	2.1	1.8	2.1	12hr
E6a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
E6b	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy31	0.7	0.7	0.8	0.6	0.5	0.8	1.6	2.8	2.3	2.8	12hr
E8a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
E7a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
E7b	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.7	0.5	0.7	12hr
E8c	0.2	0.2	0.3	0.2	0.1	0.2	0.5	0.9	0.7	0.9	12hr
E8b	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy32	1.0	0.9	1.0	0.8	0.6	1.2	2.4	4.1	3.4	4.1	12hr
E11a	1.0	1.0	1.0	0.8	0.7	1.2	2.5	4.4	3.6	4.4	12hr
E11b	1.0	1.0	1.0	0.8	0.7	1.5	3.1	5.4	4.4	5.4	12hr
E13	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.9	0.7	0.9	12hr
E12	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.4	12hr
E14	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.3	12hr
E15b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
E15a	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	12hr
Dummy29	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.5	0.4	0.5	12hr
E16a	0.2	0.2	0.2	0.1	0.1	0.2	0.5	0.9	0.8	0.9	12hr
E16b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
Dummy28	1.1	1.1	1.1	0.9	0.8	2.1	4.3	7.4	6.2	7.4	12hr
Dummy33	1.1	1.1	1.1	1.0	0.8	2.6	5.3	9.3	7.8	9.3	12hr
SE5	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.4	0.4	12hr
SE1	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.5	30min
SE2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	0.6	0.7	12hr
SE3	0.2	0.2	0.2	0.1	0.1	0.2	0.5	0.9	0.8	0.9	12hr
SE6a	0.3	0.3	0.3	0.2	0.2	0.2	0.6	1.1	1.0	1.1	12hr
Dummy58	0.7	0.7	0.6	0.4	0.4	0.5	1.1	2.1	1.8	2.1	12hr
SE6b	1.0	1.0	1.0	0.6	0.5	0.7	1.5	2.7	2.4	2.7	12hr
SE_out	1.0	1.0	1.0	0.6	0.5	0.7	1.5	2.7	2.4	2.7	12hr
33.01a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
33.01b	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
32.01	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	12hr
32.02	0.5	0.5	0.5	0.3	0.3	0.2	0.4	0.7	0.7	0.7	12hr
1.26	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	18hr
31.03	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	18hr
30.01	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
30.02	0.5	0.4	0.4	0.3	0.3	0.2	0.4	0.8	0.8	0.8	12hr
1.25b	0.5	0.5	0.5	0.3	0.3	0.2	0.5	0.9	0.8	0.9	12hr
1.25a	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	18hr
31.01b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
31.01a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	12hr
Dummy55	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.3	12hr
31.02	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.4	0.5	12hr
25.06a	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	12hr
25.06b	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
25.06c	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
25.03c	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
25.03b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
25.01	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	12hr
27.01	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.4	0.5	12hr
25.03a	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.6	0.5	0.6	12hr
26.01a	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	12hr
26.01b	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	12hr
Dummy47	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.4	0.5	12hr
25.02	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.8	0.7	0.8	12hr
Dummy48	0.5	0.5	0.5	0.4	0.3	0.3	0.7	1.3	1.2	1.3	12hr
Dummy22	0.6	0.6	0.5	0.4	0.4	0.3	0.9	1.5	1.4	1.5	12hr
25.04b	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
25.04a	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	18hr
Dummy23	0.6	0.6	0.5	0.4	0.4	0.4	1.0	1.9	1.7	1.9	12hr
25.05a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
25.05b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
28.01	0.4	0.4	0.4	0.2	0.2	0.1	0.3	0.5	0.4	0.5	12hr
28.02	0.5	0.6	0.5	0.4	0.3	0.3	0.4	0.7	0.7	0.7	12hr
Dummy24	0.9	1.0	1.0	0.8	0.7	0.6	1.6	2.8	2.7	2.8	12hr
Dummy25	0.9	1.1	1.0	0.9	0.8	0.7	1.8	3.1	3.0	3.1	12hr
25.07b	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
29.01	0.3	0.3	0.3	0.2	0.2	0.1	0.3	0.5	0.5	0.5	12hr
29.02	0.4	0.5	0.4	0.3	0.3	0.2	0.5	0.9	0.8	0.9	12hr
25.07a	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	12hr
Dummy26	1.2	1.4	1.4	1.1	1.0	0.9	2.4	4.1	4.0	4.1	12hr
1.22b	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	30min
1.20a	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
1.20b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
1.21	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.5	0.5	18hr
24.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
24.02	0.1	0.2	0.2	0.1	0.1	0.1	0.4	0.7	0.7	0.7	18hr
24.03	0.2	0.2	0.2	0.2	0.1	0.2	0.6	1.0	1.1	1.1	18hr
24.04	0.2	0.2	0.2	0.2	0.1	0.3	0.8	1.3	1.3	1.3	12hr
24.05	0.2	0.2	0.2	0.2	0.2	0.4	1.0	1.7	1.6	1.7	12hr
24.06	0.2	0.2	0.2	0.2	0.2	0.4	1.1	1.9	1.9	1.9	12hr
17.14b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
17.14a	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.3	12hr
17.13	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
23.01	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
20.01	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.4	12hr
17.10a	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
17.10b	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
17.09	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.3	0.3	18hr
17.08c	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
17.08d	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12hr
18.01	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.5	0.5	12hr
18.02	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.8	0.7	0.8	12hr
17.08b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	12hr
17.08a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
17.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
17.02	0.2	0.2	0.2	0.1	0.1	0.2	0.5	0.8	0.8	0.8	12hr
17.03	0.3	0.4	0.4	0.3	0.2	0.4	0.9	1.6	1.6	1.6	18hr
17.04	0.5	0.5	0.5	0.4	0.3	0.5	1.4	2.4	2.5	2.5	18hr
17.06	0.5	0.5	0.6	0.4	0.4	0.7	1.7	3.1	3.2	3.2	18hr
17.07	0.5	0.6	0.6	0.5	0.4	0.8	2.0	3.6	3.7	3.7	18hr
Dummy18	0.6	0.6	0.6	0.5	0.5	1.1	2.6	4.6	4.7	4.7	18hr
Dummy19	0.6	0.6	0.7	0.5	0.5	1.1	2.7	4.8	4.9	4.9	18hr
Dummy36	0.6	0.6	0.7	0.6	0.5	1.2	2.8	5.1	5.1	5.1	18hr
21.01	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.4	18hr
Dummy37	0.6	0.6	0.7	0.6	0.5	1.2	3.0	5.4	5.5	5.5	18hr
Dummy20	0.6	0.6	0.7	0.6	0.6	1.4	3.4	6.1	6.2	6.2	18hr
22.01	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.5	0.5	18hr
17.11	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	18hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	0.6	0.6	0.8	0.7	0.6	1.5	3.8	6.7	6.8	6.8	18hr
17.12	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.3	18hr
Dummy54	0.6	0.6	0.8	0.7	0.6	1.6	3.9	7.0	7.1	7.1	18hr
Dummy38	0.6	0.6	0.8	0.7	0.6	1.6	4.0	7.2	7.3	7.3	18hr
Dummy35	0.6	0.6	0.8	0.7	0.6	1.6	4.1	7.4	7.5	7.5	18hr
Dummy21	0.6	0.6	0.8	0.7	0.6	1.7	4.4	7.8	8.0	8.0	18hr
17.15a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
Dummy39	0.6	0.6	0.8	0.7	0.6	1.8	4.4	8.0	8.2	8.2	18hr
SU3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
Dummy40	0.6	0.8	0.9	0.8	0.7	2.2	5.7	10.1	10.3	10.3	18hr
17.15b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
Dummy41	0.6	0.8	0.9	0.8	0.7	2.3	5.7	10.1	10.3	10.3	18hr
17.16	0.6	0.8	0.9	0.9	0.7	2.3	5.9	10.5	10.7	10.7	18hr
1.18	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
16.01	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	12hr
15.02	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
15.01	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	18hr
14.01	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.5	0.5	12hr
1.17a	0.3	0.3	0.3	0.2	0.2	0.2	0.5	0.8	0.8	0.8	12hr
1.17b	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
1.16	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
1.14	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	30min
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12hr
12.02a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
11.01	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
10.01	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
10.02a	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.7	0.6	0.7	12hr
1.13b	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
1.13a	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	12hr
1.12a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	12hr
5.01	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	18hr
1.11a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	12hr
1.11b	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
1.09b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
1.09c	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.3	12hr
4.01	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
4.02	0.1	0.1	0.1	0.1	0.0	0.2	0.3	0.6	0.5	0.6	12hr
1.06a	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.4	0.4	12hr
1.01	0.0	0.0	0.0	0.0	0.0	0.2	0.6	1.1	1.1	1.1	18hr
1.02	0.0	0.0	0.0	0.0	0.0	0.4	1.1	1.9	2.0	2.0	18hr
2.01	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.4	1.6	1.6	18hr
1.03	0.0	0.0	0.0	0.0	0.0	0.8	2.1	3.6	3.8	3.8	18hr
1.04	0.0	0.0	0.0	0.0	0.0	0.9	2.4	4.2	4.4	4.4	18hr
1.05	0.0	0.0	0.0	0.0	0.0	1.1	3.0	5.2	5.3	5.3	18hr
1.06b	0.3	0.3	0.3	0.2	0.1	1.3	3.4	5.9	6.0	6.0	18hr
Dummy1	0.5	0.4	0.4	0.3	0.2	1.4	3.6	6.3	6.4	6.4	18hr
1.07a	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
1.07b	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.5	0.5	12hr
Dummy2	0.5	0.5	0.5	0.3	0.3	1.6	4.0	7.0	7.1	7.1	18hr
1.08a	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.3	12hr
1.08b	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4	0.3	0.4	12hr
Dummy3	0.5	0.5	0.5	0.3	0.3	1.7	4.2	7.5	7.5	7.5	18hr
3.01	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
1.09a	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4	0.3	0.4	12hr
Dummy60	0.5	0.5	0.5	0.4	0.3	1.8	4.3	7.7	7.7	7.7	18hr
Dummy4	0.5	0.6	0.6	0.4	0.4	2.0	4.7	8.3	8.3	8.3	12hr
SU2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
1.10b	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.5	12hr
Dummy42	0.6	0.6	0.6	0.4	0.4	2.1	4.9	8.7	8.7	8.7	12hr
1.10a	0.6	0.6	0.6	0.4	0.4	2.1	5.0	8.9	8.8	8.9	12hr
Dummy6	0.6	0.6	0.6	0.5	0.4	2.2	5.2	9.1	9.1	9.1	12hr
1.12c	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	12hr
1.12b	0.6	0.7	0.7	0.6	0.6	2.4	5.7	10.1	10.0	10.1	12hr
Dummy7	0.6	0.7	0.7	0.6	0.6	2.5	5.9	10.4	10.4	10.4	12hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
7.07a	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.01	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
7.02	0.3	0.2	0.2	0.1	0.1	0.2	0.5	0.9	0.9	0.9	12hr
7.03	0.4	0.4	0.4	0.3	0.2	0.4	1.0	1.7	1.7	1.7	12hr
7.04	0.5	0.5	0.4	0.3	0.3	0.5	1.2	2.0	2.1	2.1	18hr
7.05	0.5	0.5	0.5	0.4	0.4	0.6	1.5	2.7	2.8	2.8	18hr
7.06	0.5	0.6	0.5	0.4	0.4	0.7	1.7	3.0	3.1	3.1	18hr
8.01	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.5	0.5	12hr
7.07b	0.5	0.6	0.6	0.5	0.4	0.8	2.1	3.7	3.7	3.7	18hr
Dummy12	0.5	0.6	0.6	0.5	0.4	0.9	2.1	3.8	3.8	3.8	18hr
7.08b	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
7.08a	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.09a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	12hr
Dummy11	0.6	0.6	0.6	0.5	0.5	1.0	2.4	4.3	4.3	4.3	18hr
7.09c	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
7.09b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	12hr
Dummy43	0.6	0.6	0.6	0.5	0.5	1.0	2.6	4.6	4.6	4.6	18hr
7.10a	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	18hr
7.10b	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	18hr
Dummy9	0.6	0.6	0.7	0.6	0.5	1.1	2.7	4.9	4.9	4.9	18hr
9.01	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.3	12hr
9.02b	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.4	12hr
9.02a	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
Dummy59	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.7	0.6	0.7	12hr
Dummy8	0.6	0.6	0.7	0.6	0.6	1.2	3.0	5.5	5.5	5.5	12hr
7.12	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.4	0.4	18hr
7.11a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
7.11b	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	12hr
Dummy10	0.6	0.7	0.7	0.7	0.6	1.4	3.3	6.0	6.0	6.0	18hr
12.01a	0.6	0.7	0.8	0.7	0.6	1.4	3.4	6.2	6.2	6.2	18hr
Dummy13	1.0	1.3	1.4	1.4	1.2	4.0	9.6	17.0	17.0	17.0	18hr
12.01b	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
Dummy44	1.0	1.3	1.4	1.4	1.2	4.1	9.6	17.0	17.1	17.1	18hr
Dummy14	1.0	1.3	1.5	1.4	1.3	4.2	9.8	17.4	17.4	17.4	18hr
1.15	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.5	0.5	0.5	12hr
Dummy45	1.0	1.3	1.5	1.4	1.3	4.2	10.0	17.7	17.8	17.8	18hr
Dummy15	1.0	1.3	1.5	1.5	1.4	4.5	10.6	18.5	18.7	18.7	18hr
Dummy46	1.0	1.3	1.5	1.5	1.4	4.5	10.7	18.7	18.9	18.9	18hr
Dummy16	1.0	1.3	1.5	1.6	1.5	4.6	11.0	19.2	19.4	19.4	18hr
Dummy17	1.5	1.8	2.3	2.3	2.2	7.0	17.2	29.8	30.5	30.5	18hr
1.22a	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	30min
1.23	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	18hr
Dummy27	1.9	2.3	2.5	2.7	2.6	7.8	19.2	33.1	34.1	34.1	18hr
1.24	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	18hr
Dummy49	1.9	2.3	2.5	2.7	2.6	7.9	19.3	33.2	34.2	34.2	18hr
Dummy50	1.9	2.3	2.5	2.7	2.6	7.9	19.4	33.4	34.5	34.5	18hr
Dummy51	1.9	2.3	2.5	2.7	2.7	8.1	19.7	33.8	35.0	35.0	18hr
Dummy52	1.9	2.3	2.5	2.7	2.7	8.1	19.8	33.9	35.2	35.2	18hr
Dummy53	1.9	2.3	2.5	2.7	2.7	8.2	20.1	34.4	35.8	35.8	18hr
1.27	1.9	2.3	2.5	2.7	2.7	8.4	20.4	34.8	36.5	36.5	18hr
E18	0.7	0.6	0.6	0.4	0.3	0.2	0.3	0.5	0.5	0.7	30min
1.28	1.9	2.3	2.5	2.7	2.8	8.5	20.6	35.1	37.0	37.0	18hr
Out	2.1	2.4	2.7	2.7	3.0	9.1	21.8	36.5	39.9	39.9	18hr

Table C.8B Estimated 2 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E17b	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy57	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.9	0.8	0.9	12hr
E17c	0.3	0.3	0.3	0.1	0.6	1.0	1.6	2.1	1.9	2.1	12hr
E17d	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E9	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E10	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.6	0.5	0.6	12hr
E3	0.3	0.3	0.3	0.2	0.3	0.5	0.8	0.9	0.7	0.9	12hr
E2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
E1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
Dummy56	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.9	0.7	0.9	12hr
Dummy30	0.5	0.6	0.5	0.4	0.7	1.0	1.6	1.9	1.4	1.9	12hr
E5	0.7	0.8	0.8	0.6	1.0	1.5	2.4	2.9	2.3	2.9	12hr
E6a	0.2	0.1	0.2	0.1	0.2	0.2	0.4	0.4	0.4	0.4	12hr
E6b	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.4	0.5	12hr
Dummy31	0.9	0.9	1.0	0.7	1.3	1.9	3.1	3.8	3.0	3.8	12hr
E8a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	12hr
E7a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	12hr
E7b	0.3	0.3	0.3	0.1	0.3	0.4	0.7	0.9	0.7	0.9	12hr
E8c	0.3	0.3	0.3	0.2	0.4	0.6	1.0	1.1	0.9	1.1	12hr
E8b	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.4	12hr
Dummy32	1.3	1.3	1.2	1.0	1.9	2.8	4.6	5.6	4.5	5.6	12hr
E11a	1.3	1.3	1.2	1.0	2.0	3.0	4.9	5.9	4.7	5.9	12hr
E11b	1.4	1.4	1.3	1.1	2.5	3.6	6.0	7.3	5.9	7.3	12hr
E13	0.0	0.0	0.0	0.1	0.4	0.6	1.0	1.2	0.9	1.2	12hr
E12	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E14	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	12hr
E15b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	12hr
E15a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
Dummy29	0.2	0.2	0.2	0.1	0.3	0.4	0.6	0.7	0.5	0.7	12hr
E16a	0.3	0.3	0.2	0.2	0.4	0.6	1.0	1.3	1.1	1.3	12hr
E16b	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	12hr
Dummy28	1.4	1.5	1.4	1.1	3.4	5.0	8.2	10.1	8.2	10.1	12hr
Dummy33	1.4	1.5	1.5	1.2	4.2	6.2	10.2	12.8	10.5	12.8	12hr
SE5	0.3	0.3	0.3	0.1	0.2	0.3	0.5	0.6	0.5	0.6	12hr
SE1	0.6	0.6	0.6	0.3	0.3	0.2	0.3	0.4	0.3	0.6	30min
SE2	0.0	0.0	0.0	0.1	0.3	0.5	0.8	1.0	0.8	1.0	12hr
SE3	0.3	0.3	0.3	0.1	0.3	0.6	1.0	1.3	1.2	1.3	12hr
SE6a	0.4	0.3	0.3	0.2	0.4	0.7	1.2	1.7	1.6	1.7	12hr
Dummy58	0.9	0.9	0.8	0.5	0.9	1.4	2.3	3.0	2.7	3.0	12hr
SE6b	1.3	1.3	1.3	0.8	1.2	1.8	3.0	3.9	3.5	3.9	12hr
SE_out	1.3	1.3	1.3	0.8	1.2	1.8	3.0	3.9	3.5	3.9	12hr
33.01a	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.4	0.4	0.4	12hr
33.01b	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.6	0.5	0.6	12hr
32.01	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.4	12hr
32.02	0.6	0.6	0.6	0.4	0.3	0.5	0.8	1.1	1.1	1.1	12hr
1.26	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
31.03	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	18hr
30.01	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.5	0.5	0.5	12hr
30.02	0.7	0.6	0.6	0.4	0.3	0.5	0.9	1.3	1.3	1.3	12hr
1.25b	0.7	0.6	0.6	0.4	0.4	0.6	1.0	1.4	1.4	1.4	12hr
1.25a	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	18hr
31.01b	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	12hr
31.01a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
Dummy55	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	12hr
31.02	0.2	0.3	0.3	0.2	0.2	0.3	0.5	0.7	0.6	0.7	12hr
25.06a	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
25.06b	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
25.06c	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	12hr
25.03c	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
25.03b	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	12hr
25.01	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
27.01	0.3	0.3	0.2	0.2	0.2	0.3	0.5	0.7	0.7	0.7	12hr
25.03a	0.3	0.3	0.3	0.2	0.2	0.4	0.6	0.9	0.8	0.9	12hr
26.01a	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	12hr
26.01b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
Dummy47	0.3	0.3	0.3	0.2	0.2	0.3	0.5	0.7	0.7	0.7	12hr
25.02	0.5	0.4	0.4	0.3	0.3	0.5	0.9	1.2	1.2	1.2	12hr
Dummy48	0.7	0.7	0.6	0.5	0.6	0.9	1.5	2.1	2.0	2.1	12hr
Dummy22	0.8	0.7	0.7	0.5	0.6	1.0	1.7	2.4	2.3	2.4	12hr
25.04b	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
25.04a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy23	0.8	0.8	0.7	0.5	0.7	1.2	2.1	2.9	2.7	2.9	12hr
25.05a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
25.05b	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	12hr
28.01	0.5	0.5	0.5	0.3	0.2	0.3	0.5	0.7	0.7	0.7	12hr
28.02	0.7	0.7	0.7	0.5	0.4	0.5	0.8	1.2	1.2	1.2	12hr
Dummy24	1.1	1.3	1.2	1.0	1.1	1.9	3.1	4.4	4.2	4.4	12hr
Dummy25	1.2	1.4	1.3	1.1	1.2	2.1	3.5	4.9	4.7	4.9	12hr
25.07b	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	12hr
29.01	0.4	0.4	0.4	0.2	0.2	0.3	0.6	0.8	0.8	0.8	12hr
29.02	0.6	0.6	0.5	0.4	0.3	0.6	1.0	1.4	1.4	1.4	12hr
25.07a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	12hr
Dummy26	1.6	1.8	1.8	1.4	1.6	2.8	4.7	6.7	6.3	6.7	12hr
1.22b	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	30min
1.20a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
1.20b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
1.21	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.8	0.8	12hr
24.01	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.5	12hr
24.02	0.2	0.2	0.2	0.1	0.3	0.5	0.8	1.2	1.2	1.2	12hr
24.03	0.2	0.3	0.3	0.2	0.4	0.7	1.2	1.8	1.8	1.8	12hr
24.04	0.2	0.3	0.3	0.2	0.5	0.9	1.5	2.2	2.1	2.2	12hr
24.05	0.2	0.3	0.3	0.2	0.7	1.1	1.9	2.7	2.6	2.7	12hr
24.06	0.2	0.3	0.3	0.3	0.8	1.3	2.2	3.2	3.1	3.2	12hr
17.14b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
17.14a	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.6	0.6	12hr
17.13	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
23.01	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
20.01	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.6	0.6	0.6	12hr
17.10a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	12hr
17.10b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.4	0.4	0.4	12hr
17.09	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	18hr
17.08c	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
17.08d	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12hr
18.01	0.2	0.1	0.1	0.1	0.2	0.3	0.6	0.8	0.7	0.8	12hr
18.02	0.2	0.2	0.2	0.1	0.3	0.5	0.9	1.2	1.1	1.2	12hr
17.08b	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
17.08a	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
17.01	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.5	0.4	0.5	12hr
17.02	0.3	0.2	0.2	0.1	0.3	0.5	0.9	1.3	1.3	1.3	12hr
17.03	0.4	0.5	0.5	0.3	0.6	1.1	1.9	2.7	2.6	2.7	12hr
17.04	0.6	0.6	0.7	0.5	0.9	1.6	2.8	4.0	3.9	4.0	12hr
17.06	0.7	0.7	0.7	0.5	1.1	2.0	3.5	5.1	5.1	5.1	12hr
17.07	0.7	0.7	0.8	0.6	1.3	2.4	4.1	6.0	5.9	6.0	12hr
Dummy18	0.7	0.8	0.8	0.7	1.7	3.1	5.3	7.5	7.4	7.5	12hr
Dummy19	0.7	0.8	0.9	0.7	1.8	3.2	5.5	7.9	7.7	7.9	12hr
Dummy36	0.8	0.8	0.9	0.7	1.9	3.4	5.8	8.3	8.2	8.3	12hr
21.01	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.6	0.7	0.7	18hr
Dummy37	0.8	0.8	0.9	0.8	2.1	3.6	6.2	8.9	8.8	8.9	12hr
Dummy20	0.8	0.8	0.9	0.8	2.3	4.1	7.0	10.0	9.9	10.0	12hr
22.01	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.8	0.8	12hr
17.11	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	0.8	0.8	1.0	0.9	2.5	4.5	7.7	11.0	10.9	11.0	12hr
17.12	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	12hr
Dummy54	0.8	0.8	1.0	0.9	2.6	4.6	8.1	11.4	11.3	11.4	12hr
Dummy38	0.8	0.8	1.0	0.9	2.7	4.8	8.3	11.7	11.6	11.7	12hr
Dummy35	0.8	0.8	1.0	0.9	2.8	4.9	8.5	12.0	11.9	12.0	12hr
Dummy21	0.8	0.8	1.0	0.9	3.0	5.2	9.0	12.7	12.6	12.7	12hr
17.15a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy39	0.8	0.8	1.0	0.9	3.0	5.3	9.2	13.0	12.9	13.0	12hr
SU3	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy40	0.8	1.0	1.1	1.1	3.9	6.7	11.5	16.1	16.0	16.1	12hr
17.15b	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
Dummy41	0.8	1.0	1.2	1.1	3.9	6.7	11.6	16.3	16.2	16.3	12hr
17.16	0.8	1.0	1.2	1.1	4.0	7.0	12.0	16.9	16.8	16.9	12hr
1.18	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	18hr
16.01	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
15.02	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.6	0.6	0.6	12hr
15.01	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.5	0.5	0.5	12hr
14.01	0.3	0.3	0.3	0.2	0.2	0.3	0.6	0.8	0.8	0.8	12hr
1.17a	0.4	0.4	0.4	0.3	0.3	0.5	0.9	1.3	1.2	1.3	12hr
1.17b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	12hr
1.16	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.5	0.5	12hr
1.14	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	18hr
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
12.02a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
11.01	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.4	0.5	12hr
10.01	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
10.02a	0.3	0.2	0.3	0.2	0.3	0.5	0.8	1.0	0.8	1.0	12hr
1.13b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
1.13a	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
1.12a	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.4	0.5	12hr
5.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
1.11a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
1.11b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
1.09b	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	12hr
1.09c	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
4.01	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.3	12hr
4.02	0.1	0.1	0.1	0.1	0.3	0.4	0.7	0.9	0.7	0.9	12hr
1.06a	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.7	0.7	0.7	12hr
1.01	0.0	0.0	0.0	0.1	0.4	0.7	1.2	1.8	1.8	1.8	12hr
1.02	0.0	0.0	0.0	0.1	0.7	1.3	2.2	3.3	3.2	3.3	12hr
2.01	0.0	0.0	0.0	0.1	0.5	0.9	1.7	2.5	2.6	2.6	18hr
1.03	0.0	0.0	0.0	0.2	1.4	2.4	4.2	6.1	6.1	6.1	12hr
1.04	0.0	0.0	0.0	0.3	1.6	2.9	4.9	7.1	7.0	7.1	12hr
1.05	0.0	0.0	0.0	0.3	2.0	3.5	6.0	8.7	8.5	8.7	12hr
1.06b	0.4	0.4	0.4	0.4	2.3	4.0	6.8	9.8	9.6	9.8	12hr
Dummy1	0.6	0.6	0.6	0.4	2.4	4.3	7.2	10.4	10.2	10.4	12hr
1.07a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
1.07b	0.2	0.2	0.2	0.1	0.2	0.3	0.6	0.8	0.8	0.8	12hr
Dummy2	0.7	0.7	0.6	0.4	2.7	4.7	8.0	11.4	11.2	11.4	12hr
1.08a	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
1.08b	0.1	0.1	0.1	0.0	0.2	0.2	0.4	0.5	0.5	0.5	12hr
Dummy3	0.7	0.7	0.7	0.5	2.9	5.0	8.5	12.1	11.8	12.1	12hr
3.01	0.1	0.1	0.1	0.0	0.2	0.2	0.4	0.4	0.3	0.4	12hr
1.09a	0.1	0.1	0.1	0.0	0.2	0.3	0.5	0.5	0.4	0.5	12hr
Dummy60	0.7	0.7	0.7	0.5	3.0	5.2	8.8	12.4	12.2	12.4	12hr
Dummy4	0.7	0.7	0.7	0.6	3.3	5.6	9.4	13.2	13.0	13.2	12hr
SU2	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.5	12hr
1.10b	0.0	0.1	0.1	0.0	0.2	0.3	0.5	0.7	0.7	0.7	12hr
Dummy42	0.7	0.8	0.8	0.6	3.4	5.9	9.9	13.8	13.6	13.8	12hr
1.10a	0.7	0.8	0.8	0.6	3.5	6.0	10.0	14.0	13.8	14.0	12hr
Dummy6	0.7	0.8	0.8	0.6	3.6	6.2	10.3	14.4	14.1	14.4	12hr
1.12c	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.4	12hr
1.12b	0.7	0.9	0.9	0.8	4.0	6.8	11.4	15.8	15.4	15.8	12hr
Dummy7	0.7	0.9	0.9	0.8	4.2	7.0	11.8	16.3	15.9	16.3	12hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.07a	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
7.01	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.4	0.5	12hr
7.02	0.3	0.3	0.3	0.2	0.4	0.6	1.1	1.6	1.5	1.6	12hr
7.03	0.5	0.5	0.5	0.3	0.6	1.1	1.9	2.8	2.7	2.8	12hr
7.04	0.6	0.6	0.6	0.4	0.8	1.4	2.4	3.4	3.3	3.4	12hr
7.05	0.6	0.7	0.6	0.5	1.0	1.8	3.2	4.5	4.4	4.5	12hr
7.06	0.6	0.7	0.7	0.5	1.1	2.0	3.5	5.0	4.9	5.0	12hr
8.01	0.2	0.2	0.2	0.1	0.2	0.3	0.6	0.8	0.8	0.8	12hr
7.07b	0.6	0.8	0.8	0.6	1.4	2.5	4.2	6.1	6.0	6.1	12hr
Dummy12	0.7	0.8	0.8	0.6	1.4	2.5	4.4	6.2	6.1	6.2	12hr
7.08b	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
7.08a	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
7.09a	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
Dummy11	0.7	0.8	0.8	0.7	1.6	2.9	5.0	7.1	6.9	7.1	12hr
7.09c	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
7.09b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
Dummy43	0.7	0.8	0.8	0.7	1.8	3.1	5.3	7.5	7.4	7.5	12hr
7.10a	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	18hr
7.10b	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
Dummy9	0.7	0.8	0.9	0.7	1.9	3.3	5.6	8.0	7.8	8.0	12hr
9.01	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.3	12hr
9.02b	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.6	0.5	0.6	12hr
9.02a	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.4	0.5	12hr
Dummy59	0.2	0.2	0.2	0.1	0.3	0.5	0.8	1.1	1.0	1.1	12hr
Dummy8	0.7	0.8	0.9	0.8	2.1	3.6	6.2	8.8	8.6	8.8	12hr
7.12	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.6	0.6	0.6	18hr
7.11a	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.3	12hr
7.11b	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy10	0.8	0.9	1.0	0.9	2.3	4.0	6.8	9.7	9.5	9.7	12hr
12.01a	0.8	0.9	1.0	0.9	2.4	4.2	7.1	10.0	9.8	10.0	12hr
Dummy13	1.3	1.6	1.8	1.7	6.7	11.3	19.3	26.8	26.2	26.8	12hr
12.01b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
Dummy44	1.3	1.6	1.9	1.7	6.7	11.4	19.4	26.9	26.3	26.9	12hr
Dummy14	1.3	1.6	1.9	1.8	6.8	11.6	19.7	27.5	26.8	27.5	12hr
1.15	0.3	0.3	0.3	0.1	0.2	0.3	0.5	0.8	0.7	0.8	12hr
Dummy45	1.3	1.6	1.9	1.8	7.0	11.8	20.1	27.9	27.3	27.9	12hr
Dummy15	1.3	1.6	1.9	1.9	7.3	12.4	21.0	29.1	28.6	29.1	12hr
Dummy46	1.3	1.6	2.0	1.9	7.4	12.5	21.3	29.5	29.0	29.5	12hr
Dummy16	1.3	1.6	2.0	2.0	7.6	12.8	21.9	30.2	29.8	30.2	12hr
Dummy17	1.9	2.4	3.0	2.9	11.7	19.9	34.2	47.0	46.8	47.0	12hr
1.22a	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.3	30min
1.23	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy27	2.4	3.1	3.3	3.4	13.1	22.1	38.1	51.8	52.2	52.2	18hr
1.24	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	18hr
Dummy49	2.4	3.1	3.3	3.4	13.1	22.2	38.2	52.0	52.4	52.4	18hr
Dummy50	2.4	3.1	3.3	3.5	13.2	22.3	38.5	52.3	52.9	52.9	18hr
Dummy51	2.4	3.1	3.3	3.5	13.4	22.6	38.9	52.8	53.6	53.6	18hr
Dummy52	2.4	3.1	3.3	3.6	13.5	22.7	39.1	53.0	53.8	53.8	18hr
Dummy53	2.4	3.1	3.3	3.6	13.7	23.0	39.6	53.7	54.7	54.7	18hr
1.27	2.4	3.1	3.3	3.7	13.9	23.3	40.3	54.4	55.7	55.7	18hr
E18	0.9	0.8	0.8	0.5	0.4	0.3	0.5	0.8	0.7	0.9	30min
1.28	2.4	3.1	3.3	3.8	14.1	23.6	40.7	54.8	56.4	56.4	18hr
Out	2.7	3.2	3.4	4.7	14.9	24.6	42.5	56.6	60.4	60.4	18hr

Table C.8C Estimated 5 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.1	0.3	0.5	0.5	1.0	0.8	0.7	1.0	9hr
E17b	0.0	0.0	0.1	0.3	0.4	0.5	0.9	0.7	0.7	0.9	9hr
Dummy57	0.0	0.0	0.2	0.6	0.9	1.0	1.9	1.5	1.4	1.9	9hr
E17c	0.3	0.3	0.4	1.2	2.1	2.2	4.1	3.4	3.1	4.1	9hr
E17d	0.2	0.1	0.1	0.3	0.6	0.6	1.1	0.9	0.9	1.1	9hr
E9	0.0	0.0	0.2	0.5	0.6	0.6	1.4	1.1	0.9	1.4	9hr
E10	0.3	0.3	0.3	0.3	0.6	0.6	1.1	1.0	0.9	1.1	9hr
E3	0.5	0.4	0.4	0.7	0.9	1.0	2.1	1.6	1.4	2.1	9hr
E2	0.3	0.3	0.3	0.4	0.5	0.5	1.1	0.9	0.7	1.1	9hr
E1	0.2	0.2	0.2	0.3	0.4	0.4	1.0	0.8	0.6	1.0	9hr
Dummy56	0.5	0.4	0.5	0.7	0.9	0.9	2.1	1.7	1.3	2.1	9hr
Dummy30	0.7	0.8	0.7	1.4	1.8	1.9	4.2	3.3	2.6	4.2	9hr
E5	0.9	1.1	1.1	2.0	2.7	3.0	6.1	4.6	4.2	6.1	9hr
E6a	0.2	0.2	0.2	0.3	0.4	0.5	1.0	0.7	0.7	1.0	9hr
E6b	0.2	0.2	0.2	0.3	0.4	0.5	1.0	0.7	0.7	1.0	9hr
Dummy31	1.2	1.2	1.3	2.6	3.6	3.9	7.9	6.0	5.5	7.9	9hr
E8a	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.4	0.4	0.5	9hr
E7a	0.1	0.1	0.1	0.2	0.3	0.3	0.6	0.5	0.4	0.6	9hr
E7b	0.4	0.4	0.4	0.6	0.9	0.9	1.9	1.5	1.3	1.9	9hr
E8c	0.4	0.4	0.4	0.8	1.1	1.2	2.5	1.9	1.7	2.5	9hr
E8b	0.2	0.2	0.2	0.3	0.4	0.4	0.8	0.6	0.6	0.8	9hr
Dummy32	1.7	1.7	1.6	3.9	5.3	5.8	11.6	8.9	8.0	11.6	9hr
E11a	1.7	1.7	1.6	4.1	5.6	6.1	12.3	9.3	8.4	12.3	9hr
E11b	1.8	1.8	1.7	5.0	6.9	7.5	15.0	11.4	10.5	15.0	9hr
E13	0.0	0.0	0.3	0.8	1.1	1.2	2.5	1.9	1.7	2.5	9hr
E12	0.0	0.0	0.2	0.4	0.5	0.4	1.1	1.0	0.6	1.1	9hr
E14	0.2	0.1	0.2	0.2	0.3	0.3	0.8	0.6	0.5	0.8	9hr
E15b	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.2	0.4	9hr
E15a	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.4	9hr
Dummy29	0.3	0.2	0.3	0.5	0.7	0.7	1.5	1.3	1.0	1.5	9hr
E16a	0.3	0.3	0.3	0.8	1.2	1.3	2.5	2.1	1.9	2.5	9hr
E16b	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	9hr
Dummy28	1.9	1.9	2.3	6.8	9.7	10.5	20.6	15.9	14.6	20.6	9hr
Dummy33	1.9	2.0	2.8	8.4	12.3	13.2	25.7	20.1	18.5	25.7	9hr
SE5	0.4	0.3	0.4	0.4	0.6	0.6	1.2	0.9	0.9	1.2	9hr
SE1	0.8	0.7	0.7	0.4	0.4	0.4	0.8	0.6	0.5	0.8	30min
SE2	0.0	0.0	0.2	0.7	1.0	1.1	2.1	1.6	1.5	2.1	9hr
SE3	0.4	0.3	0.3	0.7	1.3	1.4	2.4	2.2	2.0	2.4	9hr
SE6a	0.5	0.4	0.5	0.9	1.6	1.8	3.1	2.8	2.5	3.1	9hr
Dummy58	1.2	1.2	1.1	1.8	2.8	3.0	5.6	4.9	4.4	5.6	9hr
SE6b	1.7	1.6	1.7	2.4	3.7	4.0	7.4	6.5	5.9	7.4	9hr
SE_out	1.7	1.6	1.7	2.4	3.7	4.0	7.4	6.5	5.9	7.4	9hr
33.01a	0.2	0.2	0.2	0.3	0.4	0.5	0.9	0.7	0.6	0.9	9hr
33.01b	0.3	0.3	0.3	0.4	0.5	0.6	1.2	0.9	0.8	1.2	9hr
32.01	0.2	0.2	0.2	0.2	0.4	0.4	0.8	0.6	0.5	0.8	9hr
32.02	0.9	0.9	0.8	0.6	1.0	1.3	1.9	2.3	2.2	2.3	12hr
1.26	0.4	0.4	0.4	0.2	0.4	0.5	0.8	0.9	0.9	0.9	12hr
31.03	0.3	0.3	0.3	0.1	0.2	0.3	0.5	0.6	0.6	0.6	12hr
30.01	0.3	0.3	0.3	0.3	0.5	0.6	1.0	0.9	0.8	1.0	9hr
30.02	0.9	0.7	0.7	0.6	1.2	1.5	2.3	2.3	2.2	2.3	12hr
1.25b	0.9	0.8	0.8	0.7	1.3	1.6	2.6	2.6	2.5	2.6	12hr
1.25a	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.5	0.5	18hr
31.01b	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.3	9hr
31.01a	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.3	0.3	0.5	9hr
Dummy55	0.2	0.2	0.2	0.2	0.3	0.3	0.7	0.5	0.5	0.7	9hr
31.02	0.3	0.4	0.3	0.4	0.6	0.7	1.3	1.2	1.0	1.3	9hr
25.06a	0.3	0.3	0.3	0.2	0.3	0.3	0.5	0.6	0.5	0.6	12hr
25.06b	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.8	0.7	0.8	9hr
25.06c	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	9hr
25.03c	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	9hr
25.03b	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	9hr
25.01	0.2	0.2	0.2	0.2	0.3	0.4	0.7	0.7	0.6	0.7	9hr
27.01	0.4	0.3	0.3	0.4	0.7	0.8	1.4	1.3	1.1	1.4	9hr
25.03a	0.4	0.4	0.4	0.5	0.8	0.9	1.6	1.5	1.3	1.6	9hr
26.01a	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.6	0.5	0.6	9hr
26.01b	0.2	0.2	0.2	0.2	0.4	0.4	0.7	0.7	0.6	0.7	9hr
Dummy47	0.4	0.4	0.4	0.4	0.7	0.8	1.3	1.3	1.1	1.3	9hr
25.02	0.6	0.5	0.6	0.6	1.2	1.4	2.3	2.2	2.0	2.3	9hr
Dummy48	1.0	0.9	0.9	1.1	1.9	2.3	3.8	3.6	3.3	3.8	9hr
Dummy22	1.0	1.0	0.9	1.3	2.2	2.6	4.4	4.2	3.7	4.4	9hr
25.04b	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.4	9hr
25.04a	0.2	0.2	0.2	0.1	0.3	0.3	0.5	0.6	0.5	0.6	12hr
Dummy23	1.1	1.0	0.9	1.5	2.7	3.2	5.4	5.1	4.6	5.4	9hr
25.05a	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
25.05b	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	9hr
28.01	0.7	0.6	0.7	0.4	0.7	0.8	1.3	1.3	1.1	1.3	9hr
28.02	0.9	1.0	0.9	0.6	1.1	1.4	2.2	2.2	2.0	2.2	9hr
Dummy24	1.5	1.7	1.7	2.2	4.1	4.9	8.2	7.9	7.2	8.2	9hr
Dummy25	1.6	1.8	1.8	2.5	4.6	5.4	9.1	8.8	8.0	9.1	9hr
25.07b	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.3	9hr
29.01	0.6	0.6	0.6	0.4	0.8	0.9	1.5	1.5	1.4	1.5	9hr
29.02	0.7	0.8	0.7	0.6	1.3	1.6	2.6	2.6	2.5	2.6	12hr
25.07a	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.4	0.3	0.4	9hr
Dummy26	2.1	2.4	2.4	3.3	6.2	7.4	12.2	12.0	11.0	12.2	9hr
1.22b	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	18hr
1.20a	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.3	9hr
1.20b	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	9hr
1.21	0.2	0.2	0.2	0.3	0.7	0.9	1.4	1.5	1.5	1.5	12hr
24.01	0.1	0.1	0.1	0.2	0.5	0.6	0.9	0.9	0.9	0.9	9hr
24.02	0.3	0.3	0.3	0.5	1.1	1.4	2.2	2.2	2.1	2.2	12hr
24.03	0.3	0.4	0.3	0.8	1.6	2.0	3.2	3.3	3.1	3.3	12hr
24.04	0.3	0.4	0.4	1.1	2.0	2.5	4.0	4.1	3.8	4.1	12hr
24.05	0.3	0.4	0.4	1.3	2.5	3.0	4.9	5.0	4.6	5.0	12hr
24.06	0.3	0.4	0.4	1.6	3.0	3.6	5.9	6.0	5.6	6.0	12hr
17.14b	0.1	0.1	0.1	0.2	0.3	0.3	0.6	0.6	0.5	0.6	9hr
17.14a	0.2	0.2	0.2	0.3	0.5	0.7	1.1	1.1	1.0	1.1	9hr
17.13	0.1	0.1	0.1	0.1	0.3	0.3	0.5	0.6	0.6	0.6	12hr
23.01	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.6	0.7	12hr
20.01	0.0	0.0	0.1	0.3	0.6	0.6	1.1	1.0	0.9	1.1	9hr
17.10a	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.5	12hr
17.10b	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.7	0.7	0.7	12hr
17.09	0.2	0.2	0.2	0.2	0.4	0.5	0.8	1.0	0.9	1.0	12hr
17.08c	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.6	0.5	0.6	9hr
17.08d	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	9hr
18.01	0.2	0.2	0.2	0.4	0.7	0.8	1.4	1.3	1.2	1.4	9hr
18.02	0.3	0.3	0.3	0.6	1.2	1.3	2.2	2.0	1.8	2.2	9hr
17.08b	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	9hr
17.08a	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.6	0.6	0.7	9hr
17.01	0.1	0.1	0.1	0.3	0.5	0.5	0.9	0.8	0.7	0.9	9hr
17.02	0.3	0.3	0.3	0.7	1.2	1.5	2.4	2.4	2.2	2.4	9hr
17.03	0.5	0.6	0.6	1.3	2.5	3.1	4.9	5.2	5.0	5.2	12hr
17.04	0.8	0.8	0.9	1.8	3.6	4.6	7.3	7.8	7.4	7.8	12hr
17.06	0.9	0.9	1.0	2.3	4.7	5.9	9.3	10.2	9.7	10.2	12hr
17.07	0.9	0.9	1.0	2.7	5.5	6.9	10.9	11.9	11.3	11.9	12hr
Dummy18	1.0	1.0	1.1	3.6	7.0	8.6	13.7	14.8	14.0	14.8	12hr
Dummy19	1.0	1.0	1.1	3.8	7.3	8.9	14.2	15.4	14.5	15.4	12hr
Dummy36	1.0	1.1	1.2	4.0	7.6	9.4	15.1	16.3	15.4	16.3	12hr
21.01	0.3	0.3	0.3	0.3	0.6	0.8	1.2	1.4	1.4	1.4	12hr
Dummy37	1.0	1.1	1.2	4.3	8.2	10.2	16.2	17.7	16.8	17.7	12hr
Dummy20	1.0	1.1	1.4	4.8	9.2	11.4	18.2	19.8	18.6	19.8	12hr
22.01	0.3	0.3	0.3	0.3	0.7	0.9	1.4	1.6	1.6	1.6	12hr
17.11	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4	12hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	1.0	1.1	1.5	5.2	10.0	12.5	20.0	21.7	20.5	21.7	12hr
17.12	0.2	0.2	0.2	0.2	0.4	0.6	0.9	1.0	0.9	1.0	12hr
Dummy54	1.0	1.1	1.5	5.5	10.4	13.0	20.8	22.6	21.3	22.6	12hr
Dummy38	1.0	1.1	1.6	5.6	10.7	13.4	21.3	23.2	21.9	23.2	12hr
Dummy35	1.0	1.1	1.6	5.7	10.9	13.7	21.8	23.7	22.4	23.7	12hr
Dummy21	1.0	1.1	1.7	6.1	11.5	14.4	23.0	24.9	23.7	24.9	12hr
17.15a	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.6	0.6	0.6	9hr
Dummy39	1.0	1.1	1.8	6.3	11.8	14.7	23.4	25.4	24.2	25.4	12hr
SU3	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.7	0.7	12hr
Dummy40	1.0	1.3	2.2	7.9	14.7	18.4	29.3	31.6	30.2	31.6	12hr
17.15b	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	9hr
Dummy41	1.0	1.3	2.2	7.9	14.8	18.5	29.5	31.9	30.4	31.9	12hr
17.16	1.0	1.3	2.3	8.2	15.3	19.2	30.7	33.0	31.6	33.0	12hr
1.18	0.1	0.1	0.1	0.1	0.3	0.4	0.6	0.8	0.8	0.8	12hr
16.01	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	9hr
15.02	0.4	0.4	0.3	0.3	0.5	0.7	1.1	1.3	1.2	1.3	12hr
15.01	0.3	0.3	0.3	0.2	0.4	0.5	0.8	0.9	0.9	0.9	12hr
14.01	0.4	0.4	0.4	0.4	0.8	0.9	1.5	1.4	1.3	1.5	9hr
1.17a	0.5	0.5	0.5	0.6	1.2	1.4	2.4	2.3	2.1	2.4	9hr
1.17b	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.4	0.4	0.5	9hr
1.16	0.2	0.2	0.2	0.3	0.5	0.6	1.1	0.9	0.8	1.1	9hr
1.14	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	18hr
12.02b	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	9hr
12.02a	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.5	0.4	0.5	9hr
11.01	0.2	0.2	0.2	0.3	0.5	0.5	1.0	0.8	0.7	1.0	9hr
10.01	0.2	0.2	0.2	0.4	0.5	0.6	1.1	0.8	0.8	1.1	9hr
10.02a	0.4	0.3	0.4	0.6	1.0	1.0	2.0	1.5	1.4	2.0	9hr
1.13b	0.2	0.2	0.2	0.2	0.4	0.5	0.8	0.7	0.6	0.8	9hr
1.13a	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.6	0.5	0.6	9hr
1.12a	0.3	0.2	0.2	0.3	0.5	0.5	1.0	0.8	0.7	1.0	9hr
5.01	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.5	12hr
1.11a	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	9hr
1.11b	0.2	0.2	0.2	0.3	0.4	0.5	0.8	0.7	0.6	0.8	9hr
1.09b	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.3	9hr
1.09c	0.1	0.1	0.1	0.2	0.4	0.4	0.7	0.6	0.5	0.7	9hr
4.01	0.1	0.1	0.1	0.2	0.3	0.3	0.7	0.5	0.5	0.7	9hr
4.02	0.2	0.1	0.2	0.5	0.8	0.9	1.7	1.4	1.3	1.7	9hr
1.06a	0.3	0.3	0.3	0.3	0.7	0.8	1.3	1.3	1.2	1.3	9hr
1.01	0.0	0.0	0.2	0.8	1.6	2.1	3.2	3.7	3.6	3.7	12hr
1.02	0.0	0.0	0.4	1.5	2.9	3.8	5.8	6.4	6.1	6.4	12hr
2.01	0.0	0.0	0.3	1.1	2.2	2.9	4.5	5.5	5.5	5.5	12hr
1.03	0.0	0.0	0.8	2.8	5.5	7.0	10.9	12.6	12.3	12.6	12hr
1.04	0.0	0.0	0.9	3.4	6.4	8.1	12.6	14.4	13.9	14.4	12hr
1.05	0.0	0.0	1.1	4.2	7.9	9.9	15.4	17.3	16.5	17.3	12hr
1.06b	0.5	0.5	1.3	4.7	8.9	11.1	17.4	19.3	18.3	19.3	12hr
Dummy1	0.8	0.8	1.4	5.1	9.5	11.8	18.5	20.5	19.4	20.5	12hr
1.07a	0.1	0.1	0.1	0.2	0.3	0.3	0.6	0.6	0.5	0.6	9hr
1.07b	0.2	0.2	0.2	0.4	0.7	0.9	1.5	1.5	1.4	1.5	12hr
Dummy2	0.9	0.9	1.6	5.6	10.5	12.9	20.3	22.3	21.1	22.3	12hr
1.08a	0.1	0.1	0.1	0.2	0.4	0.4	0.7	0.6	0.6	0.7	9hr
1.08b	0.1	0.1	0.1	0.3	0.5	0.6	1.0	0.9	0.8	1.0	9hr
Dummy3	0.9	0.9	1.7	6.0	11.1	13.6	21.4	23.5	22.2	23.5	12hr
3.01	0.1	0.1	0.1	0.3	0.4	0.5	0.9	0.7	0.6	0.9	9hr
1.09a	0.1	0.1	0.1	0.4	0.5	0.6	1.2	0.9	0.8	1.2	9hr
Dummy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30min
Dummy4	0.9	1.0	2.0	6.7	12.2	14.8	23.5	25.9	24.4	25.9	12hr
SU2	0.0	0.1	0.1	0.3	0.5	0.5	0.9	0.9	0.8	0.9	9hr
1.10b	0.1	0.1	0.1	0.4	0.7	0.8	1.4	1.2	1.1	1.4	9hr
Dummy42	0.9	1.0	2.1	7.1	12.7	15.4	24.5	27.0	25.3	27.0	12hr
1.10a	0.9	1.1	2.1	7.2	12.9	15.6	24.9	27.3	25.7	27.3	12hr
Dummy6	0.9	1.1	2.2	7.4	13.2	16.1	25.5	28.1	26.3	28.1	12hr
1.12c	0.2	0.2	0.2	0.2	0.4	0.4	0.7	0.6	0.6	0.7	9hr
1.12b	0.9	1.2	2.5	8.2	14.4	17.6	27.9	30.5	28.7	30.5	12hr
Dummy7	1.0	1.2	2.6	8.5	14.8	18.1	28.7	31.3	29.5	31.3	12hr
10.02b	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2	9hr
7.07a	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	9hr
7.01	0.0	0.0	0.1	0.3	0.4	0.5	0.9	0.8	0.7	0.9	9hr
7.02	0.4	0.4	0.4	0.7	1.4	1.7	2.8	2.9	2.7	2.9	12hr
7.03	0.7	0.7	0.6	1.4	2.6	3.1	5.1	5.1	4.8	5.1	9hr
7.04	0.8	0.8	0.8	1.6	3.2	3.9	6.3	6.4	5.9	6.4	12hr
7.05	0.8	0.9	0.8	2.2	4.2	5.1	8.3	8.4	7.9	8.4	12hr
7.06	0.8	0.9	0.9	2.4	4.6	5.7	9.2	9.5	8.9	9.5	12hr
8.01	0.3	0.3	0.3	0.4	0.8	1.0	1.5	1.6	1.5	1.6	12hr
7.07b	0.8	1.0	1.1	2.9	5.6	6.9	11.1	11.5	10.8	11.5	12hr
Dummy12	0.8	1.0	1.1	3.0	5.8	7.1	11.4	11.8	11.1	11.8	12hr
7.08b	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.7	0.6	0.7	12hr
7.08a	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	9hr
7.09a	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.6	0.5	0.6	9hr
Dummy11	0.9	1.0	1.1	3.4	6.6	8.0	12.9	13.4	12.5	13.4	12hr
7.09c	0.1	0.1	0.1	0.2	0.4	0.5	0.8	0.8	0.7	0.8	9hr
7.09b	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	9hr
Dummy43	1.0	1.0	1.2	3.7	7.0	8.5	13.7	14.3	13.3	14.3	12hr
7.10a	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.5	12hr
7.10b	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.4	12hr
Dummy9	1.0	1.1	1.2	3.9	7.4	9.0	14.6	15.2	14.2	15.2	12hr
9.01	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.5	0.5	0.7	9hr
9.02b	0.1	0.1	0.1	0.4	0.6	0.6	1.2	1.0	0.9	1.2	9hr
9.02a	0.2	0.1	0.2	0.2	0.4	0.5	0.8	0.8	0.7	0.8	9hr
Dummy59	0.3	0.3	0.3	0.6	1.0	1.1	1.9	1.8	1.6	1.9	9hr
Dummy8	1.0	1.1	1.3	4.3	8.1	9.9	16.0	16.8	15.7	16.8	12hr
7.12	0.5	0.5	0.5	0.3	0.5	0.7	1.0	1.2	1.2	1.2	12hr
7.11a	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.6	0.5	0.7	9hr
7.11b	0.1	0.1	0.1	0.3	0.4	0.5	0.9	0.7	0.7	0.9	9hr
Dummy10	1.0	1.2	1.3	4.8	8.9	10.9	17.5	18.6	17.4	18.6	12hr
12.01a	1.0	1.2	1.4	4.9	9.1	11.3	18.1	19.2	18.0	19.2	12hr
Dummy13	1.7	2.2	4.1	13.7	24.3	30.0	47.5	50.5	48.3	50.5	12hr
12.01b	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	9hr
Dummy44	1.7	2.2	4.1	13.7	24.4	30.1	47.7	50.7	48.5	50.7	12hr
Dummy14	1.7	2.2	4.2	14.0	24.9	30.7	48.6	51.7	49.6	51.7	12hr
1.15	0.4	0.3	0.4	0.4	0.7	0.8	1.4	1.3	1.1	1.4	9hr
Dummy45	1.7	2.2	4.3	14.2	25.2	31.1	49.3	52.4	50.5	52.4	12hr
Dummy15	1.7	2.2	4.5	14.9	26.3	32.5	51.4	54.5	52.9	54.5	12hr
Dummy46	1.7	2.2	4.6	15.1	26.6	32.9	52.1	55.2	53.7	55.2	12hr
Dummy16	1.7	2.2	4.7	15.4	27.2	33.7	53.5	56.7	55.4	56.7	12hr
Dummy17	2.5	3.2	7.0	23.6	42.4	52.9	83.7	89.1	88.0	89.1	12hr
1.22a	0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.4	0.5	0.5	18hr
1.23	0.3	0.2	0.2	0.1	0.3	0.3	0.6	0.6	0.6	0.6	12hr
Dummy27	3.2	4.0	7.8	26.1	46.7	58.5	92.4	98.7	98.6	98.7	12hr
1.24	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.5	0.5	18hr
Dummy49	3.2	4.0	7.8	26.1	46.9	58.7	92.8	99.1	99.0	99.1	12hr
Dummy50	3.2	4.0	7.9	26.3	47.2	59.2	93.4	99.7	100.0	100.0	18hr
Dummy51	3.2	4.0	8.0	26.6	47.7	59.8	94.4	100.7	101.5	101.5	18hr
Dummy52	3.2	4.0	8.0	26.7	47.8	60.0	94.7	100.9	101.9	101.9	18hr
Dummy53	3.2	4.0	8.1	27.0	48.4	60.8	95.8	102.1	103.8	103.8	18hr
1.27	3.2	4.0	8.3	27.4	49.1	61.6	97.1	103.4	105.9	105.9	18hr
E18	1.2	1.1	1.1	0.6	0.7	0.8	1.3	1.4	1.2	1.4	12hr
1.28	3.2	4.0	8.4	27.7	49.5	62.1	97.8	104.0	107.2	107.2	18hr
Out	3.6	4.2	9.0	28.7	51.0	64.3	101.7	107.5	116.7	116.7	18hr

Table C.8D Estimated 20 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.1	0.6	0.8	0.9	1.0	1.8	1.5	1.0	1.8	9hr
E17b	0.0	0.1	0.5	0.8	0.8	0.9	1.6	1.4	0.9	1.6	9hr
Dummy57	0.0	0.2	1.1	1.6	1.7	1.8	3.4	2.9	1.9	3.4	9hr
E17c	0.4	0.4	2.3	3.5	3.8	4.1	7.3	6.1	4.5	7.3	9hr
E17d	0.2	0.2	0.7	1.0	1.0	1.1	2.1	1.8	1.2	2.1	9hr
E9	0.0	0.2	0.8	1.1	1.1	1.3	2.1	2.2	1.4	2.2	12hr
E10	0.4	0.4	0.6	1.0	1.1	1.1	2.1	1.7	1.3	2.1	9hr
E3	0.6	0.6	1.2	1.7	1.7	2.0	3.4	3.4	2.0	3.4	9hr
E2	0.4	0.3	0.7	0.9	0.9	1.0	1.7	1.8	1.1	1.8	12hr
E1	0.3	0.2	0.6	0.8	0.8	0.9	1.5	1.6	1.0	1.6	12hr
Dummy56	0.6	0.6	1.3	1.7	1.6	1.9	3.2	3.4	2.1	3.4	12hr
Dummy30	0.9	1.0	2.5	3.3	3.3	3.9	6.6	6.4	4.1	6.6	9hr
E5	1.2	1.4	3.7	5.0	5.1	5.8	10.3	9.3	5.8	10.3	9hr
E6a	0.3	0.3	0.6	0.8	0.8	0.9	1.7	1.6	0.9	1.7	9hr
E6b	0.3	0.3	0.6	0.8	0.8	0.9	1.7	1.6	0.9	1.7	9hr
Dummy31	1.5	1.6	4.8	6.5	6.8	7.6	13.4	12.1	7.6	13.4	9hr
E8a	0.1	0.1	0.3	0.4	0.5	0.5	0.9	0.9	0.5	0.9	9hr
E7a	0.1	0.1	0.4	0.5	0.5	0.5	0.9	1.0	0.6	1.0	12hr
E7b	0.5	0.5	1.1	1.5	1.5	1.8	3.1	3.1	1.8	3.1	9hr
E8c	0.5	0.5	1.5	2.0	2.1	2.3	4.2	4.0	2.4	4.2	9hr
E8b	0.3	0.2	0.5	0.7	0.7	0.8	1.5	1.4	0.9	1.5	9hr
Dummy32	2.2	2.2	7.1	9.6	10.0	11.2	19.8	17.8	11.1	19.8	9hr
E11a	2.2	2.2	7.4	10.1	10.5	11.8	20.8	18.8	11.7	20.8	9hr
E11b	2.3	2.4	9.1	12.4	12.9	14.5	25.6	23.0	14.5	25.6	9hr
E13	0.0	0.2	1.5	2.1	2.1	2.4	4.3	4.0	2.4	4.3	9hr
E12	0.0	0.2	0.7	0.8	0.8	1.0	1.6	1.7	1.1	1.7	12hr
E14	0.2	0.2	0.5	0.6	0.6	0.7	1.2	1.2	0.7	1.2	12hr
E15b	0.1	0.1	0.2	0.3	0.3	0.3	0.6	0.6	0.4	0.6	12hr
E15a	0.1	0.1	0.3	0.3	0.3	0.4	0.7	0.7	0.4	0.7	12hr
Dummy29	0.4	0.3	0.9	1.2	1.2	1.4	2.5	2.5	1.5	2.5	12hr
E16a	0.4	0.4	1.5	2.1	2.2	2.4	4.5	4.0	2.8	4.5	9hr
E16b	0.0	0.0	0.1	0.2	0.2	0.2	0.4	0.4	0.2	0.4	9hr
Dummy28	2.4	2.7	12.4	17.1	18.0	19.9	35.0	31.2	20.3	35.0	9hr
Dummy33	2.4	3.1	15.2	21.4	22.8	25.1	43.8	38.2	25.8	43.8	9hr
SE5	0.5	0.4	0.7	1.0	1.0	1.2	2.1	2.0	1.2	2.1	9hr
SE1	1.0	1.0	1.0	0.6	0.6	0.7	1.3	1.3	0.8	1.3	12hr
SE2	0.0	0.2	1.3	1.7	1.8	2.0	3.7	3.3	2.1	3.7	9hr
SE3	0.5	0.4	1.3	2.1	2.4	2.6	4.4	3.5	3.0	4.4	9hr
SE6a	0.6	0.6	1.7	2.6	3.0	3.3	5.5	4.4	3.8	5.5	9hr
Dummy58	1.6	1.5	3.3	4.8	5.2	5.6	10.1	8.5	6.5	10.1	9hr
SE6b	2.2	2.1	4.4	6.3	6.9	7.4	13.3	11.4	8.6	13.3	9hr
SE_out	2.2	2.1	4.4	6.3	6.9	7.4	13.3	11.4	8.6	13.3	9hr
33.01a	0.3	0.3	0.5	0.7	0.8	0.9	1.6	1.5	0.9	1.6	9hr
33.01b	0.4	0.4	0.7	1.0	1.0	1.1	2.0	1.9	1.1	2.0	9hr
32.01	0.3	0.2	0.5	0.6	0.7	0.7	1.3	1.3	0.7	1.3	9hr
32.02	1.2	1.1	1.1	1.7	2.0	2.3	3.6	3.5	3.2	3.6	9hr
1.26	0.5	0.5	0.5	0.6	0.9	1.0	1.5	1.4	1.3	1.5	9hr
31.03	0.4	0.3	0.3	0.3	0.5	0.6	0.9	0.9	0.9	0.9	12hr
30.01	0.4	0.4	0.5	0.8	0.9	1.0	1.7	1.4	1.2	1.7	9hr
30.02	1.1	1.0	1.2	1.9	2.4	2.6	4.2	3.4	3.2	4.2	9hr
1.25b	1.2	1.0	1.3	2.1	2.6	2.9	4.7	3.9	3.6	4.7	9hr
1.25a	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.8	0.7	0.8	12hr
31.01b	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.4	12hr
31.01a	0.2	0.2	0.3	0.4	0.4	0.5	0.8	0.8	0.5	0.8	9hr
Dummy55	0.2	0.2	0.4	0.6	0.6	0.7	1.2	1.2	0.7	1.2	9hr
31.02	0.4	0.5	0.7	1.1	1.2	1.3	2.4	2.1	1.6	2.4	9hr
25.06a	0.4	0.4	0.4	0.4	0.5	0.6	1.0	0.8	0.7	1.0	9hr
25.06b	0.5	0.5	0.5	0.7	0.8	0.9	1.5	1.2	1.0	1.5	9hr
25.06c	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.2	0.4	9hr
25.03c	0.1	0.1	0.2	0.3	0.3	0.4	0.6	0.5	0.4	0.6	9hr
25.03b	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.4	9hr
25.01	0.3	0.3	0.3	0.6	0.7	0.8	1.2	1.0	0.9	1.2	9hr
27.01	0.5	0.4	0.8	1.2	1.3	1.4	2.5	2.1	1.7	2.5	9hr
25.03a	0.5	0.5	0.9	1.4	1.5	1.7	2.9	2.4	1.9	2.9	9hr
26.01a	0.2	0.2	0.3	0.5	0.6	0.7	1.1	0.9	0.8	1.1	9hr
26.01b	0.3	0.3	0.4	0.6	0.7	0.8	1.3	1.1	0.9	1.3	9hr
Dummy47	0.5	0.5	0.7	1.1	1.3	1.4	2.4	2.0	1.7	2.4	9hr
25.02	0.8	0.7	1.2	1.9	2.2	2.5	4.1	3.2	3.0	4.1	9hr
Dummy48	1.3	1.2	2.0	3.3	3.7	4.1	6.9	5.6	4.9	6.9	9hr
Dummy22	1.3	1.2	2.4	3.7	4.3	4.7	8.0	6.4	5.6	8.0	9hr
25.04b	0.2	0.1	0.2	0.3	0.4	0.5	0.7	0.6	0.6	0.7	9hr
25.04a	0.2	0.2	0.3	0.4	0.6	0.6	1.0	0.8	0.8	1.0	9hr
Dummy23	1.4	1.3	2.8	4.5	5.2	5.8	9.7	7.7	6.9	9.7	9hr
25.05a	0.1	0.1	0.2	0.3	0.4	0.4	0.7	0.6	0.5	0.7	9hr
25.05b	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.3	0.4	9hr
28.01	0.9	0.8	0.9	1.1	1.3	1.4	2.4	2.0	1.7	2.4	9hr
28.02	1.1	1.3	1.2	1.8	2.2	2.5	4.0	3.2	3.0	4.0	9hr
Dummy24	2.0	2.2	4.1	6.8	8.1	8.9	14.8	11.6	10.6	14.8	9hr
Dummy25	2.1	2.4	4.6	7.6	9.0	9.9	16.5	13.0	11.8	16.5	9hr
25.07b	0.2	0.2	0.2	0.3	0.3	0.3	0.6	0.5	0.4	0.6	9hr
29.01	0.8	0.7	0.8	1.3	1.5	1.7	2.7	2.2	2.1	2.7	9hr
29.02	0.9	1.1	1.3	2.1	2.6	2.9	4.6	3.9	3.6	4.6	9hr
25.07a	0.2	0.2	0.2	0.3	0.4	0.4	0.7	0.6	0.5	0.7	9hr
Dummy26	2.7	3.1	6.1	10.2	12.2	13.5	22.2	17.3	16.0	22.2	9hr
1.22b	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.5	0.5	12hr
1.20a	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.4	0.4	0.5	9hr
1.20b	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.3	0.4	9hr
1.21	0.3	0.3	0.7	1.1	1.5	1.6	2.6	2.3	2.1	2.6	9hr
24.01	0.2	0.2	0.5	0.8	1.0	1.1	1.7	1.3	1.3	1.7	9hr
24.02	0.3	0.4	1.0	1.8	2.2	2.4	3.9	3.3	3.0	3.9	9hr
24.03	0.4	0.5	1.6	2.7	3.4	3.7	5.9	4.9	4.5	5.9	9hr
24.04	0.4	0.5	2.0	3.3	4.1	4.4	7.2	5.9	5.5	7.2	9hr
24.05	0.4	0.6	2.5	4.1	5.0	5.4	8.9	7.2	6.7	8.9	9hr
24.06	0.4	0.6	3.0	4.9	6.0	6.5	10.7	8.7	8.1	10.7	9hr
17.14b	0.1	0.1	0.3	0.5	0.6	0.6	1.1	0.9	0.7	1.1	9hr
17.14a	0.2	0.2	0.6	0.9	1.1	1.2	2.0	1.5	1.5	2.0	9hr
17.13	0.1	0.1	0.2	0.4	0.6	0.6	1.0	0.9	0.8	1.0	9hr
23.01	0.1	0.1	0.3	0.5	0.6	0.7	1.1	1.0	0.9	1.1	9hr
20.01	0.0	0.1	0.6	0.9	1.1	1.2	2.0	1.6	1.3	2.0	9hr
17.10a	0.1	0.1	0.2	0.4	0.5	0.5	0.9	0.7	0.7	0.9	9hr
17.10b	0.2	0.1	0.3	0.6	0.7	0.8	1.2	1.1	1.0	1.2	9hr
17.09	0.2	0.2	0.4	0.7	0.9	1.0	1.6	1.5	1.3	1.6	9hr
17.08c	0.1	0.1	0.3	0.6	0.6	0.7	1.2	0.9	0.8	1.2	9hr
17.08d	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	9hr
18.01	0.3	0.3	0.8	1.2	1.4	1.5	2.6	2.0	1.8	2.6	9hr
18.02	0.4	0.4	1.3	1.9	2.2	2.4	4.0	3.3	2.8	4.0	9hr
17.08b	0.1	0.1	0.2	0.4	0.4	0.5	0.8	0.7	0.5	0.8	9hr
17.08a	0.1	0.1	0.4	0.6	0.7	0.7	1.2	1.0	0.9	1.2	9hr
17.01	0.1	0.1	0.5	0.8	0.9	0.9	1.7	1.4	1.0	1.7	9hr
17.02	0.4	0.4	1.3	2.0	2.4	2.7	4.3	3.5	3.2	4.3	9hr
17.03	0.7	0.8	2.4	4.0	5.1	5.6	8.9	7.7	7.0	8.9	9hr
17.04	1.0	1.1	3.5	6.0	7.6	8.3	13.2	11.5	10.4	13.2	9hr
17.06	1.2	1.2	4.3	7.5	9.8	10.9	17.0	15.2	13.7	17.0	9hr
17.07	1.2	1.3	5.1	8.8	11.4	12.7	19.9	17.7	16.0	19.9	9hr
Dummy18	1.3	1.5	6.7	11.2	14.2	15.6	24.6	21.8	19.7	24.6	9hr
Dummy19	1.3	1.5	7.0	11.6	14.7	16.2	25.6	22.7	20.5	25.6	9hr
Dummy36	1.3	1.6	7.4	12.3	15.6	17.3	27.1	24.1	21.8	27.1	9hr
21.01	0.3	0.3	0.5	0.9	1.3	1.5	2.2	2.3	2.1	2.3	12hr
Dummy37	1.3	1.6	7.8	13.1	16.9	18.8	29.3	26.4	23.8	29.3	9hr
Dummy20	1.3	1.8	8.9	14.7	18.9	21.0	32.8	29.4	26.6	32.8	9hr
22.01	0.4	0.3	0.7	1.1	1.5	1.7	2.7	2.5	2.2	2.7	9hr
17.11	0.1	0.1	0.2	0.3	0.4	0.5	0.8	0.7	0.6	0.8	9hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	1.3	1.9	9.7	16.1	20.7	23.1	36.0	32.3	29.3	36.0	9hr
17.12	0.2	0.2	0.4	0.7	1.0	1.1	1.7	1.5	1.3	1.7	9hr
Dummy54	1.3	2.0	10.0	16.7	21.6	24.1	37.5	33.6	30.6	37.5	9hr
Dummy38	1.3	2.0	10.3	17.1	22.1	24.8	38.5	34.5	31.4	38.5	9hr
Dummy35	1.3	2.0	10.5	17.5	22.7	25.4	39.4	35.3	32.2	39.4	9hr
Dummy21	1.3	2.1	11.1	18.5	23.9	26.9	41.5	37.2	34.2	41.5	9hr
17.15a	0.1	0.1	0.3	0.5	0.6	0.7	1.2	0.9	0.9	1.2	9hr
Dummy39	1.3	2.2	11.4	18.8	24.3	27.4	42.2	37.9	35.0	42.2	9hr
SU3	0.1	0.1	0.3	0.5	0.7	0.7	1.2	1.1	0.9	1.2	9hr
Dummy40	1.3	2.6	14.2	23.4	30.4	34.2	52.6	46.8	43.5	52.6	9hr
17.15b	0.1	0.1	0.2	0.3	0.3	0.4	0.6	0.5	0.4	0.6	9hr
Dummy41	1.3	2.6	14.3	23.6	30.6	34.5	52.9	47.1	43.9	52.9	9hr
17.16	1.3	2.7	14.8	24.4	31.8	35.8	54.9	48.8	45.8	54.9	9hr
1.18	0.2	0.2	0.2	0.5	0.7	0.8	1.2	1.2	1.1	1.2	12hr
16.01	0.1	0.1	0.2	0.4	0.4	0.4	0.8	0.7	0.5	0.8	9hr
15.02	0.5	0.5	0.5	0.9	1.1	1.3	2.0	2.0	1.8	2.0	12hr
15.01	0.4	0.4	0.4	0.7	0.9	1.0	1.5	1.4	1.3	1.5	9hr
14.01	0.5	0.5	0.8	1.3	1.5	1.7	2.7	2.2	2.0	2.7	9hr
1.17a	0.7	0.6	1.2	2.0	2.4	2.6	4.2	3.3	3.1	4.2	9hr
1.17b	0.2	0.1	0.2	0.4	0.4	0.5	0.8	0.7	0.6	0.8	9hr
1.16	0.3	0.3	0.6	0.9	1.0	1.1	2.0	1.7	1.2	2.0	9hr
1.14	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.4	18hr
12.02b	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	9hr
12.02a	0.2	0.2	0.3	0.5	0.5	0.6	1.0	0.8	0.7	1.0	9hr
11.01	0.3	0.2	0.6	0.8	0.9	0.9	1.8	1.6	1.0	1.8	9hr
10.01	0.3	0.3	0.7	0.9	1.0	1.1	1.9	1.8	1.1	1.9	9hr
10.02a	0.5	0.4	1.2	1.7	1.8	1.9	3.6	3.2	2.0	3.6	9hr
1.13b	0.3	0.3	0.4	0.7	0.8	0.8	1.4	1.2	1.0	1.4	9hr
1.13a	0.2	0.2	0.3	0.5	0.6	0.6	1.1	0.9	0.8	1.1	9hr
1.12a	0.3	0.3	0.6	0.8	0.9	1.0	1.8	1.6	1.1	1.8	9hr
5.01	0.1	0.1	0.2	0.3	0.5	0.5	0.8	0.7	0.7	0.8	9hr
1.11a	0.1	0.1	0.3	0.4	0.4	0.4	0.8	0.7	0.4	0.8	9hr
1.11b	0.3	0.3	0.5	0.7	0.8	0.8	1.5	1.3	0.9	1.5	9hr
1.09b	0.0	0.0	0.2	0.3	0.3	0.3	0.6	0.5	0.3	0.6	9hr
1.09c	0.1	0.1	0.4	0.6	0.7	0.7	1.3	1.2	0.8	1.3	9hr
4.01	0.1	0.1	0.4	0.6	0.6	0.6	1.1	1.1	0.7	1.1	9hr
4.02	0.2	0.2	1.0	1.4	1.5	1.7	3.1	2.7	1.8	3.1	9hr
1.06a	0.4	0.4	0.7	1.1	1.3	1.5	2.4	1.9	1.8	2.4	9hr
1.01	0.0	0.2	1.5	2.6	3.5	4.0	6.0	5.7	5.1	6.0	9hr
1.02	0.0	0.4	2.7	4.7	6.1	6.8	10.6	9.6	8.5	10.6	9hr
2.01	0.0	0.3	1.9	3.4	4.9	5.9	8.5	8.8	8.1	8.8	12hr
1.03	0.0	0.7	5.3	8.8	11.7	13.3	20.3	19.5	17.6	20.3	9hr
1.04	0.0	0.9	6.2	10.2	13.5	15.1	23.3	22.1	19.8	23.3	9hr
1.05	0.0	1.1	7.6	12.6	16.2	18.0	28.2	26.2	23.5	28.2	9hr
1.06b	0.7	1.2	8.7	14.2	18.1	20.2	31.8	29.2	26.1	31.8	9hr
Dummy1	1.0	1.3	9.3	15.2	19.3	21.5	33.9	30.9	27.7	33.9	9hr
1.07a	0.1	0.1	0.3	0.5	0.6	0.6	1.1	0.9	0.7	1.1	9hr
1.07b	0.3	0.3	0.7	1.2	1.5	1.7	2.7	2.2	2.1	2.7	9hr
Dummy2	1.1	1.5	10.2	16.7	21.0	23.5	37.1	33.7	30.2	37.1	9hr
1.08a	0.1	0.1	0.4	0.6	0.7	0.7	1.3	1.1	0.8	1.3	9hr
1.08b	0.1	0.1	0.6	0.9	1.0	1.0	1.9	1.5	1.2	1.9	9hr
Dummy3	1.2	1.6	10.9	17.7	22.1	24.8	39.1	35.6	31.9	39.1	9hr
3.01	0.1	0.1	0.6	0.8	0.8	0.9	1.6	1.5	0.9	1.6	9hr
1.09a	0.1	0.1	0.7	1.0	1.0	1.1	2.0	1.9	1.1	2.0	9hr
Dummy60	1.2	1.7	11.2	18.1	22.7	25.5	40.0	36.6	32.7	40.0	9hr
Dummy4	1.2	1.9	12.1	19.3	24.2	27.2	42.6	39.1	35.0	42.6	9hr
SU2	0.1	0.1	0.5	0.8	0.9	1.0	1.7	1.4	1.2	1.7	9hr
1.10b	0.1	0.1	0.8	1.2	1.3	1.4	2.5	2.1	1.7	2.5	9hr
Dummy42	1.2	2.0	12.6	20.2	25.3	28.3	44.3	40.7	36.5	44.3	9hr
1.10a	1.2	2.0	12.8	20.5	25.6	28.7	44.8	41.2	37.0	44.8	9hr
Dummy6	1.2	2.1	13.1	21.0	26.3	29.5	45.9	42.3	38.1	45.9	9hr
1.12c	0.3	0.2	0.4	0.6	0.7	0.7	1.3	1.1	0.8	1.3	9hr
1.12b	1.2	2.4	14.4	22.8	28.6	32.1	49.8	45.9	41.7	49.8	9hr
Dummy7	1.3	2.5	14.9	23.4	29.4	33.0	51.1	47.1	43.2	51.1	9hr
10.02b	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	12hr
7.07a	0.1	0.1	0.2	0.3	0.3	0.4	0.7	0.6	0.4	0.7	9hr
7.01	0.0	0.1	0.5	0.7	0.8	0.9	1.6	1.3	1.0	1.6	9hr
7.02	0.6	0.5	1.4	2.3	2.9	3.1	5.0	4.1	3.8	5.0	9hr
7.03	0.9	0.9	2.5	4.2	5.2	5.7	9.0	7.2	6.8	9.0	9hr
7.04	1.0	1.0	3.1	5.1	6.4	7.0	11.2	9.1	8.5	11.2	9hr
7.05	1.1	1.2	4.1	6.8	8.4	9.3	14.8	12.0	11.3	14.8	9hr
7.06	1.1	1.2	4.4	7.5	9.5	10.4	16.6	13.6	12.7	16.6	9hr
8.01	0.4	0.4	0.7	1.2	1.6	1.7	2.7	2.3	2.2	2.7	9hr
7.07b	1.1	1.4	5.4	9.1	11.4	12.6	20.1	16.6	15.4	20.1	9hr
Dummy12	1.1	1.4	5.6	9.3	11.7	12.9	20.5	17.0	15.8	20.5	9hr
7.08b	0.2	0.2	0.3	0.6	0.7	0.8	1.2	1.0	0.9	1.2	9hr
7.08a	0.1	0.1	0.2	0.3	0.4	0.4	0.7	0.6	0.5	0.7	9hr
7.09a	0.1	0.1	0.3	0.5	0.6	0.7	1.2	0.9	0.8	1.2	9hr
Dummy11	1.2	1.5	6.4	10.5	13.2	14.6	23.2	19.2	17.9	23.2	9hr
7.09c	0.2	0.2	0.4	0.7	0.8	0.9	1.4	1.1	1.0	1.4	9hr
7.09b	0.0	0.0	0.1	0.2	0.2	0.2	0.4	0.3	0.2	0.4	9hr
Dummy43	1.3	1.6	6.8	11.2	14.1	15.5	24.7	20.5	19.1	24.7	9hr
7.10a	0.1	0.1	0.2	0.3	0.5	0.6	0.9	0.8	0.7	0.9	9hr
7.10b	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.7	0.6	0.7	9hr
Dummy9	1.3	1.7	7.1	11.8	15.0	16.5	26.2	21.9	20.3	26.2	9hr
9.01	0.1	0.1	0.4	0.6	0.6	0.7	1.3	1.1	0.7	1.3	9hr
9.02b	0.2	0.2	0.7	1.0	1.1	1.2	2.1	1.8	1.3	2.1	9hr
9.02a	0.2	0.2	0.4	0.7	0.8	0.9	1.5	1.2	1.1	1.5	9hr
Dummy59	0.4	0.4	1.1	1.7	1.9	2.0	3.6	3.0	2.4	3.6	9hr
Dummy8	1.3	1.8	7.9	13.0	16.5	18.2	28.7	24.2	22.5	28.7	9hr
7.12	0.6	0.6	0.6	0.8	1.1	1.3	2.0	2.0	1.8	2.0	12hr
7.11a	0.1	0.1	0.4	0.6	0.6	0.7	1.2	1.0	0.7	1.2	9hr
7.11b	0.2	0.2	0.5	0.8	0.8	0.9	1.6	1.4	1.0	1.6	9hr
Dummy10	1.3	1.9	8.6	14.1	18.1	20.1	31.5	26.9	24.9	31.5	9hr
12.01a	1.3	2.0	8.9	14.6	18.7	20.8	32.5	27.8	25.8	32.5	9hr
Dummy13	2.3	3.9	24.1	38.4	48.9	54.6	84.0	74.6	70.3	84.0	9hr
12.01b	0.1	0.1	0.2	0.3	0.3	0.4	0.7	0.6	0.4	0.7	9hr
Dummy44	2.3	3.9	24.2	38.5	49.1	54.8	84.2	74.8	70.6	84.2	9hr
Dummy14	2.3	4.1	24.6	39.1	50.0	56.0	85.6	76.3	72.5	85.6	9hr
1.15	0.5	0.4	0.8	1.2	1.4	1.5	2.5	2.1	1.7	2.5	9hr
Dummy45	2.3	4.2	24.9	39.6	50.7	56.9	86.7	77.4	73.9	86.7	9hr
Dummy15	2.3	4.5	26.0	41.1	52.8	59.6	89.9	80.6	78.1	89.9	9hr
Dummy46	2.3	4.5	26.2	41.5	53.4	60.4	91.0	81.6	79.2	91.0	9hr
Dummy16	2.3	4.6	26.8	42.4	54.8	62.2	93.4	83.9	81.9	93.4	9hr
Dummy17	3.3	7.2	41.2	66.1	86.4	98.7	146.5	133.1	129.3	146.5	9hr
1.22a	0.6	0.5	0.5	0.4	0.3	0.5	0.7	0.8	0.9	0.9	18hr
1.23	0.3	0.3	0.3	0.4	0.6	0.7	1.0	0.9	0.8	1.0	9hr
Dummy27	4.1	8.1	45.1	72.6	95.3	110.0	160.7	148.8	145.7	160.7	9hr
1.24	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.8	0.8	0.8	12hr
Dummy49	4.1	8.1	45.3	72.8	95.6	110.4	161.2	149.4	146.3	161.2	9hr
Dummy50	4.1	8.2	45.5	73.2	96.2	111.1	162.2	150.5	147.8	162.2	9hr
Dummy51	4.1	8.3	45.9	73.8	97.1	112.3	163.6	152.2	150.2	163.6	9hr
Dummy52	4.1	8.4	46.0	74.0	97.3	112.6	164.0	152.6	150.8	164.0	9hr
Dummy53	4.1	8.5	46.6	74.8	98.4	114.0	165.9	154.7	153.6	165.9	9hr
1.27	4.1	8.7	47.2	75.7	99.6	115.5	168.0	157.3	156.9	168.0	9hr
E18	1.5	1.4	1.5	1.1	1.4	1.5	2.5	2.1	1.8	2.5	9hr
1.28	4.1	8.9	47.5	76.1	100.2	116.3	169.0	158.7	159.1	169.0	9hr
Out	4.7	10.0	48.7	77.8	102.8	120.9	175.6	170.7	174.3	175.6	9hr

Table C.8E Estimated 100 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.3	1.1	1.7	1.7	1.7	2.0	2.3	2.3	1.8	2.3	12hr
E17b	0.3	1.0	1.6	1.6	1.5	1.8	2.1	2.1	1.7	2.1	12hr
Dummy57	0.7	2.2	3.2	3.3	3.2	3.8	4.4	4.5	3.5	4.5	12hr
E17c	1.4	4.3	6.9	7.5	7.3	8.2	9.9	9.7	7.5	9.9	9hr
E17d	0.5	1.2	2.0	2.0	2.0	2.3	2.7	2.7	2.1	2.7	12hr
E9	0.7	1.8	2.3	2.2	2.3	2.6	2.6	2.8	2.2	2.8	12hr
E10	0.5	1.2	1.9	2.1	2.1	2.3	2.8	2.8	2.2	2.8	12hr
E3	1.1	2.6	3.5	3.5	3.3	4.1	4.2	4.5	3.5	4.5	12hr
E2	0.6	1.4	1.9	1.8	1.8	2.1	2.1	2.3	1.8	2.3	12hr
E1	0.5	1.3	1.7	1.6	1.6	1.8	1.8	2.0	1.5	2.0	12hr
Dummy56	1.2	2.7	3.5	3.4	3.5	3.9	4.0	4.4	3.3	4.4	12hr
Dummy30	2.1	5.3	7.0	6.8	6.8	8.0	8.1	8.5	6.7	8.5	12hr
E5	2.8	7.4	10.3	10.2	9.7	11.9	13.0	13.1	10.3	13.1	12hr
E6a	0.5	1.2	1.7	1.6	1.5	2.0	2.0	2.2	1.7	2.2	12hr
E6b	0.5	1.2	1.7	1.7	1.5	2.0	2.1	2.2	1.7	2.2	12hr
Dummy31	3.6	9.6	13.5	13.4	12.7	15.6	17.1	17.0	13.5	17.1	9hr
E8a	0.3	0.7	1.0	0.9	0.9	1.1	1.2	1.2	1.0	1.2	12hr
E7a	0.3	0.8	1.0	1.0	1.0	1.1	1.1	1.2	0.9	1.2	12hr
E7b	0.9	2.4	3.2	3.2	3.1	3.7	3.8	4.1	3.2	4.1	12hr
E8c	1.2	3.1	4.3	4.2	4.1	4.9	5.1	5.4	4.2	5.4	12hr
E8b	0.4	1.0	1.5	1.5	1.4	1.7	1.9	2.0	1.5	2.0	12hr
Dummy32	5.2	14.0	19.9	19.8	18.7	23.0	25.1	25.0	20.0	25.1	9hr
E11a	5.4	14.7	21.0	20.8	19.7	24.2	26.4	26.3	21.0	26.4	9hr
E11b	6.7	17.9	25.5	25.6	24.1	29.6	32.6	32.3	25.7	32.6	9hr
E13	1.1	3.0	4.3	4.2	4.0	5.1	5.3	5.6	4.4	5.6	12hr
E12	0.6	1.5	1.9	1.7	1.9	1.9	1.9	2.1	1.6	2.1	12hr
E14	0.4	1.0	1.2	1.2	1.2	1.5	1.5	1.6	1.2	1.6	12hr
E15b	0.2	0.5	0.7	0.6	0.7	0.7	0.7	0.8	0.6	0.8	12hr
E15a	0.2	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.7	0.9	12hr
Dummy29	0.8	2.0	2.6	2.6	2.6	3.0	3.0	3.2	2.5	3.2	12hr
E16a	1.1	3.1	4.3	4.4	4.1	5.1	6.0	6.0	4.7	6.0	12hr
E16b	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	12hr
Dummy28	9.2	24.0	34.5	35.5	33.5	40.3	44.9	43.6	35.2	44.9	9hr
Dummy33	11.0	29.1	43.1	44.9	42.7	50.3	56.3	53.9	43.7	56.3	9hr
SE5	0.6	1.4	2.1	2.1	1.9	2.5	2.6	2.8	2.2	2.8	12hr
SE1	1.2	1.2	1.3	1.3	1.2	1.5	1.6	1.7	1.3	1.7	12hr
SE2	0.9	2.5	3.6	3.6	3.4	4.2	4.6	4.8	3.7	4.8	12hr
SE3	0.9	2.4	4.1	4.6	4.7	5.0	6.3	6.2	4.7	6.3	9hr
SE6a	1.1	3.0	5.2	5.9	5.9	6.3	7.9	7.8	5.9	7.9	9hr
Dummy58	2.2	6.2	9.4	10.2	10.1	11.2	13.9	13.7	10.6	13.9	9hr
SE6b	2.9	8.2	12.5	13.6	13.3	15.0	18.5	18.2	14.0	18.5	9hr
SE_out	2.9	8.2	12.5	13.6	13.3	15.0	18.5	18.2	14.0	18.5	9hr
33.01a	0.4	1.1	1.5	1.5	1.5	1.8	2.0	2.1	1.6	2.1	12hr
33.01b	0.6	1.4	2.0	2.0	1.8	2.4	2.6	2.7	2.1	2.7	12hr
32.01	0.4	0.9	1.3	1.3	1.2	1.6	1.7	1.8	1.4	1.8	12hr
32.02	1.4	2.0	3.4	3.8	4.0	4.2	5.7	5.4	4.6	5.7	9hr
1.26	0.6	0.7	1.3	1.6	1.7	1.8	2.3	2.2	1.9	2.3	9hr
31.03	0.4	0.4	0.8	1.0	1.1	1.2	1.5	1.4	1.3	1.5	9hr
30.01	0.5	1.0	1.6	1.8	1.8	2.0	2.5	2.5	1.9	2.5	9hr
30.02	1.3	2.1	3.9	4.5	4.6	4.8	6.3	6.1	4.4	6.3	9hr
1.25b	1.4	2.3	4.3	5.0	5.1	5.4	7.0	6.7	5.0	7.0	9hr
1.25a	0.4	0.4	0.6	0.8	0.9	0.9	1.2	1.2	1.0	1.2	9hr
31.01b	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	12hr
31.01a	0.2	0.6	0.8	0.8	0.8	1.0	1.0	1.1	0.8	1.1	12hr
Dummy55	0.4	0.9	1.2	1.2	1.2	1.5	1.5	1.6	1.3	1.6	12hr
31.02	0.6	1.5	2.2	2.4	2.3	2.7	3.3	3.3	2.5	3.3	9hr
25.06a	0.5	0.5	0.9	1.0	1.1	1.1	1.5	1.4	1.1	1.5	9hr
25.06b	0.6	0.8	1.4	1.5	1.5	1.6	2.1	2.1	1.6	2.1	9hr
25.06c	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.4	0.6	12hr
25.03c	0.2	0.3	0.6	0.7	0.7	0.7	0.9	0.9	0.7	0.9	9hr
25.03b	0.1	0.2	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.6	12hr
25.01	0.3	0.6	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
27.01	0.6	1.4	2.3	2.6	2.5	2.8	3.5	3.4	2.6	3.5	9hr
25.03a	0.6	1.6	2.7	3.0	3.0	3.2	4.1	4.0	3.1	4.1	9hr
26.01a	0.3	0.6	1.1	1.2	1.2	1.3	1.6	1.6	1.2	1.6	9hr
26.01b	0.3	0.7	1.3	1.4	1.4	1.5	1.9	1.9	1.4	1.9	9hr
Dummy47	0.6	1.3	2.3	2.6	2.6	2.8	3.5	3.5	2.6	3.5	9hr
25.02	1.0	2.1	3.9	4.4	4.4	4.8	6.0	5.9	4.4	6.0	9hr
Dummy48	1.6	3.8	6.6	7.4	7.4	8.0	10.1	9.9	7.4	10.1	9hr
Dummy22	1.7	4.3	7.5	8.5	8.5	9.1	11.5	11.2	8.5	11.5	9hr
25.04b	0.2	0.4	0.7	0.8	0.8	0.8	1.1	1.1	0.8	1.1	9hr
25.04a	0.3	0.5	0.9	1.1	1.1	1.2	1.5	1.4	1.0	1.5	9hr
Dummy23	2.1	5.1	9.1	10.3	10.3	11.1	14.0	13.5	10.3	14.0	9hr
25.05a	0.2	0.3	0.6	0.7	0.7	0.8	1.0	1.0	0.7	1.0	9hr
25.05b	0.1	0.2	0.4	0.5	0.5	0.5	0.7	0.7	0.5	0.7	9hr
28.01	1.0	1.3	2.3	2.5	2.5	2.7	3.4	3.4	2.6	3.4	9hr
28.02	1.5	2.0	3.7	4.3	4.4	4.6	5.9	5.7	4.3	5.9	9hr
Dummy24	3.1	7.5	13.8	15.8	15.9	17.0	21.4	20.3	15.5	21.4	9hr
Dummy25	3.5	8.4	15.3	17.5	17.7	18.9	23.7	22.5	17.2	23.7	9hr
25.07b	0.2	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	12hr
29.01	0.9	1.4	2.6	2.9	3.0	3.1	4.0	3.9	2.9	4.0	9hr
29.02	1.4	2.2	4.3	5.0	5.1	5.4	6.9	6.6	4.9	6.9	9hr
25.07a	0.3	0.4	0.7	0.8	0.7	0.8	1.0	1.0	0.8	1.0	12hr
Dummy26	4.5	11.0	20.5	23.6	23.9	25.5	31.9	29.9	23.1	31.9	9hr
1.22b	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.8	12hr
1.20a	0.1	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
1.20b	0.1	0.2	0.4	0.4	0.4	0.4	0.6	0.6	0.4	0.6	12hr
1.21	0.5	1.2	2.4	2.8	2.9	3.1	3.9	3.7	2.9	3.9	9hr
24.01	0.3	0.8	1.6	1.8	1.9	2.0	2.5	2.4	1.8	2.5	9hr
24.02	0.6	1.8	3.6	4.3	4.4	4.6	5.8	5.5	4.2	5.8	9hr
24.03	0.9	2.8	5.4	6.4	6.5	6.9	8.7	8.2	6.2	8.7	9hr
24.04	1.2	3.6	6.6	7.8	7.9	8.3	10.6	10.0	7.6	10.6	9hr
24.05	1.6	4.6	8.2	9.5	9.7	10.2	13.1	12.4	9.4	13.1	9hr
24.06	1.8	5.4	9.7	11.4	11.6	12.3	15.7	14.7	11.2	15.7	9hr
17.14b	0.2	0.6	1.0	1.1	1.1	1.2	1.6	1.5	1.2	1.6	9hr
17.14a	0.4	1.0	1.8	2.1	2.1	2.3	2.9	2.8	2.1	2.9	9hr
17.13	0.2	0.4	0.9	1.1	1.2	1.2	1.5	1.4	1.2	1.5	9hr
23.01	0.2	0.5	1.0	1.2	1.3	1.3	1.7	1.6	1.3	1.7	9hr
20.01	0.3	1.1	1.9	2.1	2.1	2.3	2.8	2.8	2.1	2.8	9hr
17.10a	0.2	0.4	0.8	0.9	0.9	1.0	1.3	1.2	0.9	1.3	9hr
17.10b	0.2	0.6	1.1	1.4	1.4	1.5	1.9	1.8	1.4	1.9	9hr
17.09	0.3	0.7	1.3	1.7	1.8	1.9	2.4	2.2	2.0	2.4	9hr
17.08c	0.2	0.6	1.1	1.3	1.2	1.4	1.7	1.7	1.3	1.7	9hr
17.08d	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12hr
18.01	0.5	1.3	2.4	2.7	2.7	2.9	3.7	3.6	2.7	3.7	9hr
18.02	0.8	2.2	3.9	4.3	4.2	4.6	5.8	5.7	4.3	5.8	9hr
17.08b	0.2	0.4	0.8	0.8	0.8	0.9	1.1	1.1	0.9	1.1	9hr
17.08a	0.2	0.7	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
17.01	0.3	1.0	1.6	1.7	1.7	1.9	2.3	2.3	1.7	2.3	12hr
17.02	0.8	2.2	4.1	4.6	4.7	5.0	6.4	6.1	4.6	6.4	9hr
17.03	1.4	4.2	8.1	9.6	9.9	10.5	13.5	12.6	10.0	13.5	9hr
17.04	2.1	6.2	11.8	14.3	14.8	15.7	20.1	18.6	15.0	20.1	9hr
17.06	2.6	7.8	15.0	18.4	19.2	20.4	26.0	23.9	19.8	26.0	9hr
17.07	3.1	9.1	17.4	21.4	22.5	23.8	30.3	27.7	23.0	30.3	9hr
Dummy18	4.2	12.0	22.1	26.5	27.7	29.3	37.5	34.5	28.2	37.5	9hr
Dummy19	4.4	12.6	23.0	27.5	28.8	30.4	39.0	35.8	29.3	39.0	9hr
Dummy36	4.6	13.2	24.3	29.1	30.5	32.3	41.3	37.8	31.2	41.3	9hr
21.01	0.4	0.9	1.8	2.4	2.7	2.8	3.5	3.3	3.0	3.5	9hr
Dummy37	4.9	14.0	26.0	31.5	33.2	35.1	44.8	40.7	34.1	44.8	9hr
Dummy20	5.5	15.8	29.1	35.1	36.9	39.1	50.0	45.2	37.9	50.0	9hr
22.01	0.5	1.2	2.4	2.8	3.0	3.2	4.0	3.7	3.2	4.0	9hr
17.11	0.1	0.3	0.7	0.8	0.9	0.9	1.2	1.1	0.9	1.2	9hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	6.0	17.3	31.7	38.3	40.6	43.0	54.8	49.2	41.7	54.8	9hr
17.12	0.3	0.8	1.5	1.8	1.9	2.0	2.5	2.4	1.9	2.5	9hr
Dummy54	6.2	18.0	32.9	39.8	42.3	44.8	57.0	51.0	43.4	57.0	9hr
Dummy38	6.4	18.4	33.7	40.9	43.5	46.0	58.5	52.2	44.5	58.5	9hr
Dummy35	6.5	18.8	34.5	41.8	44.5	47.1	59.9	53.3	45.6	59.9	9hr
Dummy21	7.0	19.9	36.2	43.8	46.9	49.6	62.9	55.8	48.2	62.9	9hr
17.15a	0.2	0.6	1.1	1.2	1.3	1.3	1.7	1.7	1.2	1.7	9hr
Dummy39	7.2	20.2	36.8	44.5	47.8	50.6	64.0	56.7	49.2	64.0	9hr
SU3	0.2	0.5	1.1	1.3	1.3	1.4	1.8	1.7	1.4	1.8	9hr
Dummy40	9.0	25.1	45.9	55.5	59.2	62.9	79.4	69.7	60.9	79.4	9hr
17.15b	0.1	0.3	0.6	0.7	0.7	0.7	0.9	0.9	0.7	0.9	9hr
Dummy41	9.1	25.3	46.1	55.8	59.6	63.3	79.9	70.1	61.4	79.9	9hr
17.16	9.4	26.1	47.7	57.8	62.0	65.8	82.8	72.7	63.8	82.8	9hr
1.18	0.2	0.4	1.0	1.2	1.4	1.5	1.9	1.7	1.6	1.9	9hr
16.01	0.2	0.4	0.7	0.8	0.7	0.9	1.0	1.1	0.8	1.1	12hr
15.02	0.6	1.0	1.8	2.1	2.2	2.4	3.2	3.0	2.7	3.2	9hr
15.01	0.5	0.7	1.4	1.7	1.8	1.9	2.4	2.3	1.9	2.4	9hr
14.01	0.6	1.4	2.5	2.9	2.9	3.1	4.0	3.9	2.9	4.0	9hr
1.17a	0.9	2.1	4.0	4.5	4.6	4.9	6.2	6.0	4.5	6.2	9hr
1.17b	0.2	0.4	0.8	0.9	0.9	1.0	1.2	1.2	0.9	1.2	9hr
1.16	0.5	1.2	1.9	2.0	1.9	2.2	2.6	2.7	2.1	2.7	12hr
1.14	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.7	12hr
12.02b	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	12hr
12.02a	0.2	0.5	0.9	1.0	1.0	1.1	1.4	1.4	1.1	1.4	9hr
11.01	0.4	1.1	1.7	1.7	1.6	2.0	2.2	2.3	1.8	2.3	12hr
10.01	0.5	1.3	1.9	1.9	1.7	2.3	2.4	2.5	2.0	2.5	12hr
10.02a	0.8	2.3	3.5	3.4	3.3	4.1	4.5	4.6	3.6	4.6	12hr
1.13b	0.4	0.8	1.4	1.5	1.5	1.6	2.1	2.1	1.5	2.1	9hr
1.13a	0.3	0.6	1.0	1.2	1.2	1.2	1.6	1.6	1.2	1.6	9hr
1.12a	0.4	1.1	1.7	1.8	1.7	2.0	2.4	2.4	1.9	2.4	12hr
5.01	0.2	0.3	0.7	0.9	0.9	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	0.2	0.5	0.8	0.8	0.7	0.9	1.0	1.0	0.8	1.0	12hr
1.11b	0.4	0.9	1.4	1.5	1.5	1.7	2.1	2.1	1.6	2.1	12hr
1.09b	0.1	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.7	12hr
1.09c	0.3	0.8	1.3	1.3	1.2	1.5	1.7	1.7	1.4	1.7	12hr
4.01	0.3	0.9	1.2	1.2	1.1	1.4	1.4	1.5	1.2	1.5	12hr
4.02	0.7	2.0	3.0	3.0	2.9	3.5	4.0	4.1	3.2	4.1	12hr
1.06a	0.5	1.2	2.2	2.5	2.6	2.7	3.5	3.4	2.5	3.5	9hr
1.01	0.9	2.5	5.3	6.5	7.0	7.4	9.3	8.5	7.4	9.3	9hr
1.02	1.7	4.9	9.4	11.5	12.0	12.7	16.3	15.2	12.4	16.3	9hr
2.01	1.1	3.3	7.0	9.1	10.2	10.8	13.6	12.5	11.6	13.6	9hr
1.03	3.2	9.2	17.8	21.9	23.3	24.7	31.7	29.3	25.4	31.7	9hr
1.04	3.8	10.9	20.8	25.2	26.6	28.1	36.4	33.7	28.7	36.4	9hr
1.05	4.7	13.5	25.1	30.4	31.8	33.5	43.8	40.5	34.0	43.8	9hr
1.06b	5.3	15.4	28.2	34.1	35.6	37.5	48.9	44.9	37.7	48.9	9hr
Dummy1	5.7	16.5	30.1	36.4	37.9	39.9	52.1	47.8	39.9	52.1	9hr
1.07a	0.2	0.6	1.0	1.2	1.2	1.3	1.6	1.5	1.2	1.6	9hr
1.07b	0.5	1.3	2.5	2.9	2.9	3.1	3.9	3.8	2.8	3.9	9hr
Dummy2	6.3	18.1	33.0	39.8	41.4	43.7	56.9	52.1	43.3	56.9	9hr
1.08a	0.3	0.7	1.2	1.3	1.3	1.4	1.8	1.8	1.4	1.8	9hr
1.08b	0.4	1.1	1.7	1.9	1.9	2.1	2.5	2.5	2.0	2.5	9hr
Dummy3	6.8	19.3	34.8	41.8	43.6	45.9	59.9	54.6	45.6	59.9	9hr
3.01	0.4	1.1	1.6	1.6	1.4	1.9	2.0	2.1	1.6	2.1	12hr
1.09a	0.5	1.4	2.0	2.0	1.9	2.4	2.5	2.6	2.0	2.6	12hr
Dummy60	7.2	20.0	35.6	42.8	44.7	47.1	61.4	55.9	46.8	61.4	9hr
Dummy4	8.0	21.5	37.5	45.3	47.6	50.2	65.1	58.7	50.0	65.1	9hr
SU2	0.4	0.9	1.6	1.8	1.8	1.9	2.4	2.4	1.8	2.4	9hr
1.10b	0.5	1.4	2.4	2.6	2.6	2.8	3.5	3.5	2.7	3.5	9hr
Dummy42	8.4	22.6	39.0	47.1	49.5	52.2	67.5	60.6	51.9	67.5	9hr
1.10a	8.6	22.9	39.5	47.6	50.1	52.8	68.3	61.2	52.6	68.3	9hr
Dummy6	8.9	23.5	40.5	48.7	51.4	54.2	69.8	62.4	54.0	69.8	9hr
1.12c	0.3	0.8	1.2	1.3	1.3	1.5	1.8	1.8	1.4	1.8	12hr
1.12b	9.8	25.4	43.8	52.4	56.0	59.1	75.3	66.6	58.9	75.3	9hr
Dummy7	10.2	26.0	44.8	53.6	57.6	60.9	77.2	68.4	60.8	77.2	9hr
10.02b	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	0.2	0.4	0.7	0.7	0.7	0.8	0.9	0.9	0.7	0.9	12hr
7.01	0.3	0.9	1.5	1.7	1.6	1.8	2.2	2.2	1.7	2.2	9hr
7.02	0.8	2.5	4.7	5.4	5.5	5.8	7.6	7.1	5.3	7.6	9hr
7.03	1.5	4.5	8.4	9.7	9.9	10.5	13.4	12.7	9.4	13.4	9hr
7.04	1.8	5.5	10.3	12.1	12.3	13.1	16.7	15.6	11.8	16.7	9hr
7.05	2.4	7.2	13.4	15.9	16.3	17.3	22.0	20.5	15.5	22.0	9hr
7.06	2.6	7.9	14.9	17.9	18.4	19.5	24.7	23.0	17.7	24.7	9hr
8.01	0.5	1.3	2.6	3.0	3.0	3.2	4.1	3.9	3.0	4.1	9hr
7.07b	3.2	9.6	18.0	21.6	22.3	23.6	29.9	27.6	21.4	29.9	9hr
Dummy12	3.4	9.9	18.5	22.1	22.8	24.1	30.6	28.3	21.9	30.6	9hr
7.08b	0.2	0.6	1.1	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
7.08a	0.2	0.4	0.7	0.8	0.8	0.8	1.0	1.0	0.8	1.0	9hr
7.09a	0.2	0.6	1.1	1.3	1.3	1.4	1.7	1.7	1.3	1.7	9hr
Dummy11	3.9	11.3	20.8	24.9	25.7	27.2	34.5	31.8	24.8	34.5	9hr
7.09c	0.3	0.7	1.3	1.5	1.5	1.6	2.1	2.1	1.5	2.1	9hr
7.09b	0.1	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	12hr
Dummy43	4.2	12.1	22.1	26.4	27.3	28.9	36.7	33.7	26.4	36.7	9hr
7.10a	0.2	0.4	0.8	0.9	1.0	1.1	1.3	1.2	1.1	1.3	9hr
7.10b	0.1	0.3	0.6	0.8	0.8	0.9	1.1	1.0	0.8	1.1	9hr
Dummy9	4.4	12.8	23.4	28.1	29.1	30.8	39.0	35.6	28.2	39.0	9hr
9.01	0.3	0.8	1.2	1.2	1.2	1.4	1.6	1.7	1.3	1.7	12hr
9.02b	0.4	1.3	2.0	2.1	2.1	2.4	2.8	2.8	2.2	2.8	12hr
9.02a	0.3	0.8	1.4	1.6	1.6	1.7	2.2	2.2	1.6	2.2	9hr
Dummy59	0.7	2.0	3.4	3.7	3.6	4.0	5.1	5.0	3.8	5.1	9hr
Dummy8	5.0	14.1	25.6	30.6	31.9	33.8	42.6	38.6	31.1	42.6	9hr
7.12	0.8	0.8	1.6	2.1	2.3	2.4	3.0	2.8	2.6	3.0	9hr
7.11a	0.3	0.7	1.2	1.2	1.2	1.3	1.6	1.6	1.3	1.6	12hr
7.11b	0.4	1.0	1.6	1.6	1.6	1.8	2.2	2.2	1.7	2.2	12hr
Dummy10	5.5	15.3	27.8	33.6	35.2	37.3	46.8	42.0	34.7	46.8	9hr
12.01a	5.7	15.8	28.7	34.6	36.4	38.6	48.3	43.2	35.9	48.3	9hr
Dummy13	16.0	41.5	73.3	88.7	94.5	100.7	125.9	110.5	97.9	125.9	9hr
12.01b	0.2	0.4	0.7	0.7	0.7	0.8	0.9	1.0	0.7	1.0	12hr
Dummy44	16.0	41.6	73.5	88.9	94.9	101.1	126.3	110.8	98.3	126.3	9hr
Dummy14	16.3	42.2	74.5	90.3	96.7	103.2	128.6	112.7	100.8	128.6	9hr
1.15	0.6	1.3	2.4	2.6	2.6	2.9	3.6	3.5	2.7	3.6	9hr
Dummy45	16.6	42.7	75.3	91.4	98.2	104.9	130.3	114.6	102.7	130.3	9hr
Dummy15	17.3	44.1	77.6	94.4	102.2	109.7	135.3	120.3	108.2	135.3	9hr
Dummy46	17.5	44.5	78.4	95.4	103.5	111.2	136.8	122.2	109.8	136.8	9hr
Dummy16	17.9	45.3	80.1	97.6	106.4	114.6	140.3	126.8	113.8	140.3	9hr
Dummy17	27.0	69.1	124.5	152.8	168.4	180.5	218.9	196.6	179.4	218.9	9hr
1.22a	0.8	0.7	0.7	0.7	0.9	1.0	1.2	1.4	1.4	1.4	12hr
1.23	0.4	0.5	0.9	1.1	1.2	1.2	1.6	1.5	1.2	1.6	9hr
Dummy27	29.6	75.3	135.0	166.4	186.8	200.0	240.8	221.0	201.8	240.8	9hr
1.24	0.4	0.4	0.6	0.8	0.9	1.0	1.2	1.2	1.1	1.2	12hr
Dummy49	29.7	75.5	135.4	166.9	187.5	200.8	241.6	222.1	202.8	241.6	9hr
Dummy50	29.9	75.9	136.0	167.6	188.6	202.4	243.1	224.6	205.4	243.1	9hr
Dummy51	30.2	76.5	136.8	168.7	190.2	204.7	245.3	228.6	209.6	245.3	9hr
Dummy52	30.2	76.7	137.1	169.1	190.6	205.3	245.9	229.6	210.7	245.9	9hr
Dummy53	30.6	77.6	138.3	170.5	192.6	207.8	248.7	234.2	215.8	248.7	9hr
1.27	31.0	78.5	139.6	172.1	194.9	210.9	251.9	239.3	221.6	251.9	9hr
E18	1.8	1.8	2.3	2.6	2.7	2.8	3.6	3.7	2.8	3.7	12hr
1.28	31.2	78.9	140.1	172.8	195.9	212.4	253.5	243.1	226.0	253.5	9hr
Out	32.1	80.4	142.0	175.5	201.1	223.5	264.4	271.5	260.4	271.5	12hr

Table C.8F Estimated 200 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.6	1.4	1.9	1.8	1.7	2.1	2.4	2.3	1.8	2.4	9hr
E17b	0.5	1.3	1.8	1.7	1.6	1.9	2.2	2.1	1.6	2.2	9hr
Dummy57	1.1	2.7	3.7	3.5	3.3	4.0	4.5	4.4	3.4	4.5	9hr
E17c	2.2	5.5	7.8	8.0	7.7	8.5	10.2	9.5	7.3	10.2	9hr
E17d	0.7	1.6	2.2	2.2	2.1	2.4	2.8	2.6	2.1	2.8	9hr
E9	1.1	2.3	2.6	2.4	2.5	2.7	2.7	2.8	2.1	2.8	12hr
E10	0.7	1.5	2.2	2.3	2.2	2.3	2.9	2.7	2.1	2.9	9hr
E3	1.6	3.3	3.9	3.7	3.5	4.2	4.3	4.4	3.4	4.4	12hr
E2	0.9	1.9	2.1	1.9	1.9	2.2	2.2	2.3	1.8	2.3	12hr
E1	0.8	1.7	1.9	1.7	1.8	1.9	1.9	2.0	1.5	2.0	12hr
Dummy56	1.7	3.5	4.1	3.7	3.7	4.0	4.1	4.3	3.3	4.3	12hr
Dummy30	3.1	6.7	7.9	7.4	7.2	8.3	8.4	8.3	6.6	8.4	9hr
E5	4.2	9.4	11.6	11.0	10.3	12.3	13.5	12.8	10.1	13.5	9hr
E6a	0.7	1.5	1.9	1.8	1.6	2.0	2.1	2.1	1.7	2.1	12hr
E6b	0.7	1.5	1.9	1.8	1.7	2.1	2.2	2.2	1.7	2.2	12hr
Dummy31	5.4	12.2	15.3	14.5	13.5	16.1	17.7	16.7	13.2	17.7	9hr
E8a	0.4	0.9	1.1	1.0	0.9	1.1	1.2	1.2	0.9	1.2	12hr
E7a	0.5	1.0	1.2	1.0	1.1	1.2	1.2	1.2	0.9	1.2	12hr
E7b	1.3	3.1	3.6	3.4	3.3	3.8	4.0	4.0	3.1	4.0	12hr
E8c	1.7	4.0	4.7	4.5	4.3	5.1	5.3	5.3	4.1	5.3	9hr
E8b	0.6	1.3	1.7	1.6	1.5	1.8	2.0	2.0	1.5	2.0	9hr
Dummy32	7.8	17.9	22.5	21.4	19.9	23.8	26.0	24.5	19.5	26.0	9hr
E11a	8.1	18.8	23.6	22.5	21.0	25.0	27.4	25.7	20.5	27.4	9hr
E11b	10.0	22.7	28.7	27.7	25.7	30.7	33.8	31.6	25.1	33.8	9hr
E13	1.6	3.9	4.9	4.6	4.3	5.3	5.5	5.5	4.3	5.5	9hr
E12	1.0	1.9	2.1	1.9	2.1	2.0	2.0	2.1	1.5	2.1	4.5hr
E14	0.6	1.2	1.4	1.3	1.3	1.5	1.5	1.6	1.2	1.6	12hr
E15b	0.3	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.6	0.8	12hr
E15a	0.3	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.7	0.9	12hr
Dummy29	1.2	2.6	2.9	2.7	2.7	3.1	3.1	3.2	2.5	3.2	12hr
E16a	1.7	3.9	4.9	4.8	4.4	5.3	6.2	5.9	4.6	6.2	9hr
E16b	0.1	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.5	9hr
Dummy28	13.7	30.5	38.8	38.2	35.6	41.6	46.5	42.8	34.4	46.5	9hr
Dummy33	16.5	36.9	48.2	48.2	45.2	51.9	58.4	52.8	42.8	58.4	9hr
SE5	0.9	1.9	2.4	2.3	2.1	2.6	2.7	2.7	2.1	2.7	9hr
SE1	1.3	1.4	1.4	1.3	1.3	1.5	1.6	1.7	1.3	1.7	12hr
SE2	1.3	3.2	4.1	3.8	3.5	4.4	4.8	4.7	3.6	4.8	9hr
SE3	1.3	3.1	4.7	5.0	4.9	5.2	6.6	6.1	4.5	6.6	9hr
SE6a	1.6	3.8	5.9	6.4	6.2	6.5	8.2	7.6	5.7	8.2	9hr
Dummy58	3.3	7.9	10.7	11.0	10.5	11.6	14.4	13.4	10.3	14.4	9hr
SE6b	4.4	10.6	14.2	14.6	13.9	15.5	19.2	17.8	13.6	19.2	9hr
SE_out	4.4	10.6	14.2	14.6	13.9	15.5	19.2	17.8	13.6	19.2	9hr
33.01a	0.6	1.4	1.8	1.7	1.5	1.9	2.1	2.1	1.6	2.1	9hr
33.01b	0.8	1.8	2.3	2.1	2.0	2.5	2.6	2.7	2.0	2.7	12hr
32.01	0.5	1.2	1.5	1.4	1.3	1.6	1.7	1.7	1.3	1.7	9hr
32.02	1.6	2.6	3.8	4.1	4.2	4.3	6.0	5.2	4.5	6.0	9hr
1.26	0.7	0.8	1.4	1.7	1.8	1.9	2.4	2.1	1.8	2.4	9hr
31.03	0.5	0.5	0.9	1.1	1.2	1.2	1.5	1.4	1.2	1.5	9hr
30.01	0.6	1.2	1.9	2.0	1.9	2.1	2.6	2.5	1.8	2.6	9hr
30.02	1.5	2.7	4.4	4.9	4.8	5.0	6.5	5.9	4.3	6.5	9hr
1.25b	1.6	3.0	4.9	5.4	5.4	5.6	7.3	6.6	4.9	7.3	9hr
1.25a	0.4	0.4	0.7	0.8	0.9	1.0	1.2	1.1	1.0	1.2	9hr
31.01b	0.2	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.5	12hr
31.01a	0.3	0.7	0.9	0.9	0.8	1.0	1.1	1.1	0.8	1.1	12hr
Dummy55	0.5	1.1	1.4	1.3	1.2	1.5	1.6	1.6	1.2	1.6	12hr
31.02	0.8	1.9	2.5	2.5	2.4	2.8	3.4	3.2	2.4	3.4	9hr
25.06a	0.5	0.7	1.0	1.1	1.1	1.1	1.5	1.4	1.0	1.5	9hr
25.06b	0.7	1.1	1.6	1.7	1.6	1.7	2.2	2.1	1.6	2.2	9hr
25.06c	0.2	0.3	0.5	0.4	0.4	0.5	0.6	0.6	0.4	0.6	12hr
25.03c	0.2	0.4	0.7	0.7	0.7	0.7	0.9	0.9	0.6	0.9	9hr
25.03b	0.2	0.3	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.6	9hr
25.01	0.4	0.8	1.3	1.4	1.4	1.5	1.9	1.8	1.3	1.9	9hr
27.01	0.8	1.9	2.6	2.7	2.6	2.8	3.7	3.4	2.5	3.7	9hr
25.03a	0.9	2.2	3.0	3.2	3.1	3.3	4.3	3.9	3.0	4.3	9hr
26.01a	0.4	0.8	1.2	1.3	1.2	1.3	1.7	1.6	1.2	1.7	9hr
26.01b	0.4	0.9	1.4	1.5	1.4	1.5	2.0	1.8	1.4	2.0	9hr
Dummy47	0.8	1.8	2.6	2.8	2.7	2.9	3.7	3.4	2.5	3.7	9hr
25.02	1.2	2.8	4.4	4.8	4.7	4.9	6.3	5.7	4.2	6.3	9hr
Dummy48	2.1	5.0	7.4	8.0	7.8	8.2	10.5	9.7	7.2	10.5	9hr
Dummy22	2.4	5.7	8.5	9.1	8.9	9.4	12.0	11.0	8.3	12.0	9hr
25.04b	0.2	0.5	0.8	0.9	0.8	0.9	1.1	1.1	0.8	1.1	9hr
25.04a	0.3	0.6	1.0	1.2	1.1	1.2	1.6	1.4	1.0	1.6	9hr
Dummy23	2.8	6.8	10.3	11.1	10.9	11.5	14.6	13.2	10.0	14.6	9hr
25.05a	0.2	0.4	0.7	0.8	0.8	0.8	1.1	1.0	0.7	1.1	9hr
25.05b	0.1	0.3	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.7	9hr
28.01	1.2	1.6	2.5	2.7	2.7	2.8	3.6	3.4	2.5	3.6	9hr
28.02	1.8	2.6	4.2	4.6	4.6	4.8	6.2	5.6	4.1	6.2	9hr
Dummy24	4.0	9.9	15.6	17.0	16.7	17.6	22.2	19.8	15.1	22.2	9hr
Dummy25	4.5	11.1	17.2	18.9	18.5	19.5	24.6	22.0	16.7	24.6	9hr
25.07b	0.3	0.4	0.6	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
29.01	1.0	1.9	2.9	3.1	3.1	3.2	4.2	3.8	2.8	4.2	9hr
29.02	1.6	3.0	4.8	5.4	5.4	5.6	7.2	6.4	4.8	7.2	9hr
25.07a	0.3	0.5	0.8	0.8	0.8	0.8	1.1	1.0	0.7	1.1	9hr
Dummy26	6.0	14.6	23.1	25.4	25.0	26.3	33.2	29.2	22.4	33.2	9hr
1.22b	0.3	0.3	0.3	0.5	0.6	0.6	0.8	0.8	0.8	0.8	12hr
1.20a	0.2	0.3	0.6	0.6	0.6	0.6	0.8	0.7	0.6	0.8	9hr
1.20b	0.1	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.4	0.6	9hr
1.21	0.7	1.5	2.7	3.0	3.1	3.2	4.1	3.6	2.9	4.1	9hr
24.01	0.5	1.1	1.8	2.0	2.0	2.0	2.6	2.4	1.7	2.6	9hr
24.02	1.0	2.4	4.1	4.6	4.6	4.7	6.1	5.4	4.1	6.1	9hr
24.03	1.5	3.7	6.1	6.9	6.9	7.1	9.1	8.0	6.1	9.1	9hr
24.04	2.0	4.7	7.5	8.4	8.3	8.6	11.1	9.8	7.4	11.1	9hr
24.05	2.5	6.0	9.3	10.2	10.1	10.5	13.6	12.1	9.1	13.6	9hr
24.06	2.9	7.0	11.0	12.2	12.2	12.7	16.3	14.3	10.9	16.3	9hr
17.14b	0.3	0.8	1.2	1.2	1.2	1.3	1.6	1.5	1.1	1.6	9hr
17.14a	0.5	1.3	2.1	2.3	2.2	2.3	3.0	2.7	2.0	3.0	9hr
17.13	0.2	0.6	1.0	1.2	1.2	1.3	1.6	1.4	1.2	1.6	9hr
23.01	0.3	0.7	1.2	1.3	1.3	1.4	1.8	1.6	1.2	1.8	9hr
20.01	0.6	1.4	2.1	2.3	2.2	2.4	2.9	2.7	2.1	2.9	9hr
17.10a	0.2	0.6	0.9	1.0	1.0	1.0	1.4	1.2	0.9	1.4	9hr
17.10b	0.3	0.7	1.3	1.5	1.5	1.5	2.0	1.8	1.4	2.0	9hr
17.09	0.4	0.9	1.5	1.8	1.9	2.0	2.5	2.2	1.9	2.5	9hr
17.08c	0.3	0.8	1.3	1.3	1.3	1.4	1.8	1.6	1.2	1.8	9hr
17.08d	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12hr
18.01	0.8	1.8	2.7	2.9	2.8	3.0	3.8	3.5	2.6	3.8	9hr
18.02	1.2	3.0	4.3	4.6	4.4	4.8	6.0	5.5	4.2	6.0	9hr
17.08b	0.2	0.6	0.9	0.9	0.9	0.9	1.2	1.1	0.8	1.2	9hr
17.08a	0.4	0.9	1.3	1.4	1.4	1.5	1.9	1.7	1.3	1.9	9hr
17.01	0.5	1.2	1.8	1.8	1.7	1.9	2.3	2.2	1.7	2.3	9hr
17.02	1.2	3.0	4.6	5.0	4.9	5.1	6.6	6.0	4.4	6.6	9hr
17.03	2.2	5.5	9.2	10.4	10.4	10.8	14.1	12.3	9.8	14.1	9hr
17.04	3.2	8.0	13.5	15.4	15.6	16.2	20.9	18.1	14.7	20.9	9hr
17.06	4.0	10.1	17.0	19.9	20.2	21.1	27.2	23.3	19.4	27.2	9hr
17.07	4.7	11.9	19.8	23.2	23.6	24.6	31.6	27.0	22.5	31.6	9hr
Dummy18	6.4	15.6	25.0	28.7	29.1	30.2	39.1	33.6	27.6	39.1	9hr
Dummy19	6.7	16.3	26.1	29.8	30.2	31.3	40.7	34.9	28.7	40.7	9hr
Dummy36	7.0	17.2	27.5	31.6	32.0	33.3	43.1	36.9	30.5	43.1	9hr
21.01	0.5	1.2	2.1	2.6	2.8	2.9	3.7	3.2	3.0	3.7	9hr
Dummy37	7.4	18.3	29.5	34.1	34.8	36.2	46.8	39.7	33.4	46.8	9hr
Dummy20	8.4	20.7	32.8	37.9	38.7	40.3	52.1	44.1	37.1	52.1	9hr
22.01	0.7	1.5	2.7	3.1	3.2	3.3	4.2	3.6	3.1	4.2	9hr
17.11	0.2	0.5	0.8	0.9	0.9	0.9	1.2	1.1	0.8	1.2	9hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	9.2	22.5	35.8	41.4	42.6	44.4	57.1	48.0	40.8	57.1	9hr
17.12	0.4	1.0	1.7	2.0	2.0	2.0	2.6	2.4	1.9	2.6	9hr
Dummy54	9.5	23.4	37.1	43.1	44.4	46.2	59.5	49.7	42.5	59.5	9hr
Dummy38	9.8	24.0	38.0	44.2	45.6	47.4	61.0	50.9	43.6	61.0	9hr
Dummy35	10.0	24.5	38.9	45.2	46.7	48.6	62.4	52.0	44.7	62.4	9hr
Dummy21	10.6	25.8	40.8	47.3	49.2	51.3	65.6	54.4	47.2	65.6	9hr
17.15a	0.3	0.8	1.2	1.3	1.3	1.4	1.8	1.6	1.2	1.8	9hr
Dummy39	10.8	26.2	41.5	48.1	50.1	52.2	66.7	55.4	48.2	66.7	9hr
SU3	0.3	0.7	1.2	1.4	1.4	1.4	1.9	1.6	1.3	1.9	9hr
Dummy40	13.5	32.6	51.6	59.8	62.1	64.9	82.8	68.0	59.6	82.8	9hr
17.15b	0.2	0.5	0.7	0.7	0.7	0.7	0.9	0.9	0.7	0.9	9hr
Dummy41	13.6	32.8	51.9	60.1	62.5	65.3	83.2	68.4	60.1	83.2	9hr
17.16	14.0	33.9	53.6	62.3	65.0	67.9	86.3	70.9	62.5	86.3	9hr
1.18	0.3	0.6	1.1	1.4	1.5	1.5	2.0	1.7	1.6	2.0	9hr
16.01	0.2	0.6	0.8	0.8	0.8	0.9	1.1	1.0	0.8	1.1	9hr
15.02	0.7	1.3	2.0	2.3	2.4	2.5	3.3	2.9	2.6	3.3	9hr
15.01	0.5	0.9	1.5	1.8	1.8	1.9	2.5	2.2	1.8	2.5	9hr
14.01	0.9	1.9	2.9	3.1	3.1	3.2	4.1	3.8	2.8	4.1	9hr
1.17a	1.2	2.9	4.5	4.9	4.8	5.1	6.5	5.9	4.3	6.5	9hr
1.17b	0.3	0.6	0.9	1.0	0.9	1.0	1.3	1.2	0.9	1.3	9hr
1.16	0.7	1.5	2.1	2.1	2.0	2.3	2.7	2.6	2.0	2.7	9hr
1.14	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.7	0.7	12hr
12.02b	0.1	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	9hr
12.02a	0.3	0.7	1.1	1.1	1.1	1.2	1.5	1.4	1.0	1.5	9hr
11.01	0.6	1.4	1.9	1.8	1.7	2.1	2.3	2.3	1.8	2.3	9hr
10.01	0.8	1.7	2.2	2.1	1.9	2.3	2.5	2.5	1.9	2.5	9hr
10.02a	1.3	3.0	3.9	3.7	3.5	4.2	4.7	4.5	3.5	4.7	9hr
1.13b	0.5	1.0	1.5	1.6	1.6	1.7	2.1	2.0	1.5	2.1	9hr
1.13a	0.3	0.8	1.2	1.2	1.2	1.3	1.6	1.5	1.1	1.6	9hr
1.12a	0.7	1.4	1.9	1.9	1.8	2.1	2.4	2.4	1.8	2.4	9hr
5.01	0.2	0.5	0.8	1.0	1.0	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	0.3	0.7	0.9	0.8	0.7	0.9	1.0	1.0	0.8	1.0	9hr
1.11b	0.5	1.2	1.6	1.6	1.6	1.8	2.1	2.1	1.6	2.1	9hr
1.09b	0.2	0.5	0.6	0.6	0.5	0.7	0.7	0.7	0.6	0.7	9hr
1.09c	0.4	1.1	1.4	1.4	1.3	1.5	1.8	1.7	1.3	1.8	9hr
4.01	0.5	1.1	1.3	1.3	1.2	1.4	1.5	1.5	1.1	1.5	12hr
4.02	1.1	2.6	3.4	3.2	3.0	3.6	4.2	4.0	3.1	4.2	9hr
1.06a	0.7	1.5	2.5	2.7	2.7	2.8	3.6	3.3	2.4	3.6	9hr
1.01	1.3	3.3	6.0	7.1	7.3	7.6	9.7	8.3	7.3	9.7	9hr
1.02	2.5	6.3	10.8	12.4	12.6	13.0	17.0	14.8	12.1	17.0	9hr
2.01	1.7	4.3	8.1	9.9	10.7	11.2	14.2	12.2	11.3	14.2	9hr
1.03	4.8	11.9	20.4	23.7	24.5	25.4	33.2	28.5	24.9	33.2	9hr
1.04	5.7	14.2	23.6	27.2	27.9	28.9	38.1	32.8	28.1	38.1	9hr
1.05	7.1	17.5	28.6	32.8	33.4	34.6	45.8	39.4	33.2	45.8	9hr
1.06b	8.1	19.9	32.1	36.8	37.3	38.7	51.1	43.8	36.9	51.1	9hr
Dummy1	8.7	21.2	34.4	39.2	39.7	41.1	54.4	46.5	39.0	54.4	9hr
1.07a	0.3	0.8	1.2	1.3	1.2	1.3	1.6	1.5	1.1	1.6	9hr
1.07b	0.7	1.7	2.8	3.1	3.1	3.2	4.1	3.7	2.8	4.1	9hr
Dummy2	9.6	23.4	37.6	42.9	43.4	45.0	59.4	50.7	42.4	59.4	9hr
1.08a	0.4	1.0	1.4	1.4	1.4	1.5	1.9	1.7	1.3	1.9	9hr
1.08b	0.6	1.4	2.0	2.0	1.9	2.1	2.6	2.5	1.9	2.6	9hr
Dummy3	10.4	24.9	39.5	45.0	45.7	47.4	62.5	53.2	44.6	62.5	9hr
3.01	0.6	1.4	1.8	1.7	1.6	1.9	2.0	2.0	1.6	2.0	12hr
1.09a	0.8	1.8	2.3	2.2	2.0	2.5	2.6	2.6	2.0	2.6	9hr
Dummy60	10.8	25.6	40.3	46.0	46.8	48.6	64.1	54.4	45.8	64.1	9hr
Dummy4	11.8	27.4	42.4	48.9	49.8	51.7	67.9	57.2	48.9	67.9	9hr
SU2	0.5	1.2	1.8	1.9	1.9	2.0	2.5	2.3	1.8	2.5	9hr
1.10b	0.8	1.9	2.7	2.8	2.7	2.9	3.7	3.4	2.6	3.7	9hr
Dummy42	12.4	28.6	44.2	50.8	51.8	53.8	70.4	59.1	50.8	70.4	9hr
1.10a	12.6	28.9	44.7	51.4	52.4	54.4	71.2	59.7	51.5	71.2	9hr
Dummy6	13.1	29.6	45.7	52.5	53.7	55.9	72.8	60.8	52.9	72.8	9hr
1.12c	0.4	1.0	1.4	1.4	1.4	1.5	1.8	1.8	1.3	1.8	9hr
1.12b	14.3	32.0	49.3	56.6	58.5	60.9	78.5	65.0	57.6	78.5	9hr
Dummy7	14.8	32.7	50.3	57.9	60.3	62.7	80.5	66.8	59.5	80.5	9hr
10.02b	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	0.2	0.5	0.7	0.8	0.7	0.8	1.0	0.9	0.7	1.0	9hr
7.01	0.4	1.2	1.7	1.8	1.7	1.9	2.3	2.2	1.6	2.3	9hr
7.02	1.2	3.3	5.3	5.8	5.8	6.0	7.9	6.9	5.2	7.9	9hr
7.03	2.3	5.9	9.5	10.5	10.4	10.9	14.0	12.3	9.2	14.0	9hr
7.04	2.8	7.1	11.7	13.1	13.0	13.5	17.3	15.2	11.5	17.3	9hr
7.05	3.7	9.4	15.3	17.2	17.2	17.8	22.9	20.0	15.2	22.9	9hr
7.06	4.1	10.4	17.0	19.3	19.3	20.1	25.7	22.4	17.3	25.7	9hr
8.01	0.8	1.7	2.9	3.2	3.2	3.3	4.3	3.8	2.9	4.3	9hr
7.07b	5.0	12.6	20.4	23.3	23.4	24.3	31.1	26.9	21.0	31.1	9hr
Dummy12	5.1	12.9	20.9	23.8	23.9	24.9	31.8	27.6	21.5	31.8	9hr
7.08b	0.3	0.8	1.3	1.4	1.4	1.5	1.9	1.7	1.2	1.9	9hr
7.08a	0.2	0.5	0.8	0.8	0.8	0.9	1.1	1.0	0.7	1.1	9hr
7.09a	0.3	0.8	1.2	1.3	1.3	1.4	1.8	1.6	1.2	1.8	9hr
Dummy11	5.9	14.7	23.6	26.9	27.0	28.1	35.9	31.0	24.3	35.9	9hr
7.09c	0.4	1.0	1.5	1.7	1.6	1.7	2.2	2.0	1.5	2.2	9hr
7.09b	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	9hr
Dummy43	6.3	15.8	25.0	28.5	28.7	29.9	38.1	32.9	25.9	38.1	9hr
7.10a	0.2	0.5	0.9	1.0	1.0	1.1	1.4	1.2	1.0	1.4	9hr
7.10b	0.2	0.4	0.7	0.8	0.9	0.9	1.1	1.0	0.8	1.1	9hr
Dummy9	6.6	16.6	26.5	30.3	30.5	31.8	40.6	34.8	27.7	40.6	9hr
9.01	0.5	1.1	1.4	1.3	1.2	1.5	1.7	1.6	1.3	1.7	9hr
9.02b	0.7	1.7	2.3	2.3	2.1	2.5	2.9	2.8	2.1	2.9	9hr
9.02a	0.4	1.0	1.6	1.8	1.7	1.8	2.3	2.1	1.5	2.3	9hr
Dummy59	1.0	2.7	3.8	4.0	3.8	4.2	5.3	4.9	3.7	5.3	9hr
Dummy8	7.4	18.2	28.9	33.1	33.5	34.9	44.3	37.7	30.5	44.3	9hr
7.12	0.9	1.1	1.9	2.3	2.4	2.5	3.2	2.7	2.5	3.2	9hr
7.11a	0.4	1.0	1.3	1.3	1.2	1.4	1.7	1.6	1.2	1.7	9hr
7.11b	0.5	1.3	1.8	1.7	1.6	1.9	2.2	2.2	1.7	2.2	9hr
Dummy10	8.1	19.7	31.4	36.2	36.9	38.5	48.8	41.0	34.0	48.8	9hr
12.01a	8.4	20.4	32.4	37.3	38.1	39.8	50.3	42.2	35.2	50.3	9hr
Dummy13	23.3	52.5	82.6	95.6	99.0	103.8	131.1	107.7	95.8	131.1	9hr
12.01b	0.2	0.6	0.8	0.8	0.7	0.8	1.0	0.9	0.7	1.0	9hr
Dummy44	23.4	52.6	82.8	95.9	99.4	104.2	131.5	108.1	96.2	131.5	9hr
Dummy14	23.8	53.3	83.8	97.3	101.3	106.4	133.9	110.0	98.7	133.9	9hr
1.15	0.8	1.8	2.7	2.8	2.8	3.0	3.7	3.4	2.6	3.7	9hr
Dummy45	24.1	53.9	84.7	98.5	102.8	108.1	135.7	111.8	100.5	135.7	9hr
Dummy15	25.1	55.6	87.1	101.6	107.1	113.0	140.8	117.4	105.9	140.8	9hr
Dummy46	25.4	56.1	88.0	102.7	108.4	114.6	142.4	119.3	107.5	142.4	9hr
Dummy16	25.9	57.3	89.9	105.1	111.4	118.1	146.0	123.8	111.4	146.0	9hr
Dummy17	39.0	87.6	139.5	164.5	176.6	185.8	228.0	192.2	175.6	228.0	9hr
1.22a	0.8	0.8	0.8	0.7	0.9	1.0	1.2	1.4	1.4	1.4	12hr
1.23	0.5	0.6	1.0	1.2	1.2	1.3	1.6	1.5	1.2	1.6	9hr
Dummy27	42.5	96.0	151.1	179.1	195.8	205.8	250.7	216.0	197.5	250.7	9hr
1.24	0.4	0.4	0.7	0.8	1.0	1.0	1.3	1.2	1.0	1.3	9hr
Dummy49	42.6	96.3	151.6	179.6	196.6	206.6	251.6	217.1	198.5	251.6	9hr
Dummy50	42.8	96.8	152.2	180.4	197.7	208.2	253.1	219.6	200.8	253.1	9hr
Dummy51	43.1	97.5	153.1	181.6	199.3	210.6	255.4	223.5	204.9	255.4	9hr
Dummy52	43.3	97.7	153.4	181.9	199.8	211.2	256.0	224.5	205.9	256.0	9hr
Dummy53	43.7	98.6	154.6	183.4	201.8	213.8	258.9	229.1	210.9	258.9	9hr
1.27	44.3	99.7	156.0	185.1	204.1	217.0	262.2	234.1	216.5	262.2	9hr
E18	2.0	2.1	2.6	2.8	2.8	2.9	3.8	3.6	2.7	3.8	9hr
1.28	44.5	100.1	156.5	185.8	205.1	218.6	263.9	237.8	220.7	263.9	9hr
Out	45.9	101.7	158.4	188.6	210.6	230.1	275.3	265.4	254.3	275.3	9hr

Table C.8G Estimated 500 yr ARI Peak Flows (m3/s) under Existing Conditions at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.9	2.0	2.4	2.3	2.1	2.5	2.7	2.6	2.1	2.7	9hr
E17b	0.8	1.8	2.2	2.1	2.0	2.4	2.5	2.4	1.9	2.5	9hr
Dummy57	1.7	3.8	4.6	4.4	4.1	4.9	5.2	5.0	4.0	5.2	9hr
E17c	3.4	7.4	9.8	9.7	9.2	10.6	11.7	10.8	8.6	11.7	9hr
E17d	1.0	2.2	2.8	2.6	2.4	2.9	3.2	3.0	2.4	3.2	9hr
E9	1.6	3.0	3.3	2.9	3.1	3.1	3.1	3.1	2.4	3.3	2hr
E10	1.0	2.1	2.7	2.7	2.6	2.8	3.3	3.1	2.5	3.3	9hr
E3	2.3	4.3	5.0	4.5	4.5	5.0	4.9	5.1	3.9	5.1	12hr
E2	1.3	2.4	2.7	2.4	2.5	2.6	2.5	2.6	2.0	2.7	2hr
E1	1.2	2.2	2.4	2.1	2.3	2.2	2.2	2.3	1.7	2.4	2hr
Dummy56	2.5	4.5	5.0	4.5	4.8	4.8	4.7	4.9	3.7	5.0	2hr
Dummy30	4.6	8.8	9.8	9.0	9.3	9.8	9.6	9.5	7.5	9.8	2hr
E5	6.3	12.4	14.5	13.6	13.3	15.0	15.4	14.7	11.7	15.4	9hr
E6a	1.0	2.0	2.3	2.2	2.1	2.4	2.4	2.4	1.9	2.4	12hr
E6b	1.0	2.1	2.3	2.2	2.1	2.5	2.5	2.5	2.0	2.5	12hr
Dummy31	8.1	16.1	19.0	17.8	17.4	19.7	20.2	19.2	15.3	20.2	9hr
E8a	0.6	1.1	1.3	1.2	1.2	1.4	1.4	1.4	1.1	1.4	12hr
E7a	0.7	1.3	1.4	1.3	1.4	1.4	1.3	1.4	1.1	1.4	2hr
E7b	2.0	4.0	4.4	4.1	4.1	4.5	4.5	4.6	3.6	4.6	12hr
E8c	2.6	5.2	5.9	5.5	5.5	6.0	6.1	6.0	4.7	6.1	9hr
E8b	0.8	1.7	2.1	1.9	1.8	2.2	2.3	2.2	1.8	2.3	9hr
Dummy32	11.7	23.6	27.8	26.2	25.6	28.9	29.7	28.1	22.5	29.7	9hr
E11a	12.3	24.7	29.2	27.6	26.9	30.3	31.2	29.5	23.6	31.2	9hr
E11b	14.9	29.8	35.7	33.8	32.6	37.0	38.6	36.2	29.0	38.6	9hr
E13	2.5	5.2	6.0	5.6	5.5	6.3	6.3	6.3	5.0	6.3	6hr
E12	1.5	2.5	2.5	2.2	2.6	2.4	2.3	2.4	1.8	2.6	4.5hr
E14	0.9	1.6	1.8	1.6	1.7	1.8	1.7	1.8	1.4	1.8	2hr
E15b	0.5	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.7	0.9	2hr
E15a	0.5	1.0	1.1	1.0	1.0	1.0	1.0	1.0	0.8	1.1	2hr
Dummy29	1.8	3.3	3.7	3.4	3.5	3.6	3.6	3.6	2.8	3.7	2hr
E16a	2.6	5.3	6.2	5.8	5.6	6.4	7.1	6.7	5.3	7.1	9hr
E16b	0.2	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.6	9hr
Dummy28	20.3	39.6	48.0	46.1	44.2	50.2	53.1	48.8	39.6	53.1	9hr
Dummy33	24.5	47.7	59.6	58.2	55.7	62.8	66.7	60.4	49.2	66.7	9hr
SE5	1.3	2.5	2.9	2.7	2.6	3.1	3.1	3.1	2.4	3.1	12hr
SE1	1.6	1.7	1.7	1.6	1.7	1.9	1.9	2.0	1.5	2.0	12hr
SE2	2.0	4.2	5.1	4.8	4.5	5.4	5.5	5.4	4.2	5.5	9hr
SE3	2.0	4.1	5.9	6.1	5.9	6.4	7.6	7.1	5.5	7.6	9hr
SE6a	2.4	5.2	7.4	7.7	7.4	8.0	9.5	8.8	6.8	9.5	9hr
Dummy58	5.0	10.5	13.5	13.2	12.5	14.4	16.6	15.5	12.1	16.6	9hr
SE6b	6.7	14.1	18.0	17.4	16.5	19.2	22.0	20.5	16.2	22.0	9hr
SE_out	6.7	14.1	18.0	17.4	16.5	19.2	22.0	20.5	16.2	22.0	9hr
33.01a	0.9	1.8	2.2	2.1	1.9	2.3	2.4	2.4	1.9	2.4	9hr
33.01b	1.2	2.4	2.8	2.6	2.5	3.0	3.0	3.0	2.4	3.0	12hr
32.01	0.8	1.6	1.8	1.7	1.6	1.9	2.0	2.0	1.5	2.0	12hr
32.02	1.9	3.5	4.7	5.0	5.1	5.2	7.2	6.3	5.2	7.2	9hr
1.26	0.8	1.2	1.9	2.1	2.2	2.2	2.8	2.5	2.1	2.8	9hr
31.03	0.6	0.7	1.1	1.3	1.4	1.5	1.8	1.6	1.4	1.8	9hr
30.01	0.8	1.6	2.3	2.4	2.3	2.5	3.0	2.8	2.2	3.0	9hr
30.02	1.9	3.8	5.5	5.9	5.8	6.1	7.6	6.9	5.2	7.6	9hr
1.25b	2.1	4.1	6.1	6.6	6.5	6.8	8.5	7.7	5.8	8.5	9hr
1.25a	0.5	0.6	0.9	1.1	1.1	1.2	1.5	1.3	1.2	1.5	9hr
31.01b	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	2hr
31.01a	0.5	1.0	1.1	1.1	1.0	1.2	1.2	1.2	1.0	1.2	12hr
Dummy55	0.8	1.5	1.7	1.6	1.6	1.8	1.8	1.8	1.4	1.8	12hr
31.02	1.2	2.6	3.2	3.1	2.9	3.4	3.9	3.7	2.9	3.9	9hr
25.06a	0.6	0.9	1.3	1.4	1.3	1.4	1.8	1.6	1.2	1.8	9hr
25.06b	0.8	1.5	1.9	2.0	1.9	2.1	2.6	2.4	1.9	2.6	9hr
25.06c	0.2	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6	12hr
25.03c	0.3	0.6	0.8	0.9	0.8	0.9	1.1	1.0	0.8	1.1	9hr
25.03b	0.2	0.4	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	9hr
25.01	0.6	1.1	1.7	1.8	1.7	1.8	2.2	2.1	1.6	2.2	9hr
27.01	1.2	2.5	3.3	3.3	3.2	3.5	4.2	3.9	3.0	4.2	9hr
25.03a	1.4	2.9	3.9	3.9	3.7	4.2	4.9	4.6	3.5	4.9	9hr
26.01a	0.6	1.1	1.5	1.6	1.5	1.6	1.9	1.8	1.4	1.9	9hr
26.01b	0.6	1.3	1.8	1.8	1.7	1.9	2.3	2.1	1.6	2.3	9hr
Dummy47	1.2	2.4	3.3	3.4	3.2	3.5	4.2	4.0	3.0	4.2	9hr
25.02	1.8	3.8	5.5	5.8	5.6	6.0	7.2	6.7	5.2	7.2	9hr
Dummy48	3.2	6.7	9.2	9.7	9.3	10.0	12.1	11.2	8.7	12.1	9hr
Dummy22	3.6	7.6	10.6	11.1	10.7	11.5	13.8	12.7	9.9	13.8	9hr
25.04b	0.3	0.7	1.0	1.1	1.0	1.1	1.3	1.2	0.9	1.3	9hr
25.04a	0.4	0.8	1.3	1.4	1.4	1.4	1.8	1.7	1.2	1.8	9hr
Dummy23	4.2	9.1	12.9	13.5	13.1	14.0	16.8	15.3	12.0	16.8	9hr
25.05a	0.3	0.6	0.9	0.9	0.9	1.0	1.2	1.1	0.8	1.2	9hr
25.05b	0.2	0.4	0.6	0.6	0.6	0.7	0.8	0.7	0.6	0.8	9hr
28.01	1.4	2.3	3.2	3.3	3.2	3.4	4.1	3.9	3.0	4.1	9hr
28.02	2.3	3.5	5.3	5.7	5.6	5.8	7.1	6.5	5.0	7.1	9hr
Dummy24	6.1	13.4	19.6	20.7	20.1	21.4	25.6	23.0	18.1	25.6	9hr
Dummy25	6.9	14.9	21.7	22.9	22.3	23.8	28.3	25.4	20.0	28.3	9hr
25.07b	0.3	0.6	0.7	0.8	0.7	0.8	0.9	0.9	0.7	0.9	9hr
29.01	1.3	2.5	3.6	3.9	3.8	3.9	4.9	4.5	3.4	4.9	9hr
29.02	2.1	3.9	6.0	6.6	6.5	6.8	8.4	7.5	5.7	8.4	9hr
25.07a	0.4	0.7	1.0	1.0	0.9	1.0	1.2	1.2	0.9	1.2	9hr
Dummy26	9.1	19.5	29.0	30.9	30.2	32.0	38.2	33.8	26.8	38.2	9hr
1.22b	0.4	0.4	0.4	0.6	0.7	0.8	0.9	0.9	0.9	0.9	12hr
1.20a	0.2	0.5	0.7	0.7	0.7	0.8	0.9	0.9	0.7	0.9	9hr
1.20b	0.2	0.4	0.5	0.5	0.5	0.6	0.7	0.6	0.5	0.7	9hr
1.21	1.0	2.2	3.4	3.7	3.7	3.8	4.8	4.3	3.3	4.8	9hr
24.01	0.7	1.5	2.2	2.4	2.4	2.5	3.0	2.8	2.1	3.0	9hr
24.02	1.5	3.2	5.1	5.6	5.5	5.8	7.1	6.3	4.8	7.1	9hr
24.03	2.2	4.9	7.7	8.3	8.3	8.6	10.5	9.3	7.3	10.5	9hr
24.04	2.9	6.3	9.3	10.0	9.9	10.4	12.8	11.4	8.9	12.8	9hr
24.05	3.7	8.0	11.5	12.3	12.2	12.8	15.7	14.0	10.9	15.7	9hr
24.06	4.3	9.3	13.8	14.8	14.6	15.4	18.8	16.6	13.0	18.8	9hr
17.14b	0.5	1.1	1.5	1.5	1.4	1.6	1.9	1.7	1.3	1.9	9hr
17.14a	0.8	1.7	2.5	2.7	2.7	2.8	3.4	3.1	2.4	3.4	9hr
17.13	0.4	0.8	1.3	1.5	1.5	1.5	1.9	1.7	1.4	1.9	9hr
23.01	0.4	0.9	1.5	1.6	1.6	1.7	2.1	1.9	1.4	2.1	9hr
20.01	0.9	2.0	2.7	2.7	2.6	2.9	3.4	3.1	2.4	3.4	9hr
17.10a	0.3	0.7	1.1	1.2	1.2	1.3	1.6	1.4	1.1	1.6	9hr
17.10b	0.5	1.0	1.6	1.8	1.8	1.8	2.3	2.1	1.6	2.3	9hr
17.09	0.6	1.2	2.0	2.2	2.3	2.4	2.9	2.6	2.2	2.9	9hr
17.08c	0.5	1.1	1.6	1.7	1.6	1.7	2.1	1.9	1.5	2.1	9hr
17.08d	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12hr
18.01	1.1	2.4	3.4	3.6	3.4	3.7	4.4	4.0	3.1	4.4	9hr
18.02	1.8	4.0	5.4	5.6	5.3	5.8	6.9	6.4	5.0	6.9	9hr
17.08b	0.4	0.8	1.1	1.1	1.0	1.2	1.3	1.3	1.0	1.3	9hr
17.08a	0.6	1.2	1.7	1.7	1.7	1.8	2.2	2.0	1.5	2.2	9hr
17.01	0.8	1.7	2.2	2.2	2.1	2.4	2.7	2.5	2.0	2.7	9hr
17.02	1.8	4.0	5.7	6.1	5.9	6.3	7.7	7.0	5.4	7.7	9hr
17.03	3.3	7.4	11.6	12.7	12.6	13.1	16.5	14.5	11.1	16.5	9hr
17.04	4.8	10.7	17.1	18.9	18.8	19.6	24.5	21.4	16.7	24.5	9hr
17.06	6.0	13.4	21.7	24.4	24.6	25.4	31.8	27.5	22.1	31.8	9hr
17.07	7.1	15.8	25.2	28.4	28.6	29.7	36.9	31.8	25.6	36.9	9hr
Dummy18	9.6	20.6	31.7	35.1	35.2	36.4	45.7	39.5	31.5	45.7	9hr
Dummy19	10.1	21.6	32.9	36.4	36.5	37.8	47.4	41.0	32.7	47.4	9hr
Dummy36	10.6	22.8	34.7	38.5	38.7	40.2	50.3	43.3	34.8	50.3	9hr
21.01	0.8	1.6	2.6	3.2	3.4	3.5	4.3	3.7	3.4	4.3	9hr
Dummy37	11.2	24.3	37.2	41.6	42.0	43.7	54.5	46.7	38.1	54.5	9hr
Dummy20	12.7	27.3	41.3	46.3	46.7	48.6	60.8	51.8	42.3	60.8	9hr
22.01	1.0	2.1	3.4	3.8	3.8	3.9	5.0	4.3	3.5	5.0	9hr
17.11	0.3	0.6	1.0	1.1	1.1	1.1	1.4	1.3	1.0	1.4	9hr

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	13.8	29.7	45.1	50.8	51.2	53.5	66.5	56.2	46.5	66.5	9hr
17.12	0.7	1.3	2.2	2.4	2.4	2.5	3.1	2.8	2.1	3.1	9hr
Dummy54	14.4	30.9	46.8	52.8	53.3	55.7	69.2	58.2	48.4	69.2	9hr
Dummy38	14.8	31.7	48.0	54.1	54.7	57.2	70.9	59.6	49.6	70.9	9hr
Dummy35	15.1	32.4	49.1	55.4	56.1	58.7	72.5	60.8	50.9	72.5	9hr
Dummy21	16.0	34.0	51.3	58.0	59.1	61.8	76.2	63.6	53.7	76.2	9hr
17.15a	0.5	1.1	1.6	1.6	1.6	1.7	2.1	1.9	1.4	2.1	9hr
Dummy39	16.3	34.6	52.1	58.9	60.2	63.0	77.6	64.6	54.8	77.6	9hr
SU3	0.4	0.9	1.5	1.7	1.7	1.7	2.2	2.0	1.5	2.2	9hr
Dummy40	20.3	42.7	64.3	73.3	74.6	78.4	96.0	79.6	68.0	96.0	9hr
17.15b	0.3	0.6	0.9	0.9	0.8	0.9	1.1	1.0	0.8	1.1	9hr
Dummy41	20.4	43.0	64.6	73.7	75.1	78.9	96.5	80.0	68.5	96.5	9hr
17.16	21.1	44.4	66.9	76.3	78.0	82.0	100.1	82.9	71.3	100.1	9hr
1.18	0.4	0.8	1.4	1.7	1.8	1.9	2.3	2.0	1.8	2.3	9hr
16.01	0.4	0.8	1.0	1.0	1.0	1.1	1.2	1.2	0.9	1.2	9hr
15.02	0.8	1.7	2.6	2.8	2.9	3.0	3.9	3.5	3.0	3.9	9hr
15.01	0.7	1.2	2.0	2.2	2.2	2.3	2.9	2.6	2.1	2.9	9hr
14.01	1.3	2.5	3.6	3.8	3.7	3.9	4.8	4.4	3.4	4.8	9hr
1.17a	1.9	3.8	5.6	6.0	5.9	6.2	7.5	6.8	5.2	7.5	9hr
1.17b	0.4	0.8	1.1	1.2	1.1	1.2	1.5	1.4	1.1	1.5	9hr
1.16	1.0	2.1	2.7	2.5	2.4	2.8	3.1	3.0	2.4	3.1	9hr
1.14	0.3	0.3	0.3	0.4	0.6	0.6	0.7	0.8	0.8	0.8	12hr
12.02b	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	9hr
12.02a	0.5	1.0	1.3	1.4	1.3	1.4	1.7	1.6	1.2	1.7	9hr
11.01	1.0	2.0	2.4	2.3	2.1	2.5	2.6	2.6	2.1	2.6	9hr
10.01	1.2	2.3	2.7	2.5	2.4	2.8	2.8	2.8	2.2	2.8	12hr
10.02a	1.9	4.0	4.9	4.6	4.3	5.1	5.4	5.1	4.1	5.4	9hr
1.13b	0.7	1.4	1.9	2.0	1.9	2.1	2.4	2.3	1.8	2.4	9hr
1.13a	0.5	1.0	1.5	1.5	1.5	1.6	1.9	1.8	1.4	1.9	9hr
1.12a	0.9	1.9	2.4	2.3	2.1	2.6	2.8	2.7	2.1	2.8	9hr
5.01	0.3	0.7	1.1	1.2	1.2	1.2	1.6	1.4	1.1	1.6	9hr
1.11a	0.4	0.9	1.1	1.0	1.0	1.1	1.2	1.2	0.9	1.2	12hr
1.11b	0.8	1.6	2.1	2.0	1.9	2.2	2.4	2.3	1.8	2.4	9hr
1.09b	0.3	0.7	0.8	0.7	0.7	0.8	0.8	0.8	0.6	0.8	9hr
1.09c	0.7	1.4	1.8	1.7	1.6	1.9	2.0	2.0	1.5	2.0	9hr
4.01	0.7	1.5	1.7	1.5	1.5	1.7	1.6	1.7	1.3	1.7	12hr
4.02	1.6	3.5	4.2	4.0	3.7	4.4	4.8	4.6	3.6	4.8	9hr
1.06a	1.0	2.1	3.1	3.3	3.2	3.4	4.2	3.8	2.9	4.2	9hr
1.01	2.0	4.6	7.7	8.7	8.8	9.1	11.4	9.9	8.3	11.4	9hr
1.02	3.8	8.5	13.7	15.3	15.2	15.8	19.9	17.5	13.8	19.9	9hr
2.01	2.6	6.0	10.4	12.3	12.9	13.5	16.8	14.0	13.1	16.8	9hr
1.03	7.4	16.2	25.7	29.2	29.6	30.5	39.1	34.0	28.6	39.1	9hr
1.04	8.7	19.2	29.6	33.3	33.7	34.8	44.8	39.0	32.3	44.8	9hr
1.05	10.8	23.5	35.9	40.1	40.3	41.6	53.6	46.6	38.1	53.6	9hr
1.06b	12.3	26.6	40.5	44.9	45.1	46.6	59.8	52.0	42.2	59.8	9hr
Dummy1	13.2	28.5	43.3	47.8	47.9	49.6	63.6	55.3	44.7	63.6	9hr
1.07a	0.5	1.1	1.5	1.5	1.4	1.6	1.9	1.8	1.4	1.9	9hr
1.07b	1.1	2.3	3.5	3.8	3.7	3.9	4.9	4.3	3.2	4.9	9hr
Dummy2	14.5	31.4	47.2	52.1	52.3	54.3	69.3	60.2	48.5	69.3	9hr
1.08a	0.6	1.3	1.7	1.7	1.6	1.8	2.1	2.0	1.6	2.1	9hr
1.08b	0.9	1.9	2.5	2.4	2.3	2.6	3.0	2.8	2.2	3.0	9hr
Dummy3	15.6	33.4	49.5	54.7	54.9	57.2	72.8	62.9	51.1	72.8	9hr
3.01	0.9	1.9	2.2	2.1	2.0	2.3	2.3	2.3	1.8	2.3	12hr
1.09a	1.2	2.4	2.8	2.7	2.6	2.9	3.0	2.9	2.3	3.0	9hr
Dummy60	16.2	34.2	50.6	56.0	56.3	58.6	74.5	64.3	52.5	74.5	9hr
Dummy4	17.6	36.3	53.5	59.3	59.7	62.3	78.8	67.3	56.1	78.8	9hr
SU2	0.8	1.6	2.3	2.3	2.3	2.4	2.9	2.7	2.1	2.9	9hr
1.10b	1.1	2.5	3.3	3.4	3.2	3.6	4.2	3.9	3.1	4.2	9hr
Dummy42	18.4	37.8	55.6	61.5	62.1	64.7	81.7	69.5	58.3	81.7	9hr
1.10a	18.7	38.2	56.2	62.2	62.8	65.5	82.6	70.1	59.0	82.6	9hr
Dummy6	19.2	39.0	57.4	63.6	64.4	67.2	84.4	71.3	60.6	84.4	9hr
1.12c	0.7	1.4	1.8	1.7	1.6	1.9	2.1	2.0	1.6	2.1	9hr
1.12b	20.9	41.9	61.6	68.9	70.0	73.2	91.3	76.0	66.1	91.3	9hr
Dummy7	21.4	42.8	62.8	70.5	72.0	75.4	93.6	78.0	68.2	93.6	9hr
10.02b	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	2hr
7.07a	0.3	0.7	0.9	0.9	0.9	1.0	1.1	1.1	0.8	1.1	9hr
7.01	0.7	1.6	2.1	2.2	2.1	2.3	2.6	2.5	2.0	2.6	9hr
7.02	1.9	4.3	6.6	7.2	7.1	7.4	9.1	8.1	6.2	9.1	9hr
7.03	3.5	7.7	11.9	12.9	12.7	13.3	16.2	14.4	11.1	16.2	9hr
7.04	4.2	9.4	14.7	16.0	15.8	16.5	20.1	17.8	13.7	20.1	9hr
7.05	5.6	12.4	19.3	21.0	20.8	21.8	26.5	23.4	18.0	26.5	9hr
7.06	6.2	13.6	21.4	23.6	23.4	24.4	29.8	26.2	20.1	29.8	9hr
8.01	1.2	2.3	3.6	3.9	3.9	4.0	5.1	4.5	3.3	5.1	9hr
7.07b	7.5	16.6	25.8	28.4	28.3	29.5	35.9	31.4	24.4	35.9	9hr
Dummy12	7.8	17.1	26.4	29.1	28.9	30.2	36.8	32.2	25.0	36.8	9hr
7.08b	0.5	1.1	1.6	1.7	1.7	1.8	2.2	2.0	1.5	2.2	9hr
7.08a	0.3	0.7	1.0	1.0	1.0	1.0	1.2	1.2	0.9	1.2	9hr
7.09a	0.5	1.1	1.6	1.7	1.6	1.7	2.1	1.9	1.5	2.1	9hr
Dummy11	8.9	19.5	29.7	32.7	32.6	34.0	41.5	36.2	28.4	41.5	9hr
7.09c	0.6	1.3	1.9	2.0	2.0	2.1	2.5	2.3	1.8	2.5	9hr
7.09b	0.2	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	9hr
Dummy43	9.6	20.9	31.6	34.7	34.6	36.1	44.0	38.3	30.2	44.0	9hr
7.10a	0.3	0.7	1.1	1.2	1.3	1.3	1.6	1.4	1.2	1.6	9hr
7.10b	0.3	0.6	0.9	1.0	1.0	1.1	1.3	1.2	0.9	1.3	9hr
Dummy9	10.1	22.0	33.4	36.9	36.8	38.5	46.8	40.5	32.0	46.8	9hr
9.01	0.7	1.4	1.7	1.6	1.5	1.8	1.9	1.9	1.5	1.9	9hr
9.02b	1.0	2.2	2.9	2.8	2.6	3.1	3.4	3.2	2.5	3.4	9hr
9.02a	0.7	1.3	2.0	2.2	2.1	2.2	2.7	2.5	1.9	2.7	9hr
Dummy59	1.6	3.5	4.8	4.8	4.6	5.1	6.0	5.6	4.4	6.0	9hr
Dummy8	11.2	24.2	36.3	40.2	40.3	42.1	51.2	43.7	35.1	51.2	9hr
7.12	1.0	1.4	2.4	2.8	2.9	3.0	3.7	3.3	2.9	3.7	9hr
7.11a	0.6	1.3	1.7	1.6	1.5	1.7	2.0	1.9	1.5	2.0	9hr
7.11b	0.8	1.8	2.2	2.1	2.0	2.3	2.6	2.5	1.9	2.6	9hr
Dummy10	12.2	26.2	39.5	44.1	44.4	46.4	56.4	47.7	38.7	56.4	9hr
12.01a	12.6	27.0	40.6	45.4	45.7	47.9	58.2	49.1	40.0	58.2	9hr
Dummy13	34.0	68.4	103.0	116.7	118.6	124.7	151.9	125.8	109.6	151.9	9hr
12.01b	0.4	0.8	1.0	0.9	0.9	1.0	1.1	1.1	0.8	1.1	9hr
Dummy44	34.1	68.6	103.2	117.0	119.0	125.2	152.4	126.2	110.1	152.4	9hr
Dummy14	34.7	69.3	104.4	118.8	121.5	127.7	155.2	128.3	112.9	155.2	9hr
1.15	1.2	2.4	3.4	3.5	3.3	3.6	4.3	4.0	3.1	4.3	9hr
Dummy45	35.1	70.0	105.5	120.0	123.3	129.7	157.2	130.3	115.0	157.2	9hr
Dummy15	36.3	71.8	108.3	123.5	128.6	135.5	162.9	136.4	121.1	162.9	9hr
Dummy46	36.7	72.5	109.4	124.8	130.2	137.3	164.7	138.6	122.9	164.7	9hr
Dummy16	37.4	74.0	111.7	127.5	133.7	141.6	168.8	143.6	127.3	168.8	9hr
Dummy17	56.0	114.1	172.8	199.6	212.1	221.7	264.2	222.3	201.5	264.2	9hr
1.22a	1.0	0.9	0.9	0.9	1.1	1.3	1.5	1.6	1.6	1.6	12hr
1.23	0.5	0.8	1.3	1.5	1.5	1.5	2.0	1.8	1.4	2.0	9hr
Dummy27	61.5	124.3	186.4	217.3	234.5	245.0	290.1	248.9	227.8	290.1	9hr
1.24	0.5	0.5	0.9	1.1	1.2	1.2	1.5	1.3	1.2	1.5	9hr
Dummy49	61.6	124.6	186.9	218.0	235.3	246.0	291.1	250.1	228.9	291.1	9hr
Dummy50	62.0	125.2	187.6	218.9	236.6	247.9	292.9	253.1	231.9	292.9	9hr
Dummy51	62.6	126.0	188.6	220.2	238.4	250.7	295.4	257.6	236.7	295.4	9hr
Dummy52	62.8	126.3	188.9	220.6	239.0	251.4	296.1	258.7	238.0	296.1	9hr
Dummy53	63.5	127.4	190.2	222.2	241.3	254.6	299.4	263.8	244.0	299.4	9hr
1.27	64.4	128.7	191.7	224.2	244.1	258.3	303.1	269.7	250.8	303.1	9hr
E18	2.4	2.6	3.3	3.5	3.4	3.5	4.4	4.2	3.2	4.4	9hr
1.28	64.9	129.1	192.3	224.9	245.3	260.3	305.1	274.0	255.9	305.1	9hr
Out	66.5	130.9	194.3	228.0	251.8	274.5	318.5	307.7	295.2	318.5	9hr

Table C.8H Estimated PMF Peak Flows (m3/s) under Existing Conditions at All Locations

Node	15min	30min	45min	1hr	1.5hr	2hr	2.5hr	3hr	4hr	5hr	6hr	Max Flow	Critical Duration
E17a	8.1	13.3	15.7	16.6	15.5	14.4	13.2	11.9	10.5	9.2	8.2	16.6	1hr
E17b	7.6	12.4	14.6	15.4	14.3	13.2	12.1	11.0	9.6	8.4	7.5	15.4	1hr
Dummy57	15.8	25.7	30.3	31.9	29.8	27.6	25.3	22.9	20.0	17.6	15.6	31.9	1hr
E17c	31.3	51.1	64.0	70.3	68.8	64.0	58.7	54.4	47.3	42.3	37.6	70.3	1hr
E17d	9.2	15.0	18.2	19.5	18.3	17.0	15.8	14.3	12.5	11.0	9.8	19.5	1hr
E9	14.6	20.2	20.8	20.2	18.2	16.1	14.5	13.0	11.1	9.8	8.8	20.8	45min
E10	8.6	14.1	17.7	19.6	19.2	18.0	16.7	15.5	13.5	12.0	10.7	19.6	1hr
E3	20.1	29.3	32.2	31.7	29.1	26.3	23.6	21.4	18.2	16.0	14.3	32.2	45min
E2	11.3	16.0	16.8	16.5	14.9	13.2	11.9	10.7	9.1	8.0	7.2	16.8	45min
E1	10.5	14.3	14.7	14.3	12.8	11.4	10.2	9.1	7.8	6.9	6.2	14.7	45min
Dummy56	21.8	30.2	31.5	30.7	27.7	24.6	22.0	19.8	16.8	14.9	13.3	31.5	45min
Dummy30	39.4	57.2	61.9	62.1	56.0	50.7	45.2	41.2	35.1	30.9	27.7	62.1	1hr
E5	54.2	81.8	93.7	96.8	89.3	81.3	74.0	67.1	58.2	51.0	45.5	96.8	1hr
E6a	8.8	13.5	15.2	15.3	13.9	12.9	11.5	10.6	9.0	7.9	7.1	15.3	1hr
E6b	9.0	13.8	15.6	15.8	14.4	13.3	11.9	10.9	9.3	8.2	7.3	15.8	1hr
Dummy31	67.8	101.9	120.4	125.3	115.9	106.2	96.8	87.9	76.4	67.1	59.8	125.3	1hr
E8a	5.0	7.7	8.7	8.7	8.0	7.4	6.6	6.0	5.1	4.5	4.0	8.7	1hr
E7a	6.4	8.7	9.0	8.8	7.9	7.0	6.3	5.6	4.8	4.2	3.8	9.0	45min
E7b	18.3	27.1	29.6	29.1	26.6	24.0	21.6	19.6	16.7	14.7	13.2	29.6	45min
E8c	23.5	34.8	38.9	39.0	35.7	32.0	29.0	26.4	22.6	19.9	17.8	39.0	1hr
E8b	7.2	11.5	13.4	14.1	13.1	12.2	11.0	10.0	8.7	7.6	6.8	14.1	1hr
Dummy32	94.8	145.7	172.6	182.0	169.7	156.0	141.8	129.5	112.5	98.9	88.2	182.0	1hr
E11a	98.2	151.1	179.2	189.8	178.4	164.0	149.2	136.6	118.6	104.4	93.1	189.8	1hr
E11b	116.4	179.3	214.6	229.9	220.1	202.7	185.0	169.8	147.5	130.1	115.9	229.9	1hr
E13	23.1	35.4	40.1	40.3	36.6	33.8	30.1	27.7	23.7	20.8	18.6	40.3	1hr
E12	13.0	16.0	15.6	15.0	13.0	11.6	10.2	9.2	7.9	7.0	6.3	16.0	30min
E14	7.7	10.8	11.6	11.3	10.3	9.1	8.3	7.4	6.3	5.6	5.0	11.6	45min
E15b	4.1	5.7	5.8	5.6	5.1	4.5	4.0	3.6	3.1	2.7	2.4	5.8	45min
E15a	4.6	6.4	6.7	6.5	5.9	5.2	4.7	4.2	3.6	3.2	2.8	6.7	45min
Dummy29	15.5	21.9	23.2	22.9	20.7	18.6	16.8	15.2	12.9	11.4	10.2	23.2	45min
E16a	23.2	35.0	40.7	42.8	40.5	37.6	34.4	31.8	27.8	24.8	22.2	42.8	1hr
E16b	2.1	3.2	3.7	3.8	3.5	3.2	2.9	2.6	2.3	2.0	1.8	3.8	1hr
Dummy28	147.5	223.7	272.4	300.4	298.4	279.9	258.1	236.8	207.2	183.9	164.0	300.4	1hr
Dummy33	176.3	263.1	322.9	360.9	372.4	353.0	327.6	302.3	266.0	236.2	211.4	372.4	1.5hr
SE5	10.8	16.8	19.2	19.6	17.9	16.6	14.8	13.6	11.6	10.2	9.1	19.6	1hr
SE1	7.5	9.9	11.5	11.6	10.8	10.1	9.0	8.2	7.0	6.1	5.5	11.6	1hr
SE2	18.2	29.0	33.3	34.5	31.7	29.3	26.4	24.2	20.8	18.3	16.3	34.5	1hr
SE3	17.3	29.0	38.4	43.3	44.1	41.3	38.3	36.1	31.6	28.3	25.4	44.1	1.5hr
SE6a	21.5	36.2	47.3	53.8	55.1	52.0	48.0	45.3	39.6	35.6	32.0	55.1	1.5hr
Dummy58	44.9	71.4	87.6	95.7	93.8	87.9	81.6	75.8	66.4	59.7	53.5	95.7	1hr
SE6b	59.9	95.1	115.8	126.1	123.9	115.8	107.6	100.1	87.6	78.9	70.6	126.1	1hr
SE_out	59.9	95.1	115.8	126.1	123.9	115.8	107.6	100.1	87.6	78.9	70.6	126.1	1hr
33.01a	7.9	12.3	14.3	14.9	13.7	12.8	11.5	10.5	9.0	7.9	7.1	14.9	1hr
33.01b	10.9	16.2	18.4	18.9	17.4	16.1	14.5	13.3	11.4	10.0	8.9	18.9	1hr
32.01	6.9	10.6	12.1	12.5	11.4	10.6	9.5	8.7	7.4	6.5	5.8	12.5	1hr
32.02	14.5	23.8	31.1	35.6	38.4	39.0	38.0	35.9	33.1	30.7	28.3	39.0	2hr
1.26	5.3	8.0	10.8	13.4	15.7	16.3	15.8	14.9	13.6	12.7	11.5	16.3	2hr
31.03	3.4	4.7	6.4	8.0	9.7	10.3	10.3	10.0	9.2	8.5	7.9	10.3	2.5hr
30.01	7.1	11.5	15.0	17.0	17.5	16.3	15.2	14.4	12.6	11.2	10.1	17.5	1.5hr
30.02	15.8	25.7	35.1	41.0	44.0	42.6	39.9	37.4	34.0	30.3	27.5	44.0	1.5hr
1.25b	17.2	28.2	38.4	45.2	49.2	48.1	45.1	42.4	38.5	34.5	31.2	49.2	1.5hr
1.25a	2.7	3.7	5.1	6.3	7.8	8.4	8.4	8.2	7.5	6.9	6.5	8.4	2.5hr
31.01b	2.6	3.6	3.9	3.8	3.5	3.1	2.8	2.5	2.1	1.9	1.7	3.9	45min
31.01a	4.3	6.7	7.6	7.7	7.0	6.5	5.8	5.3	4.5	4.0	3.6	7.7	1hr
Dummy55	6.9	10.3	11.5	11.4	10.5	9.6	8.6	7.8	6.7	5.8	5.2	11.5	45min
31.02	10.9	17.3	21.3	22.8	22.4	20.9	19.5	18.0	15.8	14.3	12.8	22.8	1hr
25.06a	4.3	6.1	8.2	9.5	10.2	9.7	9.1	8.6	7.7	6.8	6.2	10.2	1.5hr
25.06b	6.9	10.1	12.7	14.3	14.7	13.9	13.0	12.3	10.9	9.7	8.8	14.7	1.5hr
25.06c	2.2	3.2	3.8	4.1	3.8	3.5	3.2	2.9	2.5	2.2	2.0	4.1	1hr
25.03c	2.5	4.0	5.4	6.1	6.2	5.8	5.4	5.1	4.4	4.0	3.6	6.2	1.5hr
25.03b	1.9	3.0	3.8	4.3	4.2	4.0	3.7	3.4	3.0	2.6	2.4	4.3	1hr
25.01	4.8	8.0	10.5	12.1	12.7	12.0	11.3	10.6	9.4	8.4	7.6	12.7	1.5hr
27.01	10.5	16.8	21.1	23.4	23.6	22.3	20.6	19.4	17.2	15.4	13.9	23.6	1.5hr
25.03a	12.3	19.8	24.9	27.5	27.7	26.1	24.2	22.7	20.1	18.0	16.2	27.7	1.5hr
26.01a	4.6	7.7	9.9	11.0	11.1	10.4	9.7	9.1	7.9	7.1	6.3	11.1	1.5hr
26.01b	5.3	8.7	11.3	12.8	13.1	12.2	11.3	10.7	9.3	8.4	7.5	13.1	1.5hr
Dummy47	9.9	16.5	21.2	23.8	24.2	22.6	20.9	19.8	17.2	15.4	13.8	24.2	1.5hr
25.02	15.8	26.4	34.9	40.3	42.1	39.9	37.2	34.9	31.1	27.7	25.1	42.1	1.5hr
Dummy48	27.9	46.2	59.8	67.6	69.7	66.0	61.4	57.5	51.1	45.7	41.3	69.7	1.5hr
Dummy22	32.0	52.5	67.6	76.8	79.1	75.3	69.9	65.6	58.1	52.2	47.1	79.1	1.5hr
25.04b	2.8	4.6	6.2	7.2	7.7	7.3	6.9	6.4	5.8	5.2	4.7	7.7	1.5hr
25.04a	3.6	5.9	8.1	9.5	10.4	10.2	9.5	8.9	8.2	7.3	6.6	10.4	1.5hr
Dummy23	37.9	62.0	80.1	91.8	96.2	92.5	86.1	80.8	71.6	64.3	58.1	96.2	1.5hr
25.05a	2.5	4.0	5.5	6.4	7.0	6.8	6.3	5.9	5.4	4.8	4.3	7.0	1.5hr
25.05b	1.8	2.9	3.8	4.4	4.6	4.3	4.1	3.8	3.4	3.0	2.7	4.6	1.5hr
28.01	10.1	15.4	20.3	23.2	24.2	22.7	21.2	20.1	17.7	15.8	14.2	24.2	1.5hr
28.02	15.4	24.4	32.5	38.6	41.5	40.2	37.7	35.4	31.6	28.2	25.6	41.5	1.5hr
Dummy24	55.5	90.7	117.6	136.7	146.4	142.6	133.7	124.9	111.6	100.2	90.5	146.4	1.5hr
Dummy25	61.2	98.6	127.9	149.1	161.4	157.8	148.6	138.7	124.2	111.8	100.8	161.4	1.5hr
25.07b	2.6	3.8	4.9	5.5	5.4	5.1	4.8	4.4	3.8	3.4	3.1	5.5	1hr
29.01	10.7	17.1	23.0	26.5	28.2	27.0	25.4	23.7	21.4	19.0	17.2	28.2	1.5hr
29.02	16.7	27.4	36.9	43.8	48.5	47.6	44.9	41.9	37.8	34.1	30.8	48.5	1.5hr
25.07a	3.2	4.7	6.1	6.9	7.1	6.7	6.2	5.9	5.1	4.6	4.1	7.1	1.5hr
Dummy26	79.6	127.5	165.2	194.2	214.7	213.2	202.0	188.8	169.9	153.3	138.1	214.7	1.5hr
1.22b	1.8	2.1	2.7	3.3	4.2	5.0	5.3	5.4	5.5	5.2	4.8	5.5	4hr
1.20a	2.2	3.4	4.5	5.2	5.4	5.0	4.7	4.4	3.9	3.5	3.1	5.4	1.5hr
1.20b	1.7	2.7	3.5	3.9	3.9	3.7	3.4	3.2	2.8	2.5	2.2	3.9	1.5hr
1.21	8.9	14.8	20.6	24.6	27.3	27.5	25.8	24.5	22.3	20.2	18.1	27.5	2hr
24.01	6.2	10.4	14.2	16.5	17.6	16.9	15.9	14.7	13.4	11.9	10.8	17.6	1.5hr
24.02	13.4	22.8	30.8	37.2	41.1	40.5	38.2	35.8	32.3	29.3	26.3	41.1	1.5hr
24.03	20.3	33.9	45.0	53.7	59.7	59.5	56.6	53.0	47.9	43.4	39.1	59.7	1.5hr
24.04	25.8	41.2	53.5	63.4	70.9	71.0	67.7	63.9	57.6	52.4	47.3	71.0	2hr
24.05	31.8	50.3	64.1	75.9	85.0	85.5	82.2	77.4	70.0	63.8	57.6	85.5	2hr
24.06	37.2	59.0	75.8	89.7	101.0	102.5	98.7	93.0	84.2	76.8	69.6	102.5	2hr
17.14b	4.2	7.3	9.5	10.6	10.8	10.1	9.4	8.9	7.7	6.9	6.2	10.8	1.5hr
17.14a	7.1	11.8	16.1	18.9	20.3	19.5	18.3	17.0	15.5	13.7	12.5	20.3	1.5hr
17.13	3.2	5.5	7.6	9.4	10.7	10.9	10.5	9.8	9.0	8.3	7.5	10.9	2hr
23.01	3.8	6.5	8.9	10.7	11.9	11.9	11.2	10.6	9.6	8.7	7.8	11.9	2hr
20.01	7.9	13.5	17.4	19.6	19.8	18.5	17.1	16.1	14.0	12.6	11.3	19.8	1.5hr
17.10a	3.1	5.2	7.1	8.4	9.1	8.8	8.2	7.7	7.0	6.2	5.7	9.1	1.5hr
17.10b	4.2	7.1	9.8	11.8	13.2	13.3	12.4	11.8	10.7	9.7	8.7	13.3	2hr
17.09	4.9	8.2	11.3	14.1	16.5	17.1	16.6	15.6	14.2	13.2	12.0	17.1	2hr
17.08c	4.6	7.9	10.3	11.6	11.8	11.1	10.3	9.7	8.5	7.6	6.8	11.8	1.5hr
17.08d	0.5	0.8	0.9	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.9	45min
18.01	9.8	16.6	22.1	25.0	25.7	24.2	22.6	21.3	18.7	16.8	15.0	25.7	1.5hr
18.02	16.4	27.6	35.5	39.5	39.9	37.5	34.7	32.7	28.6	25.7	23.0	39.9	1.5hr
17.08b	3.3	5.7	7.1	7.9	7.7	7.2	6.7	6.2	5.4	4.8	4.3	7.9	1hr
17.08a	4.8	8.2	10.8	12.2	12.5	11.7	10.9	10.2	9.0	8.1	7.2	12.5	1.5hr
17.01	6.9	11.6	14.5	15.9	15.4	14.4	13.4	12.3	10.7	9.5	8.5	15.9	1hr
17.02	16.4	27.9	37.1	42.5	44.6	42.6	39.8	37.2	33.6	29.9	27.2	44.6	1.5hr
17.03	30.4	52.0	69.9	84.0	93.6	93.2	88.7	83.2	75.3	68.9	61.8	93.6	1.5hr
17.04	44.1	75.1	100.5	121.7	138.1	138.6	132.5	124.3	112.5	103.1	92.8	138.6	2hr
17.06	55.2	93.6	125.7	152.8	175.7	179.8	172.8	163.3	147.9	135.4	122.8	179.8	2hr
17.07	64.4	107.7	143.0	174.4	201.5	206.7	199.7	189.8	172.2	157.0	143.0	206.7	2hr
Dummy18	80.7	130.1	171.5	207.1	242.3	249.4	243.1	231.1	210.7	192.1	175.5	249.4	2hr
Dummy19	83.7	134.2	176.5	212.8	249.4	257.3	251.5	239.4	218.5	199.3	182.0	257.3	2hr
Dummy36	87.8	140.9	185.6	223.4	261.9	271.7	266.3	254.0	232.1	212.0	193.4	271.7	2hr
21.01	6.7	11.0	15.2	19.4	23.5	25.0	24.9	24.1	22.1	20.4	19.0	25.0	2hr
Dummy37	93.8	150.7	198.6	239.2	281.3	294.2	289.6	276.9	253.7	232.2	211.7	294.2	2hr
Dummy20	103.3	165.4	215.7	259.3	306.1	323.5	319.0	305.9	281.3	257.9	235.4	323.5	2hr
22.01	8.7	14.5	20.2	24.5	28.0	28.6	27.4	25.7	23.4	21.7	19.6	28.6	2hr
17.11	2.6	4.4	6.1	7.4	8.2	8.2	7.7	7.3	6.6	6.0	5.4	8.2	2hr

Node	15min	30min	45min	1hr	1.5hr	2hr	2.5hr	3hr	4hr	5hr	6hr	Max Flow	Critical Duration
Dummy34	111.1	178.4	231.5	277.8	327.7	349.3	346.2	333.9	308.4	283.0	258.5	349.3	2hr
17.12	5.7	9.4	13.2	15.9	17.6	17.8	16.7	15.8	14.3	13.0	11.7	17.8	2hr
Dummy54	114.6	183.9	238.3	285.6	337.2	360.2	358.3	346.8	320.8	294.6	269.2	360.2	2hr
Dummy38	117.1	187.5	242.7	290.6	343.1	367.3	366.1	355.4	329.0	302.3	276.3	367.3	2hr
Dummy35	119.3	190.8	247.0	295.3	348.8	373.9	373.7	363.4	336.8	309.6	283.1	373.9	2hr
Dummy21	123.0	196.2	254.0	303.1	357.9	385.5	388.7	380.3	354.4	326.6	299.2	388.7	2.5hr
17.15a	4.3	7.3	9.8	11.3	12.0	11.4	10.7	10.0	9.0	8.0	7.2	12.0	1.5hr
Dummy39	124.3	197.9	256.3	305.6	360.9	389.2	393.7	386.2	360.8	333.0	305.3	393.7	2.5hr
SU3	3.8	6.5	9.0	10.9	12.3	12.5	11.8	11.2	10.2	9.3	8.3	12.5	2hr
Dummy40	152.0	236.3	308.5	367.7	436.0	471.9	481.0	473.4	444.9	410.9	378.2	481.0	2.5hr
17.15b	2.6	4.3	5.6	6.2	6.2	5.8	5.4	5.0	4.3	3.9	3.5	6.2	1hr
Dummy41	152.4	236.8	309.2	368.7	437.3	473.5	483.1	475.9	447.9	413.9	381.1	483.1	2.5hr
17.16	156.6	243.1	316.6	378.1	448.7	486.2	497.3	491.2	464.4	429.8	396.1	497.3	2.5hr
1.18	3.5	5.8	8.1	10.1	12.4	13.2	13.2	12.7	11.6	10.7	10.0	13.2	2hr
16.01	3.4	5.6	6.9	7.5	7.1	6.6	6.2	5.6	4.9	4.3	3.9	7.5	1hr
15.02	7.1	12.2	16.2	19.3	21.5	22.0	21.6	20.8	19.1	17.7	16.5	22.0	2hr
15.01	5.4	8.5	11.6	14.3	16.4	16.8	16.0	15.1	13.8	12.7	11.5	16.8	2hr
14.01	10.5	17.3	23.1	26.5	27.8	26.4	24.8	23.2	20.8	18.5	16.7	27.8	1.5hr
1.17a	15.9	26.5	35.3	41.2	43.6	41.8	39.1	36.5	32.8	29.3	26.5	43.6	1.5hr
1.17b	3.5	5.7	7.4	8.3	8.5	7.9	7.3	6.9	6.0	5.4	4.8	8.5	1.5hr
1.16	8.7	14.2	17.4	18.8	17.8	16.5	15.4	14.1	12.3	10.8	9.6	18.8	1hr
1.14	1.3	1.6	2.0	2.5	3.2	3.7	4.1	4.3	4.5	4.5	4.3	4.5	4hr
12.02b	1.3	2.0	2.2	2.2	2.0	1.9	1.7	1.5	1.3	1.2	1.0	2.2	1hr
12.02a	4.0	6.7	8.6	9.6	9.8	9.1	8.5	8.0	6.9	6.2	5.5	9.8	1.5hr
11.01	8.5	13.5	15.7	16.5	15.3	14.2	12.9	11.7	10.2	8.9	7.9	16.5	1hr
10.01	9.9	15.4	17.6	18.0	16.5	15.3	13.6	12.5	10.7	9.4	8.4	18.0	1hr
10.02a	17.0	27.0	32.1	33.4	31.0	28.6	26.0	23.7	20.7	18.1	16.1	33.4	1hr
1.13b	5.8	9.5	12.4	13.9	14.1	13.3	12.3	11.6	10.1	9.1	8.1	14.1	1.5hr
1.13a	4.3	7.1	9.3	10.6	11.0	10.3	9.6	9.1	8.0	7.1	6.4	11.0	1.5hr
1.12a	8.1	13.1	15.8	16.9	16.0	14.8	13.8	12.5	10.9	9.6	8.5	16.9	1hr
5.01	2.7	4.5	6.3	7.8	8.8	8.9	8.5	8.0	7.3	6.7	6.0	8.9	2hr
1.11a	3.9	6.1	7.1	7.3	6.7	6.2	5.6	5.1	4.4	3.8	3.4	7.3	1hr
1.11b	6.8	11.1	13.5	14.6	13.8	12.8	12.0	10.9	9.5	8.4	7.5	14.6	1hr
1.09b	2.7	4.4	5.0	5.2	4.7	4.4	3.9	3.6	3.1	2.7	2.4	5.2	1hr
1.09c	6.1	9.9	11.8	12.5	11.6	10.8	9.9	8.9	7.8	6.8	6.1	12.5	1hr
4.01	6.8	10.0	10.8	10.7	9.8	8.8	7.9	7.2	6.1	5.4	4.8	10.8	45min
4.02	14.9	23.8	27.8	29.3	27.4	25.3	23.4	21.3	18.7	16.4	14.6	29.3	1hr
1.06a	8.9	14.7	19.9	23.0	24.4	23.3	21.9	20.5	18.5	16.4	14.9	24.4	1.5hr
1.01	18.6	31.8	44.9	55.0	63.9	65.6	63.4	59.5	54.2	50.2	45.5	65.6	2hr
1.02	35.2	59.7	80.6	96.5	109.7	111.2	106.8	100.8	91.6	84.0	76.4	111.2	2hr
2.01	24.2	42.2	58.0	73.7	90.0	95.4	95.1	91.6	83.8	77.0	71.9	95.4	2hr
1.03	66.9	111.3	148.9	181.4	210.9	218.1	213.2	202.5	185.3	170.5	156.9	218.1	2hr
1.04	78.8	129.3	172.8	207.5	238.2	246.1	240.4	228.7	209.4	193.0	177.0	246.1	2hr
1.05	96.4	157.0	206.9	245.4	279.8	289.4	282.3	270.0	247.2	228.3	208.7	289.4	2hr
1.06b	108.1	174.8	228.9	270.6	307.7	318.8	311.7	299.0	274.4	253.8	231.8	318.8	2hr
Dummy1	115.0	185.9	241.6	285.0	324.5	335.9	328.9	316.2	290.3	268.6	245.6	335.9	2hr
1.07a	4.3	7.5	9.7	10.7	10.9	10.2	9.4	8.8	7.7	6.9	6.2	10.9	1.5hr
1.07b	9.3	15.8	21.8	25.6	27.9	27.5	25.7	24.2	22.1	19.7	17.8	27.9	1.5hr
Dummy2	124.6	200.6	258.5	303.7	347.5	360.3	354.8	342.8	315.7	291.7	267.1	360.3	2hr
1.08a	5.3	8.9	11.2	12.4	12.1	11.4	10.6	9.8	8.5	7.6	6.8	12.4	1hr
1.08b	7.7	13.0	16.1	17.7	17.2	16.1	14.9	13.8	12.0	10.7	9.5	17.7	1hr
Dummy3	129.4	207.2	265.7	312.1	358.1	374.2	370.5	358.8	331.9	306.2	281.0	374.2	2hr
3.01	8.3	12.9	14.5	14.7	13.4	12.4	11.1	10.2	8.7	7.6	6.8	14.7	1hr
1.09a	10.7	16.3	18.5	18.8	17.3	15.9	14.2	13.1	11.2	9.9	8.8	18.8	1hr
Dummy60	131.0	209.5	268.6	315.6	363.7	381.6	378.9	367.2	340.4	314.0	288.5	381.6	2hr
Dummy4	135.0	214.9	274.7	323.1	375.5	398.8	398.4	387.8	362.6	334.0	307.9	398.8	2hr
SU2	6.9	11.4	14.8	16.6	16.8	15.8	14.6	13.8	12.0	10.8	9.7	16.8	1.5hr
1.10b	10.5	17.2	21.8	24.2	24.2	22.7	21.0	19.7	17.2	15.4	13.8	24.2	1hr
Dummy42	138.7	219.7	280.3	330.1	384.7	411.2	411.5	401.1	376.4	346.6	319.7	411.5	2.5hr
1.10a	139.5	220.8	281.7	331.8	387.3	414.7	415.4	405.2	380.9	350.7	323.7	415.4	2.5hr
Dummy6	140.9	222.5	283.9	334.4	391.3	420.6	423.0	413.6	390.8	360.0	332.7	423.0	2.5hr
1.12c	5.8	9.4	11.7	12.6	12.0	11.2	10.4	9.5	8.3	7.3	6.5	12.6	1hr
1.12b	146.9	230.8	293.9	346.0	408.8	442.6	451.3	445.6	423.0	391.5	362.1	451.3	2.5hr
Dummy7	148.4	232.6	296.1	348.5	412.7	448.3	458.4	455.1	433.8	403.6	373.3	458.4	2.5hr
10.02b	2.2	3.1	3.2	3.2	2.9	2.6	2.3	2.1	1.8	1.6	1.4	3.2	45min
7.07a	2.8	4.8	6.0	6.6	6.4	6.0	5.6	5.2	4.5	4.0	3.5	6.6	1hr
7.01	6.5	11.0	14.1	15.5	15.4	14.3	13.3	12.4	10.8	9.6	8.6	15.5	1hr
7.02	17.7	30.7	40.5	48.5	52.5	51.8	48.4	45.5	41.0	37.0	33.4	52.5	1.5hr
7.03	32.0	54.0	71.2	84.9	93.1	91.5	85.7	80.5	72.5	65.6	59.2	93.1	1.5hr
7.04	38.9	65.3	86.5	103.5	114.9	113.7	107.2	100.5	90.6	81.9	74.0	114.9	1.5hr
7.05	50.5	83.8	111.0	132.2	148.4	147.7	141.2	132.0	119.5	108.1	97.7	148.4	1.5hr
7.06	55.6	92.4	122.5	146.3	165.5	166.4	159.7	149.7	135.8	123.0	111.5	166.4	2hr
8.01	9.6	16.2	22.2	26.3	28.8	28.5	26.6	25.2	22.9	20.6	18.6	28.8	1.5hr
7.07b	66.3	109.5	144.0	172.5	196.9	199.7	191.8	180.4	163.8	148.9	135.0	199.7	2hr
Dummy12	67.7	111.6	146.7	175.5	200.8	204.0	196.1	184.7	167.7	152.5	138.4	204.0	2hr
7.08b	4.4	7.5	10.1	11.8	12.7	12.2	11.4	10.6	9.6	8.5	7.8	12.7	1.5hr
7.08a	2.8	4.8	6.3	7.1	7.2	6.7	6.2	5.9	5.1	4.6	4.1	7.2	1.5hr
7.09a	4.5	7.7	10.2	11.5	11.9	11.2	10.4	9.8	8.6	7.7	6.9	11.9	1.5hr
Dummy11	75.2	123.1	160.8	192.1	221.3	226.9	219.5	207.8	188.3	171.9	156.3	226.9	2hr
7.09c	5.4	9.0	12.1	14.0	14.7	13.9	13.0	12.2	10.9	9.7	8.8	14.7	1.5hr
7.09b	1.9	3.0	3.6	3.8	3.6	3.3	3.0	2.8	2.4	2.1	1.9	3.8	1hr
Dummy43	78.9	128.9	168.0	201.0	232.2	239.2	232.2	220.6	199.9	182.6	166.3	239.2	2hr
7.10a	2.8	4.6	6.4	8.0	9.2	9.5	9.1	8.6	7.8	7.3	6.6	9.5	2hr
7.10b	2.4	3.8	5.4	6.6	7.6	7.7	7.3	6.9	6.3	5.8	5.2	7.7	2hr
Dummy9	83.4	135.7	176.4	211.1	244.5	253.7	246.8	235.0	213.2	194.9	177.6	253.7	2hr
9.01	6.1	9.8	11.4	11.9	11.0	10.2	9.2	8.4	7.2	6.3	5.7	11.9	1hr
9.02b	9.5	15.6	19.0	20.4	19.4	18.0	16.5	15.2	13.3	11.8	10.5	20.4	1hr
9.02a	5.6	9.4	12.7	14.7	15.6	14.9	13.9	13.0	11.7	10.4	9.4	15.6	1.5hr
Dummy59	14.9	24.8	31.7	35.0	34.7	32.4	30.0	28.2	24.7	22.2	19.9	35.0	1hr
Dummy8	89.7	143.1	185.4	222.4	259.7	272.9	268.0	256.7	233.9	214.4	195.4	272.9	2hr
7.12	6.7	10.0	13.8	17.2	20.7	21.7	21.5	20.3	18.7	17.3	15.9	21.7	2hr
7.11a	5.3	8.7	10.7	11.7	11.1	10.4	9.7	8.9	7.7	6.8	6.1	11.7	1hr
7.11b	7.6	12.2	14.5	15.5	14.6	13.6	12.6	11.5	10.1	8.9	7.9	15.5	1hr
Dummy10	96.3	152.5	197.8	237.0	279.3	296.8	293.7	283.3	259.7	238.6	217.6	296.8	2hr
12.01a	98.8	155.4	201.3	241.1	284.9	303.6	301.6	291.6	268.1	246.4	224.8	303.6	2hr
Dummy13	232.4	355.9	460.3	553.9	670.0	729.4	744.1	732.9	697.6	650.4	600.6	744.1	2.5hr
12.01b	3.2	5.3	6.4	6.9	6.4	6.0	5.5	5.0	4.4	3.9	3.4	6.9	1hr
Dummy44	232.6	356.2	460.6	554.3	670.6	730.4	745.6	734.9	700.3	653.1	603.2	745.6	2.5hr
Dummy14	234.2	358.3	463.6	558.1	676.1	738.4	756.4	748.0	715.8	669.3	618.5	756.4	2.5hr
1.15	10.1	16.7	21.8	24.5	25.0	23.4	21.7	20.6	17.9	16.0	14.3	25.0	1.5hr
Dummy45	235.2	359.4	465.1	559.8	678.9	742.2	761.9	755.5	726.0	680.3	629.3	761.9	2.5hr
Dummy15	238.2	362.7	469.4	565.4	686.6	753.2	777.2	776.5	754.1	710.7	660.2	777.2	2.5hr
Dummy46	239.6	364.3	471.6	568.0	689.9	757.2	782.3	782.9	762.3	719.4	669.4	782.9	3hr
Dummy16	237.0	368.6	477.4	574.5	697.9	766.7	793.8	797.2	781.2	740.0	691.0	797.2	3hr
Dummy17	379.9	583.7	749.5	889.6	1060.2	1173.6	1230.0	1247.2	1227.4	1163.5	1083.1	1247.2	3hr
1.22a	4.7	4.3	4.7	5.4	6.7	7.9	8.7	9.0	9.4	9.2	8.7	9.4	4hr
1.23	3.8	5.7	7.8	9.5	10.8	11.0	10.5	9.9	9.1	8.3	7.5	11.0	2hr
Dummy27	403.1	614.9	786.1	932.4	1116.0	1241.7	1316.7	1352.8	1356.3	1297.0	1211.5	1356.3	4hr
1.24	2.8	3.7	5.0	6.3	7.9	8.5	8.6	8.4	7.7	7.2	6.7	8.6	2.5hr
Dummy49	393.7	616.3	787.7	934.3	1118.2	1244.3	1319.6	1356.1	1360.6	1301.8	1216.7	1360.6	4hr
Dummy50	318.1	617.4	789.0	935.8	1120.0	1246.4	1322.2	1359.6	1366.4	1310.9	1227.7	1366.4	4hr
Dummy51	292.0	618.9	790.5	937.6	1122.2	1249.2	1325.8	1364.1	1374.1	1323.6	1244.3	1374.1	4hr
Dummy52	248.3	619.5	791.2	938.3	1123.0	1250.2	1327.0	1365.5	1376.3	1326.7	1248.4	1376.3	4hr
Dummy53	236.8	621.8	793.6	941.1	1126.3	1254.0	1331.4	1370.7	1384.5	1339.5	1267.3	1384.5	4hr
1.27	211.5	624.3	796.4	944.2	1129.7	1258.0	1336.0	1376.3	1393.1	1353.2	1288.2	1393.1	4hr
E18	11.8	15.9	20.6	23.8	25.2	23.7	22.3	21.1	18.7	16.6	15.0	25.2	1.5hr
1.28	148.2	625.0	797.1	945.0	1130.6	1259.1	1337.5	1378.2	1396.6	1360.2	1301.7	1396.6	4hr
Out	286.0	627.2	799.4	947.7	1133.9	1263.4	1343.2	1386.2	1414.8	1419.0	1408.8	1419.0	5hr

Table C.9 Estimated 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF Peak Flows (m3/s) under Existing Conditions at All Locations

Node	ARI (years)															
	1yr		2yr		5yr		20yr		100yr		200yr		500yr		PMF	
	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur
E17a	0.4	12hr	0.5	12hr	1.0	9hr	1.8	9hr	2.3	12hr	2.4	9hr	2.7	9hr	16.6	1hr
E17b	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.1	12hr	2.2	9hr	2.5	9hr	15.4	1hr
Dummy57	0.7	12hr	0.9	12hr	1.9	9hr	3.4	9hr	4.5	12hr	4.5	9hr	5.2	9hr	31.9	1hr
E17c	1.5	12hr	2.1	12hr	4.1	9hr	7.3	9hr	9.9	9hr	10.2	9hr	11.7	9hr	70.3	1hr
E17d	0.4	12hr	0.6	12hr	1.1	9hr	2.1	9hr	2.7	12hr	2.8	9hr	3.2	9hr	19.5	1hr
E9	0.5	12hr	0.6	12hr	1.4	9hr	2.2	12hr	2.8	12hr	2.8	12hr	3.3	2hr	20.8	45min
E10	0.4	12hr	0.6	12hr	1.1	9hr	2.1	9hr	2.8	12hr	2.9	9hr	3.3	9hr	19.6	1hr
E3	0.7	12hr	0.9	12hr	2.1	9hr	3.4	9hr	4.5	12hr	4.4	12hr	5.1	12hr	32.2	45min
E2	0.4	12hr	0.5	12hr	1.1	9hr	1.8	12hr	2.3	12hr	2.3	12hr	2.7	2hr	16.8	45min
E1	0.3	12hr	0.4	12hr	1.0	9hr	1.6	12hr	2.0	12hr	2.0	12hr	2.4	2hr	14.7	45min
Dummy56	0.7	12hr	0.9	12hr	2.1	9hr	3.4	12hr	4.4	12hr	4.3	12hr	5.0	2hr	31.5	45min
Dummy30	1.4	12hr	1.9	12hr	4.2	9hr	6.6	9hr	8.5	12hr	8.4	9hr	9.8	2hr	62.1	1hr
E5	2.1	12hr	2.9	12hr	6.1	9hr	10.3	9hr	13.1	12hr	13.5	9hr	15.4	9hr	96.8	1hr
E6a	0.3	12hr	0.4	12hr	1.0	9hr	1.7	9hr	2.2	12hr	2.1	12hr	2.4	12hr	15.3	1hr
E6b	0.3	12hr	0.5	12hr	1.0	9hr	1.7	9hr	2.2	12hr	2.2	12hr	2.5	12hr	15.8	1hr
Dummy31	2.8	12hr	3.8	12hr	7.9	9hr	13.4	9hr	17.1	9hr	17.7	9hr	20.2	9hr	125.3	1hr
E8a	0.2	12hr	0.3	12hr	0.5	9hr	0.9	9hr	1.2	12hr	1.2	12hr	1.4	12hr	8.7	1hr
E7a	0.2	12hr	0.3	12hr	0.6	9hr	1.0	12hr	1.2	12hr	1.2	12hr	1.4	2hr	9.0	45min
E7b	0.7	12hr	0.9	12hr	1.9	9hr	3.1	9hr	4.1	12hr	4.0	12hr	4.6	12hr	29.6	45min
E8c	0.9	12hr	1.1	12hr	2.5	9hr	4.2	9hr	5.4	12hr	5.3	9hr	6.1	9hr	39.0	1hr
E8b	0.3	12hr	0.4	12hr	0.8	9hr	1.5	9hr	2.0	12hr	2.0	9hr	2.3	9hr	14.1	1hr
Dummy32	4.1	12hr	5.6	12hr	11.6	9hr	19.8	9hr	25.1	9hr	26.0	9hr	29.7	9hr	182.0	1hr
E11a	4.4	12hr	5.9	12hr	12.3	9hr	20.8	9hr	26.4	9hr	27.4	9hr	31.2	9hr	189.8	1hr
E11b	5.4	12hr	7.3	12hr	15.0	9hr	25.6	9hr	32.6	9hr	33.8	9hr	38.6	9hr	229.9	1hr
E13	0.9	12hr	1.2	12hr	2.5	9hr	4.3	9hr	5.6	12hr	5.5	9hr	6.3	6hr	40.3	1hr
E12	0.4	12hr	0.5	12hr	1.1	9hr	1.7	12hr	2.1	12hr	2.1	4.5hr	2.6	4.5hr	16.0	30min
E14	0.3	12hr	0.3	12hr	0.8	9hr	1.2	12hr	1.6	12hr	1.6	12hr	1.8	2hr	11.6	45min
E15b	0.1	12hr	0.2	12hr	0.4	9hr	0.6	12hr	0.8	12hr	0.8	12hr	0.9	2hr	5.8	45min
E15a	0.2	12hr	0.2	12hr	0.4	9hr	0.7	12hr	0.9	12hr	0.9	12hr	1.1	2hr	6.7	45min
Dummy29	0.5	12hr	0.7	12hr	1.5	9hr	2.5	12hr	3.2	12hr	3.2	12hr	3.7	2hr	23.2	45min
E16a	0.9	12hr	1.3	12hr	2.5	9hr	4.5	9hr	6.0	12hr	6.2	9hr	7.1	9hr	42.8	1hr
E16b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.5	12hr	0.5	9hr	0.6	9hr	3.8	1hr
Dummy28	7.4	12hr	10.1	12hr	20.6	9hr	35.0	9hr	44.9	9hr	46.5	9hr	53.1	9hr	300.4	1hr
Dummy33	9.3	12hr	12.8	12hr	25.7	9hr	43.8	9hr	56.3	9hr	58.4	9hr	66.7	9hr	372.4	1.5hr
SE5	0.4	12hr	0.6	12hr	1.2	9hr	2.1	9hr	2.8	12hr	2.7	9hr	3.1	12hr	19.6	1hr
SE1	0.5	30min	0.6	30min	0.8	30min	1.3	12hr	1.7	12hr	1.7	12hr	2.0	12hr	11.6	1hr
SE2	0.7	12hr	1.0	12hr	2.1	9hr	3.7	9hr	4.8	12hr	4.8	9hr	5.5	9hr	34.5	1hr
SE3	0.9	12hr	1.3	12hr	2.4	9hr	4.4	9hr	6.3	9hr	6.6	9hr	7.6	9hr	44.1	1.5hr
SE6a	1.1	12hr	1.7	12hr	3.1	9hr	5.5	9hr	7.9	9hr	8.2	9hr	9.5	9hr	55.1	1.5hr
Dummy58	2.1	12hr	3.0	12hr	5.6	9hr	10.1	9hr	13.9	9hr	14.4	9hr	16.6	9hr	95.7	1hr
SE6b	2.7	12hr	3.9	12hr	7.4	9hr	13.3	9hr	18.5	9hr	19.2	9hr	22.0	9hr	126.1	1hr
SE_out	2.7	12hr	3.9	12hr	7.4	9hr	13.3	9hr	18.5	9hr	19.2	9hr	22.0	9hr	126.1	1hr
33.01a	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.1	12hr	2.1	9hr	2.4	9hr	14.9	1hr
33.01b	0.4	12hr	0.6	12hr	1.2	9hr	2.0	9hr	2.7	12hr	2.7	12hr	3.0	12hr	18.9	1hr
32.01	0.3	12hr	0.4	12hr	0.8	9hr	1.3	9hr	1.8	12hr	1.7	9hr	2.0	12hr	12.5	1hr
32.02	0.7	12hr	1.1	12hr	2.3	12hr	3.6	9hr	5.7	9hr	6.0	9hr	7.2	9hr	39.0	2hr
1.26	0.3	18hr	0.4	12hr	0.9	12hr	1.5	9hr	2.3	9hr	2.4	9hr	2.8	9hr	16.3	2hr
31.03	0.2	18hr	0.3	18hr	0.6	12hr	0.9	12hr	1.5	9hr	1.5	9hr	1.8	9hr	10.3	2.5hr
30.01	0.3	12hr	0.5	12hr	1.0	9hr	1.7	9hr	2.5	9hr	2.6	9hr	3.0	9hr	17.5	1.5hr
30.02	0.8	12hr	1.3	12hr	2.3	12hr	4.2	9hr	6.3	9hr	6.5	9hr	7.6	9hr	44.0	1.5hr
1.25b	0.9	12hr	1.4	12hr	2.6	12hr	4.7	9hr	7.0	9hr	7.3	9hr	8.5	9hr	49.2	1.5hr
1.25a	0.1	18hr	0.2	18hr	0.5	18hr	0.8	12hr	1.2	9hr	1.2	9hr	1.5	9hr	8.4	2.5hr
31.01b	0.1	12hr	0.1	12hr	0.3	9hr	0.4	12hr	0.5	12hr	0.5	12hr	0.6	2hr	3.9	45min
31.01a	0.2	12hr	0.2	12hr	0.5	9hr	0.8	9hr	1.1	12hr	1.1	12hr	1.2	12hr	7.7	1hr
Dummy55	0.3	12hr	0.3	12hr	0.7	9hr	1.2	9hr	1.6	12hr	1.6	12hr	1.8	12hr	11.5	45min
31.02	0.5	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.3	9hr	3.4	9hr	3.9	9hr	22.8	1hr
25.06a	0.2	12hr	0.3	12hr	0.6	12hr	1.0	9hr	1.5	9hr	1.5	9hr	1.8	9hr	10.2	1.5hr
25.06b	0.3	12hr	0.4	12hr	0.8	9hr	1.5	9hr	2.1	9hr	2.2	9hr	2.6	9hr	14.7	1.5hr
25.06c	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.6	12hr	0.6	12hr	0.6	12hr	4.1	1hr
25.03c	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.9	9hr	0.9	9hr	1.1	9hr	6.2	1.5hr
25.03b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.6	12hr	0.6	9hr	0.7	9hr	4.3	1hr
25.01	0.2	12hr	0.4	12hr	0.7	9hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.7	1.5hr
27.01	0.5	12hr	0.7	12hr	1.4	9hr	2.5	9hr	3.5	9hr	3.7	9hr	4.2	9hr	23.6	1.5hr
25.03a	0.6	12hr	0.9	12hr	1.6	9hr	2.9	9hr	4.1	9hr	4.3	9hr	4.9	9hr	27.7	1.5hr
26.01a	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.7	9hr	1.9	9hr	11.1	1.5hr
26.01b	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.9	9hr	2.0	9hr	2.3	9hr	13.1	1.5hr
Dummy47	0.5	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.5	9hr	3.7	9hr	4.2	9hr	24.2	1.5hr
25.02	0.8	12hr	1.2	12hr	2.3	9hr	4.1	9hr	6.0	9hr	6.3	9hr	7.2	9hr	42.1	1.5hr
Dummy48	1.3	12hr	2.1	12hr	3.8	9hr	6.9	9hr	10.1	9hr	10.5	9hr	12.1	9hr	69.7	1.5hr
Dummy22	1.5	12hr	2.4	12hr	4.4	9hr	8.0	9hr	11.5	9hr	12.0	9hr	13.8	9hr	79.1	1.5hr
25.04b	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.1	9hr	1.1	9hr	1.3	9hr	7.7	1.5hr
25.04a	0.2	18hr	0.3	12hr	0.6	12hr	1.0	9hr	1.5	9hr	1.6	9hr	1.8	9hr	10.4	1.5hr
Dummy23	1.9	12hr	2.9	12hr	5.4	9hr	9.7	9hr	14.0	9hr	14.6	9hr	16.8	9hr	96.2	1.5hr
25.05a	0.1	12hr	0.2	12hr	0.4	12hr	0.7	9hr	1.0	9hr	1.1	9hr	1.2	9hr	7.0	1.5hr
25.05b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.7	9hr	0.7	9hr	0.8	9hr	4.6	1.5hr
28.01	0.5	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.4	9hr	3.6	9hr	4.1	9hr	24.2	1.5hr
28.02	0.7	12hr	1.2	12hr	2.2	9hr	4.0	9hr	5.9	9hr	6.2	9hr	7.1	9hr	41.5	1.5hr
Dummy24	2.8	12hr	4.4	12hr	8.2	9hr	14.8	9hr	21.4	9hr	22.2	9hr	25.6	9hr	146.4	1.5hr
Dummy25	3.1	12hr	4.9	12hr	9.1	9hr	16.5	9hr	23.7	9hr	24.6	9hr	28.3	9hr	161.4	1.5hr
25.07b	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.8	12hr	0.8	9hr	0.9	9hr	5.5	1hr
29.01	0.5	12hr	0.8	12hr	1.5	9hr	2.7	9hr	4.0	9hr	4.2	9hr	4.9	9hr	28.2	1.5hr
29.02	0.9	12hr	1.4	12hr	2.6	12hr	4.6	9hr	6.9	9hr	7.2	9hr	8.4	9hr	48.5	1.5hr
25.07a	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.0	12hr	1.1	9hr	1.2	9hr	7.1	1.5hr
Dummy26	4.1	12hr	6.7	12hr	12.2	9hr	22.2	9hr	31.9	9hr	33.2	9hr	38.2	9hr	214.7	1.5hr
1.22b	0.1	30min	0.1	30min	0.3	18hr	0.5	12hr	0.8	12hr	0.8	12hr	0.9	12hr	5.5	4hr
1.20a	0.1	12hr	0.2	12hr	0.3	9hr	0.5	9hr	0.8	9hr	0.8	9hr	0.9	9hr	5.4	1.5hr
1.20b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.6	12hr	0.6	9hr	0.7	9hr	3.9	1.5hr
1.21	0.5	18hr	0.8	12hr	1.5	12hr	2.6	9hr	3.9	9hr	4.1	9hr	4.8	9hr	27.5	2hr
24.01	0.3	12hr	0.5	12hr	0.9	9hr	1.7	9hr	2.5	9hr	2.6	9hr	3.0	9hr	17.6	1.5hr
24.02	0.7	18hr	1.2	12hr	2.2	12hr	3.9	9hr	5.8	9hr	6.1	9hr	7.1	9hr	41.1	1.5hr
24.03	1.1	18hr	1.8	12hr	3.3	12hr	5.9	9hr	8.7	9hr	9.1	9hr	10.5	9hr	59.7	1.5hr
24.04	1.3	12hr	2.2	12hr	4.1	12hr	7.2	9hr	10.6	9hr	11.1	9hr	12.8	9hr	71.0	2hr
24.05	1.7	12hr	2.7	12hr	5.0	12hr	8.9	9hr	13.1	9hr	13.6	9hr	15.7	9hr	85.5	2hr
24.06	1.9	12hr	3.2	12hr	6.0	12hr	10.7	9hr	15.7	9hr	16.3	9hr	18.8	9hr	102.5	2hr
17.14b	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.6	9hr	1.9	9hr	10.8	1.5hr
17.14a	0.3	12hr	0.6	12hr	1.1	9hr	2.0	9hr	2.9	9hr	3.0	9hr	3.4	9hr	20.3	1.5hr
17.13	0.2	18hr	0.3	12hr	0.6	12hr	1.0	9hr	1.5	9hr	1.6	9hr	1.9	9hr	10.9	2hr
23.01	0.2	18hr	0.3	12hr	0.7	12hr	1.1	9hr	1.7	9hr	1.8	9hr	2.1	9hr	11.9	2hr
20.01	0.4	12hr	0.6	12hr	1.1	9hr	2.0	9hr	2.8	9hr	2.9	9hr	3.4	9hr	19.8	1.5hr
17.10a	0.2	18hr	0.3	12hr	0.5	12hr	0.9	9hr	1.3	9hr	1.4	9hr	1.6	9hr	9.1	1.5hr
17.10b	0.2	18hr	0.4	12hr	0.7	12hr	1.2	9hr	1.9	9hr	2.0	9hr	2.3	9hr	13.3	2hr
17.09	0.3	18hr	0.5	18hr	1.0	12hr	1.6	9hr	2.4	9hr	2.5	9hr	2.9	9hr	17.1	2hr
17.08c	0.2	12hr	0.4	12hr	0.6	9hr	1.2	9hr	1.7	9hr	1.8	9hr	2.1	9hr	11.8	1.5hr
17.08d	0.0	12hr	0.0	12hr	0.1	9hr	0.1	9hr	0.1	12hr	0.1	12hr	0.1	12hr	0.9	45min
18.01	0.5	12hr	0.8	12hr	1.4	9hr	2.6	9hr	3.7	9hr	3.8	9hr	4.4	9hr	25.7	1.5hr
18.02	0.8	12hr	1.2	12hr	2.2	9hr	4.0	9hr	5.8	9hr	6.0	9hr	6.9	9hr	39.9	1.5hr
17.08b	0.2	12hr	0.2	12hr	0.4	9hr	0.8	9hr	1.1	9hr	1.2	9hr	1.3	9hr	7.9	1hr
17.08a	0.2	12hr	0.4	12hr	0.7	9hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.5	1.5hr
17.01	0.3	12hr	0.5	12hr	0.9	9hr	1.7	9hr	2.3	12hr	2.3	9hr	2.7	9hr	15.9	1hr
17.02	0.8	12hr	1.3	12hr	2.4	9hr	4.3	9hr	6.4	9hr	6.6	9hr	7.7	9hr	44.6	1.5hr
17.03	1.6	18hr	2.7	12hr	5.2	12hr	8.9	9hr	13.5	9hr	14.1	9hr	16.5	9hr	93.6	1.5hr
17.04	2.5	18hr	4.0	12hr	7.8	12hr	13.2	9hr	20.1	9hr	20.9	9hr	24.5	9hr	138.6	2hr
17.06	3.2	18hr	5.1	12hr	10.2	12hr	17.0	9hr	26.0	9hr	27.2	9hr	31.8	9hr	179.8	2hr
17.07	3.7	18hr	6.0	12hr	11.9	12hr	19.9	9hr	30.3	9hr	31.6	9hr	36.9	9hr	206.7	2hr
Dummy18	4.7	18hr	7.5	12hr	14.8	12hr	24.6	9hr	37.5	9hr	39.1	9hr	45.7	9hr	249.4	2hr
Dummy19	4.9	18hr	7.9	12hr	15.4	12hr	25.6	9hr	39.0	9hr	40.7	9hr	47.4	9hr	257.3	2hr
Dummy36	5.1	18hr	8.3	12hr	16.3	12hr	27.1	9hr	41.3	9hr	43.1	9hr	50.3	9hr	271.7	2hr
21.01	0.4	18hr	0.7	18hr	1.4	12hr	2.3	12hr	3.5	9hr	3.7	9hr	4.3	9hr	25.0	2hr
Dummy37	5.5	18hr	8.9	12hr	17.7	12hr	29.3	9hr	44.8	9hr	46.8	9hr	54.5	9hr	294.2	2hr
Dummy20	6.2	18hr	10.0	12hr	19.8	12hr	32.8	9hr	50.0	9hr	52.1	9hr	60.8	9hr	323.5	2hr
22.01	0.5	18hr	0.8	12hr	1.6	12hr	2.7	9hr	4.0	9hr	4.2	9hr	5.0	9hr	28.6	2hr
17.11	0.1	18hr	0.2	12hr	0.4	12hr	0.8	9hr	1.2	9hr	1.2	9hr	1.4	9hr	8.2	2hr

Node	ARI (years)															
	1yr		2yr		5yr		20yr		100yr		200yr		500yr		PMF	
	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur	Flow	Crit.dur
Dummy34	6.8	18hr	11.0	12hr	21.7	12hr	36.0	9hr	54.8	9hr	57.1	9hr	66.5	9hr	349.3	2hr
17.12	0.3	18hr	0.5	12hr	1.0	12hr	1.7	9hr	2.5	9hr	2.6	9hr	3.1	9hr	17.8	2hr
Dummy54	7.1	18hr	11.4	12hr	22.6	12hr	37.5	9hr	57.0	9hr	59.5	9hr	69.2	9hr	360.2	2hr
Dummy38	7.3	18hr	11.7	12hr	23.2	12hr	38.5	9hr	58.5	9hr	61.0	9hr	70.9	9hr	367.3	2hr
Dummy35	7.5	18hr	12.0	12hr	23.7	12hr	39.4	9hr	59.9	9hr	62.4	9hr	72.5	9hr	373.9	2hr
Dummy21	8.0	18hr	12.7	12hr	24.9	12hr	41.5	9hr	62.9	9hr	65.6	9hr	76.2	9hr	388.7	2.5hr
17.15a	0.2	12hr	0.3	12hr	0.6	9hr	1.2	9hr	1.7	9hr	1.8	9hr	2.1	9hr	12.0	1.5hr
Dummy39	8.2	18hr	13.0	12hr	25.4	12hr	42.2	9hr	64.0	9hr	66.7	9hr	77.6	9hr	393.7	2.5hr
SU3	0.2	18hr	0.3	12hr	0.7	12hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.5	2hr
Dummy40	10.3	18hr	16.1	12hr	31.6	12hr	52.6	9hr	79.4	9hr	82.8	9hr	96.0	9hr	481.0	2.5hr
17.15b	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.9	9hr	0.9	9hr	1.1	9hr	6.2	1hr
Dummy41	10.3	18hr	16.3	12hr	31.9	12hr	52.9	9hr	79.9	9hr	83.2	9hr	96.5	9hr	483.1	2.5hr
17.16	10.7	18hr	16.9	12hr	33.0	12hr	54.9	9hr	82.8	9hr	86.3	9hr	100.1	9hr	497.3	2.5hr
1.18	0.2	18hr	0.3	18hr	0.8	12hr	1.2	12hr	1.9	9hr	2.0	9hr	2.3	9hr	13.2	2hr
16.01	0.2	12hr	0.2	12hr	0.4	9hr	0.8	9hr	1.1	12hr	1.1	9hr	1.2	9hr	7.5	1hr
15.02	0.4	12hr	0.6	12hr	1.3	12hr	2.0	12hr	3.2	9hr	3.3	9hr	3.9	9hr	22.0	2hr
15.01	0.3	18hr	0.5	12hr	0.9	12hr	1.5	9hr	2.4	9hr	2.5	9hr	2.9	9hr	16.8	2hr
14.01	0.5	12hr	0.8	12hr	1.5	9hr	2.7	9hr	4.0	9hr	4.1	9hr	4.8	9hr	27.8	1.5hr
1.17a	0.8	12hr	1.3	12hr	2.4	9hr	4.2	9hr	6.2	9hr	6.5	9hr	7.5	9hr	43.6	1.5hr
1.17b	0.2	12hr	0.3	12hr	0.5	9hr	0.8	9hr	1.2	9hr	1.3	9hr	1.5	9hr	8.5	1.5hr
1.16	0.4	12hr	0.5	12hr	1.1	9hr	2.0	9hr	2.7	12hr	2.7	9hr	3.1	9hr	18.8	1hr
1.14	0.1	30min	0.1	18hr	0.2	18hr	0.4	18hr	0.7	12hr	0.7	12hr	0.8	12hr	4.5	4hr
12.02b	0.0	12hr	0.1	12hr	0.1	9hr	0.2	9hr	0.3	12hr	0.3	9hr	0.3	9hr	2.2	1hr
12.02a	0.2	12hr	0.3	12hr	0.5	9hr	1.0	9hr	1.4	9hr	1.5	9hr	1.7	9hr	9.8	1.5hr
11.01	0.4	12hr	0.5	12hr	1.0	9hr	1.8	9hr	2.3	12hr	2.3	9hr	2.6	9hr	16.5	1hr
10.01	0.4	12hr	0.5	12hr	1.1	9hr	1.9	9hr	2.5	12hr	2.5	9hr	2.8	12hr	18.0	1hr
10.02a	0.7	12hr	1.0	12hr	2.0	9hr	3.6	9hr	4.6	12hr	4.7	9hr	5.4	9hr	33.4	1hr
1.13b	0.3	12hr	0.4	12hr	0.8	9hr	1.4	9hr	2.1	9hr	2.1	9hr	2.4	9hr	14.1	1.5hr
1.13a	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.6	9hr	1.9	9hr	11.0	1.5hr
1.12a	0.4	12hr	0.5	12hr	1.0	9hr	1.8	9hr	2.4	12hr	2.4	9hr	2.8	9hr	16.9	1hr
5.01	0.2	18hr	0.2	12hr	0.5	12hr	0.8	9hr	1.3	9hr	1.3	9hr	1.6	9hr	8.9	2hr
1.11a	0.2	12hr	0.2	12hr	0.4	9hr	0.8	9hr	1.0	12hr	1.0	9hr	1.2	12hr	7.3	1hr
1.11b	0.3	12hr	0.4	12hr	0.8	9hr	1.5	9hr	2.1	12hr	2.1	9hr	2.4	9hr	14.6	1hr
1.09b	0.1	12hr	0.2	12hr	0.3	9hr	0.6	9hr	0.7	12hr	0.7	9hr	0.8	9hr	5.2	1hr
1.09c	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.7	12hr	1.8	9hr	2.0	9hr	12.5	1hr
4.01	0.2	12hr	0.3	12hr	0.7	9hr	1.1	9hr	1.5	12hr	1.5	12hr	1.7	12hr	10.8	45min
4.02	0.6	12hr	0.9	12hr	1.7	9hr	3.1	9hr	4.1	12hr	4.2	9hr	4.8	9hr	29.3	1hr
1.06a	0.4	12hr	0.7	12hr	1.3	9hr	2.4	9hr	3.5	9hr	3.6	9hr	4.2	9hr	24.4	1.5hr
1.01	1.1	18hr	1.8	12hr	3.7	12hr	6.0	9hr	9.3	9hr	9.7	9hr	11.4	9hr	65.6	2hr
1.02	2.0	18hr	3.3	12hr	6.4	12hr	10.6	9hr	16.3	9hr	17.0	9hr	19.9	9hr	111.2	2hr
2.01	1.6	18hr	2.6	18hr	5.5	12hr	8.8	12hr	13.6	9hr	14.2	9hr	16.8	9hr	95.4	2hr
1.03	3.8	18hr	6.1	12hr	12.6	12hr	20.3	9hr	31.7	9hr	33.2	9hr	39.1	9hr	218.1	2hr
1.04	4.4	18hr	7.1	12hr	14.4	12hr	23.3	9hr	36.4	9hr	38.1	9hr	44.8	9hr	246.1	2hr
1.05	5.3	18hr	8.7	12hr	17.3	12hr	28.2	9hr	43.8	9hr	45.8	9hr	53.6	9hr	289.4	2hr
1.06b	6.0	18hr	9.8	12hr	19.3	12hr	31.8	9hr	48.9	9hr	51.1	9hr	59.8	9hr	318.8	2hr
Dummy1	6.4	18hr	10.4	12hr	20.5	12hr	33.9	9hr	52.1	9hr	54.4	9hr	63.6	9hr	335.9	2hr
1.07a	0.2	12hr	0.3	12hr	0.6	9hr	1.1	9hr	1.6	9hr	1.6	9hr	1.9	9hr	10.9	1.5hr
1.07b	0.5	12hr	0.8	12hr	1.5	12hr	2.7	9hr	3.9	9hr	4.1	9hr	4.9	9hr	27.9	1.5hr
Dummy2	7.1	18hr	11.4	12hr	22.3	12hr	37.1	9hr	56.9	9hr	59.4	9hr	69.3	9hr	360.3	2hr
1.08a	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.8	9hr	1.9	9hr	2.1	9hr	12.4	1hr
1.08b	0.4	12hr	0.5	12hr	1.0	9hr	1.9	9hr	2.5	9hr	2.6	9hr	3.0	9hr	17.7	1hr
Dummy3	7.5	18hr	12.1	12hr	23.5	12hr	39.1	9hr	59.9	9hr	62.5	9hr	72.8	9hr	374.2	2hr
3.01	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.1	12hr	2.0	12hr	2.3	12hr	14.7	1hr
1.09a	0.4	12hr	0.5	12hr	1.2	9hr	2.0	9hr	2.6	12hr	2.6	9hr	3.0	9hr	18.8	1hr
Dummy60	7.7	18hr	12.4	12hr	0.0	30min	40.0	9hr	61.4	9hr	64.1	9hr	74.5	9hr	381.6	2hr
Dummy4	8.3	12hr	13.2	12hr	25.9	12hr	42.6	9hr	65.1	9hr	67.9	9hr	78.8	9hr	398.8	2hr
SU2	0.3	12hr	0.5	12hr	0.9	9hr	1.7	9hr	2.4	9hr	2.5	9hr	2.9	9hr	16.8	1.5hr
1.10b	0.5	12hr	0.7	12hr	1.4	9hr	2.5	9hr	3.5	9hr	3.7	9hr	4.2	9hr	24.2	1hr
Dummy42	8.7	12hr	13.8	12hr	27.0	12hr	44.3	9hr	67.5	9hr	70.4	9hr	81.7	9hr	411.5	2.5hr
1.10a	8.9	12hr	14.0	12hr	27.3	12hr	44.8	9hr	68.3	9hr	71.2	9hr	82.6	9hr	415.4	2.5hr
Dummy6	9.1	12hr	14.4	12hr	28.1	12hr	45.9	9hr	69.8	9hr	72.8	9hr	84.4	9hr	423.0	2.5hr
1.12c	0.3	12hr	0.4	12hr	0.7	9hr	1.3	9hr	1.8	12hr	1.8	9hr	2.1	9hr	12.6	1hr
1.12b	10.1	12hr	15.8	12hr	30.5	12hr	49.8	9hr	75.3	9hr	78.5	9hr	91.3	9hr	451.3	2.5hr
Dummy7	10.4	12hr	16.3	12hr	31.3	12hr	51.1	9hr	77.2	9hr	80.5	9hr	93.6	9hr	458.4	2.5hr
10.02b	0.1	12hr	0.1	12hr	0.2	9hr	0.3	12hr	0.4	12hr	0.4	12hr	0.5	2hr	3.2	45min
7.07a	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	0.9	12hr	1.0	9hr	1.1	9hr	6.6	1hr
7.01	0.3	12hr	0.5	12hr	0.9	9hr	1.6	9hr	2.2	9hr	2.3	9hr	2.6	9hr	15.5	1hr
7.02	0.9	12hr	1.6	12hr	2.9	12hr	5.0	9hr	7.6	9hr	7.9	9hr	9.1	9hr	52.5	1.5hr
7.03	1.7	12hr	2.8	12hr	5.1	9hr	9.0	9hr	13.4	9hr	14.0	9hr	16.2	9hr	93.1	1.5hr
7.04	2.1	18hr	3.4	12hr	6.4	12hr	11.2	9hr	16.7	9hr	17.3	9hr	20.1	9hr	114.9	1.5hr
7.05	2.8	18hr	4.5	12hr	8.4	12hr	14.8	9hr	22.0	9hr	22.9	9hr	26.5	9hr	148.4	1.5hr
7.06	3.1	18hr	5.0	12hr	9.5	12hr	16.6	9hr	24.7	9hr	25.7	9hr	29.8	9hr	166.4	2hr
8.01	0.5	12hr	0.8	12hr	1.6	12hr	2.7	9hr	4.1	9hr	4.3	9hr	5.1	9hr	28.8	1.5hr
7.07b	3.7	18hr	6.1	12hr	11.5	12hr	20.1	9hr	29.9	9hr	31.1	9hr	35.9	9hr	199.7	2hr
Dummy12	3.8	18hr	6.2	12hr	11.8	12hr	20.5	9hr	30.6	9hr	31.8	9hr	36.8	9hr	204.0	2hr
7.08b	0.2	12hr	0.4	12hr	0.7	12hr	1.2	9hr	1.8	9hr	1.9	9hr	2.2	9hr	12.7	1.5hr
7.08a	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.0	9hr	1.1	9hr	1.2	9hr	7.2	1.5hr
7.09a	0.2	12hr	0.4	12hr	0.6	9hr	1.2	9hr	1.7	9hr	1.8	9hr	2.1	9hr	11.9	1.5hr
Dummy11	4.3	18hr	7.1	12hr	13.4	12hr	23.2	9hr	34.5	9hr	35.9	9hr	41.5	9hr	226.9	2hr
7.09c	0.3	12hr	0.4	12hr	0.8	9hr	1.4	9hr	2.1	9hr	2.2	9hr	2.5	9hr	14.7	1.5hr
7.09b	0.1	12hr	0.1	12hr	0.2	9hr	0.4	9hr	0.5	12hr	0.5	9hr	0.6	9hr	3.8	1hr
Dummy43	4.6	18hr	7.5	12hr	14.3	12hr	24.7	9hr	36.7	9hr	38.1	9hr	44.0	9hr	239.2	2hr
7.10a	0.2	18hr	0.2	18hr	0.5	12hr	0.9	9hr	1.3	9hr	1.4	9hr	1.6	9hr	9.5	2hr
7.10b	0.1	18hr	0.2	12hr	0.4	12hr	0.7	9hr	1.1	9hr	1.1	9hr	1.3	9hr	7.7	2hr
Dummy9	4.9	18hr	8.0	12hr	15.2	12hr	26.2	9hr	39.0	9hr	40.6	9hr	46.8	9hr	253.7	2hr
9.01	0.3	12hr	0.3	12hr	0.7	9hr	1.3	9hr	1.7	12hr	1.7	9hr	1.9	9hr	11.9	1hr
9.02b	0.4	12hr	0.6	12hr	1.2	9hr	2.1	9hr	2.8	12hr	2.9	9hr	3.4	9hr	20.4	1hr
9.02a	0.3	12hr	0.5	12hr	0.8	9hr	1.5	9hr	2.2	9hr	2.3	9hr	2.7	9hr	15.6	1.5hr
Dummy59	0.7	12hr	1.1	12hr	1.9	9hr	3.6	9hr	5.1	9hr	5.3	9hr	6.0	9hr	35.0	1hr
Dummy8	5.5	12hr	8.8	12hr	16.8	12hr	28.7	9hr	42.6	9hr	44.3	9hr	51.2	9hr	272.9	2hr
7.12	0.4	18hr	0.6	18hr	1.2	12hr	2.0	12hr	3.0	9hr	3.2	9hr	3.7	9hr	21.7	2hr
7.11a	0.2	12hr	0.3	12hr	0.7	9hr	1.2	9hr	1.6	12hr	1.7	9hr	2.0	9hr	11.7	1hr
7.11b	0.3	12hr	0.4	12hr	0.9	9hr	1.6	9hr	2.2	12hr	2.2	9hr	2.6	9hr	15.5	1hr
Dummy10	6.0	18hr	9.7	12hr	18.6	12hr	31.5	9hr	46.8	9hr	48.8	9hr	56.4	9hr	296.8	2hr
12.01a	6.2	18hr	10.0	12hr	19.2	12hr	32.5	9hr	48.3	9hr	50.3	9hr	58.2	9hr	303.6	2hr
Dummy13	17.0	18hr	26.8	12hr	50.5	12hr	84.0	9hr	125.9	9hr	131.1	9hr	151.9	9hr	744.1	2.5hr
12.01b	0.1	12hr	0.2	12hr	0.4	9hr	0.7	9hr	1.0	12hr	1.0	9hr	1.1	9hr	6.9	1hr
Dummy44	17.1	18hr	26.9	12hr	50.7	12hr	84.2	9hr	126.3	9hr	131.5	9hr	152.4	9hr	745.6	2.5hr
Dummy14	17.4	18hr	27.5	12hr	51.7	12hr	85.6	9hr	128.6	9hr	133.9	9hr	155.2	9hr	756.4	2.5hr
1.15	0.5	12hr	0.8	12hr	1.4	9hr	2.5	9hr	3.6	9hr	3.7	9hr	4.3	9hr	25.0	1.5hr
Dummy45	17.8	18hr	27.9	12hr	52.4	12hr	86.7	9hr	130.3	9hr	135.7	9hr	157.2	9hr	761.9	2.5hr
Dummy15	18.7	18hr	29.1	12hr	54.5	12hr	89.9	9hr	135.3	9hr	140.8	9hr	162.9	9hr	777.2	2.5hr
Dummy46	18.9	18hr	29.5	12hr	55.2	12hr	91.0	9hr	136.8	9hr	142.4	9hr	164.7	9hr	782.9	3hr
Dummy16	19.4	18hr	30.2	12hr	56.7	12hr	93.4	9hr	140.3	9hr	146.0	9hr	168.8	9hr	797.2	3hr
Dummy17	30.5	18hr	47.0	12hr	89.1	12hr	146.5	9hr	218.9	9hr	228.0	9hr	264.2	9hr	1247.2	3hr
1.22a	0.3	30min	0.3	30min	0.5	18hr	0.9	18hr	1.4	12hr	1.4	12hr	1.6	12hr	9.4	4hr
1.23	0.2	18hr	0.3	12hr	0.6	12hr	1.0	9hr	1.6	9hr	1.6	9hr	2.0	9hr	11.0	2hr
Dummy27	34.1	18hr	52.2	18hr	98.7	12hr	160.7	9hr	240.8	9hr	250.7	9hr	290.1	9hr	1356.3	4hr
1.24	0.1	18hr	0.2	18hr	0.5	18hr	0.8	12hr	1.2	12hr	1.3	9hr	1.5	9hr	8.6	2.5hr
Dummy49	34.2	18hr	52.4	18hr	99.1	12hr	161.2	9hr	241.6	9hr	251.6	9hr	291.1	9hr	1360.6	4hr
Dummy50	34.5	18hr	52.9	18hr	100.0	18hr	162.2	9hr	243.1	9hr	253.1	9hr	292.9	9hr	1366.4	4hr
Dummy51	35.0	18hr	53.6	18hr	101.5	18hr	163.6	9hr	245.3	9hr	255.4	9hr	295.4	9hr	1374.1	4hr
Dummy52	35.2	18hr	53.8	18hr	101.9	18hr	164.0	9hr	245.9	9hr	256.0	9hr	296.1	9hr	1376.3	4hr
Dummy53	35.8	18hr	54.7	18hr	103.8	18hr	165.9	9hr	248.7	9hr	258.9	9hr	299.4	9hr	1384.5	4hr
1.27	36.5	18hr	55.7	18hr	105.9	18hr	168.0	9hr	251.9	9hr	262.2	9hr	303.1	9hr	1393.1	4hr
E18	0.7	30min	0.9	30min	1.4	12hr	2.5	9hr	3.7	12hr	3.8	9hr	4.4	9hr	25.2	1.5hr
1.28	37.0	18hr	56.4	18hr	107.2	18hr	169.0	9hr	253.5	9hr	263.9	9hr	305.1	9hr	1396.6	4hr
Out	39.9	18hr	60.4	18hr	116.7	18hr	175.6	9hr	271.5	12hr	275.3	9hr	318.5	9hr	1419.0	5hr

Table C.10A Estimated 2 yr ARI Peak Flows (m3/s) under Scenario A Development at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E17b	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy57	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.9	0.8	0.9	12hr
E17c	2.2	2.1	2.1	1.2	1.0	1.0	1.6	2.1	1.9	2.2	30min
E17d	0.4	0.4	0.4	0.2	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E9	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E10	4.3	3.8	3.8	2.3	2.0	1.5	1.3	1.3	0.9	4.3	30min
E3	5.2	5.0	5.0	2.7	2.4	1.7	1.5	1.6	1.0	5.2	30min
E2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
E1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
Dummy56	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.9	0.7	0.9	12hr
Dummy30	5.4	5.2	5.1	2.9	2.5	1.8	1.8	2.1	1.5	5.4	30min
E5	10.9	9.3	10.2	6.5	5.7	4.2	3.7	3.8	2.6	10.9	30min
E6a	2.7	2.6	2.6	1.4	1.3	0.9	0.8	0.8	0.5	2.7	30min
E6b	1.6	1.5	1.5	0.8	0.7	0.5	0.5	0.6	0.4	1.6	30min
Dummy31	12.8	11.7	12.0	8.8	7.6	5.6	4.9	5.1	3.4	12.8	30min
E8a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
E7a	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
E7b	1.6	1.6	1.6	0.9	0.8	0.5	0.7	1.0	0.7	1.6	30min
E8c	1.8	1.8	1.9	1.2	1.0	0.8	1.0	1.2	0.9	1.9	2hr
E8b	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
Dummy32	15.7	14.9	13.9	10.8	9.8	7.6	6.7	7.0	4.9	15.7	30min
E11a	16.1	15.3	14.1	11.0	10.2	8.0	7.0	7.3	5.1	16.1	30min
E11b	17.5	17.1	15.3	12.8	12.0	9.7	8.5	8.9	6.4	17.5	30min
E13	4.9	4.7	4.7	2.5	2.2	1.6	1.4	1.6	1.1	4.9	30min
E12	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E14	2.0	1.9	2.0	1.1	0.9	0.7	0.6	0.6	0.4	2.0	30min
E15b	1.0	0.9	1.0	0.5	0.4	0.3	0.3	0.3	0.2	1.0	30min
E15a	1.1	1.1	1.1	0.6	0.5	0.4	0.3	0.3	0.2	1.1	30min
Dummy29	3.6	3.1	3.3	2.1	1.9	1.4	1.2	1.2	0.8	3.6	30min
E16a	5.2	5.5	5.3	4.0	3.4	2.7	2.4	2.4	1.6	5.5	1hr
E16b	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy28	18.7	19.8	19.1	16.2	14.5	13.1	11.8	12.3	9.0	19.8	1hr
Dummy33	18.7	20.0	19.7	16.9	14.7	13.6	12.9	14.9	11.4	20.0	1hr
SE5	0.7	0.6	0.6	0.3	0.3	0.3	0.5	0.6	0.5	0.7	30min
SE1	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
SE2	6.6	6.2	6.2	3.5	3.1	2.2	2.0	2.0	1.3	6.6	30min
SE3	0.3	0.3	0.3	0.1	0.3	0.6	1.0	1.3	1.2	1.3	12hr
SE6a	1.4	1.3	1.2	0.8	0.7	0.7	1.2	1.7	1.6	1.7	12hr
Dummy58	9.2	8.3	8.8	5.5	4.8	3.5	3.1	3.6	2.8	9.2	30min
SE6b	10.6	9.5	10.2	6.9	6.0	4.4	3.9	4.7	3.7	10.6	30min
SE_out	10.6	9.5	10.2	6.9	6.0	4.4	3.9	4.7	3.7	10.6	30min
33.01a	1.1	1.0	1.0	0.6	0.5	0.4	0.4	0.5	0.4	1.1	30min
33.01b	1.1	1.1	1.1	0.6	0.5	0.4	0.5	0.6	0.5	1.1	30min
32.01	2.4	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.4	30min
32.02	5.5	6.0	5.3	4.2	3.6	2.7	2.4	2.4	1.6	6.0	1hr
1.26	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
31.03	1.3	1.2	1.1	0.7	0.7	0.5	0.4	0.4	0.3	1.3	30min
30.01	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.5	0.5	0.5	12hr
30.02	0.7	0.6	0.6	0.4	0.3	0.5	0.9	1.3	1.3	1.3	12hr
1.25b	0.7	0.6	0.6	0.4	0.4	0.6	1.0	1.4	1.4	1.4	12hr
1.25a	0.9	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.9	30min
31.01b	0.7	0.7	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.7	30min
31.01a	1.5	1.4	1.4	0.8	0.7	0.5	0.4	0.4	0.3	1.5	30min
Dummy55	2.1	2.1	2.1	1.1	1.0	0.7	0.6	0.6	0.4	2.1	30min
31.02	2.9	3.5	3.1	2.3	2.0	1.5	1.3	1.3	0.9	3.5	1hr
25.06a	2.5	2.3	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
25.06b	2.9	2.7	2.7	1.7	1.5	1.1	1.0	1.0	0.7	2.9	30min
25.06c	0.5	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.5	30min
25.03c	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
25.03b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.4	30min
25.01	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.4	30min
27.01	2.9	2.7	2.6	1.6	1.4	1.0	0.9	0.9	0.7	2.9	30min
25.03a	3.5	3.3	3.3	2.1	1.8	1.3	1.2	1.2	0.9	3.5	30min
26.01a	2.6	2.4	2.3	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
26.01b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
Dummy47	2.7	2.5	2.5	1.4	1.3	0.9	0.8	0.9	0.7	2.7	30min
25.02	5.7	5.2	5.1	3.7	3.2	2.3	2.1	2.1	1.4	5.7	30min
Dummy48	9.2	8.4	8.0	5.8	5.1	3.7	3.2	3.3	2.2	9.2	30min
Dummy22	9.7	9.1	8.5	6.2	5.6	4.3	3.7	3.8	2.6	9.7	30min
25.04b	1.5	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min
25.04a	2.5	2.2	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
Dummy23	10.8	10.3	9.3	7.3	7.0	5.6	4.9	5.0	3.3	10.8	30min
25.05a	1.6	1.4	1.4	0.9	0.8	0.6	0.5	0.5	0.3	1.6	30min
25.05b	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.2	0.1	0.6	30min
28.01	5.8	5.3	5.2	3.1	2.8	2.0	1.8	1.8	1.2	5.8	30min
28.02	7.1	6.8	6.5	4.8	4.2	3.3	2.9	2.9	2.0	7.1	30min
Dummy24	13.9	16.6	15.9	12.7	11.1	9.5	8.3	8.4	5.8	16.6	1hr
Dummy25	14.7	17.7	16.8	14.0	12.3	10.5	9.3	9.2	6.5	17.7	1hr
25.07b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.4	30min
29.01	7.2	6.4	6.3	3.9	3.4	2.5	2.2	2.2	1.5	7.2	30min
29.02	8.5	8.0	7.7	5.6	5.0	4.0	3.5	3.5	2.4	8.5	30min
25.07a	1.4	1.2	1.2	0.7	0.7	0.5	0.4	0.4	0.3	1.4	30min
Dummy26	19.3	21.9	22.3	18.6	16.3	14.3	12.7	12.0	9.3	22.3	2hr
1.22b	1.2	1.1	1.1	0.8	0.7	0.5	0.5	0.5	0.3	1.2	30min
1.20a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
1.20b	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	30min
1.21	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.8	0.8	12hr
24.01	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.5	12hr
24.02	0.2	0.2	0.2	0.1	0.3	0.5	0.8	1.2	1.2	1.2	12hr
24.03	0.2	0.3	0.3	0.2	0.4	0.7	1.2	1.8	1.8	1.8	12hr
24.04	0.2	0.3	0.3	0.2	0.5	0.9	1.5	2.2	2.1	2.2	12hr
24.05	0.2	0.3	0.3	0.2	0.7	1.1	1.9	2.7	2.6	2.7	12hr
24.06	0.2	0.3	0.3	0.3	0.8	1.3	2.2	3.2	3.1	3.2	12hr
17.14b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
17.14a	3.2	2.8	2.7	1.8	1.5	1.1	1.0	1.0	0.7	3.2	30min
17.13	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
23.01	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
20.01	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.6	0.6	0.6	12hr
17.10a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	12hr
17.10b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.4	0.4	0.4	12hr
17.09	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	18hr
17.08c	1.5	1.3	1.3	0.8	0.7	0.5	0.4	0.5	0.4	1.5	30min
17.08d	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12hr
18.01	0.2	0.1	0.1	0.1	0.2	0.3	0.6	0.8	0.7	0.8	12hr
18.02	0.2	0.2	0.2	0.1	0.3	0.5	0.9	1.2	1.1	1.2	12hr
17.08b	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
17.08a	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
17.01	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.5	0.4	0.5	12hr
17.02	0.3	0.2	0.2	0.1	0.3	0.5	0.9	1.3	1.3	1.3	12hr
17.03	0.4	0.5	0.5	0.3	0.6	1.1	1.9	2.7	2.6	2.7	12hr
17.04	0.6	0.6	0.7	0.5	0.9	1.6	2.8	4.0	3.9	4.0	12hr
17.06	0.7	0.7	0.7	0.5	1.1	2.0	3.5	5.1	5.1	5.1	12hr
17.07	0.7	0.7	0.8	0.6	1.3	2.4	4.1	6.0	5.9	6.0	12hr
Dummy18	0.7	0.8	0.8	0.7	1.7	3.1	5.3	7.5	7.4	7.5	12hr
Dummy19	1.6	1.8	1.7	1.2	1.8	3.2	5.5	7.8	7.7	7.8	12hr
Dummy36	1.7	1.8	1.8	1.3	1.9	3.4	5.8	8.2	8.1	8.2	12hr
21.01	6.5	5.8	5.5	3.8	3.4	2.5	2.2	2.2	1.5	6.5	30min
Dummy37	6.6	6.6	6.5	4.8	4.1	3.6	6.2	8.8	8.8	8.8	18hr
Dummy20	6.7	6.6	6.6	4.8	4.2	4.1	7.0	9.8	9.9	9.9	18hr
22.01	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.8	0.8	12hr
17.11	1.5	1.3	1.3	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	7.2	7.2	7.0	5.1	4.8	4.5	7.7	10.7	10.8	10.8	18hr
17.12	3.9	3.5	3.4	2.2	1.9	1.4	1.2	1.2	0.8	3.9	30min
Dummy54	8.2	8.4	7.8	6.1	6.1	5.1	8.0	11.1	11.3	11.3	18hr
Dummy38	8.2	8.4	7.9	6.1	6.1	5.1	8.2	11.4	11.6	11.6	18hr
Dummy35	8.2	8.4	7.9	6.2	6.1	5.1	8.4	11.7	11.8	11.8	18hr
Dummy21	8.3	8.9	8.6	6.9	6.5	5.8	8.9	12.4	12.5	12.5	18hr
17.15a	2.3	2.1	2.0	1.3	1.1	0.8	0.7	0.7	0.5	2.3	30min
Dummy39	8.3	9.0	8.9	7.5	6.7	6.3	9.1	12.5	12.7	12.7	18hr
SU3	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy40	8.5	9.3	9.2	7.7	6.9	6.6	11.4	15.8	15.9	15.9	18hr
17.15b	0.8	0.8	0.7	0.4	0.4	0.3	0.2	0.3	0.2	0.8	30min
Dummy41	8.5	9.3	9.3	7.9	7.0	6.7	11.5	15.9	16.0	16.0	18hr
17.16	8.5	9.3	9.3	7.9	7.0	6.9	11.9	16.5	16.6	16.6	18hr
1.18	2.9	2.7	2.6	1.8	1.6	1.2	1.0	1.0	0.7	2.9	30min
16.01	1.6	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.6	30min
15.02	2.2	2.3	2.2	1.7	1.4	1.1	1.0	1.0	0.7	2.3	1hr
15.01	3.2	2.8	2.7	1.9	1.6	1.2	1.0	1.1	0.7	3.2	30min
14.01	6.2	5.5	5.3	3.4	3.0	2.2	1.9	1.9	1.3	6.2	30min
1.17a	7.2	6.7	6.7	4.7	4.0	3.1	2.7	2.7	1.8	7.2	30min
1.17b	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
1.16	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
1.14	0.8	0.9	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.9	2hr
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
12.02a	1.7	1.5	1.5	0.9	0.8	0.6	0.5	0.5	0.3	1.7	30min
11.01	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
10.01	3.4	3.2	3.2	1.8	1.6	1.1	1.0	1.0	0.7	3.4	30min
10.02a	5.6	4.7	5.2	3.5	3.0	2.2	1.9	2.0	1.3	5.6	30min
1.13b	1.6	1.5	1.4	0.9	0.8	0.6	0.5	0.6	0.4	1.6	30min
1.13a	1.8	1.6	1.6	1.0	0.9	0.6	0.6	0.6	0.4	1.8	30min
1.12a	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
5.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
1.11a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
1.11b	2.2	2.0	2.0	1.2	1.0	0.7	0.7	0.7	0.4	2.2	30min
1.09b	0.9	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
1.09c	2.0	1.9	1.9	1.1	1.0	0.7	0.6	0.6	0.4	2.0	30min
4.01	2.5	2.3	2.3	1.3	1.2	0.8	0.7	0.7	0.5	2.5	30min
4.02	7.0	6.1	6.3	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
1.06a	4.1	3.6	3.5	2.2	2.0	1.4	1.3	1.3	0.9	4.1	30min
1.01	0.0	0.0	0.0	0.1	0.4	0.7	1.2	1.8	1.8	1.8	12hr
1.02	0.0	0.0	0.0	0.1	0.7	1.3	2.2	3.3	3.2	3.3	12hr
2.01	0.0	0.0	0.0	0.1	0.5	0.9	1.7	2.5	2.6	2.6	18hr
1.03	0.0	0.0	0.0	0.2	1.4	2.4	4.2	6.1	6.1	6.1	12hr
1.04	0.0	0.0	0.0	0.3	1.6	2.9	4.9	7.1	7.0	7.1	12hr
1.05	0.0	0.0	0.0	0.3	2.0	3.5	6.0	8.7	8.5	8.7	12hr
1.06b	0.4	0.4	0.4	0.4	2.3	4.0	6.8	9.8	9.6	9.8	12hr
Dummy1	4.5	4.0	3.9	2.4	2.4	4.2	7.2	10.2	10.1	10.2	12hr
1.07a	1.3	1.2	1.2	0.7	0.6	0.5	0.4	0.5	0.3	1.3	30min
1.07b	0.7	0.7	0.7	0.4	0.3	0.3	0.6	0.8	0.8	0.8	12hr
Dummy2	5.1	4.7	4.5	3.2	2.8	4.6	7.9	11.2	11.1	11.2	12hr
1.08a	3.0	2.7	2.7	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
1.08b	2.7	2.5	2.5	1.5	1.3	0.9	0.8	0.9	0.6	2.7	30min
Dummy3	7.0	6.9	7.2	5.9	4.8	4.8	8.3	11.6	11.6	11.6	12hr
3.01	3.5	3.3	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
1.09a	3.8	3.6	3.7	2.3	2.0	1.5	1.3	1.3	0.9	3.8	30min
Dummy60	10.4	10.0	10.9	8.2	6.6	5.7	8.5	11.8	11.9	11.9	18hr
Dummy4	14.2	14.9	15.1	12.4	10.6	8.9	9.0	12.4	12.6	15.1	2hr
SU2	0.6	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.6	1.0	2hr
1.10b	1.7	1.6	1.6	1.2	1.3	1.2	1.2	1.2	0.9	1.7	30min
Dummy42	15.2	16.1	16.4	13.4	11.8	10.0	9.4	12.9	13.2	16.4	2hr
1.10a	15.5	16.8	17.0	13.8	12.3	10.4	9.5	13.1	13.3	17.0	2hr
Dummy6	15.9	18.0	17.7	14.4	13.5	11.2	10.0	13.5	13.6	18.0	1hr
1.12c	2.6	2.4	2.4	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
1.12b	17.5	20.6	19.7	16.7	16.0	13.6	12.4	14.5	14.7	20.6	1hr
Dummy7	17.5	20.7	20.3	17.2	16.3	14.4	13.1	15.0	15.1	20.7	1hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.07a	0.6	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.6	30min
7.01	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.4	0.5	12hr
7.02	0.3	0.3	0.3	0.2	0.4	0.6	1.1	1.6	1.5	1.6	12hr
7.03	0.5	0.5	0.5	0.3	0.6	1.1	1.9	2.8	2.7	2.8	12hr
7.04	0.6	0.6	0.6	0.4	0.8	1.4	2.4	3.4	3.3	3.4	12hr
7.05	0.6	0.7	0.6	0.5	1.0	1.8	3.2	4.5	4.4	4.5	12hr
7.06	0.6	0.7	0.7	0.5	1.1	2.0	3.5	5.0	4.9	5.0	12hr
8.01	7.0	6.2	6.1	3.8	3.4	2.4	2.1	2.2	1.4	7.0	30min
7.07b	7.7	7.0	7.0	4.7	4.2	3.1	4.1	6.1	5.9	7.7	30min
Dummy12	7.9	7.2	7.2	5.0	4.4	3.3	4.2	6.2	6.1	7.9	30min
7.08b	3.6	3.2	3.1	2.0	1.7	1.2	1.1	1.1	0.7	3.6	30min
7.08a	0.9	0.9	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
7.09a	2.9	2.6	2.6	1.6	1.4	1.0	0.9	0.9	0.6	2.9	30min
Dummy11	10.2	11.2	10.4	8.2	7.2	5.8	5.1	7.0	6.9	11.2	1hr
7.09c	4.4	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.4	30min
7.09b	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy43	11.4	13.6	13.4	10.2	8.9	7.4	6.5	7.5	7.4	13.6	1hr
7.10a	2.7	2.4	2.3	1.5	1.3	1.0	0.9	0.9	0.6	2.7	30min
7.10b	2.0	1.8	1.7	1.1	1.0	0.7	0.6	0.7	0.4	2.0	30min
Dummy9	12.9	15.2	14.7	11.5	10.5	8.8	7.7	7.8	8.0	15.2	1hr
9.01	2.3	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.3	30min
9.02b	3.7	3.1	3.5	2.3	2.0	1.4	1.3	1.3	0.9	3.7	30min
9.02a	3.8	3.4	3.3	2.1	1.8	1.3	1.2	1.2	0.8	3.8	30min
Dummy59	7.5	6.4	6.4	4.3	3.8	2.8	2.4	2.5	1.6	7.5	30min
Dummy8	14.8	17.1	16.3	13.6	12.5	10.9	9.6	9.4	8.8	17.1	1hr
7.12	4.8	4.2	4.1	2.8	2.4	1.8	1.6	1.6	1.1	4.8	30min
7.11a	2.5	2.3	2.3	1.3	1.1	0.8	0.7	0.7	0.5	2.5	30min
7.11b	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
Dummy10	15.5	18.5	18.5	15.3	14.7	12.8	11.5	11.4	9.9	18.5	1hr
12.01a	15.5	18.7	18.9	15.7	15.0	13.2	12.0	11.7	10.2	18.9	2hr
Dummy13	29.4	35.8	38.1	33.2	30.1	28.3	26.4	24.8	25.4	38.1	2hr
12.01b	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.3	30min
Dummy44	29.4	35.8	38.1	33.2	30.1	28.3	26.5	25.0	25.5	38.1	2hr
Dummy14	29.5	36.0	39.0	34.3	30.8	29.1	27.5	26.0	26.1	39.0	2hr
1.15	4.0	3.6	3.6	2.2	1.9	1.4	1.2	1.3	0.8	4.0	30min
Dummy45	29.5	36.0	39.4	34.8	31.2	29.6	28.1	26.7	26.6	39.4	2hr
Dummy15	29.5	36.1	40.5	36.4	32.7	31.0	30.0	28.7	28.0	40.5	2hr
Dummy46	29.5	36.1	40.8	36.9	33.2	31.3	30.5	29.2	28.4	40.8	2hr
Dummy16	29.5	36.1	41.2	37.6	34.1	32.0	31.4	29.9	29.3	41.2	2hr
Dummy17	30.1	38.0	44.9	42.1	38.1	36.1	39.4	46.3	46.7	46.7	18hr
1.22a	1.5	1.5	1.5	1.1	0.9	0.7	0.6	0.6	0.4	1.5	1hr
1.23	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy27	30.5	38.3	48.0	47.9	44.6	41.8	45.9	51.9	52.1	52.1	18hr
1.24	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	18hr
Dummy49	30.5	38.3	48.0	48.0	44.7	41.8	46.1	52.1	52.3	52.3	18hr
Dummy50	30.5	38.3	48.0	48.1	45.1	42.3	46.5	52.4	52.8	52.8	18hr
Dummy51	30.5	38.3	48.0	48.1	45.4	42.7	47.5	53.3	53.7	53.7	18hr
Dummy52	30.5	38.3	48.0	48.1	45.5	42.8	47.7	53.4	53.9	53.9	18hr
Dummy53	30.5	38.3	48.0	48.2	46.1	43.7	48.6	54.2	54.8	54.8	18hr
1.27	30.5	38.3	48.0	48.2	46.5	44.4	49.7	55.2	55.9	55.9	18hr
E18	0.9	0.8	0.8	0.5	0.4	0.3	0.5	0.8	0.7	0.9	30min
1.28	30.5	38.3	48.0	48.3	47.0	45.2	50.6	55.8	56.7	56.7	18hr
Out	30.5	38.3	48.0	49.0	53.1	54.4	56.0	60.5	61.0	61.0	18hr

Table C.10B Estimated 100 yr ARI Peak Flows (m3/s) under Scenario A Development at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.3	1.1	1.7	1.7	1.7	2.0	2.3	2.3	1.8	2.3	12hr
E17b	0.3	1.0	1.6	1.6	1.5	1.8	2.1	2.1	1.7	2.1	12hr
Dummy57	0.7	2.2	3.2	3.3	3.2	3.8	4.4	4.5	3.5	4.5	12hr
E17c	4.6	4.6	7.0	7.6	7.4	8.2	10.0	10.0	7.7	10.0	9hr
E17d	0.9	1.3	2.0	2.0	2.0	2.3	2.7	2.8	2.2	2.8	12hr
E9	0.7	1.8	2.3	2.2	2.3	2.6	2.6	2.8	2.2	2.8	12hr
E10	8.9	8.5	8.7	5.1	4.7	3.7	3.6	3.9	2.8	8.9	30min
E3	10.6	10.5	10.9	6.3	5.8	5.1	4.9	5.3	3.8	10.9	2hr
E2	0.6	1.4	1.9	1.8	1.8	2.1	2.1	2.3	1.8	2.3	12hr
E1	0.5	1.3	1.7	1.6	1.6	1.8	1.8	2.0	1.5	2.0	12hr
Dummy56	1.2	2.7	3.5	3.4	3.5	3.9	4.0	4.4	3.3	4.4	12hr
Dummy30	11.0	11.0	11.3	7.0	7.5	8.1	8.2	9.2	7.0	11.3	2hr
E5	22.8	20.0	22.5	14.6	13.3	13.1	13.7	15.5	11.6	22.8	30min
E6a	5.6	5.5	5.7	3.3	3.0	2.5	2.4	2.6	1.9	5.7	2hr
E6b	3.2	3.2	3.3	2.0	2.1	2.1	2.2	2.5	1.9	3.3	2hr
Dummy31	27.6	24.7	27.2	19.6	17.8	17.0	17.9	20.2	15.1	27.6	30min
E8a	2.7	2.6	2.7	1.6	1.5	1.3	1.3	1.5	1.1	2.7	2hr
E7a	0.7	0.8	1.1	1.0	1.1	1.1	1.1	1.3	1.0	1.3	12hr
E7b	3.3	3.4	3.5	3.2	3.4	3.8	3.9	4.4	3.3	4.4	12hr
E8c	3.9	4.1	4.5	4.2	4.3	5.0	5.2	5.6	4.3	5.6	12hr
E8b	4.6	4.6	4.7	2.7	2.5	2.2	2.2	2.4	1.8	4.7	2hr
Dummy32	34.2	32.3	33.5	24.4	24.3	24.5	26.1	28.8	21.9	34.2	30min
E11a	35.2	33.5	34.5	25.2	25.8	25.7	27.5	29.9	22.8	35.2	30min
E11b	39.2	38.4	38.9	28.9	32.1	31.6	34.2	36.9	28.3	39.2	30min
E13	9.9	9.9	10.4	6.1	5.8	5.5	5.9	6.5	4.8	10.4	2hr
E12	0.6	1.5	1.9	1.7	1.9	1.9	1.9	2.1	1.6	2.1	12hr
E14	4.1	4.1	4.2	2.4	2.2	1.9	1.8	1.9	1.3	4.2	2hr
E15b	2.0	2.0	2.0	1.2	1.1	0.9	0.9	0.9	0.6	2.0	2hr
E15a	2.3	2.3	2.4	1.4	1.3	1.1	1.0	1.0	0.7	2.4	2hr
Dummy29	7.5	6.5	7.5	4.8	4.5	3.8	3.5	3.8	2.7	7.5	30min
E16a	11.1	12.0	11.7	8.9	8.0	7.0	7.1	7.8	5.6	12.0	1hr
E16b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy28	43.9	48.6	50.6	40.1	43.5	44.0	48.1	48.1	38.3	50.6	2hr
Dummy33	45.6	54.1	58.4	48.1	50.9	54.3	60.1	58.9	47.5	60.1	9hr
SE5	1.4	1.4	2.2	2.1	1.9	2.5	2.6	2.9	2.2	2.9	12hr
SE1	4.6	4.5	4.7	2.7	2.4	2.0	1.9	2.1	1.5	4.7	2hr
SE2	13.6	13.4	13.8	7.9	7.2	5.9	5.6	6.1	4.3	13.8	2hr
SE3	0.9	2.4	4.1	4.6	4.7	5.0	6.3	6.2	4.7	6.3	9hr
SE6a	2.9	2.9	5.1	5.8	5.9	6.3	7.8	7.6	5.8	7.8	9hr
Dummy58	19.1	17.7	19.8	12.3	11.3	11.5	14.0	15.6	11.4	19.8	2hr
SE6b	22.2	20.6	23.4	15.3	14.6	15.6	18.6	20.4	15.1	23.4	2hr
SE_out	22.2	20.6	23.4	15.3	14.6	15.6	18.6	20.4	15.1	23.4	2hr
33.01a	2.2	2.2	2.3	1.6	1.7	1.9	2.0	2.3	1.7	2.3	2hr
33.01b	2.3	2.3	2.5	2.0	2.1	2.5	2.6	2.9	2.2	2.9	12hr
32.01	4.8	4.8	4.9	2.8	2.6	2.1	2.0	2.2	1.5	4.9	2hr
32.02	12.8	13.4	12.5	9.4	8.4	6.9	7.6	8.4	5.8	13.4	1hr
1.26	0.6	0.7	1.3	1.6	1.7	1.8	2.3	2.2	1.9	2.3	9hr
31.03	2.8	2.6	2.6	1.7	1.6	1.3	1.7	1.9	1.4	2.8	30min
30.01	0.5	1.0	1.6	1.8	1.8	2.0	2.5	2.5	1.9	2.5	9hr
30.02	1.3	2.1	3.9	4.5	4.6	4.8	6.3	6.1	4.4	6.3	9hr
1.25b	1.4	2.3	4.3	5.0	5.1	5.4	7.0	6.7	5.0	7.0	9hr
1.25a	1.9	1.8	1.8	1.2	1.1	1.0	1.3	1.5	1.1	1.9	30min
31.01b	1.4	1.4	1.4	0.8	0.7	0.6	0.6	0.6	0.4	1.4	2hr
31.01a	3.0	2.9	3.1	1.7	1.6	1.3	1.2	1.3	0.9	3.1	2hr
Dummy55	4.3	4.3	4.5	2.5	2.3	1.9	1.8	1.9	1.4	4.5	2hr
31.02	6.5	7.6	7.0	5.1	4.6	3.8	4.0	4.4	3.1	7.6	1hr
25.06a	5.2	5.0	5.1	3.0	2.7	2.1	2.0	2.2	1.6	5.2	30min
25.06b	6.2	5.9	6.2	3.8	3.5	2.8	2.8	3.1	2.2	6.2	2hr
25.06c	1.0	1.0	1.0	0.6	0.6	0.5	0.6	0.7	0.5	1.0	2hr
25.03c	2.6	2.6	2.6	1.5	1.4	1.1	1.1	1.2	0.9	2.6	30min
25.03b	0.9	0.9	0.9	0.5	0.5	0.5	0.6	0.7	0.5	0.9	2hr
25.01	0.8	0.9	1.2	1.3	1.3	1.4	1.9	1.9	1.4	1.9	12hr
27.01	6.0	5.7	5.7	3.6	3.3	3.0	3.6	4.1	3.0	6.0	30min
25.03a	7.4	7.1	7.4	4.6	4.2	3.6	4.3	4.8	3.5	7.4	2hr
26.01a	5.3	5.1	5.2	3.0	2.7	2.1	2.1	2.3	1.6	5.3	30min
26.01b	0.3	0.7	1.3	1.4	1.4	1.5	1.9	1.9	1.4	1.9	9hr
Dummy47	5.6	5.5	5.6	3.4	3.2	3.1	3.7	4.2	3.0	5.6	2hr
25.02	12.5	11.5	11.4	8.1	7.4	6.1	7.0	7.9	5.7	12.5	30min
Dummy48	19.8	18.0	17.4	12.7	11.6	9.6	11.3	12.7	9.2	19.8	30min
Dummy22	21.1	19.6	18.9	13.7	13.1	10.9	12.8	14.1	10.2	21.1	30min
25.04b	3.1	3.0	3.1	1.8	1.7	1.3	1.4	1.6	1.1	3.1	30min
25.04a	5.2	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.2	30min
Dummy23	24.0	22.7	21.4	16.4	16.5	13.5	15.8	17.4	12.6	24.0	30min
25.05a	3.3	3.1	3.2	1.9	1.7	1.4	1.4	1.5	1.1	3.3	30min
25.05b	1.2	1.2	1.3	0.7	0.7	0.6	0.7	0.8	0.6	1.3	2hr
28.01	12.1	11.6	11.8	7.0	6.3	4.9	4.7	5.1	3.6	12.1	30min
28.02	15.3	15.6	15.0	10.9	9.7	8.0	8.1	8.8	6.2	15.6	1hr
Dummy24	32.1	37.3	36.1	28.6	26.2	22.7	24.9	27.5	20.0	37.3	1hr
Dummy25	34.5	40.1	38.5	31.6	29.2	25.5	27.8	30.3	22.2	40.1	1hr
25.07b	0.9	0.9	0.9	0.6	0.6	0.7	0.8	0.9	0.7	0.9	2hr
29.01	14.9	14.2	14.5	8.6	7.7	6.0	5.8	6.2	4.4	14.9	30min
29.02	18.3	17.9	17.6	12.7	11.5	9.5	9.6	10.5	7.4	18.3	30min
25.07a	2.8	2.7	2.8	1.7	1.5	1.2	1.3	1.4	1.0	2.8	30min
Dummy26	43.4	49.7	52.0	42.4	38.5	35.4	38.4	39.9	30.2	52.0	2hr
1.22b	2.8	2.5	2.6	1.8	1.6	1.2	1.2	1.4	0.9	2.8	30min
1.20a	0.1	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
1.20b	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.6	12hr
1.21	0.5	1.2	2.4	2.8	2.9	3.1	3.9	3.7	2.9	3.9	9hr
24.01	0.3	0.8	1.6	1.8	1.9	2.0	2.5	2.4	1.8	2.5	9hr
24.02	0.6	1.8	3.6	4.3	4.4	4.6	5.8	5.5	4.2	5.8	9hr
24.03	0.9	2.8	5.4	6.4	6.5	6.9	8.7	8.2	6.2	8.7	9hr
24.04	1.2	3.6	6.6	7.8	7.9	8.3	10.6	10.0	7.6	10.6	9hr
24.05	1.6	4.6	8.2	9.5	9.7	10.2	13.1	12.4	9.4	13.1	9hr
24.06	1.8	5.4	9.7	11.4	11.6	12.3	15.7	14.7	11.2	15.7	9hr
17.14b	0.2	0.6	1.0	1.1	1.1	1.2	1.6	1.5	1.2	1.6	9hr
17.14a	6.6	6.3	6.5	4.0	3.6	3.0	3.5	3.9	2.8	6.6	30min
17.13	0.2	0.4	0.9	1.1	1.2	1.2	1.5	1.4	1.2	1.5	9hr
23.01	0.2	0.5	1.0	1.2	1.3	1.3	1.7	1.6	1.3	1.7	9hr
20.01	0.3	1.1	1.9	2.1	2.1	2.3	2.8	2.8	2.1	2.8	9hr
17.10a	0.2	0.4	0.8	0.9	0.9	1.0	1.3	1.2	0.9	1.3	9hr
17.10b	0.2	0.6	1.1	1.4	1.4	1.5	1.9	1.8	1.4	1.9	9hr
17.09	0.3	0.7	1.3	1.7	1.8	1.9	2.4	2.2	2.0	2.4	9hr
17.08c	3.0	3.0	3.0	1.9	1.7	1.6	1.9	2.1	1.5	3.0	30min
17.08d	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12hr
18.01	0.5	1.3	2.4	2.7	2.7	2.9	3.7	3.6	2.7	3.7	9hr
18.02	0.8	2.2	3.9	4.3	4.2	4.6	5.8	5.7	4.3	5.8	9hr
17.08b	0.2	0.4	0.8	0.8	0.8	0.9	1.1	1.1	0.9	1.1	9hr
17.08a	0.2	0.7	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
17.01	0.3	1.0	1.6	1.7	1.7	1.9	2.3	2.3	1.7	2.3	12hr
17.02	0.8	2.2	4.1	4.6	4.7	5.0	6.4	6.1	4.6	6.4	9hr
17.03	1.4	4.2	8.1	9.6	9.9	10.5	13.5	12.6	10.0	13.5	9hr
17.04	2.1	6.2	11.8	14.3	14.8	15.7	20.1	18.6	15.0	20.1	9hr
17.06	2.6	7.8	15.0	18.4	19.2	20.4	26.0	23.9	19.8	26.0	9hr
17.07	3.1	9.1	17.4	21.4	22.5	23.8	30.3	27.7	23.0	30.3	9hr
Dummy18	4.2	12.0	22.1	26.5	27.7	29.3	37.5	34.5	28.2	37.5	9hr
Dummy19	4.3	12.4	22.7	27.3	28.6	30.3	38.7	35.4	29.3	38.7	9hr
Dummy36	4.5	13.0	24.0	28.9	30.4	32.2	41.1	37.4	31.1	41.1	9hr
21.01	14.1	12.8	12.8	8.5	7.6	5.8	5.8	6.4	4.4	14.1	30min
Dummy37	14.5	14.7	24.9	30.7	33.0	35.0	44.0	39.0	33.7	44.0	9hr
Dummy20	14.6	15.2	27.9	34.3	36.7	39.1	49.2	43.7	37.5	49.2	9hr
22.01	0.5	1.2	2.4	2.8	3.0	3.2	4.0	3.7	3.2	4.0	9hr
17.11	3.1	2.9	3.0	1.8	1.7	1.3	1.5	1.7	1.2	3.1	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	16.3	17.1	30.4	37.5	40.3	42.8	53.8	47.3	41.3	53.8	9hr
17.12	8.3	7.8	8.0	4.9	4.4	3.4	3.6	3.9	2.8	8.3	30min
Dummy54	19.0	19.9	31.0	38.5	41.7	44.3	55.6	48.1	42.9	55.6	9hr
Dummy38	19.2	20.2	31.9	39.6	42.8	45.5	57.1	49.3	44.1	57.1	9hr
Dummy35	19.3	20.6	32.7	40.6	43.9	46.7	58.4	50.5	45.3	58.4	9hr
Dummy21	19.8	22.7	34.0	42.0	46.1	49.0	60.9	52.8	47.9	60.9	9hr
17.15a	4.9	4.6	4.7	2.9	2.6	2.1	2.2	2.4	1.7	4.9	30min
Dummy39	20.0	23.4	34.2	42.4	46.8	49.8	61.8	53.6	48.8	61.8	9hr
SU3	0.2	0.5	1.1	1.3	1.3	1.4	1.8	1.7	1.4	1.8	9hr
Dummy40	21.7	27.5	43.7	54.1	58.5	62.2	77.4	66.4	61.0	77.4	9hr
17.15b	1.7	1.7	1.7	1.0	1.0	0.8	1.0	1.1	0.8	1.7	2hr
Dummy41	21.8	27.8	43.9	54.3	58.9	62.6	77.8	66.8	61.5	77.8	9hr
17.16	22.1	28.7	45.6	56.3	61.2	65.1	80.8	69.4	64.1	80.8	9hr
1.18	6.5	5.9	5.9	4.1	3.6	2.8	2.9	3.2	2.2	6.5	30min
16.01	3.2	3.1	3.2	1.8	1.7	1.3	1.3	1.4	1.0	3.2	30min
15.02	4.8	5.2	5.0	3.8	3.4	2.9	3.6	4.1	2.9	5.2	1hr
15.01	6.9	6.2	6.3	4.2	3.8	3.0	3.3	3.6	2.5	6.9	30min
14.01	12.9	12.1	12.4	7.6	6.8	5.4	5.4	5.9	4.2	12.9	30min
1.17a	15.1	14.8	15.5	10.5	9.4	7.6	8.0	8.8	6.3	15.5	2hr
1.17b	0.7	0.7	0.8	0.9	0.9	1.0	1.2	1.3	1.0	1.3	12hr
1.16	7.4	7.2	7.4	4.3	3.9	3.2	3.2	3.5	2.5	7.4	30min
1.14	2.1	2.1	2.1	1.6	1.4	1.1	1.1	1.2	0.8	2.1	2hr
12.02b	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	12hr
12.02a	3.5	3.3	3.4	2.1	1.9	1.6	1.7	1.9	1.4	3.5	30min
11.01	6.6	6.5	6.7	3.8	3.5	2.8	2.7	2.9	2.1	6.7	2hr
10.01	7.0	6.9	7.2	4.1	3.7	3.1	2.9	3.1	2.2	7.2	2hr
10.02a	11.9	10.1	11.7	7.7	7.0	5.6	5.5	5.9	4.3	11.9	30min
1.13b	3.4	3.2	3.3	2.1	1.9	1.9	2.2	2.5	1.8	3.4	30min
1.13a	3.7	3.6	3.7	2.2	2.0	1.7	1.9	2.1	1.5	3.7	30min
1.12a	7.5	7.2	7.3	4.4	3.9	3.1	3.0	3.2	2.3	7.5	30min
5.01	0.2	0.3	0.7	0.9	0.9	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	2.7	2.7	2.7	1.6	1.5	1.2	1.2	1.3	0.9	2.7	2hr
1.11b	4.5	4.4	4.5	2.7	2.5	2.2	2.3	2.6	1.9	4.5	30min
1.09b	1.8	1.8	1.9	1.1	1.0	0.8	0.8	0.9	0.6	1.9	2hr
1.09c	4.2	4.1	4.2	2.5	2.3	1.9	2.0	2.2	1.6	4.2	30min
4.01	5.1	5.0	5.2	2.9	2.6	2.0	1.8	1.8	1.3	5.2	2hr
4.02	14.7	13.2	13.9	8.8	7.9	6.0	5.4	5.7	4.0	14.7	30min
1.06a	8.6	8.1	8.3	5.1	4.6	3.8	4.3	4.8	3.4	8.6	30min
1.01	0.9	2.5	5.3	6.5	7.0	7.4	9.3	8.5	7.4	9.3	9hr
1.02	1.7	4.9	9.4	11.5	12.0	12.7	16.3	15.2	12.4	16.3	9hr
2.01	1.1	3.3	7.0	9.1	10.2	10.8	13.6	12.5	11.6	13.6	9hr
1.03	3.2	9.2	17.8	21.9	23.3	24.7	31.7	29.3	25.4	31.7	9hr
1.04	3.8	10.9	20.8	25.2	26.6	28.1	36.4	33.7	28.7	36.4	9hr
1.05	4.7	13.5	25.1	30.4	31.8	33.5	43.8	40.5	34.0	43.8	9hr
1.06b	5.3	15.4	28.2	34.1	35.6	37.5	48.9	44.9	37.7	48.9	9hr
Dummy1	9.3	16.0	29.3	35.9	37.5	39.7	51.4	47.0	39.7	51.4	9hr
1.07a	2.8	2.7	2.8	1.7	1.6	1.5	1.7	1.9	1.4	2.8	30min
1.07b	1.5	1.5	2.5	2.9	2.9	3.1	4.0	4.0	2.9	4.0	9hr
Dummy2	11.3	17.5	31.9	39.0	40.9	43.3	56.1	50.8	43.1	56.1	9hr
1.08a	6.3	6.1	6.2	3.7	3.3	2.5	2.4	2.5	1.8	6.3	30min
1.08b	5.7	5.5	5.7	3.4	3.1	2.7	2.9	3.2	2.4	5.7	30min
Dummy3	15.1	17.8	32.4	40.2	42.9	45.3	58.3	51.9	45.1	58.3	9hr
3.01	7.3	7.1	7.3	4.1	3.7	2.8	2.5	2.6	1.8	7.3	2hr
1.09a	7.9	7.9	8.5	5.1	4.6	3.6	3.2	3.4	2.4	8.5	2hr
Dummy60	22.4	22.3	32.6	40.8	44.0	46.4	59.3	52.1	46.1	59.3	9hr
Dummy4	31.0	32.9	34.0	42.3	46.6	49.2	62.1	53.2	49.1	62.1	9hr
SU2	2.1	2.8	3.1	2.8	2.9	2.8	2.8	3.0	2.3	3.1	2hr
1.10b	3.6	3.8	4.2	3.9	4.1	4.0	4.0	4.3	3.3	4.3	12hr
Dummy42	33.7	35.9	37.6	43.7	48.3	51.0	64.2	55.5	51.4	64.2	9hr
1.10a	34.7	37.3	38.9	44.1	48.9	51.6	64.8	56.5	52.1	64.8	9hr
Dummy6	36.5	40.3	41.0	44.6	50.0	52.7	66.0	59.1	53.6	66.0	9hr
1.12c	5.4	5.2	5.4	3.1	2.8	2.3	2.2	2.4	1.7	5.4	30min
1.12b	41.1	47.6	47.7	47.4	53.8	56.8	69.9	65.6	59.1	69.9	9hr
Dummy7	41.4	48.9	50.4	48.1	54.9	58.5	71.3	67.9	61.1	71.3	9hr
10.02b	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	1.2	1.2	1.2	0.7	0.7	0.8	1.0	1.1	0.8	1.2	2hr
7.01	0.3	0.9	1.5	1.7	1.6	1.8	2.2	2.2	1.7	2.2	9hr
7.02	0.8	2.5	4.7	5.4	5.5	5.8	7.6	7.1	5.3	7.6	9hr
7.03	1.5	4.5	8.4	9.7	9.9	10.5	13.4	12.7	9.4	13.4	9hr
7.04	1.8	5.5	10.3	12.1	12.3	13.1	16.7	15.6	11.8	16.7	9hr
7.05	2.4	7.2	13.4	15.9	16.3	17.3	22.0	20.5	15.5	22.0	9hr
7.06	2.6	7.9	14.9	17.9	18.4	19.5	24.7	23.0	17.7	24.7	9hr
8.01	14.5	13.7	14.0	8.5	7.6	6.0	6.0	6.5	4.6	14.5	30min
7.07b	16.1	15.6	17.1	20.7	21.8	23.0	28.9	26.2	21.8	28.9	9hr
Dummy12	16.5	16.2	17.5	21.2	22.3	23.6	29.5	26.7	22.3	29.5	9hr
7.08b	7.5	7.1	7.2	4.3	3.8	2.9	2.7	2.9	2.0	7.5	30min
7.08a	1.9	1.9	2.0	1.1	1.1	1.0	1.1	1.3	1.0	2.0	2hr
7.09a	6.0	5.8	5.9	3.4	3.1	2.4	2.3	2.5	1.8	6.0	30min
Dummy11	22.4	25.0	23.6	23.2	24.7	26.2	32.4	30.1	25.6	32.4	9hr
7.09c	9.1	8.6	8.8	5.2	4.7	3.5	3.2	3.4	2.4	9.1	30min
7.09b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy43	25.8	29.8	30.4	24.2	26.0	27.6	33.8	33.0	27.4	33.8	9hr
7.10a	5.7	5.2	5.3	3.4	3.0	2.3	2.2	2.4	1.7	5.7	30min
7.10b	4.3	4.0	4.0	2.5	2.3	1.8	1.7	1.8	1.3	4.3	30min
Dummy9	28.8	33.6	33.3	25.6	27.4	29.3	35.6	34.9	29.3	35.6	9hr
9.01	4.7	4.7	4.9	2.8	2.5	2.0	2.0	2.1	1.5	4.9	2hr
9.02b	7.8	6.6	7.8	5.0	4.5	3.6	3.5	3.8	2.7	7.8	2hr
9.02a	7.9	7.6	7.7	4.6	4.1	3.2	3.1	3.4	2.4	7.9	30min
Dummy59	15.7	14.0	14.0	9.5	8.6	6.8	6.7	7.2	5.1	15.7	30min
Dummy8	33.6	38.7	37.6	31.0	29.6	32.0	38.8	38.8	32.7	38.8	12hr
7.12	10.3	9.4	9.5	6.2	5.6	4.3	4.5	5.0	3.5	10.3	30min
7.11a	5.1	5.0	5.2	2.9	2.7	2.1	2.1	2.2	1.6	5.2	2hr
7.11b	6.6	6.3	6.6	3.8	3.4	2.8	2.7	2.9	2.1	6.6	2hr
Dummy10	35.4	42.8	43.5	35.2	34.7	35.3	43.5	43.5	36.9	43.5	2hr
12.01a	35.6	43.8	44.7	36.5	35.8	36.3	45.2	45.0	38.2	45.2	9hr
Dummy13	68.8	86.0	92.6	80.9	88.7	94.9	113.5	110.6	101.3	113.5	9hr
12.01b	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.0	0.8	1.0	12hr
Dummy44	68.9	86.3	93.2	81.6	89.0	95.2	113.9	111.1	101.8	113.9	9hr
Dummy14	69.3	87.3	96.9	85.4	90.7	97.4	115.8	114.1	104.4	115.8	9hr
1.15	8.4	8.1	8.3	5.0	4.5	3.8	4.2	4.8	3.4	8.4	30min
Dummy45	69.6	88.0	99.0	88.0	91.8	99.0	117.1	116.3	106.3	117.1	9hr
Dummy15	70.2	89.7	105.2	95.4	94.9	103.6	120.6	122.4	111.7	122.4	12hr
Dummy46	70.4	90.1	106.7	97.3	95.8	104.9	121.6	124.0	113.2	124.0	12hr
Dummy16	70.6	90.8	109.4	101.1	97.9	107.7	124.7	127.9	116.9	127.9	12hr
Dummy17	79.4	114.3	148.7	143.6	161.4	172.2	209.0	196.1	183.7	209.0	9hr
1.22a	3.6	3.4	3.5	2.5	2.2	1.7	1.8	2.0	1.5	3.6	30min
1.23	0.4	0.5	0.9	1.1	1.2	1.2	1.6	1.5	1.2	1.6	9hr
Dummy27	81.5	119.7	167.0	168.7	178.1	190.1	230.6	218.0	205.3	230.6	9hr
1.24	0.4	0.4	0.6	0.8	0.9	1.0	1.2	1.2	1.1	1.2	12hr
Dummy49	81.5	119.9	167.5	169.5	178.9	190.8	231.6	218.9	206.3	231.6	9hr
Dummy50	81.7	120.3	168.2	170.4	179.5	191.8	233.1	220.4	209.0	233.1	9hr
Dummy51	82.2	121.4	170.2	173.1	181.4	193.9	236.1	223.2	213.1	236.1	9hr
Dummy52	82.3	121.6	170.5	173.6	181.7	194.3	236.8	223.8	214.0	236.8	9hr
Dummy53	82.6	122.4	172.0	175.6	183.1	196.0	239.9	227.5	218.4	239.9	9hr
1.27	83.2	123.7	174.5	179.0	185.6	198.9	244.1	232.5	223.9	244.1	9hr
E18	1.8	1.8	2.3	2.6	2.7	2.8	3.6	3.7	2.8	3.7	12hr
1.28	83.6	124.4	175.6	180.9	187.8	200.4	246.4	235.9	228.1	246.4	9hr
Out	84.7	126.0	178.7	187.5	204.4	222.2	259.8	269.6	258.0	269.6	12hr

Table C.11A Estimated 2 yr ARI Peak Flows (m3/s) under Scenario B Development at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E17b	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy57	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.9	0.8	0.9	12hr
E17c	2.2	2.1	2.1	1.2	1.0	1.0	1.6	2.1	1.9	2.2	30min
E17d	0.4	0.4	0.4	0.2	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E9	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E10	4.3	3.8	3.8	2.3	2.0	1.5	1.3	1.3	0.9	4.3	30min
E3	5.2	5.0	5.0	2.7	2.4	1.7	1.5	1.6	1.0	5.2	30min
E2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
E1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
Dummy56	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.9	0.7	0.9	12hr
Dummy30	5.4	5.2	5.1	2.9	2.5	1.8	1.8	2.1	1.5	5.4	30min
E5	10.9	9.3	10.2	6.5	5.7	4.2	3.7	3.8	2.6	10.9	30min
E6a	2.7	2.6	2.6	1.4	1.3	0.9	0.8	0.8	0.5	2.7	30min
E6b	1.6	1.5	1.5	0.8	0.7	0.5	0.5	0.6	0.4	1.6	30min
Dummy31	12.8	11.7	12.0	8.8	7.6	5.6	4.9	5.1	3.4	12.8	30min
E8a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
E8b	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
E7a	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
E7b	1.6	1.6	1.6	0.9	0.8	0.5	0.7	1.0	0.7	1.6	30min
E8c	1.8	1.8	1.9	1.2	1.0	0.8	1.0	1.2	0.9	1.9	2hr
Dummy32	15.7	14.9	13.9	10.8	9.8	7.6	6.7	7.0	4.9	15.7	30min
E11a	16.1	15.3	14.1	11.0	10.2	8.0	7.0	7.3	5.1	16.1	30min
E11b	17.5	17.1	15.3	12.8	12.0	9.7	8.5	8.9	6.4	17.5	30min
E13	4.9	4.7	4.7	2.5	2.2	1.6	1.4	1.6	1.1	4.9	30min
E12	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E14	2.0	1.9	2.0	1.1	0.9	0.7	0.6	0.6	0.4	2.0	30min
E15b	1.0	0.9	1.0	0.5	0.4	0.3	0.3	0.3	0.2	1.0	30min
E15a	1.1	1.1	1.1	0.6	0.5	0.4	0.3	0.3	0.2	1.1	30min
Dummy29	3.6	3.1	3.3	2.1	1.9	1.4	1.2	1.2	0.8	3.6	30min
E16a	5.2	5.5	5.3	4.0	3.4	2.7	2.4	2.4	1.6	5.5	1hr
E16b	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy28	18.7	19.8	19.1	16.2	14.5	13.1	11.8	12.3	9.0	19.8	1hr
Dummy33	18.7	20.0	19.7	16.9	14.7	13.6	12.9	14.9	11.4	20.0	1hr
SE5	0.7	0.6	0.6	0.3	0.3	0.3	0.5	0.6	0.5	0.7	30min
SE1	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
SE2	6.6	6.2	6.2	3.5	3.1	2.2	2.0	2.0	1.3	6.6	30min
SE3	0.3	0.3	0.3	0.1	0.3	0.6	1.0	1.3	1.2	1.3	12hr
SE6a	1.4	1.3	1.2	0.8	0.7	0.7	1.2	1.7	1.6	1.7	12hr
Dummy58	9.2	8.3	8.8	5.5	4.8	3.5	3.1	3.6	2.8	9.2	30min
SE6b	10.6	9.5	10.2	6.9	6.0	4.4	3.9	4.7	3.7	10.6	30min
SE_out	10.6	9.5	10.2	6.9	6.0	4.4	3.9	4.7	3.7	10.6	30min
33.01a	1.1	1.0	1.0	0.6	0.5	0.4	0.4	0.5	0.4	1.1	30min
33.01b	1.1	1.1	1.1	0.6	0.5	0.4	0.5	0.6	0.5	1.1	30min
32.01	2.4	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.4	30min
32.02	5.5	6.0	5.3	4.2	3.6	2.7	2.4	2.4	1.6	6.0	1hr
1.26	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
31.03	1.3	1.2	1.1	0.7	0.7	0.5	0.4	0.4	0.3	1.3	30min
30.01	4.1	3.7	3.7	2.2	1.9	1.4	1.2	1.2	0.8	4.1	30min
30.02	9.9	8.5	9.0	6.0	5.3	3.9	3.4	3.4	2.3	9.9	30min
1.25b	10.6	9.3	9.6	6.6	5.9	4.4	3.9	3.9	2.6	10.6	30min
1.25a	0.9	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.9	30min
31.01b	0.7	0.7	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.7	30min
31.01a	1.5	1.4	1.4	0.8	0.7	0.5	0.4	0.4	0.3	1.5	30min
Dummy55	2.1	2.1	2.1	1.1	1.0	0.7	0.6	0.6	0.4	2.1	30min
31.02	2.9	3.5	3.1	2.3	2.0	1.5	1.3	1.3	0.9	3.5	1hr
25.06a	2.5	2.3	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
25.06b	2.9	2.7	2.7	1.7	1.5	1.1	1.0	1.0	0.7	2.9	30min
25.06c	0.5	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.5	30min
25.03c	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
25.03b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.4	30min
25.01	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.4	30min
27.01	2.9	2.7	2.6	1.6	1.4	1.0	0.9	0.9	0.7	2.9	30min
25.03a	3.5	3.3	3.3	2.1	1.8	1.3	1.2	1.2	0.9	3.5	30min
26.01a	2.6	2.4	2.3	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
26.01b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
Dummy47	2.7	2.5	2.5	1.4	1.3	0.9	0.8	0.9	0.7	2.7	30min
25.02	5.7	5.2	5.1	3.7	3.2	2.3	2.1	2.1	1.4	5.7	30min
Dummy48	9.2	8.4	8.0	5.8	5.1	3.7	3.2	3.3	2.2	9.2	30min
Dummy22	9.7	9.1	8.5	6.2	5.6	4.3	3.7	3.8	2.6	9.7	30min
25.04b	1.5	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min
25.04a	2.5	2.2	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
Dummy23	10.8	10.3	9.3	7.3	7.0	5.6	4.9	5.0	3.3	10.8	30min
25.05a	1.6	1.4	1.4	0.9	0.8	0.6	0.5	0.5	0.3	1.6	30min
25.05b	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.2	0.1	0.6	30min
28.01	5.8	5.3	5.2	3.1	2.8	2.0	1.8	1.8	1.2	5.8	30min
28.02	7.1	6.8	6.5	4.8	4.2	3.3	2.9	2.9	2.0	7.1	30min
Dummy24	13.9	16.6	15.9	12.7	11.1	9.5	8.3	8.4	5.8	16.6	1hr
Dummy25	14.7	17.7	16.8	14.0	12.3	10.5	9.3	9.2	6.5	17.7	1hr
25.07b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.4	30min
29.01	7.2	6.4	6.3	3.9	3.4	2.5	2.2	2.2	1.5	7.2	30min
29.02	8.5	8.0	7.7	5.6	5.0	4.0	3.5	3.5	2.4	8.5	30min
25.07a	1.4	1.2	1.2	0.7	0.7	0.5	0.4	0.4	0.3	1.4	30min
Dummy26	19.3	21.9	22.3	18.6	16.3	14.3	12.7	12.0	9.3	22.3	2hr
1.22b	1.2	1.1	1.1	0.8	0.7	0.5	0.5	0.5	0.3	1.2	30min
1.20a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
1.20b	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	30min
1.21	7.0	6.2	5.9	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
24.01	4.3	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.3	30min
24.02	6.7	8.1	7.4	5.6	4.7	3.8	3.3	3.3	2.2	8.1	1hr
24.03	8.4	10.0	9.1	7.4	6.5	5.5	4.8	4.8	3.3	10.0	1hr
24.04	8.7	10.7	9.7	8.1	7.1	6.3	5.6	5.3	4.0	10.7	1hr
24.05	8.8	11.4	10.7	8.9	8.3	7.2	6.6	6.3	4.9	11.4	1hr
24.06	8.9	11.9	11.6	10.1	9.6	8.3	7.7	7.3	5.9	11.9	1hr
17.14b	2.5	2.2	2.2	1.3	1.2	0.9	0.8	0.8	0.5	2.5	30min
17.14a	3.2	2.8	2.7	1.8	1.5	1.1	1.0	1.0	0.7	3.2	30min
17.13	3.0	2.6	2.5	1.7	1.5	1.1	0.9	1.0	0.6	3.0	30min
23.01	3.1	2.8	2.7	1.7	1.5	1.1	1.0	1.0	0.7	3.1	30min
20.01	4.6	4.2	4.1	2.4	2.2	1.6	1.4	1.4	0.9	4.6	30min
17.10a	2.2	2.0	1.9	1.2	1.1	0.8	0.7	0.7	0.5	2.2	30min
17.10b	3.3	3.0	2.9	1.9	1.7	1.2	1.1	1.1	0.7	3.3	30min
17.09	4.7	4.2	4.0	2.7	2.4	1.7	1.5	1.5	1.0	4.7	30min
17.08c	1.5	1.3	1.3	0.8	0.7	0.5	0.4	0.5	0.4	1.5	30min
17.08d	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.2	30min
18.01	6.1	5.5	5.5	3.3	2.9	2.1	1.8	1.9	1.2	6.1	30min
18.02	8.9	8.0	8.1	5.0	4.4	3.2	2.8	2.8	1.9	8.9	30min
17.08b	1.7	1.6	1.5	0.9	0.8	0.6	0.5	0.5	0.4	1.7	30min
17.08a	2.8	2.5	2.5	1.6	1.4	1.0	0.9	0.9	0.6	2.8	30min
17.01	3.5	3.2	3.2	1.8	1.6	1.2	1.0	1.0	0.7	3.5	30min
17.02	9.7	8.7	8.2	6.0	5.2	3.8	3.3	3.4	2.3	9.7	30min
17.03	14.5	16.2	16.1	12.7	10.4	9.0	7.8	7.9	5.3	16.2	1hr
17.04	20.3	22.7	23.6	18.7	14.9	13.2	11.6	11.7	8.0	23.6	2hr
17.06	24.1	26.0	26.6	21.5	19.3	16.2	14.5	14.0	10.6	26.6	2hr
17.07	25.2	27.4	28.3	23.3	21.5	18.1	16.4	15.9	12.3	28.3	2hr
Dummy18	26.9	30.0	31.1	26.2	25.3	21.9	19.6	19.2	15.1	31.1	2hr
Dummy19	27.0	30.2	31.3	26.7	25.5	22.3	20.1	19.3	15.4	31.3	2hr
Dummy36	27.0	30.6	32.3	27.6	26.0	23.4	20.8	19.7	15.8	32.3	2hr
21.01	6.5	5.8	5.5	3.8	3.4	2.5	2.2	2.2	1.5	6.5	30min
Dummy37	27.1	31.0	33.9	29.2	26.7	24.9	22.3	20.2	16.5	33.9	2hr
Dummy20	27.8	31.6	35.9	31.6	29.0	27.3	24.7	21.4	18.0	35.9	2hr
22.01	7.8	6.9	6.6	4.4	3.9	2.8	2.5	2.5	1.7	7.8	30min
17.11	1.5	1.3	1.3	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	27.9	31.7	37.3	33.6	30.1	28.7	26.2	22.1	18.9	37.3	2hr
17.12	3.9	3.5	3.4	2.2	1.9	1.4	1.2	1.2	0.8	3.9	30min
Dummy54	27.9	31.8	37.9	34.3	30.5	29.2	26.7	22.5	19.2	37.9	2hr
Dummy38	27.9	31.8	38.4	34.8	30.8	29.6	27.1	23.0	19.4	38.4	2hr
Dummy35	27.9	31.8	38.7	35.3	31.0	30.0	27.5	23.3	19.7	38.7	2hr
Dummy21	27.9	31.8	39.2	36.0	31.7	30.6	28.3	23.8	20.0	39.2	2hr
17.15a	2.3	2.1	2.0	1.3	1.1	0.8	0.7	0.7	0.5	2.3	30min
Dummy39	28.0	31.8	39.4	36.3	32.1	30.9	28.7	24.0	20.1	39.4	2hr
SU3	3.3	2.9	2.9	1.9	1.6	1.2	1.1	1.1	0.7	3.3	30min
Dummy40	29.4	36.9	43.9	41.9	37.4	36.6	34.0	30.0	24.0	43.9	2hr
17.15b	0.8	0.8	0.7	0.4	0.4	0.3	0.2	0.3	0.2	0.8	30min
Dummy41	29.4	36.9	43.9	42.1	37.5	36.7	34.1	30.1	24.1	43.9	2hr
17.16	29.4	37.1	44.4	43.0	38.5	37.5	34.9	30.6	24.5	44.4	2hr
1.18	2.9	2.7	2.6	1.8	1.6	1.2	1.0	1.0	0.7	2.9	30min
16.01	1.6	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.6	30min
15.02	2.2	2.3	2.2	1.7	1.4	1.1	1.0	1.0	0.7	2.3	1hr
15.01	3.2	2.8	2.7	1.9	1.6	1.2	1.0	1.1	0.7	3.2	30min
14.01	6.2	5.5	5.3	3.4	3.0	2.2	1.9	1.9	1.3	6.2	30min
1.17a	7.2	6.7	6.7	4.7	4.0	3.1	2.7	2.7	1.8	7.2	30min
1.17b	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
1.16	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
1.14	0.8	0.9	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.9	2hr
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
12.02a	1.7	1.5	1.5	0.9	0.8	0.6	0.5	0.5	0.3	1.7	30min
11.01	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
10.01	3.4	3.2	3.2	1.8	1.6	1.1	1.0	1.0	0.7	3.4	30min
10.02a	5.6	4.7	5.2	3.5	3.0	2.2	1.9	2.0	1.3	5.6	30min
1.13b	1.6	1.5	1.4	0.9	0.8	0.6	0.5	0.6	0.4	1.6	30min
1.13a	1.8	1.6	1.6	1.0	0.9	0.6	0.6	0.6	0.4	1.8	30min
1.12a	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
5.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
1.11a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
1.11b	2.2	2.0	2.0	1.2	1.0	0.7	0.7	0.7	0.4	2.2	30min
1.09b	0.9	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
1.09c	2.0	1.9	1.9	1.1	1.0	0.7	0.6	0.6	0.4	2.0	30min
4.01	2.5	2.3	2.3	1.3	1.2	0.8	0.7	0.7	0.5	2.5	30min
4.02	7.0	6.1	6.3	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
1.06a	4.1	3.6	3.5	2.2	2.0	1.4	1.3	1.3	0.9	4.1	30min
1.01	16.2	15.0	14.4	10.2	8.8	6.6	5.8	5.8	3.9	16.2	30min
1.02	20.2	19.5	17.7	14.7	13.4	11.0	9.6	9.7	6.6	20.2	30min
2.01	24.1	23.2	22.5	16.3	13.9	10.6	9.3	9.4	6.3	24.1	30min
1.03	37.7	39.1	41.3	31.6	26.0	22.5	19.8	19.7	13.7	41.3	2hr
1.04	40.1	41.7	43.2	33.4	29.0	24.5	21.8	20.8	15.5	43.2	2hr
1.05	41.7	44.8	46.1	36.5	32.0	27.7	25.1	22.9	18.4	46.1	2hr
1.06b	42.0	46.3	48.2	39.1	33.3	29.9	27.5	24.2	20.3	48.2	2hr
Dummy1	42.1	46.8	49.0	40.2	33.9	30.9	28.5	24.7	21.1	49.0	2hr
1.07a	1.3	1.2	1.2	0.7	0.6	0.5	0.4	0.5	0.3	1.3	30min
1.07b	0.7	0.7	0.7	0.4	0.3	0.3	0.6	0.8	0.8	0.8	12hr
Dummy2	42.1	46.9	49.4	40.5	34.1	31.1	29.1	25.0	21.3	49.4	2hr
1.08a	3.0	2.7	2.7	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
1.08b	2.7	2.5	2.5	1.5	1.3	0.9	0.8	0.9	0.6	2.7	30min
Dummy3	42.1	47.0	50.1	41.5	34.5	31.8	29.9	25.4	21.6	50.1	2hr
3.01	3.5	3.3	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
1.09a	3.8	3.6	3.7	2.3	2.0	1.5	1.3	1.3	0.9	3.8	30min
Dummy60	42.1	47.1	50.8	42.2	34.9	32.3	30.5	25.7	21.9	50.8	2hr
Dummy4	42.1	47.1	51.5	43.5	36.5	33.5	31.8	26.3	22.5	51.5	2hr
SU2	0.6	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.6	1.0	2hr
1.10b	1.7	1.6	1.6	1.2	1.3	1.2	1.2	1.2	0.9	1.7	30min
Dummy42	42.5	47.8	52.5	44.5	37.4	34.4	32.8	27.0	23.1	52.5	2hr
1.10a	42.5	47.8	52.6	44.6	37.7	34.6	33.0	27.0	23.2	52.6	2hr
Dummy6	42.5	47.8	52.8	45.1	38.2	35.0	33.6	27.2	23.4	52.8	2hr
1.12c	2.6	2.4	2.4	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
1.12b	42.5	47.8	53.6	46.5	39.6	36.1	35.1	27.5	24.1	53.6	2hr
Dummy7	42.5	47.8	53.6	46.8	40.0	36.4	35.7	27.9	24.4	53.6	2hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.07a	0.6	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.6	30min
8.01	7.0	6.2	6.1	3.8	3.4	2.4	2.1	2.2	1.4	7.0	30min
7.01	3.5	3.2	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
7.02	10.0	10.6	10.1	7.1	5.9	4.8	4.2	4.2	2.8	10.6	1hr
7.03	14.1	15.6	14.8	12.3	10.0	8.4	7.4	7.4	5.0	15.6	1hr
7.04	16.4	18.5	17.4	13.8	12.2	10.0	8.9	8.8	6.3	18.5	1hr
7.05	18.2	21.3	19.6	15.7	15.4	12.7	11.1	11.3	8.3	21.3	1hr
7.06	18.6	22.4	20.8	17.1	16.3	14.1	12.4	12.1	9.5	22.4	1hr
7.07b	19.0	23.9	22.4	19.2	18.4	16.0	14.3	14.1	11.1	23.9	1hr
Dummy12	19.0	23.9	22.6	19.3	18.4	16.1	14.5	14.2	11.2	23.9	1hr
7.08b	3.6	3.2	3.1	2.0	1.7	1.2	1.1	1.1	0.7	3.6	30min
7.08a	0.9	0.9	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
7.09a	2.9	2.6	2.6	1.6	1.4	1.0	0.9	0.9	0.6	2.9	30min
Dummy11	19.8	24.7	23.9	20.9	20.2	17.8	16.2	15.0	12.5	24.7	1hr
7.09c	4.4	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.4	30min
7.09b	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy43	20.9	25.0	24.9	21.7	21.6	18.8	17.2	16.0	13.2	25.0	1hr
7.10a	2.7	2.4	2.3	1.5	1.3	1.0	0.9	0.9	0.6	2.7	30min
7.10b	2.0	1.8	1.7	1.1	1.0	0.7	0.6	0.7	0.4	2.0	30min
Dummy9	21.3	25.1	26.0	22.8	22.4	19.9	18.3	16.5	13.7	26.0	2hr
9.01	2.3	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.3	30min
9.02b	3.7	3.1	3.5	2.3	2.0	1.4	1.3	1.3	0.9	3.7	30min
9.02a	3.8	3.4	3.3	2.1	1.8	1.3	1.2	1.2	0.8	3.8	30min
Dummy59	7.5	6.4	6.4	4.3	3.8	2.8	2.4	2.5	1.6	7.5	30min
Dummy8	21.4	25.2	27.3	24.4	23.3	21.3	19.6	17.1	14.5	27.3	2hr
7.12	4.8	4.2	4.1	2.8	2.4	1.8	1.6	1.6	1.1	4.8	30min
7.11a	2.5	2.3	2.3	1.3	1.1	0.8	0.7	0.7	0.5	2.5	30min
7.11b	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
Dummy10	21.5	25.3	28.5	26.0	24.1	22.6	20.8	18.1	15.1	28.5	2hr
12.01a	21.5	25.4	28.8	26.3	24.2	22.8	21.1	18.3	15.2	28.8	2hr
Dummy13	44.5	52.9	63.9	61.7	57.2	53.7	51.6	43.5	34.9	63.9	2hr
12.01b	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.3	30min
Dummy44	44.5	52.9	63.9	61.7	57.2	53.7	51.8	43.5	34.9	63.9	2hr
Dummy14	44.5	52.9	63.9	62.2	58.0	54.3	52.6	43.8	35.4	63.9	2hr
1.15	4.0	3.6	3.6	2.2	1.9	1.4	1.2	1.3	0.8	4.0	30min
Dummy45	44.5	52.9	63.9	62.4	58.5	54.7	53.2	43.9	36.1	63.9	2hr
Dummy15	44.5	52.9	63.9	63.0	59.7	55.9	54.6	44.4	38.4	63.9	2hr
Dummy46	44.5	52.9	63.9	63.2	60.0	56.3	55.0	44.6	39.0	63.9	2hr
Dummy16	44.5	52.9	63.9	63.3	60.7	57.0	55.7	45.6	40.2	63.9	2hr
Dummy17	64.3	77.3	91.2	88.9	88.7	88.0	82.3	67.9	62.5	91.2	2hr
1.22a	1.5	1.5	1.5	1.1	0.9	0.7	0.6	0.6	0.4	1.5	1hr
1.23	3.0	2.6	2.5	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
Dummy27	64.3	77.3	93.0	93.9	94.8	93.1	88.8	73.3	70.6	94.8	4.5hr
1.24	2.5	2.3	2.2	1.6	1.4	1.0	0.9	0.9	0.6	2.5	30min
Dummy49	64.3	77.3	93.0	94.0	95.0	93.4	89.0	73.7	70.9	95.0	4.5hr
Dummy50	64.3	77.3	93.0	94.1	95.5	93.9	89.4	74.7	71.5	95.5	4.5hr
Dummy51	64.3	77.3	93.0	94.1	96.3	95.0	90.2	76.3	72.4	96.3	4.5hr
Dummy52	64.3	77.3	93.0	94.1	96.4	95.2	90.4	76.6	72.7	96.4	4.5hr
Dummy53	64.3	77.3	93.0	94.2	96.9	96.1	91.3	77.8	73.9	96.9	4.5hr
1.27	64.3	77.3	93.0	94.2	97.3	96.8	92.4	79.4	75.4	97.3	4.5hr
E18	0.9	0.8	0.8	0.5	0.4	0.3	0.5	0.8	0.7	0.9	30min
1.28	64.3	77.3	93.0	94.3	97.8	97.6	93.3	81.1	76.5	97.8	4.5hr
Out	64.3	77.3	93.0	95.0	102.7	106.3	98.6	94.5	88.8	106.3	6hr

Table C.11B Estimated 100 yr ARI Peak Flows (m3/s) under Scenario B Development at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.3	1.1	1.7	1.7	1.7	2.0	2.3	2.3	1.8	2.3	12hr
E17b	0.3	1.0	1.6	1.6	1.5	1.8	2.1	2.1	1.7	2.1	12hr
Dummy57	0.7	2.2	3.2	3.3	3.2	3.8	4.4	4.5	3.5	4.5	12hr
E17c	4.6	4.6	7.0	7.6	7.4	8.2	10.0	10.0	7.7	10.0	9hr
E17d	0.9	1.3	2.0	2.0	2.0	2.3	2.7	2.8	2.2	2.8	12hr
E9	0.7	1.8	2.3	2.2	2.3	2.6	2.6	2.8	2.2	2.8	12hr
E10	8.9	8.5	8.7	5.1	4.7	3.7	3.6	3.9	2.8	8.9	30min
E3	10.6	10.5	10.9	6.3	5.8	5.1	4.9	5.3	3.8	10.9	2hr
E2	0.6	1.4	1.9	1.8	1.8	2.1	2.1	2.3	1.8	2.3	12hr
E1	0.5	1.3	1.7	1.6	1.6	1.8	1.8	2.0	1.5	2.0	12hr
Dummy56	1.2	2.7	3.5	3.4	3.5	3.9	4.0	4.4	3.3	4.4	12hr
Dummy30	11.0	11.0	11.3	7.0	7.5	8.1	8.2	9.2	7.0	11.3	2hr
E5	22.8	20.0	22.5	14.6	13.3	13.1	13.7	15.5	11.6	22.8	30min
E6a	5.6	5.5	5.7	3.3	3.0	2.5	2.4	2.6	1.9	5.7	2hr
E6b	3.2	3.2	3.3	2.0	2.1	2.1	2.2	2.5	1.9	3.3	2hr
Dummy31	27.6	24.7	27.2	19.6	17.8	17.0	17.9	20.2	15.1	27.6	30min
E8a	2.7	2.6	2.7	1.6	1.5	1.3	1.3	1.5	1.1	2.7	2hr
E8b	4.6	4.6	4.7	2.7	2.5	2.2	2.2	2.4	1.8	4.7	2hr
E7a	0.7	0.8	1.1	1.0	1.1	1.1	1.1	1.3	1.0	1.3	12hr
E7b	3.3	3.4	3.5	3.2	3.4	3.8	3.9	4.4	3.3	4.4	12hr
E8c	3.9	4.1	4.5	4.2	4.3	5.0	5.2	5.6	4.3	5.6	12hr
Dummy32	34.2	32.3	33.5	24.4	24.3	24.5	26.1	28.8	21.9	34.2	30min
E11a	35.2	33.5	34.5	25.2	25.8	25.7	27.5	29.9	22.8	35.2	30min
E11b	39.2	38.4	38.9	28.9	32.1	31.6	34.2	36.9	28.3	39.2	30min
E13	9.9	9.9	10.4	6.1	5.8	5.5	5.9	6.5	4.8	10.4	2hr
E12	0.6	1.5	1.9	1.7	1.9	1.9	1.9	2.1	1.6	2.1	12hr
E14	4.1	4.1	4.2	2.4	2.2	1.9	1.8	1.9	1.3	4.2	2hr
E15b	2.0	2.0	2.0	1.2	1.1	0.9	0.9	0.9	0.6	2.0	2hr
E15a	2.3	2.3	2.4	1.4	1.3	1.1	1.0	1.0	0.7	2.4	2hr
Dummy29	7.5	6.5	7.5	4.8	4.5	3.8	3.5	3.8	2.7	7.5	30min
E16a	11.1	12.0	11.7	8.9	8.0	7.0	7.1	7.8	5.6	12.0	1hr
E16b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy28	43.9	48.6	50.6	40.1	43.5	44.0	48.1	48.1	38.3	50.6	2hr
Dummy33	45.6	54.1	58.4	48.1	50.9	54.3	60.1	58.9	47.5	60.1	9hr
SE5	1.4	1.4	2.2	2.1	1.9	2.5	2.6	2.9	2.2	2.9	12hr
SE1	4.6	4.5	4.7	2.7	2.4	2.0	1.9	2.1	1.5	4.7	2hr
SE2	13.6	13.4	13.8	7.9	7.2	5.9	5.6	6.1	4.3	13.8	2hr
SE3	0.9	2.4	4.1	4.6	4.7	5.0	6.3	6.2	4.7	6.3	9hr
SE6a	2.9	2.9	5.1	5.8	5.9	6.3	7.8	7.6	5.8	7.8	9hr
Dummy58	19.1	17.7	19.8	12.3	11.3	11.5	14.0	15.6	11.4	19.8	2hr
SE6b	22.2	20.6	23.4	15.3	14.6	15.6	18.6	20.4	15.1	23.4	2hr
SE_out	22.2	20.6	23.4	15.3	14.6	15.6	18.6	20.4	15.1	23.4	2hr
33.01a	2.2	2.2	2.3	1.6	1.7	1.9	2.0	2.3	1.7	2.3	2hr
33.01b	2.3	2.3	2.5	2.0	2.1	2.5	2.6	2.9	2.2	2.9	12hr
32.01	4.8	4.8	4.9	2.8	2.6	2.1	2.0	2.2	1.5	4.9	2hr
32.02	12.8	13.4	12.5	9.4	8.4	6.9	7.6	8.4	5.8	13.4	1hr
1.26	0.6	0.7	1.3	1.6	1.7	1.8	2.3	2.2	1.9	2.3	9hr
31.03	2.8	2.6	2.6	1.7	1.6	1.3	1.7	1.9	1.4	2.8	30min
30.01	8.4	8.1	8.3	4.8	4.4	3.4	3.4	3.6	2.6	8.4	30min
30.02	21.2	18.4	20.0	13.3	11.9	9.2	9.1	9.8	7.0	21.2	30min
1.25b	22.7	20.0	21.3	14.6	13.3	10.3	10.2	11.0	7.8	22.7	30min
1.25a	1.9	1.8	1.8	1.2	1.1	1.0	1.3	1.5	1.1	1.9	30min
31.01b	1.4	1.4	1.4	0.8	0.7	0.6	0.6	0.6	0.4	1.4	2hr
31.01a	3.0	2.9	3.1	1.7	1.6	1.3	1.2	1.3	0.9	3.1	2hr
Dummy55	4.3	4.3	4.5	2.5	2.3	1.9	1.8	1.9	1.4	4.5	2hr
31.02	6.5	7.6	7.0	5.1	4.6	3.8	4.0	4.4	3.1	7.6	1hr
25.06a	5.2	5.0	5.1	3.0	2.7	2.1	2.0	2.2	1.6	5.2	30min
25.06b	6.2	5.9	6.2	3.8	3.5	2.8	2.8	3.1	2.2	6.2	2hr
25.06c	1.0	1.0	1.0	0.6	0.6	0.5	0.6	0.7	0.5	1.0	2hr
25.03c	2.6	2.6	2.6	1.5	1.4	1.1	1.1	1.2	0.9	2.6	30min
25.03b	0.9	0.9	0.9	0.5	0.5	0.5	0.6	0.7	0.5	0.9	2hr
25.01	0.8	0.9	1.2	1.3	1.3	1.4	1.9	1.9	1.4	1.9	12hr
27.01	6.0	5.7	5.7	3.6	3.3	3.0	3.6	4.1	3.0	6.0	30min
25.03a	7.4	7.1	7.4	4.6	4.2	3.6	4.3	4.8	3.5	7.4	2hr
26.01a	5.3	5.1	5.2	3.0	2.7	2.1	2.1	2.3	1.6	5.3	30min
26.01b	0.3	0.7	1.3	1.4	1.4	1.5	1.9	1.9	1.4	1.9	9hr
Dummy47	5.6	5.5	5.6	3.4	3.2	3.1	3.7	4.2	3.0	5.6	2hr
25.02	12.5	11.5	11.4	8.1	7.4	6.1	7.0	7.9	5.7	12.5	30min
Dummy48	19.8	18.0	17.4	12.7	11.6	9.6	11.3	12.7	9.2	19.8	30min
Dummy22	21.1	19.6	18.9	13.7	13.1	10.9	12.8	14.1	10.2	21.1	30min
25.04b	3.1	3.0	3.1	1.8	1.7	1.3	1.4	1.6	1.1	3.1	30min
25.04a	5.2	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.2	30min
Dummy23	24.0	22.7	21.4	16.4	16.5	13.5	15.8	17.4	12.6	24.0	30min
25.05a	3.3	3.1	3.2	1.9	1.7	1.4	1.4	1.5	1.1	3.3	30min
25.05b	1.2	1.2	1.3	0.7	0.7	0.6	0.7	0.8	0.6	1.3	2hr
28.01	12.1	11.6	11.8	7.0	6.3	4.9	4.7	5.1	3.6	12.1	30min
28.02	15.3	15.6	15.0	10.9	9.7	8.0	8.1	8.8	6.2	15.6	1hr
Dummy24	32.1	37.3	36.1	28.6	26.2	22.7	24.9	27.5	20.0	37.3	1hr
Dummy25	34.5	40.1	38.5	31.6	29.2	25.5	27.8	30.3	22.2	40.1	1hr
25.07b	0.9	0.9	0.9	0.6	0.6	0.7	0.8	0.9	0.7	0.9	2hr
29.01	14.9	14.2	14.5	8.6	7.7	6.0	5.8	6.2	4.4	14.9	30min
29.02	18.3	17.9	17.6	12.7	11.5	9.5	9.6	10.5	7.4	18.3	30min
25.07a	2.8	2.7	2.8	1.7	1.5	1.2	1.3	1.4	1.0	2.8	30min
Dummy26	43.4	49.7	52.0	42.4	38.5	35.4	38.4	39.9	30.2	52.0	2hr
1.22b	2.8	2.5	2.6	1.8	1.6	1.2	1.2	1.4	0.9	2.8	30min
1.20a	0.1	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
1.20b	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.6	12hr
1.21	15.0	13.6	13.8	8.9	8.0	6.2	6.1	6.5	4.6	15.0	30min
24.01	9.0	8.6	8.8	5.2	4.7	3.6	3.6	3.9	2.8	9.0	30min
24.02	15.1	18.2	17.2	12.4	10.8	8.8	8.7	9.4	6.6	18.2	1hr
24.03	19.4	22.6	21.0	16.8	15.2	12.9	12.7	13.8	9.8	22.6	1hr
24.04	20.2	24.6	22.8	18.5	16.9	15.1	15.0	15.3	11.8	24.6	1hr
24.05	20.6	26.6	25.6	20.6	19.8	17.9	18.0	18.3	14.3	26.6	1hr
24.06	20.8	28.3	28.3	23.7	22.4	20.9	21.4	21.0	17.1	28.3	2hr
17.14b	5.1	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.1	30min
17.14a	6.6	6.3	6.5	4.0	3.6	3.0	3.5	3.9	2.8	6.6	30min
17.13	6.3	5.8	5.9	3.7	3.3	2.6	2.5	2.7	1.9	6.3	30min
23.01	6.6	6.2	6.3	3.8	3.5	2.7	2.6	2.8	2.0	6.6	30min
20.01	9.5	9.1	9.4	5.4	4.9	3.9	3.8	4.1	2.9	9.5	30min
17.10a	4.7	4.3	4.4	2.7	2.5	1.9	1.9	2.0	1.4	4.7	30min
17.10b	7.2	6.5	6.6	4.3	3.9	3.0	2.9	3.1	2.2	7.2	30min
17.09	10.1	9.2	9.3	6.0	5.4	4.1	4.0	4.3	3.0	10.1	30min
17.08c	3.0	3.0	3.0	1.9	1.7	1.6	1.9	2.1	1.5	3.0	30min
17.08d	0.4	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.4	2hr
18.01	12.6	12.1	12.3	7.3	6.5	5.1	5.0	5.4	3.9	12.6	30min
18.02	18.6	17.4	18.2	11.1	10.0	7.8	7.7	8.3	5.9	18.6	30min
17.08b	3.6	3.4	3.5	2.1	1.9	1.5	1.4	1.6	1.1	3.6	30min
17.08a	5.9	5.6	5.8	3.5	3.1	2.5	2.4	2.6	1.9	5.9	30min
17.01	7.1	7.0	7.2	4.1	3.7	2.9	2.9	3.1	2.2	7.2	2hr
17.02	20.9	19.0	18.2	13.1	11.8	9.2	9.0	9.8	6.9	20.9	30min
17.03	32.4	37.9	37.4	28.3	23.9	20.9	20.5	22.2	15.6	37.9	1hr
17.04	46.8	51.2	54.0	41.8	34.4	31.0	30.3	32.9	23.2	54.0	2hr
17.06	56.3	58.8	60.6	48.0	44.4	38.3	38.5	39.5	29.9	60.6	2hr
17.07	59.6	62.7	65.4	52.7	50.2	43.5	44.2	45.1	34.6	65.4	2hr
Dummy18	65.2	69.3	73.4	61.0	60.1	52.6	53.8	55.2	42.5	73.4	2hr
Dummy19	65.4	70.2	74.6	62.1	61.2	54.3	55.8	56.6	43.9	74.6	2hr
Dummy36	65.6	70.9	76.9	64.9	62.7	56.6	58.1	58.1	45.4	76.9	2hr
21.01	14.1	12.8	12.8	8.5	7.6	5.8	5.8	6.4	4.4	14.1	30min
Dummy37	65.8	72.1	80.5	69.4	64.9	61.0	61.5	60.7	47.7	80.5	2hr
Dummy20	66.2	74.6	86.2	75.6	68.6	67.6	68.6	64.1	51.8	86.2	2hr
22.01	16.5	15.2	15.5	9.7	8.7	6.7	6.5	7.0	4.9	16.5	30min
17.11	3.1	2.9	3.0	1.8	1.7	1.3	1.5	1.7	1.2	3.1	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	66.5	76.1	90.5	80.9	72.9	72.2	73.5	66.7	54.9	90.5	2hr
17.12	8.3	7.8	8.0	4.9	4.4	3.4	3.6	3.9	2.8	8.3	30min
Dummy54	66.6	76.7	92.7	83.1	75.2	74.2	75.7	68.2	56.4	92.7	2hr
Dummy38	66.7	77.0	94.3	84.6	76.9	75.5	77.1	69.2	57.3	94.3	2hr
Dummy35	66.7	77.2	95.4	86.1	78.4	76.7	78.4	70.2	58.2	95.4	2hr
Dummy21	67.0	78.1	97.8	89.2	81.9	80.0	81.8	72.6	60.6	97.8	2hr
17.15a	4.9	4.6	4.7	2.9	2.6	2.1	2.2	2.4	1.7	4.9	30min
Dummy39	67.1	78.4	98.9	90.5	83.2	81.3	83.0	73.2	61.5	98.9	2hr
SU3	7.1	6.5	6.7	4.1	3.7	2.8	2.8	3.0	2.1	7.1	30min
Dummy40	69.2	85.9	113.4	107.1	97.4	97.3	99.5	91.8	74.5	113.4	2hr
17.15b	1.7	1.7	1.7	1.0	1.0	0.8	1.0	1.1	0.8	1.7	2hr
Dummy41	69.2	86.1	113.9	107.8	98.0	97.9	100.1	92.3	74.9	113.9	2hr
17.16	69.4	86.9	115.9	111.0	100.8	100.6	102.6	94.4	76.8	115.9	2hr
1.18	6.5	5.9	5.9	4.1	3.6	2.8	2.9	3.2	2.2	6.5	30min
16.01	3.2	3.1	3.2	1.8	1.7	1.3	1.3	1.4	1.0	3.2	30min
15.02	4.8	5.2	5.0	3.8	3.4	2.9	3.6	4.1	2.9	5.2	1hr
15.01	6.9	6.2	6.3	4.2	3.8	3.0	3.3	3.6	2.5	6.9	30min
14.01	12.9	12.1	12.4	7.6	6.8	5.4	5.4	5.9	4.2	12.9	30min
1.17a	15.1	14.8	15.5	10.5	9.4	7.6	8.0	8.8	6.3	15.5	2hr
1.17b	0.7	0.7	0.8	0.9	0.9	1.0	1.2	1.3	1.0	1.3	12hr
1.16	7.4	7.2	7.4	4.3	3.9	3.2	3.2	3.5	2.5	7.4	30min
1.14	2.1	2.1	2.1	1.6	1.4	1.1	1.1	1.2	0.8	2.1	2hr
12.02b	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	12hr
12.02a	3.5	3.3	3.4	2.1	1.9	1.6	1.7	1.9	1.4	3.5	30min
11.01	6.6	6.5	6.7	3.8	3.5	2.8	2.7	2.9	2.1	6.7	2hr
10.01	7.0	6.9	7.2	4.1	3.7	3.1	2.9	3.1	2.2	7.2	2hr
10.02a	11.9	10.1	11.7	7.7	7.0	5.6	5.5	5.9	4.3	11.9	30min
1.13b	3.4	3.2	3.3	2.1	1.9	1.9	2.2	2.5	1.8	3.4	30min
1.13a	3.7	3.6	3.7	2.2	2.0	1.7	1.9	2.1	1.5	3.7	30min
1.12a	7.5	7.2	7.3	4.4	3.9	3.1	3.0	3.2	2.3	7.5	30min
5.01	0.2	0.3	0.7	0.9	0.9	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	2.7	2.7	2.7	1.6	1.5	1.2	1.2	1.3	0.9	2.7	2hr
1.11b	4.5	4.4	4.5	2.7	2.5	2.2	2.3	2.6	1.9	4.5	30min
1.09b	1.8	1.8	1.9	1.1	1.0	0.8	0.8	0.9	0.6	1.9	2hr
1.09c	4.2	4.1	4.2	2.5	2.3	1.9	2.0	2.2	1.6	4.2	30min
4.01	5.1	5.0	5.2	2.9	2.6	2.0	1.8	1.8	1.3	5.2	2hr
4.02	14.7	13.2	13.9	8.8	7.9	6.0	5.4	5.7	4.0	14.7	30min
1.06a	8.6	8.1	8.3	5.1	4.6	3.8	4.3	4.8	3.4	8.6	30min
1.01	36.7	32.9	33.1	22.6	20.3	15.6	15.1	16.3	11.4	36.7	30min
1.02	46.5	43.3	40.8	33.0	31.2	25.8	25.2	27.3	19.2	46.5	30min
2.01	56.2	51.5	51.8	36.4	32.3	24.9	23.9	25.8	17.8	56.2	30min
1.03	85.7	91.4	96.0	70.8	60.0	53.2	51.7	55.4	38.9	96.0	2hr
1.04	91.8	97.6	100.8	75.2	67.3	58.7	57.7	59.0	43.6	100.8	2hr
1.05	95.3	105.3	108.8	83.5	75.2	67.6	67.3	66.2	51.7	108.8	2hr
1.06b	96.2	109.5	115.0	90.5	79.8	74.3	74.4	70.7	57.0	115.0	2hr
Dummy1	96.6	111.4	118.0	93.7	82.0	77.7	78.4	73.5	60.4	118.0	2hr
1.07a	2.8	2.7	2.8	1.7	1.6	1.5	1.7	1.9	1.4	2.8	30min
1.07b	1.5	1.5	2.5	2.9	2.9	3.1	4.0	4.0	2.9	4.0	9hr
Dummy2	97.2	113.2	121.1	96.8	84.7	81.5	83.6	78.1	64.1	121.1	2hr
1.08a	6.3	6.1	6.2	3.7	3.3	2.5	2.4	2.5	1.8	6.3	30min
1.08b	5.7	5.5	5.7	3.4	3.1	2.7	2.9	3.2	2.4	5.7	30min
Dummy3	97.5	114.1	124.4	100.2	87.0	84.5	86.5	80.3	66.2	124.4	2hr
3.01	7.3	7.1	7.3	4.1	3.7	2.8	2.5	2.6	1.8	7.3	2hr
1.09a	7.9	7.9	8.5	5.1	4.6	3.6	3.2	3.4	2.4	8.5	2hr
Dummy60	97.6	114.4	126.4	102.2	88.2	85.9	87.8	81.2	67.1	126.4	2hr
Dummy4	97.9	115.1	129.3	106.5	92.4	89.8	91.4	83.1	69.5	129.3	2hr
SU2	2.1	2.8	3.1	2.8	2.9	2.8	2.8	3.0	2.3	3.1	2hr
1.10b	3.6	3.8	4.2	3.9	4.1	4.0	4.0	4.3	3.3	4.3	12hr
Dummy42	99.1	117.0	132.3	109.7	95.6	92.8	94.3	85.4	71.8	132.3	2hr
1.10a	99.2	117.3	133.0	110.6	96.6	93.7	95.1	85.8	72.4	133.0	2hr
Dummy6	99.4	117.7	134.7	112.8	98.8	95.5	96.8	86.6	73.7	134.7	2hr
1.12c	5.4	5.2	5.4	3.1	2.8	2.3	2.2	2.4	1.7	5.4	30min
1.12b	99.9	119.1	139.1	119.2	105.2	100.9	102.2	89.4	77.7	139.1	2hr
Dummy7	100.2	119.7	140.3	121.5	107.7	103.1	104.3	91.1	79.9	140.3	2hr
10.02b	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	1.2	1.2	1.2	0.7	0.7	0.8	1.0	1.1	0.8	1.2	2hr
8.01	14.5	13.7	14.0	8.5	7.6	6.0	6.0	6.5	4.6	14.5	30min
7.01	7.2	7.0	7.2	4.1	3.8	3.0	2.9	3.1	2.2	7.2	2hr
7.02	21.4	23.3	23.3	15.6	13.5	11.3	11.1	12.0	8.5	23.3	1hr
7.03	33.2	35.0	33.7	27.5	23.2	19.8	19.5	21.2	15.0	35.0	1hr
7.04	38.3	41.0	39.8	30.8	28.3	23.6	23.6	25.2	18.4	41.0	1hr
7.05	43.3	47.6	45.0	35.9	36.1	30.0	30.3	32.5	24.2	47.6	1hr
7.06	44.1	50.3	48.2	39.4	38.5	33.4	34.1	34.9	27.0	50.3	1hr
7.07b	45.2	54.6	53.2	45.1	43.5	39.0	40.7	41.7	32.5	54.6	1hr
Dummy12	45.3	55.0	53.8	45.7	44.0	39.8	41.6	42.4	33.2	55.0	1hr
7.08b	7.5	7.1	7.2	4.3	3.8	2.9	2.7	2.9	2.0	7.5	30min
7.08a	1.9	1.9	2.0	1.1	1.1	1.0	1.1	1.3	1.0	2.0	2hr
7.09a	6.0	5.8	5.9	3.4	3.1	2.4	2.3	2.5	1.8	6.0	30min
Dummy11	46.0	57.6	57.8	50.1	47.0	44.5	46.5	45.3	36.9	57.8	2hr
7.09c	9.1	8.6	8.8	5.2	4.7	3.5	3.2	3.4	2.4	9.1	30min
7.09b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy43	49.0	58.7	60.0	52.5	50.5	47.2	48.9	47.3	38.9	60.0	2hr
7.10a	5.7	5.2	5.3	3.4	3.0	2.3	2.2	2.4	1.7	5.7	30min
7.10b	4.3	4.0	4.0	2.5	2.3	1.8	1.7	1.8	1.3	4.3	30min
Dummy9	49.6	59.2	62.9	54.8	52.5	50.0	51.7	48.9	40.3	62.9	2hr
9.01	4.7	4.7	4.9	2.8	2.5	2.0	2.0	2.1	1.5	4.9	2hr
9.02b	7.8	6.6	7.8	5.0	4.5	3.6	3.5	3.8	2.7	7.8	2hr
9.02a	7.9	7.6	7.7	4.6	4.1	3.2	3.1	3.4	2.4	7.9	30min
Dummy59	15.7	14.0	14.0	9.5	8.6	6.8	6.7	7.2	5.1	15.7	30min
Dummy8	50.0	60.1	67.1	59.3	55.8	54.3	55.8	51.6	42.8	67.1	2hr
7.12	10.3	9.4	9.5	6.2	5.6	4.3	4.5	5.0	3.5	10.3	30min
7.11a	5.1	5.0	5.2	2.9	2.7	2.1	2.1	2.2	1.6	5.2	2hr
7.11b	6.6	6.3	6.6	3.8	3.4	2.8	2.7	2.9	2.1	6.6	2hr
Dummy10	50.4	60.9	71.3	63.8	58.9	58.1	60.1	54.9	45.5	71.3	2hr
12.01a	50.6	61.3	72.7	65.1	59.9	59.5	61.6	56.1	46.6	72.7	2hr
Dummy13	107.2	138.0	177.5	170.2	154.3	153.3	156.1	140.5	117.1	177.5	2hr
12.01b	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.0	0.8	1.0	12hr
Dummy44	107.3	138.2	177.8	170.7	155.0	153.8	156.6	140.9	117.6	177.8	2hr
Dummy14	107.4	138.5	178.5	172.9	158.2	156.4	159.1	142.4	120.4	178.5	2hr
1.15	8.4	8.1	8.3	5.0	4.5	3.8	4.2	4.8	3.4	8.4	30min
Dummy45	107.6	138.8	179.1	174.5	160.6	158.5	160.7	143.5	122.8	179.1	2hr
Dummy15	108.0	139.5	180.6	178.6	167.0	164.4	165.1	147.7	129.8	180.6	2hr
Dummy46	108.1	139.8	181.1	179.7	168.7	166.1	166.4	149.1	131.8	181.1	2hr
Dummy16	108.4	140.4	182.3	181.7	172.4	169.8	169.6	153.7	136.6	182.3	2hr
Dummy17	151.7	194.0	249.5	254.2	252.9	250.6	253.2	229.0	202.9	254.2	3hr
1.22a	3.6	3.4	3.5	2.5	2.2	1.7	1.8	2.0	1.5	3.6	30min
1.23	6.3	5.8	5.9	3.7	3.3	2.5	2.5	2.7	1.9	6.3	30min
Dummy27	153.7	199.2	263.5	271.1	276.6	274.4	275.6	247.5	230.4	276.6	4.5hr
1.24	5.6	5.1	5.1	3.4	3.1	2.3	2.2	2.4	1.6	5.6	30min
Dummy49	153.8	199.3	263.7	271.4	277.5	275.2	276.3	249.3	231.4	277.5	4.5hr
Dummy50	153.9	199.6	264.3	272.0	279.3	277.5	277.9	252.4	233.9	279.3	4.5hr
Dummy51	154.0	199.9	264.6	272.4	281.4	281.1	279.9	257.1	237.9	281.4	4.5hr
Dummy52	154.1	200.1	265.0	272.8	282.1	281.9	280.6	258.3	239.1	282.1	4.5hr
Dummy53	154.5	200.8	266.3	274.2	284.8	285.9	283.8	264.0	245.0	285.9	6hr
1.27	155.0	202.0	268.4	277.1	288.8	291.1	288.0	270.8	251.6	291.1	6hr
E18	1.8	1.8	2.3	2.6	2.7	2.8	3.6	3.7	2.8	3.7	12hr
1.28	155.4	202.6	269.4	278.7	291.1	294.6	290.3	275.8	257.1	294.6	6hr
Out	156.6	204.1	271.7	284.1	307.7	319.5	303.8	312.1	294.9	319.5	6hr

Table C.12A Impact of Scenario A Development on 2 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.6	1.6	2.9	2.9	4.9	4.9	7.1	7.1	7.0	7.0
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	0.7	5.1	0.7	4.7	0.6	4.5	0.4	3.2	2.7	2.8	4.7	4.6	8.0	7.9	11.4	11.2	11.2	11.1
BC3	**Bonds Creek** - Bringelly Road	1.10a	0.7	15.5	0.8	16.8	0.8	17.0	0.6	13.8	3.5	12.3	6.0	10.4	10.0	9.5	14.0	13.1	13.8	13.3
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	0.7	17.5	0.9	20.6	0.9	19.7	0.8	16.7	4.0	16.0	6.8	13.6	11.4	12.4	15.8	14.5	15.4	14.7
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	1.3	29.5	1.6	36.0	1.9	39.0	1.8	34.3	6.8	30.8	11.6	29.1	19.7	27.5	27.5	26.0	26.8	26.1
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	1.3	29.5	1.6	36.1	2.0	41.2	2.0	37.6	7.6	34.1	12.8	32.0	21.9	31.4	30.2	29.9	29.8	29.3
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	0.8	8.5	1.0	9.3	1.2	9.3	1.1	7.9	4.0	7.0	7.0	6.9	12.0	11.9	16.9	16.5	16.8	16.6
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	1.9	30.1	2.4	38.0	3.0	44.9	2.9	42.1	11.7	38.1	19.9	36.1	34.2	39.4	47.0	46.3	46.8	46.7
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	2.4	30.5	3.1	38.3	3.3	48.0	3.6	48.1	13.5	45.5	22.7	42.8	39.1	47.7	53.0	53.4	53.8	53.9
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	0.8	15.5	0.9	18.5	1.0	18.5	0.9	15.3	2.3	14.7	4.0	12.8	6.8	11.5	9.7	11.4	9.5	9.9
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	1.6	19.3	1.8	21.9	1.8	22.3	1.4	18.6	1.6	16.3	2.8	14.3	4.7	12.7	6.7	12.0	6.3	9.3
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	1.3	15.7	1.3	14.9	1.2	13.9	1.0	10.8	1.9	9.8	2.8	7.6	4.6	6.7	5.6	7.0	4.5	4.9

Critical Duration - Existing Conditions

Critical Duration - Scenario A Development Conditions

Table C.12B Impact of Scenario A Development on 100 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	3.8	3.8	10.9	10.9	20.8	20.8	25.2	25.2	26.6	26.6	28.1	28.1	36.4	36.4	33.7	33.7	28.7	28.7
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	6.3	11.3	18.1	17.5	33.0	31.9	39.8	39.0	41.4	40.9	43.7	43.3	56.9	56.1	52.1	50.8	43.3	43.1
BC3	**Bonds Creek** - Bringelly Road	1.10a	8.6	34.7	22.9	37.3	39.5	38.9	47.6	44.1	50.1	48.9	52.8	51.6	68.3	64.8	61.2	56.5	52.6	52.1
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9.8	41.1	25.4	47.6	43.8	47.7	52.4	47.4	56.0	53.8	59.1	56.8	75.3	69.9	66.6	65.6	58.9	59.1
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	16.3	69.3	42.2	87.3	74.5	96.9	90.3	85.4	96.7	90.7	103.2	97.4	128.6	115.8	112.7	114.1	100.8	104.4
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	17.9	70.6	45.3	90.8	80.1	109.4	97.6	101.1	106.4	97.9	114.6	107.7	140.3	124.7	126.8	127.9	113.8	116.9
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	9.4	22.1	26.1	28.7	47.7	45.6	57.8	56.3	62.0	61.2	65.8	65.1	82.8	80.8	72.7	69.4	63.8	64.1
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	27.0	79.4	69.1	114.3	124.5	148.7	152.8	143.6	168.4	161.4	180.5	172.2	218.9	209.0	196.6	196.1	179.4	183.7
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	30.2	82.3	76.7	121.6	137.1	170.5	169.1	173.6	190.6	181.7	205.3	194.3	245.9	236.8	229.6	223.8	210.7	214.0
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	5.5	35.4	15.3	42.8	27.8	43.5	33.6	35.2	35.2	34.7	37.3	35.3	46.8	43.5	42.0	43.5	34.7	36.9
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	4.5	43.4	11.0	49.7	20.5	52.0	23.6	42.4	23.9	38.5	25.5	35.4	31.9	38.4	29.9	39.9	23.1	30.2
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5.2	34.2	14.0	32.3	19.9	33.5	19.8	24.4	18.7	24.3	23.0	24.5	25.1	26.1	25.0	28.8	20.0	21.9

Critical Duration - Existing Conditions

Critical Duration - Scenario A Development Conditions

Table C.13A Impact of Scenario B Development on 2 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	0.0	40.1	0.0	41.7	0.0	43.2	0.3	33.4	1.6	29.0	2.9	24.5	4.9	21.8	7.1	20.8	7.0	15.5
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	0.7	42.1	0.7	46.9	0.6	49.4	0.4	40.5	2.7	34.1	4.7	31.1	8.0	29.1	11.4	25.0	11.2	21.3
BC3	**Bonds Creek** - Bringelly Road	1.10a	0.7	42.5	0.8	47.8	0.8	52.6	0.6	44.6	3.5	37.7	6.0	34.6	10.0	33.0	14.0	27.0	13.8	23.2
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	0.7	42.5	0.9	47.8	0.9	53.6	0.8	46.5	4.0	39.6	6.8	36.1	11.4	35.1	15.8	27.5	15.4	24.1
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	1.3	44.5	1.6	52.9	1.9	63.9	1.8	62.2	6.8	58.0	11.6	54.3	19.7	52.6	27.5	43.8	26.8	35.4
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	1.3	44.5	1.6	52.9	2.0	63.9	2.0	63.3	7.6	60.7	12.8	57.0	21.9	55.7	30.2	45.6	29.8	40.2
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	0.8	29.4	1.0	37.1	1.2	44.4	1.1	43.0	4.0	38.5	7.0	37.5	12.0	34.9	16.9	30.6	16.8	24.5
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	1.9	64.3	2.4	77.3	3.0	91.2	2.9	88.9	11.7	88.7	19.9	88.0	34.2	82.3	47.0	67.9	46.8	62.5
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	2.4	64.3	3.1	77.3	3.3	93.0	3.6	94.1	13.5	96.4	22.7	95.2	39.1	90.4	53.0	76.6	53.8	72.7
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	0.8	21.5	0.9	25.3	1.0	28.5	0.9	26.0	2.3	24.1	4.0	22.6	6.8	20.8	9.7	18.1	9.5	15.1
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	1.6	19.3	1.8	21.9	1.8	22.3	1.4	18.6	1.6	16.3	2.8	14.3	4.7	12.7	6.7	12.0	6.3	9.3
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	1.3	15.7	1.3	14.9	1.2	13.9	1.0	10.8	1.9	9.8	2.8	7.6	4.6	6.7	5.6	7.0	4.5	4.9

Critical Duration - Existing Conditions

Critical Duration - Scenario B Development Conditions

Table C.13B Impact of Scenario B Development on 100 yr ARI Peak Flows for Durations up to 18 hours

Location ID (see Fig C.2)	Location Name	2011 Node Name (see Fig C.3)	Storm Durations																	
			30min		1hr		2hr		3hr		4.5hr		6hr		9hr		12hr		18hr	
			Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev	Existing	Dev
BC1	**Bonds Creek** - Denham Court Road	1.04	3.8	91.8	10.9	97.6	20.8	100.8	25.2	75.2	26.6	67.3	28.1	58.7	36.4	57.7	33.7	59.0	28.7	43.6
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	6.3	97.2	18.1	113.2	33.0	121.1	39.8	96.8	41.4	84.7	43.7	81.5	56.9	83.6	52.1	78.1	43.3	64.1
BC3	**Bonds Creek** - Bringelly Road	1.10a	8.6	99.2	22.9	117.3	39.5	133.0	47.6	110.6	50.1	96.6	52.8	93.7	68.3	95.1	61.2	85.8	52.6	72.4
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9.8	99.9	25.4	119.1	43.8	139.1	52.4	119.2	56.0	105.2	59.1	100.9	75.3	102.2	66.6	89.4	58.9	77.7
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	16.3	107.4	42.2	138.5	74.5	178.5	90.3	172.9	96.7	158.2	103.2	156.4	128.6	159.1	112.7	142.4	100.8	120.4
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	17.9	108.4	45.3	140.4	80.1	182.3	97.6	181.7	106.4	172.4	114.6	169.8	140.3	169.6	126.8	153.7	113.8	136.6
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	9.4	69.4	26.1	86.9	47.7	115.9	57.8	111.0	62.0	100.8	65.8	100.6	82.8	102.6	72.7	94.4	63.8	76.8
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	27.0	151.7	69.1	194.0	124.5	249.5	152.8	254.2	168.4	252.9	180.5	250.6	218.9	253.2	196.6	229.0	179.4	202.9
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	30.2	154.1	76.7	200.1	137.1	265.0	169.1	272.8	190.6	282.1	205.3	281.9	245.9	280.6	229.6	258.3	210.7	239.1
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	5.5	50.4	15.3	60.9	27.8	71.3	33.6	63.8	35.2	58.9	37.3	58.1	46.8	60.1	42.0	54.9	34.7	45.5
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	4.5	43.4	11.0	49.7	20.5	52.0	23.6	42.4	23.9	38.5	25.5	35.4	31.9	38.4	29.9	39.9	23.1	30.2
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5.2	34.2	14.0	32.3	19.9	33.5	19.8	24.4	18.7	24.3	23.0	24.5	25.1	26.1	25.0	28.8	20.0	21.9

Critical Duration - Existing Conditions

Critical Duration - Scenario B Development Conditions

Table C.14 Impact of Scenario A and Scenario B Development on 2 yr ARI and 100 yr ARI Peak Flows at All Locations

Node	2 yr ARI Peak Flow (m3/s)					100 yr ARI Peak Flow (m3/s)					2 yr ARI Critical Duration			100 yr ARI Critical Duration		
	Existing	DevA	Diff	DevB	Diff	Existing	DevA	Diff	DevB	Diff	Existing	DevA	DevB	Existing	DevA	DevB
	(a)	(b)	(b)-(a)	(c)	(c) - (a)	(a)	(b)	(b)-(a)	(c)	(c) - (a)						
E17a	0.5	0.5	0.0%	0.5	0.0%	2.3	2.3	0.0%	2.3	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
E17b	0.4	0.4	0.0%	0.4	0.0%	2.1	2.1	0.0%	2.1	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
Dummy57	0.9	0.9	0.0%	0.9	0.0%	4.5	4.5	0.0%	4.5	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
E17c	2.1	2.2	6.5%	2.2	6.5%	9.9	10.0	1.8%	10.0	1.8%	12hr	30min	30min	9hr	9hr	9hr
E17d	0.6	0.6	0.7%	0.6	0.7%	2.7	2.8	3.1%	2.8	3.1%	12hr	12hr	12hr	12hr	12hr	12hr
E9	0.6	0.6	0.0%	0.6	0.0%	2.8	2.8	0.0%	2.8	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
E10	0.6	4.3	633.6%	4.3	633.6%	2.8	8.9	217.3%	8.9	217.3%	12hr	30min	30min	12hr	30min	30min
E3	0.9	5.2	450.5%	5.2	450.5%	4.5	10.9	142.9%	10.9	142.9%	12hr	30min	30min	12hr	2hr	2hr
E2	0.5	0.5	0.0%	0.5	0.0%	2.3	2.3	0.0%	2.3	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
E1	0.4	0.4	0.0%	0.4	0.0%	2.0	2.0	0.0%	2.0	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
Dummy56	0.9	0.9	0.0%	0.9	0.0%	4.4	4.4	0.0%	4.4	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
Dummy30	1.9	5.4	192.3%	5.4	192.3%	8.5	11.3	33.2%	11.3	33.2%	12hr	30min	30min	12hr	2hr	2hr
E5	2.9	10.9	276.0%	10.9	276.0%	13.1	22.8	74.1%	22.8	74.1%	12hr	30min	30min	12hr	30min	30min
E6a	0.4	2.7	513.5%	2.7	513.5%	2.2	5.7	162.9%	5.7	162.9%	12hr	30min	30min	12hr	2hr	2hr
E6b	0.5	1.6	240.2%	1.6	240.2%	2.2	3.3	48.3%	3.3	48.3%	12hr	30min	30min	12hr	2hr	2hr
Dummy31	3.8	12.8	239.1%	12.8	239.1%	17.1	27.6	61.5%	27.6	61.5%	12hr	30min	30min	9hr	30min	30min
E8a	0.3	1.3	408.4%	1.3	408.4%	1.2	2.7	120.8%	2.7	120.8%	12hr	30min	30min	12hr	2hr	2hr
E7a	0.3	0.4	38.9%	2.3	769.9%	1.2	1.3	3.1%	4.7	279.7%	12hr	30min	30min	12hr	12hr	2hr
E7b	0.9	1.6	90.3%	0.4	-58.1%	4.1	4.4	6.5%	1.3	-68.7%	12hr	30min	30min	12hr	12hr	12hr
E8c	1.1	1.9	64.1%	1.6	42.8%	5.4	5.6	4.6%	4.4	-18.7%	12hr	2hr	30min	12hr	12hr	12hr
E8b	0.4	2.3	459.1%	1.9	365.9%	2.0	4.7	135.2%	5.6	179.8%	12hr	30min	2hr	12hr	2hr	12hr
Dummy32	5.6	15.7	182.6%	15.7	182.6%	25.1	34.2	36.3%	34.2	36.3%	12hr	30min	30min	9hr	30min	30min
E11a	5.9	16.1	173.7%	16.1	173.7%	26.4	35.2	33.3%	35.2	33.3%	12hr	30min	30min	9hr	30min	30min
E11b	7.3	17.5	140.8%	17.5	140.8%	32.6	39.2	20.3%	39.2	20.3%	12hr	30min	30min	9hr	30min	30min
E13	1.2	4.9	313.8%	4.9	313.8%	5.6	10.4	85.1%	10.4	85.1%	12hr	30min	30min	12hr	2hr	2hr
E12	0.5	0.5	0.0%	0.5	0.0%	2.1	2.1	0.0%	2.1	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
E14	0.3	2.0	509.6%	2.0	509.6%	1.6	4.2	164.0%	4.2	164.0%	12hr	30min	30min	12hr	2hr	2hr
E15b	0.2	1.0	478.3%	1.0	478.3%	0.8	2.0	155.8%	2.0	155.8%	12hr	30min	30min	12hr	2hr	2hr
E15a	0.2	1.1	486.5%	1.1	486.5%	0.9	2.4	157.3%	2.4	157.3%	12hr	30min	30min	12hr	2hr	2hr
Dummy29	0.7	3.6	422.2%	3.6	422.2%	3.2	7.5	134.4%	7.5	134.4%	12hr	30min	30min	12hr	30min	30min
E16a	1.3	5.5	327.4%	5.5	327.4%	6.0	12.0	99.2%	12.0	99.2%	12hr	1hr	1hr	12hr	1hr	1hr
E16b	0.1	0.3	152.4%	0.3	152.4%	0.5	0.6	11.1%	0.6	11.1%	12hr	30min	30min	12hr	2hr	2hr
Dummy28	10.1	19.8	95.4%	19.8	95.4%	44.9	50.6	12.7%	50.6	12.7%	12hr	1hr	1hr	9hr	2hr	2hr
Dummy33	12.8	20.0	56.9%	20.0	56.9%	56.3	60.1	6.9%	60.1	6.9%	12hr	1hr	1hr	9hr	9hr	9hr
SE5	0.6	0.7	16.5%	0.7	16.5%	2.8	2.9	3.3%	2.9	3.3%	12hr	30min	30min	12hr	12hr	12hr
SE1	0.6	2.3	284.1%	2.3	284.1%	1.7	4.7	168.7%	4.7	168.7%	30min	30min	30min	12hr	2hr	2hr
SE2	1.0	6.6	557.3%	6.6	557.3%	4.8	13.8	189.8%	13.8	189.8%	12hr	30min	30min	12hr	2hr	2hr
SE3	1.3	1.3	0.0%	1.3	0.0%	6.3	6.3	0.0%	6.3	0.0%	12hr	12hr	12hr	9hr	9hr	9hr
SE6a	1.7	1.7	0.7%	1.7	0.7%	7.9	7.8	-1.5%	7.8	-1.5%	12hr	12hr	12hr	9hr	9hr	9hr
Dummy58	3.0	9.2	209.7%	9.2	209.7%	13.9	19.8	42.6%	19.8	42.6%	12hr	30min	30min	9hr	2hr	2hr
SE6b	3.9	10.6	171.6%	10.6	171.6%	18.5	23.4	26.8%	23.4	26.8%	12hr	30min	30min	9hr	2hr	2hr
SE_out	3.9	10.6	171.6%	10.6	171.6%	18.5	23.4	26.8%	23.4	26.8%	12hr	30min	30min	9hr	2hr	2hr
33.01a	0.4	1.1	150.1%	1.1	150.1%	2.1	2.3	8.1%	2.3	8.1%	12hr	30min	30min	12hr	2hr	2hr
33.01b	0.6	1.1	103.8%	1.1	103.8%	2.7	2.9	6.0%	2.9	6.0%	12hr	30min	30min	12hr	12hr	12hr
32.01	0.4	2.4	559.3%	2.4	559.3%	1.8	4.9	181.3%	4.9	181.3%	12hr	30min	30min	12hr	2hr	2hr
32.02	1.1	6.0	431.3%	6.0	431.3%	5.7	13.4	135.0%	13.4	135.0%	12hr	1hr	1hr	9hr	1hr	1hr
1.26	0.4	0.4	0.0%	0.4	0.0%	2.3	2.3	0.0%	2.3	0.0%	12hr	12hr	12hr	9hr	9hr	9hr
31.03	0.3	1.3	391.1%	1.3	391.1%	1.5	2.8	91.9%	2.8	91.9%	18hr	30min	30min	9hr	30min	30min
30.01	0.5	0.5	0.0%	4.1	675.2%	2.5	2.5	0.0%	8.4	234.2%	12hr	12hr	30min	9hr	9hr	30min
30.02	1.3	1.3	0.0%	9.9	660.6%	6.3	6.3	0.0%	21.2	239.1%	12hr	12hr	30min	9hr	9hr	30min
1.25b	1.4	1.4	0.0%	10.6	638.9%	7.0	7.0	0.0%	22.7	225.2%	12hr	12hr	30min	9hr	9hr	30min
1.25a	0.2	0.9	315.6%	0.9	315.6%	1.2	1.9	63.5%	1.9	63.5%	18hr	30min	30min	9hr	30min	30min
31.01b	0.1	0.7	498.5%	0.7	498.5%	0.5	1.4	164.6%	1.4	164.6%	12hr	30min	30min	12hr	2hr	2hr
31.01a	0.2	1.5	545.6%	1.5	545.6%	1.1	3.1	178.3%	3.1	178.3%	12hr	30min	30min	12hr	2hr	2hr
Dummy55	0.3	2.1	540.3%	2.1	540.3%	1.6	4.5	172.2%	4.5	172.2%	12hr	30min	30min	12hr	2hr	2hr
31.02	0.7	3.5	417.8%	3.5	417.8%	3.3	7.6	130.8%	7.6	130.8%	12hr	1hr	1hr	9hr	1hr	1hr
25.06a	0.3	2.5	752.5%	2.5	752.5%	1.5	5.2	260.7%	5.2	260.7%	12hr	30min	30min	9hr	30min	30min
25.06b	0.4	2.9	568.4%	2.9	568.4%	2.1	6.2	190.2%	6.2	190.2%	12hr	30min	30min	9hr	2hr	2hr
25.06c	0.1	0.5	316.1%	0.5	316.1%	0.6	1.0	78.9%	1.0	78.9%	12hr	30min	30min	12hr	2hr	2hr
25.03c	0.2	1.3	584.4%	1.3	584.4%	0.9	2.6	195.8%	2.6	195.8%	12hr	30min	30min	9hr	30min	30min
25.03b	0.1	0.4	229.8%	0.4	229.8%	0.6	0.9	43.7%	0.9	43.7%	12hr	30min	30min	12hr	2hr	2hr
25.01	0.4	0.4	11.5%	0.4	11.5%	1.8	1.9	2.5%	1.9	2.5%	12hr	30min	30min	9hr	12hr	12hr
27.01	0.7	2.9	296.1%	2.9	296.1%	3.5	6.0	70.1%	6.0	70.1%	12hr	30min	30min	9hr	30min	30min
25.03a	0.9	3.5	309.3%	3.5	309.3%	4.1	7.4	79.1%	7.4	79.1%	12hr	30min	30min	9hr	2hr	2hr
26.01a	0.3	2.6	665.3%	2.6	665.3%	1.6	5.3	226.9%	5.3	226.9%	12hr	30min	30min	9hr	30min	30min
26.01b	0.4	0.4	0.0%	0.4	0.0%	1.9	1.9	0.0%	1.9	0.0%	12hr	12hr	12hr	9hr	9hr	9hr
Dummy47	0.7	2.7	275.8%	2.7	275.8%	3.5	5.6	60.4%	5.6	60.4%	12hr	30min	30min	9hr	2hr	2hr
25.02	1.2	5.7	355.6%	5.7	355.6%	6.0	12.5	106.8%	12.5	106.8%	12hr	30min	30min	9hr	30min	30min
Dummy48	2.1	9.2	336.8%	9.2	336.8%	10.1	19.8	95.2%	19.8	95.2%	12hr	30min	30min	9hr	30min	30min
Dummy22	2.4	9.7	306.0%	9.7	306.0%	11.5	21.1	82.8%	21.1	82.8%	12hr	30min	30min	9hr	30min	30min
25.04b	0.2	1.5	566.7%	1.5	566.7%	1.1	3.1	182.7%	3.1	182.7%	12hr	30min	30min	9hr	30min	30min
25.04a	0.3	2.5	728.5%	2.5	728.5%	1.5	5.2	247.0%	5.2	247.0%	12hr	30min	30min	9hr	30min	30min
Dummy23	2.9	10.8	272.1%	10.8	272.1%	14.0	24.0	70.7%	24.0	70.7%	12hr	30min	30min	9hr	30min	30min
25.05a	0.2	1.6	681.3%	1.6	681.3%	1.0	3.3	229.1%	3.3	229.1%	12hr	30min	30min	9hr	30min	30min
25.05b	0.1	0.6	337.7%	0.6	337.7%	0.7	1.3	90.4%	1.3	90.4%	12hr	30min	30min	9hr	2hr	2hr
28.01	0.7	5.8	712.0%	5.8	712.0%	3.4	12.1	250.5%	12.1	250.5%	12hr	30min	30min	9hr	30min	30min
28.02	1.2	7.1	482.9%	7.1	482.9%	5.9	15.6	162.7%	15.6	162.7%	12hr	30min	30min	9hr	1hr	1hr
Dummy24	4.4	16.6	276.4%	16.6	276.4%	21.4	37.3	74.6%	37.3	74.6%	12hr	1hr	1hr	9hr	1hr	1hr
Dummy25	4.9	17.7	260.8%	17.7	260.8%	23.7	40.1	69.4%	40.1	69.4%	12hr	1hr	1hr	9hr	1hr	1hr
25.07b	0.2	0.4	155.2%	0.4	155.2%	0.8	0.9	12.0%	0.9	12.0%	12hr	30min	30min	12hr	2hr	2hr
29.01	0.8	7.2	751.2%	7.2	751.2%	4.0	14.9	270.1%	14.9	270.1%	12hr	30min	30min	9hr	30min	30min
29.02	1.4	8.5	506.4%	8.5	506.4%	6.9	18.3	166.1%	18.3	166.1%	12hr	30min	30min	9hr	30min	30min
25.07a	0.2	1.4	539.7%	1.4	539.7%	1.0	2.8	174.3%	2.8	174.3%	12hr	30min	30min	12hr	30min	30min
Dummy26	6.7	22.3	235.0%	22.3	235.0%	31.9	52.0	63.1%	52.0	63.1%	12hr	2hr	2hr	9hr	2hr	2hr
1.22b	0.1	1.2	735.1%	1.2	735.1%	0.8	2.8	234.1%	2.8	234.1%	30min	30min	30min	12hr	30min	30min
1.20a	0.2	0.2	0.1%	0.2	0.1%	0.8	0.8	0.1%	0.8	0.1%	12hr	12hr	12hr	9hr	9hr	9hr
1.20b	0.1	0.2	108.7%	0.2	108.7%	0.6	0.6	10.0%	0.6	10.0%	12hr	30min	30min	12hr	12hr	12hr
1.21	0.8	0.8	0.0%	7.0	786.0%	3.9	3.9	0.0%	15.0	287.5%	12hr	12hr	30min	9hr	9hr	30min
24.01	0.5	0.5	0.0%	4.3	730.3%	2.5	2.5	0.0%	9.0	259.3%	12hr	12hr	30min	9hr	9hr	30min
24.02	1.2	1.2	0.0%	8.1	584.6%	5.8	5.8	0.0%	18.2	211.3%	12hr	12hr	1hr	9hr	9hr	1hr
24.03	1.8	1.8	0.0%	10.0	462.1%	8.7	8.7	0.0%	22.6	158.0%	12hr	12hr	1hr	9hr	9hr	1hr
24.04	2.2	2.2	0.0%	10.7	391.3%	10.6	10.6	0.0%	24.6	131.1%	12hr	12hr	1hr	9hr	9hr	1hr
24.05	2.7	2.7	0.0%	11.4	320.2%	13.1	13.1	0.0%	26.6	102.5%	12hr	12hr	1hr	9hr	9hr	1hr
24.06	3.2	3.2	0.0%	11.9	270.6%	15.7	15.7	0.0%	28.3	80.6%	12hr	12hr	1hr	9hr	9hr	2hr
17.14b	0.3	0.3	0.0%	2.5	661.3%	1.6	1.6	0.0%	5.1	229.1%	12hr	12hr	30min	9hr	9hr	30min
17.14a	0.6	3.2	431.9%	3.2	431.9%	2.9	6.6	132.0%	6.6	132.0%	12hr	30min	30min	9hr	30min	30min
17.13	0.3	0.3	0.0%	3.0	920.0%	1.5	1.5	0.0%	6.3	309.5%	12hr	12hr	30min	9hr	9hr	30min
23.01	0.3	0.3	0.0%	3.1	836.1%	1.7	1.7	-0.1%	6.6	284.6%	12hr	12hr	30min	9hr	9hr	30min
20.01	0.6	0.6	0.0%	4.6	674.8%	2.8	2.8	0.0%	9.5	235.7%	12hr	12hr	30min	9hr	9hr	30min
17.10a	0.3	0.3	0.0%	2.2	749.8%	1.3	1.3	0.0%	4.7	260.6%	12hr	12hr	30min	9hr	9hr	30min
17.10b	0.4	0.4	0.0%	3.3	805.1%	1.9	1.9	0.0%	7.2	278.4%	12hr	12hr	30min	9hr	9hr	30min
17.09	0.5	0.5	0.0%	4.7	937.0%	2.4	2.4	0.0%	10.1	319.1%	18hr	18hr	30min	9hr	9hr	30min
17.08c	0.4	1.5	318.7%	1.5	318.7%	1.7	3.0	78.2%	3.0	78.2%	12hr	30min	30min	9hr	30min	30min
17.08d	0.0	0.0	-0.4%	0.2	562.1%	0.1	0.1	-0.2%	0.4	175.1%	12hr	12hr	30min	12hr	12hr	2hr
18.01	0.8	0.8	0.0%	6.1	687.9%	3.7	3.7	0.0%	12.6	244.5%	12hr	12hr	30min	9hr	9hr	30min
18.02	1.2	1.2	0.0%	8.9	632.5%	5.8	5.8	0.0%	18.6	221.6%	12hr	12hr	30min	9hr	9hr	30min
17.08b	0.2	0.2	0.0%	1.7	627.1%	1.1	1.1	0.0%	3.6	215.1%	12hr	12hr	30min	9hr	9hr	30min
17.08a	0.4	0.4	0.0%	2.8	668.0%	1.8	1.8	0.0%	5.9	229.9%	12hr	12hr	30min	9hr	9hr	30min
17.01	0.5	0.5	0.0%	3.5	640.3%	2.3	2.3	0.0%	7.2	218.1%	12hr	12hr	30min	12hr	12hr	2hr
17.02	1.3	1.3	0.0%	9.7	629.5%	6.4	6.4	0.0%	20.9	227.8%	12hr	12hr	30min	9hr	9hr	30min
17.03	2.7	2.7	0.0%	16.2	501.8%	13.5	13.5	0.0%	37.9	180.7%	12hr	12hr	1hr	9hr	9hr	1hr
17.04	4.0	4.0	0.0%	23.6	493.9%	20.1	20.1	0.0%	54.0	169.0%	12hr	12hr	2hr	9hr	9hr	2hr
17.06	5.1	5.1	0.0%	26.6	421.3%	26.0	26.0	0.0%	60.6	133.1%	12hr	12hr	2hr	9hr	9hr	2hr
17.07	6.0	6.0	0.0%	28.3	375.1%	30.3	30.3	0.0%	65.4	116.1%	12hr	12hr	2hr	9hr	9hr	2hr
Dummy18	7.5	7.5	0.0%	31.1	311.7%	37.5	37.5	0.0%	73.4	95.8%	12hr	12hr	2hr	9hr	9hr	2hr
Dummy19	7.9	7.8	-0.9%	31.3	298.6%	39.0	38.7	-0.6%	74.6	91.5%	12hr	12hr	2hr	9hr	9hr	2hr
Dummy36	8.3	8.2	-0.8%	32.3	289.3%	41.3	41.1	-0.6%	76.9	86.0%	12hr	12hr	2hr	9hr	9hr	2hr
21.01	0.7	6.5	852.6%	6.5	852.6%	3.5	14.1	303.5%	14.1	303.5%	18hr	30min	30min	9hr	30min	30min
Dummy37	8.9	8.8	-1.1%	33.9	279.5%	44.8	44.0	-1.7%	80.5	79.7%	12hr	18hr	2hr	9hr	9hr	2hr
Dummy20	10.0	9.9	-1.4%	35.9	258.4%	50.0	49.2	-1.5%	86.2	72.4%	12hr	18hr	2hr	9hr	9hr	2hr
22.01	0.8	0.8	0.0%	7.8	888.1%	4.0	4.0	0.0%	16.5	312.6%	12hr	12hr	30min	9hr	9hr	30min
17.11	0.2	1.5	545.1%	1.5	545.1%	1.2	3.1	163.6%	3.1	163.6%	12hr	30min	30min	9hr	30min	30min

Node	2 yr ARI Peak Flow (m3/s)					100 yr ARI Peak Flow (m3/s)					2 yr ARI Critical Duration			100 yr ARI Critical Duration		
	Existing	DevA	Diff	DevB	Diff	Existing	DevA	Diff	DevB	Diff	Existing	DevA	DevB	Existing	DevA	DevB
	(a)	(b)	(b)-(a)	(c)	(c) - (a)	(a)	(b)	(b)-(a)	(c)	(c) - (a)						
Dummy34	11.0	10.8	-1.2%	37.3	239.4%	54.8	53.8	-1.7%	90.5	65.2%	12hr	18hr	2hr	9hr	9hr	2hr
17.12	0.5	3.9	668.9%	3.9	668.9%	2.5	8.3	229.1%	8.3	229.1%	12hr	30min	30min	9hr	30min	30min
Dummy54	11.4	11.3	-1.5%	37.9	231.8%	57.0	55.6	-2.5%	92.7	62.7%	12hr	18hr	2hr	9hr	9hr	2hr
Dummy38	11.7	11.6	-1.4%	38.4	227.1%	58.5	57.1	-2.4%	94.3	61.2%	12hr	18hr	2hr	9hr	9hr	2hr
Dummy35	12.0	11.8	-1.4%	38.7	222.5%	59.9	58.4	-2.4%	95.4	59.4%	12hr	18hr	2hr	9hr	9hr	2hr
Dummy21	12.7	12.5	-1.7%	39.2	208.0%	62.9	60.9	-3.1%	97.8	55.5%	12hr	18hr	2hr	9hr	9hr	2hr
17.15a	0.3	2.3	571.4%	2.3	571.4%	1.7	4.9	186.7%	4.9	186.7%	12hr	30min	30min	9hr	30min	30min
Dummy39	13.0	12.7	-2.3%	39.4	203.1%	64.0	61.8	-3.5%	98.9	54.6%	12hr	18hr	2hr	9hr	9hr	2hr
SU3	0.3	0.3	0.0%	3.3	880.5%	1.8	1.8	0.0%	7.1	299.0%	12hr	12hr	30min	9hr	9hr	30min
Dummy40	16.1	15.9	-1.5%	43.9	171.9%	79.4	77.4	-2.5%	113.4	42.9%	12hr	18hr	2hr	9hr	9hr	2hr
17.15b	0.2	0.8	335.3%	0.8	335.3%	0.9	1.7	89.4%	1.7	89.4%	12hr	30min	30min	9hr	2hr	2hr
Dummy41	16.3	16.0	-1.5%	43.9	170.4%	79.9	77.8	-2.6%	113.9	42.7%	12hr	18hr	2hr	9hr	9hr	2hr
17.16	16.9	16.6	-1.3%	44.4	163.6%	82.8	80.8	-2.5%	115.9	39.9%	12hr	18hr	2hr	9hr	9hr	2hr
1.18	0.3	2.9	738.8%	2.9	738.8%	1.9	6.5	249.8%	6.5	249.8%	18hr	30min	30min	9hr	30min	30min
16.01	0.2	1.6	609.5%	1.6	609.5%	1.1	3.2	201.4%	3.2	201.4%	12hr	30min	30min	12hr	30min	30min
15.02	0.6	2.3	293.4%	2.3	293.4%	3.2	5.2	62.1%	5.2	62.1%	12hr	1hr	1hr	9hr	1hr	1hr
15.01	0.5	3.2	588.8%	3.2	588.8%	2.4	6.9	191.1%	6.9	191.1%	12hr	30min	30min	9hr	30min	30min
14.01	0.8	6.2	638.4%	6.2	638.4%	4.0	12.9	226.6%	12.9	226.6%	12hr	30min	30min	9hr	30min	30min
1.17a	1.3	7.2	454.0%	7.2	454.0%	6.2	15.5	149.4%	15.5	149.4%	12hr	30min	30min	9hr	2hr	2hr
1.17b	0.3	0.4	38.5%	0.4	38.5%	1.2	1.3	6.2%	1.3	6.2%	12hr	30min	30min	9hr	12hr	12hr
1.16	0.5	3.6	553.0%	3.6	553.0%	2.7	7.4	178.1%	7.4	178.1%	12hr	30min	30min	12hr	30min	30min
1.14	0.1	0.9	731.1%	0.9	731.1%	0.7	2.1	203.5%	2.1	203.5%	18hr	2hr	2hr	12hr	2hr	2hr
12.02b	0.1	0.1	0.0%	0.1	0.0%	0.3	0.3	0.0%	0.3	0.0%	12hr	12hr	12hr	12hr	12hr	12hr
12.02a	0.3	1.7	477.7%	1.7	477.7%	1.4	3.5	147.8%	3.5	147.8%	12hr	30min	30min	9hr	30min	30min
11.01	0.5	3.2	578.5%	3.2	578.5%	2.3	6.7	189.4%	6.7	189.4%	12hr	30min	30min	12hr	2hr	2hr
10.01	0.5	3.4	553.4%	3.4	553.4%	2.5	7.2	182.7%	7.2	182.7%	12hr	30min	30min	12hr	2hr	2hr
10.02a	1.0	5.6	475.4%	5.6	475.4%	4.6	11.9	159.7%	11.9	159.7%	12hr	30min	30min	12hr	30min	30min
1.13b	0.4	1.6	284.5%	1.6	284.5%	2.1	3.4	62.6%	3.4	62.6%	12hr	30min	30min	9hr	30min	30min
1.13a	0.3	1.8	458.3%	1.8	458.3%	1.6	3.7	137.5%	3.7	137.5%	12hr	30min	30min	9hr	30min	30min
1.12a	0.5	3.6	634.0%	3.6	634.0%	2.4	7.5	210.8%	7.5	210.8%	12hr	30min	30min	12hr	30min	30min
5.01	0.2	0.2	0.0%	0.2	0.0%	1.3	1.3	0.0%	1.3	0.0%	12hr	12hr	12hr	9hr	9hr	9hr
1.11a	0.2	1.3	519.2%	1.3	519.2%	1.0	2.7	164.2%	2.7	164.2%	12hr	30min	30min	12hr	2hr	2hr
1.11b	0.4	2.2	415.6%	2.2	415.6%	2.1	4.5	113.4%	4.5	113.4%	12hr	30min	30min	12hr	30min	30min
1.09b	0.2	0.9	493.2%	0.9	493.2%	0.7	1.9	162.7%	1.9	162.7%	12hr	30min	30min	12hr	2hr	2hr
1.09c	0.4	2.0	473.8%	2.0	473.8%	1.7	4.2	141.5%	4.2	141.5%	12hr	30min	30min	12hr	30min	30min
4.01	0.3	2.5	696.9%	2.5	696.9%	1.5	5.2	243.8%	5.2	243.8%	12hr	30min	30min	12hr	2hr	2hr
4.02	0.9	7.0	718.1%	7.0	718.1%	4.1	14.7	259.6%	14.7	259.6%	12hr	30min	30min	12hr	30min	30min
1.06a	0.7	4.1	465.6%	4.1	465.6%	3.5	8.6	147.6%	8.6	147.6%	12hr	30min	30min	9hr	30min	30min
1.01	1.8	1.8	0.0%	16.2	795.5%	9.3	9.3	0.0%	36.7	293.5%	12hr	12hr	30min	9hr	9hr	30min
1.02	3.3	3.3	0.0%	20.2	520.6%	16.3	16.3	0.0%	46.5	186.2%	12hr	12hr	30min	9hr	9hr	30min
2.01	2.6	2.6	0.0%	24.1	825.1%	13.6	13.6	0.0%	56.2	313.6%	18hr	18hr	30min	9hr	9hr	30min
1.03	6.1	6.1	0.0%	41.3	575.7%	31.7	31.7	0.0%	96.0	202.6%	12hr	12hr	2hr	9hr	9hr	2hr
1.04	7.1	7.1	0.0%	43.2	505.6%	36.4	36.4	0.0%	100.8	176.9%	12hr	12hr	2hr	9hr	9hr	2hr
1.05	8.7	8.7	0.0%	46.1	431.1%	43.8	43.8	0.0%	108.8	148.5%	12hr	12hr	2hr	9hr	9hr	2hr
1.06b	9.8	9.8	0.0%	48.2	393.2%	48.9	48.9	0.0%	115.0	134.9%	12hr	12hr	2hr	9hr	9hr	2hr
Dummy1	10.4	10.2	-1.8%	49.0	370.9%	52.1	51.4	-1.2%	118.0	126.6%	12hr	12hr	2hr	9hr	9hr	2hr
1.07a	0.3	1.3	311.4%	1.3	311.4%	1.6	2.8	76.0%	2.8	76.0%	12hr	30min	30min	9hr	30min	30min
1.07b	0.8	0.8	1.4%	0.8	1.4%	3.9	4.0	2.2%	4.0	2.2%	12hr	12hr	12hr	9hr	9hr	9hr
Dummy2	11.4	11.2	-2.3%	49.4	332.8%	56.9	56.1	-1.5%	121.1	112.9%	12hr	12hr	2hr	9hr	9hr	2hr
1.08a	0.4	3.0	726.9%	3.0	726.9%	1.8	6.3	256.5%	6.3	256.5%	12hr	30min	30min	9hr	30min	30min
1.08b	0.5	2.7	425.6%	2.7	425.6%	2.5	5.7	127.2%	5.7	127.2%	12hr	30min	30min	9hr	30min	30min
Dummy3	12.1	11.6	-3.5%	50.1	315.8%	59.9	58.3	-2.7%	124.4	107.8%	12hr	12hr	2hr	9hr	9hr	2hr
3.01	0.4	3.5	727.8%	3.5	727.8%	2.1	7.3	250.8%	7.3	250.8%	12hr	30min	30min	12hr	2hr	2hr
1.09a	0.5	3.8	593.5%	3.8	593.5%	2.6	8.5	221.7%	8.5	221.7%	12hr	30min	30min	12hr	2hr	2hr
Dummy60	12.4	11.9	-3.9%	50.8	310.3%	61.4	59.3	-3.4%	126.4	106.0%	12hr	18hr	2hr	9hr	9hr	2hr
Dummy4	13.2	15.1	14.4%	51.5	289.2%	65.1	62.1	-4.6%	129.3	98.7%	12hr	2hr	2hr	9hr	9hr	2hr
SU2	0.5	1.0	90.2%	1.0	90.2%	2.4	3.1	29.5%	3.1	29.5%	12hr	2hr	2hr	9hr	2hr	2hr
1.10b	0.7	1.7	125.8%	1.7	125.8%	3.5	4.3	21.1%	4.3	21.1%	12hr	30min	30min	9hr	12hr	12hr
Dummy42	13.8	16.4	18.8%	52.5	279.5%	67.5	64.2	-5.0%	132.3	95.9%	12hr	2hr	2hr	9hr	9hr	2hr
1.10a	14.0	17.0	20.9%	52.6	275.2%	68.3	64.8	-5.1%	133.0	94.8%	12hr	2hr	2hr	9hr	9hr	2hr
Dummy6	14.4	18.0	24.6%	52.8	266.0%	69.8	66.0	-5.6%	134.7	92.9%	12hr	1hr	2hr	9hr	9hr	2hr
1.12c	0.4	2.6	615.5%	2.6	615.5%	1.8	5.4	200.9%	5.4	200.9%	12hr	30min	30min	12hr	30min	30min
1.12b	15.8	20.6	30.2%	53.6	238.9%	75.3	69.9	-7.1%	139.1	84.9%	12hr	1hr	2hr	9hr	9hr	2hr
Dummy7	16.3	20.7	26.7%	53.6	228.2%	77.2	71.3	-7.6%	140.3	81.8%	12hr	1hr	2hr	9hr	9hr	2hr
10.02b	0.1	0.1	0.2%	0.1	0.2%	0.4	0.4	0.2%	0.4	0.2%	12hr	12hr	12hr	12hr	12hr	12hr
7.07a	0.2	0.6	186.7%	0.6	186.7%	0.9	1.2	27.9%	1.2	27.9%	12hr	30min	30min	12hr	2hr	2hr
7.01	0.5	0.5	0.0%	7.0	1402.2%	2.2	2.2	0.0%	14.5	551.2%	12hr	12hr	30min	9hr	9hr	30min
7.02	1.6	1.6	0.0%	3.5	125.4%	7.6	7.6	0.0%	7.2	-4.3%	12hr	12hr	30min	9hr	9hr	2hr
7.03	2.8	2.8	0.0%	10.6	277.9%	13.4	13.4	0.0%	23.3	73.6%	12hr	12hr	1hr	9hr	9hr	1hr
7.04	3.4	3.4	0.0%	15.6	353.5%	16.7	16.7	0.0%	35.0	110.2%	12hr	12hr	1hr	9hr	9hr	1hr
7.05	4.5	4.5	0.0%	18.5	308.4%	22.0	22.0	0.0%	41.0	86.6%	12hr	12hr	1hr	9hr	9hr	1hr
7.06	5.0	5.0	0.0%	21.3	323.1%	24.7	24.7	0.0%	47.6	92.4%	12hr	12hr	1hr	9hr	9hr	1hr
8.01	0.8	7.0	721.3%	22.4	2543.2%	4.1	14.5	255.6%	50.3	1131.3%	12hr	30min	1hr	9hr	30min	1hr
7.07b	6.1	7.7	26.4%	23.9	292.6%	29.9	28.9	-3.2%	54.6	82.9%	12hr	30min	1hr	9hr	9hr	1hr
Dummy12	6.2	7.9	25.7%	23.9	283.1%	30.6	29.5	-3.4%	55.0	80.0%	12hr	30min	1hr	9hr	9hr	1hr
7.08b	0.4	3.6	867.1%	3.6	867.1%	1.8	7.5	308.0%	7.5	308.0%	12hr	30min	30min	9hr	30min	30min
7.08a	0.2	0.9	333.4%	0.9	333.4%	1.0	2.0	89.7%	2.0	89.7%	12hr	30min	30min	9hr	2hr	2hr
7.09a	0.4	2.9	717.6%	2.9	717.6%	1.7	6.0	248.3%	6.0	248.3%	12hr	30min	30min	9hr	30min	30min
Dummy11	7.1	11.2	58.8%	24.7	249.0%	34.5	32.4	-6.2%	57.8	67.5%	12hr	1hr	1hr	9hr	9hr	2hr
7.09c	0.4	4.4	908.5%	4.4	908.5%	2.1	9.1	329.0%	9.1	329.0%	12hr	30min	30min	9hr	30min	30min
7.09b	0.1	0.3	172.9%	0.3	172.9%	0.5	0.6	18.3%	0.6	18.3%	12hr	30min	30min	12hr	2hr	2hr
Dummy43	7.5	13.6	80.5%	25.0	232.0%	36.7	33.8	-7.7%	60.0	63.6%	12hr	1hr	1hr	9hr	9hr	2hr
7.10a	0.2	2.7	970.1%	2.7	970.1%	1.3	5.7	328.6%	5.7	328.6%	18hr	30min	30min	9hr	30min	30min
7.10b	0.2	2.0	877.5%	2.0	877.5%	1.1	4.3	295.3%	4.3	295.3%	12hr	30min	30min	9hr	30min	30min
Dummy9	8.0	15.2	90.1%	26.0	225.5%	39.0	35.6	-8.8%	62.9	61.5%	12hr	1hr	2hr	9hr	9hr	2hr
9.01	0.3	2.3	585.5%	2.3	585.5%	1.7	4.9	192.9%	4.9	192.9%	12hr	30min	30min	12hr	2hr	2hr
9.02b	0.6	3.7	519.0%	3.7	519.0%	2.8	7.8	176.5%	7.8	176.5%	12hr	30min	30min	12hr	2hr	2hr
9.02a	0.5	3.8	722.8%	3.8	722.8%	2.2	7.9	251.3%	7.9	251.3%	12hr	30min	30min	9hr	30min	30min
Dummy59	1.1	7.5	609.0%	7.5	609.0%	5.1	15.7	208.9%	15.7	208.9%	12hr	30min	30min	9hr	30min	30min
Dummy8	8.8	17.1	93.5%	27.3	209.6%	42.6	38.8	-8.8%	67.1	57.7%	12hr	1hr	2hr	9hr	12hr	2hr
7.12	0.6	4.8	720.1%	4.8	720.1%	3.0	10.3	241.1%	10.3	241.1%	18hr	30min	30min	9hr	30min	30min
7.11a	0.3	2.5	633.1%	2.5	633.1%	1.6	5.2	213.5%	5.2	213.5%	12hr	30min	30min	12hr	2hr	2hr
7.11b	0.4	3.2	610.1%	3.2	610.1%	2.2	6.6	199.6%	6.6	199.6%	12hr	30min	30min	12hr	2hr	2hr
Dummy10	9.7	18.5	90.8%	28.5	194.3%	46.8	43.5	-7.1%	71.3	52.3%	12hr	1hr	2hr	9hr	2hr	2hr
12.01a	10.0	18.9	88.5%	28.8	187.7%	48.3	45.2	-6.6%	72.7	50.5%	12hr	2hr	2hr	9hr	9hr	2hr
Dummy13	26.8	38.1	41.9%	63.9	137.9%	125.9	113.5	-9.8%	177.5	41.0%	12hr	2hr	2hr	9hr	9hr	2hr
12.01b	0.2	0.3	44.2%	0.3	44.2%	1.0	1.0	5.4%	1.0	5.4%	12hr	30min	30min	12hr	12hr	12hr
Dummy44	26.9	38.1	41.6%	63.9	137.1%	126.3	113.9	-9.8%	177.8	40.8%	12hr	2hr	2hr	9hr	9hr	2hr
Dummy14	27.5	39.0	42.0%	63.9	132.4%	128.6	115.8	-9.9%	178.5	38.8%	12hr	2hr	2hr	9hr	9hr	2hr
1.15	0.8	4.0	436.6%	4.0	436.6%	3.6	8.4	135.3%	8.4	135.3%	12hr	30min	30min	9hr	30min	30min
Dummy45	27.9	39.4	41.1%	63.9	129.0%	130.3	117.1	-10.2%	179.1	37.5%	12hr	2hr	2hr	9hr	9hr	2hr
Dummy15	29.1	40.5	39.1%	63.9	119.4%	135.3	122.4	-9.5%	180.6	33.5%	12hr	2hr	2hr	9hr	12hr	2hr
Dummy46	29.5	40.8	38.3%	63.9	116.8%	136.8	124.0	-9.4%	181.1	32.4%	12hr	2hr	2hr	9hr	12hr	2hr
Dummy16	30.2	41.2	36.5%	63.9	111.7%	140.3	127.9	-8.8%	182.3	30.0%	12hr	2hr	2hr	9hr	12hr	2hr
Dummy17	47.0	46.7	-0.6%	91.2	94.1%	218.9	209.0	-4.5%	254.2	16.1%	12hr	18hr	2hr	9hr	9hr	3hr
1.22a	0.3	1.5	344.7%	1.5	344.7%	1.4	3.6	153.1%	3.6	153.1%	30min	1hr	1hr	12hr	30min	30min
1.23	0.3	0.3	0.0%	3.0	882.4%	1.6	1.6	0.0%	6.3	301.5%	12hr	12hr	30min	9hr	9hr	30min
Dummy27	52.2	52.1	-0.3%	94.8	81.5%	240.8	230.6	-4.2%	276.6	14.9%	18hr	18hr	4.5hr	9hr	9hr	4.5hr
1.24	0.2	0.2	0.0%	2.5	1036.2%	1.2	1.2	0.1%	5.6	372.7%	18hr	18hr	30min	12hr	12hr	30min
Dummy49	52.4	52.3	-0.2%	95.0	81.2%	241.6	231.6	-4.1%	277.5	14.9%	18hr	18hr	4.5hr	9hr	9hr	4.5hr
Dummy50	52.9	52.8	-0.2%	95.5	80.5%	243.1	233.1	-4.1%	279.3	14.9%	18hr	18hr	4.5hr	9hr	9hr	4.5hr
Dummy51	53.6	53.7	0.1%	96.3	79.7%	245.3	236.1	-3.7%	281.4	14.7%	18hr	18hr	4.5hr	9hr	9hr	4.5hr
Dummy52	53.8	53.9	0.1%	96.4	79.1%	245.9	236.8	-3.7%	282.1	14.7%	18hr	18hr	4.5hr	9hr	9hr	4.5hr
Dummy53	54.7	54.8	0.1%	96.9	77.1%	248.7	239.9	-3.5%	285.9	15.0%	18hr	18hr	4.5hr	9hr	9hr	6hr
1.27	55.7	55.9	0.3%	97.3	74.6%	251.9	244.1	-3.1%	291.1	15.6%	18hr	18hr	4.5hr	9hr	9hr	6hr
E18	0.9	0.9	0.0%	0.9	0.0%	3.7	3.7	0.0%	3.7	0.0%	30min	30min	30min	12hr	12hr	12hr
1.28	56.4	56.7	0.5%	97.8	73.3%	253.5	246.4	-2.8%	294.6	16.2%	18hr	18hr	4.5hr	9hr	9hr	6hr
Out	60.4	61.0	1.0%	106.3	75.8%	271.5	269.6	-0.7%	319.5	17.7%	18hr	18hr	6hr	12hr	12hr	6hr

Table C.15 Properties of Regional Basins located with the Austral and Leppington North Precincts

Basin ID	Basin Node	Catchment Area (ha)	Basin Area (m2)	Basin / Catchment Area	100 yr ARI Ave Basin Depth (m)	Indicative Unit Vol (m3/ha)	2yr ARI Outlet Width (m)	100yr ARI Total Outlet Width (m)
1	8.01	46.54	15,231	3.3%	1.51	494	0.81	2.36
2	7.07a	8.65	846	1.0%	1.35	132	0.49	0.49
3	7.08b	19.24	7,927	4.1%	1.44	593	0.42	1.35
4	7.09a	17.05	5,992	3.5%	1.39	489	0.46	1.24
5	Dummy59	48.91	16,347	3.3%	1.36	455	1.07	3.57
6	7.11a	14.81	5,103	3.4%	1.25	431	0.5	1.36
7	7.09c	21.59	9,844	4.6%	1.37	625	0.5	1.69
8	17.12	29.61	8,505	2.9%	1.51	434	0.61	1.42
9	17.14a	30.93	5,246	1.7%	1.62	275	0.74	1.18
10	17.15a	17.78	4,371	2.5%	1.52	374	0.46	0.98
11	1.17a	65.30	15,491	2.4%	1.62	384	1.14	2.79
12	15.02	43.64	4,690	1.1%	1.69	182	0.71	1.29
13	7.12	41.12	10,847	2.6%	1.61	425	0.64	1.55
14	10.02a	39.27	12,416	3.2%	1.26	398	1.06	3.59
15	1.12a	20.90	7,336	3.5%	1.28	449	0.61	1.99
16	1.12c	15.87	4,608	2.9%	1.45	421	0.45	1.23
17	29.02	77.34	21,966	2.8%	1.61	457	1.16	3.47
18	31.02	31.60	7,266	2.3%	1.48	340	0.71	1.95
19	32.02	73.39	13,927	1.9%	1.72	326	1.03	2.31
20	28.02	63.68	17,901	2.8%	1.59	447	1.04	3.06
21	25.06a	15.06	5,310	3.5%	1.40	495	0.41	1.04
22	25.02	61.89	11,294	1.8%	1.44	263	1.42	2.73
23	25.03a	39.93	5,120	1.3%	1.48	190	1.02	1.85
24								
25	E16a	54.45	13,576	2.5%	1.38	345	1.24	3.73
26								
27	E10	26.11	8,713	3.3%	1.34	445	0.7	1.94
28								
29	E5	110.82	16,614	1.5%	1.40	209	3.28	6.03
30								
31	1.10b	33.95	7,843	2.3%	1.35	312	0.69	3.64
32	SE2	39.51	13,196	3.3%	1.18	393	1.19	4.03
33								
34	1.09a	21.29	8,867	4.2%	1.19	494	0.65	2.89
35	1.06a	36.76	6,992	1.9%	1.60	305	0.83	1.45

Table C.16 Estimated Performance of Regional Basins located within the Precincts in a 2 yr ARI Event under Scenario A development

Basin ID	Basin Name	Existing Peak Flow (m^3/s) (a)	Existing Critical Duration (hr)	Dev A Peak Flow without Basin (m^3/s)	Dev A Critical Duration without Basin (hr)	Dev A Peak Flow with Basin (m^3/s) (b)	Dev A with Basin Critical Duration (hr)	Peak Average Depth (m)	Difference in Peak Flows (m^3/s) (b) - (a)
1	8.01	0.80	12	6.96	0.5	0.88	12	0.77	0.08
2	7.07a	0.20	12	0.57	0.5	0.20	12	0.45	0.00
3	7.08b	0.37	12	3.56	0.5	0.39	12	0.79	0.02
4	7.09a	0.35	12	2.89	0.5	0.36	9 and 12	0.71	0.01
5	Dummy59	1.05	12	7.47	0.5	1.08	9	0.71	0.03
6	7.11a	0.34	12	2.49	0.5	0.35	9	0.65	0.01
7	7.09c	0.43	12	4.37	0.5	0.45	12	0.76	0.02
8	17.12	0.51	12	4.83	0.5	0.54	12	0.73	0.03
9	17.14a	0.59	12	3.16	0.5	0.60	12	0.66	0.01
10	17.15a	0.35	12	2.34	0.5	0.36	12	0.72	0.01
11	1.17a	1.29	12	7.17	0.5	1.32	9	0.77	0.03
12	15.02	0.60	12	2.35	1	0.61	12	0.70	0.01
13	7.12	0.59	18	4.83	0.5	0.65	12	0.78	0.06
14	10.02a	0.97	12	5.57	0.5	1.01	9	0.67	0.04
15	1.12a	0.49	12	3.60	0.5	0.51	9	0.69	0.02
16	1.12c	0.37	12	2.62	0.5	0.38	9	0.76	0.01
17	29.02	1.41	12	8.54	0.5	1.49	12	0.82	0.08
18	31.02	0.67	12	3.47	1	0.69	9	0.75	0.02
19	32.02	1.14	12	6.04	1	1.20	12	0.79	0.06
20	28.02	1.22	12	7.11	0.5	1.27	12	0.81	0.05
21	25.06a	0.30	12	2.52	0.5	0.31	12	0.72	0.01
22	25.02	1.25	12	5.69	0.5	1.27	9	0.63	0.02
23	25.03a	0.85	12	3.50	0.5	0.85	2	0.63	0.00
25	E16a	1.28	12	5.47	1	1.32	9	0.71	0.04
27	E10	0.58	12	4.26	0.5	0.60	9	0.69	0.02
29	E5	2.89	12	10.85	0.5	2.90	2	0.60	0.00
31	1.10b	0.74	12	1.68	0.5	0.78	9	0.82	0.04
32	SE2	1.01	12	6.64	0.5	1.05	9	0.63	0.04
34	1.09a	0.55	12	3.81	0.5	0.58	9	0.70	0.029
35	1.06a	0.72	12	4.08	0.5	0.73	9	0.68	0.005

Table C.17 Estimated Performance of Regional Basins located within the Precincts in a 2 yr ARI Event under Scenario A development

Basin ID	Basin Name	Existing Peak Flow (m^3/s) (a)	Existing Critical Duration (hr)	Dev A Peak Flow without Basin (m^3/s)	Dev A Critical Duration without Basin (hr)	Dev A Peak Flow with Basin (m^3/s) (b)	Dev A with Basin Critical Duration (hr)	Peak Average Depth (m)	Difference in Peak Flows (m^3/s) (b) - (a)
1	8.01	4.09	9	14.53	0.5	4.17	9	1.51	0.08
2	7.07a	0.94	12	1.20	2	0.95	12	1.35	0.01
3	7.08b	1.83	9	7.46	0.5	1.82	9	1.44	-0.01
4	7.09a	1.72	9	5.98	0.5	1.72	12	1.39	0.00
5	Dummy59	5.08	9	15.68	0.5	5.05	12	1.36	-0.03
6	7.11a	1.65	12	5.16	2	1.65	12	1.25	0.00
7	7.09c	2.12	9	9.11	0.5	2.09	12	1.37	-0.03
8	17.12	2.52	9	10.32	0.5	2.60	9	1.51	0.08
9	17.14a	2.87	9	6.65	0.5	2.92	9	1.62	0.05
10	17.15a	1.72	9	4.92	0.5	1.73	12 and 9	1.52	0.01
11	1.17a	6.22	9	15.51	2	6.29	9	1.62	0.07
12	15.02	3.20	9	5.19	1	3.27	9	1.69	0.07
13	7.12	3.03	9	10.32	0.5	3.17	9	1.61	0.14
14	10.02a	4.59	12	11.91	0.5	4.56	12	1.26	-0.03
15	1.12a	2.41	12	7.49	0.5	2.39	12	1.28	-0.02
16	1.12c	1.80	12	5.42	0.5	1.79	12	1.45	-0.01
17	29.02	6.90	9	18.35	0.5	7.04	9	1.61	0.14
18	31.02	3.30	9	7.61	1	3.30	12	1.48	0.00
19	32.02	5.71	9	13.43	1	5.94	9	1.72	0.23
20	28.02	5.92	9	15.56	1	5.99	9	1.59	0.07
21	25.06a	1.45	9	5.24	0.5	1.45	9	1.40	0.00
22	25.02	6.04	9	12.50	0.5	6.09	12	1.44	0.05
23	25.03a	4.11	9	7.37	2	4.13	12	1.48	0.02
25	E16a	6.00	12	11.95	1	5.99	12	1.38	-0.01
27	E10	2.79	12	8.86	0.5	2.78	12	1.34	-0.01
29	E5	13.08	12	22.79	0.5	13.07	12	1.40	-0.02
31	1.10b	3.53	9	4.27	12	3.56	9	1.35	0.03
32	SE2	4.78	12	13.85	2	4.75	12	1.18	-0.03
34	1.09a	2.64	12	8.51	2	2.61	12	1.19	-0.03
35	1.06a	3.46	9	8.56	0.5	3.51	9	1.60	0.05

Table C.18A Estimated 2 yr ARI Peak Flows (m3/s) under Scenario A Development with Precinct Basins Only at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E17b	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy57	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.9	0.8	0.9	12hr
E17c	2.2	2.1	2.1	1.2	1.0	1.0	1.6	2.1	1.9	2.2	30min
E17d	0.4	0.4	0.4	0.2	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E9	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E10	4.3	3.8	3.8	2.3	2.0	1.5	1.3	1.3	0.9	4.3	30min
DumB27	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.6	9hr
E3	5.2	5.0	5.0	2.7	2.4	1.7	1.5	1.6	1.0	5.2	30min
E2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
E1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
Dummy56	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.9	0.7	0.9	12hr
Dummy30	5.4	5.2	5.1	2.9	2.5	1.8	1.8	2.1	1.5	5.4	30min
E5	10.9	9.3	10.2	6.5	5.7	4.2	3.7	3.8	2.6	10.9	30min
DumB29	2.2	2.8	2.9	2.6	2.8	2.6	2.7	2.7	2.4	2.9	2hr
E6a	2.7	2.6	2.6	1.4	1.3	0.9	0.8	0.8	0.5	2.7	30min
E6b	1.6	1.5	1.5	0.8	0.7	0.5	0.5	0.6	0.4	1.6	30min
Dummy31	4.5	4.7	4.8	3.6	3.9	3.5	3.8	3.6	3.2	4.8	2hr
E8a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
E8b	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
E7a	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
E7b	1.6	1.6	1.6	0.9	0.8	0.5	0.7	1.0	0.7	1.6	30min
E8c	1.8	1.8	1.9	1.2	1.0	0.8	1.0	1.2	0.9	1.9	2hr
Dummy32	8.5	8.0	8.9	6.1	5.7	5.1	5.4	5.4	4.7	8.9	2hr
E11a	8.8	8.4	9.2	6.4	6.1	5.3	5.7	5.7	5.0	9.2	2hr
E11b	9.3	9.0	9.8	6.9	6.7	5.9	6.9	7.1	6.2	9.8	2hr
E13	4.9	4.7	4.7	2.5	2.2	1.6	1.4	1.6	1.1	4.9	30min
E12	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E14	2.0	1.9	2.0	1.1	0.9	0.7	0.6	0.6	0.4	2.0	30min
E15b	1.0	0.9	1.0	0.5	0.4	0.3	0.3	0.3	0.2	1.0	30min
E15a	1.1	1.1	1.1	0.6	0.5	0.4	0.3	0.3	0.2	1.1	30min
Dummy29	3.6	3.1	3.3	2.1	1.9	1.4	1.2	1.2	0.8	3.6	30min
E16a	5.2	5.5	5.3	4.0	3.4	2.7	2.4	2.4	1.6	5.5	1hr
DumB25	0.6	0.9	1.0	1.0	1.0	1.1	1.3	1.2	1.1	1.3	9hr
E16b	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy28	10.2	10.5	11.8	8.8	8.8	7.9	9.7	10.1	8.6	11.8	2hr
Dummy33	10.2	10.7	12.2	9.5	9.1	8.5	11.4	12.7	10.9	12.7	12hr
SE5	0.7	0.6	0.6	0.3	0.3	0.3	0.5	0.6	0.5	0.7	30min
SE1	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
SE2	6.6	6.2	6.2	3.5	3.1	2.2	2.0	2.0	1.3	6.6	30min
DumB32	0.5	0.7	0.8	0.8	0.8	0.9	1.1	0.9	0.9	1.1	9hr
SE3	0.3	0.3	0.3	0.1	0.3	0.6	1.0	1.3	1.2	1.3	12hr
SE6a	1.4	1.3	1.2	0.8	0.7	0.7	1.2	1.7	1.6	1.7	12hr
Dummy58	3.7	3.6	3.5	2.3	2.1	1.8	2.4	2.9	2.7	3.7	30min
SE6b	5.4	5.4	5.7	3.7	3.3	2.7	3.2	3.9	3.6	5.7	2hr
SE_out	5.4	5.4	5.7	3.7	3.3	2.7	3.2	3.9	3.6	5.7	2hr
33.01a	1.1	1.0	1.0	0.6	0.5	0.4	0.4	0.5	0.4	1.1	30min
33.01b	1.1	1.1	1.1	0.6	0.5	0.4	0.5	0.6	0.5	1.1	30min
32.01	2.4	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.4	30min
32.02	5.5	6.0	5.3	4.2	3.6	2.7	2.4	2.4	1.6	6.0	1hr
DumB19	0.5	0.7	0.9	0.9	0.9	0.9	1.2	1.2	1.1	1.2	12hr
1.26	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
31.03	1.3	1.2	1.1	0.7	0.7	0.5	0.4	0.4	0.3	1.3	30min
30.01	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.5	0.5	0.5	12hr
30.02	0.7	0.6	0.6	0.4	0.3	0.5	0.9	1.3	1.3	1.3	12hr
1.25b	0.7	0.6	0.6	0.4	0.4	0.6	1.0	1.4	1.4	1.4	12hr
1.25a	0.9	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.9	30min
31.01b	0.7	0.7	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.7	30min
31.01a	1.5	1.4	1.4	0.8	0.7	0.5	0.4	0.4	0.3	1.5	30min
Dummy55	2.1	2.1	2.1	1.1	1.0	0.7	0.6	0.6	0.4	2.1	30min
31.02	2.9	3.5	3.1	2.3	2.0	1.5	1.3	1.3	0.9	3.5	1hr
DumB18	0.3	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.7	9hr
25.06a	2.5	2.3	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
DumB21	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	12hr
25.06b	0.7	0.7	0.7	0.5	0.4	0.4	0.5	0.5	0.4	0.7	30min
25.06c	0.5	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.5	30min
25.03c	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
25.03b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.4	30min
25.01	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.4	30min
27.01	2.9	2.7	2.6	1.6	1.4	1.0	0.9	0.9	0.7	2.9	30min
25.03a	3.5	3.3	3.3	2.1	1.8	1.3	1.2	1.2	0.9	3.5	30min
DumB23	0.6	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	2hr
26.01a	2.6	2.4	2.3	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
26.01b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
Dummy47	2.7	2.5	2.5	1.4	1.3	0.9	0.8	0.9	0.7	2.7	30min
25.02	5.7	5.2	5.1	3.7	3.2	2.3	2.1	2.1	1.4	5.7	30min
DumB22	0.8	1.0	1.1	1.1	1.1	1.1	1.3	1.3	1.2	1.3	9hr
Dummy48	1.4	1.8	2.0	1.8	1.9	1.9	2.1	2.1	1.9	2.1	9hr
Dummy22	1.7	2.0	2.3	2.1	2.1	2.2	2.4	2.4	2.2	2.4	9hr
25.04b	1.5	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min
25.04a	2.5	2.2	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
Dummy23	5.1	4.6	4.6	3.4	3.3	3.1	3.2	3.2	2.8	5.1	30min
25.05a	1.6	1.4	1.4	0.9	0.8	0.6	0.5	0.5	0.3	1.6	30min
25.05b	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.2	0.1	0.6	30min
28.01	5.8	5.3	5.2	3.1	2.8	2.0	1.8	1.8	1.2	5.8	30min
28.02	7.1	6.8	6.5	4.8	4.2	3.3	2.9	2.9	2.0	7.1	30min
DumB20	0.5	0.7	0.9	0.9	0.9	1.0	1.2	1.3	1.2	1.3	12hr
Dummy24	6.1	5.9	5.8	4.5	4.5	4.3	4.8	4.6	4.4	6.1	30min
Dummy25	6.6	6.4	6.3	4.9	5.0	4.7	5.3	5.1	4.9	6.6	30min
25.07b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.4	30min
29.01	7.2	6.4	6.3	3.9	3.4	2.5	2.2	2.2	1.5	7.2	30min
29.02	8.5	8.0	7.7	5.6	5.0	4.0	3.5	3.5	2.4	8.5	30min
DumB17	0.6	0.8	1.0	1.1	1.1	1.1	1.4	1.5	1.4	1.5	12hr
25.07a	1.4	1.2	1.2	0.7	0.7	0.5	0.4	0.4	0.3	1.4	30min
Dummy26	7.3	7.5	7.3	5.8	6.2	6.0	7.0	6.9	6.6	7.5	1hr
1.22b	1.2	1.1	1.1	0.8	0.7	0.5	0.5	0.5	0.3	1.2	30min
1.20a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
1.20b	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	30min
1.21	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.8	0.8	12hr
24.01	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.5	12hr
24.02	0.2	0.2	0.2	0.1	0.3	0.5	0.8	1.2	1.2	1.2	12hr
24.03	0.2	0.3	0.3	0.2	0.4	0.7	1.2	1.8	1.8	1.8	12hr
24.04	0.2	0.3	0.3	0.2	0.5	0.9	1.5	2.2	2.1	2.2	12hr
24.05	0.2	0.3	0.3	0.2	0.7	1.1	1.9	2.7	2.6	2.7	12hr
24.06	0.2	0.3	0.3	0.3	0.8	1.3	2.2	3.2	3.1	3.2	12hr
17.14b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
17.14a	3.2	2.8	2.7	1.8	1.5	1.1	1.0	1.0	0.7	3.2	30min
DumB9	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	12hr
17.13	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
23.01	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
20.01	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.6	0.6	0.6	12hr
17.10a	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	12hr
17.10b	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.4	0.4	0.4	12hr
17.09	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	18hr
17.08c	1.5	1.3	1.3	0.8	0.7	0.5	0.4	0.5	0.4	1.5	30min
17.08d	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12hr
18.01	0.2	0.1	0.1	0.1	0.2	0.3	0.6	0.8	0.7	0.8	12hr
18.02	0.2	0.2	0.2	0.1	0.3	0.5	0.9	1.2	1.1	1.2	12hr
17.08b	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	12hr
17.08a	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.4	12hr
17.01	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.5	0.4	0.5	12hr
17.02	0.3	0.2	0.2	0.1	0.3	0.5	0.9	1.3	1.3	1.3	12hr
17.03	0.4	0.5	0.5	0.3	0.6	1.1	1.9	2.7	2.6	2.7	12hr
17.04	0.6	0.6	0.7	0.5	0.9	1.6	2.8	4.0	3.9	4.0	12hr
17.06	0.7	0.7	0.7	0.5	1.1	2.0	3.5	5.1	5.1	5.1	12hr
17.07	0.7	0.7	0.8	0.6	1.3	2.4	4.1	6.0	5.9	6.0	12hr
Dummy18	0.7	0.8	0.8	0.7	1.7	3.1	5.3	7.5	7.4	7.5	12hr
Dummy19	1.6	1.8	1.7	1.2	1.8	3.2	5.5	7.8	7.7	7.8	12hr
Dummy36	1.7	1.8	1.8	1.3	1.9	3.4	5.8	8.2	8.1	8.2	12hr
21.01	6.5	5.8	5.5	3.8	3.4	2.5	2.2	2.2	1.5	6.5	30min
Dummy37	6.6	6.6	6.5	4.8	4.1	3.6	6.2	8.8	8.8	8.8	18hr
Dummy20	6.7	6.6	6.6	4.8	4.2	4.1	7.0	9.8	9.9	9.9	18hr
22.01	0.2	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.8	0.8	12hr
17.11	1.5	1.3	1.3	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	7.2	7.2	7.0	5.1	4.8	4.5	7.7	10.7	10.8	10.8	18hr
17.12	3.9	3.5	3.4	2.2	1.9	1.4	1.2	1.2	0.8	3.9	30min
DumB8	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	12hr
Dummy54	7.4	7.5	7.3	5.4	5.1	4.8	8.1	11.2	11.3	11.3	18hr
Dummy38	7.4	7.5	7.3	5.4	5.1	4.9	8.4	11.5	11.6	11.6	18hr
Dummy35	7.4	7.5	7.3	5.4	5.1	5.0	8.6	11.8	11.9	11.9	18hr
Dummy21	7.8	8.0	7.8	5.9	5.6	5.4	9.1	12.6	12.6	12.6	18hr
17.15a	2.3	2.1	2.0	1.3	1.1	0.8	0.7	0.7	0.5	2.3	30min
DumB10	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	12hr
Dummy39	7.9	8.2	8.1	6.2	5.8	5.6	9.4	12.9	12.9	12.9	18hr
SU3	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy40	8.1	8.5	8.4	6.4	6.0	7.0	11.7	16.2	16.1	16.2	12hr
17.15b	0.8	0.8	0.7	0.4	0.4	0.3	0.2	0.3	0.2	0.8	30min
Dummy41	8.1	8.5	8.5	6.5	6.1	7.1	11.8	16.4	16.2	16.4	12hr
17.16	8.1	8.5	8.5	6.6	6.1	7.3	12.2	17.0	16.8	17.0	12hr
1.18	2.9	2.7	2.6	1.8	1.6	1.2	1.0	1.0	0.7	2.9	30min
16.01	1.6	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.6	30min
15.02	2.2	2.3	2.2	1.7	1.4	1.1	1.0	1.0	0.7	2.3	1hr
DumB12	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	12hr
15.01	3.2	2.8	2.7	1.9	1.6	1.2	1.0	1.1	0.7	3.2	30min
14.01	6.2	5.5	5.3	3.4	3.0	2.2	1.9	1.9	1.3	6.2	30min
1.17a	7.2	6.7	6.7	4.7	4.0	3.1	2.7	2.7	1.8	7.2	30min
DumB11	0.6	0.8	1.0	1.0	1.0	1.1	1.3	1.3	1.2	1.3	9hr
1.17b	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
1.16	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
1.14	0.8	0.9	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.9	2hr
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
12.02a	1.7	1.5	1.5	0.9	0.8	0.6	0.5	0.5	0.3	1.7	30min
11.01	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
10.01	3.4	3.2	3.2	1.8	1.6	1.1	1.0	1.0	0.7	3.4	30min
10.02a	5.6	4.7	5.2	3.5	3.0	2.2	1.9	2.0	1.3	5.6	30min
DumB14	0.5	0.6	0.8	0.8	0.7	0.8	1.0	0.9	0.8	1.0	9hr
1.13b	1.6	1.5	1.4	0.9	0.8	0.6	0.5	0.6	0.4	1.6	30min
1.13a	1.8	1.6	1.6	1.0	0.9	0.6	0.6	0.6	0.4	1.8	30min
1.12a	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
DumB15	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	9hr
5.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
1.11a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
1.11b	2.2	2.0	2.0	1.2	1.0	0.7	0.7	0.7	0.4	2.2	30min
1.09b	0.9	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
1.09c	2.0	1.9	1.9	1.1	1.0	0.7	0.6	0.6	0.4	2.0	30min
4.01	2.5	2.3	2.3	1.3	1.2	0.8	0.7	0.7	0.5	2.5	30min
4.02	7.0	6.1	6.3	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
1.06a	4.1	3.6	3.5	2.2	2.0	1.4	1.3	1.3	0.9	4.1	30min
DumB35	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	9hr
1.01	0.0	0.0	0.0	0.1	0.4	0.7	1.2	1.8	1.8	1.8	12hr
1.02	0.0	0.0	0.0	0.1	0.7	1.3	2.2	3.3	3.2	3.3	12hr
2.01	0.0	0.0	0.0	0.1	0.5	0.9	1.7	2.5	2.6	2.6	18hr
1.03	0.0	0.0	0.0	0.2	1.4	2.4	4.2	6.1	6.1	6.1	12hr
1.04	0.0	0.0	0.0	0.3	1.6	2.9	4.9	7.1	7.0	7.1	12hr
1.05	0.0	0.0	0.0	0.3	2.0	3.5	6.0	8.7	8.5	8.7	12hr
1.06b	0.4	0.4	0.4	0.4	2.3	4.0	6.8	9.8	9.6	9.8	12hr
Dummy1	0.5	0.6	0.7	0.7	2.6	4.4	7.3	10.4	10.2	10.4	12hr
1.07a	1.3	1.2	1.2	0.7	0.6	0.5	0.4	0.5	0.3	1.3	30min
1.07b	0.7	0.7	0.7	0.4	0.3	0.3	0.6	0.8	0.8	0.8	12hr
Dummy2	2.1	2.2	2.1	1.4	2.8	4.8	8.0	11.4	11.2	11.4	12hr
1.08a	3.0	2.7	2.7	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
1.08b	2.7	2.5	2.5	1.5	1.3	0.9	0.8	0.9	0.6	2.7	30min
Dummy3	7.0	6.5	6.0	4.4	3.9	5.0	8.4	11.8	11.7	11.8	12hr
3.01	3.5	3.3	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
1.09a	3.8	3.6	3.7	2.3	2.0	1.5	1.3	1.3	0.9	3.8	30min
DumB34	0.2	0.3	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.6	9hr
Dummy60	7.0	6.6	6.1	4.6	4.1	5.3	8.8	12.3	12.1	12.3	12hr
Dummy4	12.5	12.7	12.3	9.6	8.2	6.8	9.3	12.8	12.9	12.9	18hr
SU2	0.6	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.6	1.0	2hr
1.10b	1.7	1.6	1.6	1.2	1.3	1.2	1.2	1.2	0.9	1.7	30min
DumB31	0.2	0.4	0.5	0.5	0.5	0.6	0.8	0.8	0.7	0.8	9hr
Dummy42	12.5	12.8	12.4	9.7	8.3	7.0	9.9	13.5	13.5	13.5	12hr
1.10a	13.0	13.4	12.9	10.1	8.8	7.3	10.1	13.6	13.7	13.7	18hr
Dummy6	14.0	14.7	13.6	10.7	10.0	8.3	10.3	13.9	14.0	14.7	1hr
1.12c	2.6	2.4	2.4	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
DumB16	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	9hr
1.12b	14.8	16.1	15.1	12.2	11.3	9.7	11.4	15.1	15.3	16.1	1hr
Dummy7	14.8	16.2	15.6	12.8	11.6	10.5	11.6	15.4	15.7	16.2	1hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.07a	0.6	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.6	30min
DumB2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	12hr
7.01	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.4	0.5	12hr
7.02	0.3	0.3	0.3	0.2	0.4	0.6	1.1	1.6	1.5	1.6	12hr
7.03	0.5	0.5	0.5	0.3	0.6	1.1	1.9	2.8	2.7	2.8	12hr
7.04	0.6	0.6	0.6	0.4	0.8	1.4	2.4	3.4	3.3	3.4	12hr
7.05	0.6	0.7	0.6	0.5	1.0	1.8	3.2	4.5	4.4	4.5	12hr
7.06	0.6	0.7	0.7	0.5	1.1	2.0	3.5	5.0	4.9	5.0	12hr
8.01	7.0	6.2	6.1	3.8	3.4	2.4	2.1	2.2	1.4	7.0	30min
DumB1	0.3	0.4	0.5	0.6	0.6	0.6	0.8	0.9	0.8	0.9	12hr
7.07b	1.2	1.3	1.3	1.1	1.7	2.7	4.4	6.1	6.0	6.1	12hr
Dummy12	1.3	1.4	1.5	1.3	1.8	2.8	4.5	6.3	6.1	6.3	12hr
7.08b	3.6	3.2	3.1	2.0	1.7	1.2	1.1	1.1	0.7	3.6	30min
DumB3	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	12hr
7.08a	0.9	0.9	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
7.09a	2.9	2.6	2.6	1.6	1.4	1.0	0.9	0.9	0.6	2.9	30min
DumB4	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	12hr
Dummy11	1.8	2.0	2.2	1.9	2.3	3.3	5.2	7.1	6.9	7.1	12hr
7.09c	4.4	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.4	30min
DumB7	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	12hr
7.09b	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy43	2.0	2.3	2.5	2.2	2.6	3.7	5.6	7.6	7.4	7.6	12hr
7.10a	2.7	2.4	2.3	1.5	1.3	1.0	0.9	0.9	0.6	2.7	30min
7.10b	2.0	1.8	1.7	1.1	1.0	0.7	0.6	0.7	0.4	2.0	30min
Dummy9	5.0	5.0	5.0	3.9	3.7	3.8	5.9	7.9	7.8	7.9	12hr
9.01	2.3	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.3	30min
9.02b	3.7	3.1	3.5	2.3	2.0	1.4	1.3	1.3	0.9	3.7	30min
9.02a	3.8	3.4	3.3	2.1	1.8	1.3	1.2	1.2	0.8	3.8	30min
Dummy59	7.5	6.4	6.4	4.3	3.8	2.8	2.4	2.5	1.6	7.5	30min
DumB5	0.5	0.6	0.8	0.8	0.8	0.8	1.1	1.1	1.0	1.1	9hr
Dummy8	5.3	5.4	5.5	4.3	4.4	4.5	6.8	8.8	8.7	8.8	12hr
7.12	4.8	4.2	4.1	2.8	2.4	1.8	1.6	1.6	1.1	4.8	30min
DumB13	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	12hr
7.11a	2.5	2.3	2.3	1.3	1.1	0.8	0.7	0.7	0.5	2.5	30min
DumB6	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	9hr
7.11b	0.8	0.8	0.8	0.5	0.5	0.4	0.5	0.5	0.4	0.8	30min
Dummy10	5.8	6.1	6.1	4.9	5.0	5.1	7.6	9.7	9.6	9.7	12hr
12.01a	6.1	6.5	6.6	5.4	5.2	5.3	7.8	10.0	9.9	10.0	12hr
Dummy13	18.0	21.1	21.4	18.2	16.8	16.3	19.9	26.1	26.0	26.1	12hr
12.01b	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.3	30min
Dummy44	18.0	21.1	21.4	18.2	16.9	16.3	20.0	26.2	26.1	26.2	12hr
Dummy14	18.0	21.2	21.9	19.0	17.7	17.1	20.4	26.7	26.6	26.7	12hr
1.15	4.0	3.6	3.6	2.2	1.9	1.4	1.2	1.3	0.8	4.0	30min
Dummy45	18.0	21.2	22.3	19.6	18.3	17.5	20.7	27.0	27.0	27.0	12hr
Dummy15	18.5	21.9	23.5	21.0	19.8	19.0	21.9	28.3	28.4	28.4	18hr
Dummy46	18.5	21.9	23.7	21.4	20.2	19.3	22.2	28.6	28.7	28.7	18hr
Dummy16	18.7	22.1	24.1	22.2	21.0	20.1	22.8	29.3	29.6	29.6	18hr
Dummy17	19.8	24.0	27.2	26.2	24.0	24.0	35.6	46.1	47.1	47.1	18hr
1.22a	1.5	1.5	1.5	1.1	0.9	0.7	0.6	0.6	0.4	1.5	1hr
1.23	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	12hr
Dummy27	21.4	26.5	31.2	31.7	29.4	29.6	40.4	51.4	52.9	52.9	18hr
1.24	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	18hr
Dummy49	21.4	26.5	31.2	31.7	29.4	29.6	40.6	51.6	53.1	53.1	18hr
Dummy50	21.5	26.7	31.5	32.1	30.0	30.2	41.0	52.1	53.7	53.7	18hr
Dummy51	21.5	26.7	31.5	32.1	30.3	30.6	41.5	52.6	54.4	54.4	18hr
Dummy52	21.5	26.7	31.5	32.1	30.4	30.7	41.6	52.8	54.6	54.6	18hr
Dummy53	21.7	26.9	31.9	32.7	31.2	31.7	42.4	53.6	55.7	55.7	18hr
1.27	21.7	26.9	31.9	32.8	31.6	32.4	43.1	54.4	56.8	56.8	18hr
E18	0.9	0.8	0.8	0.5	0.4	0.3	0.5	0.8	0.7	0.9	30min
1.28	21.7	26.9	31.9	32.8	32.1	33.2	43.5	54.8	57.5	57.5	18hr
Out	22.3	27.8	33.1	35.3	38.5	42.3	49.3	57.8	62.7	62.7	18hr

Table C.18B Estimated 100 yr ARI Peak Flows (m3/s) under Scenario A Development with Precinct Basins Only at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.3	1.1	1.7	1.7	1.7	2.0	2.3	2.3	1.8	2.3	12hr
E17b	0.3	1.0	1.6	1.6	1.5	1.8	2.1	2.1	1.7	2.1	12hr
Dummy57	0.7	2.2	3.2	3.3	3.2	3.8	4.4	4.5	3.5	4.5	12hr
E17c	4.6	4.6	7.0	7.6	7.4	8.2	10.0	10.0	7.7	10.0	9hr
E17d	0.9	1.3	2.0	2.0	2.0	2.3	2.7	2.8	2.2	2.8	12hr
E9	0.7	1.8	2.3	2.2	2.3	2.6	2.6	2.8	2.2	2.8	12hr
E10	8.9	8.5	8.7	5.1	4.7	3.7	3.6	3.9	2.8	8.9	30min
DumB27	1.1	1.7	2.1	2.1	2.0	2.3	2.7	2.8	2.1	2.8	12hr
E3	10.6	10.5	10.9	6.3	5.8	5.1	4.9	5.3	3.8	10.9	2hr
E2	0.6	1.4	1.9	1.8	1.8	2.1	2.1	2.3	1.8	2.3	12hr
E1	0.5	1.3	1.7	1.6	1.6	1.8	1.8	2.0	1.5	2.0	12hr
Dummy56	1.2	2.7	3.5	3.4	3.5	3.9	4.0	4.4	3.3	4.4	12hr
Dummy30	11.0	11.0	11.3	7.0	7.5	8.1	8.2	9.2	7.0	11.3	2hr
E5	22.8	20.0	22.5	14.6	13.3	13.1	13.7	15.5	11.6	22.8	30min
DumB29	7.4	9.3	10.4	10.2	10.2	11.7	12.7	13.1	10.2	13.1	12hr
E6a	5.6	5.5	5.7	3.3	3.0	2.5	2.4	2.6	1.9	5.7	2hr
E6b	3.2	3.2	3.3	2.0	2.1	2.1	2.2	2.5	1.9	3.3	2hr
Dummy31	9.7	12.4	13.8	13.3	13.5	15.1	16.6	17.2	13.3	17.2	12hr
E8a	2.7	2.6	2.7	1.6	1.5	1.3	1.3	1.5	1.1	2.7	2hr
E8b	4.6	4.6	4.7	2.7	2.5	2.2	2.2	2.4	1.8	4.7	2hr
E7a	0.7	0.8	1.1	1.0	1.1	1.1	1.1	1.3	1.0	1.3	12hr
E7b	3.3	3.4	3.5	3.2	3.4	3.8	3.9	4.4	3.3	4.4	12hr
E8c	3.9	4.1	4.5	4.2	4.3	5.0	5.2	5.6	4.3	5.6	12hr
Dummy32	18.0	18.5	21.4	19.7	19.8	22.5	24.6	25.4	19.8	25.4	12hr
E11a	18.9	19.8	22.5	20.7	20.8	23.7	25.7	26.5	20.7	26.5	12hr
E11b	20.3	22.5	26.6	25.8	25.9	29.4	31.9	32.9	25.5	32.9	12hr
E13	9.9	9.9	10.4	6.1	5.8	5.5	5.9	6.5	4.8	10.4	2hr
E12	0.6	1.5	1.9	1.7	1.9	1.9	1.9	2.1	1.6	2.1	12hr
E14	4.1	4.1	4.2	2.4	2.2	1.9	1.8	1.9	1.3	4.2	2hr
E15b	2.0	2.0	2.0	1.2	1.1	0.9	0.9	0.9	0.6	2.0	2hr
E15a	2.3	2.3	2.4	1.4	1.3	1.1	1.0	1.0	0.7	2.4	2hr
Dummy29	7.5	6.5	7.5	4.8	4.5	3.8	3.5	3.8	2.7	7.5	30min
E16a	11.1	12.0	11.7	8.9	8.0	7.0	7.1	7.8	5.6	12.0	1hr
DumB25	2.7	4.1	4.8	4.7	4.7	5.2	5.9	6.0	4.5	6.0	12hr
E16b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy28	24.0	31.0	37.5	36.1	35.9	40.2	43.8	43.9	34.4	43.9	12hr
Dummy33	25.7	36.6	46.1	45.6	44.4	50.5	55.7	54.2	42.9	55.7	9hr
SE5	1.4	1.4	2.2	2.1	1.9	2.5	2.6	2.9	2.2	2.9	12hr
SE1	4.6	4.5	4.7	2.7	2.4	2.0	1.9	2.1	1.5	4.7	2hr
SE2	13.6	13.4	13.8	7.9	7.2	5.9	5.6	6.1	4.3	13.8	2hr
DumB32	2.2	3.3	3.8	3.7	3.9	4.2	4.5	4.8	3.6	4.8	12hr
SE3	0.9	2.4	4.1	4.6	4.7	5.0	6.3	6.2	4.7	6.3	9hr
SE6a	2.9	2.9	5.1	5.8	5.9	6.3	7.8	7.6	5.8	7.8	9hr
Dummy58	7.9	7.9	9.4	10.1	10.0	10.9	13.8	14.1	10.5	14.1	12hr
SE6b	11.4	11.8	13.1	13.4	13.3	15.0	18.4	18.8	14.2	18.8	12hr
SE_out	11.4	11.8	13.1	13.4	13.3	15.0	18.4	18.8	14.2	18.8	12hr
33.01a	2.2	2.2	2.3	1.6	1.7	1.9	2.0	2.3	1.7	2.3	2hr
33.01b	2.3	2.3	2.5	2.0	2.1	2.5	2.6	2.9	2.2	2.9	12hr
32.01	4.8	4.8	4.9	2.8	2.6	2.1	2.0	2.2	1.5	4.9	2hr
32.02	12.8	13.4	12.5	9.4	8.4	6.9	7.6	8.4	5.8	13.4	1hr
DumB19	1.9	3.1	3.9	4.2	4.2	4.4	5.9	5.7	4.7	5.9	9hr
1.26	0.6	0.7	1.3	1.6	1.7	1.8	2.3	2.2	1.9	2.3	9hr
31.03	2.8	2.6	2.6	1.7	1.6	1.3	1.7	1.9	1.4	2.8	30min
30.01	0.5	1.0	1.6	1.8	1.8	2.0	2.5	2.5	1.9	2.5	9hr
30.02	1.3	2.1	3.9	4.5	4.6	4.8	6.3	6.1	4.4	6.3	9hr
1.25b	1.4	2.3	4.3	5.0	5.1	5.4	7.0	6.7	5.0	7.0	9hr
1.25a	1.9	1.8	1.8	1.2	1.1	1.0	1.3	1.5	1.1	1.9	30min
31.01b	1.4	1.4	1.4	0.8	0.7	0.6	0.6	0.6	0.4	1.4	2hr
31.01a	3.0	2.9	3.1	1.7	1.6	1.3	1.2	1.3	0.9	3.1	2hr
Dummy55	4.3	4.3	4.5	2.5	2.3	1.9	1.8	1.9	1.4	4.5	2hr
31.02	6.5	7.6	7.0	5.1	4.6	3.8	4.0	4.4	3.1	7.6	1hr
DumB18	1.4	2.1	2.5	2.5	2.5	2.8	3.3	3.3	2.5	3.3	12hr
25.06a	5.2	5.0	5.1	3.0	2.7	2.1	2.0	2.2	1.6	5.2	30min
DumB21	0.5	0.8	1.0	1.1	1.1	1.2	1.4	1.4	1.0	1.4	9hr
25.06b	1.5	1.6	1.6	1.6	1.5	1.8	2.1	2.2	1.6	2.2	12hr
25.06c	1.0	1.0	1.0	0.6	0.6	0.5	0.6	0.7	0.5	1.0	2hr
25.03c	2.6	2.6	2.6	1.5	1.4	1.1	1.1	1.2	0.9	2.6	30min
25.03b	0.9	0.9	0.9	0.5	0.5	0.5	0.6	0.7	0.5	0.9	2hr
25.01	0.8	0.9	1.2	1.3	1.3	1.4	1.9	1.9	1.4	1.9	12hr
27.01	6.0	5.7	5.7	3.6	3.3	3.0	3.6	4.1	3.0	6.0	30min
25.03a	7.4	7.1	7.4	4.6	4.2	3.6	4.3	4.8	3.5	7.4	2hr
DumB23	2.3	2.8	3.1	2.8	3.0	3.2	4.0	4.1	3.0	4.1	12hr
26.01a	5.3	5.1	5.2	3.0	2.7	2.1	2.1	2.3	1.6	5.3	30min
26.01b	0.3	0.7	1.3	1.4	1.4	1.5	1.9	1.9	1.4	1.9	9hr
Dummy47	5.6	5.5	5.6	3.4	3.2	3.1	3.7	4.2	3.0	5.6	2hr
25.02	12.5	11.5	11.4	8.1	7.4	6.1	7.0	7.9	5.7	12.5	30min
DumB22	2.8	3.8	4.3	4.4	4.4	4.8	6.1	6.1	4.4	6.1	12hr
Dummy48	5.1	6.6	7.2	7.3	7.2	8.0	10.1	10.2	7.4	10.2	12hr
Dummy22	5.2	7.4	8.4	8.2	8.2	9.1	11.2	11.2	8.3	11.2	9hr
25.04b	3.1	3.0	3.1	1.8	1.7	1.3	1.4	1.6	1.1	3.1	30min
25.04a	5.2	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.2	30min
Dummy23	11.0	9.9	11.0	10.3	10.0	11.1	14.0	13.6	10.1	14.0	9hr
25.05a	3.3	3.1	3.2	1.9	1.7	1.4	1.4	1.5	1.1	3.3	30min
25.05b	1.2	1.2	1.3	0.7	0.7	0.6	0.7	0.8	0.6	1.3	2hr
28.01	12.1	11.6	11.8	7.0	6.3	4.9	4.7	5.1	3.6	12.1	30min
28.02	15.3	15.6	15.0	10.9	9.7	8.0	8.1	8.8	6.2	15.6	1hr
DumB20	2.0	3.3	4.2	4.4	4.4	4.8	6.0	5.9	4.3	6.0	9hr
Dummy24	13.3	13.1	15.9	16.0	15.6	17.0	21.4	20.6	15.4	21.4	9hr
Dummy25	14.6	14.7	17.8	17.8	17.4	19.1	23.8	22.8	17.1	23.8	9hr
25.07b	0.9	0.9	0.9	0.6	0.6	0.7	0.8	0.9	0.7	0.9	2hr
29.01	14.9	14.2	14.5	8.6	7.7	6.0	5.8	6.2	4.4	14.9	30min
29.02	18.3	17.9	17.6	12.7	11.5	9.5	9.6	10.5	7.4	18.3	30min
DumB17	2.2	3.7	4.9	5.2	5.2	5.5	7.0	6.9	5.1	7.0	9hr
25.07a	2.8	2.7	2.8	1.7	1.5	1.2	1.3	1.4	1.0	2.8	30min
Dummy26	16.8	18.6	23.8	24.2	23.7	25.9	32.2	30.7	23.0	32.2	9hr
1.22b	2.8	2.5	2.6	1.8	1.6	1.2	1.2	1.4	0.9	2.8	30min
1.20a	0.1	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
1.20b	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.6	12hr
1.21	0.5	1.2	2.4	2.8	2.9	3.1	3.9	3.7	2.9	3.9	9hr
24.01	0.3	0.8	1.6	1.8	1.9	2.0	2.5	2.4	1.8	2.5	9hr
24.02	0.6	1.8	3.6	4.3	4.4	4.6	5.8	5.5	4.2	5.8	9hr
24.03	0.9	2.8	5.4	6.4	6.5	6.9	8.7	8.2	6.2	8.7	9hr
24.04	1.2	3.6	6.6	7.8	7.9	8.3	10.6	10.0	7.6	10.6	9hr
24.05	1.6	4.6	8.2	9.5	9.7	10.2	13.1	12.4	9.4	13.1	9hr
24.06	1.8	5.4	9.7	11.4	11.6	12.3	15.7	14.7	11.2	15.7	9hr
17.14b	0.2	0.6	1.0	1.1	1.1	1.2	1.6	1.5	1.2	1.6	9hr
17.14a	6.6	6.3	6.5	4.0	3.6	3.0	3.5	3.9	2.8	6.6	30min
DumB9	1.3	1.7	2.0	2.1	2.1	2.2	2.9	2.9	2.1	2.9	9hr
17.13	0.2	0.4	0.9	1.1	1.2	1.2	1.5	1.4	1.2	1.5	9hr
23.01	0.2	0.5	1.0	1.2	1.3	1.3	1.7	1.6	1.3	1.7	9hr
20.01	0.3	1.1	1.9	2.1	2.1	2.3	2.8	2.8	2.1	2.8	9hr
17.10a	0.2	0.4	0.8	0.9	0.9	1.0	1.3	1.2	0.9	1.3	9hr
17.10b	0.2	0.6	1.1	1.4	1.4	1.5	1.9	1.8	1.4	1.9	9hr
17.09	0.3	0.7	1.3	1.7	1.8	1.9	2.4	2.2	2.0	2.4	9hr
17.08c	3.0	3.0	3.0	1.9	1.7	1.6	1.9	2.1	1.5	3.0	30min
17.08d	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	12hr
18.01	0.5	1.3	2.4	2.7	2.7	2.9	3.7	3.6	2.7	3.7	9hr
18.02	0.8	2.2	3.9	4.3	4.2	4.6	5.8	5.7	4.3	5.8	9hr
17.08b	0.2	0.4	0.8	0.8	0.8	0.9	1.1	1.1	0.9	1.1	9hr
17.08a	0.2	0.7	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
17.01	0.3	1.0	1.6	1.7	1.7	1.9	2.3	2.3	1.7	2.3	12hr
17.02	0.8	2.2	4.1	4.6	4.7	5.0	6.4	6.1	4.6	6.4	9hr
17.03	1.4	4.2	8.1	9.6	9.9	10.5	13.5	12.6	10.0	13.5	9hr
17.04	2.1	6.2	11.8	14.3	14.8	15.7	20.1	18.6	15.0	20.1	9hr
17.06	2.6	7.8	15.0	18.4	19.2	20.4	26.0	23.9	19.8	26.0	9hr
17.07	3.1	9.1	17.4	21.4	22.5	23.8	30.3	27.7	23.0	30.3	9hr
Dummy18	4.2	12.0	22.1	26.5	27.7	29.3	37.5	34.5	28.2	37.5	9hr
Dummy19	4.3	12.4	22.7	27.3	28.6	30.3	38.7	35.4	29.3	38.7	9hr
Dummy36	4.5	13.0	24.0	28.9	30.4	32.2	41.1	37.4	31.1	41.1	9hr
21.01	14.1	12.8	12.8	8.5	7.6	5.8	5.8	6.4	4.4	14.1	30min
Dummy37	14.5	14.7	24.9	30.7	33.0	35.0	44.0	39.0	33.7	44.0	9hr
Dummy20	14.6	15.2	27.9	34.3	36.7	39.1	49.2	43.7	37.5	49.2	9hr
22.01	0.5	1.2	2.4	2.8	3.0	3.2	4.0	3.7	3.2	4.0	9hr
17.11	3.1	2.9	3.0	1.8	1.7	1.3	1.5	1.7	1.2	3.1	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	16.3	17.1	30.4	37.5	40.3	42.8	53.8	47.3	41.3	53.8	9hr
17.12	8.3	7.8	8.0	4.9	4.4	3.4	3.6	3.9	2.8	8.3	30min
DumB8	0.8	1.3	1.7	1.9	1.9	1.9	2.6	2.5	1.9	2.6	9hr
Dummy54	17.0	18.2	31.7	39.1	41.9	44.6	56.0	49.0	43.2	56.0	9hr
Dummy38	17.2	18.5	32.6	40.1	43.0	45.8	57.5	50.2	44.4	57.5	9hr
Dummy35	17.3	18.9	33.4	41.1	44.1	47.0	58.8	51.3	45.6	58.8	9hr
Dummy21	18.6	21.1	35.2	43.2	46.5	49.6	61.9	53.8	48.3	61.9	9hr
17.15a	4.9	4.6	4.7	2.9	2.6	2.1	2.2	2.4	1.7	4.9	30min
DumB10	0.7	1.0	1.2	1.3	1.3	1.4	1.7	1.7	1.2	1.7	9hr
Dummy39	19.1	22.1	35.9	44.0	47.4	50.6	63.0	54.7	49.4	63.0	9hr
SU3	0.2	0.5	1.1	1.3	1.3	1.4	1.8	1.7	1.4	1.8	9hr
Dummy40	20.9	26.2	45.4	55.4	59.1	62.9	78.6	68.3	61.5	78.6	9hr
17.15b	1.7	1.7	1.7	1.0	1.0	0.8	1.0	1.1	0.8	1.7	2hr
Dummy41	21.0	26.5	45.6	55.6	59.5	63.3	79.0	68.7	62.0	79.0	9hr
17.16	21.3	27.4	47.2	57.6	61.9	65.8	82.0	71.2	64.5	82.0	9hr
1.18	6.5	5.9	5.9	4.1	3.6	2.8	2.9	3.2	2.2	6.5	30min
16.01	3.2	3.1	3.2	1.8	1.7	1.3	1.3	1.4	1.0	3.2	30min
15.02	4.8	5.2	5.0	3.8	3.4	2.9	3.6	4.1	2.9	5.2	1hr
DumB12	1.4	1.9	2.1	2.2	2.2	2.4	3.3	3.2	2.7	3.3	9hr
15.01	6.9	6.2	6.3	4.2	3.8	3.0	3.3	3.6	2.5	6.9	30min
14.01	12.9	12.1	12.4	7.6	6.8	5.4	5.4	5.9	4.2	12.9	30min
1.17a	15.1	14.8	15.5	10.5	9.4	7.6	8.0	8.8	6.3	15.5	2hr
DumB11	2.3	3.6	4.5	4.6	4.6	5.0	6.3	6.2	4.5	6.3	9hr
1.17b	0.7	0.7	0.8	0.9	0.9	1.0	1.2	1.3	1.0	1.3	12hr
1.16	7.4	7.2	7.4	4.3	3.9	3.2	3.2	3.5	2.5	7.4	30min
1.14	2.1	2.1	2.1	1.6	1.4	1.1	1.1	1.2	0.8	2.1	2hr
12.02b	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	12hr
12.02a	3.5	3.3	3.4	2.1	1.9	1.6	1.7	1.9	1.4	3.5	30min
11.01	6.6	6.5	6.7	3.8	3.5	2.8	2.7	2.9	2.1	6.7	2hr
10.01	7.0	6.9	7.2	4.1	3.7	3.1	2.9	3.1	2.2	7.2	2hr
10.02a	11.9	10.1	11.7	7.7	7.0	5.6	5.5	5.9	4.3	11.9	30min
DumB14	2.0	3.1	3.7	3.6	3.7	4.0	4.4	4.6	3.5	4.6	12hr
1.13b	3.4	3.2	3.3	2.1	1.9	1.9	2.2	2.5	1.8	3.4	30min
1.13a	3.7	3.6	3.7	2.2	2.0	1.7	1.9	2.1	1.5	3.7	30min
1.12a	7.5	7.2	7.3	4.4	3.9	3.1	3.0	3.2	2.3	7.5	30min
DumB15	0.9	1.5	1.8	1.8	1.8	2.0	2.3	2.4	1.8	2.4	12hr
5.01	0.2	0.3	0.7	0.9	0.9	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	2.7	2.7	2.7	1.6	1.5	1.2	1.2	1.3	0.9	2.7	2hr
1.11b	4.5	4.4	4.5	2.7	2.5	2.2	2.3	2.6	1.9	4.5	30min
1.09b	1.8	1.8	1.9	1.1	1.0	0.8	0.8	0.9	0.6	1.9	2hr
1.09c	4.2	4.1	4.2	2.5	2.3	1.9	2.0	2.2	1.6	4.2	30min
4.01	5.1	5.0	5.2	2.9	2.6	2.0	1.8	1.8	1.3	5.2	2hr
4.02	14.7	13.2	13.9	8.8	7.9	6.0	5.4	5.7	4.0	14.7	30min
1.06a	8.6	8.1	8.3	5.1	4.6	3.8	4.3	4.8	3.4	8.6	30min
DumB35	1.5	2.1	2.5	2.6	2.6	2.7	3.5	3.5	2.5	3.5	9hr
1.01	0.9	2.5	5.3	6.5	7.0	7.4	9.3	8.5	7.4	9.3	9hr
1.02	1.7	4.9	9.4	11.5	12.0	12.7	16.3	15.2	12.4	16.3	9hr
2.01	1.1	3.3	7.0	9.1	10.2	10.8	13.6	12.5	11.6	13.6	9hr
1.03	3.2	9.2	17.8	21.9	23.3	24.7	31.7	29.3	25.4	31.7	9hr
1.04	3.8	10.9	20.8	25.2	26.6	28.1	36.4	33.7	28.7	36.4	9hr
1.05	4.7	13.5	25.1	30.4	31.8	33.5	43.8	40.5	34.0	43.8	9hr
1.06b	5.3	15.4	28.2	34.1	35.6	37.5	48.9	44.9	37.7	48.9	9hr
Dummy1	6.2	16.6	30.1	36.4	37.9	39.9	51.9	47.7	39.9	51.9	9hr
1.07a	2.8	2.7	2.8	1.7	1.6	1.5	1.7	1.9	1.4	2.8	30min
1.07b	1.5	1.5	2.5	2.9	2.9	3.1	4.0	4.0	2.9	4.0	9hr
Dummy2	6.7	18.1	32.6	39.5	41.3	43.5	56.5	51.5	43.3	56.5	9hr
1.08a	6.3	6.1	6.2	3.7	3.3	2.5	2.4	2.5	1.8	6.3	30min
1.08b	5.7	5.5	5.7	3.4	3.1	2.7	2.9	3.2	2.4	5.7	30min
Dummy3	15.1	18.5	33.2	40.7	43.3	45.5	58.7	52.5	45.3	58.7	9hr
3.01	7.3	7.1	7.3	4.1	3.7	2.8	2.5	2.6	1.8	7.3	2hr
1.09a	7.9	7.9	8.5	5.1	4.6	3.6	3.2	3.4	2.4	8.5	2hr
DumB34	1.1	1.8	2.1	2.1	2.2	2.3	2.4	2.6	2.0	2.6	12hr
Dummy60	15.3	19.2	34.0	41.7	44.5	46.8	60.2	53.7	46.5	60.2	9hr
Dummy4	27.8	28.0	34.3	43.1	47.2	49.5	63.0	54.6	49.3	63.0	9hr
SU2	2.1	2.8	3.1	2.8	2.9	2.8	2.8	3.0	2.3	3.1	2hr
1.10b	3.6	3.8	4.2	3.9	4.1	4.0	4.0	4.3	3.3	4.3	12hr
DumB31	1.0	2.2	3.1	3.1	3.0	3.3	3.6	3.5	2.8	3.6	9hr
Dummy42	28.0	28.2	35.8	45.0	49.1	51.6	65.5	56.5	51.3	65.5	9hr
1.10a	29.1	29.7	36.0	45.3	49.6	52.2	66.2	56.8	51.9	66.2	9hr
Dummy6	31.9	33.0	36.4	45.8	50.7	53.3	67.3	58.0	53.3	67.3	9hr
1.12c	5.4	5.2	5.4	3.1	2.8	2.3	2.2	2.4	1.7	5.4	30min
DumB16	0.7	1.1	1.4	1.3	1.3	1.5	1.7	1.8	1.3	1.8	12hr
1.12b	34.6	38.2	39.3	49.3	54.9	57.9	72.1	63.8	58.3	72.1	9hr
Dummy7	34.9	39.5	40.1	49.9	56.0	59.6	73.5	66.1	60.2	73.5	9hr
10.02b	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	1.2	1.2	1.2	0.7	0.7	0.8	1.0	1.1	0.8	1.2	2hr
DumB2	0.2	0.4	0.6	0.6	0.6	0.7	0.8	0.8	0.6	0.8	9hr
7.01	0.3	0.9	1.5	1.7	1.6	1.8	2.2	2.2	1.7	2.2	9hr
7.02	0.8	2.5	4.7	5.4	5.5	5.8	7.6	7.1	5.3	7.6	9hr
7.03	1.5	4.5	8.4	9.7	9.9	10.5	13.4	12.7	9.4	13.4	9hr
7.04	1.8	5.5	10.3	12.1	12.3	13.1	16.7	15.6	11.8	16.7	9hr
7.05	2.4	7.2	13.4	15.9	16.3	17.3	22.0	20.5	15.5	22.0	9hr
7.06	2.6	7.9	14.9	17.9	18.4	19.5	24.7	23.0	17.7	24.7	9hr
8.01	14.5	13.7	14.0	8.5	7.6	6.0	6.0	6.5	4.6	14.5	30min
DumB1	1.1	2.0	2.7	3.0	3.0	3.1	4.2	4.1	3.0	4.2	9hr
7.07b	3.7	9.8	17.8	21.3	22.1	23.3	29.5	27.2	21.5	29.5	9hr
Dummy12	3.9	10.1	18.3	21.9	22.6	23.9	30.3	27.9	22.0	30.3	9hr
7.08b	7.5	7.1	7.2	4.3	3.8	2.9	2.7	2.9	2.0	7.5	30min
DumB3	0.5	0.9	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
7.08a	1.9	1.9	2.0	1.1	1.1	1.0	1.1	1.3	1.0	2.0	2hr
7.09a	6.0	5.8	5.9	3.4	3.1	2.4	2.3	2.5	1.8	6.0	30min
DumB4	0.6	1.0	1.2	1.3	1.2	1.4	1.7	1.7	1.2	1.7	12hr
Dummy11	5.0	11.5	20.4	24.5	25.4	26.8	33.9	31.1	24.9	33.9	9hr
7.09c	9.1	8.6	8.8	5.2	4.7	3.5	3.2	3.4	2.4	9.1	30min
DumB7	0.6	1.1	1.5	1.5	1.5	1.7	2.1	2.1	1.5	2.1	12hr
7.09b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy43	5.6	12.4	21.6	25.9	26.9	28.4	36.0	32.8	26.6	36.0	9hr
7.10a	5.7	5.2	5.3	3.4	3.0	2.3	2.2	2.4	1.7	5.7	30min
7.10b	4.3	4.0	4.0	2.5	2.3	1.8	1.7	1.8	1.3	4.3	30min
Dummy9	10.8	12.7	22.2	27.0	28.3	30.1	37.7	33.6	28.2	37.7	9hr
9.01	4.7	4.7	4.9	2.8	2.5	2.0	2.0	2.1	1.5	4.9	2hr
9.02b	7.8	6.6	7.8	5.0	4.5	3.6	3.5	3.8	2.7	7.8	2hr
9.02a	7.9	7.6	7.7	4.6	4.1	3.2	3.1	3.4	2.4	7.9	30min
Dummy59	15.7	14.0	14.0	9.5	8.6	6.8	6.7	7.2	5.1	15.7	30min
DumB5	1.8	3.0	3.8	3.7	3.7	4.2	5.0	5.1	3.7	5.1	12hr
Dummy8	11.7	14.2	24.6	29.7	31.2	33.1	41.2	36.7	31.5	41.2	9hr
7.12	10.3	9.4	9.5	6.2	5.6	4.3	4.5	5.0	3.5	10.3	30min
DumB13	0.8	1.4	1.9	2.2	2.3	2.4	3.2	3.0	2.6	3.2	9hr
7.11a	5.1	5.0	5.2	2.9	2.7	2.1	2.1	2.2	1.6	5.2	2hr
DumB6	0.7	1.0	1.2	1.2	1.2	1.4	1.6	1.6	1.2	1.6	12hr
7.11b	1.7	1.8	1.9	1.7	1.8	1.9	2.1	2.3	1.7	2.3	12hr
Dummy10	13.4	15.7	27.2	32.7	34.4	36.6	45.4	40.3	35.2	45.4	9hr
12.01a	14.2	16.6	27.8	33.4	35.5	37.6	46.6	41.1	36.3	46.6	9hr
Dummy13	44.7	57.0	68.0	84.2	92.4	98.3	120.0	105.6	98.8	120.0	9hr
12.01b	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.0	0.8	1.0	12hr
Dummy44	44.8	57.3	68.2	84.4	92.7	98.7	120.4	106.1	99.3	120.4	9hr
Dummy14	45.2	58.2	68.6	85.2	94.1	100.7	122.2	109.0	101.8	122.2	9hr
1.15	8.4	8.1	8.3	5.0	4.5	3.8	4.2	4.8	3.4	8.4	30min
Dummy45	45.4	59.0	69.0	85.7	95.2	102.4	123.3	111.1	103.6	123.3	9hr
Dummy15	47.1	62.1	74.8	88.5	99.1	107.3	127.8	117.2	109.2	127.8	9hr
Dummy46	47.2	62.5	76.0	89.0	99.9	108.6	128.8	118.7	110.7	128.8	9hr
Dummy16	47.8	63.5	78.3	90.6	102.2	111.7	131.8	123.3	114.7	131.8	9hr
Dummy17	57.6	88.4	122.5	146.9	164.6	176.2	211.7	192.9	181.6	211.7	9hr
1.22a	3.6	3.4	3.5	2.5	2.2	1.7	1.8	2.0	1.5	3.6	30min
1.23	0.4	0.5	0.9	1.1	1.2	1.2	1.6	1.5	1.2	1.6	9hr
Dummy27	62.9	98.2	141.4	160.5	182.9	195.8	232.9	219.6	204.6	232.9	9hr
1.24	0.4	0.4	0.6	0.8	0.9	1.0	1.2	1.2	1.1	1.2	12hr
Dummy49	63.0	98.5	141.9	161.0	183.6	196.6	233.8	220.6	205.6	233.8	9hr
Dummy50	63.4	99.1	142.9	162.0	184.8	198.1	235.3	222.6	208.4	235.3	9hr
Dummy51	63.9	100.1	144.5	163.3	186.6	200.3	237.9	226.0	212.6	237.9	9hr
Dummy52	63.9	100.4	144.8	163.6	187.0	200.7	238.4	226.6	213.5	238.4	9hr
Dummy53	64.7	101.6	146.8	165.5	189.2	203.5	241.8	230.6	218.7	241.8	9hr
1.27	65.2	102.8	149.0	167.4	191.7	206.4	245.4	235.2	224.3	245.4	9hr
E18	1.8	1.8	2.3	2.6	2.7	2.8	3.6	3.7	2.8	3.7	12hr
1.28	65.7	103.4	149.9	168.3	192.9	208.0	247.5	238.5	228.6	247.5	9hr
Out	68.1	106.7	154.6	172.4	199.5	218.5	260.6	269.1	260.3	269.1	12hr

Table C.19A Estimated 2 yr ARI Peak Flows (m3/s) under Scenario B Development + Precinct Basins + Major External Basins at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E17b	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy57	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.9	0.8	0.9	12hr
E17c	2.2	2.1	2.1	1.2	1.0	1.0	1.6	2.1	1.9	2.2	30min
E17d	0.4	0.4	0.4	0.2	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E9	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E10	4.3	3.8	3.8	2.3	2.0	1.5	1.3	1.3	0.9	4.3	30min
DumB27	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.6	9hr
E3	5.2	5.0	5.0	2.7	2.4	1.7	1.5	1.6	1.0	5.2	30min
E2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
E1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
Dummy56	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.9	0.7	0.9	12hr
Dummy30	5.4	5.2	5.1	2.9	2.5	1.8	1.8	2.1	1.5	5.4	30min
E5	10.9	9.3	10.2	6.5	5.7	4.2	3.7	3.8	2.6	10.9	30min
DumB29	2.2	2.8	2.9	2.6	2.8	2.6	2.7	2.7	2.4	2.9	2hr
E6a	2.7	2.6	2.6	1.4	1.3	0.9	0.8	0.8	0.5	2.7	30min
E6b	1.6	1.5	1.5	0.8	0.7	0.5	0.5	0.6	0.4	1.6	30min
Dummy31	4.5	4.7	4.8	3.6	3.9	3.5	3.8	3.6	3.2	4.8	2hr
E8a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
E8b	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
E7a	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
E7b	1.6	1.6	1.6	0.9	0.8	0.5	0.7	1.0	0.7	1.6	30min
E8c	1.8	1.8	1.9	1.2	1.0	0.8	1.0	1.2	0.9	1.9	2hr
Dummy32	8.5	8.0	8.9	6.1	5.7	5.1	5.4	5.4	4.7	8.9	2hr
E11a	8.8	8.4	9.2	6.4	6.1	5.3	5.7	5.7	5.0	9.2	2hr
E11b	9.3	9.0	9.8	6.9	6.7	5.9	6.9	7.1	6.2	9.8	2hr
E13	4.9	4.7	4.7	2.5	2.2	1.6	1.4	1.6	1.1	4.9	30min
E12	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E14	2.0	1.9	2.0	1.1	0.9	0.7	0.6	0.6	0.4	2.0	30min
E15b	1.0	0.9	1.0	0.5	0.4	0.3	0.3	0.3	0.2	1.0	30min
E15a	1.1	1.1	1.1	0.6	0.5	0.4	0.3	0.3	0.2	1.1	30min
Dummy29	3.6	3.1	3.3	2.1	1.9	1.4	1.2	1.2	0.8	3.6	30min
E16a	5.2	5.5	5.3	4.0	3.4	2.7	2.4	2.4	1.6	5.5	1hr
DumB25	0.6	0.9	1.0	1.0	1.0	1.1	1.3	1.2	1.1	1.3	9hr
E16b	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy28	10.2	10.5	11.8	8.8	8.8	7.9	9.7	10.1	8.6	11.8	2hr
Dummy33	10.2	10.7	12.2	9.5	9.1	8.5	11.4	12.7	10.9	12.7	12hr
SE5	0.7	0.6	0.6	0.3	0.3	0.3	0.5	0.6	0.5	0.7	30min
SE1	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
SE2	6.6	6.2	6.2	3.5	3.1	2.2	2.0	2.0	1.3	6.6	30min
DumB32	0.5	0.7	0.8	0.8	0.8	0.9	1.1	0.9	0.9	1.1	9hr
SE3	0.3	0.3	0.3	0.1	0.3	0.6	1.0	1.3	1.2	1.3	12hr
SE6a	1.4	1.3	1.2	0.8	0.7	0.7	1.2	1.7	1.6	1.7	12hr
Dummy58	3.7	3.6	3.5	2.3	2.1	1.8	2.4	2.9	2.7	3.7	30min
SE6b	5.4	5.4	5.7	3.7	3.3	2.7	3.2	3.9	3.6	5.7	2hr
SE_out	5.4	5.4	5.7	3.7	3.3	2.7	3.2	3.9	3.6	5.7	2hr
33.01a	1.1	1.0	1.0	0.6	0.5	0.4	0.4	0.5	0.4	1.1	30min
33.01b	1.1	1.1	1.1	0.6	0.5	0.4	0.5	0.6	0.5	1.1	30min
32.01	2.4	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.4	30min
32.02	5.5	6.0	5.3	4.2	3.6	2.7	2.4	2.4	1.6	6.0	1hr
DumB19	0.5	0.7	0.9	0.9	0.9	0.9	1.2	1.2	1.1	1.2	12hr
1.26	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
31.03	1.3	1.2	1.1	0.7	0.7	0.5	0.4	0.4	0.3	1.3	30min
30.01	4.1	3.7	3.7	2.2	1.9	1.4	1.2	1.2	0.8	4.1	30min
30.02	9.9	8.5	9.0	6.0	5.3	3.9	3.4	3.4	2.3	9.9	30min
1.25b	10.6	9.3	9.6	6.6	5.9	4.4	3.9	3.9	2.6	10.6	30min
DummyO5	0.5	0.7	0.9	1.0	1.0	1.1	1.4	1.5	1.4	1.5	12hr
1.25a	0.9	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.9	30min
31.01b	0.7	0.7	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.7	30min
31.01a	1.5	1.4	1.4	0.8	0.7	0.5	0.4	0.4	0.3	1.5	30min
Dummy55	2.1	2.1	2.1	1.1	1.0	0.7	0.6	0.6	0.4	2.1	30min
31.02	2.9	3.5	3.1	2.3	2.0	1.5	1.3	1.3	0.9	3.5	1hr
DumB18	0.3	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.7	9hr
25.06a	2.5	2.3	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
DumB21	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	12hr
25.06b	0.7	0.7	0.7	0.5	0.4	0.4	0.5	0.5	0.4	0.7	30min
25.06c	0.5	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.5	30min
25.03c	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
25.03b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.4	30min
25.01	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.4	30min
27.01	2.9	2.7	2.6	1.6	1.4	1.0	0.9	0.9	0.7	2.9	30min
25.03a	3.5	3.3	3.3	2.1	1.8	1.3	1.2	1.2	0.9	3.5	30min
DumB23	0.6	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	2hr
26.01a	2.6	2.4	2.3	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
26.01b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
Dummy47	2.7	2.5	2.5	1.4	1.3	0.9	0.8	0.9	0.7	2.7	30min
25.02	5.7	5.2	5.1	3.7	3.2	2.3	2.1	2.1	1.4	5.7	30min
DumB22	0.8	1.0	1.1	1.1	1.1	1.1	1.3	1.3	1.2	1.3	9hr
Dummy48	1.4	1.8	2.0	1.8	1.9	1.9	2.1	2.1	1.9	2.1	9hr
Dummy22	1.7	2.0	2.3	2.1	2.1	2.2	2.4	2.4	2.2	2.4	9hr
25.04b	1.5	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min
25.04a	2.5	2.2	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
Dummy23	5.1	4.6	4.6	3.4	3.3	3.1	3.2	3.2	2.8	5.1	30min
25.05a	1.6	1.4	1.4	0.9	0.8	0.6	0.5	0.5	0.3	1.6	30min
25.05b	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.2	0.1	0.6	30min
28.01	5.8	5.3	5.2	3.1	2.8	2.0	1.8	1.8	1.2	5.8	30min
28.02	7.1	6.8	6.5	4.8	4.2	3.3	2.9	2.9	2.0	7.1	30min
DumB20	0.5	0.7	0.9	0.9	0.9	1.0	1.2	1.3	1.2	1.3	12hr
Dummy24	6.1	5.9	5.8	4.5	4.5	4.3	4.8	4.6	4.4	6.1	30min
Dummy25	6.6	6.4	6.3	4.9	5.0	4.7	5.3	5.1	4.9	6.6	30min
25.07b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.4	30min
29.01	7.2	6.4	6.3	3.9	3.4	2.5	2.2	2.2	1.5	7.2	30min
29.02	8.5	8.0	7.7	5.6	5.0	4.0	3.5	3.5	2.4	8.5	30min
DumB17	0.6	0.8	1.0	1.1	1.1	1.1	1.4	1.5	1.4	1.5	12hr
25.07a	1.4	1.2	1.2	0.7	0.7	0.5	0.4	0.4	0.3	1.4	30min
Dummy26	7.3	7.5	7.3	5.8	6.2	6.0	7.0	6.9	6.6	7.5	1hr
1.22b	1.2	1.1	1.1	0.8	0.7	0.5	0.5	0.5	0.3	1.2	30min
1.20a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
1.20b	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	30min
1.21	7.0	6.2	5.9	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
24.01	4.3	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.3	30min
24.02	6.7	8.1	7.4	5.6	4.7	3.8	3.3	3.3	2.2	8.1	1hr
24.03	8.4	10.0	9.1	7.4	6.5	5.5	4.8	4.8	3.3	10.0	1hr
24.04	8.7	10.7	9.7	8.1	7.1	6.3	5.6	5.3	4.0	10.7	1hr
24.05	8.8	11.4	10.7	8.9	8.3	7.2	6.6	6.3	4.9	11.4	1hr
24.06	8.9	11.9	11.6	10.1	9.6	8.3	7.7	7.3	5.9	11.9	1hr
DummyO4	1.1	1.6	2.0	2.2	2.3	2.4	3.2	3.4	3.2	3.4	12hr
17.14b	2.5	2.2	2.2	1.3	1.2	0.9	0.8	0.8	0.5	2.5	30min
17.14a	3.2	2.8	2.7	1.8	1.5	1.1	1.0	1.0	0.7	3.2	30min
DumB9	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	12hr
17.13	3.0	2.6	2.5	1.7	1.5	1.1	0.9	1.0	0.6	3.0	30min
23.01	3.1	2.8	2.7	1.7	1.5	1.1	1.0	1.0	0.7	3.1	30min
20.01	4.6	4.2	4.1	2.4	2.2	1.6	1.4	1.4	0.9	4.6	30min
17.10a	2.2	2.0	1.9	1.2	1.1	0.8	0.7	0.7	0.5	2.2	30min
17.10b	3.3	3.0	2.9	1.9	1.7	1.2	1.1	1.1	0.7	3.3	30min
17.09	4.7	4.2	4.0	2.7	2.4	1.7	1.5	1.5	1.0	4.7	30min
17.08c	1.5	1.3	1.3	0.8	0.7	0.5	0.4	0.5	0.4	1.5	30min
17.08d	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.2	30min
18.01	6.1	5.5	5.5	3.3	2.9	2.1	1.8	1.9	1.2	6.1	30min
18.02	8.9	8.0	8.1	5.0	4.4	3.2	2.8	2.8	1.9	8.9	30min
17.08b	1.7	1.6	1.5	0.9	0.8	0.6	0.5	0.5	0.4	1.7	30min
17.08a	2.8	2.5	2.5	1.6	1.4	1.0	0.9	0.9	0.6	2.8	30min
17.01	3.5	3.2	3.2	1.8	1.6	1.2	1.0	1.0	0.7	3.5	30min
17.02	9.7	8.7	8.2	6.0	5.2	3.8	3.3	3.4	2.3	9.7	30min
17.03	14.5	16.2	16.1	12.7	10.4	9.0	7.8	7.9	5.3	16.2	1hr
17.04	20.3	22.7	23.6	18.7	14.9	13.2	11.6	11.7	8.0	23.6	2hr
17.06	24.1	26.0	26.6	21.5	19.3	16.2	14.5	14.0	10.6	26.6	2hr
17.07	25.2	27.4	28.3	23.3	21.5	18.1	16.4	15.9	12.3	28.3	2hr
Dummy18	26.9	30.0	31.1	26.2	25.3	21.9	19.6	19.2	15.1	31.1	2hr
DummyO3	2.4	3.5	4.4	4.9	5.2	5.6	7.2	7.9	7.5	7.9	12hr
Dummy19	2.4	3.5	4.4	4.9	5.3	5.8	7.5	8.2	7.8	8.2	12hr
Dummy36	5.3	5.2	4.7	5.1	5.7	6.2	7.8	8.5	8.3	8.5	12hr
21.01	6.5	5.8	5.5	3.8	3.4	2.5	2.2	2.2	1.5	6.5	30min
Dummy37	10.1	10.0	10.1	7.2	6.3	6.8	8.5	9.3	8.9	10.1	2hr
Dummy20	16.0	16.7	15.5	12.3	10.7	8.9	10.1	11.0	10.3	16.7	1hr
22.01	7.8	6.9	6.6	4.4	3.9	2.8	2.5	2.5	1.7	7.8	30min
17.11	1.5	1.3	1.3	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	19.0	20.5	18.6	15.5	14.0	11.9	12.8	13.1	11.6	20.5	1hr
17.12	3.9	3.5	3.4	2.2	1.9	1.4	1.2	1.2	0.8	3.9	30min
DumB8	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	12hr
Dummy54	19.2	20.8	18.9	15.7	14.3	12.2	13.2	13.6	12.1	20.8	1hr
Dummy38	19.7	21.6	19.6	16.6	15.2	13.0	14.0	14.1	12.5	21.6	1hr
Dummy35	20.0	22.3	20.2	17.2	15.8	13.8	14.7	14.6	12.8	22.3	1hr
Dummy21	20.3	23.1	21.3	18.2	16.6	14.8	15.8	15.5	13.6	23.1	1hr
17.15a	2.3	2.1	2.0	1.3	1.1	0.8	0.7	0.7	0.5	2.3	30min
DumB10	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	12hr
Dummy39	20.5	23.3	21.5	18.4	16.8	15.1	16.1	15.9	13.9	23.3	1hr
SU3	3.3	2.9	2.9	1.9	1.6	1.2	1.1	1.1	0.7	3.3	30min
Dummy40	21.3	24.6	23.2	20.1	18.5	17.2	19.0	19.2	17.4	24.6	1hr
17.15b	0.8	0.8	0.7	0.4	0.4	0.3	0.2	0.3	0.2	0.8	30min
Dummy41	21.3	24.7	23.3	20.3	18.6	17.3	19.1	19.4	17.5	24.7	1hr
17.16	21.3	24.9	24.4	21.7	19.2	18.5	20.3	20.3	18.1	24.9	1hr
1.18	2.9	2.7	2.6	1.8	1.6	1.2	1.0	1.0	0.7	2.9	30min
16.01	1.6	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.6	30min
15.02	2.2	2.3	2.2	1.7	1.4	1.1	1.0	1.0	0.7	2.3	1hr
DumB12	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	12hr
15.01	3.2	2.8	2.7	1.9	1.6	1.2	1.0	1.1	0.7	3.2	30min
14.01	6.2	5.5	5.3	3.4	3.0	2.2	1.9	1.9	1.3	6.2	30min
1.17a	7.2	6.7	6.7	4.7	4.0	3.1	2.7	2.7	1.8	7.2	30min
DumB11	0.6	0.8	1.0	1.0	1.0	1.1	1.3	1.3	1.2	1.3	9hr
1.17b	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
1.16	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
1.14	0.8	0.9	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.9	2hr
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
12.02a	1.7	1.5	1.5	0.9	0.8	0.6	0.5	0.5	0.3	1.7	30min
11.01	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
10.01	3.4	3.2	3.2	1.8	1.6	1.1	1.0	1.0	0.7	3.4	30min
10.02a	5.6	4.7	5.2	3.5	3.0	2.2	1.9	2.0	1.3	5.6	30min
DumB14	0.5	0.6	0.8	0.8	0.7	0.8	1.0	0.9	0.8	1.0	9hr
1.13b	1.6	1.5	1.4	0.9	0.8	0.6	0.5	0.6	0.4	1.6	30min
1.13a	1.8	1.6	1.6	1.0	0.9	0.6	0.6	0.6	0.4	1.8	30min
1.12a	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
DumB15	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	9hr
5.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
1.11a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
1.11b	2.2	2.0	2.0	1.2	1.0	0.7	0.7	0.7	0.4	2.2	30min
1.09b	0.9	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
1.09c	2.0	1.9	1.9	1.1	1.0	0.7	0.6	0.6	0.4	2.0	30min
4.01	2.5	2.3	2.3	1.3	1.2	0.8	0.7	0.7	0.5	2.5	30min
4.02	7.0	6.1	6.3	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
1.06a	4.1	3.6	3.5	2.2	2.0	1.4	1.3	1.3	0.9	4.1	30min
DumB35	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	9hr
1.01	16.2	15.0	14.4	10.2	8.8	6.6	5.8	5.8	3.9	16.2	30min
1.02	20.2	19.5	17.7	14.7	13.4	11.0	9.6	9.7	6.6	20.2	30min
2.01	24.1	23.2	22.5	16.3	13.9	10.6	9.3	9.4	6.3	24.1	30min
1.03	37.7	39.1	41.3	31.6	26.0	22.5	19.8	19.7	13.7	41.3	2hr
1.04	40.1	41.7	43.2	33.4	29.0	24.5	21.8	20.8	15.5	43.2	2hr
1.05	41.7	44.8	46.1	36.5	32.0	27.7	25.1	22.9	18.4	46.1	2hr
1.06b	42.0	46.3	48.2	39.1	33.3	29.9	27.5	24.2	20.3	48.2	2hr
DummyO1	3.0	4.3	5.4	6.1	6.6	7.2	9.2	10.2	9.8	10.2	12hr
Dummy1	3.3	4.7	5.9	6.5	7.0	7.6	9.8	10.9	10.5	10.9	12hr
1.07a	1.3	1.2	1.2	0.7	0.6	0.5	0.4	0.5	0.3	1.3	30min
1.07b	0.7	0.7	0.7	0.4	0.3	0.3	0.6	0.8	0.8	0.8	12hr
Dummy2	3.3	4.7	5.9	6.6	7.3	8.0	10.5	11.8	11.4	11.8	12hr
1.08a	3.0	2.7	2.7	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
1.08b	2.7	2.5	2.5	1.5	1.3	0.9	0.8	0.9	0.6	2.7	30min
Dummy3	7.0	6.5	5.9	6.7	7.6	8.5	11.0	12.3	12.0	12.3	12hr
3.01	3.5	3.3	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
1.09a	3.8	3.6	3.7	2.3	2.0	1.5	1.3	1.3	0.9	3.8	30min
DumB34	0.2	0.3	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.6	9hr
Dummy60	7.0	6.5	6.3	7.1	8.0	8.9	11.5	12.7	12.4	12.7	12hr
Dummy4	12.5	12.7	12.3	9.5	8.8	9.8	12.1	13.3	13.1	13.3	12hr
SU2	0.6	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.6	1.0	2hr
1.10b	1.7	1.6	1.6	1.2	1.3	1.2	1.2	1.2	0.9	1.7	30min
DumB31	0.2	0.4	0.5	0.5	0.5	0.6	0.8	0.8	0.7	0.8	9hr
Dummy42	12.5	12.8	12.4	9.6	9.4	10.4	12.9	14.0	13.7	14.0	12hr
1.10a	13.0	13.4	12.9	10.0	9.5	10.5	13.0	14.1	13.9	14.1	12hr
Dummy6	14.0	14.7	13.6	10.6	10.0	10.8	13.4	14.5	14.2	14.7	1hr
1.12c	2.6	2.4	2.4	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
DumB16	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	9hr
1.12b	14.8	16.1	15.0	12.1	11.3	11.9	14.9	15.9	15.7	16.1	1hr
Dummy7	14.8	16.2	15.5	12.6	11.6	12.2	15.3	16.5	16.2	16.5	12hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.07a	0.6	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.6	30min
DumB2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	12hr
8.01	7.0	6.2	6.1	3.8	3.4	2.4	2.1	2.2	1.4	7.0	30min
DumB1	0.3	0.4	0.5	0.6	0.6	0.6	0.8	0.9	0.8	0.9	12hr
7.01	3.5	3.2	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
7.02	10.0	10.6	10.1	7.1	5.9	4.8	4.2	4.2	2.8	10.6	1hr
7.03	14.1	15.6	14.8	12.3	10.0	8.4	7.4	7.4	5.0	15.6	1hr
7.04	16.4	18.5	17.4	13.8	12.2	10.0	8.9	8.8	6.3	18.5	1hr
7.05	18.2	21.3	19.6	15.7	15.4	12.7	11.1	11.3	8.3	21.3	1hr
7.06	18.6	22.4	20.8	17.1	16.3	14.1	12.4	12.1	9.5	22.4	1hr
DummyO2	1.7	2.4	3.0	3.3	3.5	3.7	4.8	5.2	4.9	5.2	12hr
7.07b	2.0	2.8	3.5	3.9	4.2	4.5	5.8	6.3	6.0	6.3	12hr
Dummy12	2.0	2.8	3.6	4.0	4.2	4.5	6.0	6.4	6.1	6.4	12hr
7.08b	3.6	3.2	3.1	2.0	1.7	1.2	1.1	1.1	0.7	3.6	30min
DumB3	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	12hr
7.08a	0.9	0.9	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
7.09a	2.9	2.6	2.6	1.6	1.4	1.0	0.9	0.9	0.6	2.9	30min
DumB4	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	12hr
Dummy11	2.3	3.2	4.1	4.5	4.8	5.2	6.8	7.3	7.0	7.3	12hr
7.09c	4.4	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.4	30min
DumB7	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	12hr
7.09b	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy43	2.4	3.4	4.4	4.8	5.2	5.6	7.3	7.9	7.4	7.9	12hr
7.10a	2.7	2.4	2.3	1.5	1.3	1.0	0.9	0.9	0.6	2.7	30min
7.10b	2.0	1.8	1.7	1.1	1.0	0.7	0.6	0.7	0.4	2.0	30min
Dummy9	5.0	5.0	4.9	5.1	5.6	6.0	7.7	8.3	7.8	8.3	12hr
9.01	2.3	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.3	30min
9.02b	3.7	3.1	3.5	2.3	2.0	1.4	1.3	1.3	0.9	3.7	30min
9.02a	3.8	3.4	3.3	2.1	1.8	1.3	1.2	1.2	0.8	3.8	30min
Dummy59	7.5	6.4	6.4	4.3	3.8	2.8	2.4	2.5	1.6	7.5	30min
DumB5	0.5	0.6	0.8	0.8	0.8	0.8	1.1	1.1	1.0	1.1	9hr
Dummy8	5.3	5.4	5.4	5.8	6.3	6.8	8.7	9.3	8.7	9.3	12hr
7.12	4.8	4.2	4.1	2.8	2.4	1.8	1.6	1.6	1.1	4.8	30min
DumB13	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	12hr
7.11a	2.5	2.3	2.3	1.3	1.1	0.8	0.7	0.7	0.5	2.5	30min
DumB6	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	9hr
7.11b	0.8	0.8	0.8	0.5	0.5	0.4	0.5	0.5	0.4	0.8	30min
Dummy10	5.8	6.1	6.0	6.5	7.1	7.5	9.7	10.3	9.7	10.3	12hr
12.01a	6.1	6.5	6.4	6.6	7.2	7.7	10.0	10.6	10.0	10.6	12hr
Dummy13	17.5	20.7	20.8	17.7	18.5	20.5	25.9	27.5	27.0	27.5	12hr
12.01b	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.3	30min
Dummy44	17.5	20.7	20.8	17.8	18.6	20.5	26.0	27.6	27.1	27.6	12hr
Dummy14	17.6	20.7	21.4	18.6	18.9	20.9	26.4	28.2	27.8	28.2	12hr
1.15	4.0	3.6	3.6	2.2	1.9	1.4	1.2	1.3	0.8	4.0	30min
Dummy45	17.6	20.7	21.7	19.1	19.1	21.2	26.8	28.9	28.3	28.9	12hr
Dummy15	18.0	21.4	22.9	20.6	20.1	22.3	28.2	30.7	29.9	30.7	12hr
Dummy46	18.0	21.4	23.1	21.0	20.3	22.6	28.5	31.1	30.3	31.1	12hr
Dummy16	18.2	21.7	23.5	21.7	20.9	23.1	29.2	32.0	31.2	32.0	12hr
Dummy17	29.5	35.3	36.8	36.2	35.1	36.7	45.2	50.6	49.2	50.6	12hr
1.22a	1.5	1.5	1.5	1.1	0.9	0.7	0.6	0.6	0.4	1.5	1hr
1.23	3.0	2.6	2.5	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
Dummy27	32.0	39.6	42.7	41.9	41.0	41.2	52.2	57.2	55.7	57.2	12hr
1.24	2.5	2.3	2.2	1.6	1.4	1.0	0.9	0.9	0.6	2.5	30min
Dummy49	32.0	39.6	42.8	42.1	41.4	41.3	52.4	57.3	55.9	57.3	12hr
Dummy50	32.2	39.8	43.1	42.5	41.9	41.7	53.1	58.0	56.6	58.0	12hr
Dummy51	32.6	40.4	43.9	43.3	43.0	42.6	54.3	59.0	57.8	59.0	12hr
Dummy52	32.6	40.4	43.9	43.3	43.1	42.8	54.5	59.2	58.0	59.2	12hr
Dummy53	32.8	40.8	44.4	43.9	44.0	43.8	55.7	60.3	59.3	60.3	12hr
1.27	32.8	40.8	44.4	44.0	44.4	44.5	56.7	61.4	60.6	61.4	12hr
E18	0.9	0.8	0.8	0.5	0.4	0.3	0.5	0.8	0.7	0.9	30min
1.28	32.8	40.8	44.4	44.0	44.8	45.3	57.7	62.2	61.5	62.2	12hr
Out	33.7	42.0	46.2	46.7	52.1	54.4	64.9	68.3	68.7	68.7	18hr

Table C.19B Estimated 100 yr ARI Peak Flows (m3/s) under Scenario B Development + Precinct Basins + Major External Basins at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.3	1.1	1.7	1.7	1.7	2.0	2.3	2.3	1.8	2.3	12hr
E17b	0.3	1.0	1.6	1.6	1.5	1.8	2.1	2.1	1.7	2.1	12hr
Dummy57	0.7	2.2	3.2	3.3	3.2	3.8	4.4	4.5	3.5	4.5	12hr
E17c	4.6	4.6	7.0	7.6	7.4	8.2	10.0	10.0	7.7	10.0	9hr
E17d	0.9	1.3	2.0	2.0	2.0	2.3	2.7	2.8	2.2	2.8	12hr
E9	0.7	1.8	2.3	2.2	2.3	2.6	2.6	2.8	2.2	2.8	12hr
E10	8.9	8.5	8.7	5.1	4.7	3.7	3.6	3.9	2.8	8.9	30min
DumB27	1.1	1.7	2.1	2.1	2.0	2.3	2.7	2.8	2.1	2.8	12hr
E3	10.6	10.5	10.9	6.3	5.8	5.1	4.9	5.3	3.8	10.9	2hr
E2	0.6	1.4	1.9	1.8	1.8	2.1	2.1	2.3	1.8	2.3	12hr
E1	0.5	1.3	1.7	1.6	1.6	1.8	1.8	2.0	1.5	2.0	12hr
Dummy56	1.2	2.7	3.5	3.4	3.5	3.9	4.0	4.4	3.3	4.4	12hr
Dummy30	11.0	11.0	11.3	7.0	7.5	8.1	8.2	9.2	7.0	11.3	2hr
E5	22.8	20.0	22.5	14.6	13.3	13.1	13.7	15.5	11.6	22.8	30min
DumB29	7.4	9.3	10.4	10.2	10.2	11.7	12.7	13.1	10.2	13.1	12hr
E6a	5.6	5.5	5.7	3.3	3.0	2.5	2.4	2.6	1.9	5.7	2hr
E6b	3.2	3.2	3.3	2.0	2.1	2.1	2.2	2.5	1.9	3.3	2hr
Dummy31	9.7	12.4	13.8	13.3	13.5	15.1	16.6	17.2	13.3	17.2	12hr
E8a	2.7	2.6	2.7	1.6	1.5	1.3	1.3	1.5	1.1	2.7	2hr
E8b	4.6	4.6	4.7	2.7	2.5	2.2	2.2	2.4	1.8	4.7	2hr
E7a	0.7	0.8	1.1	1.0	1.1	1.1	1.1	1.3	1.0	1.3	12hr
E7b	3.3	3.4	3.5	3.2	3.4	3.8	3.9	4.4	3.3	4.4	12hr
E8c	3.9	4.1	4.5	4.2	4.3	5.0	5.2	5.6	4.3	5.6	12hr
Dummy32	18.0	18.5	21.4	19.7	19.8	22.5	24.6	25.4	19.8	25.4	12hr
E11a	18.9	19.8	22.5	20.7	20.8	23.7	25.7	26.5	20.7	26.5	12hr
E11b	20.3	22.5	26.6	25.8	25.9	29.4	31.9	32.9	25.5	32.9	12hr
E13	9.9	9.9	10.4	6.1	5.8	5.5	5.9	6.5	4.8	10.4	2hr
E12	0.6	1.5	1.9	1.7	1.9	1.9	1.9	2.1	1.6	2.1	12hr
E14	4.1	4.1	4.2	2.4	2.2	1.9	1.8	1.9	1.3	4.2	2hr
E15b	2.0	2.0	2.0	1.2	1.1	0.9	0.9	0.9	0.6	2.0	2hr
E15a	2.3	2.3	2.4	1.4	1.3	1.1	1.0	1.0	0.7	2.4	2hr
Dummy29	7.5	6.5	7.5	4.8	4.5	3.8	3.5	3.8	2.7	7.5	30min
E16a	11.1	12.0	11.7	8.9	8.0	7.0	7.1	7.8	5.6	12.0	1hr
DumB25	2.7	4.1	4.8	4.7	4.7	5.2	5.9	6.0	4.5	6.0	12hr
E16b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy28	24.0	31.0	37.5	36.1	35.9	40.2	43.8	43.9	34.4	43.9	12hr
Dummy33	25.7	36.6	46.1	45.6	44.4	50.5	55.7	54.2	42.9	55.7	9hr
SE5	1.4	1.4	2.2	2.1	1.9	2.5	2.6	2.9	2.2	2.9	12hr
SE1	4.6	4.5	4.7	2.7	2.4	2.0	1.9	2.1	1.5	4.7	2hr
SE2	13.6	13.4	13.8	7.9	7.2	5.9	5.6	6.1	4.3	13.8	2hr
DumB32	2.2	3.3	3.8	3.7	3.9	4.2	4.5	4.8	3.6	4.8	12hr
SE3	0.9	2.4	4.1	4.6	4.7	5.0	6.3	6.2	4.7	6.3	9hr
SE6a	2.9	2.9	5.1	5.8	5.9	6.3	7.8	7.6	5.8	7.8	9hr
Dummy58	7.9	7.9	9.4	10.1	10.0	10.9	13.8	14.1	10.5	14.1	12hr
SE6b	11.4	11.8	13.1	13.4	13.3	15.0	18.4	18.8	14.2	18.8	12hr
SE_out	11.4	11.8	13.1	13.4	13.3	15.0	18.4	18.8	14.2	18.8	12hr
33.01a	2.2	2.2	2.3	1.6	1.7	1.9	2.0	2.3	1.7	2.3	2hr
33.01b	2.3	2.3	2.5	2.0	2.1	2.5	2.6	2.9	2.2	2.9	12hr
32.01	4.8	4.8	4.9	2.8	2.6	2.1	2.0	2.2	1.5	4.9	2hr
32.02	12.8	13.4	12.5	9.4	8.4	6.9	7.6	8.4	5.8	13.4	1hr
DumB19	1.9	3.1	3.9	4.2	4.2	4.4	5.9	5.7	4.7	5.9	9hr
1.26	0.6	0.7	1.3	1.6	1.7	1.8	2.3	2.2	1.9	2.3	9hr
31.03	2.8	2.6	2.6	1.7	1.6	1.3	1.7	1.9	1.4	2.8	30min
30.01	8.4	8.1	8.3	4.8	4.4	3.4	3.4	3.6	2.6	8.4	30min
30.02	21.2	18.4	20.0	13.3	11.9	9.2	9.1	9.8	7.0	21.2	30min
1.25b	22.7	20.0	21.3	14.6	13.3	10.3	10.2	11.0	7.8	22.7	30min
DummyO5	1.9	3.4	4.6	5.1	5.1	5.3	7.0	6.8	5.1	7.0	9hr
1.25a	1.9	1.8	1.8	1.2	1.1	1.0	1.3	1.5	1.1	1.9	30min
31.01b	1.4	1.4	1.4	0.8	0.7	0.6	0.6	0.6	0.4	1.4	2hr
31.01a	3.0	2.9	3.1	1.7	1.6	1.3	1.2	1.3	0.9	3.1	2hr
Dummy55	4.3	4.3	4.5	2.5	2.3	1.9	1.8	1.9	1.4	4.5	2hr
31.02	6.5	7.6	7.0	5.1	4.6	3.8	4.0	4.4	3.1	7.6	1hr
DumB18	1.4	2.1	2.5	2.5	2.5	2.8	3.3	3.3	2.5	3.3	12hr
25.06a	5.2	5.0	5.1	3.0	2.7	2.1	2.0	2.2	1.6	5.2	30min
DumB21	0.5	0.8	1.0	1.1	1.1	1.2	1.4	1.4	1.0	1.4	9hr
25.06b	1.5	1.6	1.6	1.6	1.5	1.8	2.1	2.2	1.6	2.2	12hr
25.06c	1.0	1.0	1.0	0.6	0.6	0.5	0.6	0.7	0.5	1.0	2hr
25.03c	2.6	2.6	2.6	1.5	1.4	1.1	1.1	1.2	0.9	2.6	30min
25.03b	0.9	0.9	0.9	0.5	0.5	0.5	0.6	0.7	0.5	0.9	2hr
25.01	0.8	0.9	1.2	1.3	1.3	1.4	1.9	1.9	1.4	1.9	12hr
27.01	6.0	5.7	5.7	3.6	3.3	3.0	3.6	4.1	3.0	6.0	30min
25.03a	7.4	7.1	7.4	4.6	4.2	3.6	4.3	4.8	3.5	7.4	2hr
DumB23	2.3	2.8	3.1	2.8	3.0	3.2	4.0	4.1	3.0	4.1	12hr
26.01a	5.3	5.1	5.2	3.0	2.7	2.1	2.1	2.3	1.6	5.3	30min
26.01b	0.3	0.7	1.3	1.4	1.4	1.5	1.9	1.9	1.4	1.9	9hr
Dummy47	5.6	5.5	5.6	3.4	3.2	3.1	3.7	4.2	3.0	5.6	2hr
25.02	12.5	11.5	11.4	8.1	7.4	6.1	7.0	7.9	5.7	12.5	30min
DumB22	2.8	3.8	4.3	4.4	4.4	4.8	6.1	6.1	4.4	6.1	12hr
Dummy48	5.1	6.6	7.2	7.3	7.2	8.0	10.1	10.2	7.4	10.2	12hr
Dummy22	5.2	7.4	8.4	8.2	8.2	9.1	11.2	11.2	8.3	11.2	9hr
25.04b	3.1	3.0	3.1	1.8	1.7	1.3	1.4	1.6	1.1	3.1	30min
25.04a	5.2	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.2	30min
Dummy23	11.0	9.9	11.0	10.3	10.0	11.1	14.0	13.6	10.1	14.0	9hr
25.05a	3.3	3.1	3.2	1.9	1.7	1.4	1.4	1.5	1.1	3.3	30min
25.05b	1.2	1.2	1.3	0.7	0.7	0.6	0.7	0.8	0.6	1.3	2hr
28.01	12.1	11.6	11.8	7.0	6.3	4.9	4.7	5.1	3.6	12.1	30min
28.02	15.3	15.6	15.0	10.9	9.7	8.0	8.1	8.8	6.2	15.6	1hr
DumB20	2.0	3.3	4.2	4.4	4.4	4.8	6.0	5.9	4.3	6.0	9hr
Dummy24	13.3	13.1	15.9	16.0	15.6	17.0	21.4	20.6	15.4	21.4	9hr
Dummy25	14.6	14.7	17.8	17.8	17.4	19.1	23.8	22.8	17.1	23.8	9hr
25.07b	0.9	0.9	0.9	0.6	0.6	0.7	0.8	0.9	0.7	0.9	2hr
29.01	14.9	14.2	14.5	8.6	7.7	6.0	5.8	6.2	4.4	14.9	30min
29.02	18.3	17.9	17.6	12.7	11.5	9.5	9.6	10.5	7.4	18.3	30min
DumB17	2.2	3.7	4.9	5.2	5.2	5.5	7.0	6.9	5.1	7.0	9hr
25.07a	2.8	2.7	2.8	1.7	1.5	1.2	1.3	1.4	1.0	2.8	30min
Dummy26	16.8	18.6	23.8	24.2	23.7	25.9	32.2	30.7	23.0	32.2	9hr
1.22b	2.8	2.5	2.6	1.8	1.6	1.2	1.2	1.4	0.9	2.8	30min
1.20a	0.1	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
1.20b	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.6	12hr
1.21	15.0	13.6	13.8	8.9	8.0	6.2	6.1	6.5	4.6	15.0	30min
24.01	9.0	8.6	8.8	5.2	4.7	3.6	3.6	3.9	2.8	9.0	30min
24.02	15.1	18.2	17.2	12.4	10.8	8.8	8.7	9.4	6.6	18.2	1hr
24.03	19.4	22.6	21.0	16.8	15.2	12.9	12.7	13.8	9.8	22.6	1hr
24.04	20.2	24.6	22.8	18.5	16.9	15.1	15.0	15.3	11.8	24.6	1hr
24.05	20.6	26.6	25.6	20.6	19.8	17.9	18.0	18.3	14.3	26.6	1hr
24.06	20.8	28.3	28.3	23.7	22.4	20.9	21.4	21.0	17.1	28.3	2hr
DummyO4	3.9	7.4	10.8	11.7	11.6	12.5	15.6	14.6	11.3	15.6	9hr
17.14b	5.1	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.1	30min
17.14a	6.6	6.3	6.5	4.0	3.6	3.0	3.5	3.9	2.8	6.6	30min
DumB9	1.3	1.7	2.0	2.1	2.1	2.2	2.9	2.9	2.1	2.9	9hr
17.13	6.3	5.8	5.9	3.7	3.3	2.6	2.5	2.7	1.9	6.3	30min
23.01	6.6	6.2	6.3	3.8	3.5	2.7	2.6	2.8	2.0	6.6	30min
20.01	9.5	9.1	9.4	5.4	4.9	3.9	3.8	4.1	2.9	9.5	30min
17.10a	4.7	4.3	4.4	2.7	2.5	1.9	1.9	2.0	1.4	4.7	30min
17.10b	7.2	6.5	6.6	4.3	3.9	3.0	2.9	3.1	2.2	7.2	30min
17.09	10.1	9.2	9.3	6.0	5.4	4.1	4.0	4.3	3.0	10.1	30min
17.08c	3.0	3.0	3.0	1.9	1.7	1.6	1.9	2.1	1.5	3.0	30min
17.08d	0.4	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.4	2hr
18.01	12.6	12.1	12.3	7.3	6.5	5.1	5.0	5.4	3.9	12.6	30min
18.02	18.6	17.4	18.2	11.1	10.0	7.8	7.7	8.3	5.9	18.6	30min
17.08b	3.6	3.4	3.5	2.1	1.9	1.5	1.4	1.6	1.1	3.6	30min
17.08a	5.9	5.6	5.8	3.5	3.1	2.5	2.4	2.6	1.9	5.9	30min
17.01	7.1	7.0	7.2	4.1	3.7	2.9	2.9	3.1	2.2	7.2	2hr
17.02	20.9	19.0	18.2	13.1	11.8	9.2	9.0	9.8	6.9	20.9	30min
17.03	32.4	37.9	37.4	28.3	23.9	20.9	20.5	22.2	15.6	37.9	1hr
17.04	46.8	51.2	54.0	41.8	34.4	31.0	30.3	32.9	23.2	54.0	2hr
17.06	56.3	58.8	60.6	48.0	44.4	38.3	38.5	39.5	29.9	60.6	2hr
17.07	59.6	62.7	65.4	52.7	50.2	43.5	44.2	45.1	34.6	65.4	2hr
Dummy18	65.2	69.3	73.4	61.0	60.1	52.6	53.8	55.2	42.5	73.4	2hr
DummyO3	8.0	15.6	24.2	27.0	27.5	28.7	37.4	34.8	28.4	37.4	9hr
Dummy19	8.1	16.0	25.1	27.9	28.5	29.8	38.7	35.7	29.4	38.7	9hr
Dummy36	11.8	16.2	25.8	29.2	30.0	31.6	40.5	36.6	30.9	40.5	9hr
21.01	14.1	12.8	12.8	8.5	7.6	5.8	5.8	6.4	4.4	14.1	30min
Dummy37	22.8	22.0	27.1	31.3	32.6	34.5	43.4	38.1	33.5	43.4	9hr
Dummy20	35.9	36.3	35.2	34.2	35.9	38.1	47.2	39.9	36.8	47.2	9hr
22.01	16.5	15.2	15.5	9.7	8.7	6.7	6.5	7.0	4.9	16.5	30min
17.11	3.1	2.9	3.0	1.8	1.7	1.3	1.5	1.7	1.2	3.1	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	43.4	44.8	41.8	37.1	38.9	41.8	50.9	45.2	40.4	50.9	9hr
17.12	8.3	7.8	8.0	4.9	4.4	3.4	3.6	3.9	2.8	8.3	30min
DumB8	0.8	1.3	1.7	1.9	1.9	1.9	2.6	2.5	1.9	2.6	9hr
Dummy54	44.2	45.9	43.0	38.8	40.6	43.7	53.1	47.2	42.3	53.1	9hr
Dummy38	45.6	47.9	44.7	39.6	41.5	44.8	54.2	48.8	43.5	54.2	9hr
Dummy35	46.2	49.5	46.3	40.4	42.5	45.9	55.2	50.1	44.6	55.2	9hr
Dummy21	47.4	52.2	49.9	42.8	45.0	48.6	58.1	53.2	47.7	58.1	9hr
17.15a	4.9	4.6	4.7	2.9	2.6	2.1	2.2	2.4	1.7	4.9	30min
DumB10	0.7	1.0	1.2	1.3	1.3	1.4	1.7	1.7	1.2	1.7	9hr
Dummy39	48.0	53.2	51.1	43.7	46.0	49.7	59.3	54.4	48.8	59.3	9hr
SU3	7.1	6.5	6.7	4.1	3.7	2.8	2.8	3.0	2.1	7.1	30min
Dummy40	50.4	57.6	57.4	55.9	58.2	62.0	73.9	68.8	61.0	73.9	9hr
17.15b	1.7	1.7	1.7	1.0	1.0	0.8	1.0	1.1	0.8	1.7	2hr
Dummy41	50.4	57.9	58.1	56.3	58.6	62.5	74.3	69.2	61.5	74.3	9hr
17.16	50.6	58.6	61.3	57.8	60.8	64.5	76.0	70.9	64.1	76.0	9hr
1.18	6.5	5.9	5.9	4.1	3.6	2.8	2.9	3.2	2.2	6.5	30min
16.01	3.2	3.1	3.2	1.8	1.7	1.3	1.3	1.4	1.0	3.2	30min
15.02	4.8	5.2	5.0	3.8	3.4	2.9	3.6	4.1	2.9	5.2	1hr
DumB12	1.4	1.9	2.1	2.2	2.2	2.4	3.3	3.2	2.7	3.3	9hr
15.01	6.9	6.2	6.3	4.2	3.8	3.0	3.3	3.6	2.5	6.9	30min
14.01	12.9	12.1	12.4	7.6	6.8	5.4	5.4	5.9	4.2	12.9	30min
1.17a	15.1	14.8	15.5	10.5	9.4	7.6	8.0	8.8	6.3	15.5	2hr
DumB11	2.3	3.6	4.5	4.6	4.6	5.0	6.3	6.2	4.5	6.3	9hr
1.17b	0.7	0.7	0.8	0.9	0.9	1.0	1.2	1.3	1.0	1.3	12hr
1.16	7.4	7.2	7.4	4.3	3.9	3.2	3.2	3.5	2.5	7.4	30min
1.14	2.1	2.1	2.1	1.6	1.4	1.1	1.1	1.2	0.8	2.1	2hr
12.02b	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	12hr
12.02a	3.5	3.3	3.4	2.1	1.9	1.6	1.7	1.9	1.4	3.5	30min
11.01	6.6	6.5	6.7	3.8	3.5	2.8	2.7	2.9	2.1	6.7	2hr
10.01	7.0	6.9	7.2	4.1	3.7	3.1	2.9	3.1	2.2	7.2	2hr
10.02a	11.9	10.1	11.7	7.7	7.0	5.6	5.5	5.9	4.3	11.9	30min
DumB14	2.0	3.1	3.7	3.6	3.7	4.0	4.4	4.6	3.5	4.6	12hr
1.13b	3.4	3.2	3.3	2.1	1.9	1.9	2.2	2.5	1.8	3.4	30min
1.13a	3.7	3.6	3.7	2.2	2.0	1.7	1.9	2.1	1.5	3.7	30min
1.12a	7.5	7.2	7.3	4.4	3.9	3.1	3.0	3.2	2.3	7.5	30min
DumB15	0.9	1.5	1.8	1.8	1.8	2.0	2.3	2.4	1.8	2.4	12hr
5.01	0.2	0.3	0.7	0.9	0.9	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	2.7	2.7	2.7	1.6	1.5	1.2	1.2	1.3	0.9	2.7	2hr
1.11b	4.5	4.4	4.5	2.7	2.5	2.2	2.3	2.6	1.9	4.5	30min
1.09b	1.8	1.8	1.9	1.1	1.0	0.8	0.8	0.9	0.6	1.9	2hr
1.09c	4.2	4.1	4.2	2.5	2.3	1.9	2.0	2.2	1.6	4.2	30min
4.01	5.1	5.0	5.2	2.9	2.6	2.0	1.8	1.8	1.3	5.2	2hr
4.02	14.7	13.2	13.9	8.8	7.9	6.0	5.4	5.7	4.0	14.7	30min
1.06a	8.6	8.1	8.3	5.1	4.6	3.8	4.3	4.8	3.4	8.6	30min
DumB35	1.5	2.1	2.5	2.6	2.6	2.7	3.5	3.5	2.5	3.5	9hr
1.01	36.7	32.9	33.1	22.6	20.3	15.6	15.1	16.3	11.4	36.7	30min
1.02	46.5	43.3	40.8	33.0	31.2	25.8	25.2	27.3	19.2	46.5	30min
2.01	56.2	51.5	51.8	36.4	32.3	24.9	23.9	25.8	17.8	56.2	30min
1.03	85.7	91.4	96.0	70.8	60.0	53.2	51.7	55.4	38.9	96.0	2hr
1.04	91.8	97.6	100.8	75.2	67.3	58.7	57.7	59.0	43.6	100.8	2hr
1.05	95.3	105.3	108.8	83.5	75.2	67.6	67.3	66.2	51.7	108.8	2hr
1.06b	96.2	109.5	115.0	90.5	79.8	74.3	74.4	70.7	57.0	115.0	2hr
DummyO1	9.7	19.1	30.5	34.7	35.6	36.8	48.9	45.4	37.9	48.9	9hr
Dummy1	10.5	20.4	32.6	37.0	37.9	39.3	51.9	48.1	40.1	51.9	9hr
1.07a	2.8	2.7	2.8	1.7	1.6	1.5	1.7	1.9	1.4	2.8	30min
1.07b	1.5	1.5	2.5	2.9	2.9	3.1	4.0	4.0	2.9	4.0	9hr
Dummy2	11.1	21.9	35.2	40.2	41.3	43.2	56.4	51.7	43.5	56.4	9hr
1.08a	6.3	6.1	6.2	3.7	3.3	2.5	2.4	2.5	1.8	6.3	30min
1.08b	5.7	5.5	5.7	3.4	3.1	2.7	2.9	3.2	2.4	5.7	30min
Dummy3	15.1	22.3	35.8	41.5	43.4	45.4	58.6	52.6	45.5	58.6	9hr
3.01	7.3	7.1	7.3	4.1	3.7	2.8	2.5	2.6	1.8	7.3	2hr
1.09a	7.9	7.9	8.5	5.1	4.6	3.6	3.2	3.4	2.4	8.5	2hr
DumB34	1.1	1.8	2.1	2.1	2.2	2.3	2.4	2.6	2.0	2.6	12hr
Dummy60	15.3	23.0	36.8	42.7	44.5	46.7	60.0	53.7	46.7	60.0	9hr
Dummy4	27.8	28.0	37.2	44.1	47.3	49.7	62.8	55.1	49.5	62.8	9hr
SU2	2.1	2.8	3.1	2.8	2.9	2.8	2.8	3.0	2.3	3.1	2hr
1.10b	3.6	3.8	4.2	3.9	4.1	4.0	4.0	4.3	3.3	4.3	12hr
DumB31	1.0	2.2	3.1	3.1	3.0	3.3	3.6	3.5	2.8	3.6	9hr
Dummy42	28.0	28.2	39.0	46.2	49.2	51.9	65.3	56.9	51.4	65.3	9hr
1.10a	29.1	29.7	39.2	46.6	49.7	52.5	65.9	57.4	52.0	65.9	9hr
Dummy6	31.9	33.0	39.6	47.4	50.8	54.0	67.0	58.5	53.5	67.0	9hr
1.12c	5.4	5.2	5.4	3.1	2.8	2.3	2.2	2.4	1.7	5.4	30min
DumB16	0.7	1.1	1.4	1.3	1.3	1.5	1.7	1.8	1.3	1.8	12hr
1.12b	34.6	38.2	42.6	51.3	55.0	58.9	71.9	62.8	58.4	71.9	9hr
Dummy7	34.9	39.5	43.2	52.2	56.2	60.5	73.4	65.8	60.4	73.4	9hr
10.02b	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	1.2	1.2	1.2	0.7	0.7	0.8	1.0	1.1	0.8	1.2	2hr
DumB2	0.2	0.4	0.6	0.6	0.6	0.7	0.8	0.8	0.6	0.8	9hr
8.01	14.5	13.7	14.0	8.5	7.6	6.0	6.0	6.5	4.6	14.5	30min
DumB1	1.1	2.0	2.7	3.0	3.0	3.1	4.2	4.1	3.0	4.2	9hr
7.01	7.2	7.0	7.2	4.1	3.8	3.0	2.9	3.1	2.2	7.2	2hr
7.02	21.4	23.3	23.3	15.6	13.5	11.3	11.1	12.0	8.5	23.3	1hr
7.03	33.2	35.0	33.7	27.5	23.2	19.8	19.5	21.2	15.0	35.0	1hr
7.04	38.3	41.0	39.8	30.8	28.3	23.6	23.6	25.2	18.4	41.0	1hr
7.05	43.3	47.6	45.0	35.9	36.1	30.0	30.3	32.5	24.2	47.6	1hr
7.06	44.1	50.3	48.2	39.4	38.5	33.4	34.1	34.9	27.0	50.3	1hr
DummyO2	5.7	11.2	16.7	18.3	18.4	19.4	24.6	23.4	18.2	24.6	9hr
7.07b	6.7	13.3	20.2	22.0	22.2	23.5	29.5	27.8	21.9	29.5	9hr
Dummy12	6.9	13.6	20.7	22.6	22.8	24.1	30.3	28.5	22.4	30.3	9hr
7.08b	7.5	7.1	7.2	4.3	3.8	2.9	2.7	2.9	2.0	7.5	30min
DumB3	0.5	0.9	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
7.08a	1.9	1.9	2.0	1.1	1.1	1.0	1.1	1.3	1.0	2.0	2hr
7.09a	6.0	5.8	5.9	3.4	3.1	2.4	2.3	2.5	1.8	6.0	30min
DumB4	0.6	1.0	1.2	1.3	1.2	1.4	1.7	1.7	1.2	1.7	12hr
Dummy11	7.7	15.2	23.3	25.5	25.7	27.3	34.1	31.6	25.2	34.1	9hr
7.09c	9.1	8.6	8.8	5.2	4.7	3.5	3.2	3.4	2.4	9.1	30min
DumB7	0.6	1.1	1.5	1.5	1.5	1.7	2.1	2.1	1.5	2.1	12hr
7.09b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy43	8.2	16.0	24.8	27.1	27.3	29.1	36.2	33.4	26.8	36.2	9hr
7.10a	5.7	5.2	5.3	3.4	3.0	2.3	2.2	2.4	1.7	5.7	30min
7.10b	4.3	4.0	4.0	2.5	2.3	1.8	1.7	1.8	1.3	4.3	30min
Dummy9	10.8	16.3	25.7	28.5	28.9	30.9	38.0	34.2	28.3	38.0	9hr
9.01	4.7	4.7	4.9	2.8	2.5	2.0	2.0	2.1	1.5	4.9	2hr
9.02b	7.8	6.6	7.8	5.0	4.5	3.6	3.5	3.8	2.7	7.8	2hr
9.02a	7.9	7.6	7.7	4.6	4.1	3.2	3.1	3.4	2.4	7.9	30min
Dummy59	15.7	14.0	14.0	9.5	8.6	6.8	6.7	7.2	5.1	15.7	30min
DumB5	1.8	3.0	3.8	3.7	3.7	4.2	5.0	5.1	3.7	5.1	12hr
Dummy8	11.7	17.9	28.7	31.6	31.9	34.2	42.0	37.4	31.2	42.0	9hr
7.12	10.3	9.4	9.5	6.2	5.6	4.3	4.5	5.0	3.5	10.3	30min
DumB13	0.8	1.4	1.9	2.2	2.3	2.4	3.2	3.0	2.6	3.2	9hr
7.11a	5.1	5.0	5.2	2.9	2.7	2.1	2.1	2.2	1.6	5.2	2hr
DumB6	0.7	1.0	1.2	1.2	1.2	1.4	1.6	1.6	1.2	1.6	12hr
7.11b	1.7	1.8	1.9	1.7	1.8	1.9	2.1	2.3	1.7	2.3	12hr
Dummy10	13.4	19.4	31.4	34.9	35.3	37.7	46.3	40.7	34.7	46.3	9hr
12.01a	14.2	19.7	32.0	35.8	36.3	39.0	47.5	41.5	35.7	47.5	9hr
Dummy13	43.9	56.4	73.5	87.7	92.7	99.4	119.3	103.2	96.6	119.3	9hr
12.01b	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.0	0.8	1.0	12hr
Dummy44	44.0	56.7	73.7	87.9	93.1	99.8	119.7	103.8	97.0	119.7	9hr
Dummy14	44.4	57.6	74.2	88.7	95.0	101.8	121.5	107.0	99.8	121.5	9hr
1.15	8.4	8.1	8.3	5.0	4.5	3.8	4.2	4.8	3.4	8.4	30min
Dummy45	44.7	58.4	74.5	89.3	96.4	103.5	122.6	109.3	101.8	122.6	9hr
Dummy15	46.3	61.5	76.7	92.3	101.1	108.5	126.9	116.0	107.5	126.9	9hr
Dummy46	46.5	61.9	77.1	92.8	102.2	109.9	127.9	117.8	109.0	127.9	9hr
Dummy16	47.0	63.0	78.3	94.5	105.1	113.1	130.8	122.2	112.6	130.8	9hr
Dummy17	71.1	87.1	122.7	145.4	164.7	174.6	201.6	195.8	177.0	201.6	9hr
1.22a	3.6	3.4	3.5	2.5	2.2	1.7	1.8	2.0	1.5	3.6	30min
1.23	6.3	5.8	5.9	3.7	3.3	2.5	2.5	2.7	1.9	6.3	30min
Dummy27	80.3	105.1	141.1	160.8	183.7	194.5	223.3	222.2	200.0	223.3	9hr
1.24	5.6	5.1	5.1	3.4	3.1	2.3	2.2	2.4	1.6	5.6	30min
Dummy49	80.3	105.2	141.3	161.0	184.0	195.0	223.8	222.8	201.0	223.8	9hr
Dummy50	80.8	106.1	142.3	162.1	185.2	196.6	225.5	224.9	203.8	225.5	9hr
Dummy51	81.9	107.8	144.1	164.0	187.3	199.2	228.2	228.2	208.3	228.2	12hr
Dummy52	82.0	108.0	144.4	164.3	187.6	199.7	228.8	228.9	209.2	228.9	12hr
Dummy53	82.9	109.7	146.4	166.4	189.9	202.6	232.1	232.8	214.4	232.8	12hr
1.27	83.5	111.3	148.5	168.7	192.4	205.7	235.7	236.8	220.1	236.8	12hr
E18	1.8	1.8	2.3	2.6	2.7	2.8	3.6	3.7	2.8	3.7	12hr
1.28	84.1	112.4	149.5	169.7	193.5	207.4	237.7	239.1	224.4	239.1	12hr
Out	87.9	118.2	154.2	175.1	200.0	221.2	250.8	259.2	257.0	259.2	12hr

Table C.20A Estimated 2 yr ARI Peak Flows (m3/s) under Scenario B Development + Precinct Basins + Major External Basins + External OSD Only at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E17b	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	12hr
Dummy57	0.0	0.0	0.0	0.0	0.3	0.4	0.7	0.9	0.8	0.9	12hr
E17c	2.2	2.1	2.1	1.2	1.0	1.0	1.6	2.1	1.9	2.2	30min
E17d	0.4	0.4	0.4	0.2	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E9	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.6	12hr
E10	4.3	3.8	3.8	2.3	2.0	1.5	1.3	1.3	0.9	4.3	30min
DumB27	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.6	9hr
E3	5.2	5.0	5.0	2.7	2.4	1.7	1.5	1.6	1.0	5.2	30min
E2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.5	12hr
E1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.4	12hr
Dummy56	0.4	0.3	0.4	0.2	0.4	0.5	0.8	0.9	0.7	0.9	12hr
Dummy30	5.4	5.2	5.1	2.9	2.5	1.8	1.8	2.1	1.5	5.4	30min
E5	10.9	9.3	10.2	6.5	5.7	4.2	3.7	3.8	2.6	10.9	30min
DumB29	2.2	2.8	2.9	2.6	2.8	2.6	2.7	2.7	2.4	2.9	2hr
E6a	2.7	2.6	2.6	1.4	1.3	0.9	0.8	0.8	0.5	2.7	30min
E6b	1.6	1.5	1.5	0.8	0.7	0.5	0.5	0.6	0.4	1.6	30min
Dummy31	4.5	4.7	4.8	3.6	3.9	3.5	3.8	3.6	3.2	4.8	2hr
E8a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
E8b	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
E7a	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
E7b	1.6	1.6	1.6	0.9	0.8	0.5	0.7	1.0	0.7	1.6	30min
E8c	1.8	1.8	1.9	1.2	1.0	0.8	1.0	1.2	0.9	1.9	2hr
Dummy32	8.5	8.0	8.9	6.1	5.7	5.1	5.4	5.4	4.7	8.9	2hr
E11a	8.8	8.4	9.2	6.4	6.1	5.3	5.7	5.7	5.0	9.2	2hr
E11b	9.3	9.0	9.8	6.9	6.7	5.9	6.9	7.1	6.2	9.8	2hr
E13	4.9	4.7	4.7	2.5	2.2	1.6	1.4	1.6	1.1	4.9	30min
E12	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.5	0.4	0.5	12hr
E14	2.0	1.9	2.0	1.1	0.9	0.7	0.6	0.6	0.4	2.0	30min
E15b	1.0	0.9	1.0	0.5	0.4	0.3	0.3	0.3	0.2	1.0	30min
E15a	1.1	1.1	1.1	0.6	0.5	0.4	0.3	0.3	0.2	1.1	30min
Dummy29	3.6	3.1	3.3	2.1	1.9	1.4	1.2	1.2	0.8	3.6	30min
E16a	5.2	5.5	5.3	4.0	3.4	2.7	2.4	2.4	1.6	5.5	1hr
DumB25	0.6	0.9	1.0	1.0	1.0	1.1	1.3	1.2	1.1	1.3	9hr
E16b	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy28	10.2	10.5	11.8	8.8	8.8	7.9	9.7	10.1	8.6	11.8	2hr
Dummy33	10.2	10.7	12.2	9.5	9.1	8.5	11.4	12.7	10.9	12.7	12hr
SE5	0.7	0.6	0.6	0.3	0.3	0.3	0.5	0.6	0.5	0.7	30min
SE1	2.3	2.1	2.1	1.2	1.0	0.8	0.7	0.7	0.4	2.3	30min
SE2	6.6	6.2	6.2	3.5	3.1	2.2	2.0	2.0	1.3	6.6	30min
DumB32	0.5	0.7	0.8	0.8	0.8	0.9	1.1	0.9	0.9	1.1	9hr
SE3	0.3	0.3	0.3	0.1	0.3	0.6	1.0	1.3	1.2	1.3	12hr
SE6a	1.4	1.3	1.2	0.8	0.7	0.7	1.2	1.7	1.6	1.7	12hr
Dummy58	3.7	3.6	3.5	2.3	2.1	1.8	2.4	2.9	2.7	3.7	30min
SE6b	5.4	5.4	5.7	3.7	3.3	2.7	3.2	3.9	3.6	5.7	2hr
SE_out	5.4	5.4	5.7	3.7	3.3	2.7	3.2	3.9	3.6	5.7	2hr
33.01a	1.1	1.0	1.0	0.6	0.5	0.4	0.4	0.5	0.4	1.1	30min
33.01b	1.1	1.1	1.1	0.6	0.5	0.4	0.5	0.6	0.5	1.1	30min
32.01	2.4	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.4	30min
32.02	5.5	6.0	5.3	4.2	3.6	2.7	2.4	2.4	1.6	6.0	1hr
DumB19	0.5	0.7	0.9	0.9	0.9	0.9	1.2	1.2	1.1	1.2	12hr
1.26	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.4	12hr
31.03	1.3	1.2	1.1	0.7	0.7	0.5	0.4	0.4	0.3	1.3	30min
30.01	4.1	3.7	3.7	2.2	1.9	1.4	1.2	1.2	0.8	4.1	30min
30.02	9.9	8.5	9.0	6.0	5.3	3.9	3.4	3.4	2.3	9.9	30min
1.25b	10.6	9.3	9.6	6.6	5.9	4.4	3.9	3.9	2.6	10.6	30min
DummyO5	0.5	0.7	0.9	1.0	1.0	1.1	1.4	1.5	1.4	1.5	12hr
1.25a	0.9	0.8	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.9	30min
31.01b	0.7	0.7	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.7	30min
31.01a	1.5	1.4	1.4	0.8	0.7	0.5	0.4	0.4	0.3	1.5	30min
Dummy55	2.1	2.1	2.1	1.1	1.0	0.7	0.6	0.6	0.4	2.1	30min
31.02	2.9	3.5	3.1	2.3	2.0	1.5	1.3	1.3	0.9	3.5	1hr
DumB18	0.3	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.7	9hr
25.06a	2.5	2.3	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
DumB21	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	12hr
25.06b	0.7	0.7	0.7	0.5	0.4	0.4	0.5	0.5	0.4	0.7	30min
25.06c	0.5	0.5	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.5	30min
25.03c	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
25.03b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.4	30min
25.01	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.4	30min
27.01	2.9	2.7	2.6	1.6	1.4	1.0	0.9	0.9	0.7	2.9	30min
25.03a	3.5	3.3	3.3	2.1	1.8	1.3	1.2	1.2	0.9	3.5	30min
DumB23	0.6	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	2hr
26.01a	2.6	2.4	2.3	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
26.01b	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.4	12hr
Dummy47	2.7	2.5	2.5	1.4	1.3	0.9	0.8	0.9	0.7	2.7	30min
25.02	5.7	5.2	5.1	3.7	3.2	2.3	2.1	2.1	1.4	5.7	30min
DumB22	0.8	1.0	1.1	1.1	1.1	1.1	1.3	1.3	1.2	1.3	9hr
Dummy48	1.4	1.8	2.0	1.8	1.9	1.9	2.1	2.1	1.9	2.1	9hr
Dummy22	1.7	2.0	2.3	2.1	2.1	2.2	2.4	2.4	2.2	2.4	9hr
25.04b	1.5	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min
25.04a	2.5	2.2	2.2	1.4	1.2	0.9	0.8	0.8	0.5	2.5	30min
Dummy23	5.1	4.6	4.6	3.4	3.3	3.1	3.2	3.2	2.8	5.1	30min
25.05a	1.6	1.4	1.4	0.9	0.8	0.6	0.5	0.5	0.3	1.6	30min
25.05b	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.2	0.1	0.6	30min
28.01	5.8	5.3	5.2	3.1	2.8	2.0	1.8	1.8	1.2	5.8	30min
28.02	7.1	6.8	6.5	4.8	4.2	3.3	2.9	2.9	2.0	7.1	30min
DumB20	0.5	0.7	0.9	0.9	0.9	1.0	1.2	1.3	1.2	1.3	12hr
Dummy24	6.1	5.9	5.8	4.5	4.5	4.3	4.8	4.6	4.4	6.1	30min
Dummy25	6.6	6.4	6.3	4.9	5.0	4.7	5.3	5.1	4.9	6.6	30min
25.07b	0.4	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.4	30min
29.01	7.2	6.4	6.3	3.9	3.4	2.5	2.2	2.2	1.5	7.2	30min
29.02	8.5	8.0	7.7	5.6	5.0	4.0	3.5	3.5	2.4	8.5	30min
DumB17	0.6	0.8	1.0	1.1	1.1	1.1	1.4	1.5	1.4	1.5	12hr
25.07a	1.4	1.2	1.2	0.7	0.7	0.5	0.4	0.4	0.3	1.4	30min
Dummy26	7.3	7.5	7.3	5.8	6.2	6.0	7.0	6.9	6.6	7.5	1hr
1.22b	1.2	1.1	1.1	0.8	0.7	0.5	0.5	0.5	0.3	1.2	30min
1.20a	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	12hr
1.20b	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	30min
1.21	0.2	0.3	0.4	0.6	0.6	0.7	0.8	0.8	0.8	0.8	12hr
24.01	4.3	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.3	30min
24.02	6.7	8.1	7.4	5.6	4.7	3.8	3.3	3.3	2.2	8.1	1hr
24.03	8.4	10.0	9.1	7.4	6.5	5.5	4.8	4.8	3.3	10.0	1hr
24.04	8.7	10.7	9.7	8.1	7.1	6.3	5.6	5.3	4.0	10.7	1hr
24.05	8.8	11.4	10.7	8.9	8.3	7.2	6.6	6.3	4.9	11.4	1hr
24.06	8.9	11.9	11.6	10.1	9.6	8.3	7.7	7.3	5.9	11.9	1hr
DummyO4	1.1	1.6	2.0	2.2	2.3	2.4	3.2	3.4	3.2	3.4	12hr
17.14b	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	9hr
17.14a	3.2	2.8	2.7	1.8	1.5	1.1	1.0	1.0	0.7	3.2	30min
DumB9	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	12hr
17.13	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	12hr
23.01	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	12hr
20.01	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.6	9hr
17.10a	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	9hr
17.10b	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	12hr
17.09	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	12hr
17.08c	1.5	1.3	1.3	0.8	0.7	0.5	0.4	0.5	0.4	1.5	30min
17.08d	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9hr
18.01	6.1	5.5	5.5	3.3	2.9	2.1	1.8	1.9	1.2	6.1	30min
18.02	8.9	8.0	8.1	5.0	4.4	3.2	2.8	2.8	1.9	8.9	30min
17.08b	1.7	1.6	1.5	0.9	0.8	0.6	0.5	0.5	0.4	1.7	30min
17.08a	2.8	2.5	2.5	1.6	1.4	1.0	0.9	0.9	0.6	2.8	30min
17.01	3.5	3.2	3.2	1.8	1.6	1.2	1.0	1.0	0.7	3.5	30min
17.02	9.7	8.7	8.2	6.0	5.2	3.8	3.3	3.4	2.3	9.7	30min
17.03	14.5	16.2	16.1	12.7	10.4	9.0	7.8	7.9	5.3	16.2	1hr
17.04	20.3	22.7	23.6	18.7	14.9	13.2	11.6	11.7	8.0	23.6	2hr
17.06	24.1	26.0	26.6	21.5	19.3	16.2	14.5	14.0	10.6	26.6	2hr
17.07	25.2	27.4	28.3	23.3	21.5	18.1	16.4	15.9	12.3	28.3	2hr
Dummy18	26.9	30.0	31.1	26.2	25.3	21.9	19.6	19.2	15.1	31.1	2hr
DummyO3	2.4	3.5	4.4	4.9	5.2	5.6	7.2	7.9	7.5	7.9	12hr
Dummy19	2.5	3.5	4.4	5.0	5.3	5.8	7.5	8.2	7.8	8.2	12hr
Dummy36	2.6	3.7	4.6	5.2	5.7	6.2	7.9	8.6	8.3	8.6	12hr
21.01	6.5	5.8	5.5	3.8	3.4	2.5	2.2	2.2	1.5	6.5	30min
Dummy37	6.5	6.5	6.3	5.5	6.1	6.8	8.4	9.1	9.0	9.1	12hr
Dummy20	6.6	6.7	6.5	6.4	7.1	7.8	9.6	10.3	9.9	10.3	12hr
22.01	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8	12hr
17.11	1.5	1.3	1.3	0.8	0.7	0.5	0.5	0.5	0.3	1.5	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	7.3	7.4	7.1	6.9	7.8	8.6	10.5	11.3	10.9	11.3	12hr
17.12	3.9	3.5	3.4	2.2	1.9	1.4	1.2	1.2	0.8	3.9	30min
DumB8	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	12hr
Dummy54	7.5	7.6	7.4	7.3	8.2	9.0	11.0	11.8	11.4	11.8	12hr
Dummy38	7.5	7.8	7.5	7.5	8.5	9.2	11.3	12.1	11.7	12.1	12hr
Dummy35	7.6	7.9	7.6	7.7	8.7	9.5	11.6	12.4	11.9	12.4	12hr
Dummy21	8.0	8.5	8.3	8.2	9.3	10.1	12.3	13.2	12.7	13.2	12hr
17.15a	2.3	2.1	2.0	1.3	1.1	0.8	0.7	0.7	0.5	2.3	30min
DumB10	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	12hr
Dummy39	8.2	8.7	8.6	8.5	9.5	10.3	12.7	13.5	13.0	13.5	12hr
SU3	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	12hr
Dummy40	9.0	10.0	10.0	10.8	12.0	13.0	16.1	17.2	16.4	17.2	12hr
17.15b	0.8	0.8	0.7	0.4	0.4	0.3	0.2	0.3	0.2	0.8	30min
Dummy41	9.0	10.0	10.1	10.8	12.1	13.1	16.2	17.3	16.5	17.3	12hr
17.16	9.2	10.2	10.4	11.2	12.6	13.6	16.8	17.9	17.2	17.9	12hr
1.18	2.9	2.7	2.6	1.8	1.6	1.2	1.0	1.0	0.7	2.9	30min
16.01	1.6	1.4	1.4	0.8	0.7	0.5	0.5	0.5	0.3	1.6	30min
15.02	2.2	2.3	2.2	1.7	1.4	1.1	1.0	1.0	0.7	2.3	1hr
DumB12	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	12hr
15.01	3.2	2.8	2.7	1.9	1.6	1.2	1.0	1.1	0.7	3.2	30min
14.01	6.2	5.5	5.3	3.4	3.0	2.2	1.9	1.9	1.3	6.2	30min
1.17a	7.2	6.7	6.7	4.7	4.0	3.1	2.7	2.7	1.8	7.2	30min
DumB11	0.6	0.8	1.0	1.0	1.0	1.1	1.3	1.3	1.2	1.3	9hr
1.17b	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.4	30min
1.16	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
1.14	0.8	0.9	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.9	2hr
12.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
12.02a	1.7	1.5	1.5	0.9	0.8	0.6	0.5	0.5	0.3	1.7	30min
11.01	3.2	3.0	3.0	1.7	1.5	1.1	1.0	1.0	0.6	3.2	30min
10.01	3.4	3.2	3.2	1.8	1.6	1.1	1.0	1.0	0.7	3.4	30min
10.02a	5.6	4.7	5.2	3.5	3.0	2.2	1.9	2.0	1.3	5.6	30min
DumB14	0.5	0.6	0.8	0.8	0.7	0.8	1.0	0.9	0.8	1.0	9hr
1.13b	1.6	1.5	1.4	0.9	0.8	0.6	0.5	0.6	0.4	1.6	30min
1.13a	1.8	1.6	1.6	1.0	0.9	0.6	0.6	0.6	0.4	1.8	30min
1.12a	3.6	3.3	3.2	1.9	1.7	1.2	1.1	1.1	0.7	3.6	30min
DumB15	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	9hr
5.01	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	12hr
1.11a	1.3	1.2	1.2	0.7	0.6	0.4	0.4	0.4	0.3	1.3	30min
1.11b	2.2	2.0	2.0	1.2	1.0	0.7	0.7	0.7	0.4	2.2	30min
1.09b	0.9	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
1.09c	2.0	1.9	1.9	1.1	1.0	0.7	0.6	0.6	0.4	2.0	30min
4.01	2.5	2.3	2.3	1.3	1.2	0.8	0.7	0.7	0.5	2.5	30min
4.02	7.0	6.1	6.3	4.0	3.5	2.6	2.3	2.3	1.5	7.0	30min
1.06a	4.1	3.6	3.5	2.2	2.0	1.4	1.3	1.3	0.9	4.1	30min
DumB35	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	9hr
1.01	16.2	15.0	14.4	10.2	8.8	6.6	5.8	5.8	3.9	16.2	30min
1.02	20.2	19.5	17.7	14.7	13.4	11.0	9.6	9.7	6.6	20.2	30min
2.01	24.1	23.2	22.5	16.3	13.9	10.6	9.3	9.4	6.3	24.1	30min
1.03	37.7	39.1	41.3	31.6	26.0	22.5	19.8	19.7	13.7	41.3	2hr
1.04	40.1	41.7	43.2	33.4	29.0	24.5	21.8	20.8	15.5	43.2	2hr
1.05	41.7	44.8	46.1	36.5	32.0	27.7	25.1	22.9	18.4	46.1	2hr
1.06b	42.0	46.3	48.2	39.1	33.3	29.9	27.5	24.2	20.3	48.2	2hr
DummyO1	3.0	4.3	5.4	6.1	6.6	7.2	9.2	10.2	9.8	10.2	12hr
Dummy1	3.3	4.7	5.9	6.5	7.0	7.6	9.8	10.9	10.5	10.9	12hr
1.07a	1.3	1.2	1.2	0.7	0.6	0.5	0.4	0.5	0.3	1.3	30min
1.07b	0.7	0.7	0.7	0.4	0.3	0.3	0.6	0.8	0.8	0.8	12hr
Dummy2	3.3	4.7	5.9	6.6	7.3	8.0	10.5	11.8	11.4	11.8	12hr
1.08a	3.0	2.7	2.7	1.7	1.5	1.1	0.9	0.9	0.6	3.0	30min
1.08b	2.7	2.5	2.5	1.5	1.3	0.9	0.8	0.9	0.6	2.7	30min
Dummy3	7.0	6.5	5.9	6.7	7.6	8.5	11.0	12.3	12.0	12.3	12hr
3.01	3.5	3.3	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
1.09a	3.8	3.6	3.7	2.3	2.0	1.5	1.3	1.3	0.9	3.8	30min
DumB34	0.2	0.3	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.6	9hr
Dummy60	7.0	6.5	6.3	7.1	8.0	8.9	11.5	12.7	12.4	12.7	12hr
Dummy4	12.5	12.7	12.3	9.5	8.8	9.8	12.1	13.3	13.1	13.3	12hr
SU2	0.6	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.6	1.0	2hr
1.10b	1.7	1.6	1.6	1.2	1.3	1.2	1.2	1.2	0.9	1.7	30min
DumB31	0.2	0.4	0.5	0.5	0.5	0.6	0.8	0.8	0.7	0.8	9hr
Dummy42	12.5	12.8	12.4	9.6	9.4	10.4	12.9	14.0	13.7	14.0	12hr
1.10a	13.0	13.4	12.9	10.0	9.5	10.5	13.0	14.1	13.9	14.1	12hr
Dummy6	14.0	14.7	13.6	10.6	10.0	10.8	13.4	14.5	14.2	14.7	1hr
1.12c	2.6	2.4	2.4	1.4	1.2	0.9	0.8	0.8	0.5	2.6	30min
DumB16	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	9hr
1.12b	14.8	16.1	15.0	12.1	11.3	11.9	14.9	15.9	15.7	16.1	1hr
Dummy7	14.8	16.2	15.5	12.6	11.6	12.2	15.3	16.5	16.2	16.5	12hr
10.02b	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	12hr
7.07a	0.6	0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.6	30min
DumB2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	12hr
8.01	7.0	6.2	6.1	3.8	3.4	2.4	2.1	2.2	1.4	7.0	30min
DumB1	0.3	0.4	0.5	0.6	0.6	0.6	0.8	0.9	0.8	0.9	12hr
7.01	3.5	3.2	3.2	1.9	1.6	1.2	1.0	1.1	0.7	3.5	30min
7.02	10.0	10.6	10.1	7.1	5.9	4.8	4.2	4.2	2.8	10.6	1hr
7.03	14.1	15.6	14.8	12.3	10.0	8.4	7.4	7.4	5.0	15.6	1hr
7.04	16.4	18.5	17.4	13.8	12.2	10.0	8.9	8.8	6.3	18.5	1hr
7.05	18.2	21.3	19.6	15.7	15.4	12.7	11.1	11.3	8.3	21.3	1hr
7.06	18.6	22.4	20.8	17.1	16.3	14.1	12.4	12.1	9.5	22.4	1hr
DummyO2	1.7	2.4	3.0	3.3	3.5	3.7	4.8	5.2	4.9	5.2	12hr
7.07b	2.0	2.8	3.5	3.9	4.2	4.5	5.8	6.3	6.0	6.3	12hr
Dummy12	2.0	2.8	3.6	3.9	4.2	4.6	6.0	6.5	6.1	6.5	12hr
7.08b	3.6	3.2	3.1	2.0	1.7	1.2	1.1	1.1	0.7	3.6	30min
DumB3	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	12hr
7.08a	0.9	0.9	0.9	0.5	0.4	0.3	0.3	0.3	0.2	0.9	30min
7.09a	2.9	2.6	2.6	1.6	1.4	1.0	0.9	0.9	0.6	2.9	30min
DumB4	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	12hr
Dummy11	2.2	3.2	4.1	4.5	4.8	5.2	6.8	7.4	7.0	7.4	12hr
7.09c	4.4	3.9	3.8	2.4	2.1	1.5	1.3	1.3	0.9	4.4	30min
DumB7	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	12hr
7.09b	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3	30min
Dummy43	2.4	3.4	4.4	4.8	5.2	5.6	7.3	7.9	7.4	7.9	12hr
7.10a	2.7	2.4	2.3	1.5	1.3	1.0	0.9	0.9	0.6	2.7	30min
7.10b	2.0	1.8	1.7	1.1	1.0	0.7	0.6	0.7	0.4	2.0	30min
Dummy9	5.0	5.0	4.9	5.1	5.6	6.0	7.7	8.3	7.8	8.3	12hr
9.01	2.3	2.2	2.2	1.2	1.1	0.8	0.7	0.7	0.5	2.3	30min
9.02b	3.7	3.1	3.5	2.3	2.0	1.4	1.3	1.3	0.9	3.7	30min
9.02a	3.8	3.4	3.3	2.1	1.8	1.3	1.2	1.2	0.8	3.8	30min
Dummy59	7.5	6.4	6.4	4.3	3.8	2.8	2.4	2.5	1.6	7.5	30min
DumB5	0.5	0.6	0.8	0.8	0.8	0.8	1.1	1.1	1.0	1.1	9hr
Dummy8	5.3	5.4	5.4	5.8	6.3	6.8	8.7	9.3	8.7	9.3	12hr
7.12	4.8	4.2	4.1	2.8	2.4	1.8	1.6	1.6	1.1	4.8	30min
DumB13	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	12hr
7.11a	2.5	2.3	2.3	1.3	1.1	0.8	0.7	0.7	0.5	2.5	30min
DumB6	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	9hr
7.11b	0.8	0.8	0.8	0.5	0.5	0.4	0.5	0.5	0.4	0.8	30min
Dummy10	5.8	6.1	6.0	6.5	7.1	7.5	9.7	10.3	9.7	10.3	12hr
12.01a	6.1	6.5	6.5	6.6	7.2	7.7	10.0	10.6	10.0	10.6	12hr
Dummy13	17.6	20.7	20.9	17.8	18.5	20.5	25.9	27.5	27.0	27.5	12hr
12.01b	0.3	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.3	30min
Dummy44	17.6	20.7	20.9	17.8	18.6	20.5	26.0	27.6	27.2	27.6	12hr
Dummy14	17.7	20.8	21.5	18.7	18.9	20.9	26.5	28.3	27.8	28.3	12hr
1.15	4.0	3.6	3.6	2.2	1.9	1.4	1.2	1.3	0.8	4.0	30min
Dummy45	17.7	20.8	21.8	19.2	19.1	21.2	26.8	28.9	28.3	28.9	12hr
Dummy15	18.1	21.5	23.0	20.7	20.1	22.3	28.2	30.8	29.9	30.8	12hr
Dummy46	18.1	21.5	23.2	21.0	20.3	22.6	28.5	31.2	30.3	31.2	12hr
Dummy16	18.3	21.8	23.6	21.8	21.0	23.1	29.2	32.0	31.2	32.0	12hr
Dummy17	22.5	28.4	33.0	31.7	33.8	37.4	46.4	50.4	49.1	50.4	12hr
1.22a	1.5	1.5	1.5	1.1	0.9	0.7	0.6	0.6	0.4	1.5	1hr
1.23	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	12hr
Dummy27	24.2	30.9	37.0	37.0	38.3	41.9	51.9	56.9	55.4	56.9	12hr
1.24	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	12hr
Dummy49	24.3	31.0	37.1	37.2	38.5	42.2	52.1	57.2	55.6	57.2	12hr
Dummy50	24.4	31.2	37.4	37.5	38.9	42.5	52.6	57.8	56.3	57.8	12hr
Dummy51	24.7	31.7	38.1	38.4	39.7	43.4	53.6	58.9	57.4	58.9	12hr
Dummy52	24.7	31.7	38.1	38.4	39.7	43.4	53.7	59.1	57.6	59.1	12hr
Dummy53	24.9	32.0	38.4	38.9	40.3	44.1	54.7	60.2	58.9	60.2	12hr
1.27	24.9	32.0	38.4	39.0	40.6	44.6	55.7	61.2	60.1	61.2	12hr
E18	0.9	0.8	0.8	0.5	0.4	0.3	0.5	0.8	0.7	0.9	30min
1.28	24.9	32.0	38.4	39.0	41.0	45.1	56.3	61.8	60.9	61.8	12hr
Out	25.5	32.8	39.6	41.3	45.6	50.4	62.1	65.8	67.1	67.1	18hr

Table C.20B Estimated 100 yr ARI Peak Flows (m3/s) under Scenario B Development + Precinct Basins + Major External Basins + External OSD Only at All Locations

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
E17a	0.3	1.1	1.7	1.7	1.7	2.0	2.3	2.3	1.8	2.3	12hr
E17b	0.3	1.0	1.6	1.6	1.5	1.8	2.1	2.1	1.7	2.1	12hr
Dummy57	0.7	2.2	3.2	3.3	3.2	3.8	4.4	4.5	3.5	4.5	12hr
E17c	4.6	4.6	7.0	7.6	7.4	8.2	10.0	10.0	7.7	10.0	9hr
E17d	0.9	1.3	2.0	2.0	2.0	2.3	2.7	2.8	2.2	2.8	12hr
E9	0.7	1.8	2.3	2.2	2.3	2.6	2.6	2.8	2.2	2.8	12hr
E10	8.9	8.5	8.7	5.1	4.7	3.7	3.6	3.9	2.8	8.9	30min
DumB27	1.1	1.7	2.1	2.1	2.0	2.3	2.7	2.8	2.1	2.8	12hr
E3	10.6	10.5	10.9	6.3	5.8	5.1	4.9	5.3	3.8	10.9	2hr
E2	0.6	1.4	1.9	1.8	1.8	2.1	2.1	2.3	1.8	2.3	12hr
E1	0.5	1.3	1.7	1.6	1.6	1.8	1.8	2.0	1.5	2.0	12hr
Dummy56	1.2	2.7	3.5	3.4	3.5	3.9	4.0	4.4	3.3	4.4	12hr
Dummy30	11.0	11.0	11.3	7.0	7.5	8.1	8.2	9.2	7.0	11.3	2hr
E5	22.8	20.0	22.5	14.6	13.3	13.1	13.7	15.5	11.6	22.8	30min
DumB29	7.4	9.3	10.4	10.2	10.2	11.7	12.7	13.1	10.2	13.1	12hr
E6a	5.6	5.5	5.7	3.3	3.0	2.5	2.4	2.6	1.9	5.7	2hr
E6b	3.2	3.2	3.3	2.0	2.1	2.1	2.2	2.5	1.9	3.3	2hr
Dummy31	9.7	12.4	13.8	13.3	13.5	15.1	16.6	17.2	13.3	17.2	12hr
E8a	2.7	2.6	2.7	1.6	1.5	1.3	1.3	1.5	1.1	2.7	2hr
E8b	4.6	4.6	4.7	2.7	2.5	2.2	2.2	2.4	1.8	4.7	2hr
E7a	0.7	0.8	1.1	1.0	1.1	1.1	1.1	1.3	1.0	1.3	12hr
E7b	3.3	3.4	3.5	3.2	3.4	3.8	3.9	4.4	3.3	4.4	12hr
E8c	3.9	4.1	4.5	4.2	4.3	5.0	5.2	5.6	4.3	5.6	12hr
Dummy32	18.0	18.5	21.4	19.7	19.8	22.5	24.6	25.4	19.8	25.4	12hr
E11a	18.9	19.8	22.5	20.7	20.8	23.7	25.7	26.5	20.7	26.5	12hr
E11b	20.3	22.5	26.6	25.8	25.9	29.4	31.9	32.9	25.5	32.9	12hr
E13	9.9	9.9	10.4	6.1	5.8	5.5	5.9	6.5	4.8	10.4	2hr
E12	0.6	1.5	1.9	1.7	1.9	1.9	1.9	2.1	1.6	2.1	12hr
E14	4.1	4.1	4.2	2.4	2.2	1.9	1.8	1.9	1.3	4.2	2hr
E15b	2.0	2.0	2.0	1.2	1.1	0.9	0.9	0.9	0.6	2.0	2hr
E15a	2.3	2.3	2.4	1.4	1.3	1.1	1.0	1.0	0.7	2.4	2hr
Dummy29	7.5	6.5	7.5	4.8	4.5	3.8	3.5	3.8	2.7	7.5	30min
E16a	11.1	12.0	11.7	8.9	8.0	7.0	7.1	7.8	5.6	12.0	1hr
DumB25	2.7	4.1	4.8	4.7	4.7	5.2	5.9	6.0	4.5	6.0	12hr
E16b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy28	24.0	31.0	37.5	36.1	35.9	40.2	43.8	43.9	34.4	43.9	12hr
Dummy33	25.7	36.6	46.1	45.6	44.4	50.5	55.7	54.2	42.9	55.7	9hr
SE5	1.4	1.4	2.2	2.1	1.9	2.5	2.6	2.9	2.2	2.9	12hr
SE1	4.6	4.5	4.7	2.7	2.4	2.0	1.9	2.1	1.5	4.7	2hr
SE2	13.6	13.4	13.8	7.9	7.2	5.9	5.6	6.1	4.3	13.8	2hr
DumB32	2.2	3.3	3.8	3.7	3.9	4.2	4.5	4.8	3.6	4.8	12hr
SE3	0.9	2.4	4.1	4.6	4.7	5.0	6.3	6.2	4.7	6.3	9hr
SE6a	2.9	2.9	5.1	5.8	5.9	6.3	7.8	7.6	5.8	7.8	9hr
Dummy58	7.9	7.9	9.4	10.1	10.0	10.9	13.8	14.1	10.5	14.1	12hr
SE6b	11.4	11.8	13.1	13.4	13.3	15.0	18.4	18.8	14.2	18.8	12hr
SE_out	11.4	11.8	13.1	13.4	13.3	15.0	18.4	18.8	14.2	18.8	12hr
33.01a	2.2	2.2	2.3	1.6	1.7	1.9	2.0	2.3	1.7	2.3	2hr
33.01b	2.3	2.3	2.5	2.0	2.1	2.5	2.6	2.9	2.2	2.9	12hr
32.01	4.8	4.8	4.9	2.8	2.6	2.1	2.0	2.2	1.5	4.9	2hr
32.02	12.8	13.4	12.5	9.4	8.4	6.9	7.6	8.4	5.8	13.4	1hr
DumB19	1.9	3.1	3.9	4.2	4.2	4.4	5.9	5.7	4.7	5.9	9hr
1.26	0.6	0.7	1.3	1.6	1.7	1.8	2.3	2.2	1.9	2.3	9hr
31.03	2.8	2.6	2.6	1.7	1.6	1.3	1.7	1.9	1.4	2.8	30min
30.01	8.4	8.1	8.3	4.8	4.4	3.4	3.4	3.6	2.6	8.4	30min
30.02	21.2	18.4	20.0	13.3	11.9	9.2	9.1	9.8	7.0	21.2	30min
1.25b	22.7	20.0	21.3	14.6	13.3	10.3	10.2	11.0	7.8	22.7	30min
DummyO5	1.9	3.4	4.6	5.1	5.1	5.3	7.0	6.8	5.1	7.0	9hr
1.25a	1.9	1.8	1.8	1.2	1.1	1.0	1.3	1.5	1.1	1.9	30min
31.01b	1.4	1.4	1.4	0.8	0.7	0.6	0.6	0.6	0.4	1.4	2hr
31.01a	3.0	2.9	3.1	1.7	1.6	1.3	1.2	1.3	0.9	3.1	2hr
Dummy55	4.3	4.3	4.5	2.5	2.3	1.9	1.8	1.9	1.4	4.5	2hr
31.02	6.5	7.6	7.0	5.1	4.6	3.8	4.0	4.4	3.1	7.6	1hr
DumB18	1.4	2.1	2.5	2.5	2.5	2.8	3.3	3.3	2.5	3.3	12hr
25.06a	5.2	5.0	5.1	3.0	2.7	2.1	2.0	2.2	1.6	5.2	30min
DumB21	0.5	0.8	1.0	1.1	1.1	1.2	1.4	1.4	1.0	1.4	9hr
25.06b	1.5	1.6	1.6	1.6	1.5	1.8	2.1	2.2	1.6	2.2	12hr
25.06c	1.0	1.0	1.0	0.6	0.6	0.5	0.6	0.7	0.5	1.0	2hr
25.03c	2.6	2.6	2.6	1.5	1.4	1.1	1.1	1.2	0.9	2.6	30min
25.03b	0.9	0.9	0.9	0.5	0.5	0.5	0.6	0.7	0.5	0.9	2hr
25.01	0.8	0.9	1.2	1.3	1.3	1.4	1.9	1.9	1.4	1.9	12hr
27.01	6.0	5.7	5.7	3.6	3.3	3.0	3.6	4.1	3.0	6.0	30min
25.03a	7.4	7.1	7.4	4.6	4.2	3.6	4.3	4.8	3.5	7.4	2hr
DumB23	2.3	2.8	3.1	2.8	3.0	3.2	4.0	4.1	3.0	4.1	12hr
26.01a	5.3	5.1	5.2	3.0	2.7	2.1	2.1	2.3	1.6	5.3	30min
26.01b	0.3	0.7	1.3	1.4	1.4	1.5	1.9	1.9	1.4	1.9	9hr
Dummy47	5.6	5.5	5.6	3.4	3.2	3.1	3.7	4.2	3.0	5.6	2hr
25.02	12.5	11.5	11.4	8.1	7.4	6.1	7.0	7.9	5.7	12.5	30min
DumB22	2.8	3.8	4.3	4.4	4.4	4.8	6.1	6.1	4.4	6.1	12hr
Dummy48	5.1	6.6	7.2	7.3	7.2	8.0	10.1	10.2	7.4	10.2	12hr
Dummy22	5.2	7.4	8.4	8.2	8.2	9.1	11.2	11.2	8.3	11.2	9hr
25.04b	3.1	3.0	3.1	1.8	1.7	1.3	1.4	1.6	1.1	3.1	30min
25.04a	5.2	4.9	5.0	3.0	2.7	2.1	2.1	2.3	1.6	5.2	30min
Dummy23	11.0	9.9	11.0	10.3	10.0	11.1	14.0	13.6	10.1	14.0	9hr
25.05a	3.3	3.1	3.2	1.9	1.7	1.4	1.4	1.5	1.1	3.3	30min
25.05b	1.2	1.2	1.3	0.7	0.7	0.6	0.7	0.8	0.6	1.3	2hr
28.01	12.1	11.6	11.8	7.0	6.3	4.9	4.7	5.1	3.6	12.1	30min
28.02	15.3	15.6	15.0	10.9	9.7	8.0	8.1	8.8	6.2	15.6	1hr
DumB20	2.0	3.3	4.2	4.4	4.4	4.8	6.0	5.9	4.3	6.0	9hr
Dummy24	13.3	13.1	15.9	16.0	15.6	17.0	21.4	20.6	15.4	21.4	9hr
Dummy25	14.6	14.7	17.8	17.8	17.4	19.1	23.8	22.8	17.1	23.8	9hr
25.07b	0.9	0.9	0.9	0.6	0.6	0.7	0.8	0.9	0.7	0.9	2hr
29.01	14.9	14.2	14.5	8.6	7.7	6.0	5.8	6.2	4.4	14.9	30min
29.02	18.3	17.9	17.6	12.7	11.5	9.5	9.6	10.5	7.4	18.3	30min
DumB17	2.2	3.7	4.9	5.2	5.2	5.5	7.0	6.9	5.1	7.0	9hr
25.07a	2.8	2.7	2.8	1.7	1.5	1.2	1.3	1.4	1.0	2.8	30min
Dummy26	16.8	18.6	23.8	24.2	23.7	25.9	32.2	30.7	23.0	32.2	9hr
1.22b	2.8	2.5	2.6	1.8	1.6	1.2	1.2	1.4	0.9	2.8	30min
1.20a	0.1	0.3	0.5	0.6	0.6	0.6	0.8	0.8	0.6	0.8	9hr
1.20b	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.6	12hr
1.21	2.2	3.2	3.9	3.7	3.5	3.8	3.4	3.3	2.7	3.9	2hr
24.01	9.0	8.6	8.8	5.2	4.7	3.6	3.6	3.9	2.8	9.0	30min
24.02	15.1	18.2	17.2	12.4	10.8	8.8	8.7	9.4	6.6	18.2	1hr
24.03	19.4	22.6	21.0	16.8	15.2	12.9	12.7	13.8	9.8	22.6	1hr
24.04	20.2	24.6	22.8	18.5	16.9	15.1	15.0	15.3	11.8	24.6	1hr
24.05	20.6	26.6	25.6	20.6	19.8	17.9	18.0	18.3	14.3	26.6	1hr
24.06	20.8	28.3	28.3	23.7	22.4	20.9	21.4	21.0	17.1	28.3	2hr
DummyO4	3.9	7.4	10.8	11.7	11.6	12.5	15.6	14.6	11.3	15.6	9hr
17.14b	1.0	1.4	1.6	1.4	1.5	1.4	1.3	1.3	1.0	1.6	2hr
17.14a	6.6	6.3	6.5	4.0	3.6	3.0	3.5	3.9	2.8	6.6	30min
DumB9	1.3	1.7	2.0	2.1	2.1	2.2	2.9	2.9	2.1	2.9	9hr
17.13	0.8	1.3	1.5	1.5	1.4	1.5	1.4	1.3	1.1	1.5	2hr
23.01	1.0	1.4	1.7	1.6	1.6	1.7	1.5	1.5	1.2	1.7	2hr
20.01	1.8	2.5	2.8	2.6	2.6	2.5	2.3	2.3	1.8	2.8	2hr
17.10a	0.8	1.1	1.3	1.2	1.2	1.2	1.1	1.1	0.9	1.3	2hr
17.10b	1.1	1.6	1.9	1.8	1.7	1.9	1.7	1.6	1.3	1.9	2hr
17.09	1.3	2.0	2.4	2.3	2.2	2.4	2.2	2.2	1.7	2.4	2hr
17.08c	3.0	3.0	3.0	1.9	1.7	1.6	1.9	2.1	1.5	3.0	30min
17.08d	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2hr
18.01	12.6	12.1	12.3	7.3	6.5	5.1	5.0	5.4	3.9	12.6	30min
18.02	18.6	17.4	18.2	11.1	10.0	7.8	7.7	8.3	5.9	18.6	30min
17.08b	3.6	3.4	3.5	2.1	1.9	1.5	1.4	1.6	1.1	3.6	30min
17.08a	5.9	5.6	5.8	3.5	3.1	2.5	2.4	2.6	1.9	5.9	30min
17.01	7.1	7.0	7.2	4.1	3.7	2.9	2.9	3.1	2.2	7.2	2hr
17.02	20.9	19.0	18.2	13.1	11.8	9.2	9.0	9.8	6.9	20.9	30min
17.03	32.4	37.9	37.4	28.3	23.9	20.9	20.5	22.2	15.6	37.9	1hr
17.04	46.8	51.2	54.0	41.8	34.4	31.0	30.3	32.9	23.2	54.0	2hr
17.06	56.3	58.8	60.6	48.0	44.4	38.3	38.5	39.5	29.9	60.6	2hr
17.07	59.6	62.7	65.4	52.7	50.2	43.5	44.2	45.1	34.6	65.4	2hr
Dummy18	65.2	69.3	73.4	61.0	60.1	52.6	53.8	55.2	42.5	73.4	2hr
DummyO3	8.0	15.6	24.2	27.0	27.5	28.7	37.4	34.8	28.4	37.4	9hr
Dummy19	8.2	16.0	25.1	28.0	28.5	29.8	38.7	35.7	29.3	38.7	9hr
Dummy36	9.2	17.4	26.7	29.5	30.0	31.5	40.5	37.3	30.7	40.5	9hr
21.01	14.1	12.8	12.8	8.5	7.6	5.8	5.8	6.4	4.4	14.1	30min
Dummy37	14.6	17.9	27.9	31.6	32.5	34.4	43.5	38.8	33.3	43.5	9hr
Dummy20	15.9	20.7	31.6	34.8	35.6	37.8	47.4	42.1	36.2	47.4	9hr
22.01	2.2	3.2	4.0	3.9	3.7	4.0	3.6	3.5	2.8	4.0	2hr
17.11	3.1	2.9	3.0	1.8	1.7	1.3	1.5	1.7	1.2	3.1	30min

Node	30min	1hr	2hr	3hr	4.5hr	6hr	9hr	12hr	18hr	Max Flow	Critical Duration
Dummy34	19.2	23.0	34.9	38.1	38.7	41.3	51.2	45.0	39.0	51.2	9hr
17.12	8.3	7.8	8.0	4.9	4.4	3.4	3.6	3.9	2.8	8.3	30min
DumB8	0.8	1.3	1.7	1.9	1.9	1.9	2.6	2.5	1.9	2.6	9hr
Dummy54	19.9	23.8	36.4	39.8	40.4	43.2	53.3	46.6	40.7	53.3	9hr
Dummy38	20.9	24.5	37.5	40.8	41.3	44.2	54.5	47.4	41.6	54.5	9hr
Dummy35	21.7	25.2	38.4	41.7	42.1	45.2	55.5	48.2	42.4	55.5	9hr
Dummy21	23.8	27.5	40.4	44.1	44.5	47.8	58.5	50.4	44.7	58.5	9hr
17.15a	4.9	4.6	4.7	2.9	2.6	2.1	2.2	2.4	1.7	4.9	30min
DumB10	0.7	1.0	1.2	1.3	1.3	1.4	1.7	1.7	1.2	1.7	9hr
Dummy39	24.3	28.5	41.2	45.0	45.5	49.0	59.6	51.2	45.7	59.6	9hr
SU3	1.0	1.4	1.8	1.7	1.6	1.7	1.6	1.5	1.2	1.8	2hr
Dummy40	27.6	33.9	51.6	57.1	57.6	61.5	74.4	63.6	57.0	74.4	9hr
17.15b	1.7	1.7	1.7	1.0	1.0	0.8	1.0	1.1	0.8	1.7	2hr
Dummy41	27.6	34.2	51.8	57.4	58.0	62.0	74.8	64.0	57.4	74.8	9hr
17.16	29.4	36.9	53.3	59.2	60.1	64.0	76.8	65.7	59.3	76.8	9hr
1.18	6.5	5.9	5.9	4.1	3.6	2.8	2.9	3.2	2.2	6.5	30min
16.01	3.2	3.1	3.2	1.8	1.7	1.3	1.3	1.4	1.0	3.2	30min
15.02	4.8	5.2	5.0	3.8	3.4	2.9	3.6	4.1	2.9	5.2	1hr
DumB12	1.4	1.9	2.1	2.2	2.2	2.4	3.3	3.2	2.7	3.3	9hr
15.01	6.9	6.2	6.3	4.2	3.8	3.0	3.3	3.6	2.5	6.9	30min
14.01	12.9	12.1	12.4	7.6	6.8	5.4	5.4	5.9	4.2	12.9	30min
1.17a	15.1	14.8	15.5	10.5	9.4	7.6	8.0	8.8	6.3	15.5	2hr
DumB11	2.3	3.6	4.5	4.6	4.6	5.0	6.3	6.2	4.5	6.3	9hr
1.17b	0.7	0.7	0.8	0.9	0.9	1.0	1.2	1.3	1.0	1.3	12hr
1.16	7.4	7.2	7.4	4.3	3.9	3.2	3.2	3.5	2.5	7.4	30min
1.14	2.1	2.1	2.1	1.6	1.4	1.1	1.1	1.2	0.8	2.1	2hr
12.02b	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	12hr
12.02a	3.5	3.3	3.4	2.1	1.9	1.6	1.7	1.9	1.4	3.5	30min
11.01	6.6	6.5	6.7	3.8	3.5	2.8	2.7	2.9	2.1	6.7	2hr
10.01	7.0	6.9	7.2	4.1	3.7	3.1	2.9	3.1	2.2	7.2	2hr
10.02a	11.9	10.1	11.7	7.7	7.0	5.6	5.5	5.9	4.3	11.9	30min
DumB14	2.0	3.1	3.7	3.6	3.7	4.0	4.4	4.6	3.5	4.6	12hr
1.13b	3.4	3.2	3.3	2.1	1.9	1.9	2.2	2.5	1.8	3.4	30min
1.13a	3.7	3.6	3.7	2.2	2.0	1.7	1.9	2.1	1.5	3.7	30min
1.12a	7.5	7.2	7.3	4.4	3.9	3.1	3.0	3.2	2.3	7.5	30min
DumB15	0.9	1.5	1.8	1.8	1.8	2.0	2.3	2.4	1.8	2.4	12hr
5.01	0.2	0.3	0.7	0.9	0.9	1.0	1.3	1.2	1.0	1.3	9hr
1.11a	2.7	2.7	2.7	1.6	1.5	1.2	1.2	1.3	0.9	2.7	2hr
1.11b	4.5	4.4	4.5	2.7	2.5	2.2	2.3	2.6	1.9	4.5	30min
1.09b	1.8	1.8	1.9	1.1	1.0	0.8	0.8	0.9	0.6	1.9	2hr
1.09c	4.2	4.1	4.2	2.5	2.3	1.9	2.0	2.2	1.6	4.2	30min
4.01	5.1	5.0	5.2	2.9	2.6	2.0	1.8	1.8	1.3	5.2	2hr
4.02	14.7	13.2	13.9	8.8	7.9	6.0	5.4	5.7	4.0	14.7	30min
1.06a	8.6	8.1	8.3	5.1	4.6	3.8	4.3	4.8	3.4	8.6	30min
DumB35	1.5	2.1	2.5	2.6	2.6	2.7	3.5	3.5	2.5	3.5	9hr
1.01	36.7	32.9	33.1	22.6	20.3	15.6	15.1	16.3	11.4	36.7	30min
1.02	46.5	43.3	40.8	33.0	31.2	25.8	25.2	27.3	19.2	46.5	30min
2.01	56.2	51.5	51.8	36.4	32.3	24.9	23.9	25.8	17.8	56.2	30min
1.03	85.7	91.4	96.0	70.8	60.0	53.2	51.7	55.4	38.9	96.0	2hr
1.04	91.8	97.6	100.8	75.2	67.3	58.7	57.7	59.0	43.6	100.8	2hr
1.05	95.3	105.3	108.8	83.5	75.2	67.6	67.3	66.2	51.7	108.8	2hr
1.06b	96.2	109.5	115.0	90.5	79.8	74.3	74.4	70.7	57.0	115.0	2hr
DummyO1	9.7	19.1	30.5	34.7	35.6	36.8	48.9	45.4	37.9	48.9	9hr
Dummy1	10.5	20.4	32.6	37.0	37.9	39.3	51.9	48.1	40.1	51.9	9hr
1.07a	2.8	2.7	2.8	1.7	1.6	1.5	1.7	1.9	1.4	2.8	30min
1.07b	1.5	1.5	2.5	2.9	2.9	3.1	4.0	4.0	2.9	4.0	9hr
Dummy2	11.1	21.9	35.2	40.2	41.3	43.2	56.4	51.7	43.5	56.4	9hr
1.08a	6.3	6.1	6.2	3.7	3.3	2.5	2.4	2.5	1.8	6.3	30min
1.08b	5.7	5.5	5.7	3.4	3.1	2.7	2.9	3.2	2.4	5.7	30min
Dummy3	15.1	22.3	35.8	41.5	43.4	45.4	58.6	52.6	45.5	58.6	9hr
3.01	7.3	7.1	7.3	4.1	3.7	2.8	2.5	2.6	1.8	7.3	2hr
1.09a	7.9	7.9	8.5	5.1	4.6	3.6	3.2	3.4	2.4	8.5	2hr
DumB34	1.1	1.8	2.1	2.1	2.2	2.3	2.4	2.6	2.0	2.6	12hr
Dummy60	15.3	23.0	36.8	42.7	44.5	46.7	60.0	53.7	46.7	60.0	9hr
Dummy4	27.8	28.0	37.2	44.1	47.3	49.7	62.8	55.1	49.5	62.8	9hr
SU2	2.1	2.8	3.1	2.8	2.9	2.8	2.8	3.0	2.3	3.1	2hr
1.10b	3.6	3.8	4.2	3.9	4.1	4.0	4.0	4.3	3.3	4.3	12hr
DumB31	1.0	2.2	3.1	3.1	3.0	3.3	3.6	3.5	2.8	3.6	9hr
Dummy42	28.0	28.2	39.0	46.2	49.2	51.9	65.3	56.9	51.4	65.3	9hr
1.10a	29.1	29.7	39.2	46.6	49.7	52.5	65.9	57.4	52.0	65.9	9hr
Dummy6	31.9	33.0	39.6	47.4	50.8	54.0	67.0	58.5	53.5	67.0	9hr
1.12c	5.4	5.2	5.4	3.1	2.8	2.3	2.2	2.4	1.7	5.4	30min
DumB16	0.7	1.1	1.4	1.3	1.3	1.5	1.7	1.8	1.3	1.8	12hr
1.12b	34.6	38.2	42.6	51.3	55.0	58.9	71.9	62.8	58.4	71.9	9hr
Dummy7	34.9	39.5	43.2	52.2	56.2	60.5	73.4	65.8	60.4	73.4	9hr
10.02b	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	12hr
7.07a	1.2	1.2	1.2	0.7	0.7	0.8	1.0	1.1	0.8	1.2	2hr
DumB2	0.2	0.4	0.6	0.6	0.6	0.7	0.8	0.8	0.6	0.8	9hr
8.01	14.5	13.7	14.0	8.5	7.6	6.0	6.0	6.5	4.6	14.5	30min
DumB1	1.1	2.0	2.7	3.0	3.0	3.1	4.2	4.1	3.0	4.2	9hr
7.01	7.2	7.0	7.2	4.1	3.8	3.0	2.9	3.1	2.2	7.2	2hr
7.02	21.4	23.3	23.3	15.6	13.5	11.3	11.1	12.0	8.5	23.3	1hr
7.03	33.2	35.0	33.7	27.5	23.2	19.8	19.5	21.2	15.0	35.0	1hr
7.04	38.3	41.0	39.8	30.8	28.3	23.6	23.6	25.2	18.4	41.0	1hr
7.05	43.3	47.6	45.0	35.9	36.1	30.0	30.3	32.5	24.2	47.6	1hr
7.06	44.1	50.3	48.2	39.4	38.5	33.4	34.1	34.9	27.0	50.3	1hr
DummyO2	5.7	11.2	16.7	18.3	18.4	19.4	24.6	23.4	18.2	24.6	9hr
7.07b	6.7	13.3	20.2	22.0	22.2	23.5	29.5	27.8	21.9	29.5	9hr
Dummy12	6.9	13.6	20.7	22.6	22.8	24.1	30.3	28.5	22.4	30.3	9hr
7.08b	7.5	7.1	7.2	4.3	3.8	2.9	2.7	2.9	2.0	7.5	30min
DumB3	0.5	0.9	1.2	1.3	1.3	1.4	1.8	1.8	1.3	1.8	9hr
7.08a	1.9	1.9	2.0	1.1	1.1	1.0	1.1	1.3	1.0	2.0	2hr
7.09a	6.0	5.8	5.9	3.4	3.1	2.4	2.3	2.5	1.8	6.0	30min
DumB4	0.6	1.0	1.2	1.3	1.2	1.4	1.7	1.7	1.2	1.7	12hr
Dummy11	7.7	15.2	23.3	25.5	25.7	27.3	34.1	31.6	25.2	34.1	9hr
7.09c	9.1	8.6	8.8	5.2	4.7	3.5	3.2	3.4	2.4	9.1	30min
DumB7	0.6	1.1	1.5	1.5	1.5	1.7	2.1	2.1	1.5	2.1	12hr
7.09b	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.4	0.6	2hr
Dummy43	8.2	16.0	24.8	27.1	27.3	29.1	36.2	33.4	26.8	36.2	9hr
7.10a	5.7	5.2	5.3	3.4	3.0	2.3	2.2	2.4	1.7	5.7	30min
7.10b	4.3	4.0	4.0	2.5	2.3	1.8	1.7	1.8	1.3	4.3	30min
Dummy9	10.8	16.3	25.7	28.5	28.9	30.9	38.0	34.2	28.3	38.0	9hr
9.01	4.7	4.7	4.9	2.8	2.5	2.0	2.0	2.1	1.5	4.9	2hr
9.02b	7.8	6.6	7.8	5.0	4.5	3.6	3.5	3.8	2.7	7.8	2hr
9.02a	7.9	7.6	7.7	4.6	4.1	3.2	3.1	3.4	2.4	7.9	30min
Dummy59	15.7	14.0	14.0	9.5	8.6	6.8	6.7	7.2	5.1	15.7	30min
DumB5	1.8	3.0	3.8	3.7	3.7	4.2	5.0	5.1	3.7	5.1	12hr
Dummy8	11.7	17.9	28.7	31.6	31.9	34.2	42.0	37.4	31.2	42.0	9hr
7.12	10.3	9.4	9.5	6.2	5.6	4.3	4.5	5.0	3.5	10.3	30min
DumB13	0.8	1.4	1.9	2.2	2.3	2.4	3.2	3.0	2.6	3.2	9hr
7.11a	5.1	5.0	5.2	2.9	2.7	2.1	2.1	2.2	1.6	5.2	2hr
DumB6	0.7	1.0	1.2	1.2	1.2	1.4	1.6	1.6	1.2	1.6	12hr
7.11b	1.7	1.8	1.9	1.7	1.8	1.9	2.1	2.3	1.7	2.3	12hr
Dummy10	13.4	19.4	31.4	34.9	35.3	37.7	46.3	40.7	34.7	46.3	9hr
12.01a	14.2	19.7	32.0	35.8	36.3	39.0	47.5	41.5	35.7	47.5	9hr
Dummy13	43.9	56.4	73.5	87.7	92.7	99.4	119.3	103.2	96.6	119.3	9hr
12.01b	0.6	0.6	0.7	0.7	0.7	0.8	1.0	1.0	0.8	1.0	12hr
Dummy44	44.0	56.7	73.7	87.9	93.1	99.8	119.7	103.8	97.0	119.7	9hr
Dummy14	44.4	57.6	74.2	88.7	95.0	101.8	121.5	107.0	99.8	121.5	9hr
1.15	8.4	8.1	8.3	5.0	4.5	3.8	4.2	4.8	3.4	8.4	30min
Dummy45	44.7	58.4	74.5	89.3	96.4	103.5	122.6	109.3	101.8	122.6	9hr
Dummy15	46.3	61.5	76.7	92.3	101.1	108.5	126.9	116.0	107.5	126.9	9hr
Dummy46	46.5	61.9	77.1	92.8	102.2	109.9	127.9	117.8	109.0	127.9	9hr
Dummy16	47.0	63.0	78.3	94.5	105.1	113.1	130.8	122.2	112.6	130.8	9hr
Dummy17	68.1	96.9	129.6	149.0	164.3	172.6	202.6	185.6	173.5	202.6	9hr
1.22a	3.6	3.4	3.5	2.5	2.2	1.7	1.8	2.0	1.5	3.6	30min
1.23	0.8	1.3	1.6	1.5	1.4	1.5	1.4	1.4	1.1	1.6	2hr
Dummy27	73.6	106.7	148.4	163.7	183.4	192.5	224.2	211.8	196.0	224.2	9hr
1.24	0.6	0.8	1.1	1.2	1.2	1.2	1.2	1.1	0.9	1.2	6hr
Dummy49	73.9	107.1	149.0	164.2	183.9	193.1	224.9	212.6	196.8	224.9	9hr
Dummy50	74.3	107.8	150.0	165.3	185.1	194.7	226.5	214.6	199.4	226.5	9hr
Dummy51	75.1	109.1	151.8	167.0	187.1	197.3	229.4	218.0	203.8	229.4	9hr
Dummy52	75.2	109.3	152.1	167.4	187.5	197.7	230.0	218.6	204.7	230.0	9hr
Dummy53	76.0	110.5	154.1	169.4	189.8	200.6	233.4	222.5	209.9	233.4	9hr
1.27	76.5	111.7	156.3	171.6	192.2	203.7	237.0	226.5	215.4	237.0	9hr
E18	1.8	1.8	2.3	2.6	2.7	2.8	3.6	3.7	2.8	3.7	12hr
1.28	76.9	112.4	157.2	172.5	193.3	205.4	239.0	228.9	219.7	239.0	9hr
Out	79.4	115.6	161.9	177.6	199.7	220.6	252.1	258.3	250.7	258.3	12hr

Table C.21 Impact of Development and Basins on 2 yr ARI Peak Flows

Location ID (see Fig C.1)	Location Name	2011 Node Name (see Fig C.2)	2 yr ARI Peak Flow (m3/s)									
			Existing	Scenario A Dev		Scenario B Dev		Dev A + Basins		Dev B + Basins		Dev B + Basins + OSD	
			Flow	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff
BC1	**Bonds Creek** - Denham Court Road	1.04	7.1	7.1	0.0%	43.2	505.6%	7.1	0.0%	43.2	505.6%	43.2	505.6%
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	11.4	11.2	-2.3%	49.4	332.8%	11.4	-0.4%	11.8	3.4%	11.8	3.4%
BC3	**Bonds Creek** - Bringelly Road	1.10a	14.0	17.0	20.9%	52.6	275.2%	13.7	-2.6%	14.1	0.8%	14.1	0.8%
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	15.8	20.6	30.2%	53.6	238.9%	16.1	1.9%	16.1	1.9%	16.1	1.9%
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	27.5	39.0	42.0%	63.9	132.4%	26.7	-2.9%	28.2	2.7%	28.3	2.8%
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	30.2	41.2	36.5%	63.9	111.7%	29.6	-2.0%	32.0	5.9%	32.0	6.1%
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	16.9	16.6	-1.3%	44.4	163.6%	17.0	0.7%	24.9	47.5%	17.9	6.2%
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	47.0	46.7	-0.6%	91.2	94.1%	47.1	0.2%	50.6	7.6%	50.4	7.3%
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	53.8	53.9	0.1%	96.4	79.1%	54.6	1.5%	59.2	10.1%	59.1	9.8%
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	9.7	18.5	90.8%	28.5	194.3%	9.7	0.4%	10.3	6.4%	10.3	6.6%
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	6.7	22.3	235.0%	22.3	235.0%	7.5	12.3%	7.5	12.3%	7.5	12.3%
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	5.6	15.7	182.6%	15.7	182.6%	8.9	59.4%	8.9	59.4%	8.9	59.4%

Table C.22 Impact of Development and Basins on 2 yr ARI Critical Storm Burst Duration

Location ID (see Fig C.1)	Location Name	2011 Node Name (see Fig C.2)	2 yr ARI Critical Storm Burst Duration					
			Existing	Scenario A Dev	Scenario B Dev	Dev A + Basins	Dev B + Basins	Dev B + Basins + OSD
BC1	**Bonds Creek** - Denham Court Road	1.04	12hr	12hr	2hr	12hr	2hr	2hr
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	12hr	12hr	2hr	12hr	12hr	12hr
BC3	**Bonds Creek** - Bringelly Road	1.10a	12hr	2hr	2hr	18hr	12hr	12hr
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	12hr	1hr	2hr	1hr	1hr	1hr
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	12hr	2hr	2hr	12hr	12hr	12hr
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	12hr	2hr	2hr	18hr	12hr	12hr
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	12hr	18hr	2hr	12hr	1hr	12hr
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	12hr	18hr	2hr	18hr	12hr	12hr
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	18hr	18hr	4.5hr	18hr	12hr	12hr
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	12hr	1hr	2hr	12hr	12hr	12hr
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	12hr	2hr	2hr	1hr	1hr	1hr
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	12hr	30min	30min	2hr	2hr	2hr

Table C.23 Impact of Development and Basins on 100 yr ARI Peak Flows

Location ID (see Fig C.1)	Location Name	2011 Node Name (see Fig C.2)	100 yr ARI Peak Flow (m3/s) and Critical Storm Burst Duration									
			Existing	Scenario A Dev		Scenario B Dev		Dev A + Basins		Dev B + Basins		B + Basins + External OSD
			Flow	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff	Flow	Diff
BC1	**Bonds Creek** - Denham Court Road	1.04	36.4	36.4	0.0%	100.8	176.9%	36.4	0.0%	100.8	176.9%	100.8	176.9%
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	56.9	56.1	-1.5%	121.1	112.9%	56.5	-0.7%	56.4	-0.9%	56.4	-0.9%
BC3	**Bonds Creek** - Bringelly Road	1.10a	68.3	64.8	-5.1%	133.0	94.8%	66.2	-3.1%	65.9	-3.5%	65.9	-3.5%
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	75.3	69.9	-7.1%	139.1	84.9%	72.1	-4.1%	71.9	-4.5%	71.9	-4.5%
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	128.6	115.8	-9.9%	178.5	38.8%	122.2	-5.0%	121.5	-5.6%	121.5	-5.6%
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	140.3	127.9	-8.8%	182.3	30.0%	131.8	-6.1%	130.8	-6.7%	130.8	-6.7%
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	82.8	80.8	-2.5%	115.9	39.9%	82.0	-1.1%	76.0	-8.2%	76.8	-7.3%
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	218.9	209.0	-4.5%	249.5	14.0%	211.7	-3.3%	201.6	-7.9%	202.6	-7.5%
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	245.9	236.8	-3.7%	282.1	14.7%	238.4	-3.0%	228.9	-6.9%	230.0	-6.5%
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	46.8	43.5	-7.1%	71.3	52.3%	45.4	-3.1%	46.3	-1.3%	46.3	-1.3%
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	31.9	52.0	63.1%	52.0	63.1%	32.2	1.1%	32.2	1.1%	32.2	1.1%
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	25.1	34.2	36.3%	34.2	36.3%	25.4	1.3%	25.4	1.3%	25.4	1.3%

Table C.24 Impact of Development and Basins on 100 yr ARI Critical Storm Burst Duration

Location ID (see Fig C.1)	Location Name	2011 Node Name (see Fig C.2)	100 yr ARI Critical Storm Burst Duration					
			Existing	Scenario A Dev	Scenario B Dev	Dev A + Basins	Dev B + Basins	Dev B + Basins + OSD
BC1	**Bonds Creek** - Denham Court Road	1.04	9hr	9hr	2hr	9hr	2hr	2hr
BC2	**Bonds Creek** - Cowpasture Road	Dummy 2 (near 1.07a)	9hr	9hr	2hr	9hr	9hr	9hr
BC3	**Bonds Creek** - Bringelly Road	1.10a	9hr	9hr	2hr	9hr	9hr	9hr
BC4	**Bonds Creek** - u/s Tributary 1 junction	1.12b	9hr	9hr	2hr	9hr	9hr	9hr
BC5	**Bonds Creek** - d/s Tributary 1 junction	Dummy 14 (near 1.14)	9hr	9hr	2hr	9hr	9hr	9hr
BC6	**Bonds Creek** - u/s Kemps Creek junction (Fourteenth Ave)	Dummy 16 (near 1.18)	9hr	12hr	2hr	9hr	9hr	9hr
KC1	**Kemps Creek** - u/s Bonds Creek junction	17.16	9hr	9hr	2hr	9hr	9hr	9hr
KC2	**Kemps Creek** - d/s Bonds Creek junction	Dummy 17 (near 1.21)	9hr	9hr	2hr	9hr	9hr	9hr
KC3	**Kemps Creek** - d/s Tributary 2 junction (Gurner Ave)	Dummy 52 (near 31.03)	9hr	9hr	4.5hr	9hr	12hr	9hr
TR1	**Tributary 1** - u/s Bonds Creek junction	Dummy 10 (near 7.11b)	9hr	2hr	2hr	9hr	9hr	9hr
TR2	**Tributary 2** - Fourteenth Avenue	Dummy 26 (near 29.02)	9hr	2hr	2hr	9hr	9hr	9hr
TR3	**Tributary 3** - Eighteenth Avenue	Dummy 32 (near E8)	9hr	30min	30min	12hr	12hr	12hr

Appendix D

Hydraulics

D Hydraulics

D.1 Aims

The aims of hydraulic analyses were to

- Using supplied detailed survey and/or ALS data and any available data on existing road crossings, assemble an TUFLOW model of the major watercourse(s) draining the Austral and Leppington North Precincts;
- Run the calibrated TUFLOW model for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF critical duration events under current landuse and estimate the flood levels, flood extents, flood velocities and flood hazards;
- Modify the TUFLOW model to represent a development scenario that includes regional basins and run to estimate impacts in the 2 yr ARI and 100 yr ARI floods.

D.2 Previous Hydraulic Modelling

As discussed by Perrens Consultants, 2003, previous flood studies have been carried out for the South Creek catchment and its tributaries by the former Department of Water Resources (DWR) and various consultants.

The DWR as part of its South Creek Flood Study (DWR, 1990) computed water surface profiles on Kemps Creek and other major tributary streams in the South Creek catchment using a steady state backwater analysis based on the HEC-2 program. The HEC-2 model extended from Elizabeth Drive to a point 1 km upstream of Heath Road and was based on a total of 43 cross sections over this reach.

Documented historic flood levels on Kemps Creek are scarce. Historic flood level information is concentrated along the main stream (South Creek). Accordingly, design roughness values on Kemps Creek were mainly based on experience. Estimated flood levels and velocities for the 100 year ARI event were presented in the DWR report.

The DWR's HEC-2 model was later used in the Floodplain Management Study (DWR, 1991). The study report gives details of flood behaviour for South Creek for the range of flood frequencies between 1 year ARI and the PMF, under both existing conditions and with the catchments fully urbanised.

In 2003 Perrens Consultants calculated water surface profiles for all major watercourses and tributaries within the Austral study area. Series of HEC-2 models were assembled individually for the main watercourses and each tributary.

For Kemps Creek, individual HEC-2 models were created for the following watercourses and tributaries:-

- Kemps Creek from Bringelly Road to a point a short distance downstream of Elizabeth Drive:
- Kemps Creek between Bringelly Road to confluence with Bonds Creek crossing Twelfth Avenue;

- Kemps Creek from confluence of Bonds Creek to Gurner Avenue crossing Fifteenth Avenue;
- Kemps Creek from Gurner Avenue to Elizebeth Drive;
- Tributary creek denoted as branch KC01 from the confluence of Kemps Creek to approximately 450m upstream of Twelfth Avenue's crossing of Kemps Creek, and extended to Belfield Avenue;
- Tributary creek denoted as KC02 located on the west bank of Kemps Creek between Twelfth and Fifteenth Avenues from the confluence of Kemps Creek to upstream of Herley Avenue;
- Tributary creek denoted as KC03 joins the west bank of Kemps Creek upstream of Gurner Avenue;
- Tributary creek denoted as KC07 has its confluence immediately upstream of the bridge at Elizebeth Drive on Kemps Creek's west bank and extends to a point upstream of the Cross Street road crossing;
- Tributary 2 creek denoted as KC08 from its confluence with Kemps Creek at Fifteenth Avenue to Tenth Avenue through Austral village area;
- Tributary creek denoted as KC11 has its confluence with Tributary 2 creek at Fourth Avenue to upstream of Fourth Avenue;
- Tributary creek denoted as KC13 has its confluence with Tributary 2 near Kemps Creek to upstream of the intersection Fourth and Fifteenth Avenues;
- Tributary 3 creek denoted as KC14 joins Kemps Creek upstream of Elizabeth Drive to Fourteenth Avenue;
- Tributary creek denoted as KC17 starts at its confluence with Tributary 3 adjacent to Kemps Creek to a point north of Gurner Avenue;
- Tributary creek denoted as KC19 has its confluence with Tributary 3 creek downstream of Eighteenth Avenue to a location about 700m upstream;
- Tributary creek denoted as KC23 has its confluence with Tributary 3 downstream of Eighteenth Avenue to a location about 800m upstream;
- Tributary Creek denoted as KC24 has its confluence with Tributary 3 upstream of its confluence with Kemps Creek to about 1.6 km upstream; and
- Tributary creek denoted as KC27 has its confluence with Tributary 3 south of the sandmining plant at Cecil Park to about 700m upstream.

For Bonds Creek, individual HEC-2 models were created for the following watercourses and tributaries:-

- Bonds Creek between Denham Court Road to Bringelly Road;
- Bonds Creek between Bringelly Road to Kemps Creek confluence
- Tributary creek denoted as BC08 from Tenth Avenue to approximately 800m upstream; and
- Tributary 1 Creek also named as Scalabrini Creek from Bringelly Road to its confluence with Bonds Creek upstream of Seventh Avenue.

Perrens Consultants, 2003 reported the establishment of these models as follows:

> *Model cross sections for the present investigation were initially obtained from the results of the photogrammetric survey of the study area as tabulations of easting, northing and level for each point on the section. They were converted into tables of elevations and offset distances across the section and then into HEC-2 format using the HEC-2 editor.*
>
> *No quantitative data on historic flooding which could be used for model calibration were uncovered for Bonds Creek or the tributary streams during the process of community consultation. As mentioned, some limited data on Kemps Creek had been collected by DWR in their flood study (DWR, 1990) and it is understood that these were incorporated in their calibrated model of that stream. The HEC-2 model of Kemps Creek developed for the present investigation comprised DWR sections as well as sections derived from the photogrammetric survey as described above. DWR's roughness values were reviewed during site inspections of the study area and amended where considered appropriate.*
>
> *Roughness values for Bonds Creek and the remaining drainage lines were initially estimated during site inspections carried out for the present study, and a series of model runs was also carried out to test the sensitivity of results to variations in model parameters.*
>
> *In general, it was found that model results were not particularly sensitive to variations in roughness. The results presented in later sections are based on a "best estimate" of roughness.*

It is noted that HEC-2 cross sections were obtained from the results of the photogrammetric survey of the study area as tabulations of easting, northing and level for each point on the section. It is unclear if this source photogrammetric survey is currently available to allow comparisons with ALS data and 0.5 m contour levels supplied by stakeholders.

D.3 Hydraulic Modelling

In view of the availability of ALS survey data for the study area, the approach that was adopted was to assemble a 1D/2D flood routing model of the existing watercourses and floodplain using TUFLOW.

The advantages of a 1D/2D approach include the ability to:

- Represent narrow channels in 1D and overbank areas in 2D;
- Represent spatial planting strategies in overbank areas in the 2D model far more accurately than in a 1D model;
- Present flood levels and flood extents and velocity fields in spatial plots that are more readily understood by stakeholders than the tabular presentation of results from 1-D hydraulic software; and
- Identify flood extents more accurately rather than relying on linear interpolation between 1-D cross sections.

D.3.1 Survey

The available sources of survey were Aerial laser survey (ALS) and ground contours at 0.5 m intervals.

Liverpool City Council supplied ALS data cut within the riparian corridors, and processed ground contours of 0.5 m intervals outside the riparian corridor within their LGA. Camden Council also supplied ground contour data at 0.5 m intervals for Leppington North floodplain with the LGA. The extent of the supplied ALS data is compared with the 100 yr ARI flood extent previously mapped by Liverpool City are compared in **Figure D.1**. It is noted that the ALS does not cover the extent of the 100 yr ARI flood and that modelling of design floods was based on a combination of the ALS data and the ground contour data at 0.5 m intervals.

Using the supplied ALS data and contour data, a digital elevation model (DEM) was created for the TUFLOW model..

D.3.2 Hydraulic Structures

A total of 33 existing hydraulic structures were modelled in the 2003 hydraulic investigation of Kemps Creek and Bonds Creek. For the purposes of this study, 29 of these hydraulic structures were located within the current study area.

The hydraulic structures included in the TUFLOW model included:

Kemps Creek

- Hydraulic structure having a 6.7m span and pier width 0.4m having a waterway area 10m2 at Bringelly Road crossing;
- 4 x 1350mm diameter RCP having a combined waterway area 5.7m2 at Twelfth Avenue crossing;
- Hydraulic structure having a 40m span and pier width 2.25m having a waterway area 122m2 at Fifteenth Avenue;
- 2 x 900mm diameter RCP having a combined waterway area 1.5m2 at Gurner Avenue;
- 2 x 1050mm diameter RCP having a combined waterway area 1m2 at Wynyard Avenue;
- 2 x 3.2mW x 0.9mH RCBC having a combined waterway area 5.8 m2 at Devonshire Road;
- 0.9m x 1.2m oval pipe having a waterway area 0.9m2 at King Street; and
- 2 x 600mm diameter RCP having a combined waterway area 0.3m2 at Herley Avenue.

Bonds Creek

- 3 x 1.5mW x 0.9mmH RCBC having a combined waterway area 4m2 at Denham Court Road;
- 4 x 1.95mW x 1mH RCBC having a combined waterway area 8m2 at Hume Highway
- 3 x 3.3mW x 1.8mH RCBC having a combined waterway area 18m2 at Cowpasture Road;
- 3 x 3.3mW x 1.5mH RCBC having a combined waterway area 13.5m2 at Bringelly Road;
- 4 x 3.3mW x 0.95mH RCBC having a combined waterway area 11.5m2 at Edmonson Ave;
- 1 x 5.45m x 3.2m Armco having a waterway area 17.5m2 at Eighth Avenue;
- 3 x 3.3m x 2.1m Armco having a combined waterway area 21m2 at Fourth Avenue;
- 2 x 1.08mW x 0.69mH RCBC having a combined waterway area 1.5m2 at Ninth Avenue; and

- 1 x 8m semi RCP having a waterway area 20m2 at Tenth Avenue.

Tributary 1

- 1 x 750mm diameter RCP having a waterway area 0.4m2 at Fifth Avenue;

Tributary 2

- 4 x 525mm diameter RCP having a combined waterway area 0.3m2 at Tenth Avenue;
- 1 x 750mm diameter RCP having a waterway area 0.4m2 at Eleventh Avenue;
- 1 x 2.9mW x 0.75mH RCBC having a waterway area 2.2m2 at Edmonson Avenue;
- 1 x 750mm diameter RCP having a waterway area 0.4m2 at Thirteenth Avenue;
- 4 x 525mm diameter RCP having a combined waterway area 0.3m2 at Fourth Avenue; and
- 1 x 600mm diameter RCP having a waterway area 0.3m2 at Edmonson / Thirteenth Avenue.

Tributary 3

- 2 x 450mm diameter RCP having a combined waterway area 0.3m2 at Fourteenth Avenue;
- 3 x 750mm diameter RCP having a combined waterway area 1.3m2 at Fifteenth Avenue;
- 1 x 2.45mW x 1.2mH RCBC having a waterway area 2.9m2 at Sixteenth Avenue;
- 2 x 3.3mW x 1.2mH having a waterway area 7.2m2 at Seventeenth Avenue;
- 1 x 800mm diameter RCP having a waterway area 0.5m2 at Eighteenth Avenue.

These structures at road crossings were modelled in TUFLOW as 1D elements. Some non-standard structures like Armco and oval shaped conduits were represented using an equivalent box culvert having the same waterway area.

D.3.3 Modelling Approach and Parameters

The TUFLOW model was based upon a 5 m x 5m rectangular grid.

Hydraulic Roughness

For modelling purposes, the hydraulic roughness of the floodplain and waterways was classified into four (4) roughness categories which are summarised in **Table D.1**. The spatial distribution of roughness is given in **Figure D.2**.

Table D.1 Adopted Roughness Values

	2003 Study	This Study
Floodplain	0.05 to 0.08	0.06
Dense vegetation		0.07
Creek channel	0.04 to 0.08	0.05 to 0.06
Roads and Highways		0.02

The roughness values adopted in TUFLOW are comparable with the values adopted in the 2003 HEC-2 model.

Hydraulic Boundary Conditions

Inflow hydrographs were exported from the **xprafts** catchment model and imported into the TUFLOW model.

Preliminary modelling of the 100 yr ARI event was undertaken with inflows to the TUFLOW model located on the centre-line of the major watercourses and distributed along lateral tributaries (refer **Figure D.3**). This approach gave flood extents not only for the main watercourses but also the lateral tributaries. On some lateral tributaries it would appear that the ALS data and/or contour data was unable to define a local watercourse and consequently the flood was estimated to spill across the floodplain. However it is intended that regional retarding basins be constructed in the downstream reach of lateral tributaries to mitigate the impact of planned development and that works would be undertaken on the lateral tributary to direct all local flows up to the 100 yr ARI event into a basin.

Consequently a second approach was trialled where the inflows from lateral tributaries were also input on the centre-line of major watercourses. The resulting flood extent was termed the mainstream flood extent (see **Figure D.3**). This flood extent also guided the downstream limit of any retarding basin to avoid any potential drowning of a basin outlet during major floods.

This second approach was adopted for all subsequent modelling.

The downstream boundary was located well downstream of the Precinct boundary so that any downstream boundary effects would have minimal impact on estimated flood levels within the Precincts. The downstream boundary condition adopted in the TUFLOW model for all the design runs was a free outfall condition.

D.4 Existing Conditions

Preliminary modelling of the 2 hour and 9 hour storm bursts for the 2 yr ARI and 100 yr ARI events was undertaken to assess the critical storm burst duration for flood levels. It was found that under Existing Conditions that that the 9 hour storm was the critical storm for Kemps Creek, Bonds Creek and the tributary creeks. Consequently all design runs up to the 500 yr ARI event were undertaken for the 9 hour storm burst.

Similarly the 1.5 hour and 2 hour PMP storms were also modelled. It was found that 2 hour PMP event gave the peak PMF levels.

The TUFLOW model was run for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events under Existing Conditions.

D.4.1 Flood Depths

The estimated peak flood depths for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.4** to **D.11**.

D.4.2 Flood Velocities

The estimated peak flood depths for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.12** to **D.19**.

D.4.3 Pedestrian and Vehicular Stability

When considering pedestrian and vehicular stability, three velocity x depth criteria were identified as follows:

Velocity x Depth	Comment
≤ 0.4 m^2/s	This is typically adopted by Councils as a limit of stability for pedestrians
0.4 – 0.6 m^2/s	Unsafe for pedestrians but safe for vehicles if overland flood depths do not exceed around 0.3 m
> 0.6 m^2/s	This is typically adopted by Councils as a limit of stability for vehicles

The estimated peak velocity x depth for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.20** to **D.27**.

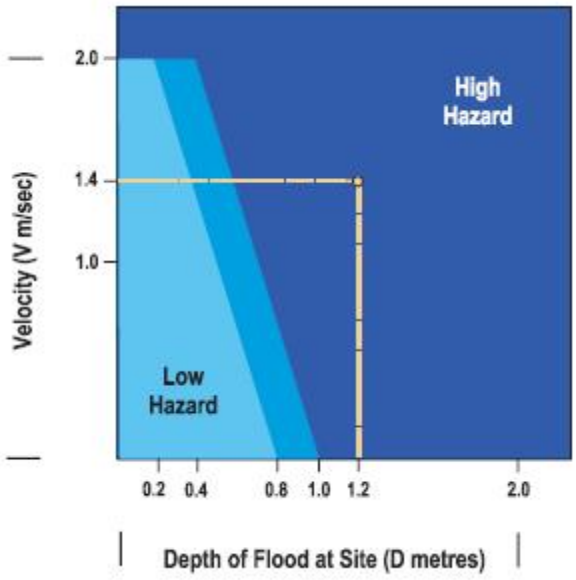
D.4.4 Flood Hazards

Experience from studies of floods throughout NSW and elsewhere has allowed authorities to develop methods of assessing the hazard to life and property on floodplains. This experience has been used in developing the NSW Floodplain Development Manual to provide guidelines for managing this hazard. These guidelines are shown schematically below.

To use the diagram, it is necessary to know the average depth and velocity of floodwaters at a given location. If the product of depth and velocity exceeds a critical value (as shown below), the flood flow will create a **high hazard** to life and property. There will probably be danger to persons caught in the floodwaters, and possible structural damage. Evacuation of persons would be difficult.

By contrast, in **low hazard** areas people and their possessions can be evacuated safely by trucks. Between the two categories a transition zone is defined in which the degree of hazard is dependent on site conditions and the nature of the proposed development.

This calculation leads to a provisional hazard rating. The provisional hazard rating may be modified by consideration of effective flood warning times, the rate of rise of floodwaters, duration of flooding and ease or otherwise of evacuation in times of flood.



Provisional Hazard Categories
(after Figure L2, NSW Government, 2005)

The estimated flood hazard for the 1 yr ARI, 2 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF events are given in **Figures D.28** to **D.35**.

D.4.5 Road Crossings

As discussed above 29 hydraulic structures were located within the current study area. These crossings are detailed in **Table D.1**.

A comparison of the 1 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI and PMF flood levels at crossings estimated in the 2003 study and the current study is given in **Table D.2**.

The estimated 1 yr ARI, 2 yr ARI, 5 yr ARI and 20 yr ARI flood levels, velocities and velocity x depths at crossings are given in **Table D.3** while the estimated 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF flood levels, velocities and velocity x depths at crossings are given in **Table D.4**.

Particular attention was taken in estimation of the 500 yr ARI result at the road crossings in order to identify safe evacuation routes. An assessment was made at each of the crossings to determine if the road can be crossed according to the criteria in **Section D.4.3**. Results of this assessment are given in **Table D.5** and the likely evacuation routes are displayed in **Figure D.37**.

It is noted from Table D.1 that the invert levels of crossings based on the ALS data can vary between ±0.7 m in comparison with invert levels reported in the 2003 study.

Similarly there are significant differences in the estimated flood levels at crossings which can range from -0.5 m to +1.45 m (in the 2 yr ARI event).

It is considered that these significant differences could be due to:

- The ALS data and/or contour data in reaches beyond the supplied ALS data are not accurately delineating watercourses and in particular channel invert levels;
- In areas of dense vegetation the ALS data is misreporting the true ground level – this phenomenon has been previously encountered on a floodplain in the Wyong Shire where in areas of dense low vegetation filed survey disclosed ground levels up to 1 m lower than represented by the ALS data;
- The adopted spatial distribution of roughness may be less detailed than adopted in the 2003 HEC-2 model;
- The discharges adopted in the 2003 HEC-2 model differ from the discharges calculated in the 2D floodplain model due to hydraulic routing (which is not included in the HEC-2 model).

To establish if the first two factors may be significant, cross sections extracted from the merged ALS data and contour levels were compared with cross sections from the HEC-2 models at selected locations immediately upstream of five crossings. The five locations which were selected were:

- Kemps Creek upstream of Bringelly Road
- Bonds Creek upstream of Eighth Avenue
- Bonds Creek upstream of Tenth Avenue
- Tributary 2 upstream of Edmonson Avenue
- Tributary 3 upstream of Fourteenth Avenue

It should be noted that the comparison is based on extracting a cross section along the best estimate of the location and alignment of the HEC-2 cross section (in the absence of any geo-referenced data on the HEC-2 cross sections).

Theses cross sections are compared in **Figure D.38A-E**.

In Kemps Creek upstream of Bringelly Road the comparison indicates that the invert level obtained from the ALS data is around 1.5 m higher than adopted in the 2003 study and that the levels on the floodplain vary from 0.2 to 0.5 m higher than the 2003 cross section.

In Bonds Creek upstream of Eighth Avenue the comparison indicates that the invert level obtained from the ALS data is around 0.7 m higher than adopted in the 2003 study and that locally levels on the floodplain can be up to 0.5 m higher than the 2003 cross section – this may be due to the presence of dense vegetation.

In Bonds Creek upstream of Tenth Avenue the comparison indicates that the invert level obtained from the ALS data is around 0.5 m higher than adopted in the 2003 study and that levels on the floodplain can be up to 0.2 to 0.4 m higher than the 2003 cross section.

In Tributary 2 upstream of Edmonson Avenue the comparison indicates that the invert level obtained from the ALS data is around 0.6 m higher than adopted in the 2003 study and that the channel section differs from the 2003 cross section. The levels on the floodplain can are in broad agreement with the 2003 cross section.

In Tributary 3 upstream of Fourteenth Avenue the comparison indicates that the ALS data was unable to define the small channel that was included in the 2003 cross section. Locally levels on the

floodplain can lower than the 2003 cross section by up to 0.2 m – this may be due to differences in the precise locations and alignments of the two cross sections.
It was concluded from the comparison of cross sections that the significant differences in the estimated flood levels at crossings could be due to

- the ALS data which has not accurately defined watercourses and in particular channel invert levels which can be up to 1.5 m lower than indicated by the ALS data; and
- In areas of dense vegetation the ALS data is misreporting the true ground level with floodplain levels estimated to be up to 0.5 m higher than adopted in the 2003 study.;

D.5 Developed Conditions

The TUFLOW model was also run with hydrographs exported from the **xprafts** model for the case of Scenario B development with Precinct basins and five external basins and OSD on other external small subcatchments.

The developed condition model was run for the 2 yr ARI and 100 yr ARI events.

It was noted that the invert levels of crossings based on the ALS data can vary between ±0.7 m in comparison with invert levels reported in the 2003 study. Similarly there are significant differences in the estimated flood levels at crossings which can range from -0.5 m to +1.45 m (in the 2 yr ARI event).

It was concluded from a comparison of five cross sections from the 2003 study with cross sections extracted from the ALS data that the significant differences in the estimated flood levels at crossings could be due to

- the ALS data which has not accurately defined watercourses and in particular channel invert levels which can be up to 1.5 m lower than indicated by the ALS data; and
- In areas of dense vegetation the ALS data is misreporting the true ground level with floodplain levels estimated to be up to 0.5 m higher than adopted in the 2003 study.

D.6 Floodplain filling assessment

An assessment of filing in the floodplain of Scalibrini and Bonds Creeks was undertaken to predict the impact on water levels in case of future development within the floodplain. The filling area is shown with the polygon drawn in the **Figure D.38**.

The areas of fill were defined by the following process:

- The fill area was drawn within the flood plain in locations where it would be expected that minimal impact on flood levels would result from filling. The extent was defined by the area having a flood depth up to 0.3m in 100 year ARI.
- The raised level of the fill area which was within flood extent was given value equal to 100yr ARI water level plus 0.2m
- The fill area that was not within flood extent was given natural surface level.
- A DTM for those fill areas was developed, which was then embedded in the existing digital terrain in the TUFLOW model.
- The 2, 20 and 100yr ARI Events were run in TUFLOW.
- Water level difference plots where prepared to assess the change in flood levels when comparing to existing conditions

The results for the difference in flood extent and flood level is shown in the figure D.39, D.40 and D.41 for the 2, 20 and 100 year ARI events respectively. In the 2 and 20 year ARI event the extents have been reduced and there is negligible impact on flood levels. In the 100yr ARI event there have been flood level increases of up to 0.1m for the most part. This is expected to have a negligible effect on existing and future development. Furthermore there is no impact on flood levels in waterways up or downstream indicating that the impact of the filling is local.

There are cases where the top of the fill area has been breached by the flood level indicating that the flood level has increased greater than 0.2m. The flood waters are then flowing over the top of the filled floodplain. It is clear that the areas of breaching represent locations where the fill should be trimmed to reduce the impact on flood levels.

The cases where the filling has been breached is

- Behind Tenth Avenue on Bonds creek
- The junction of Edmonson Ave and Sixth Avenue on Bonds Creek
- In between fifth and sixth avenue on Scalibrini Creek
- Upstream of the SWRL on Scalibrini Creek
- Adjacent to Bringelly Road on Scalibrini Creek
- Downstream of Camden Valley Way

For the location adjacent to Bringelly Road there is currently no crossing included in the model as no information for the crossing is available. It is likely that the inclusion of the crossing (if it is a culvert and not a bridge, bridges will not impact flood levels significantly) may change the flood level results in this location and one would expect that the area of fill proposed would not impact flood levels. At this stage the fill area proposed is having a slight adverse affect on the flood levels in the immediate location but negligible effect (up to 0.1m) in surrounding areas. This indicates that the loss of the floodplain in this location is not significant.

The fill area downstream of Camden Valley way at the SWRL crossing is having an extensive impact on the flood levels of up to 0.5m. The extent of fill should be reduced to avoid encroachment into the waterway area. The proposed filling can be withdrawn from the floodplain to provide sufficient waterway area for flood waters to be conveyed in a similar fashion to existing conditions.

It is therefore concluded from the assessment that floodplain filling is a feasible option to reduce the extent of the flooding. The topography of the floodplain is such that extensively wide and shallow flood extents are experienced. Filling of the floodplain up to a depth of 0.3m has negligible impact on flood levels locally and nil impact on flood levels up and down stream. As such it is considered feasible to adopt a floodplain filling approach for the Austral and Leppington North Precincts according to the depths and extents discussed herein.

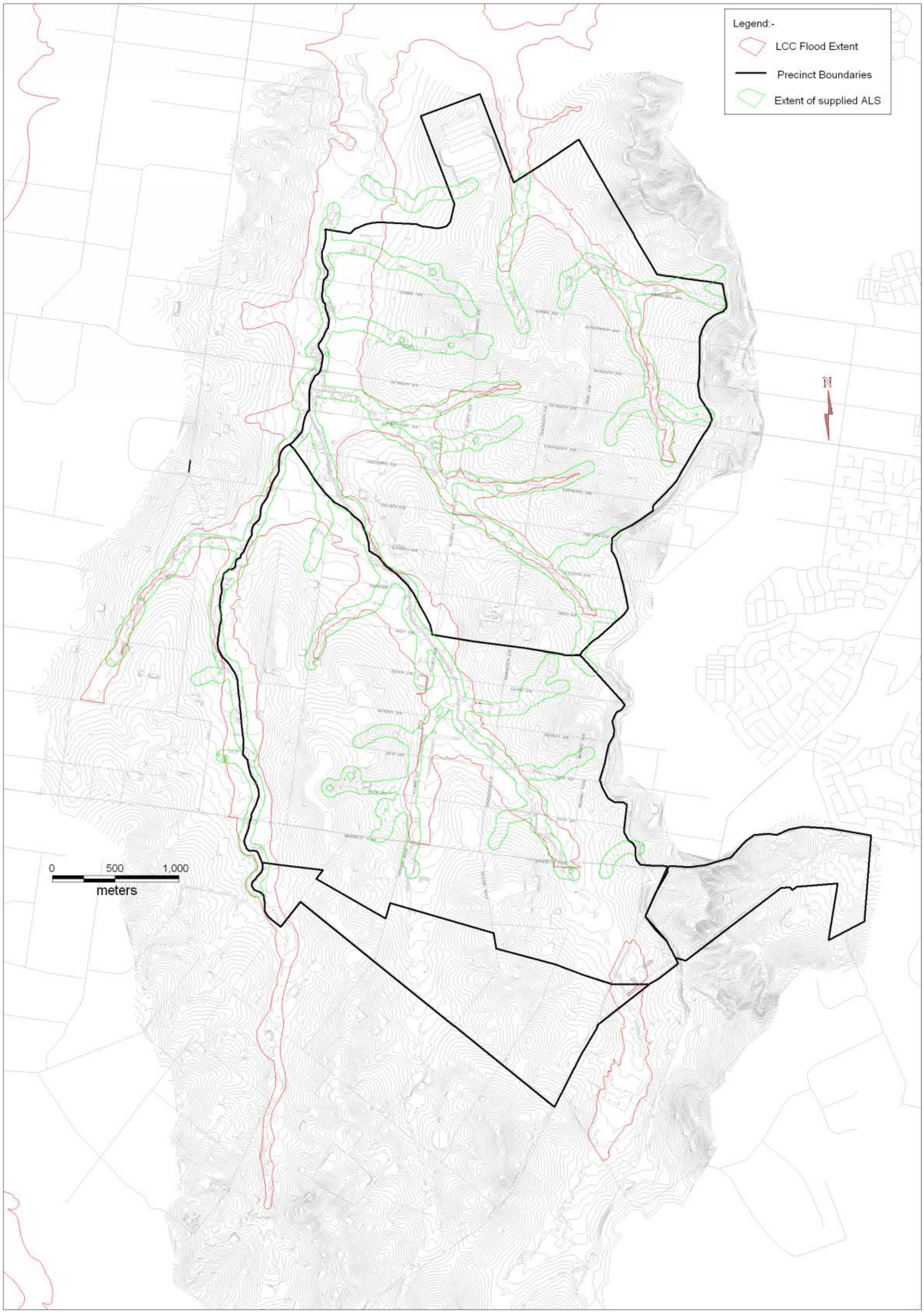


Figure D.1 Comparison of Areal Extent of 100 yr ARI Flood and Supplied ALS Data

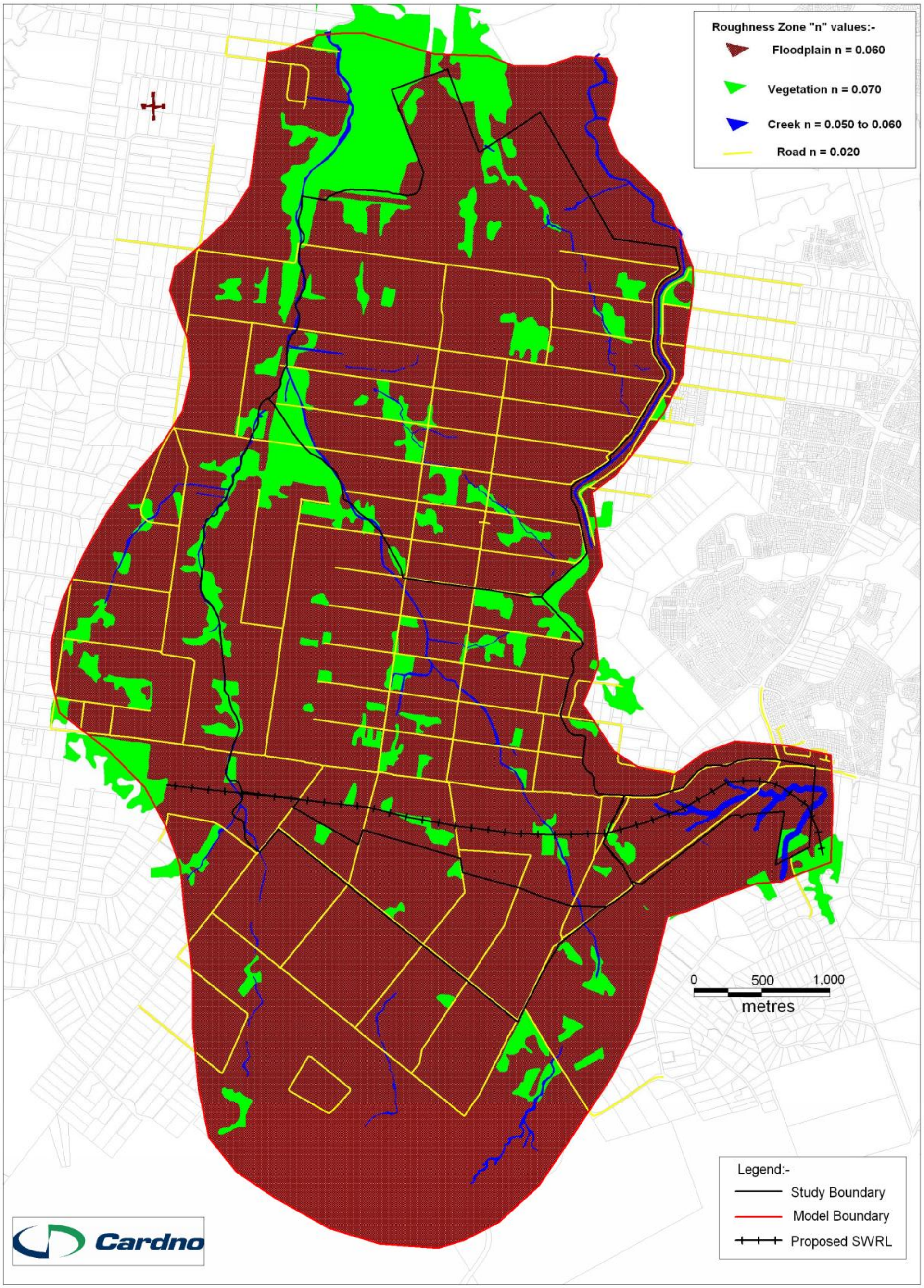


Figure D.2 Adopted Roughness Zones

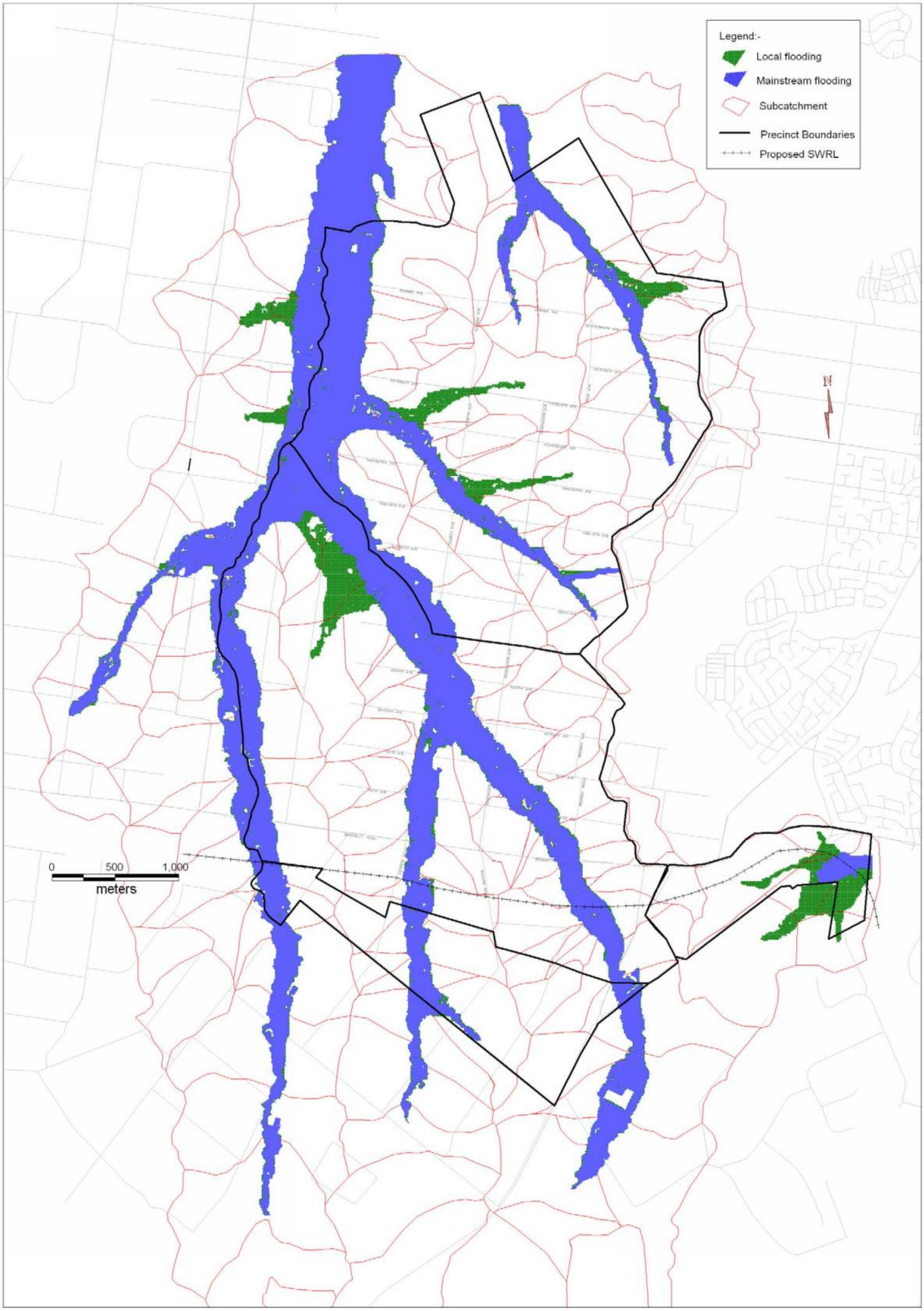


Figure D.3 Comparison of Mainstream and Local Flooding in a 100 yr ARI Event

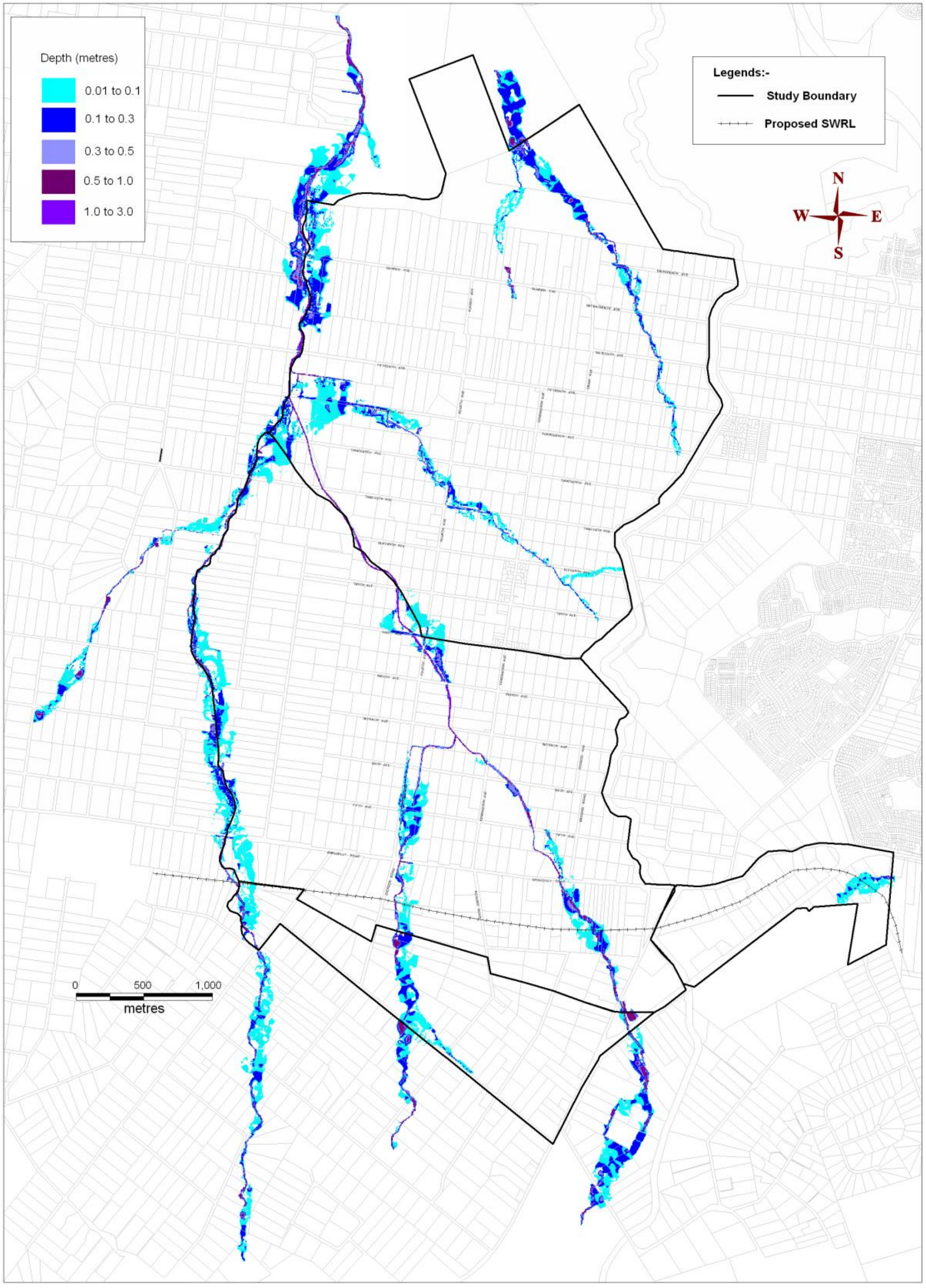


Figure D.4 1 yr ARI Flood Depths under Existing Conditions

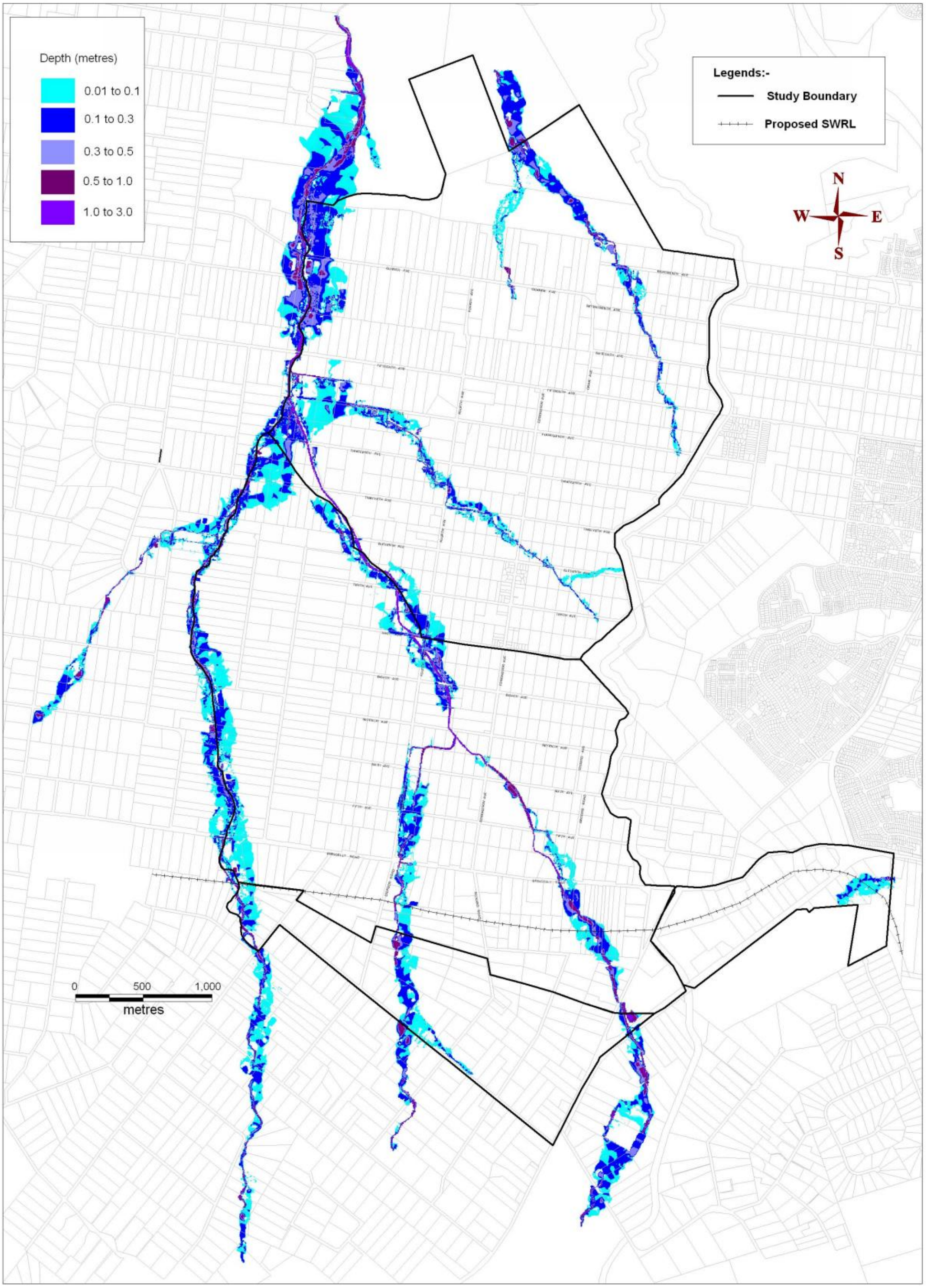


Figure D.5 2 yr ARI Flood Depths under Existing Conditions

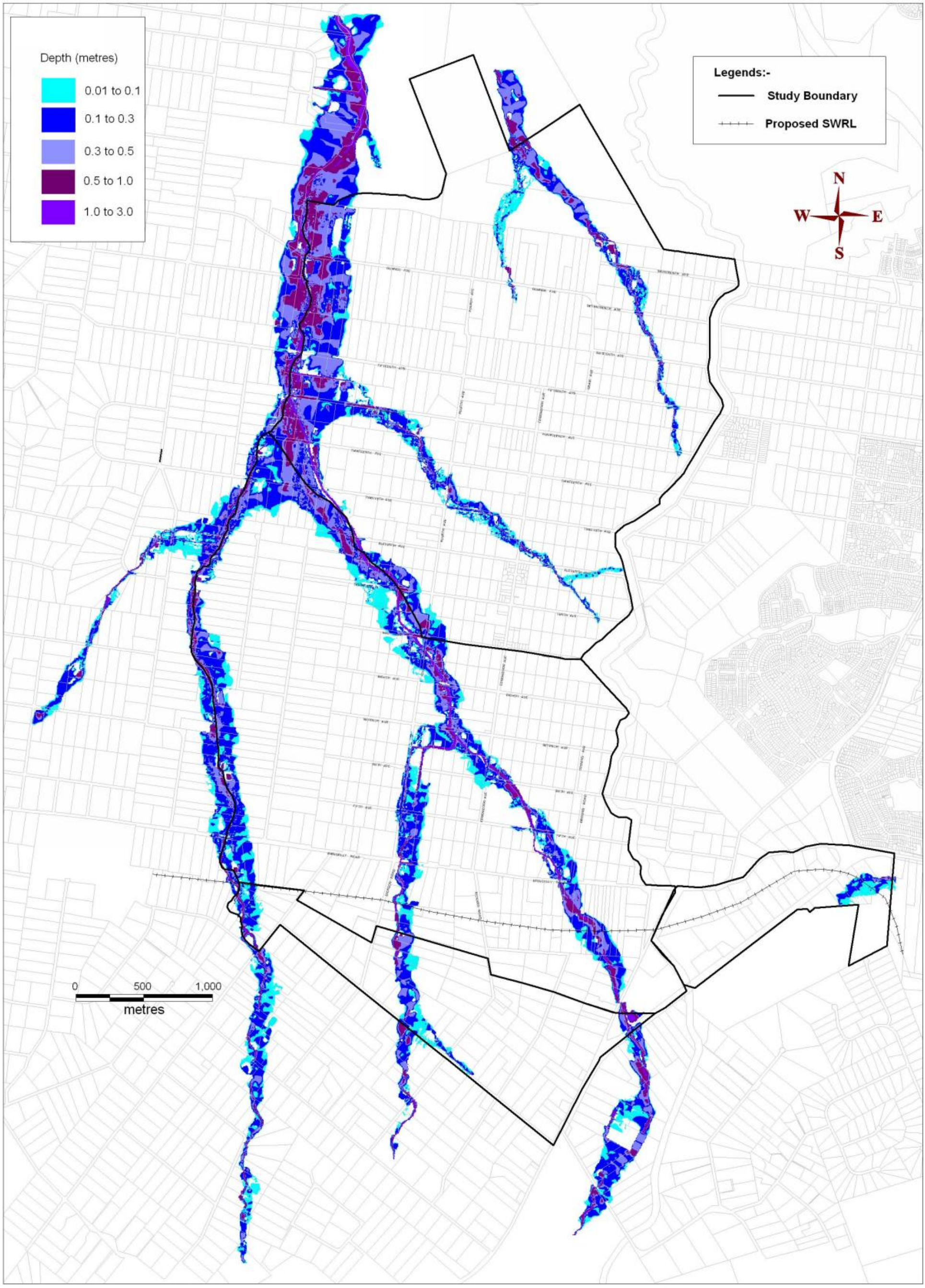


Figure D.6 5 yr ARI Flood Depths under Existing Conditions

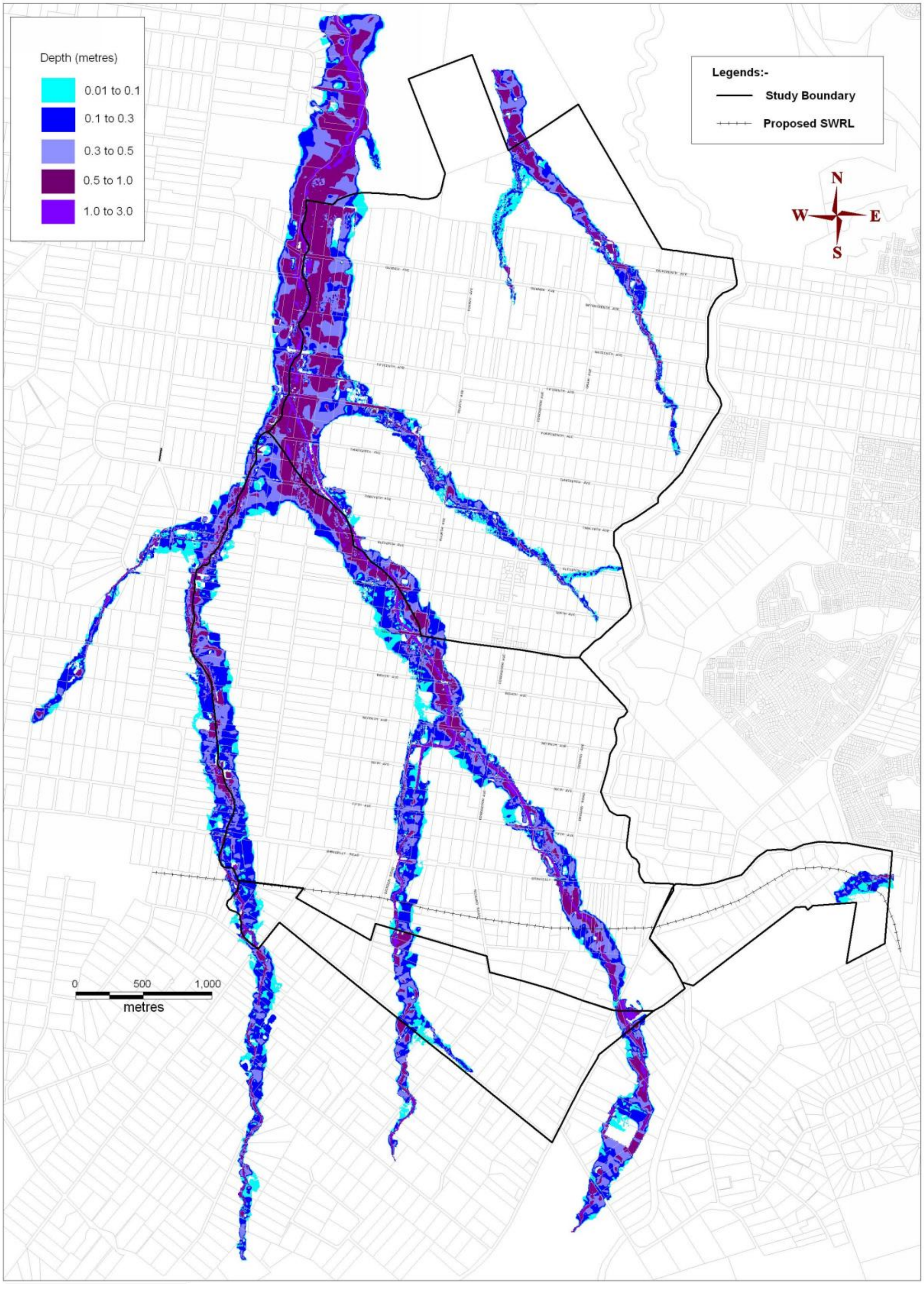


Figure D.7 20 yr ARI Flood Depths under Existing Conditions

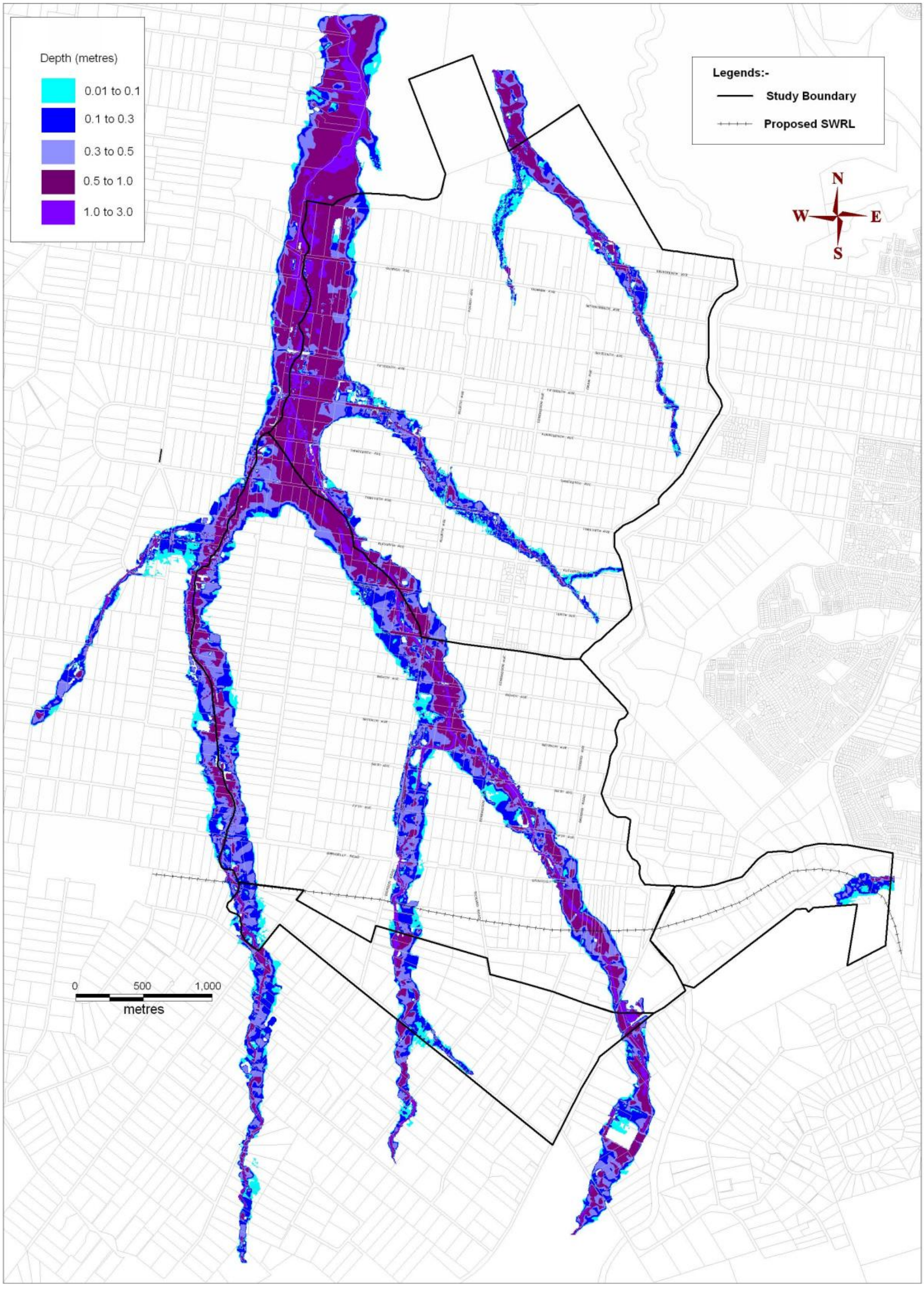


Figure D.8 100 yr ARI Flood Depths under Existing Conditions

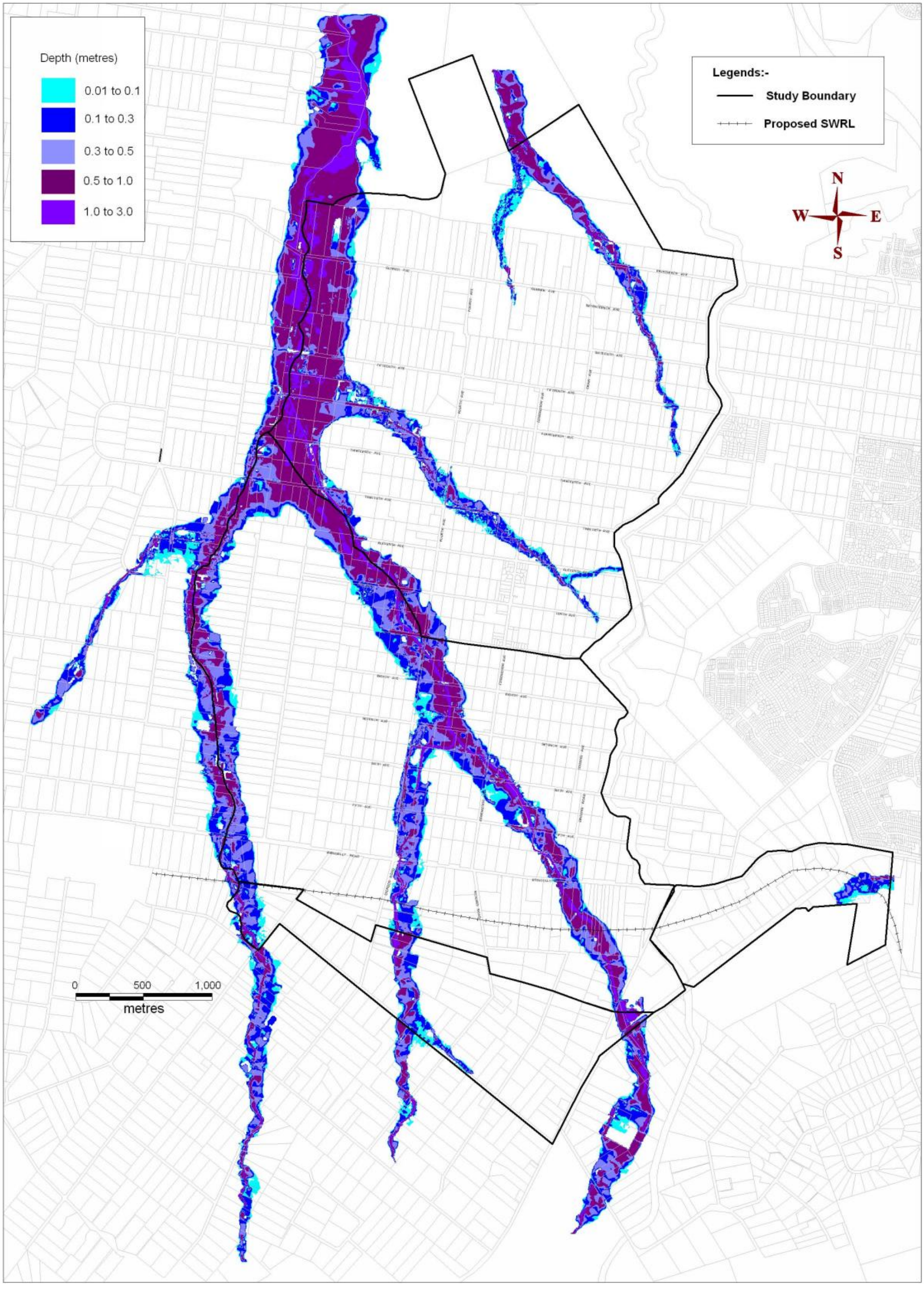


Figure D.9 200 yr ARI Flood Depths under Existing Conditions

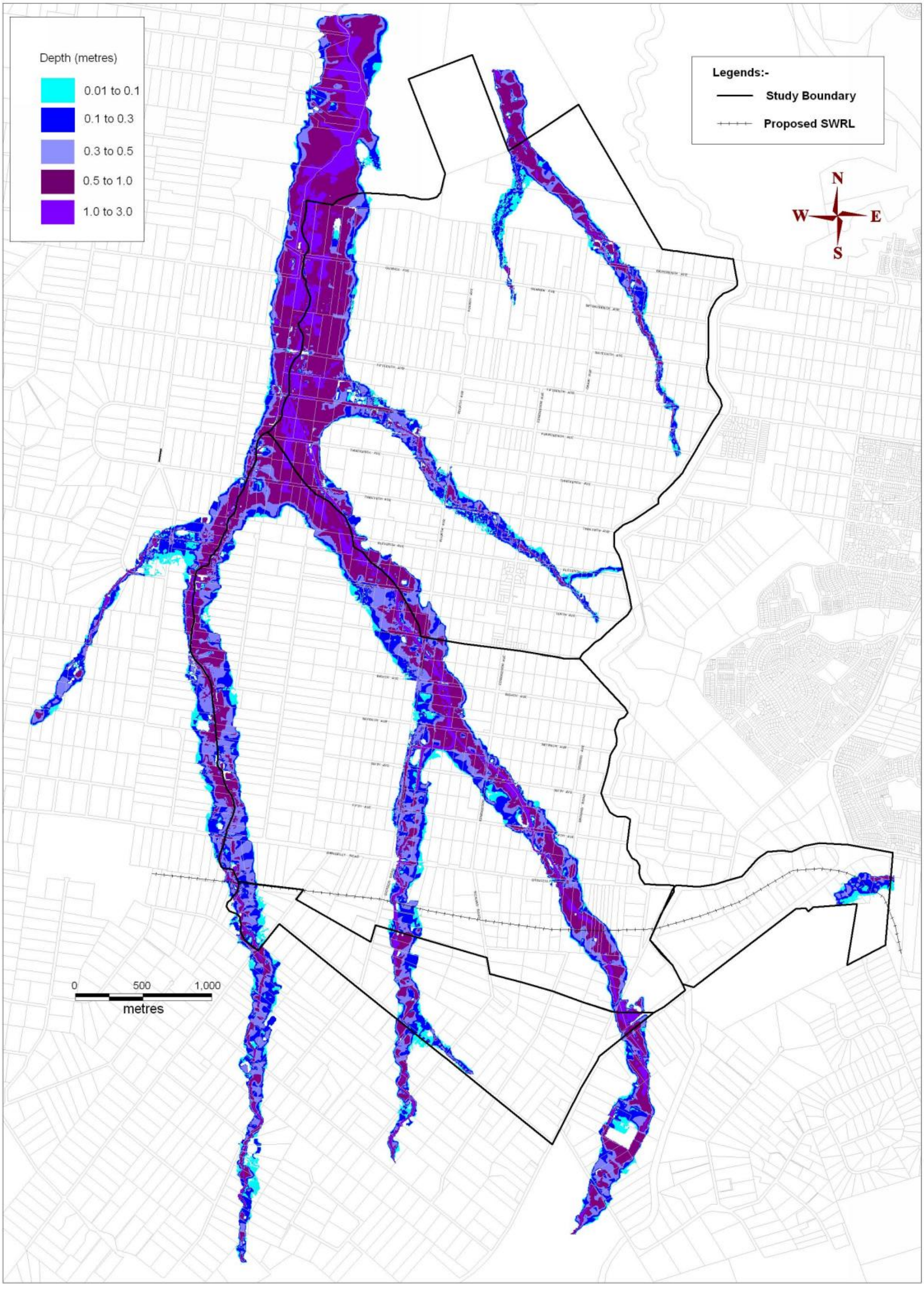


Figure D.10 500 yr ARI Flood Depths under Existing Conditions

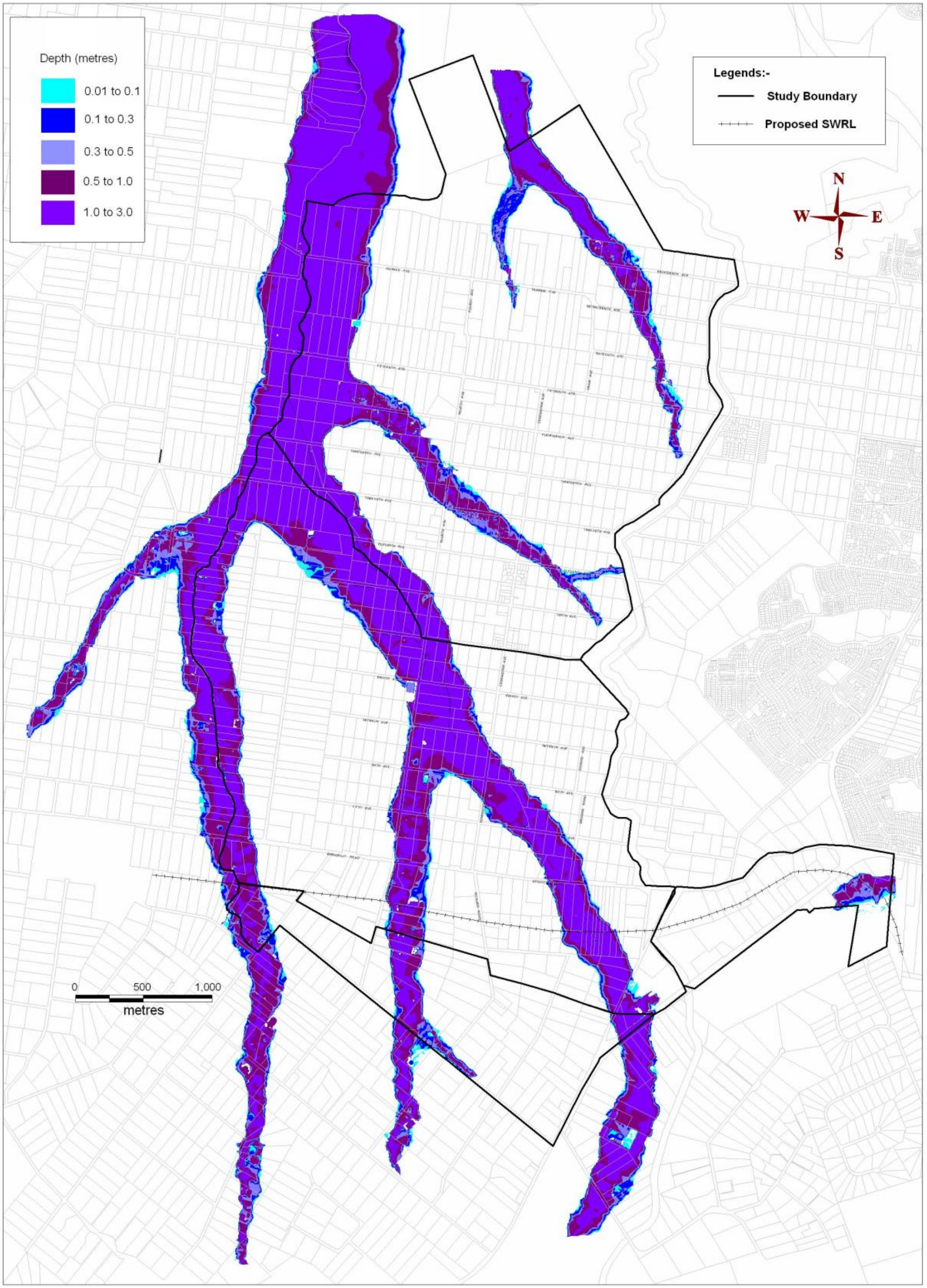


Figure D.11 PMF Flood Depths under Existing Conditions

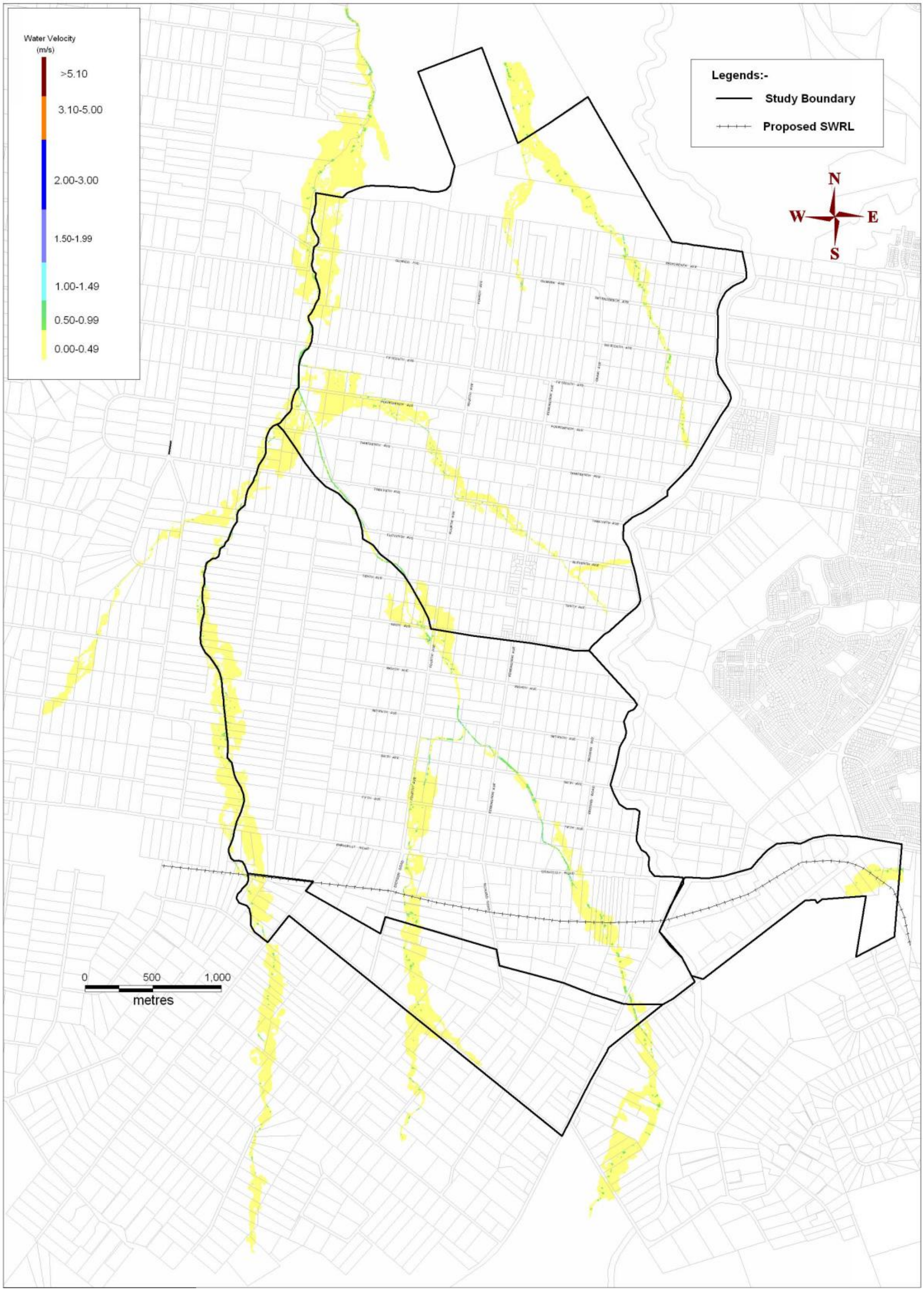


Figure D.12 1 yr ARI Flood Velocities under Existing Conditions

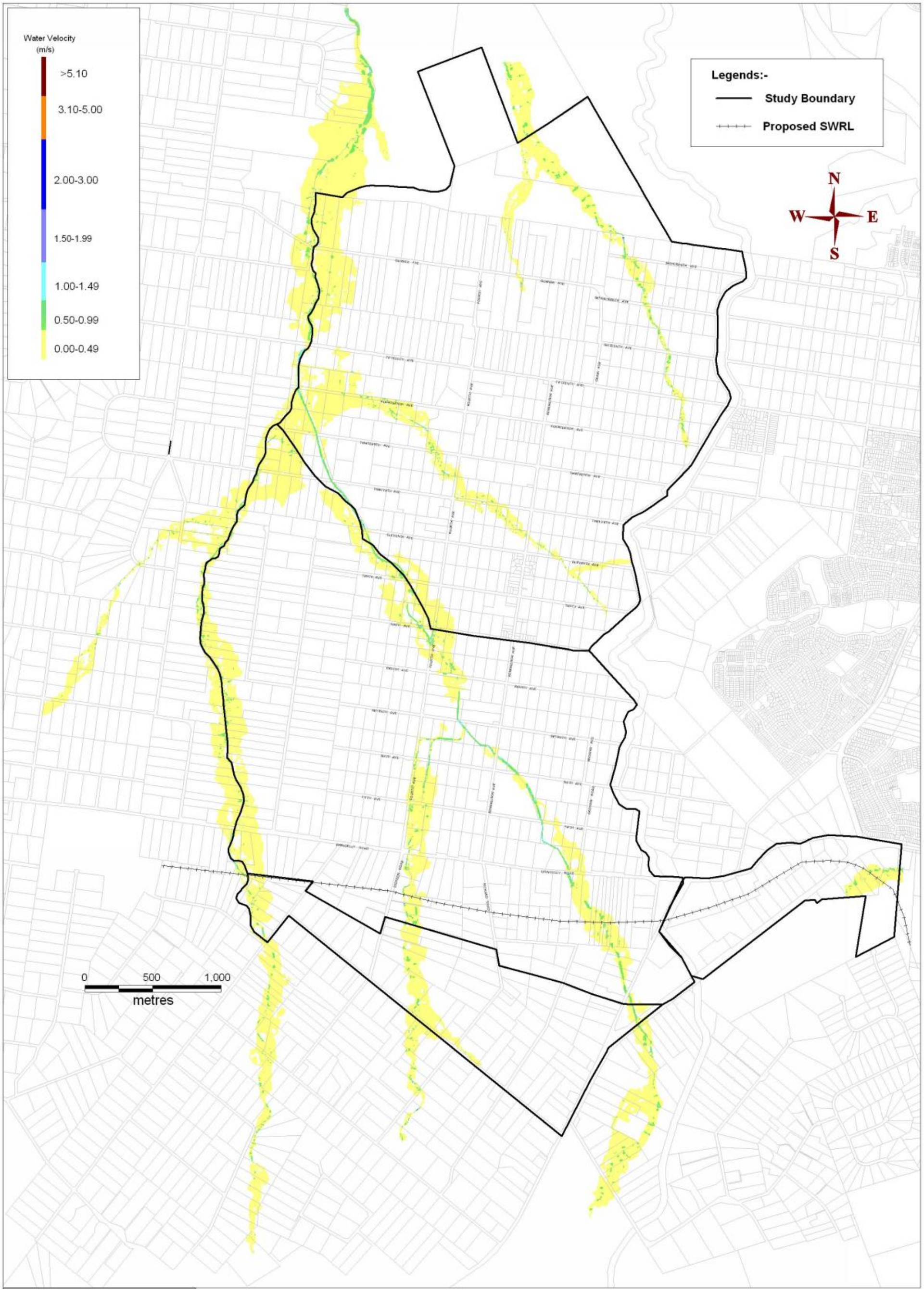


Figure D.13 2 yr ARI Flood Velocities under Existing Conditions

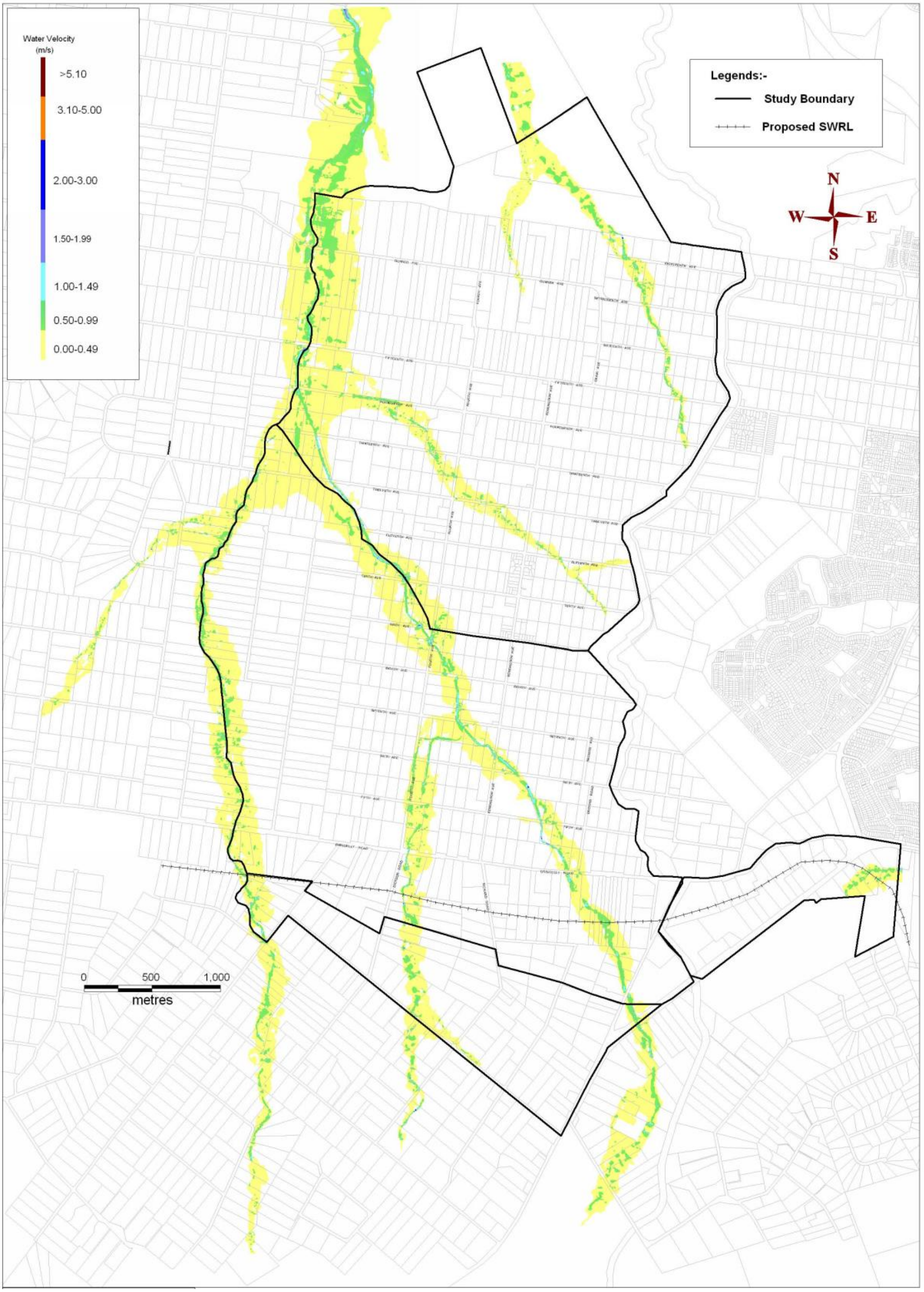


Figure D.14 5 yr ARI Flood Velocities under Existing Conditions

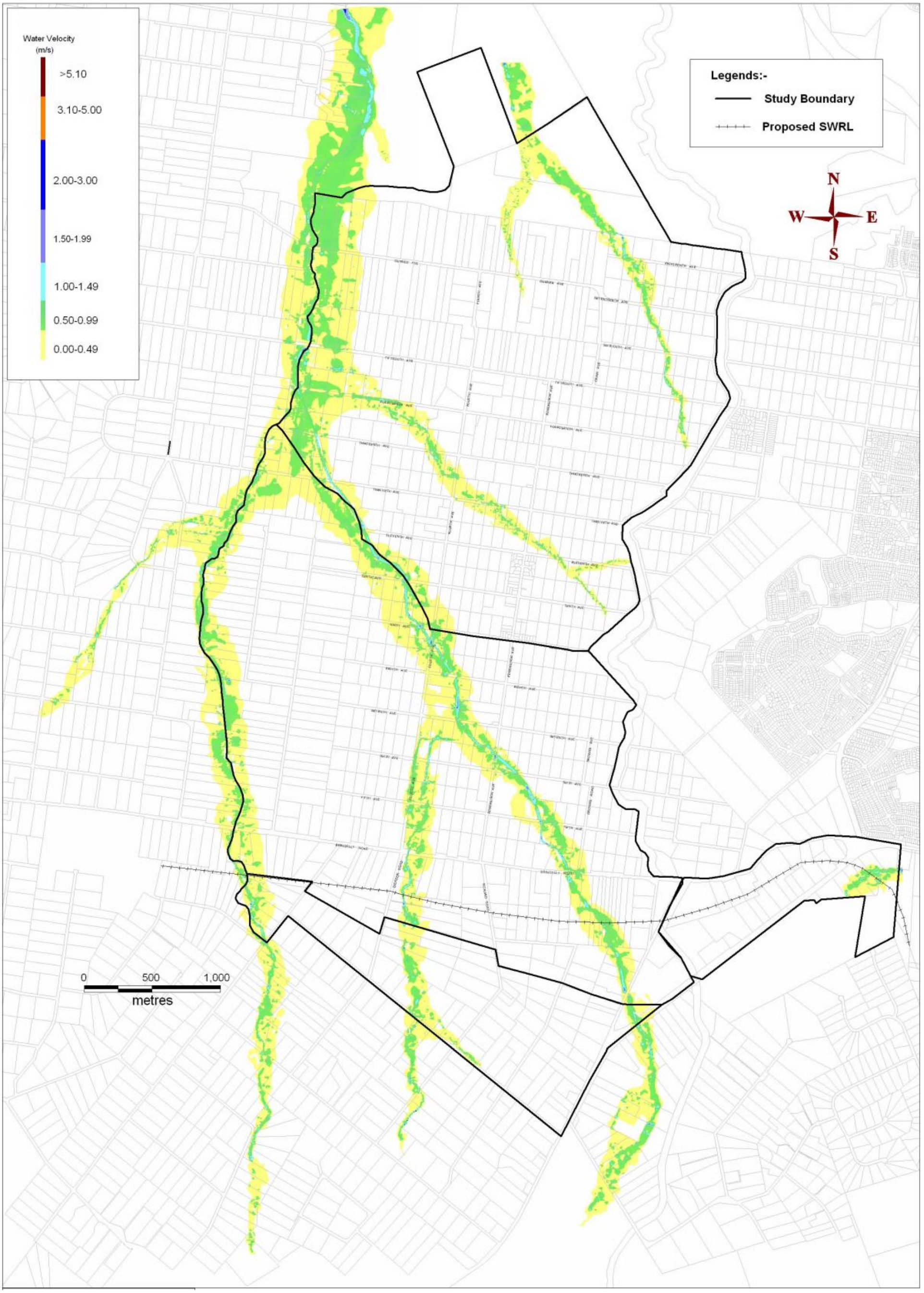


Figure D.15 20 yr ARI Flood Velocities under Existing Conditions

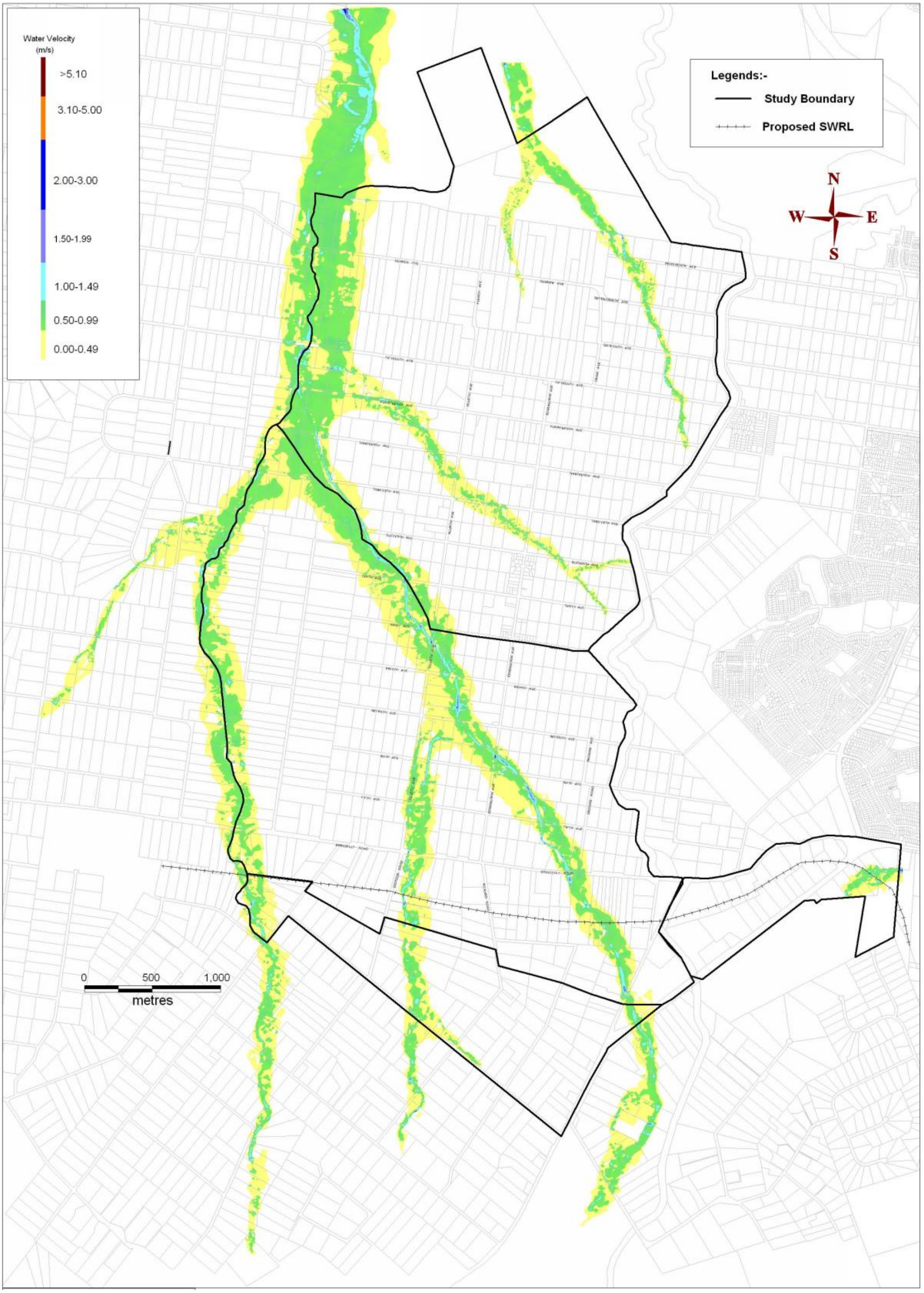


Figure D.16 100 yr ARI Flood Velocities under Existing Conditions

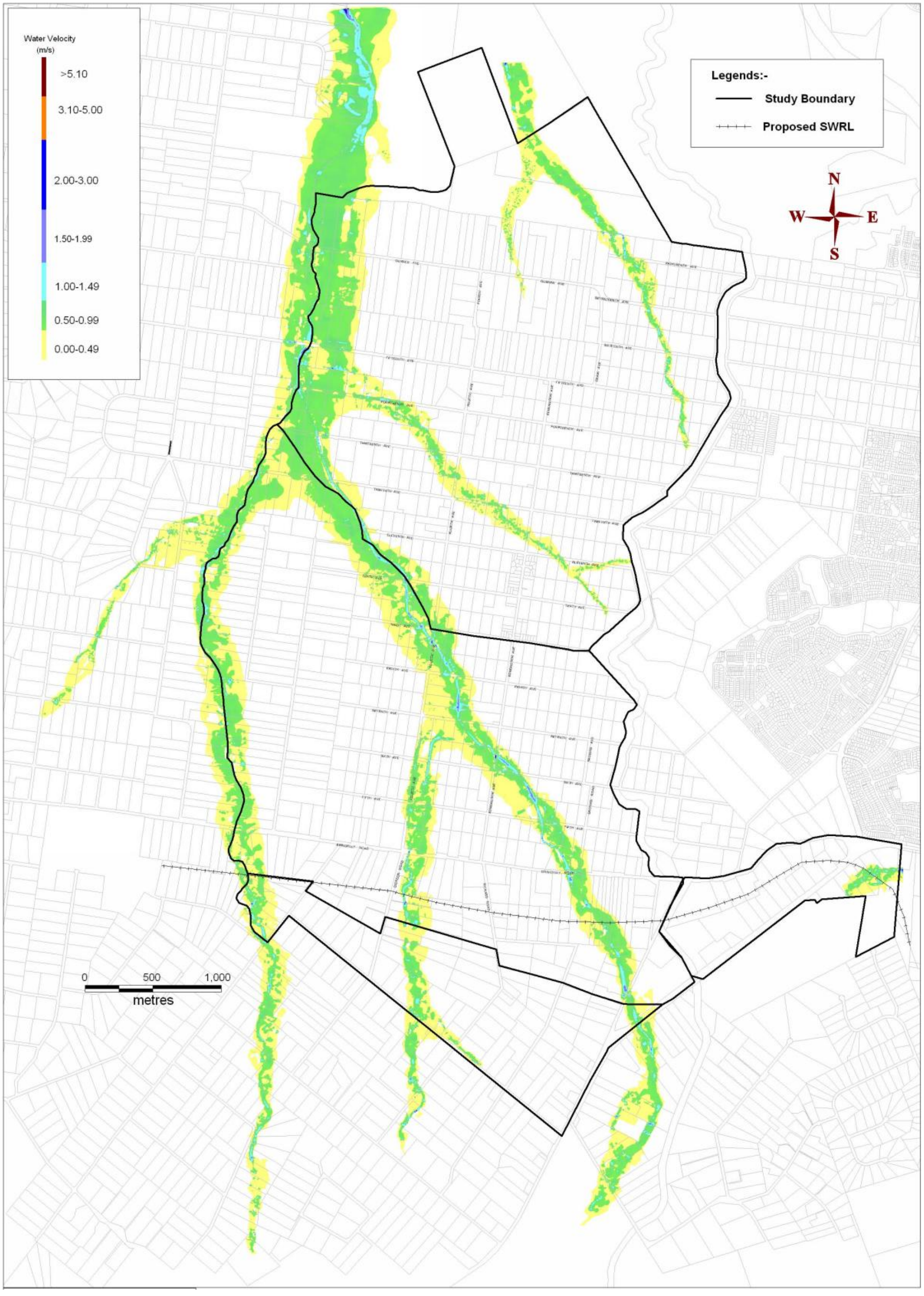


Figure D.17 200 yr ARI Flood Velocities under Existing Conditions

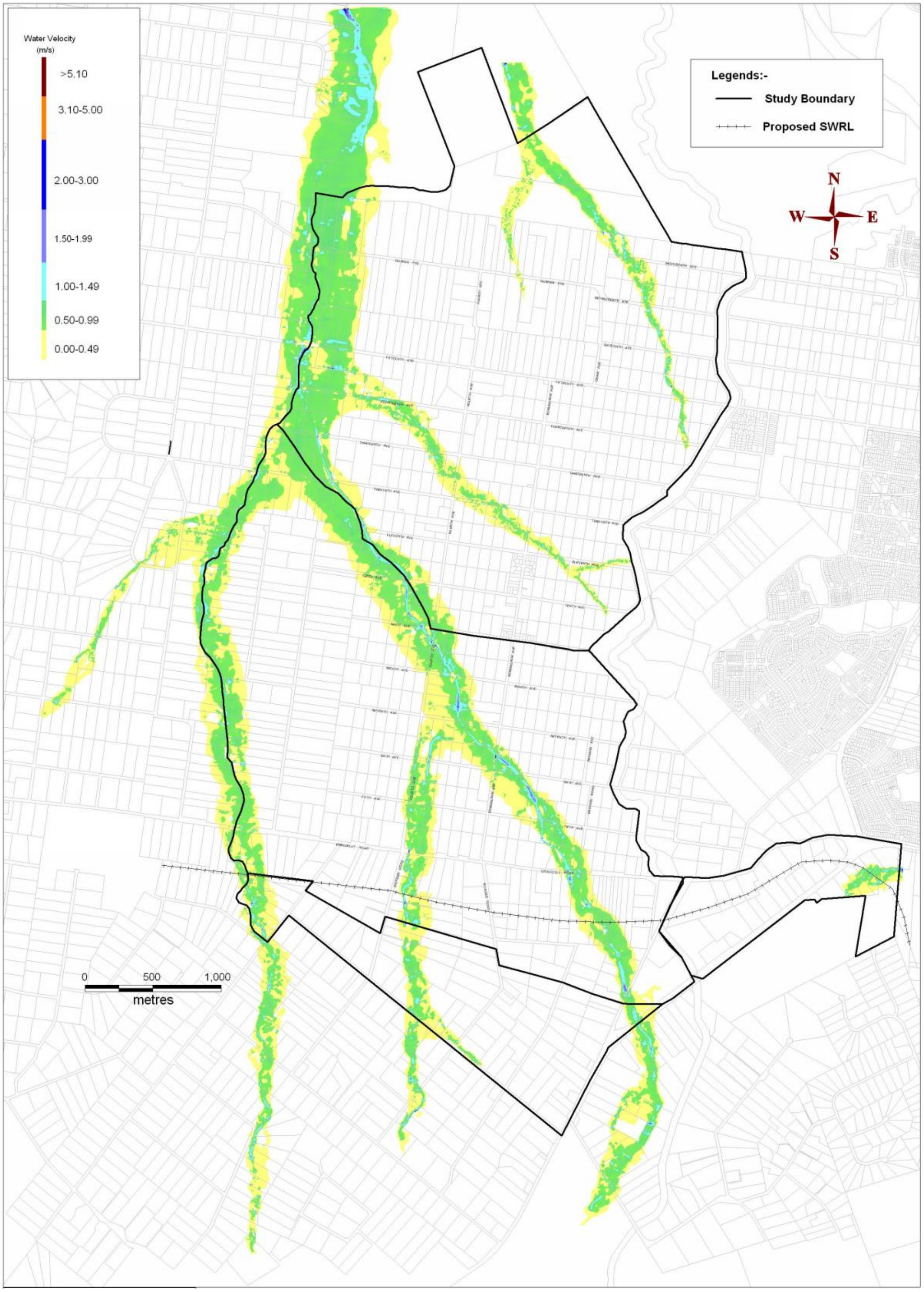


Figure D.18 500 yr ARI Flood Velocities under Existing Conditions

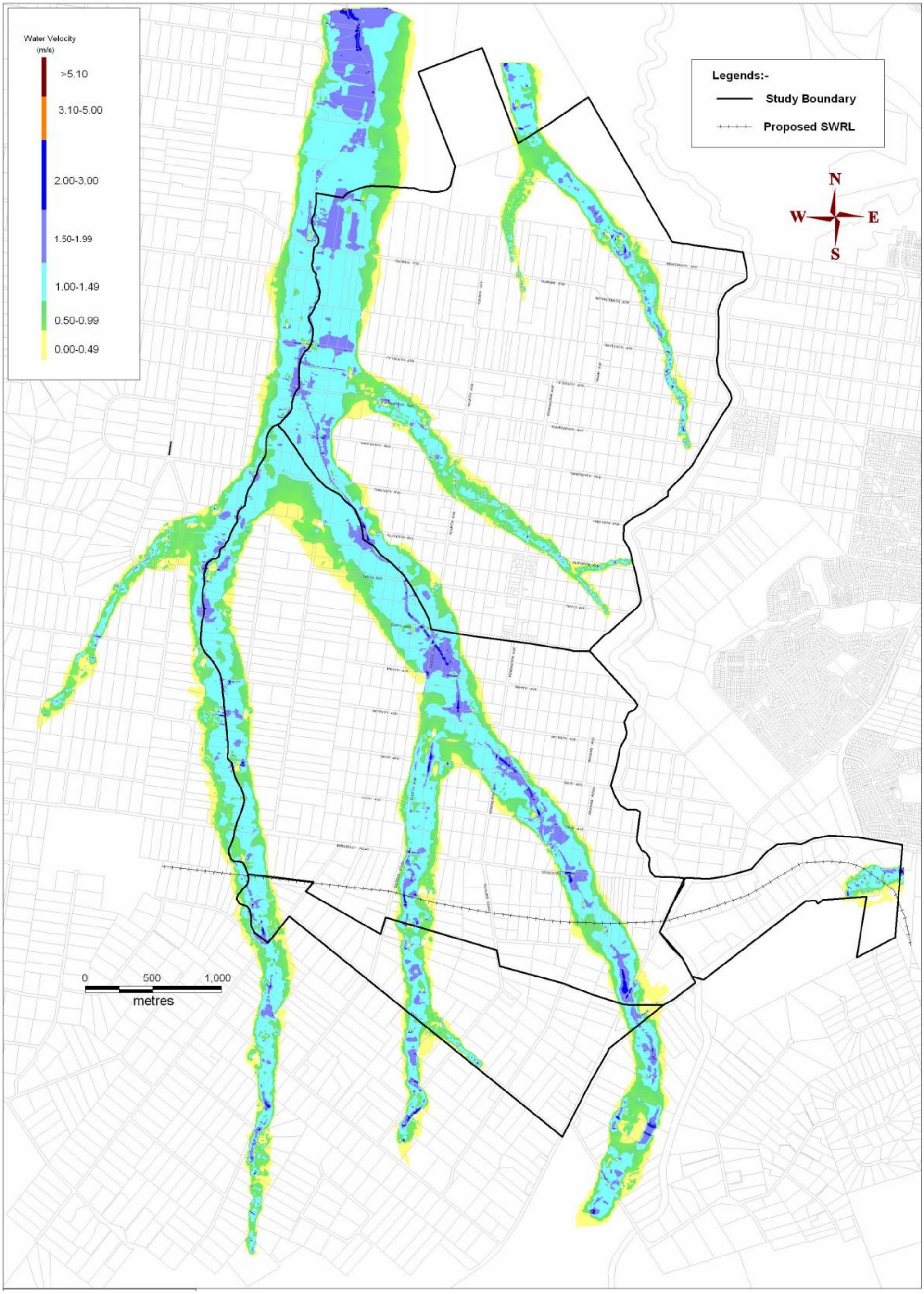


Figure D.19 PMF Flood Velocities under Existing Conditions

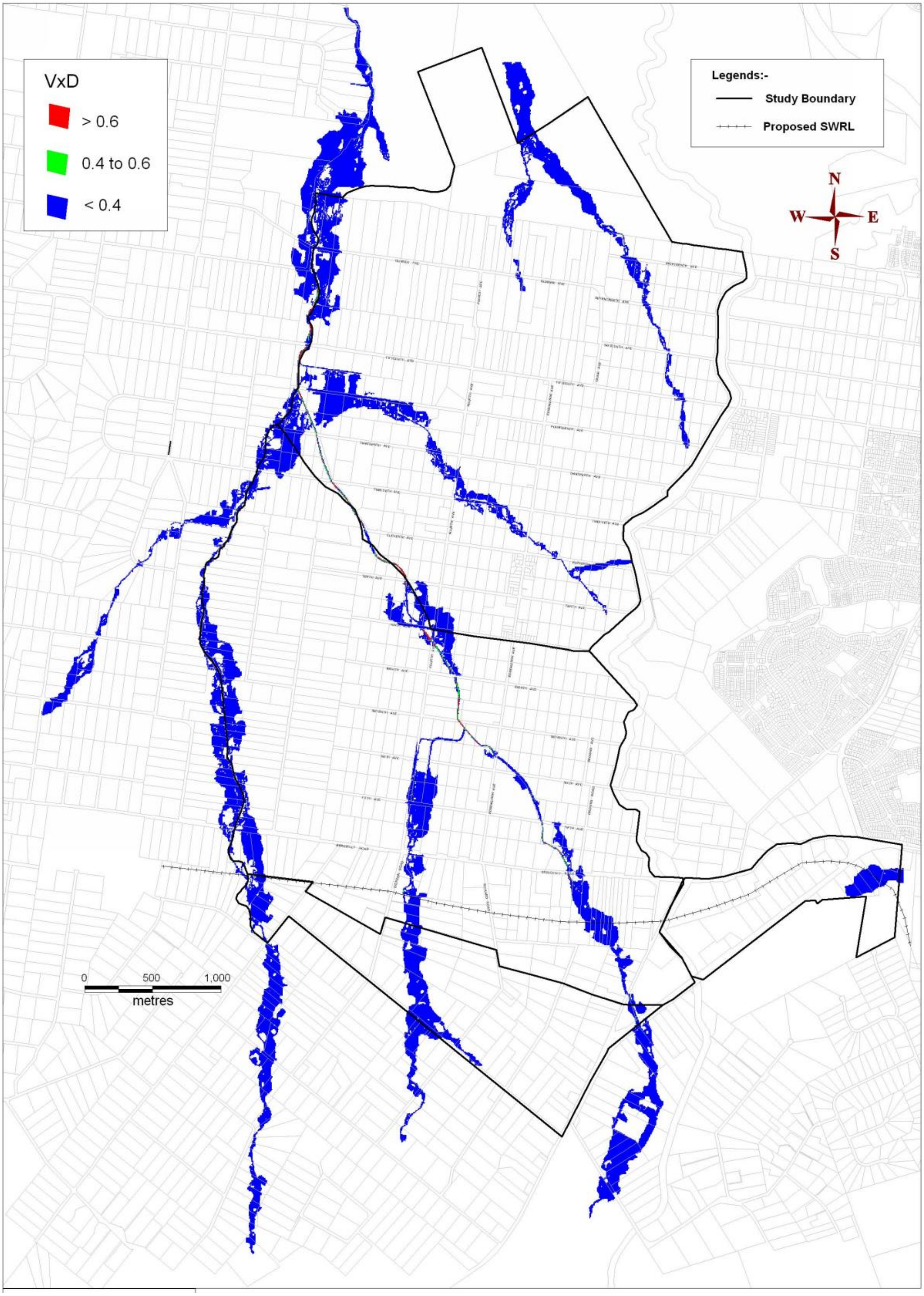


Figure D.20 1 yr ARI Flood Velocity x Depth under Existing Conditions

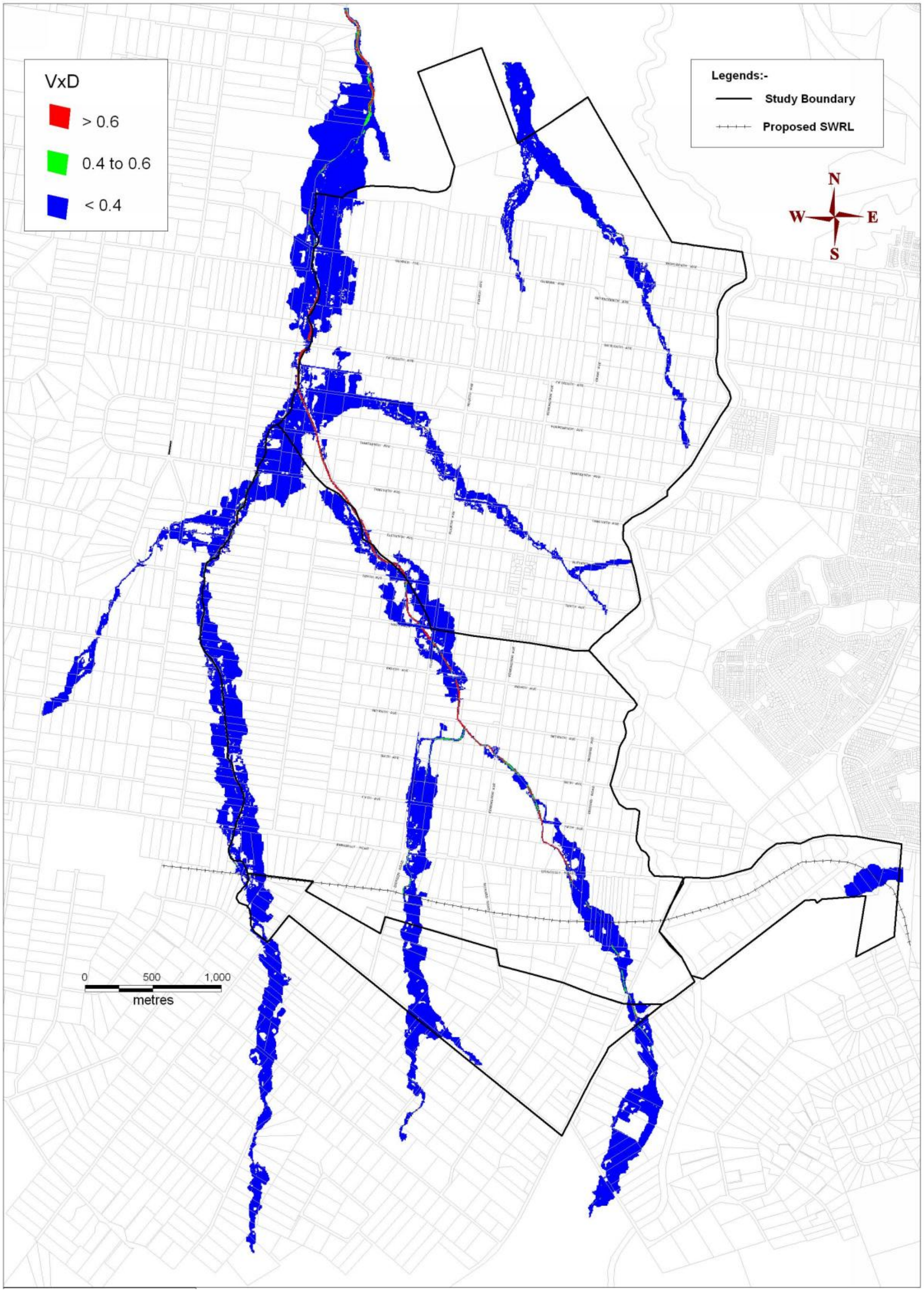


Figure D.21 2 yr ARI Flood Velocity x Depth under Existing Conditions

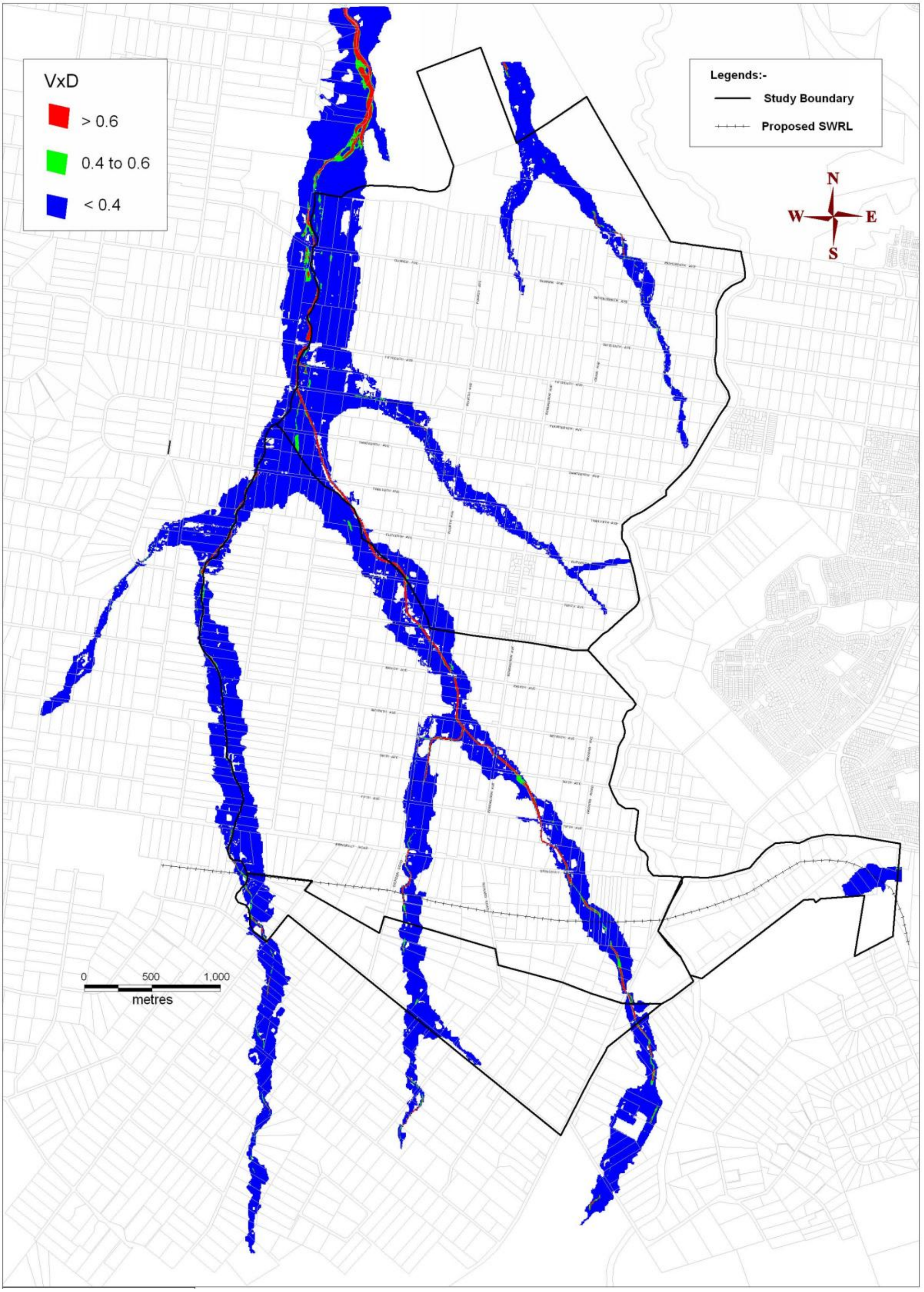


Figure D.22 5 yr ARI Flood Velocity x Depth under Existing Conditions

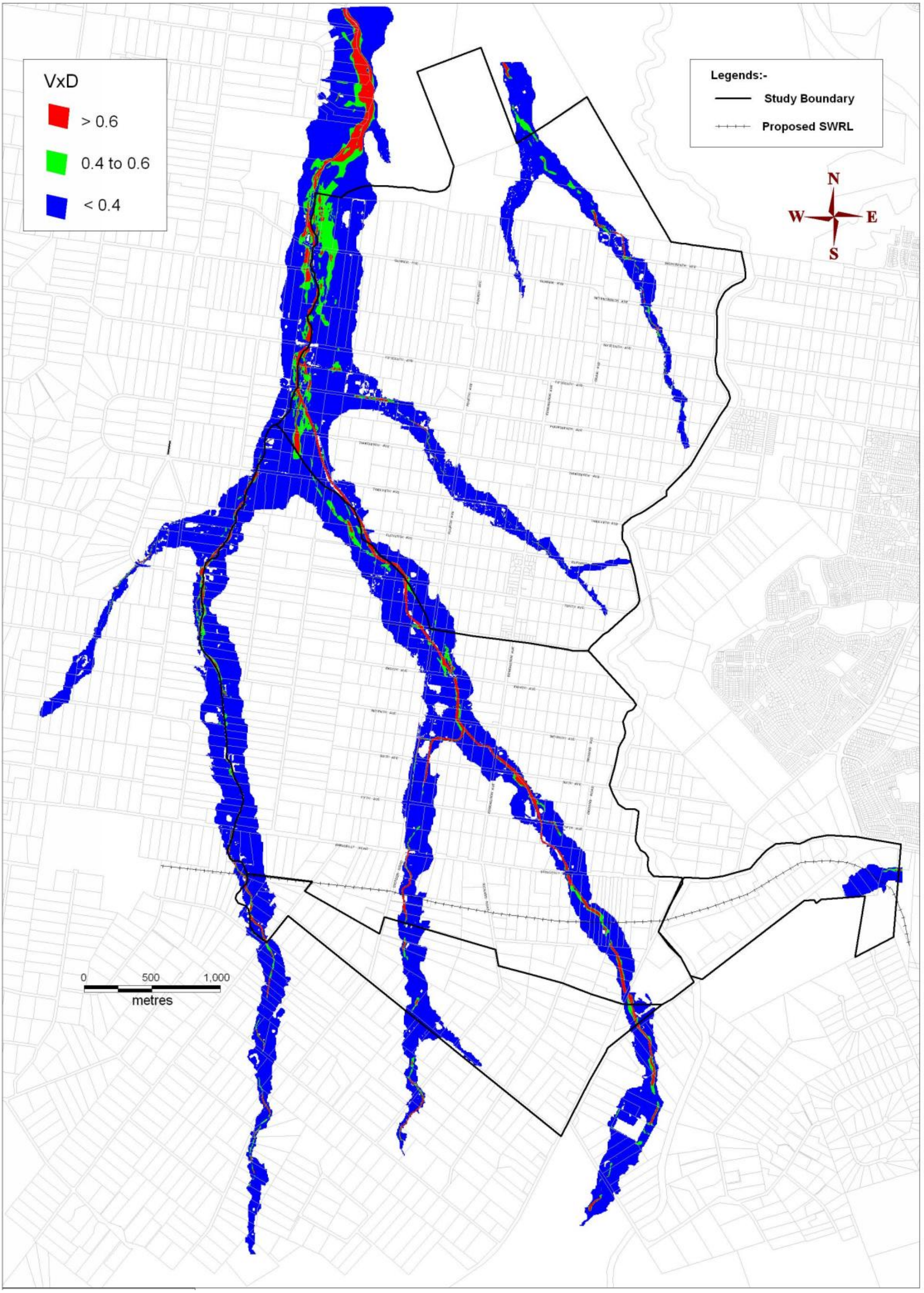


Figure D.23 20 yr ARI Flood Velocity x Depth under Existing Conditions

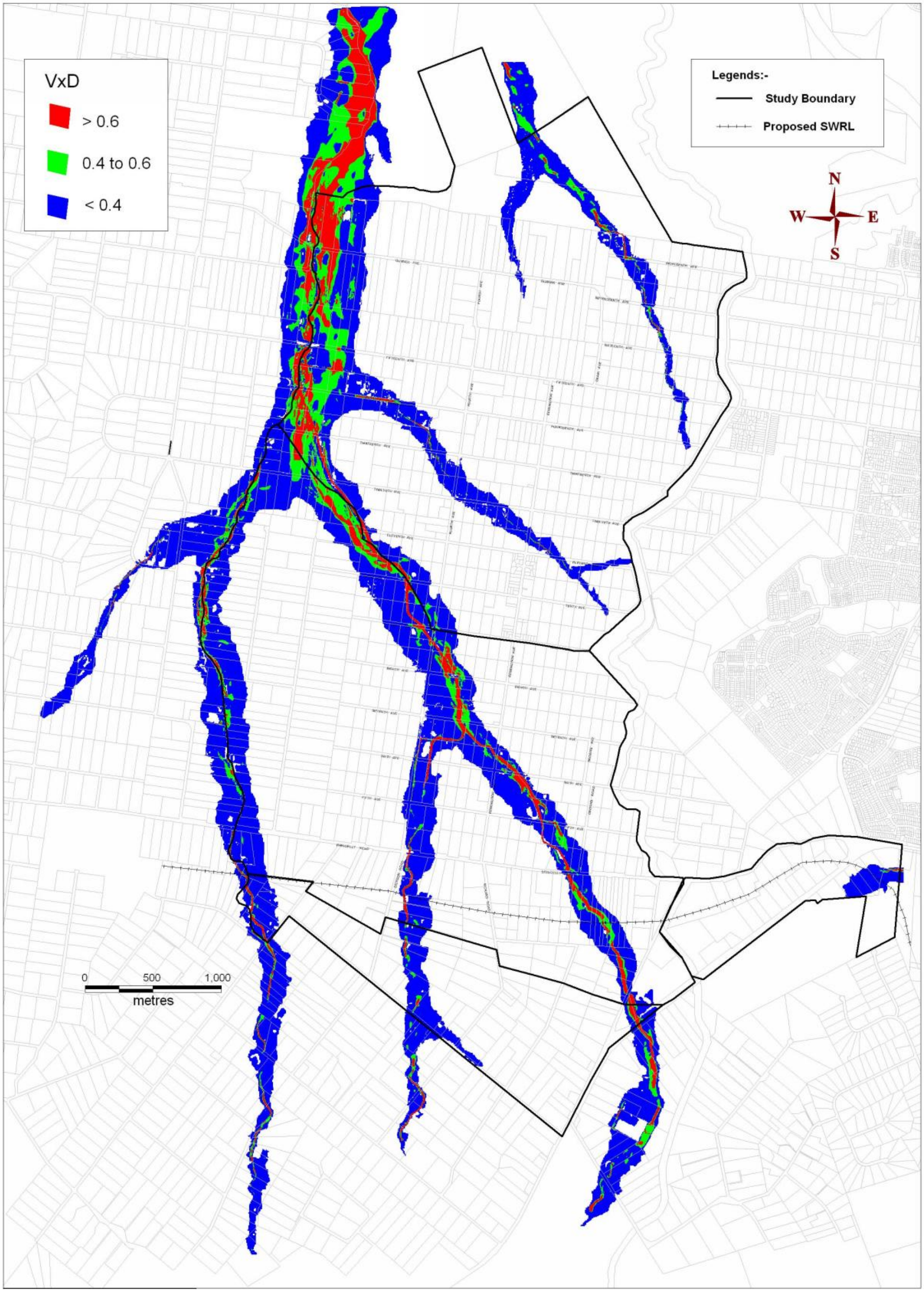


Figure D.24 100 yr ARI Flood Velocity x Depth under Existing Conditions

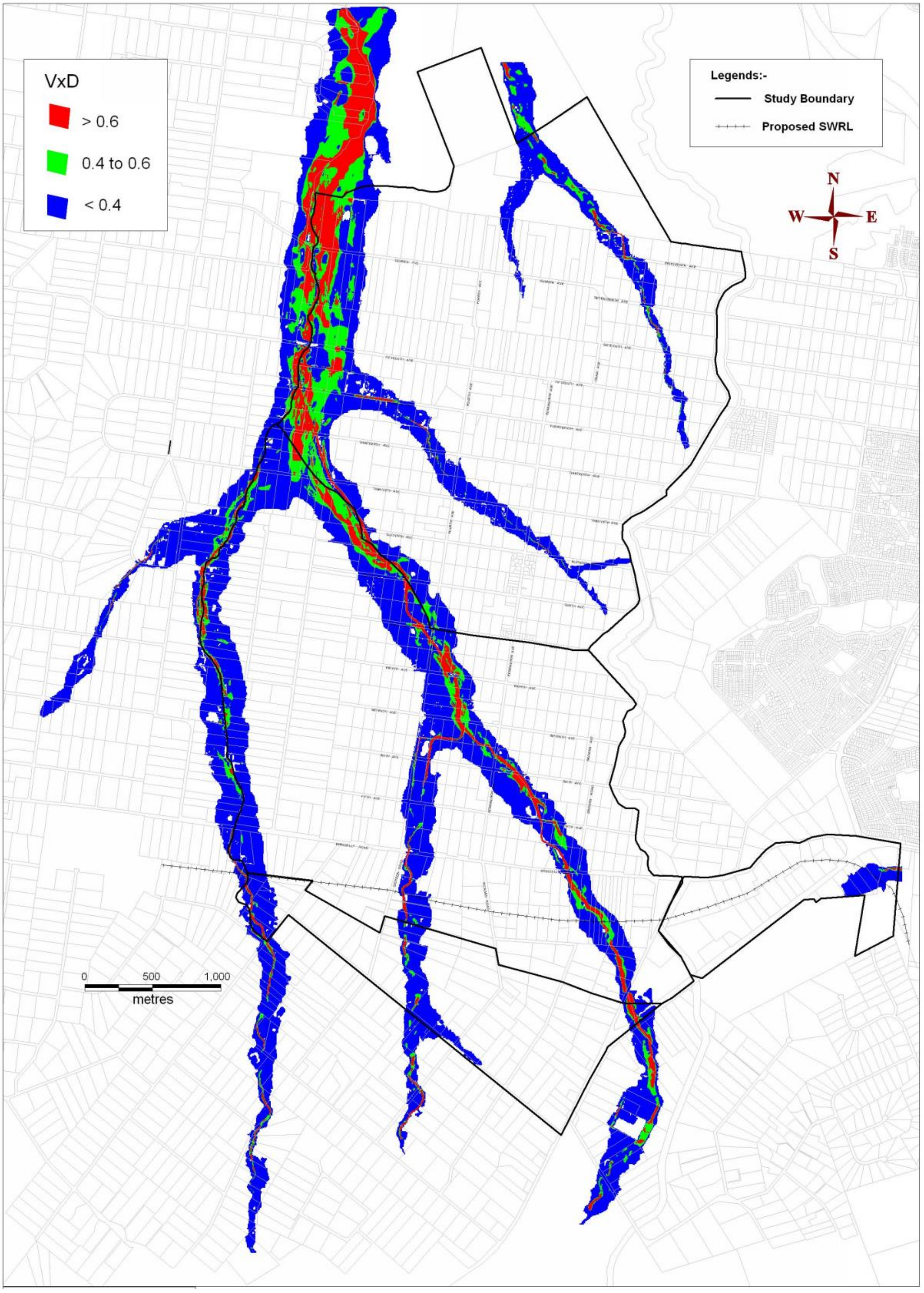


Figure D.25 200 yr ARI Flood Velocity x Depth under Existing Conditions

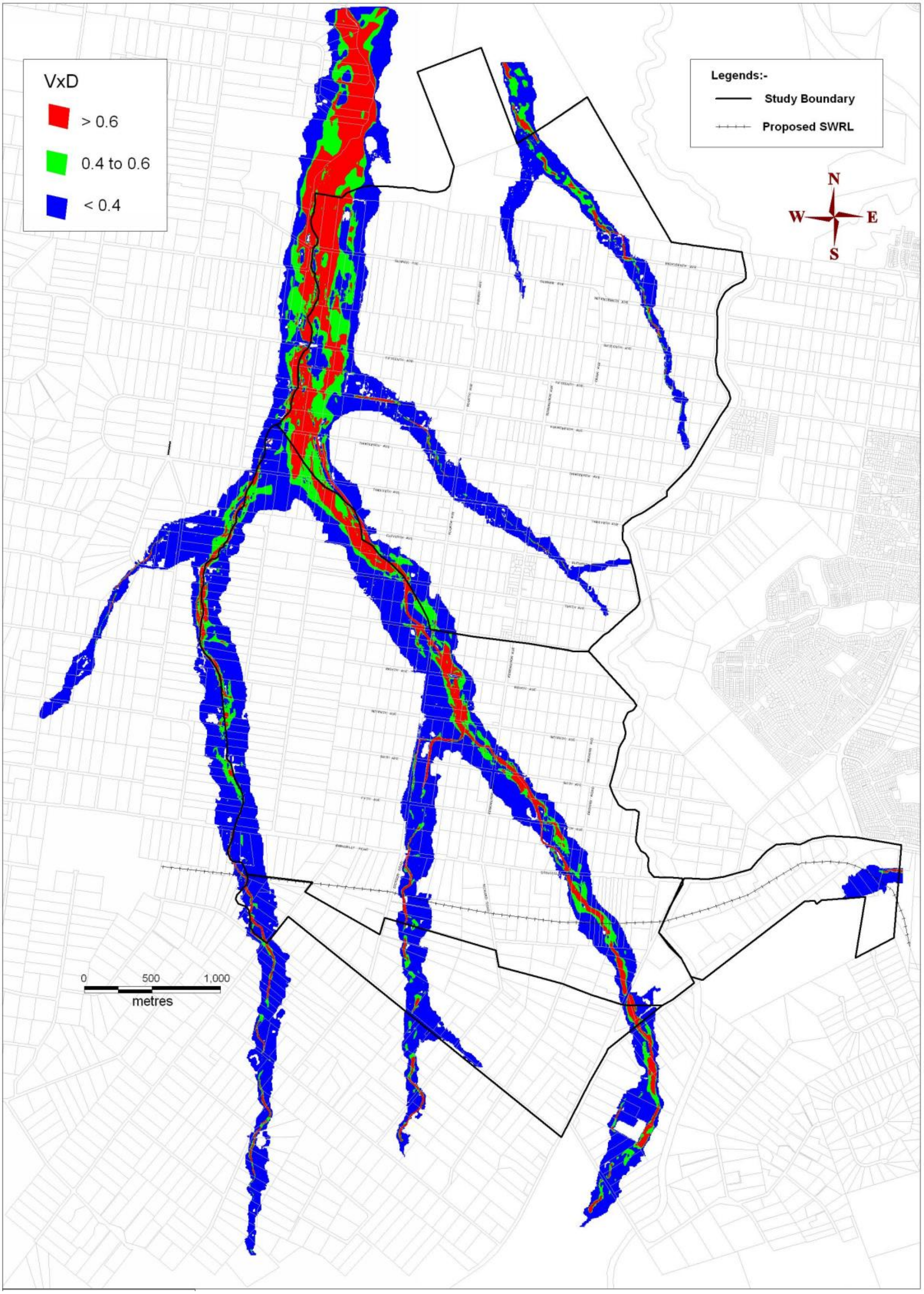


Figure D.26 500 yr ARI Flood Velocity x Depth under Existing Conditions

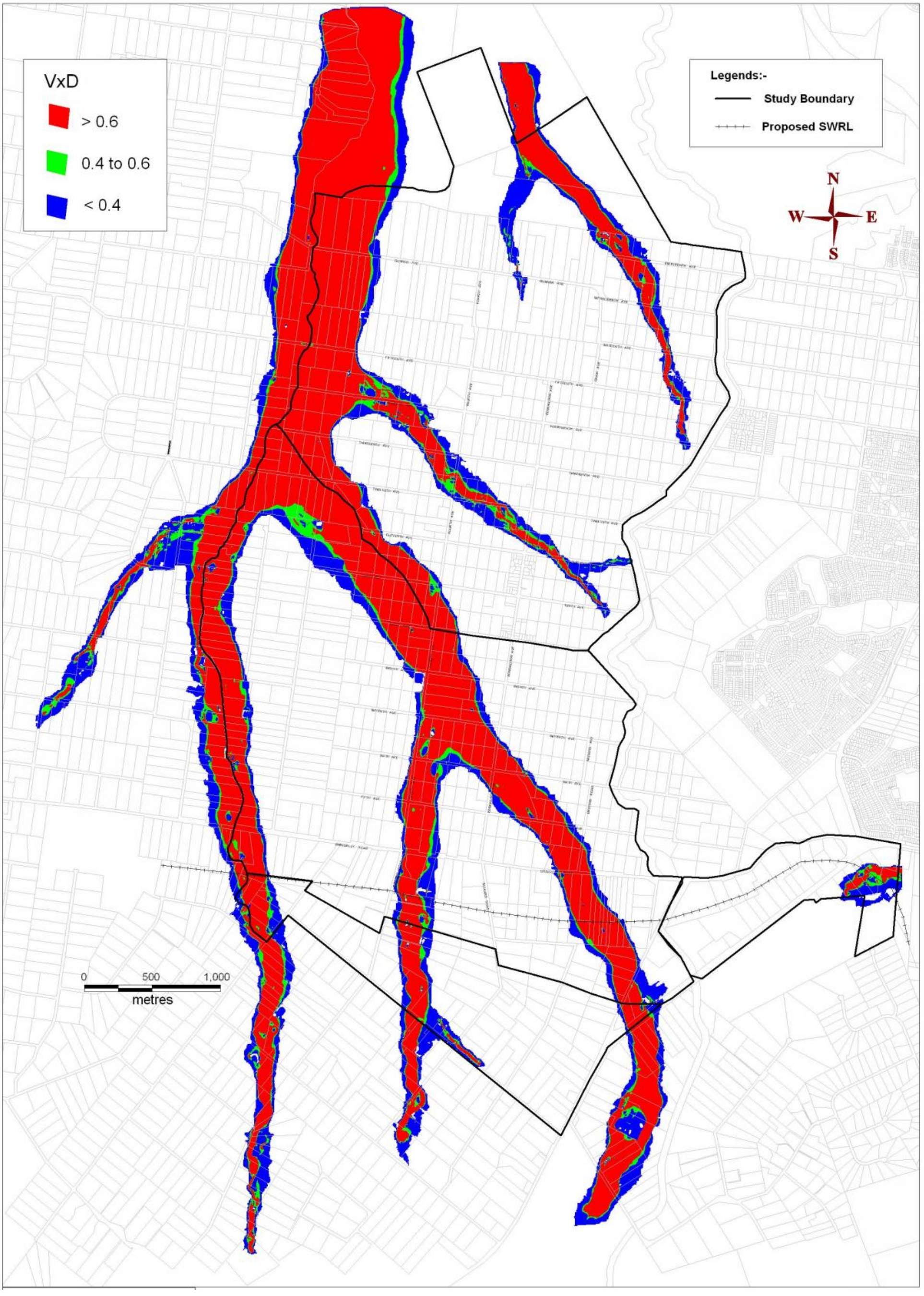


Figure D.27 PMF Flood Velocity x Depth under Existing Conditions

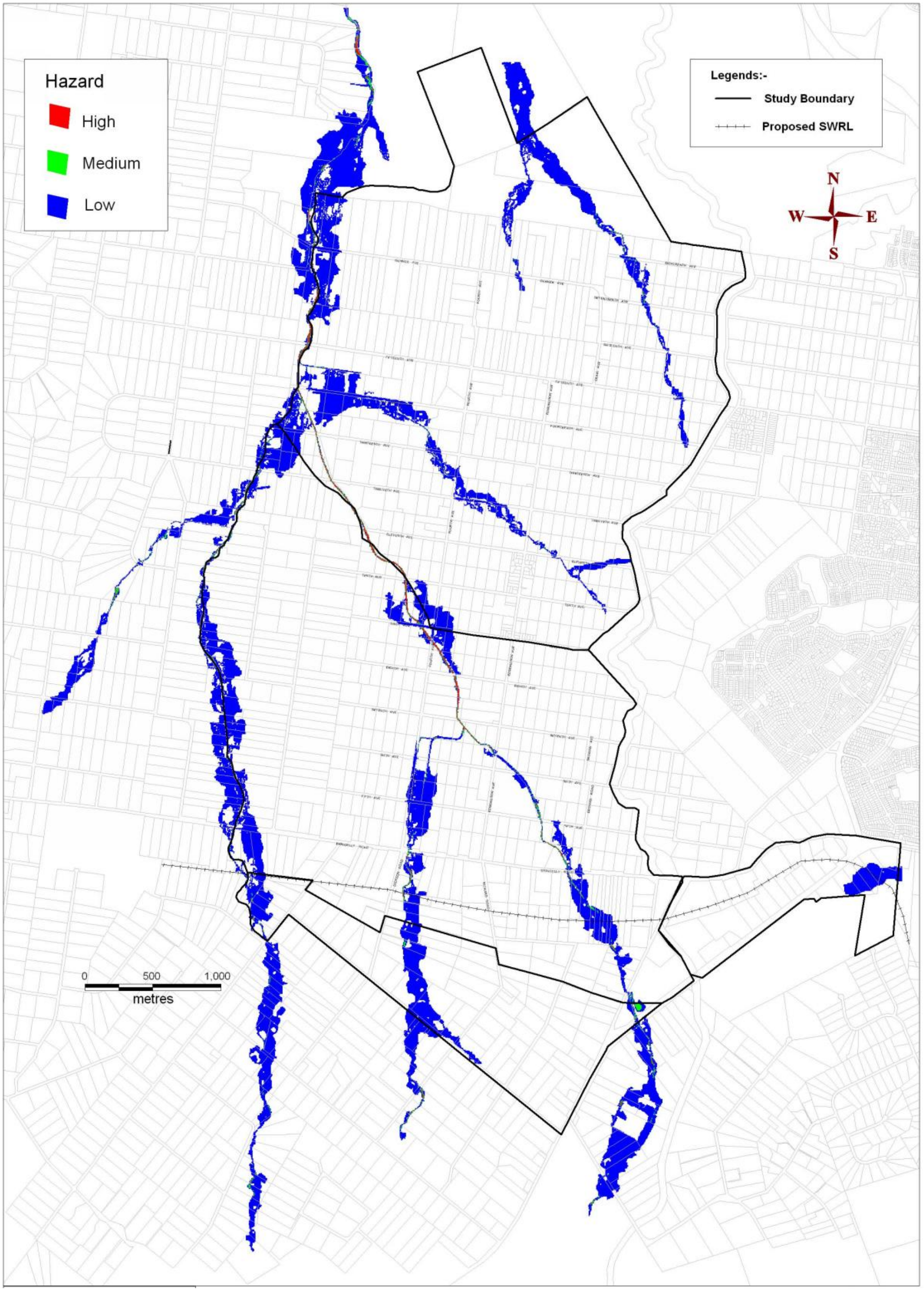


Figure D.28 1 yr ARI Flood Hazards under Existing Conditions

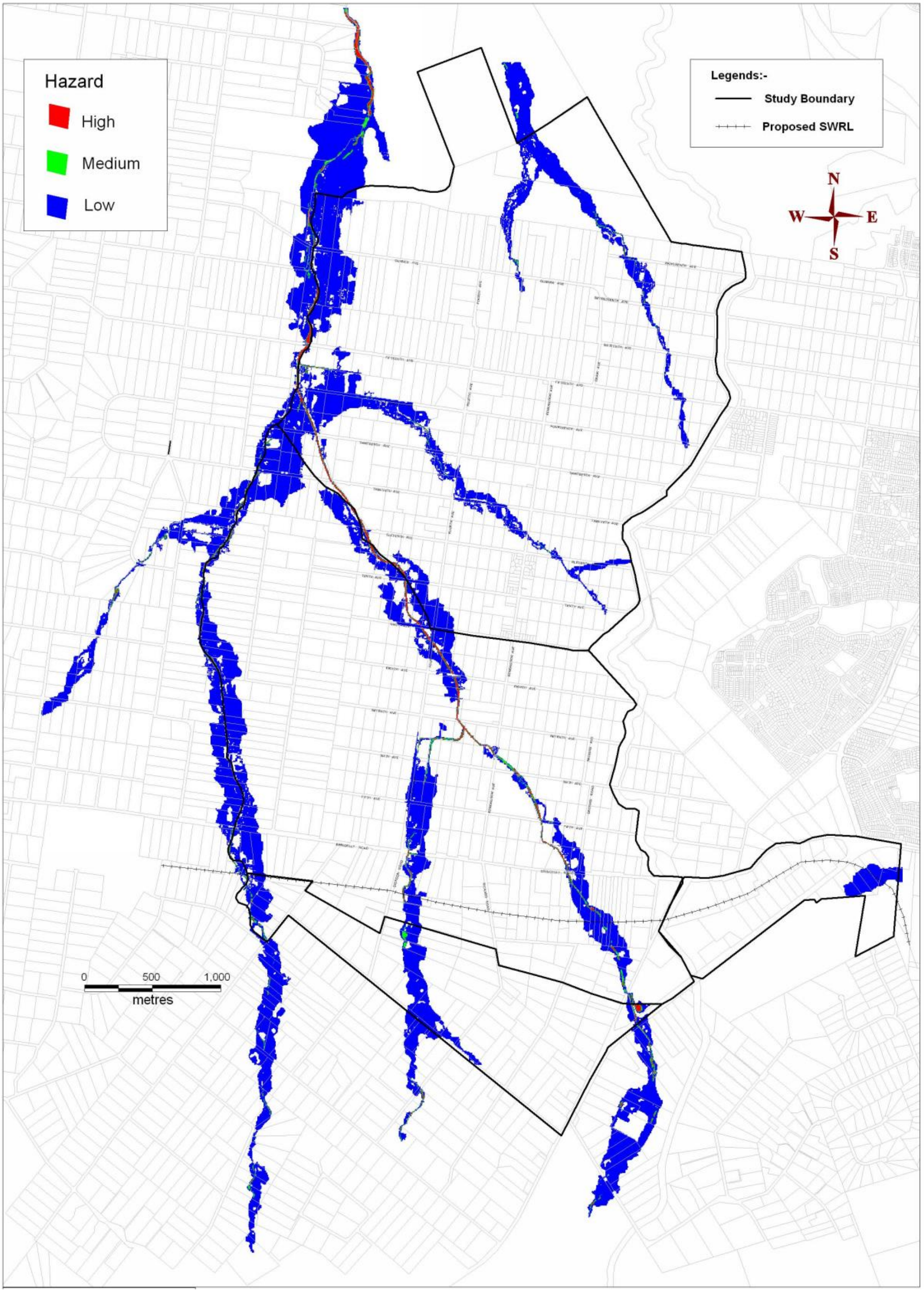


Figure D.29 2 yr ARI Flood Hazards under Existing Conditions

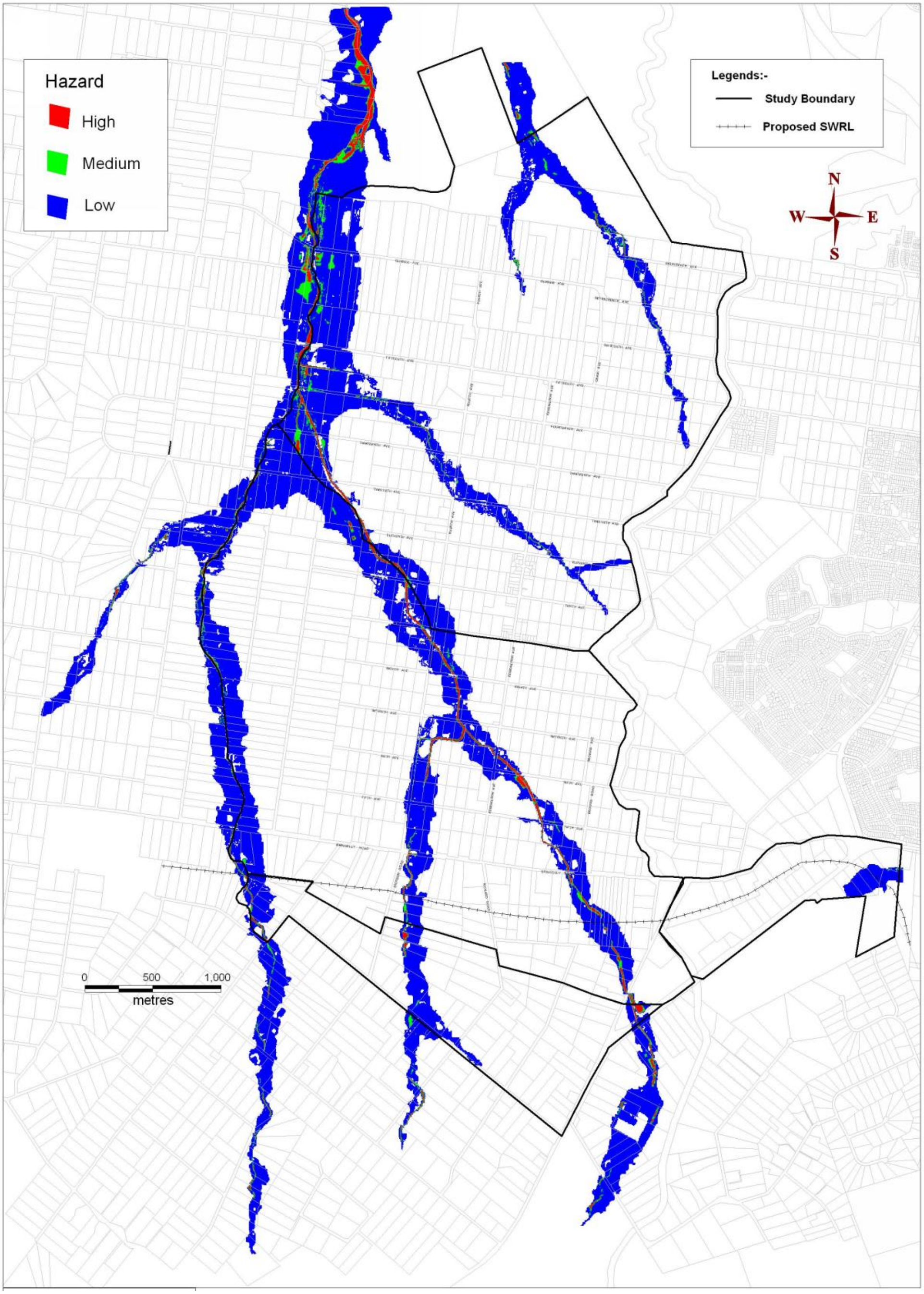


Figure D.30 5 yr ARI Flood Hazards under Existing Conditions

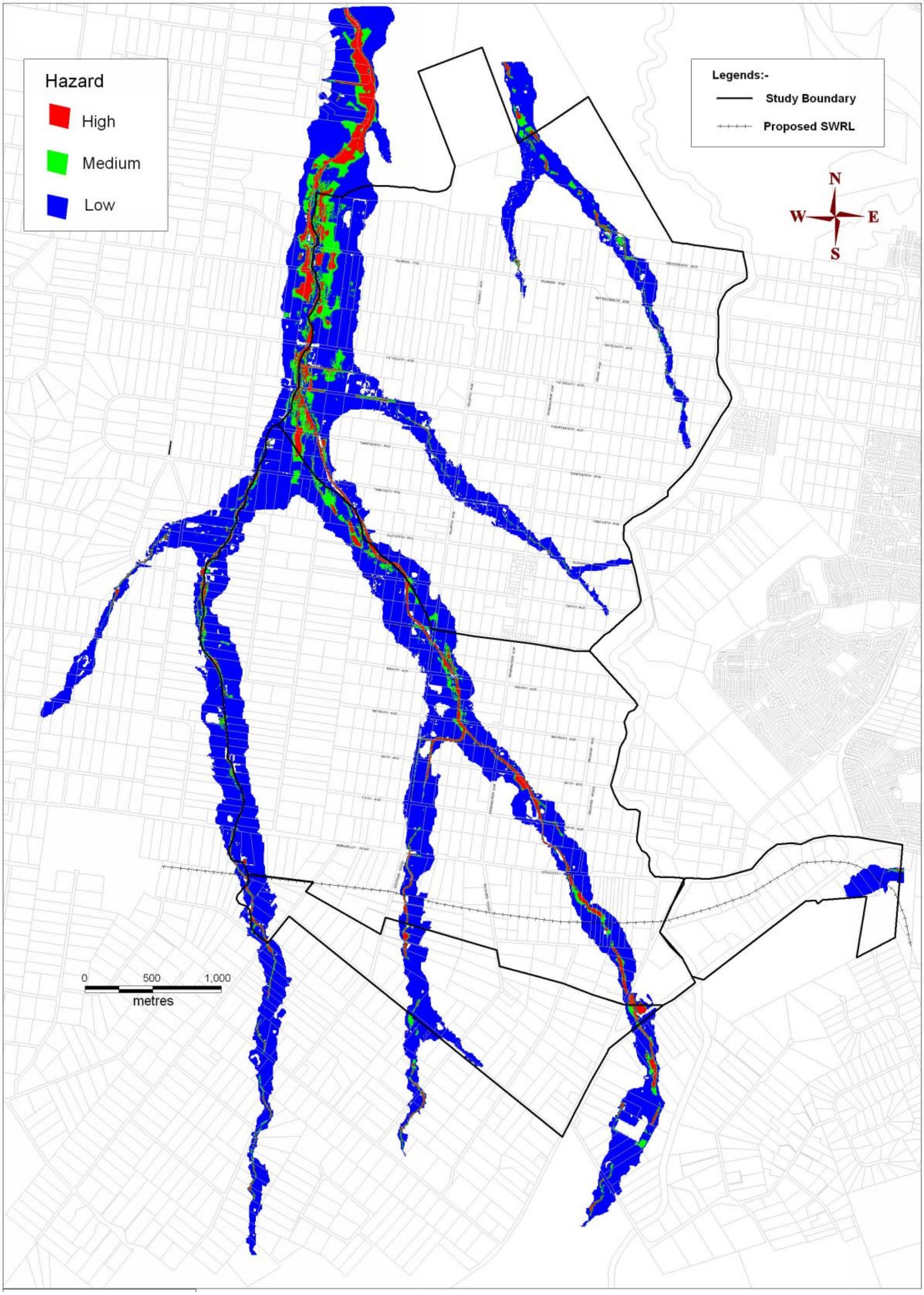


Figure D.31 20 yr ARI Flood Hazards under Existing Conditions

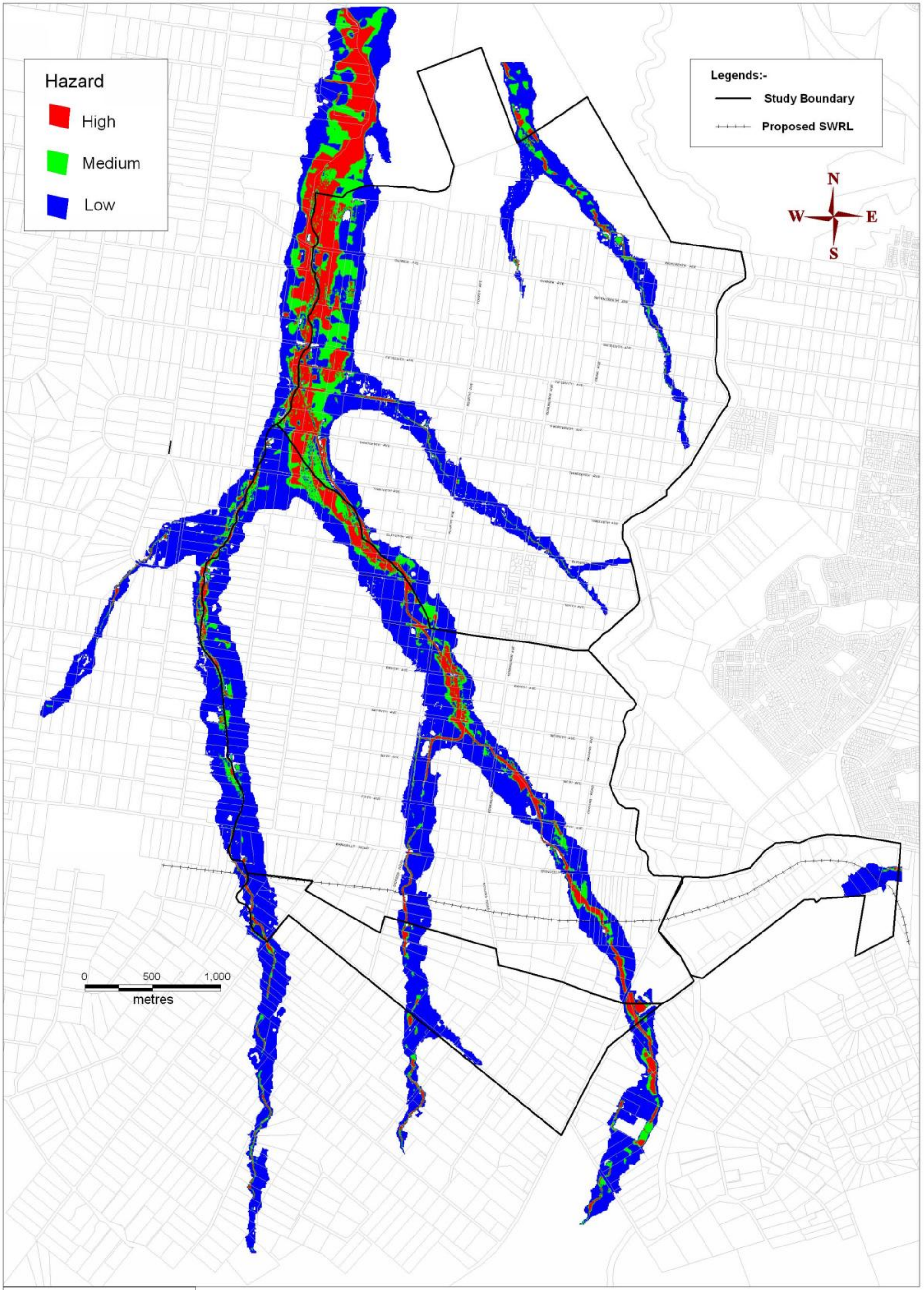


Figure D.32 100 yr ARI Flood Hazards under Existing Conditions

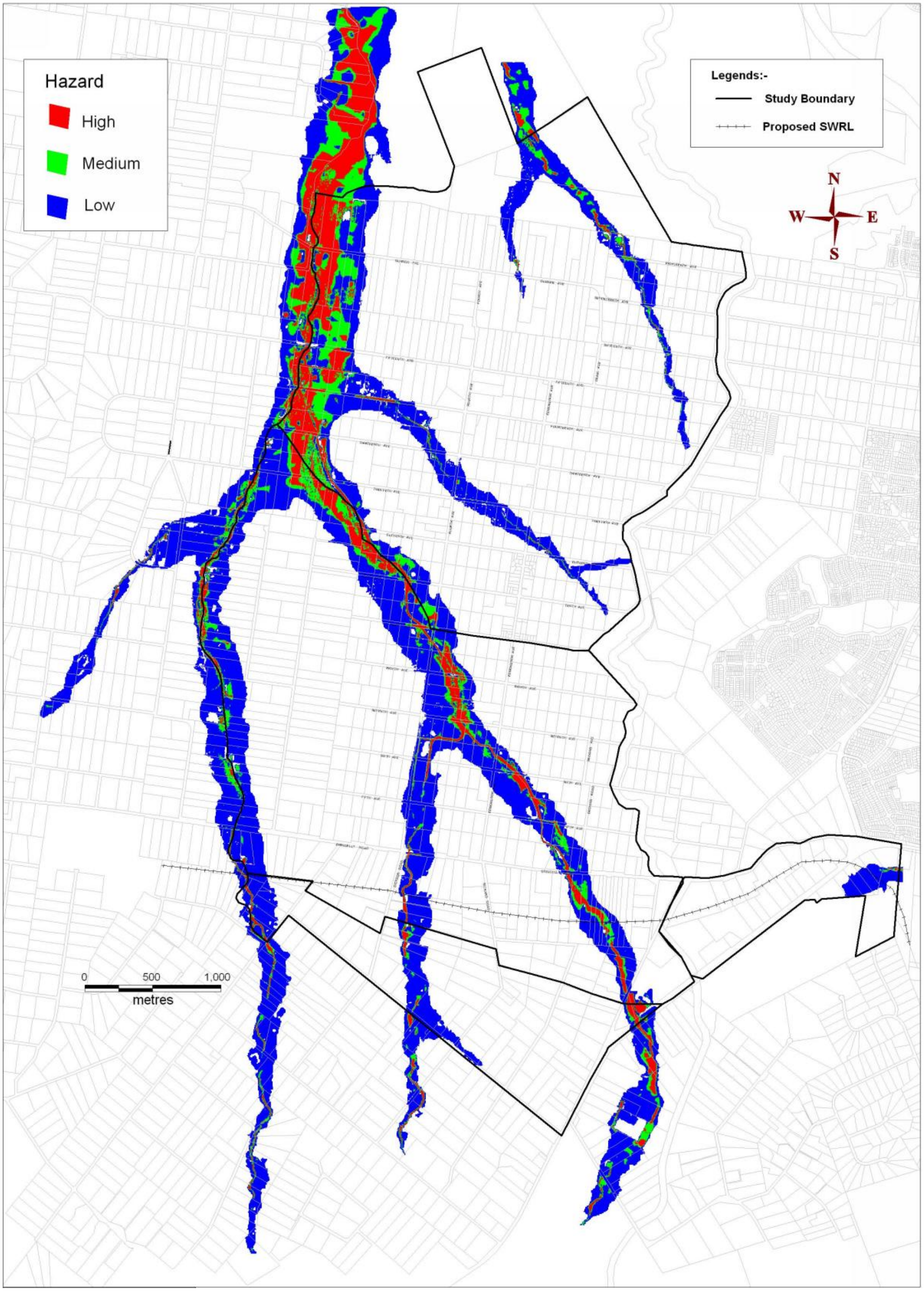


Figure D.33 200 yr ARI Flood Hazards under Existing Conditions

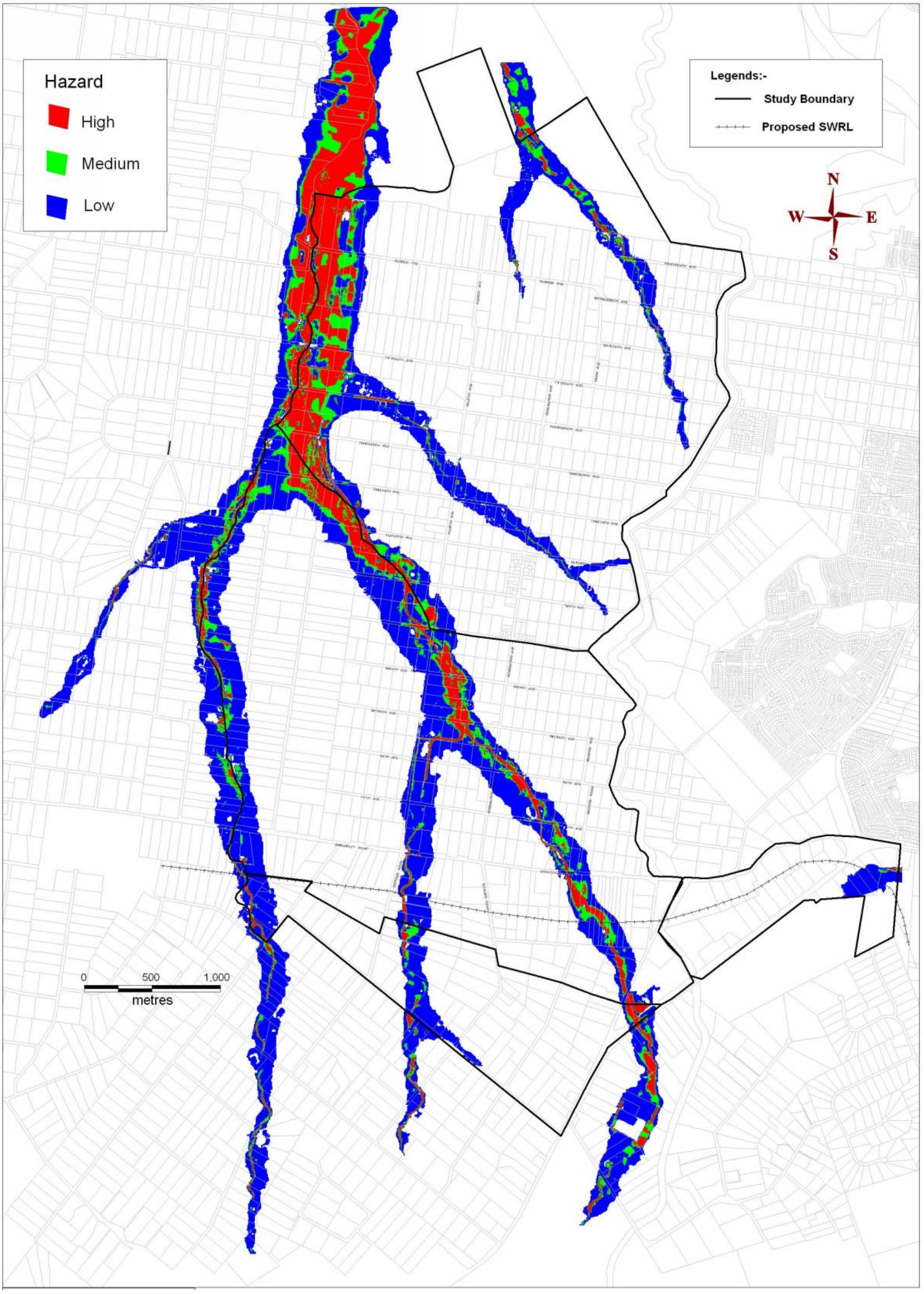


Figure D.34 500 yr ARI Flood Hazards under Existing Conditions

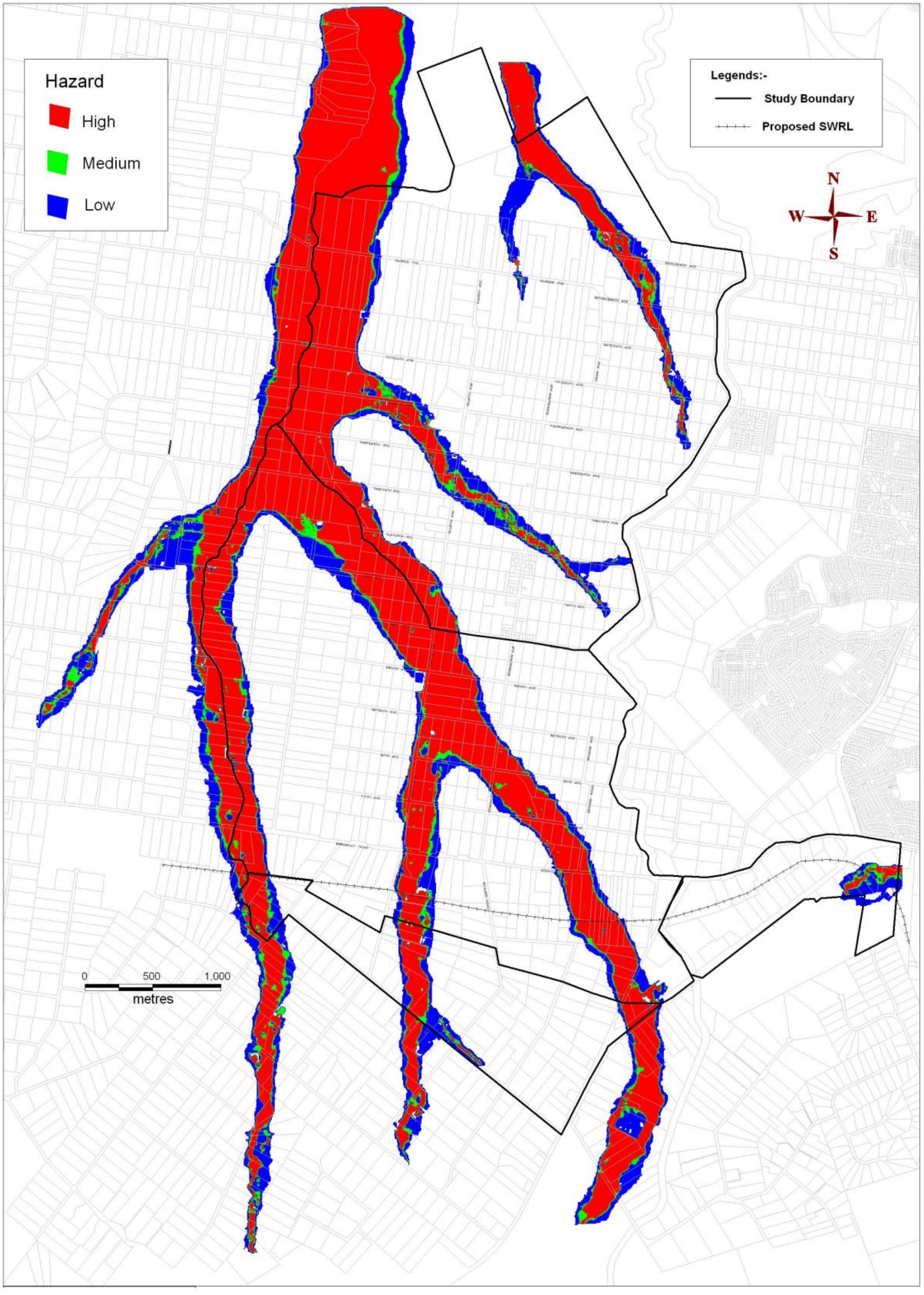


Figure D.35 PMF Flood Hazards under Existing Conditions

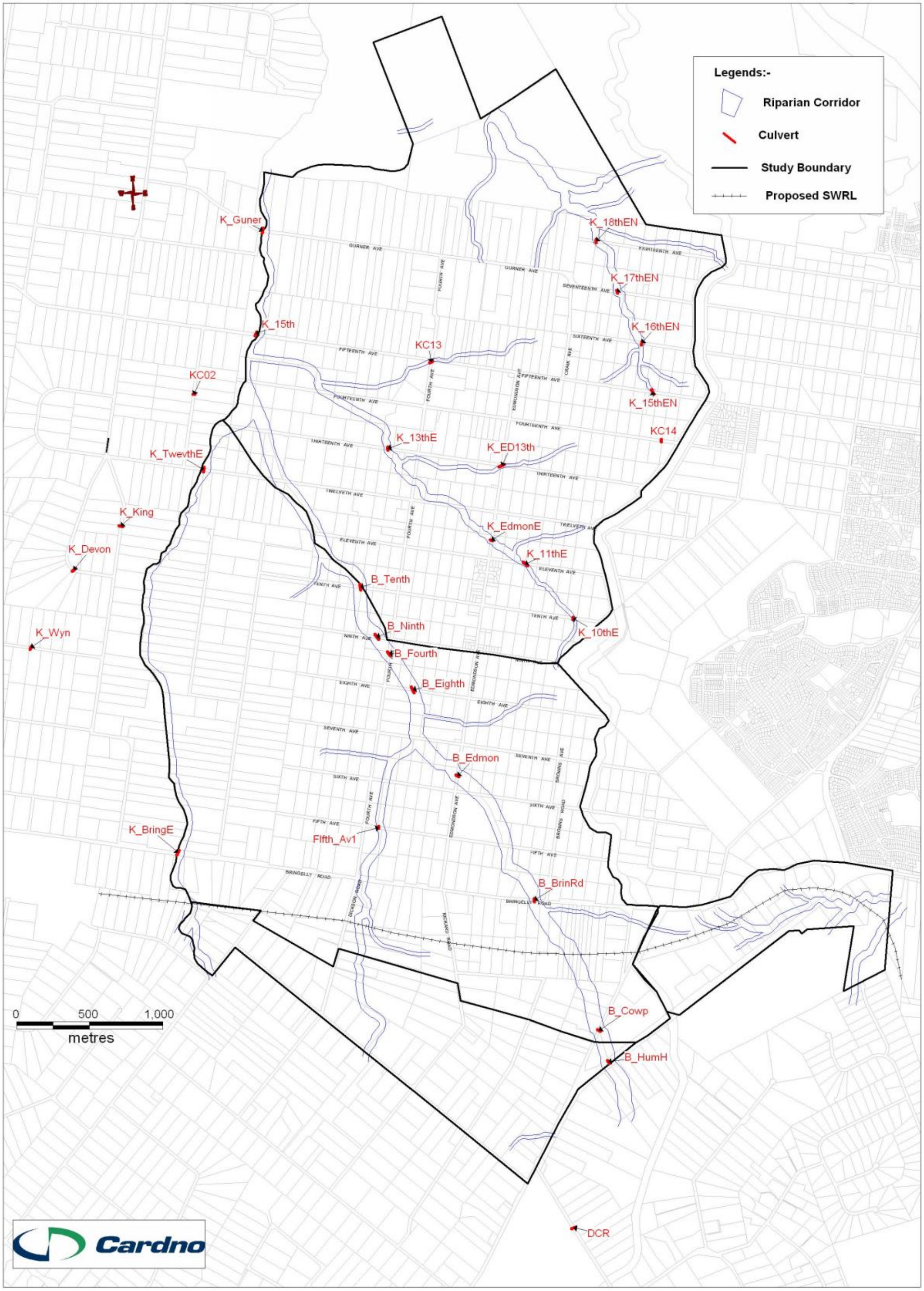


Figure D.36 Location of Modelled Road Crossings

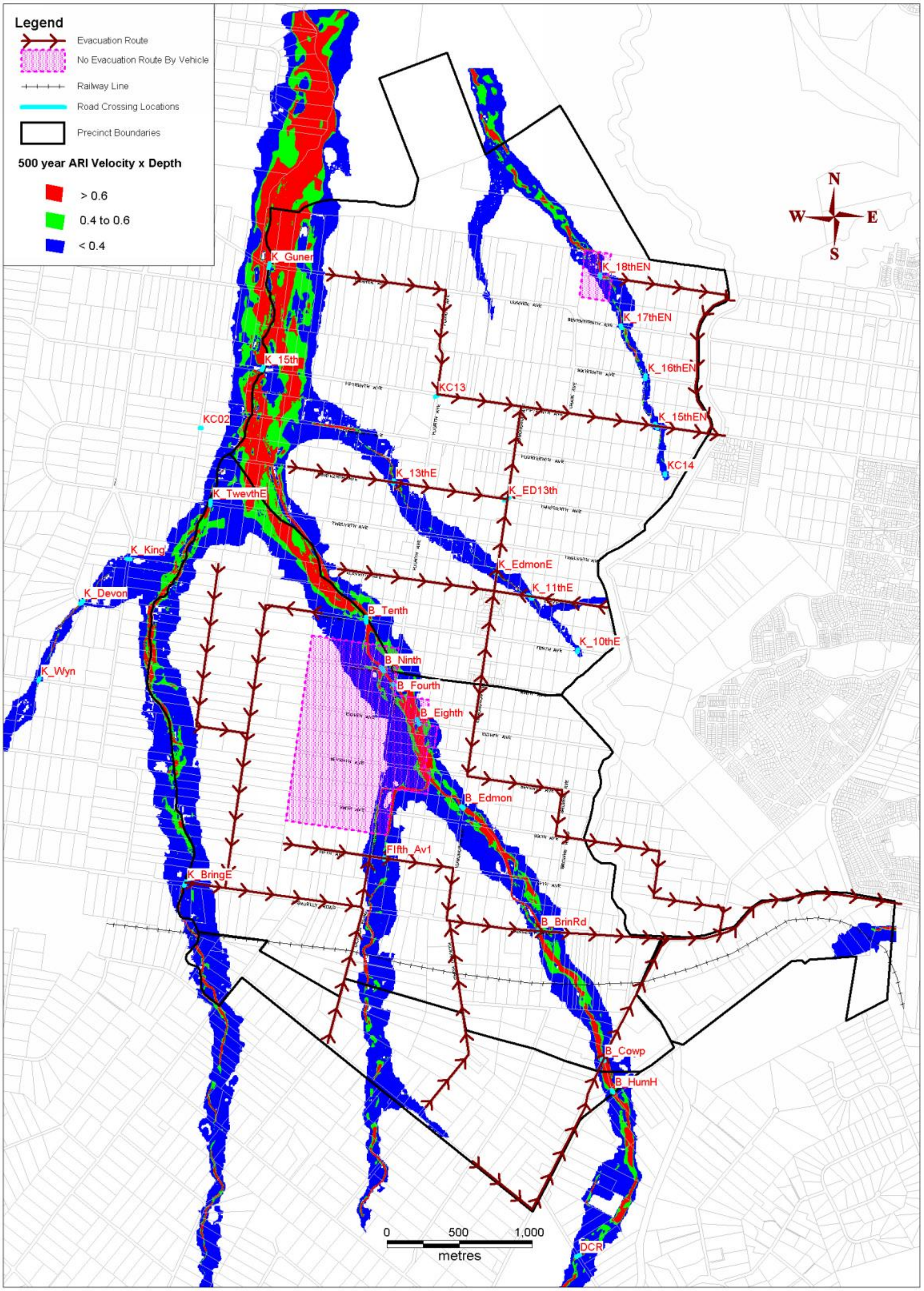


Figure D.37 Evacuation routes in the 500yr ARI

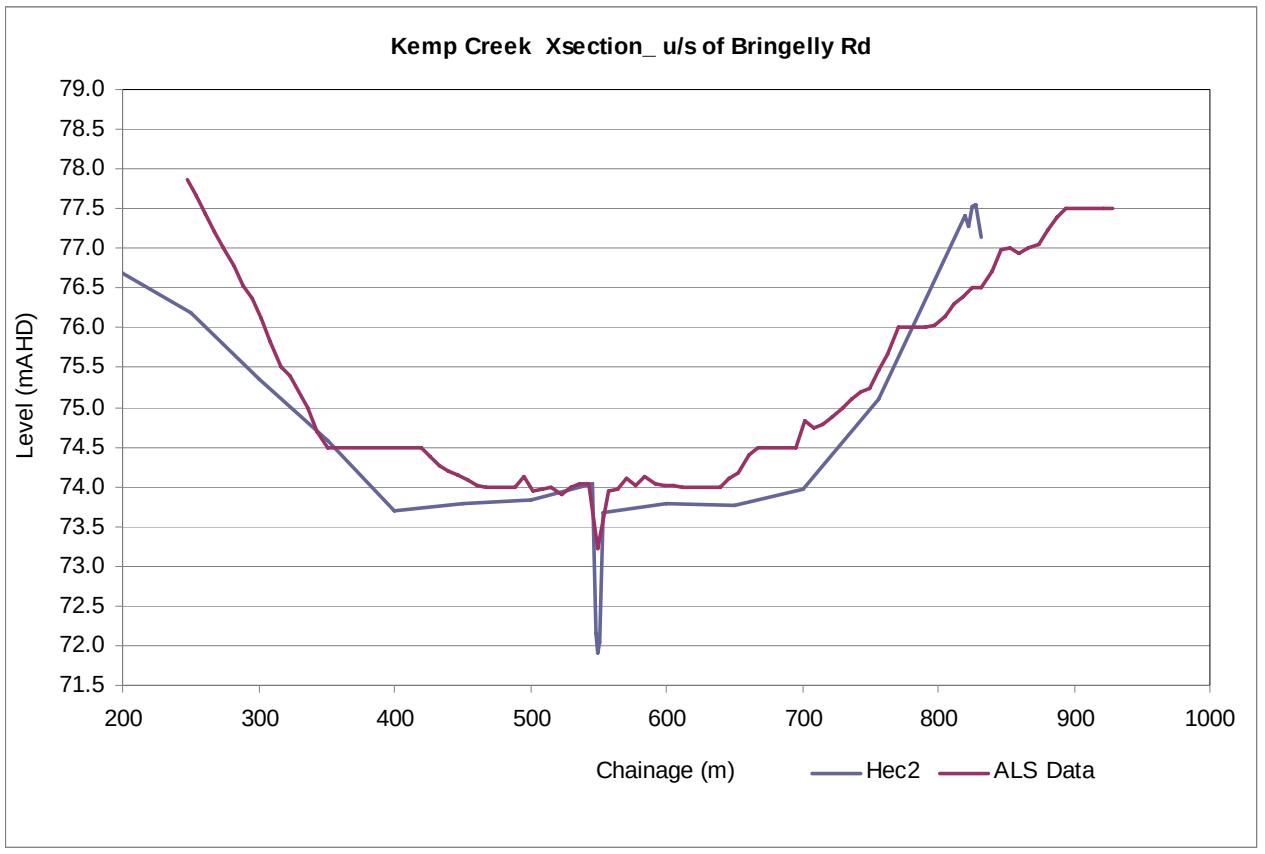


Figure D.38A Kemps Creek upstream of Bringelly Road

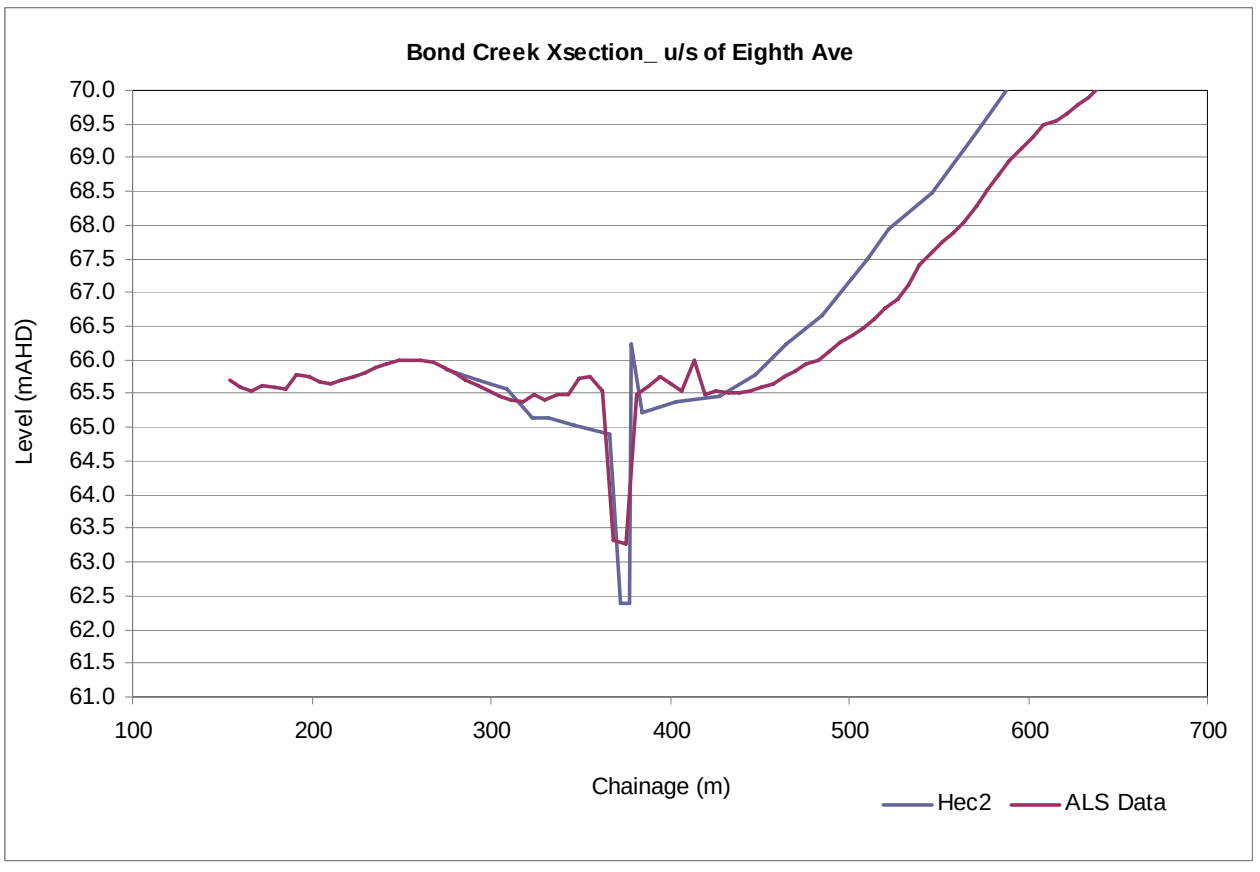


Figure D.38B Bonds Creek upstream of Eighth Avenue

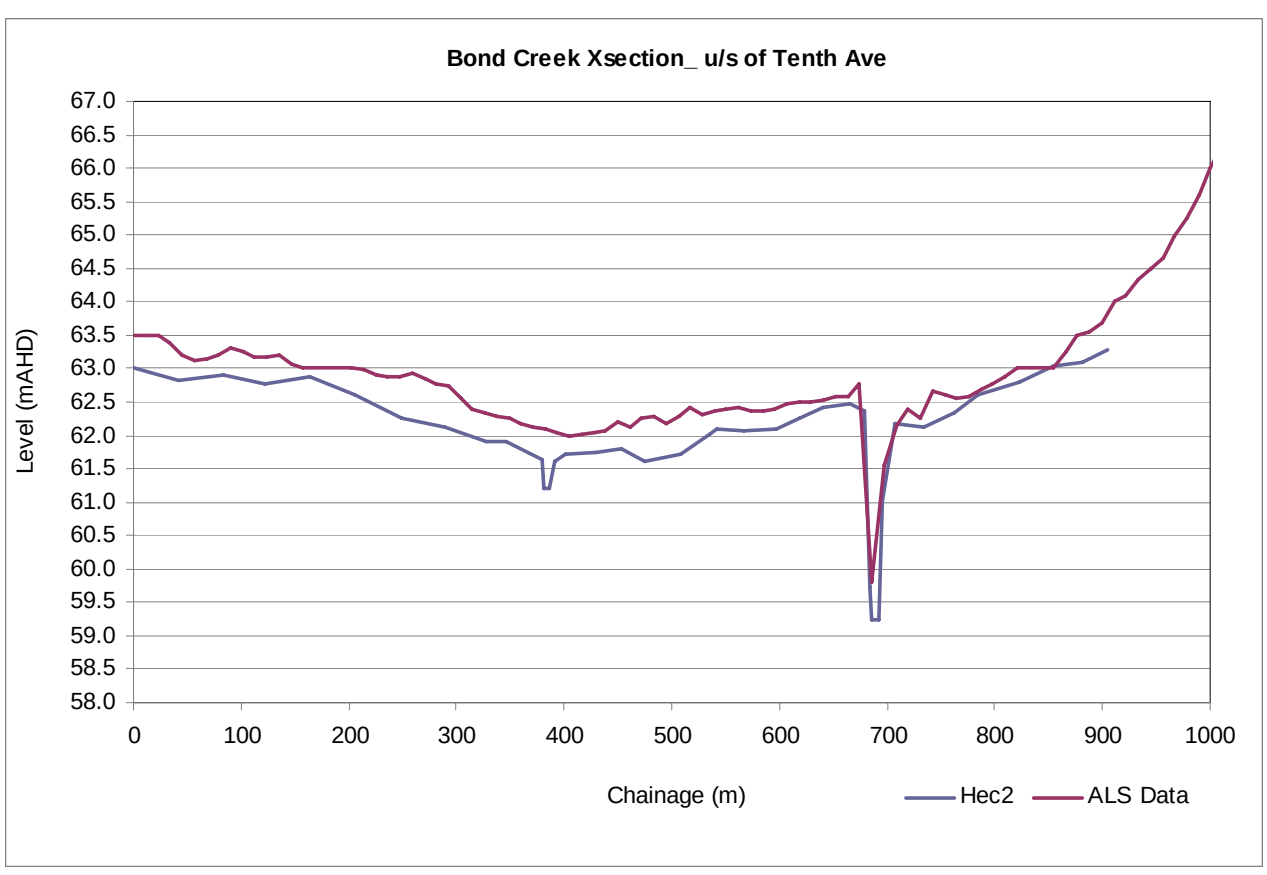


Figure D.38C Bonds Creek upstream of Tenth Avenue

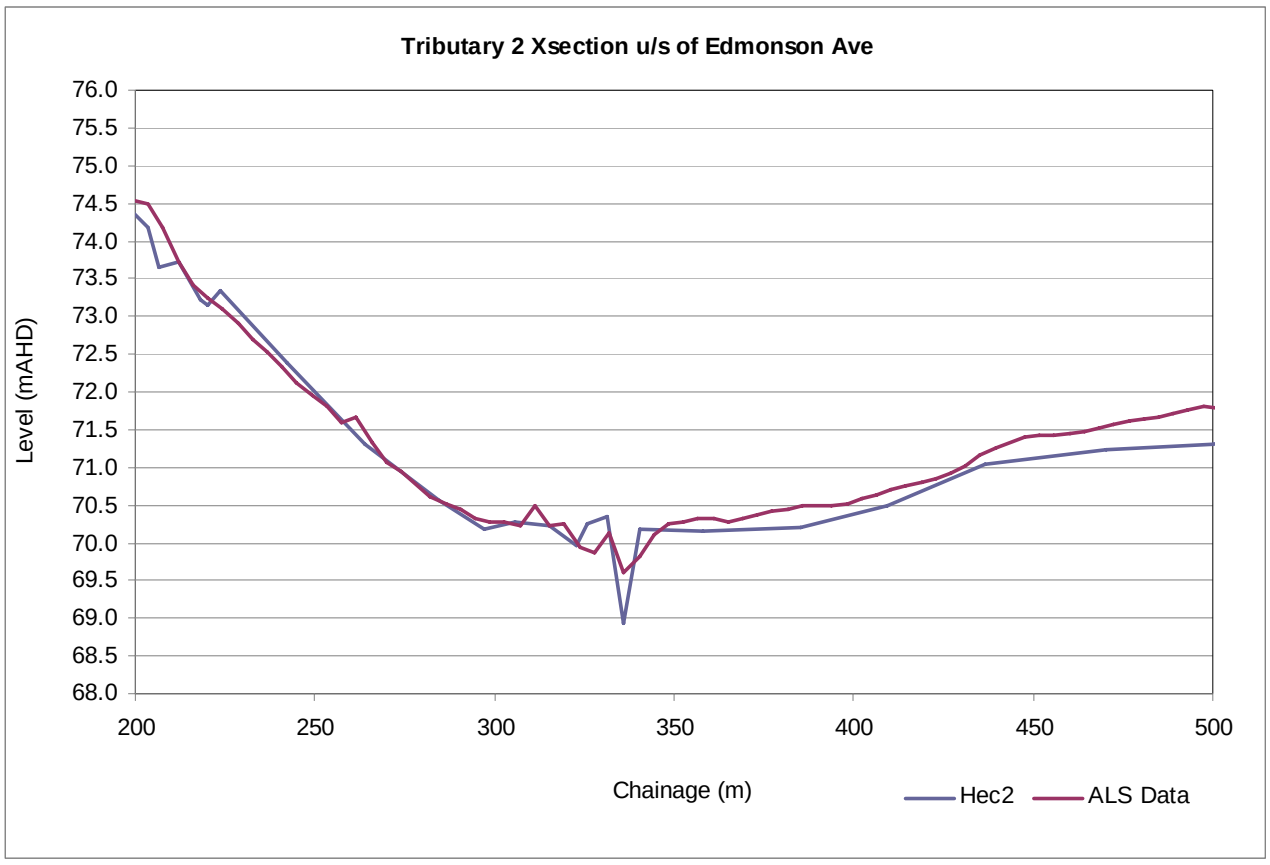


Figure D.38D Tributary 2 upstream of Edmonson Avenue

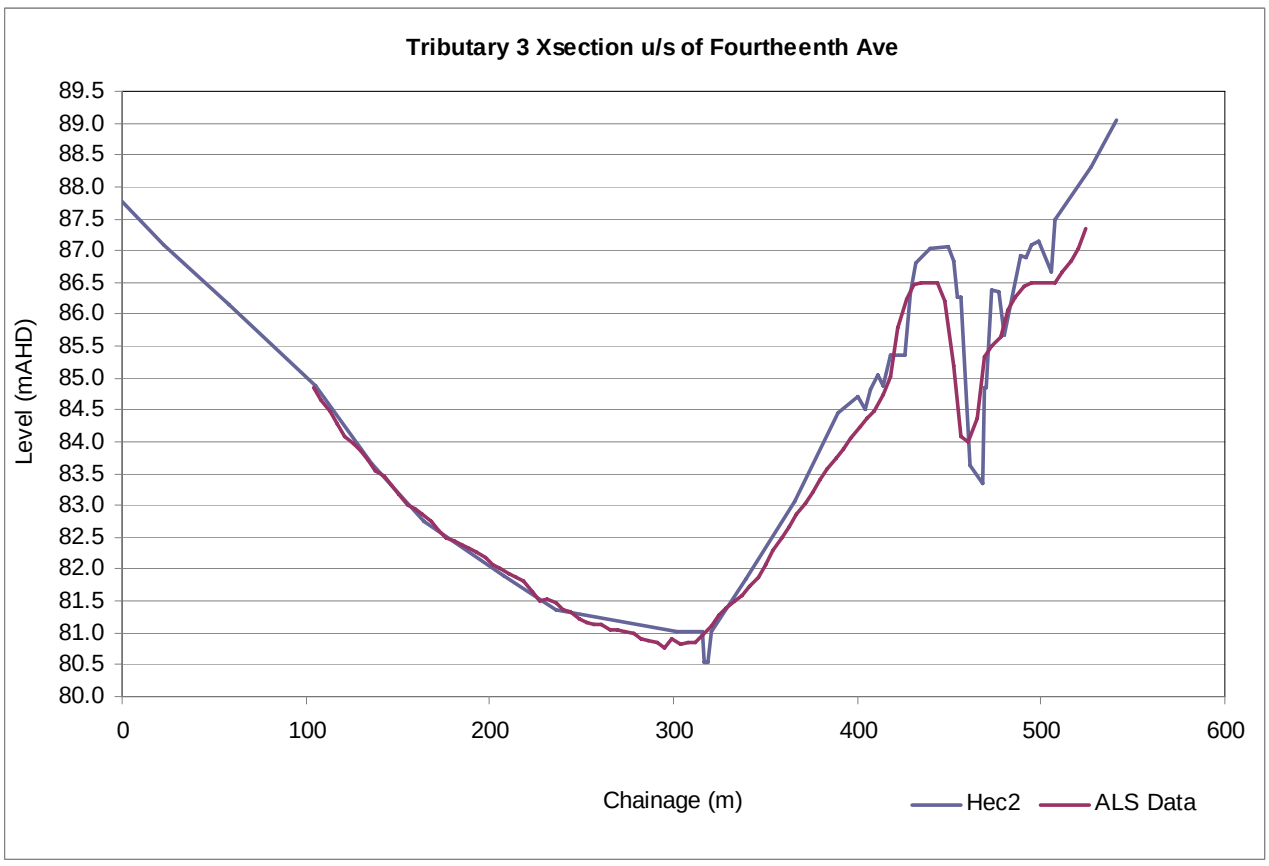


Figure D.38E Tributary 3 upstream of Fourteenth Avenue

Table D.1 Comparison of Crossing Invert Levels

Watercourse	Crossing Location	Conduit Dimension	Waterway Area (m2)	Conduit Invert Level (m AHD)		
				2003 Hec-2 Model (a)	2011 ALS (b)	Difference (m) (b)-(a)
Kemp Creek	Bringelly Rd	Span 6.7m, peir width 0.4m	10	-	73.20	-
	Twelfth Av	4 x 1350 RCP	5.7	-	58.70	-
	Fifteenth Av	Span 40m, peir width 2.25m	122	-	54.50	-
	Gumer Av	2 X 900 RCP	1.5	-	53.00	-
Branch	Wynyard Av	2 x 1050 RCP	1.0	69.84	70.50	0.66
	Devonshire Rd	2 x 3.2m x 0.9m RCBC	5.8	65.09	65.25	0.16
	Kind St	0.9m x 1.2m oval pipe	0.9	64.38	63.70	-0.68
	Herley Av	2 x 600 RCP	0.3	59.77	60.50	0.73
Bond Creek	Denham Court Rd	3 x 1500 x 900 RCBC	4	-	84.70	
	Hume Highway	4 x 1950 x 1000 RCBC	8	-	77.50	
	Cowpasture Rd	3 x 3300 x 1800 RCBC	18	-	76.75	
	Bringelly Rd	3 x 3000 x 1500 RCBC	13.5	-	72.13	
	Edmonson Av	4 x 3000 x 950 RCBC	11.5	-	66.50	
	Eighth Av	1 x 5450 x 3200 Armco	17.5	-	63.00	
	Fourth Av	3 x 3300 x 2100 Armco	21	-	61.50	
	Ninth Av	2 x 1080 x 690 RCBC	1.5	-	61.50	
	Tenth Av	1 x 8000 semi RCP	20	-	59.50	
Tributary 1	Fifth Av	1 x 750 RCP	0.4	-	70.10	
Tributary 2	Tenth Av	4 x 525 RCP	0.3	-	77.10	
	Eleventh Av	1 x 750 RCP	0.4	-	72.00	
	Edmonson Av	1 x 2900 750 RCBC	2.2	-	69.60	
	Thirteenth Av	1 x 750 RCP	0.4	-	61.90	
Branch	Fourteenth Av	4 x 525 RCP	0.3	65.7	66.30	0.60
	Edmonson/Thirteenth Av	1 x 600 RCP	0.3	70.93	71.20	0.27
Tributary 3	Fourtheen Av	2 x 450 RCP	0.3	-	80.80	
	Fifteenth Av	3 x 750 RCP	1.3	-	75.50	
	Sixteenth Av	1 x 2450 x 1200 RCBC	2.9	-	70.60	
	Seventeenth Av	2 x 3000 x 1200	7.2	-	66.90	
	Eighteenth Av	1 x 800 RCP	0.5	-	64.80	

Table D.2 Comparison of Estimated 1 yr ARI, 5 yr ARI, 20 yr ARI, 100 yr ARI and PMF Flood Levels at Crossings

Watercourse	Crossing Location	Conduit Dimension	Waterway Area (m2)	1 yr ARI Flood Level			5 yr ARI Flood Level			20 yr ARI Flood Level			100 yr ARI Flood Level			PMF Level		
				2003 Hec-2 Model (c)	2011 TUFLOW (cc)	Difference (m) (cc)-(c)	2003 Hec-2 Model (d)	2011 TUFLOW (dd)	Difference (m) (dd)-(d)	2003 Hec-2 Model (e)	2011 TUFLOW (ee)	Difference (m) (ee)-(e)	2003 Hec-2 Model (f)	2011 TUFLOW (ff)	Difference (m) (ff)-(f)	2003 Hec-2 Model (g)	2011 TUFLOW (gg)	Difference (m) (gg)-(g)
Kemp Creek	Bringelly Rd	Span 6.7m, peir width 0.4m	10	73.6	73.93	0.33	73.9	74.17	0.27	73.9	74.24	0.34	74	74.31	0.31	74.3	74.95	0.65
	Twelfth Av	4 x 1350 RCP	5.7	59.7	59.92	0.22	60.1	60.17	0.07	60.1	60.28	0.18	60.1	60.37	0.27	60.6	61.39	0.79
	Fifteenth Av	Span 40m, peir width 2.25m	122	56.1	55.94	-0.16	56.6	56.75	0.15	56.7	56.93	0.23	56.9	57.12	0.22	57.8	58.73	0.93
	Gumer Av	2 X 900 RCP	1.5	54.6	54.51	-0.09	54.9	54.94	0.04	55	55.14	0.14	55.2	55.36	0.16	56	56.83	0.83
Branch	Wynyard Av	2 x 1050 RCP	1.0	70.6	70.88	0.28	70.9	71.56	0.66	71.1	71.65	0.55	71.3	71.71	0.41	71.7	72.15	0.45
	Devonshire Rd	2 x 3.2m x 0.9m RCBC	5.8	66.3	66.61	0.31	66.6	66.85	0.25	66.8	66.98	0.18	66.9	67.12	0.22	67.3	67.93	0.63
	Kind St	0.9m x 1.2m oval pipe	0.9	64.4	64.15	-0.25	64.5	64.46	-0.04	64.5	64.52	0.02	64.6	64.57	-0.03	64.7	64.90	0.20
	Herley Av	2 x 600 RCP	0.3	60.5	-	-	60.7	-	-	61.1	-	-	61.3	-	-	61.5	-	-
Bond Creek	Denham Court Rd	3 x 1500 x 900 RCBC	4	85.5	85.65	0.15	86.1	85.83	-0.27	86.1	85.99	-0.11	86.2	86.07	-0.13	86.7	86.59	-0.11
	Hume Highway	4 x 1950 x 1000 RCBC	8	78.5	78.49	-0.01	78.9	78.86	-0.04	79	79.08	0.08	79.4	79.27	-0.13	79.7	80.42	0.72
	Cowpasture Rd	3 x 3300 x 1800 RCBC	18	77.2	77.33	0.13	77.5	78.02	0.52	78	78.48	0.48	78.4	78.68	0.28	78.7	79.57	0.87
	Bringelly Rd	3 x 3000 x 1500 RCBC	13.5	72.8	72.50	-0.30	73.3	73.51	0.21	73.3	73.85	0.55	73.8	73.97	0.17	74.4	74.75	0.35
	Edmonson Av	4 x 3000 x 950 RCBC	11.5	67.3	67.49	0.19	67.7	68.48	0.78	68.3	68.58	0.28	68.5	68.68	0.18	69.1	69.49	0.39
	Eighth Av	1 x 5450 x 3200 Armco	17.5	64.1	65.35	1.25	65.2	65.99	0.79	65.9	66.18	0.28	66.1	66.41	0.31	66.8	67.69	0.89
	Fourth Av	3 x 3300 x 2100 Armco	21	63.8	64.72	0.92	64.1	65.06	0.96	64.4	65.11	0.71	65.1	65.19	0.09	66	66.00	0.00
	Ninth Av	2 x 1080 x 690 RCBC	1.5	63.4	63.62	0.22	63.7	63.97	0.27	63.9	64.13	0.23	64	64.30	0.30	64.6	65.36	0.76
	Tenth Av	1 x 8000 semi RCP	20	60.8	62.25	1.45	61.7	62.96	1.26	62.2	63.05	0.85	62.4	63.14	0.74	63.1	64.23	1.13
Tributary 1	Fifth Av	1 x 750 RCP	0.4	70.7	70.63	-0.07	70.8	70.81	0.01	70.9	70.90	0.00	71	70.97	-0.03	71.3	71.64	0.34
Tributary 2	Tenth Av	4 x 525 RCP	0.3	77.3	77.28	-0.02	77.4	77.36	-0.04	77.5	77.39	-0.11	77.5	77.41	-0.09	77.9	77.61	-0.29
	Eleventh Av	1 x 750 RCP	0.4	72	72.46	0.46	72.3	72.67	0.37	72.4	72.76	0.36	72.4	72.82	0.42	72.8	73.35	0.55
	Edmonson Av	1 x 2900 750 RCBC	2.2	70.4	69.91	-0.49	70.7	70.42	-0.28	70.8	70.49	-0.31	70.8	70.55	-0.25	71.3	70.97	-0.33
	Thirteenth Av	1 x 750 RCP	0.4	62.7	62.68	-0.02	62.9	62.86	-0.04	63.1	62.94	-0.16	63.1	63.01	-0.09	63.8	63.62	-0.18
Branch	Fourteenth Av	4 x 525 RCP	0.3	66.5	-	-	66.6	-	-	66.7	-	-	66.7	-	-	67.1	-	-
	Edmonson/Thirteenth Av	1 x 600 RCP	0.3	71.7	-	-	71.7	-	-	71.7	-	-	71.7	-	-	72	-	-
Tributary 3	Fourtheen Av	2 x 450 RCP	0.3	81.2	81.03	-0.17	81.4	81.08	-0.32	81.4	81.10	-0.30	81.6	81.11	-0.49	81.8	81.25	-0.55
	Fifteenth Av	3 x 750 RCP	1.3	75.8	76.14	0.34	76.1	76.25	0.15	76.2	76.28	0.08	76.2	76.29	0.09	76.7	76.57	-0.13
	Sixteenth Av	1 x 2450 x 1200 RCBC	2.9	71	70.96	-0.04	71.3	71.55	0.25	71.5	71.63	0.13	71.5	71.67	0.17	72.3	72.16	-0.14
	Seventeenth Av	2 x 3000 x 1200	7.2	67.6	67.99	0.39	68.1	68.25	0.15	68.4	68.37	-0.03	68.5	68.42	-0.08	69.1	69.00	-0.10
	Eighteenth Av	1 x 800 RCP	0.5	65.4	65.45	0.05	65.6	65.72	0.12	65.8	65.85	0.05	65.9	65.91	0.01	66.5	66.57	0.07

Table D.3 Estimated 1 yr ARI, 2 yr ARI, 5 yr ARI and 20 yr ARI Flood Levels, Velocities and Velocity x Depths at Crossings

Watercourse	Crossing Location	Conduit Dimension	Waterway Area (m2)	1 yr ARI			2 yr ARI			5 yr ARI			20 yr ARI		
				Depth (m)	Velocity (m/s)	V x D (m2/s)	Depth (m)	Velocity (m/s)	V x D (m2/s)	Depth (m)	Velocity (m/s)	V x D (m2/s)	Depth (m)	Velocity (m/s)	V x D (m2/s)
Kemp Creek	Bringelly Rd	Span 6.7m, peir width 0.4m	10	-	-	-	-	-	-	-	-	-	-	-	-
	Twelfth Av	4 x 1350 RCP	5.7	-	-	-	0.0717	0.89	0.06	0.1702	1.30	0.22	0.2812	1.18	0.33
	Fifteenth Av	Span 40m, peir width 2.25m	122	-	-	-	-	-	-	-	-	-	-	-	-
	Gumer Av	2 X 900 RCP	1.5	0.0141	0.54	0.01	0.146	0.84	0.12	0.4399	0.63	0.28	0.6441	0.71	0.46
Branch	Wynyard Av	2 x 1050 RCP	1.0	-	-	-	-	-	-	0.0597	0.69	0.04	0.1504	1.22	0.18
	Devonshire Rd	2 x 3.2m x 0.9m RCBC	5.8	-	-	-	0.0173	0.40	0.01	0.2013	0.97	0.20	0.3308	0.98	0.32
	Kind St	0.9m x 1.2m oval pipe	0.9	-	-	-	0.0198	0.12	0.00	0.1102	0.57	0.06	0.1733	0.59	0.10
	Herley Av	2 x 600 RCP	0.3	flood extent not covered by model											
Bond Creek	Denham Court Rd	3 x 1500 x 900 RCBC	4	-	-	-	-	-	-	-	-	-	-	-	-
	Hume Highway	4 x 1950 x 1000 RCBC	8	-	-	-	0.1085	0.98	0.11	0.359	0.76	0.27	0.579	1.00	0.58
	Cowpasture Rd	3 x 3300 x 1800 RCBC	18	-	-	-	-	-	-	-	-	-	-	-	-
	Bringelly Rd	3 x 3000 x 1500 RCBC	13.5	-	-	-	-	-	-	-	-	-	0.1007	0.99	0.10
	Edmonson Av	4 x 3000 x 950 RCBC	11.5	-	-	-	-	-	-	0.164	1.38	0.23	0.2635	1.75	0.46
	Eighth Av	1 x 5450 x 3200 Armco	17.5	-	-	-	-	-	-	-	-	-	-	-	-
	Fourth Av	3 x 3300 x 2100 Armco	21	-	-	-	0.2035	1.04	0.21	0.2563	1.10	0.28	0.3105	1.82	0.56
	Ninth Av	2 x 1080 x 690 RCBC	1.5	0.0245	0.56	0.01	0.2237	1.23	0.28	0.3736	1.69	0.63	0.5301	1.65	0.88
	Tenth Av	1 x 8000 semi RCP	20	-	-	-	0.2487	0.28	0.07	0.5587	1.28	0.72	0.6462	1.54	0.99
Tributary 1	Fifth Av	1 x 750 RCP	0.4	0.0301	0.48	0.01	0.0919	0.42	0.04	0.211	0.40	0.08	0.2972	0.52	0.15
Tributary 2	Tenth Av	4 x 525 RCP	0.3	-	-	-	0.0083	0.21	0.00	0.0592	0.60	0.04	0.0916	0.71	0.07
	Eleventh Av	1 x 750 RCP	0.4	-	-	-	-	-	-	-	-	-	0.0607	0.86	0.05
	Edmonson Av	1 x 2900 750 RCBC	2.2	-	-	-	-	-	-	0.0455	0.25	0.01	0.1248	0.51	0.06
	Thirteenth Av	1 x 750 RCP	0.4	-	-	-	-	-	-	0.0605	1.35	0.08	0.139	1.55	0.22
Branch	Fourteenth Av	4 x 525 RCP	0.3	flood extent not covered by model											
	Edmonson/Thirteenth Av	1 x 600 RCP	0.3	flood extent not covered by model											
Tributary 3	Fourtheen Av	2 x 450 RCP	0.3	-	-	-	-	-	-	0.0103	0.54	0.01	0.0266	0.62	0.02
	Fifteenth Av	3 x 750 RCP	1.3	-	-	-	-	-	-	0.0024	0.15	0.00	0.0309	0.22	0.01
	Sixteenth Av	1 x 2450 x 1200 RCBC	2.9	-	-	-	-	-	-	0.0469	0.43	0.02	0.1305	0.79	0.10
	Seventeenth Av	2 x 3000 x 1200	7.2	-	-	-	0.0684	0.91	0.06	0.2464	0.61	0.15	0.3676	0.63	0.23
	Eighteenth Av	1 x 800 RCP	0.5	0.0532	0.53	0.03	0.1427	0.74	0.11	0.3224	1.12	0.36	0.4534	1.24	0.56

Table D.4 Estimated 100 yr ARI, 200 yr ARI, 500 yr ARI and PMF Flood Levels, Velocities and Velocity x Depths at Crossings

Watercourse	Crossing Location	Conduit Dimension	Waterway Area (m2)	100 yr ARI			200 yr ARI			500 yr ARI			PMF		
				Depth (m)	Velocity (m/s)	V x D (m2/s)	Depth (m)	Velocity (m/s)	V x D (m2/s)	Depth (m)	Velocity (m/s)	V x D (m2/s)	Depth (m)	Velocity (m/s)	V x D (m2/s)
Kemp Creek	Bringelly Rd	Span 6.7m, peir width 0.4m	10	0.0587	0.81	0.05	0.0677	0.83	0.06	0.0957	1.00	0.10	0.6997	1.41	0.99
	Twelfth Av	4 x 1350 RCP	5.7	0.3744	1.18	0.44	0.3849	1.21	0.46	0.4233	1.30	0.55	1.3927	1.77	2.47
	Fifteenth Av	Span 40m, peir width 2.25m	122	-	-	-	-	-	-	-	-	-	0.3783	2.02	0.76
	Gumer Av	2 X 900 RCP	1.5	0.8562	0.85	0.72	0.8791	0.86	0.76	0.9648	0.92	0.88	2.3283	1.51	3.51
Branch	Wynyard Av	2 x 1050 RCP	1.0	0.21	1.40	0.29	0.2113	1.42	0.30	0.2323	1.46	0.34	0.6524	2.96	1.93
	Devonshire Rd	2 x 3.2m x 0.9m RCBC	5.8	0.4658	0.89	0.41	0.4798	0.89	0.43	0.5303	0.91	0.48	1.2757	1.18	1.51
	Kind St	0.9m x 1.2m oval pipe	0.9	0.2231	0.49	0.11	0.2273	0.50	0.11	0.2481	0.53	0.13	0.5514	0.95	0.52
	Herley Av	2 x 600 RCP	0.3	flood extent not covered by model											
Bond Creek	Denham Court Rd	3 x 1500 x 900 RCBC	4	0.0702	0.94	0.07	0.0783	0.97	0.08	0.1106	1.07	0.12	0.5888	2.24	1.32
	Hume Highway	4 x 1950 x 1000 RCBC	8	0.774	1.10	0.85	0.7909	1.11	0.88	0.863	1.15	0.99	1.9198	1.75	3.36
	Cowpasture Rd	3 x 3300 x 1800 RCBC	18	0.1846	1.10	0.20	0.2033	1.15	0.23	0.2678	1.31	0.35	1.0739	2.64	2.83
	Bringelly Rd	3 x 3000 x 1500 RCBC	13.5	0.2181	1.51	0.33	0.2313	1.56	0.36	0.2704	1.71	0.46	1.0034	2.82	2.83
	Edmonson Av	4 x 3000 x 950 RCBC	11.5	0.3555	2.05	0.73	0.367	2.08	0.76	0.4245	1.83	0.78	1.167	2.37	2.76
	Eighth Av	1 x 5450 x 3200 Armco	17.5	-	-	-	-	-	-	-	-	-	1.0933	2.75	3.01
	Fourth Av	3 x 3300 x 2100 Armco	21	0.3928	1.83	0.72	0.4018	1.86	0.75	0.4526	1.92	0.87	1.1976	2.63	3.15
	Ninth Av	2 x 1080 x 690 RCBC	1.5	0.7037	1.74	1.23	0.7196	1.76	1.27	0.7895	1.79	1.41	1.7618	2.31	4.07
	Tenth Av	1 x 8000 semi RCP	20	0.741	1.64	1.21	0.751	1.64	1.23	0.7924	1.64	1.30	1.8348	1.96	3.60
Tributary 1	Fifth Av	1 x 750 RCP	0.4	0.3736	0.59	0.22	0.3812	0.60	0.23	0.4128	0.62	0.26	1.0365	1.10	1.14
Tributary 2	Tenth Av	4 x 525 RCP	0.3	0.1133	0.85	0.10	0.1158	0.85	0.10	0.1257	0.86	0.11	0.3074	1.25	0.38
	Eleventh Av	1 x 750 RCP	0.4	0.117	0.77	0.09	0.1273	0.78	0.10	0.1593	0.81	0.13	0.646	1.42	0.91
	Edmonson Av	1 x 2900 750 RCBC	2.2	0.1818	0.73	0.13	0.1875	0.76	0.14	0.2099	0.68	0.14	0.6035	1.63	0.98
	Thirteenth Av	1 x 750 RCP	0.4	0.2094	1.47	0.31	0.2171	1.47	0.32	0.2491	1.15	0.29	0.82	1.21	0.99
Branch	Fourteenth Av	4 x 525 RCP	0.3	flood extent not covered by model											
	Edmonson/Thirteenth Av	1 x 600 RCP	0.3	flood extent not covered by model											
Tributary 3	Fourtheen Av	2 x 450 RCP	0.3	0.0371	0.64	0.02	0.0389	0.68	0.03	0.0454	0.72	0.03	0.1841	1.32	0.24
	Fifteenth Av	3 x 750 RCP	1.3	0.0426	0.30	0.01	0.0448	0.30	0.01	0.0537	0.47	0.03	0.3167	1.29	0.41
	Sixteenth Av	1 x 2450 x 1200 RCBC	2.9	0.1685	0.91	0.15	0.1751	0.94	0.16	0.2049	1.03	0.21	0.6589	1.92	1.27
	Seventeenth Av	2 x 3000 x 1200	7.2	0.4192	0.62	0.26	0.4271	0.62	0.27	0.4611	0.61	0.28	1.0016	1.11	1.11
	Eighteenth Av	1 x 800 RCP	0.5	0.5141	1.35	0.69	0.524	1.36	0.71	0.5559	1.35	0.75	1.1747	1.97	2.31

Table D.5 Evacuation Assessment - 500 yr ARI Velocities and Velocity x Depths at Crossings

Watercourse	Crossing Location	Model ID	500 yr ARI Depth (m)	500 yr ARI Velocity (m/s)	500 yr ARI V x D (m2/s)	Suitable for crossing by
Kemp Creek	Bringelly Rd	K_BringE	0.0957	1.00	0.10	Pedestrians
	Twelfth Av	K_TwevthE	0.4233	1.30	0.55	Vehicles
	Fifteenth Av	K_15th	-	-	-	
	Gumer Av	K_Guner	0.9648	0.92	0.88	Not Stable
Branch	Wynyard Av	K_Wyn	0.2323	1.46	0.34	Pedestrians
	Devonshire Rd	K_Devon	0.5303	0.91	0.48	Vehicles
	Kind St	K_King	0.2481	0.53	0.13	Pedestrians
	Herley Av	KC02				
Bond Creek	Denham Court Rd	DCR	0.1106	1.07	0.12	Pedestrians
	Hume Highway	B_HumH	0.863	1.15	0.99	Not Stable
	Cowpasture Rd	B_Cowp	0.2678	1.31	0.35	Pedestrians
	Bringelly Rd	B_BrinRd	0.2704	1.71	0.46	Vehicles
	Edmonson Av	B_Edmon	0.4245	1.83	0.78	Not Stable
	Eighth Av	B_Eighth	-	-	-	
	Fourth Av	B_Fourth	0.4526	1.92	0.87	Not Stable
	Ninth Av	B_Ninth	0.7895	1.79	1.41	Not Stable
	Tenth Av	B_Tenth	0.7924	1.64	1.30	Not Stable
Tributary 1	Fifth Av	FIfth_Av1	0.4128	0.62	0.26	Pedestrians
Tributary 2	Tenth Av	K_10thE	0.1257	0.86	0.11	Pedestrians
	Eleventh Av	K_11thE	0.1593	0.81	0.13	Pedestrians
	Edmonson Av	K_EdmonE	0.2099	0.68	0.14	Pedestrians
	Thirteenth Av	K_13thE	0.2491	1.15	0.29	Pedestrians
Branch	Fourteenth Av	KC13				
	Edmonson/Thirteenth Av	K_ED13th				
Tributary 3	Fourtheen Av	KC14	0.0454	0.72	0.03	Pedestrians
	Fifteenth Av	K_15thEN	0.0537	0.47	0.03	Pedestrians
	Sixteenth Av	K_16thEN	0.2049	1.03	0.21	Pedestrians
	Seventeenth Av	K_17thEN	0.4611	0.61	0.28	Pedestrians
	Eighteenth Av	K_18thEN	0.5559	1.35	0.75	Not Stable

Pedestrian and Vehicular Stability

Evacuation Type	Stability Limit (m^2/s)
Pedestrians	0.4
Vehicles	0.6
Not Stable	> 0.6