SARFIIP First Operations

Hydrodynamic model review, update and scenario modelling

Department for Environment and Water
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Foreword

The Department for Environment and Water (DEW) is responsible for the management of the State's natural resources, ranging from policy leadership to on-ground delivery in consultation with government, industry and communities.

High-quality science and effective monitoring provides the foundation for the successful management of our environment and natural resources. This is achieved through undertaking appropriate research, investigations, assessments, monitoring and evaluation.

DEW's strong partnerships with educational and research institutions, industries, government agencies, Landscape Boards and the community ensures that there is continual capacity building across the sector, and that the best skills and expertise are used to inform decision making.

John Schutz
CHIEF EXECUTIVE
DEPARTMENT FOR ENVIRONMENT AND WATER

Acknowledgements

The South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP) is a $155 million investment program funded by the Australian Government and implemented by the South Australian Government to improve the watering and management of River Murray floodplains in South Australia's Riverland.

We acknowledge the program leadership and support provided by staff from the Water Infrastructure and Operations Branch within DEW. We also acknowledge the contribution of Strategy, Science and Corporate Services Division, Information and Communication Technology Branch within DEW, in particular Matt Gregory – Systems Administrator, for maintaining the high-performance modelling servers and related software required for producing the modelling component of this work.

We also acknowledge members of the DEW Surface Water Science Team for additional assistance with modelling activities related to this work, including Mahdi Montazeri, Tom Stewart, Alison Miller and Eva Beh.

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Summary

Pike and Katarapko Floodplains have received a number of infrastructure upgrades under the South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP). The basic objective of these upgrades was to improve the ecological condition of each site through greater variability in operations, including managed inundation. This infrastructure was operated for the first time in 2020 to instigate managed inundation at each floodplain.

The 'first operations' events provided the first major opportunity to collect a substantial amount of observed hydraulic data with the upgraded infrastructure operational. This data in turn was used to recalibrate the Lock 3 to 6 hydrodynamic MIKE FLOOD model, which incorporates each floodplain and its upgraded infrastructure. Note that these first operations events generated data with a much greater variability in river and floodplain levels and flows compared to the relatively limited monitoring data previously available for calibration. The purpose of this technical note is to present the outcomes from the hydrodynamic model calibration and validation process following these first operations events.

The data predominantly used for model calibration and validation included:

- Daily data recorded by SA Water operational staff, including water levels, rated flows and gate settings at structures;
- Surface water monitoring data, including water levels and flows at various locations throughout each floodplain and in the River Murray;
- Meteorological data from nearby weather stations showing daily rainfall and evaporation; and
- Satellite imagery showing inundation extents at various dates during the operations.

An operational hydrograph was synthesised from the available data to simulate each event. This included Flow to South Australia (QSA) for the inflow boundary at Lock 6 and weir pool levels at Lock 3 to Lock 5. A time series of rainfall and evaporation experienced during the event was also generated. Control definitions at floodplain structures were configured using recorded gate settings, rated flows and/or water levels as appropriate.

Simulation of the events from commencement to completion provided outputs that were used to improve the model calibration on an iterative basis. This process involved comparing the generated model outputs to satellite imagery and monitored data, modifying the model to better align with the comparison data, and rerunning the simulation for further comparisons. The outcome of the calibration and validation process was an improved Lock 3 to 6 hydrodynamic model, with a greater confidence in its ability to represent the upgraded system at each floodplain.

Recommendations for future model updates included:

- Further refinements to the Lock 3 weir pool in order to address an issue identified in the results relating to overestimation of the downstream Lock 4 level for a given flow.
- Adjustments to the floodplain hydraulics following the collection of data during future operational events.
- Consideration of a more nuanced approach to daily exchange calculations within each floodplain, particularly Katarapko Floodplain, which may allow a more representative indication of exchange to be developed.
- Other updates related to the general workings of the model as applicable.

Following conclusion of the model recalibration process, the model was configured to simulate a variety of steady state River Murray flows and floodplain levels. This work had the primary purpose of updating the parameterisation of the River Murray Source model (see DEW 2020) with regards to representation of Pike and Katarapko floodplains. This in turn allowed some preliminary operating limits for each floodplain to be developed, which related river flow to required lock levels and targeted floodplain inundation heights, Further adjustment of

the model in line with the preceding recommendations will allow the refinement of these relationships to be continued, which in turn will allow further refinement of the River Murray Source model.

1 Background

Construction of new floodplain management infrastructure at Pike and Katarapko Floodplains was completed in 2020 under the South Australian Riverland Floodplains Integrated Infrastructure Program (SARFIIP). Site details including creek names, structure names and locations, and gauging measurement locations are shown in Figure 1.1 for Pike and Figure 1.2 for Katarapko. First operations at both sites were undertaken between August and December 2020. First operations involved raising water levels within the floodplain and main river channel under a "managed inundation" mode of operation, and included the collection of an extensive amount of operational and observational data.

MIKE FLOOD Flexible Mesh (FM) hydrodynamic models were used to support the planning process of construction and operations over the planning, design, construction and testing phases of SARFIIP. The models have undergone extensive updates and calibration as additional data has been collected, progressing from the original floodplain-only grid-based models to a FM model spanning from Lock 3 to Lock 6. The first operations at each floodplain site has been the first opportunity to validate and calibrate the models with the new infrastructure in place and with the collection of operational data.

The purpose of this technical note is to present the outcomes from the hydrodynamic model calibration and validation process following the first operations events. This includes presenting modelled hydraulic data at each floodplain (i.e. water levels, flows, velocities, inundation extents and daily exchange) from the 2020 event simulation, as well as under a range of operational conditions incorporating both typical and managed inundation operations. The base model used for the model validation and updates is a recently updated and calibrated model comprising the area between Lock 3 and Lock 6, as detailed in DHI (2020). This model in turn was based on the separate floodplain models (DEW 2021) used for the floodplain operations modelling conducted to inform the Pike and Katarapko Floodplain operations plans.

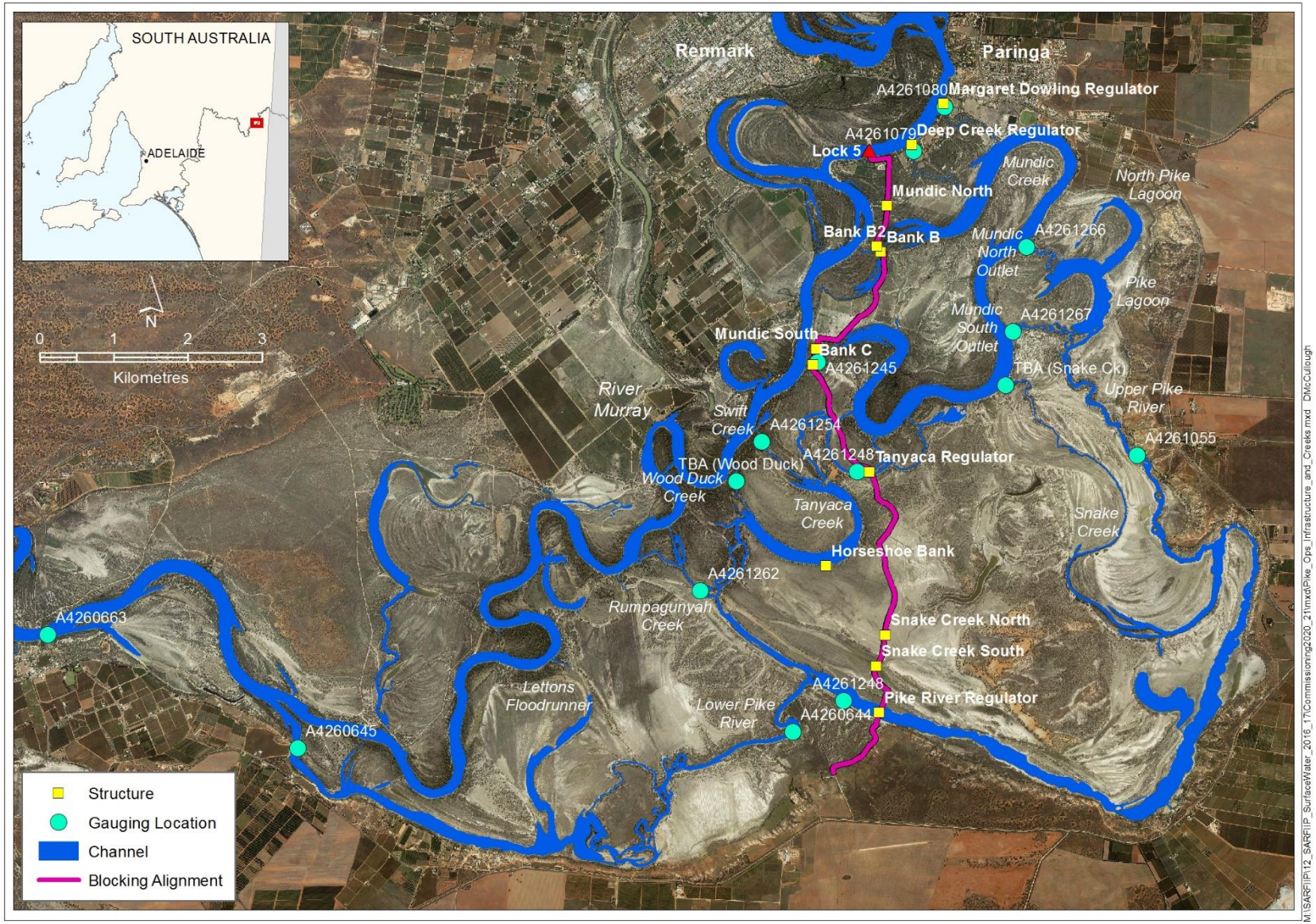


Figure 1.1. Map of Pike Floodplain creeks, structures and gauging locations.

Figure 1.2. Map of Katarapko Floodplain creeks, structures and gauging locations.

2 Methodology

The outline of the model recalibration and validation process is as follows:

- Develop a hydrograph of the operations occurring at each floodplain and river operations in the main channel (i.e. weir pool operations) within the Lock 3 to 6 reach for the 2020 operational event. The hydrograph is developed using a combination of floodplain operations recorded during operation at the floodplain structure level, as well as continuous observational data recorded at various monitoring locations. Figure 2.1 shows the main hydraulics governing the event operations, including Flow to South Australia (QSA), water levels at Locks 4 and 5, and floodplain levels at The Splash and Pike Environmental Regulators.
- Run the base model with the synthesised hydrograph, using the operational data to develop control rules at each structure. The type of control methodology used was dependent on the information available at each structure, which may include:
    - Theoretical rated flow, or
    - Direct gate settings where available (e.g. number of stop logs per bay).

  Note that for the base model simulation no mapping of 1D branches to 2D was conducted due to some model issues preventing this at the time. This connection was represented in the underlying modelling, however without this mapping permanent channels (other than those represented in the mesh) are not available for display in the outputs.
- Compare the results to a variety of observational data, including:
    - Satellite imagery for inundation extents at specific dates,
    - Monitoring data indicating levels and flows at various locations for direct comparison with model outputs.
- Adjust the model as required, which may include:
    - Mesh elevation updates to improve connectivity in each floodplain
    - Mesh structure updates for changes to localised terrain resolution
    - Inclusion of new 1D branches and/or modification of existing branches, as required
    - Adjustment of bed resistance parameters to fine-tune the calibration of specific reaches against observed/gauged data.

Details of the model updates and adjustments performed from the base model are contained in Appendix A. With the model updated with the 2020 event data, further steady state scenarios were run to update previously calculated relationships of floodplain height against impounded volumes and areas of inundation at given operational conditions (e.g. weir pool level, QSA, etc.). From these modelled outputs, the associated hydraulics at each floodplain were extracted for further calculation of variables such as daily exchange. These relationships are necessary for operational planning for future events, and in particular used in the River Murray Source model to support water balance calculations (e.g. DEW 2020). Area and volume calculations were based on the sub-area definitions shown in Figure 2.2 for Pike, and Figure 2.3 for Katarapko. Also shown in these figures are numbered floodplain reaches used to define velocity profiles on a reach by reach basis. These profiles are expressed as the percentage of each reach (by area) containing velocities within the range of 0.2 to 0.5 m/s, which are considered to promote favourable hydraulic conditions for fish species such as Murray Cod (Fredberg and Zampatti 2018).

Three main sets of results for each floodplain were developed, calculating the inundated area, volume and daily exchange at each floodplain:

- based on the 2020 event simulation (dynamic simulation);

- for 'normal' floodplain operations between river flows of 5 and 100 GL/d, in 5 GL/d steady state increments; and
- for managed inundation operations at water levels ranging from normal to maximum operating height upstream of the environmental regulators at each site, initially in 0.1 m steady state increments and for a river flow of 10 GL/d and various Lock 4 and 5 weir pool levels (WPLs).

In the latter two cases, all inlet structures were considered to be operated in a fully open state to provide an indication of the maximum total inflow possible at each site for a given set of river conditions. Note however, for Bank J this assumes a single board is retained in each bay. The hydraulic results from the modelling are presented in Appendix B.

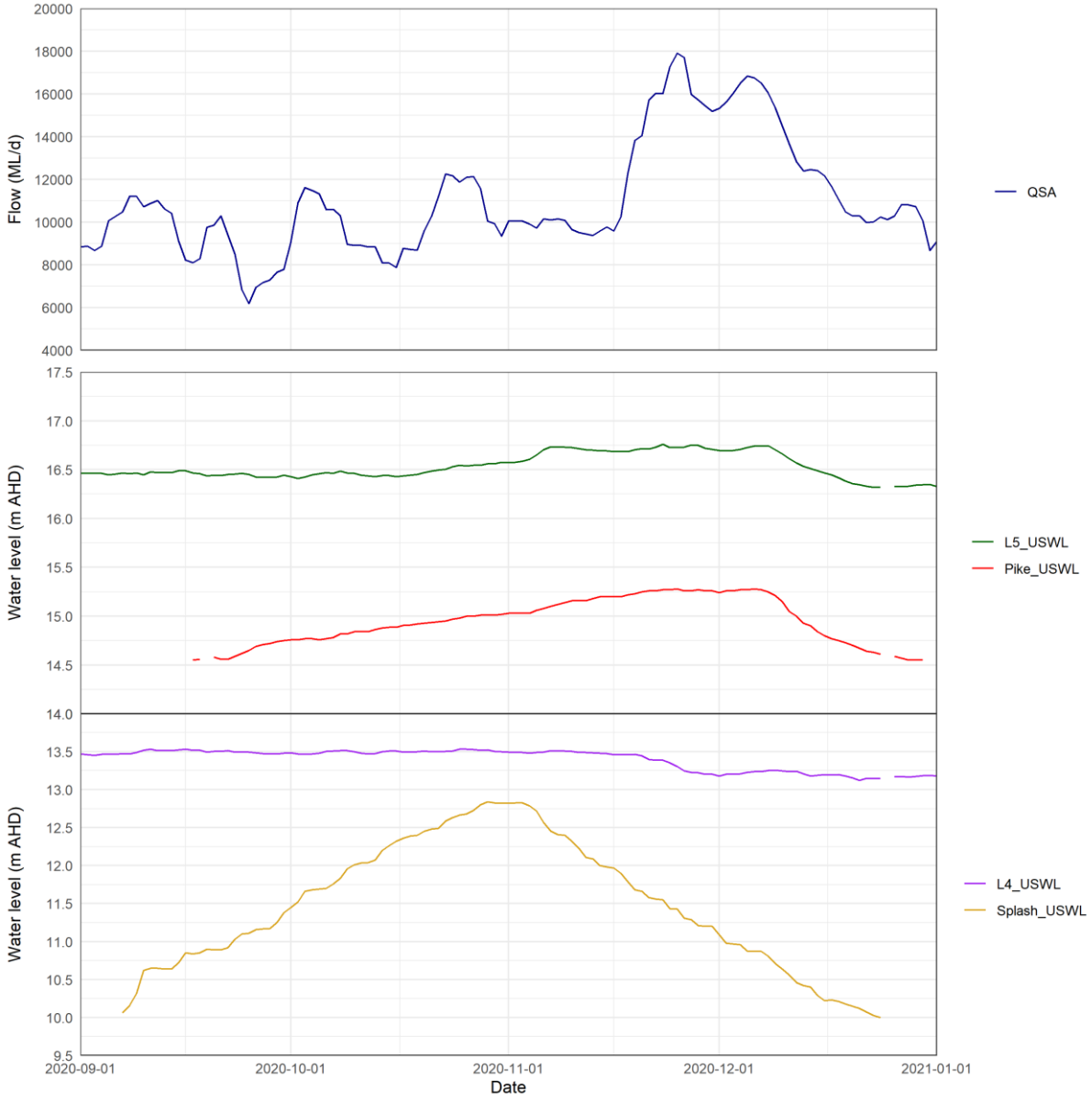


Figure 2.1. River flow and water level hydrographs used for event simulations.

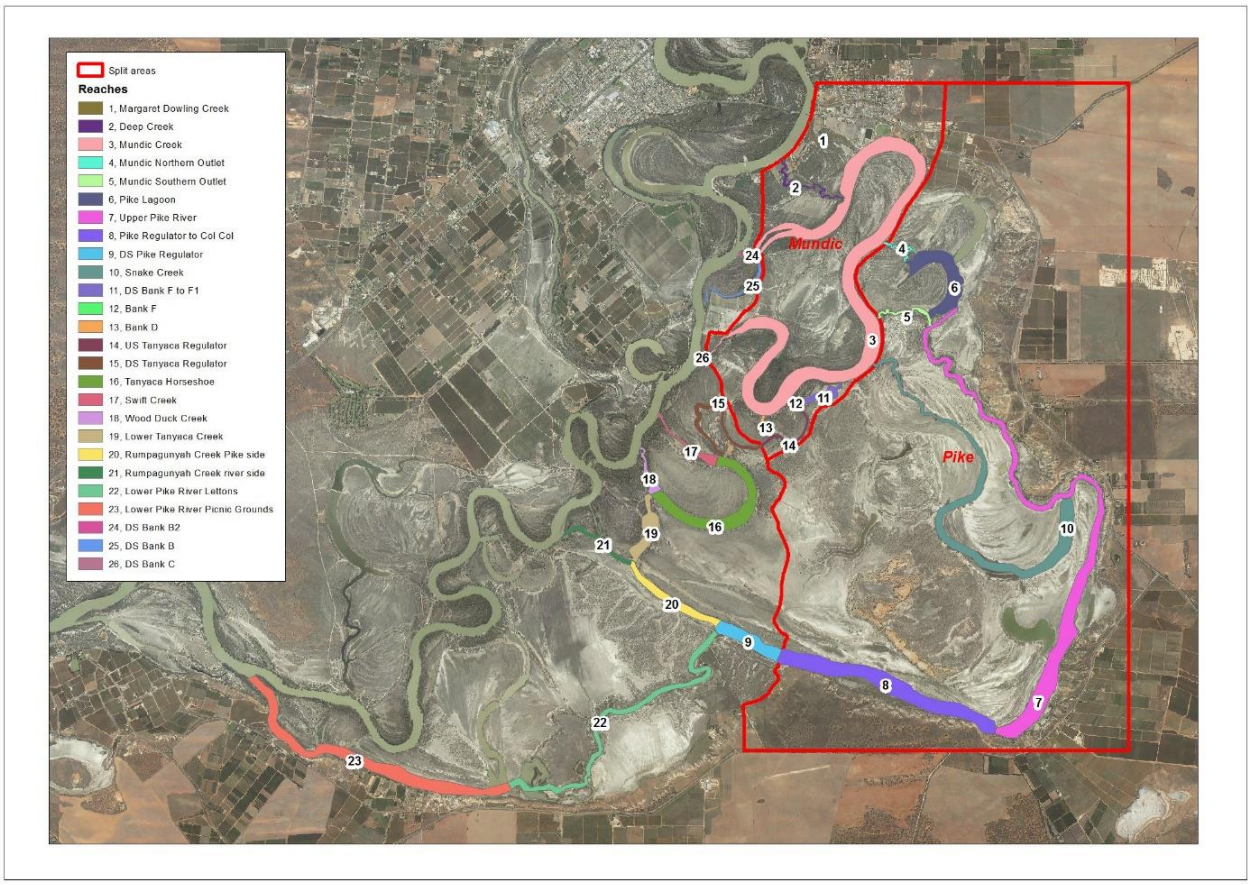


Figure 2.2. Pike floodplain sub-area definitions for area and volume calculations, and reach numbering for velocity analysis.

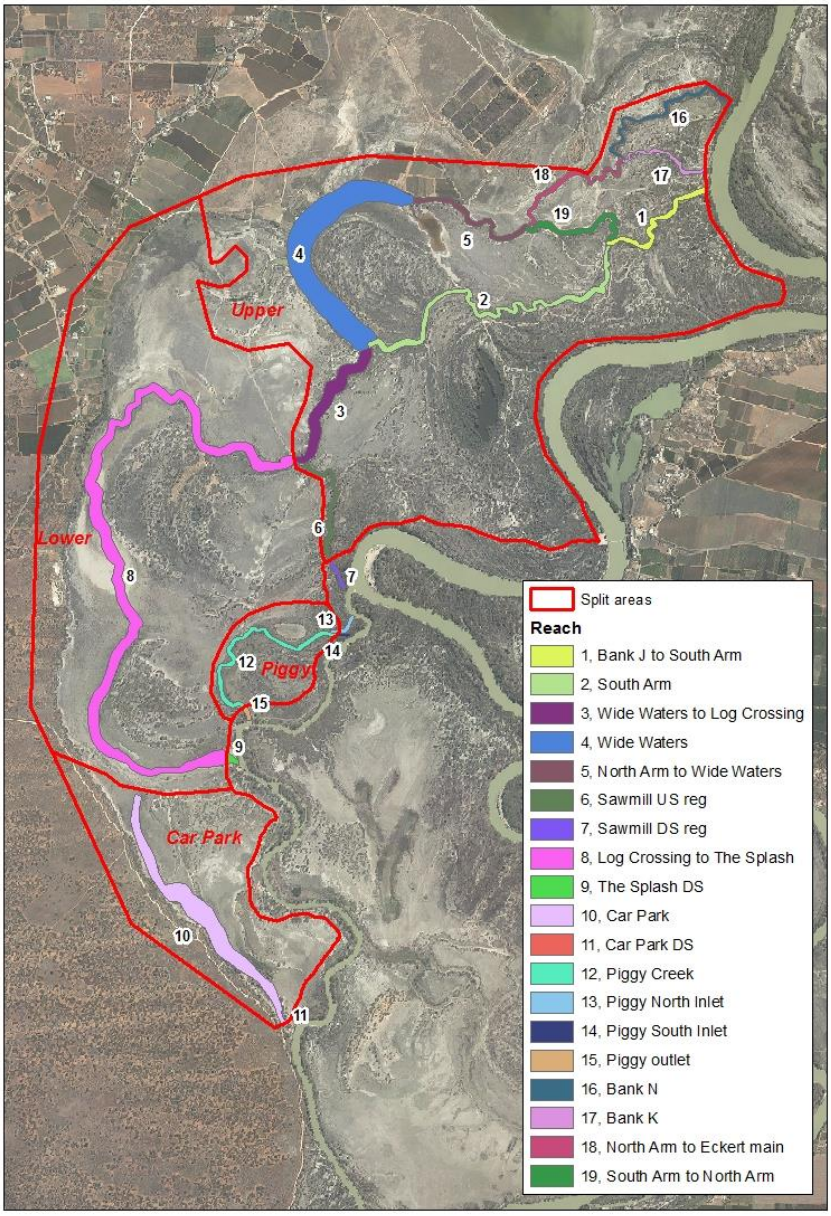


Figure 2.3. Katarapko floodplain sub-area definitions for area and volume calculations, and reach numbering for velocity analysis.

Preliminary tables of approximate operating limits for each floodplain were further developed based on the hydraulics calculated from the preceding normal and managed inundation operations simulations, combined with available observed data, to provide a simple presentation of the results for referencing during the planning process. The methodology for developing the tables for each floodplain is as follows:

1. Develop a mathematical relationship at the lock associated with each floodplain (i.e. Lock 5 at Pike, Lock 4 at Katarapko) between downstream water level and flow, using historical recorded data up to approximately 50 GL/d flows.
2. Identify the historical observed maximum of head difference over each lock – approximately 3.36 m at Lock 4, and 3.7 m at Lock 5.
3. Use the relationship from Step 1 to calculate an approximate downstream level from a range of downstream flows at each lock, and use the maximum observed head difference from Step 2 to calculate a

potential maximum upstream WPL at the lock. Note that where the potential maximum exceeded the top of piers level, the top of piers level was applied.

4. At each upstream WPL, the modelling results were used to determine:
    - Total maximum floodplain inflow, calculated for fully open structures at each lock WPL and QSA.
    - Maximum floodplain level (upstream of the main downstream environmental regulator at each floodplain) that still allows the desired daily exchange to be achieved i.e. 20% for Katarapko and 10% for Pike.
5. Add the total inflow to the downstream flows to calculate total river flow, approximating to QSA, for each set of operational conditions.

The tables should be considered a 'work in progress', to be continually developed as further scenarios over a range of different operational conditions are completed.

2.1 Assumptions and limitations

The focus of this specific model validation and calibration work was on the hydraulics within Katarapko and Pike floodplains. Hydraulics outside the floodplains, including the main River Murray channel from Lock 3 to Lock 6, were validated in the DHI (2020) model upgrades, and as such were not included in this specific model validation exercise.

Note that the hydrographs used to test the model were derived from operational data collected, typically, on a daily basis. However some issues with data collection included:

- Occasional gaps in data and some suspected recording errors.
- Flows recorded at various structures based on theoretical ratings, with some ratings in particular becoming unreliable at certain conditions e.g. elevated tail water levels at Bank J.

Where gaps in observed data existed, estimates were made, with interpolation between recorded values conducted as appropriate. Recording errors (e.g. transposed digits, missing decimal places) were corrected where apparent, such as values with a clear difference between adjacent observations without any alternative explanation. There may however be some undetected errors that were used in the 2020 event simulation, however these are likely to be isolated instances and not provide a substantial impact on the results overall.

Due to the limitations of theoretical ratings under certain hydraulic conditions, water levels and/or structure board or gate configurations, where available, were prioritised over the targeting of rated structure flows in the model setup. Only Tanyaca regulator was based on an adjusted rated flow in the model configuration due to its relatively close correspondence with gauging results; periodic flow gaugings indicated the actual flow downstream of Tanyaca regulator had a mean difference of approximately +65 ML/d over the rated flow, and thus 65 ML/d was added to the daily rated flow over the period of operation for modelling purposes.

All observed data used for comparisons with modelled outputs, including continuous data from field sensors and flow gaugings, possess an inherent uncertainty. Such uncertainties have been assumed to be insignificant with respect to the absolute values recorded, for the purposes of these comparisons.

Due to the uncertainty associated with extraction rates on a daily basis, no diversions were included in the modelled setup. This may result in greater flow passing through the most downstream regulator at each site (i.e. Pike regulator for Pike floodplain and The Splash regulator for Katarapko floodplain). Similarly, no additional seepage was applied, but assumed generally low relative to evapotranspiration.

In addition, observed data was only recorded once each day (at approximately 0900 hrs each day), and thus the model assumes there is a linear interpolation in the intervening periods between readings.

Satellite imagery provided a general indication of the areas becoming inundated during operation, however in localised areas, such as those with extensive vegetation, the inundation extent may have been obscured. Thus, estimations are necessary when comparing modelled outputs to the imagery, with the complementary use of

other available information (e.g. Digital Elevation Models) to determine if inundation may have occurred in these questionable areas.

Extraction of in-channel hydraulic data was limited to locations present in the 1D model component. Therefore, any flow through flow paths defined exclusively in the 2D model component may not have been captured in the sum of total inflows and/or outflows. Inspection of results suggests that this issue was mainly related to the total inflows in Katarapko at raised WPL, and formed a minor component of the overall total inflow.

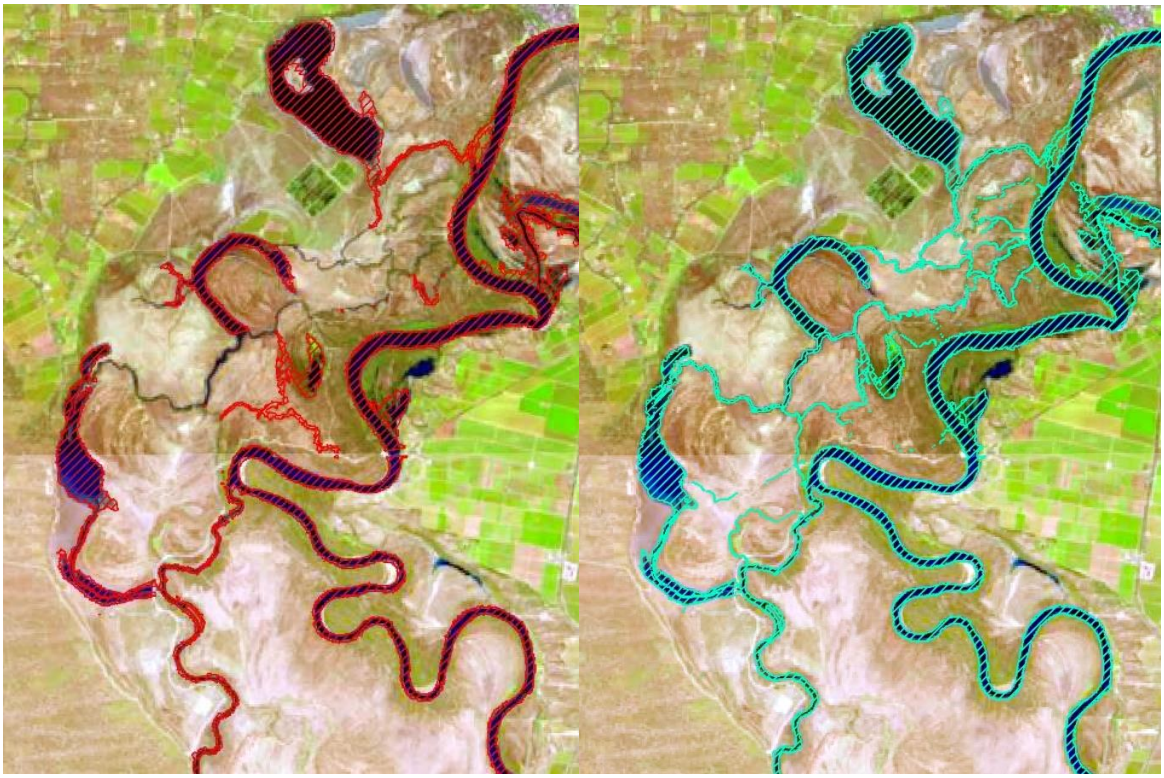
3 Results

3.1 Inundation extent comparisons – Katarapko Floodplain

Comparisons of the base model outputs against the satellite imagery showed a generally reasonable alignment in the upper section of Katarapko Floodplain, but some localities in the lower floodplain/Car Park areas were not inundating in the model to match the imagery (refer to Figure 1.2 for creek names and Figure 2.3 for sub-area naming). Figure 3.1 to Figure 3.4 shows available imagery for various dates during the first operations event with raised level at The Splash regulator, overlaid with the modelled inundation extent from the base model (red shaded area) and updated model (blue shaded area). Comparisons at each available imagery date up to and including the peak of inundation for the event are summarised in the following points:

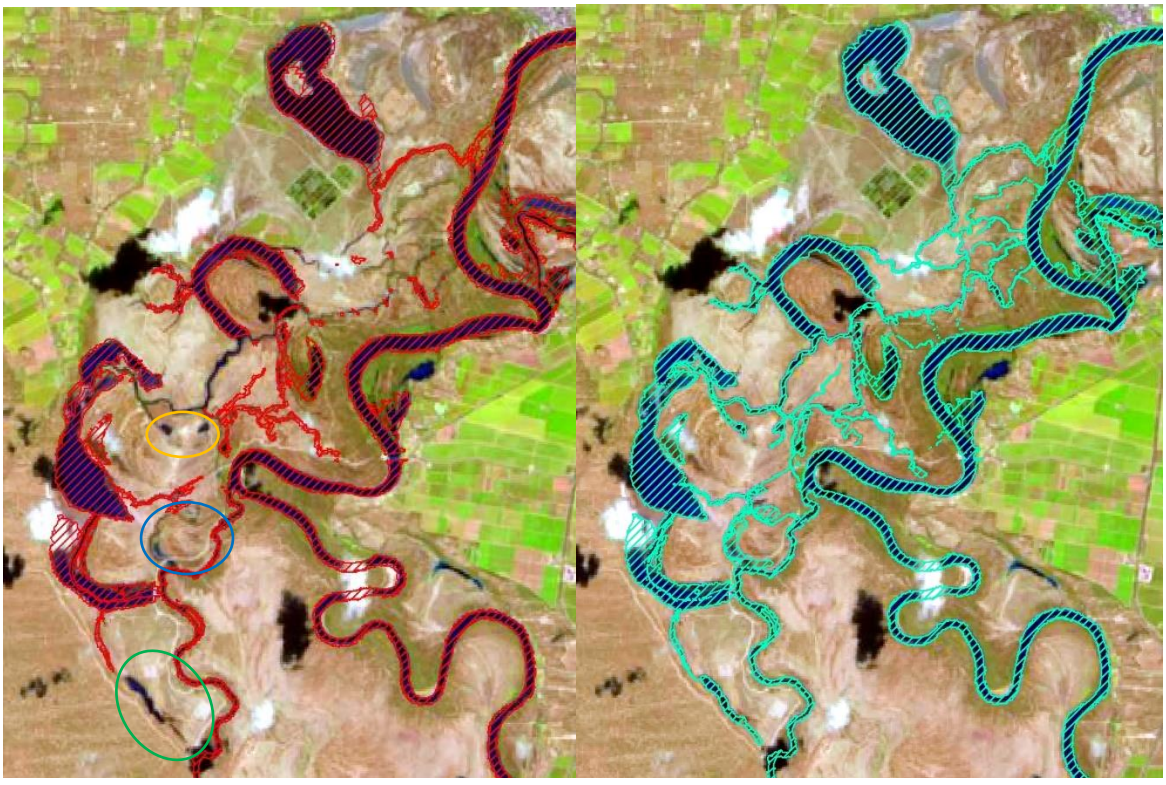
- 13 October 2020 (Figure 3.1): Only minor overbank inundation is occurring, and the extents between base and updated models provide an acceptable match. Some inundation suggested in the updated model around Piggy Creek and the area directly to the north appears to be an artefact of the initial model conditions used, and is not hydraulically connected to the rest of the floodplain at this stage of the hydrograph.
- 28 October 2020 (Figure 3.2): In the base model output, areas of inundation missing from the modelled outputs are circled, predominantly in the lower floodplain to the west of Sawmill Creek, and the southern section of Car Park lagoon. The updated model outputs shows a good correspondence with the underlying imagery, including inundating the missing areas from the base model outputs.
- 2 November 2020 (Figure 3.3): Gaps in the inundation extent remain at the same locations as for the preceding date for the base model outputs, while the updated model outputs continue to correspond well with the imagery.
- 7 November 2020 (Figure 3.4): Similar comparison outcomes to the previous two imagery dates.

In summary, from an inundation extent perspective the model outputs for both base and updated models have corresponded reasonably well in the upper floodplain, with notable improvements to the comparison in the lower floodplain (west of Sawmill Creek) and Car Park lagoon areas with the updated model.



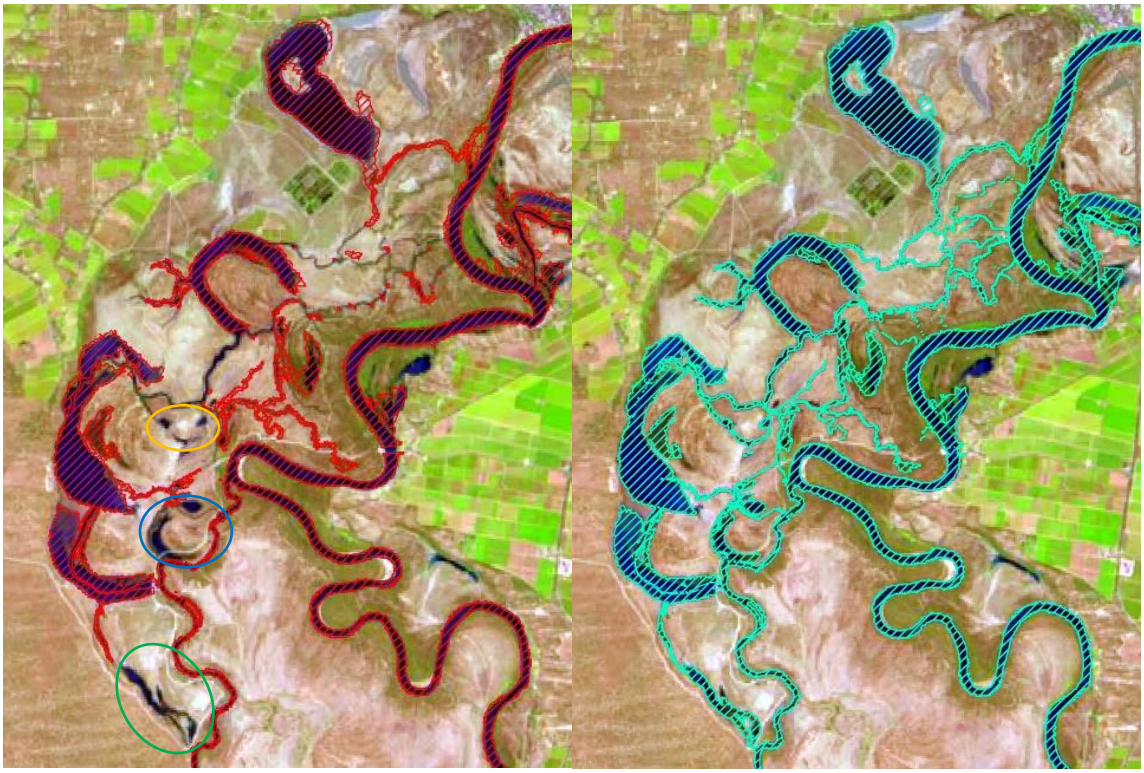
(a) (b)

Figure 3.1. Katarapko imagery for 13 October 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event.



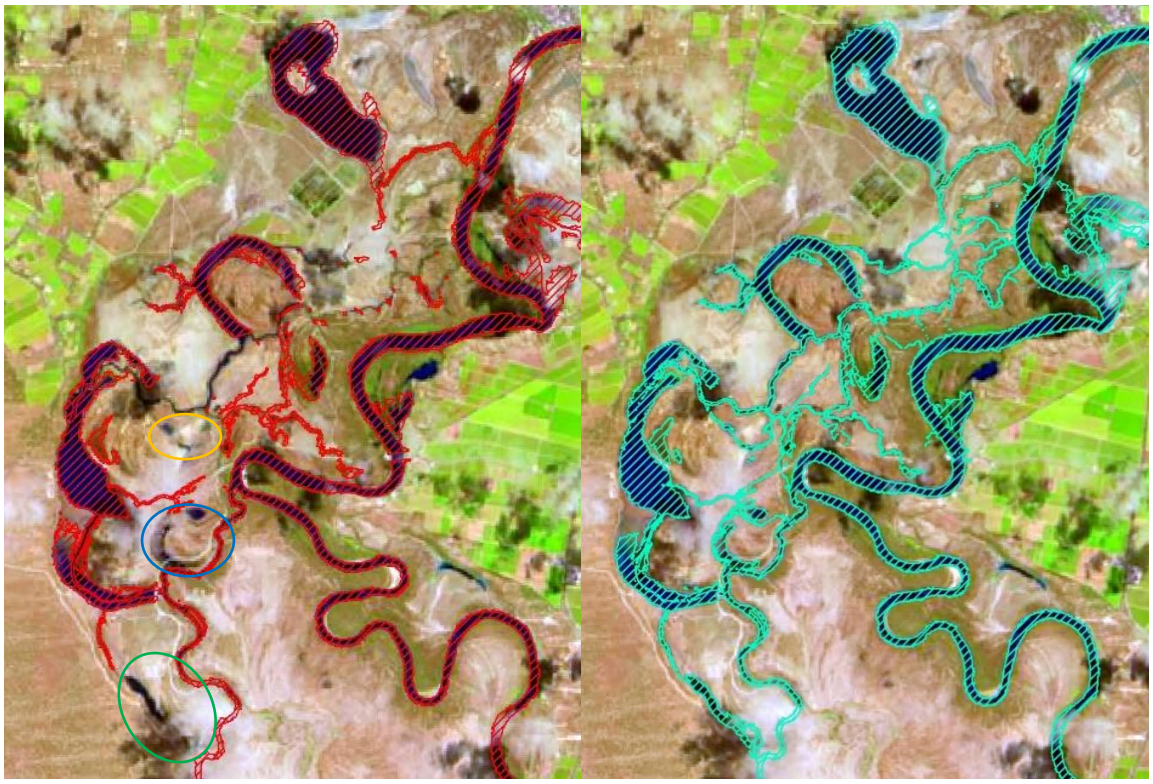
(a) (b)

Figure 3.2. Katarapko imagery for 28 October 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.



(a) (b)

Figure 3.3. Katarapko imagery for 2 November 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.



(a) (b)

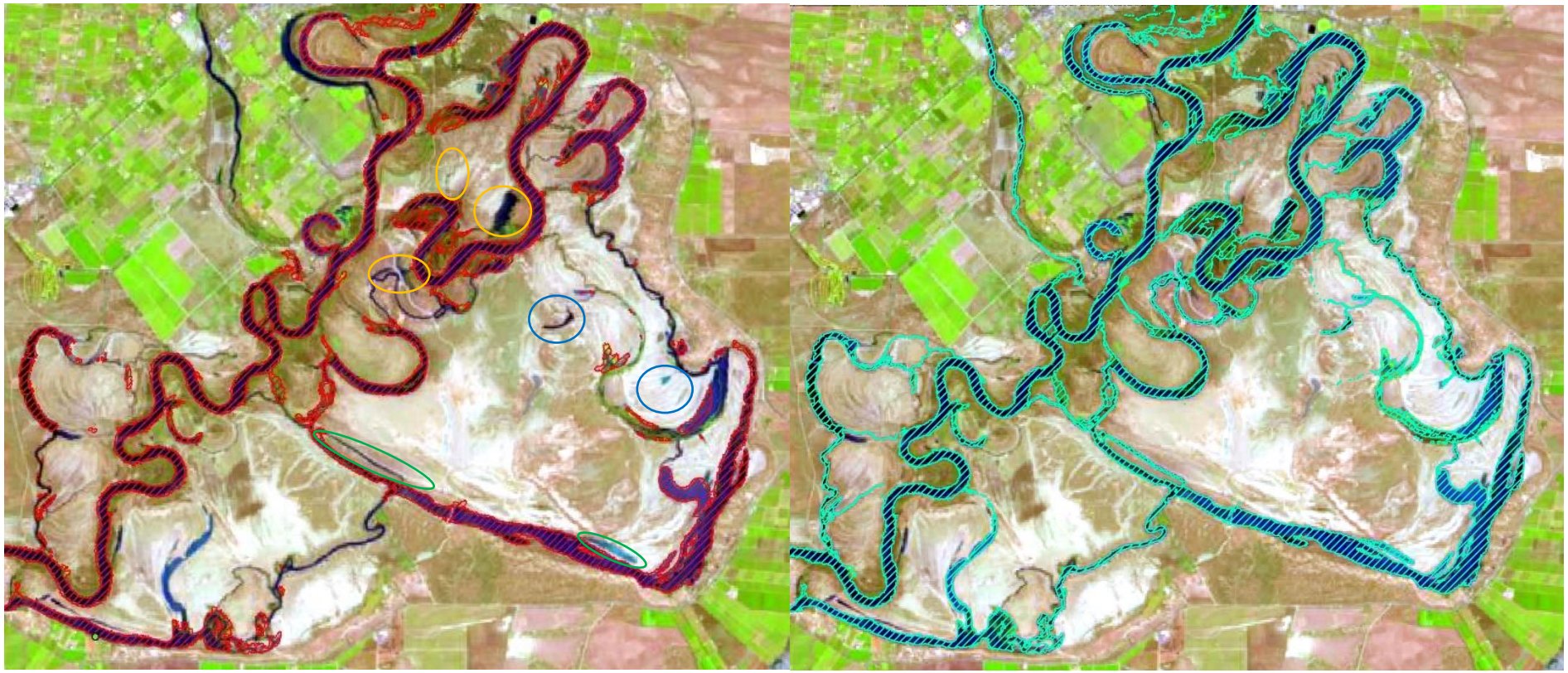
Figure 3.4. Katarapko imagery for 7 November 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.

3.2 Inundation extent comparisons – Pike floodplain

Comparisons of the base model outputs against the satellite imagery showed a number of gaps in the extents related typically to smaller flood runners and connected low elevation areas within both the Mundic and Pike sub-areas (Figure 2.2). Conversely, in the lower Pike River to the west and north of the Pike Environmental Regulator (refer to Figure 1.1 for structure and creek names), there was modelled inundation of flood runners that were not inundated during the event. Figure 3.5 to Figure 3.8 shows available imagery at various dates during the first operations event. These dates coincide with the operational stages of raised water level upstream of the Pike Environmental regulator, and overlaid with the modelled inundation extent from the base model (red shaded area) and updated model (blue shaded area). Comparisons at each available imagery date up to and including the peak of inundation for the event are summarised in the following points:

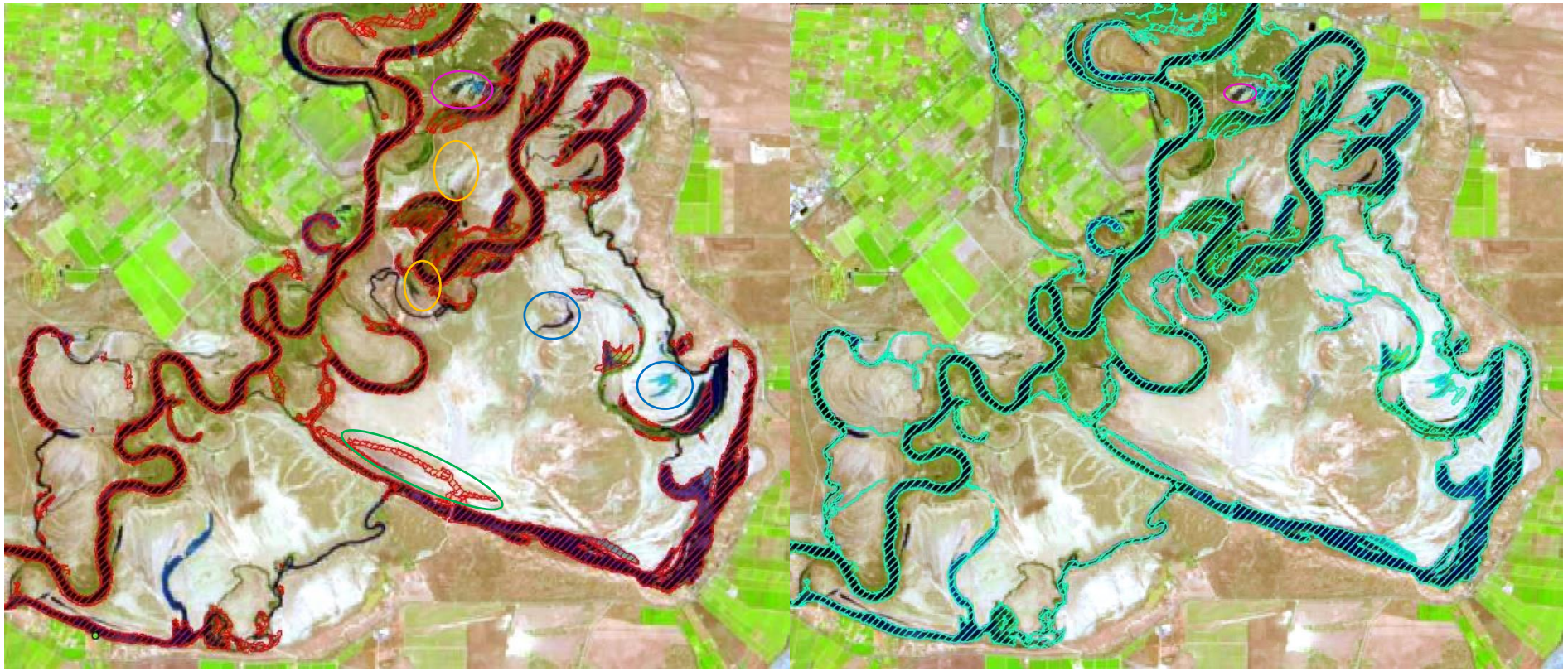
- 2 November 2020 (Figure 3.5): Areas upstream of the blocking alignment in the base model outputs – circled to indicate missing inundation when compared to the satellite imagery – include Duck Hole (and possibly inner Mundic flood runner) in the inner Mundic area; breakout areas in Tanyaca Creek on either side of the Tanyaca regulator; a wetland to the west of Snake Creek; the area between Upper Pike River and Snake Creek near the confluence that was commencing to inundate; and an area to the north of Pike River, just downstream of the Col Col Bank site. Downstream of the Pike Regulator there is also a flood runner not inundated in the model outputs that is inundated in the imagery under the raised Lock 4 WPL. The updated model outputs better reflect the inundation extents in each of these areas.
- 17 November 2020 (Figure 3.6): Similar discrepancies to the previous imagery comparison in the base model outputs are noted in the 17 November comparison, with the addition of the area to the south of Deep Creek, and the inner Mundic flood runner, that are inundated in the imagery but not in the base modelled outputs. The updated model outputs show an improvement in matching each of these areas, with only a minor discrepancy in the order of 2 to 3 ha (compared to approximately 930 ha total inundated area) persisting to part of the area to the south of Deep Creek (i.e. magenta circle in Figure 3.6 for updated model output).
- 27 November 2020 (Figure 3.7): Similar discrepancies between base model outputs and imagery are present as for the previous two comparisons. The updated model again provides a much improved comparison, including matching the inundation in the area to the south of Deep Creek that was only partially inundated in the previous comparison date.
- 2 December 2020 (Figure 3.8): Outcomes from the 2 December comparisons are similar to the previous comparison date.

As an additional note, inundation downstream of Bank B in all comparison dates between base and updated models shows water present in the channel in the 1D model component, but is not being captured in the modelled outputs via projection of the results to 2D. The discrepancy in inundation in this area is therefore related to a display issue rather than an issue with the model functionality or calibration. It is recommended that further investigation into the model settings is made to ensure appropriate projection of the results in this specific area of the model into 2D.



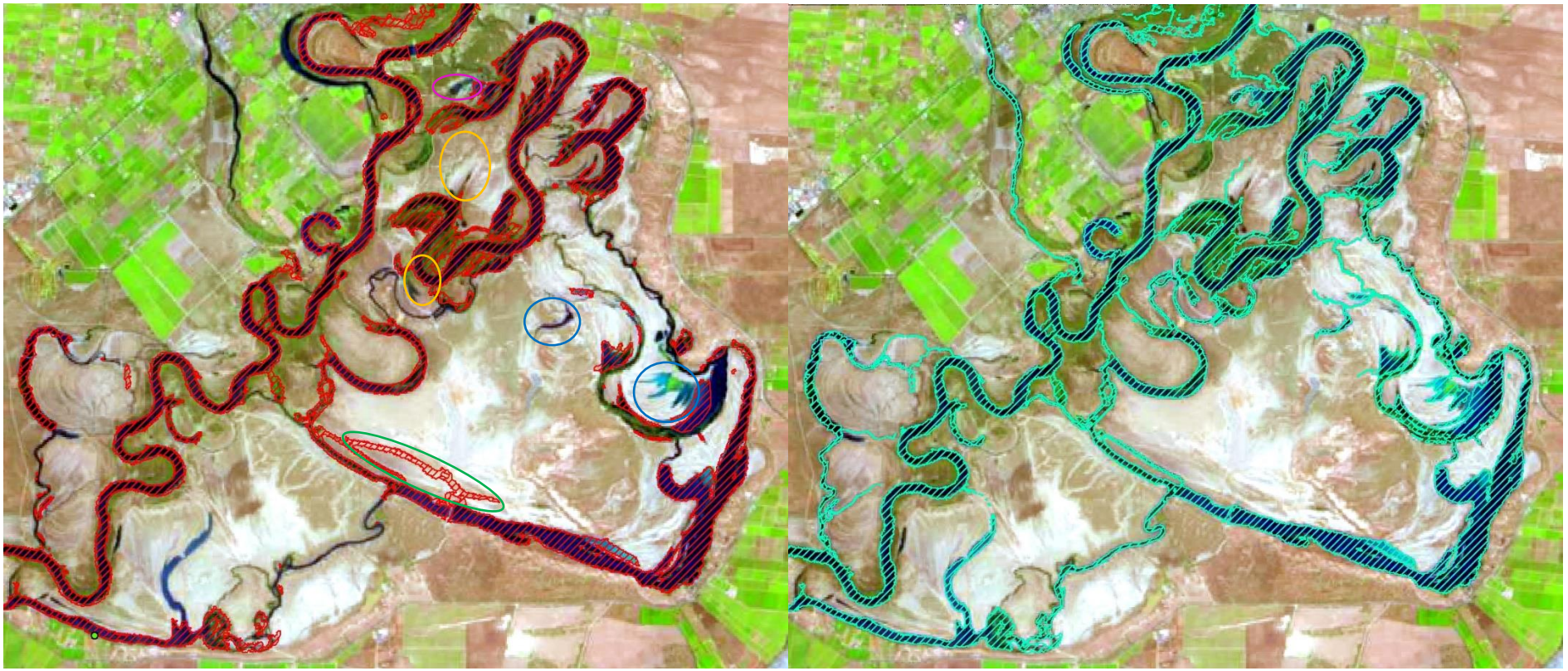
(a) **(b)**

Figure 3.5. Pike imagery for 2 November 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.



(a) **(b)**

Figure 3.6. Pike imagery for 17 November 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.



(a) (b)

Figure 3.7. Pike imagery for 27 November 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.

(a) (b)

Figure 3.8. Pike imagery for 2 December 2020, compared to (a) base and (b) updated model outputs from simulation of 2020 event. Circled areas indicate discrepancy between observed and modelled.

3.3 Hydraulic data comparisons

3.3.1 River hydraulics

Comparison of river hydraulics at Locks 4 and 5 are shown in Figure 3.9 (downstream flows) and Figure 3.10 (downstream water levels), respectively. Note that only downstream hydraulics are shown given that the model was configured to control water level upstream at each lock to the observed levels, and hence provide an exact match.

For downstream flow (Figure 3.9) there is a reasonable correspondence between observed and modelled outputs for both Lock 4 and Lock 5. In relation to downstream water level (Figure 3.10), Lock 5 shows an excellent correspondence between observed and modelled, with minimal difference over the entire simulation period. For Lock 4 however, the model overestimates the level by between approximately 0.2 and 0.4 m over the simulation period, with the lowest levels showing the greater discrepancy. This difference is consistent with the calibration outcomes of the model presented in DHI (2020), rather than a consequence of the current model updates.

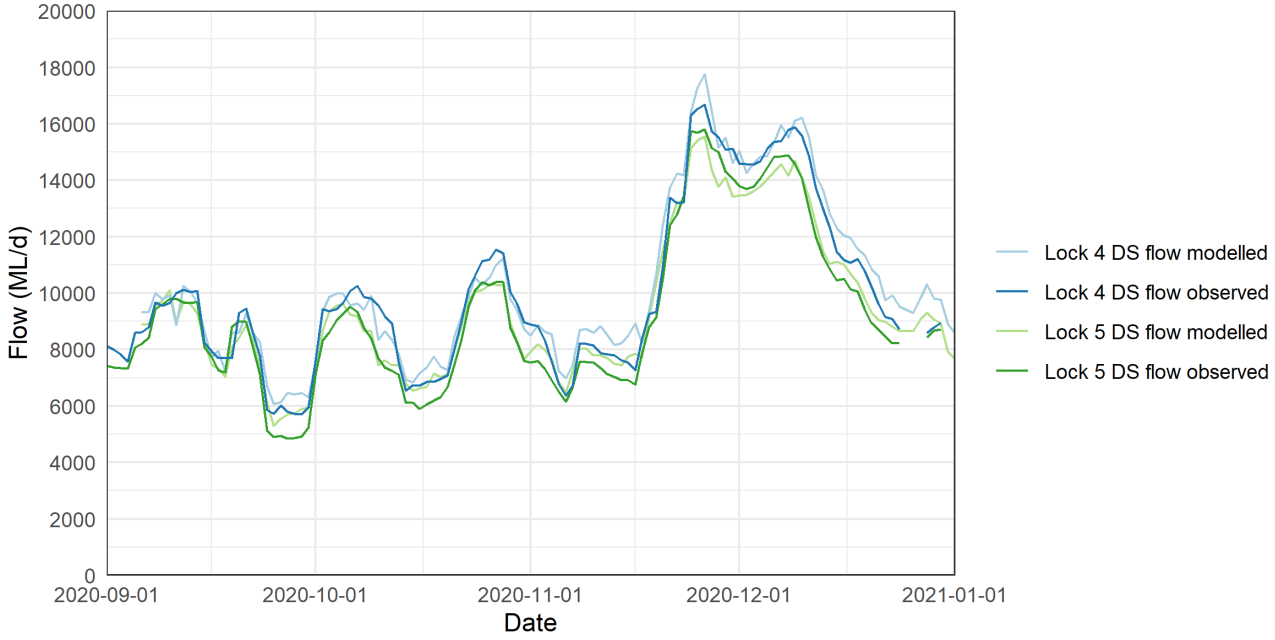


Figure 3.9. River flows downstream of Locks 4 and 5 comparison, observed versus modelled.

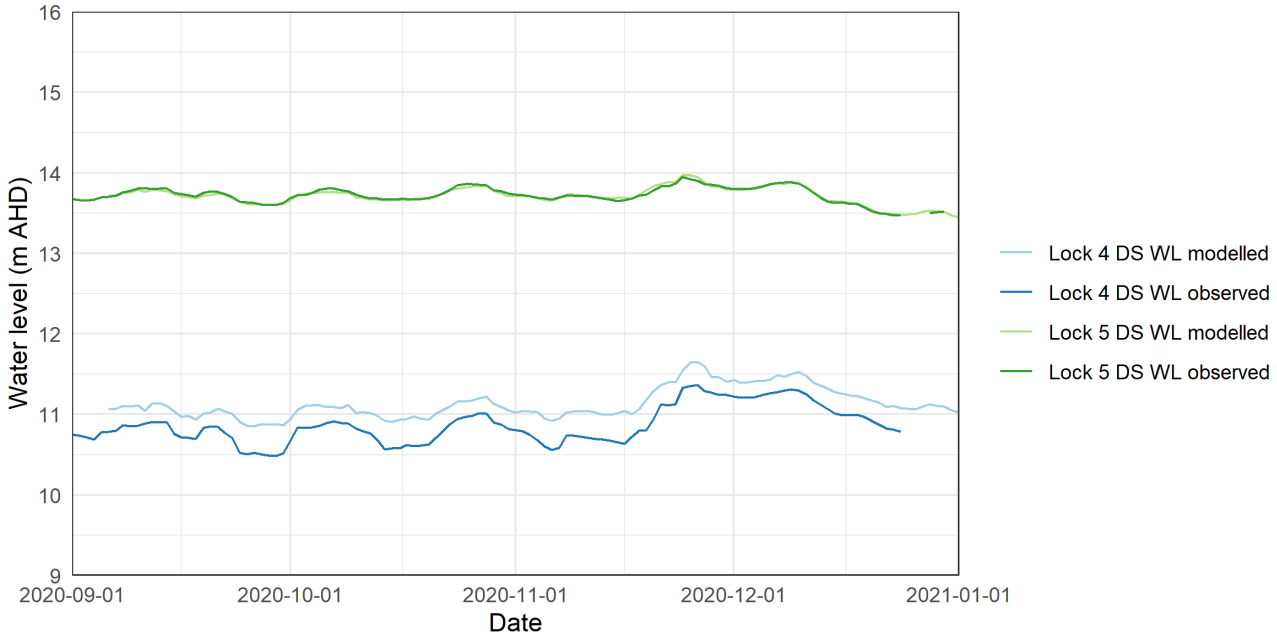


Figure 3.10. River levels downstream of Locks 4 and 5 comparison, observed versus modelled.

3.3.2 Pike hydraulics

Modelled inflows through Margaret Dowling (site ID A4261080) and Deep (A4261079) Creeks, as shown in Figure 1.1, each display a good agreement with observed (gauged) flows, as shown in Figure 3.11. For Deep Creek there is reasonable agreement with modelled to observed values for the October and December gauging events, with approximately 100 ML/d greater inflow modelled compared with the September gauging event result. Note however that some estimation during model set up was applied to the Deep Creek regulator operation for this initial period given that the structure was being operated manually throughout the operation, and was not necessarily in a fully open mode of operation at that time compared to later in the operation. Hence, the actual inflow may be expected to be lower compared the modelled inflow, which assumed a fully open structure. For Margaret Dowling, a good agreement between observed and modelled flows occurs in the September and October rounds of gaugings, while the modelled flow exceeds observed by approximately 100 ML/d in the December gauging.

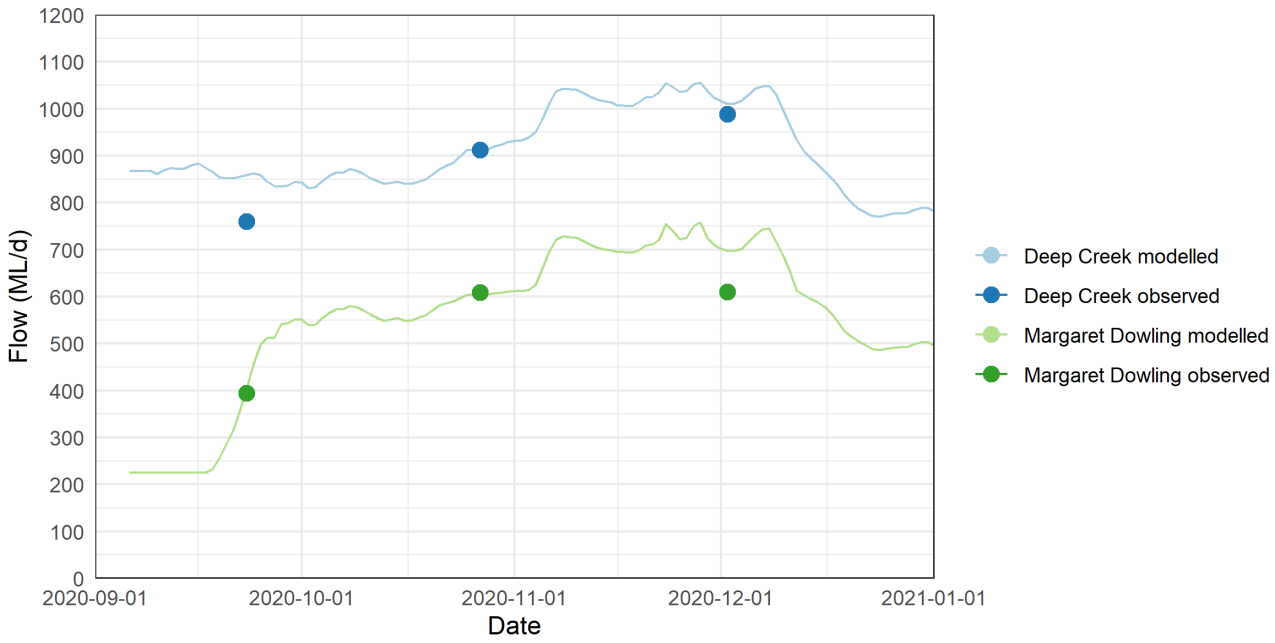


Figure 3.11. Pike inlets flows comparison, gauged versus modelled.

Comparison of gauging results with modelled flows at locations within the floodplain – Mundic North (A4261266) and South (A4261267) outlets, and Coombs pontoon site (A4261055) – shows variable differences, depending on the stage of operation. Figure 3.12 shows the comparison of modelled to gauged flows at each site. At Mundic North outlet, the difference between modelled and observed flow increased as the operation progressed, with modelled flows being greater in the order of 100 ML/d for the September and October gauging results, but in the order of 200 ML/d greater in December. Conversely, at Mundic South outlet the difference between modelled and observed flow decreased as the operation progressed, with modelled flows being greater than observed by approximately 150 ML/d in September and October, but in the order of 50 ML/d for December.

For the Coombs pontoon site – which is the common downstream location of each of the Mundic outlet sites – a reasonable agreement occurs between observed and modelled results in October and December measurements, being modelled in the order of 50 ML/d greater than the gauged flow. However the difference is substantially greater in the September round of gaugings, with the modelled flow in the order of 300 ML/d greater than measured flow. It should be noted however that flows through Snake Creek (Figure 1.1) were not gauged for the duration of this operation, and thus the difference between the modelled results and actual flows through the creek during this event is not known. Future events should thus include Snake Creek for regular measurement to quantify the flow splits between Snake Creek and Upper Pike River. The modelled inflow through Deep Creek was also greater than gauged flow at this stage of operation due to uncertainty in the specifics of regulator operation, which may have increased this discrepancy by up to approximately 100 ML/d. Another potential reason for the discrepancy in flow comparison may be a result of some elevated seepage/loss early in the operation as water levels began to rise and inundate the dry soil.

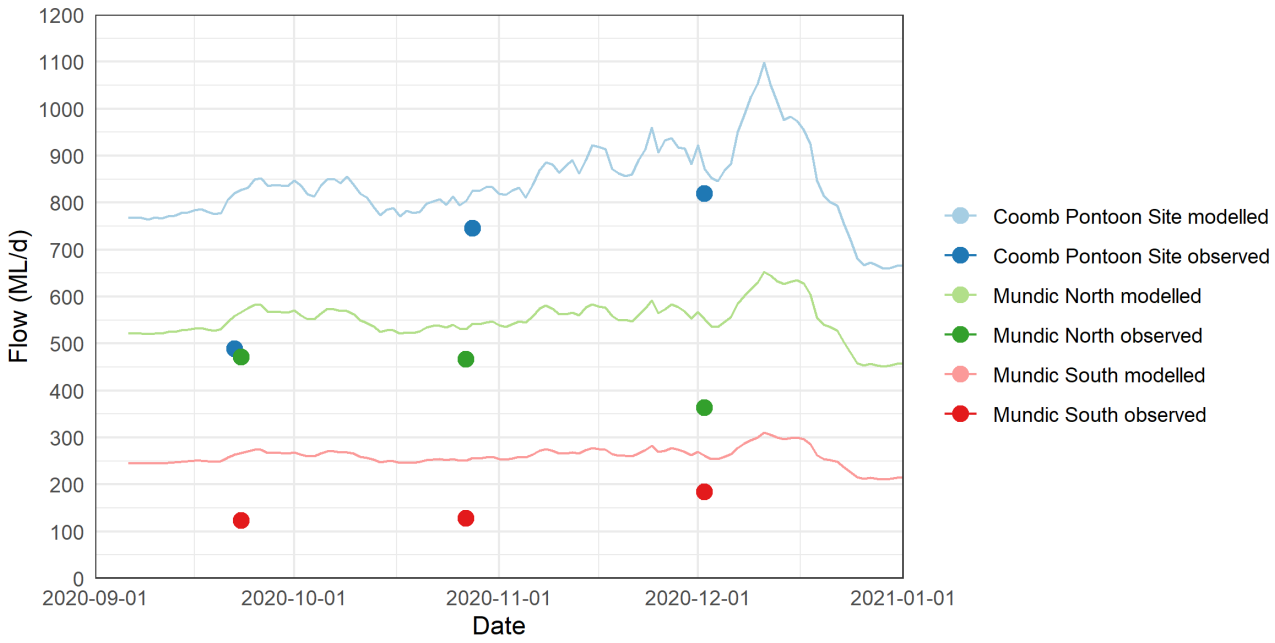


Figure 3.12. Pike floodplain flows comparison, gauged versus modelled.

Flows through Tanyaca Environmental Regulator were set against the rated flows through the structure, adjusted to the gauging results (i.e. the mean difference of approximately +65 ML/d applied). Bank C flow was also modelled to approximate the gauging results, at approximately 120 ML/d mean flow. Hence, the modelled flows match the gauged results relatively closely, as shown in Figure 3.13.

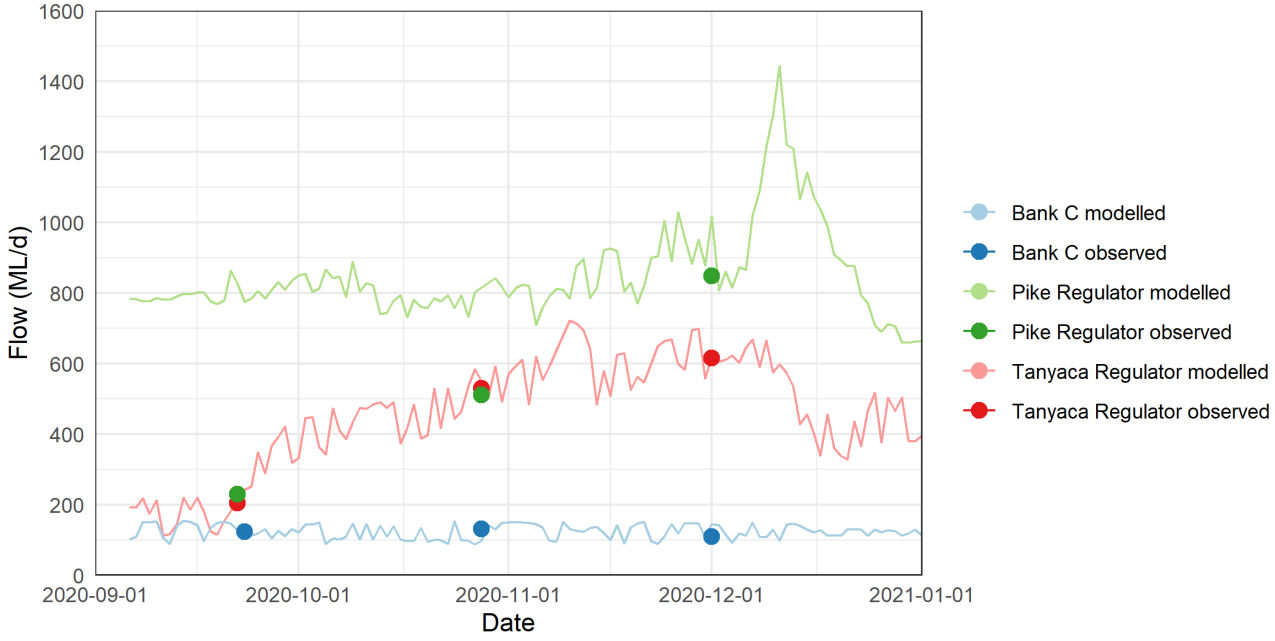


Figure 3.13. Pike outflows comparison, gauged versus modelled.

For the Pike Environmental Regulator flow, the agreement of modelled to gauged flow varied substantially over the operating period, with the discrepancy decreasing as the event progressed. At the September gauging result, the modelled flow was approximately 600 ML/d greater than observed; at the October gauging, modelled flow was approximately 300 ML/d greater; and for the December result the modelled flow was approximately equivalent.

Potential reasons for this large variability early in the operations are similar to those mentioned for the flow discrepancy between modelled and measured at Coombs pontoon site, such as the apparently overestimated flows at Deep Creek, and the dry antecedent condition of the floodplain. The latter in particular may have resulted in larger losses than accounted for in the model as dry areas were wetted under the rising water level. Extraction rates by water users may have additionally contributed to larger losses than modelled, but less-likely given diversion rates typically increase over warmer periods.

Theoretical ratings available at the main structures, which involve the calculation of flow based on structure operability data (e.g. gate positions) and/or hydraulic data (e.g. water level upstream of the structure) were additionally used to assist in understanding the reasons for the aforementioned flow discrepancies. Figure 3.14 shows a comparison of modelled, observed, and rated flows at both Pike and Tanyaca regulators. For Tanyaca regulator the modelled flows were set to the rated flows (adjusted by gauging results), hence the good match between gauged, rated and modelled flows. At Pike regulator however, where upstream level rather than flow was controlled at the structure, a departure between each of the flow types can be observed throughout the event, with the differences particularly apparent early in the operation.

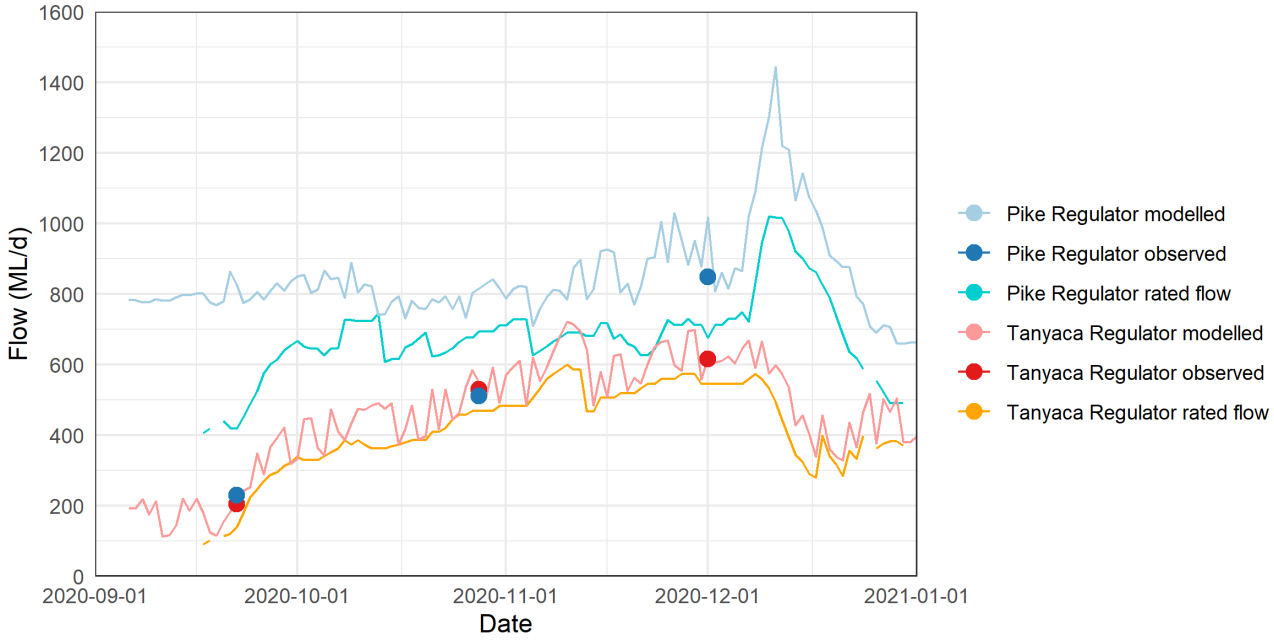


Figure 3.14. Pike regulator outflows comparison, modelled, gauged and rated flows.

The rated flow further suggests the model overestimated outflows from Pike regulator in the early stages of operation, however the difference is reduced compared to the difference between modelled and gauged flows. In September, the difference between modelled and rated flows was 400 ML/d, compared to the aforementioned difference between modelled and gauged flows of approximately 600 ML/d. For the October round of gaugings, the difference between modelled and rated flows was only approximately 100 ML/d, compared to 300 ML/d between modelled and gauged flows. In contrast, for the December round of gaugings the rated flow was also approximately 100 ML/d less than modelled, compared to approximately equivalent flows between modelled and gauged.

The large difference between gauged and rated flow at Pike regulator in the early stages of operation may additionally be affected by an increased uncertainty associated with the gaugings conducted at the time. The channel downstream of the Pike regulator is wide (approximately 150 to 200 m width) and shallow (in the order of 1 m maximum depth), which results in a large cross-sectional area and correspondingly low velocities distributed across the channel. Monitoring experience suggests that these channel characteristics contribute to a non-uniform flow direction and increase the difficulty of controlling boat navigation across the channel during periods of high wind velocities, which may have reduced the consistency of repeated transects across

the section for certain measurements (A Lever 2021, personal communication, 28 September). Note that wind monitoring data from weather stations in the vicinity of the site (A4261167 – Chowilla automatic weather station; Bureau of Meteorology station 024024 – Loxton Research Centre) suggests strong winds in the order of 30 to 60 km/h in an upstream direction were present at the time of the September gauging. These conditions may have contributed to a greater uncertainty in the measurement compared to other sites with narrower cross-sections. Noting again that the modelled inflow through Deep Creek at the September gauging was apparently overestimated as previously discussed, these factors combined may have exacerbated any discrepancy between gauged and modelled flows at the site. Further gaugings during subsequent raising events, including additional sites, may aid in further improvements to model validation.

Water levels at the main environmental regulating structures at Tanyaca and Pike showed variable agreement between observed and modelled, depending on locations. With Pike regulator upstream level being explicitly set in the model hydrograph against the recorded levels, it can be seen in Figure 3.15 that modelled and observed water levels are almost identical through the entire period of simulation. Similarly, calibration of the bed roughness in the reach downstream of Tanyaca regulator yielded a good agreement between observed and modelled water levels downstream of Tanyaca regulator, at less than approximately 0.1 m difference over the period of operation.

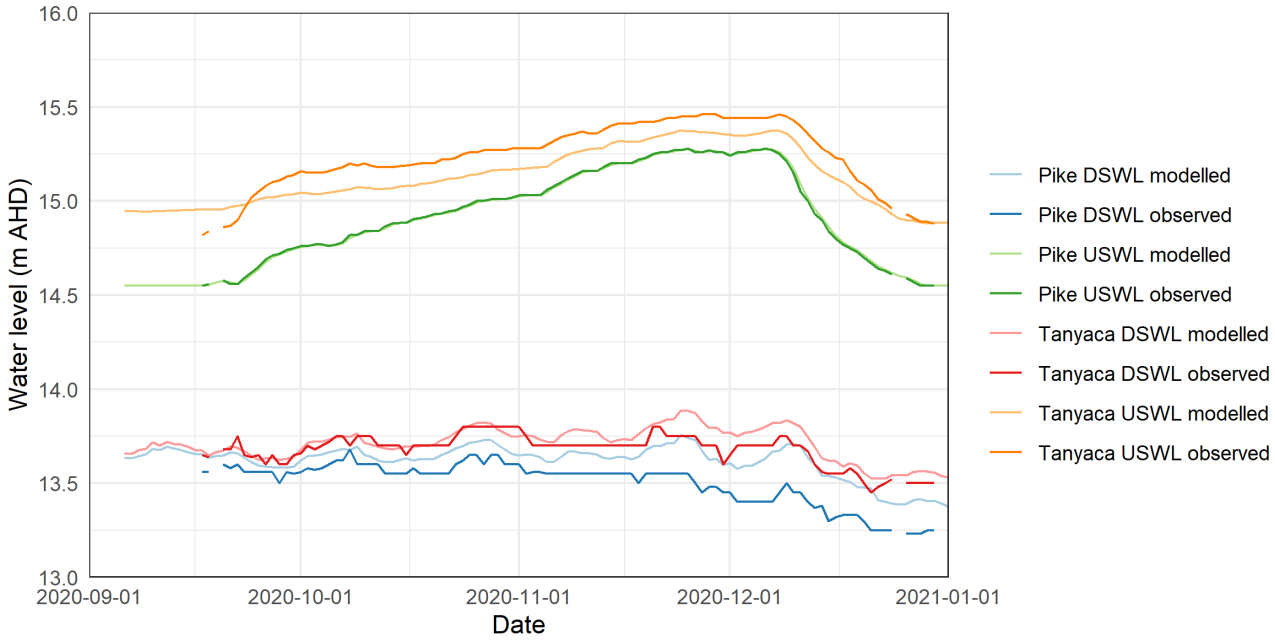


Figure 3.15. Pike Floodplain environmental regulators, upstream and downstream levels, observed versus modelled.

At Pike Regulator, the modelled downstream water level commences the period relatively close to the observed level, but the discrepancy gradually increases towards the end of the period, with modelled results in the order of 0.1 to 0.2 m greater than observed. This despite the difference between observed and modelled flows at Pike gradually decreasing over the same period.

Upstream of Tanyaca regulator, the modelled level for the majority of the run was approximately 0.1 to 0.2 m less than the observed level – noting that modelling of the inlet regulators may not have been fully representative of actual operations early in the period, prior to fully opening the structures. This underestimation in level may also be related to the calibration of Mundic outlets into Upper Pike River. While roughness values for Mundic North and South outlets were adjusted as part of this model recalibration process (Appendix A), future validation work may indicate additional adjustments are required, and in turn may improve the representation of Mundic levels in the model. At the end of the operating period however, as levels returned to normal, the modelled and observed levels appear to converge.

In the Lower Pike system, downstream of the environmental regulators, variable agreement between observed and modelled results are shown in Figure 3.16. Modelled Swift Creek flow was reasonably close to each of the gauged results. Wood Duck Creek modelled flow was equivalent to the gauged flow in the September round of gauging, but underestimated the flow gauged in the following two gauging events. Rumpagunyah Creek flow was overestimated by the model in September, approximately the same for the October gauging event, and underestimated for the December gauging result. For the flow at Lettons gauging station in the Lower Pike, there was good agreement between modelled and observed flows in the September gauging event, but the observed was underestimated by the model results by approximately 500 to 600 ML/d.

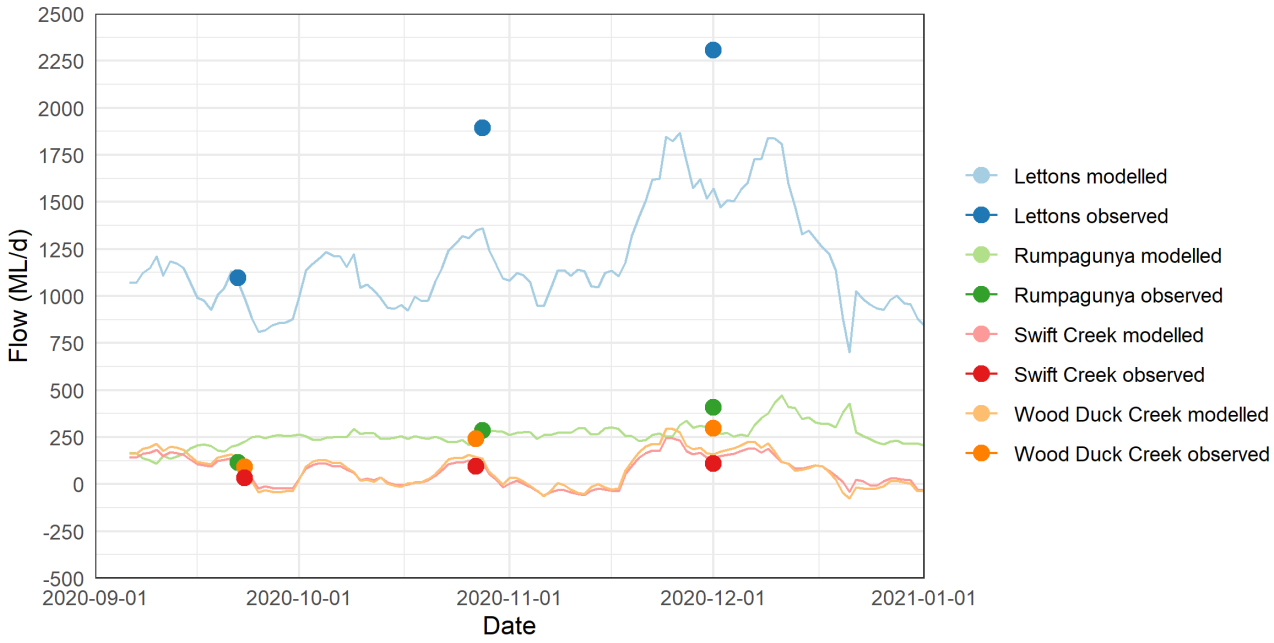


Figure 3.16. Lower Pike flows comparison, gauged versus modelled.

In summary, the inlet flows have been calibrated to show a reasonable agreement with gauged results for the 2020 operational event, and calibration of hydraulics through other sections of floodplain have been improved over the base model. Future events where operation at full Lock 5 top of piers operation can be achieved will be useful for confirming modelled flows through the inlets and floodplain reaches in general. There is scope for further improvement in the calibration of hydraulics through the various floodplain creeks including Mundic outlets, and those connecting river to floodplain in the Lower Pike in particular, due to the complexities of these reaches. This will be facilitated by future gauging events, particularly with different operational conditions and/or at higher floodplain levels.

Recommended gauging locations for future operating events at Pike Floodplain are shown in Table 3.1 and in the map in Figure 1.1. Note that only Snake Creek was not included as a regular site for the 2020 inundation event.

Table 3.1. Recommended gauging locations in Pike Floodplain for future operating events.

Site name	Site Number	Longitude	Latitude
Deep Creek	A4261079	140.772894	-34.188095
Margaret Dowling	A4261080	140.777100	-34.182500
Mundic North Outlet	A4261266	140.790231	-34.199028
Mundic South Outlet	A4261267	140.788858	-34.209392
Coombs Pontoon	A4261055	140.808050	-34.223600
Bank C	A4261245	140.760516	-34.214415
Snake Creek	TBA	140.788196	-34.215950
Pike Environmental Regulator	A4261248	140.766970	-34.255420
Tanyaca Regulator	A4261248	140.767170	-34.227480
Rumpagunyah Creek	A4261262	140.745071	-34.242943
Wood Duck	TBA	140.749548	-34.229406
Swift Creek	A4261254	140.752981	-34.224439
Lettons	A4260644	140.759760	-34.259530
Picnic Grounds	A4260645	140.687290	-34.264690
Lyrup IPS	A4260663	140.649800	-34.252500

3.3.3 Katarapko hydraulics

Recalibration of Katarapko reaches was limited by only two gauging periods and not all gauging locations across the two periods remained consistent, resulting in some key locations with only a single gauging to calibrate against. Therefore, while calibration was conducted appropriately against the available flows, more observations from future events are required to further improve confidence in the calibration of Katarapko hydraulics.

Performance of the modelled inlet flows against the gauged inflows is shown in Figure 3.17. The modelled inflows through Bank J were approximately 50 ML/d greater than the observed flow in the October gauging, while for Ngak Indau inlet the modelled and observed flows were approximately equivalent. Flow through Bank K creek, gauged in the September round, showed approximately 50 ML/d greater than observed flow, which was measured in the order of only 5 ML/d.

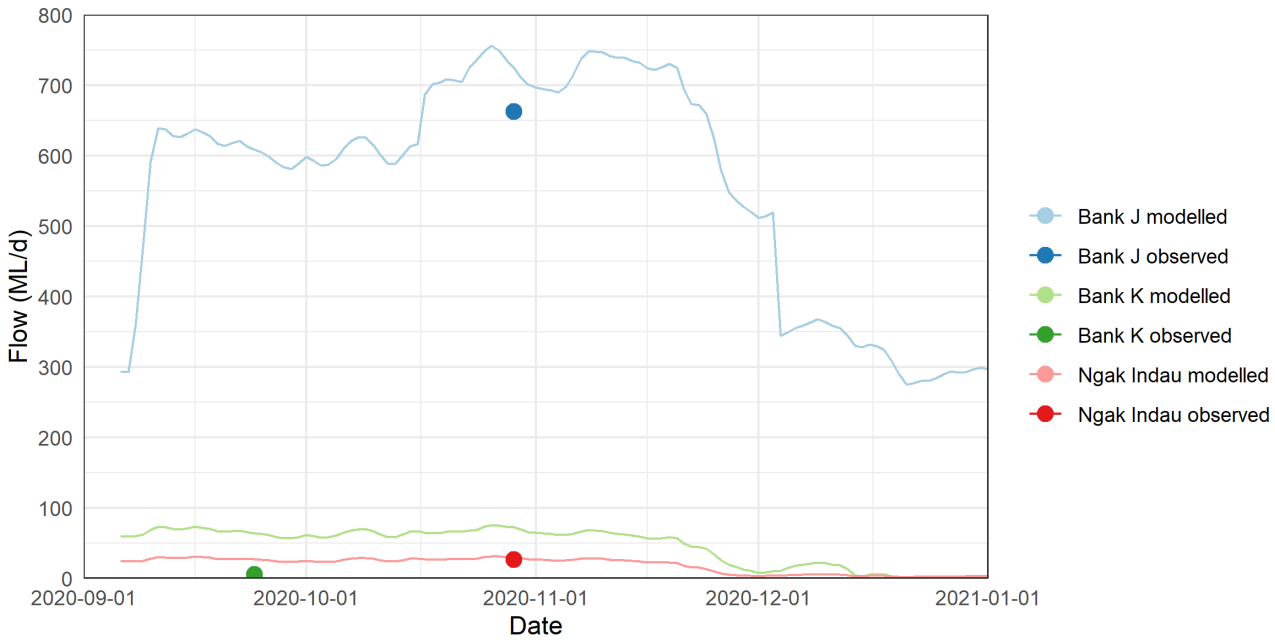


Figure 3.17. Katarapko inlet flows comparison, gauged versus modelled.

Flow comparisons at South Arm Road Crossing and upstream Log Crossing are shown in Figure 3.18. At South Arm Road Crossing the modelled flow matched the observed within approximately 10 ML/d. Upstream of Log Crossing, modelled flow exceeded the gauged flow in the order of 50-100 ML/d for the September gauging period, and approximately 150 ML/d for the October–November period. Noting that the greatest discrepancy in the latter coincides with the peak of operation at Katarapko, there is potential that the extra flow modelled is due to additional losses, such as seepage, not fully accounted for in the model.

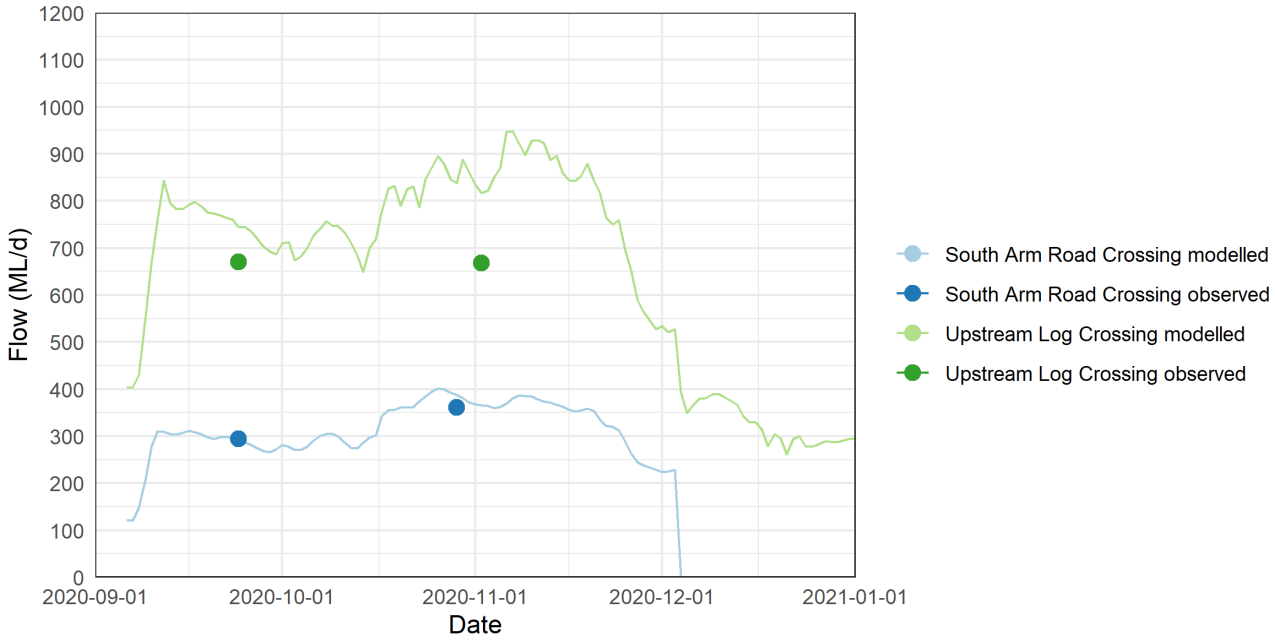


Figure 3.18. Katarapko floodplain flows comparison, gauged versus modelled.

Comparison of gauged to modelled outflows at The Splash and Sawmill environmental regulators is shown in Figure 3.19. In terms of Sawmill flow, gauged and modelled flows at the two measurement periods present a

close match. Only one gauging result was measured at The Splash in October-November, with an overestimation of approximately 50 ML/d with the modelled result.

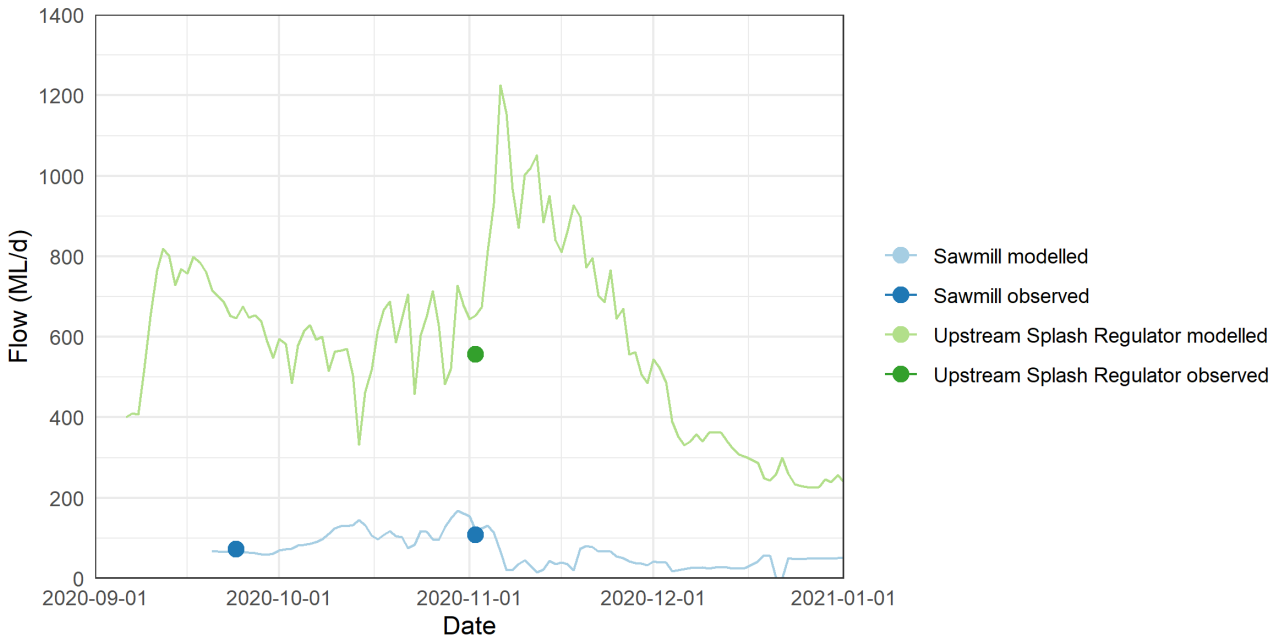


Figure 3.19. Katarapko outflows comparison, gauged versus modelled.

Referring to water levels over each of the environmental regulators (Figure 3.20), both Sawmill Creek and The Splash show reasonable agreement with upstream levels due to the modelling targeting these heights for regulator operations. Downstream levels show a general overestimation by the modelled results in comparison to observed at both locations, in particular downstream of The Splash with up to approximately 0.5 m greater for the modelled compared to observed levels at certain times over the period. This is expected to be due to the overestimation of Lock 4 downstream level in the original model, which would cause levels to be higher for a given flow at both the Sawmill site and also contribute to a greater flow over Katarapko Creek Stone Weir and hence a greater level downstream of The Splash.

Overall, a reasonable calibration has been achieved throughout the Katarapko floodplain with the limited gauging results available. The main scope for further improvement at Katarapko appears to be in the calibration of the main river channel hydraulics, which is resulting not only in a greater downstream level at Lock 4 compared to observed, but also resulting in increased flow down Katarapko Creek for a given river flow. This in turn has resulted in an overestimation of levels downstream of The Splash, particularly at lower levels (i.e. below approximately 10.5 m AHD, although this minimum may vary higher or lower depending on river flow). It should be noted however that at these levels the flow in the lower sections of floodplain remained largely in-channel, and therefore the impact on overall area–volume calculations within the impounded area of the floodplain appeared to be low. Conversely, these calculations at higher levels at The Splash, where levels below the structure were less than the target upstream levels, remained generally unaffected. Further refinement work on the reach downstream of Lock 4 is recommended. Confidence in the floodplain calibration will also be improved with a greater number of gauging periods performed at future inundation events, particularly covering other inlet channels (e.g. Bank N) that were not gauged during the 2020 event. Table 3.2 shows recommended gauging locations for future inundation events, which are also displayed in Figure 1.2.

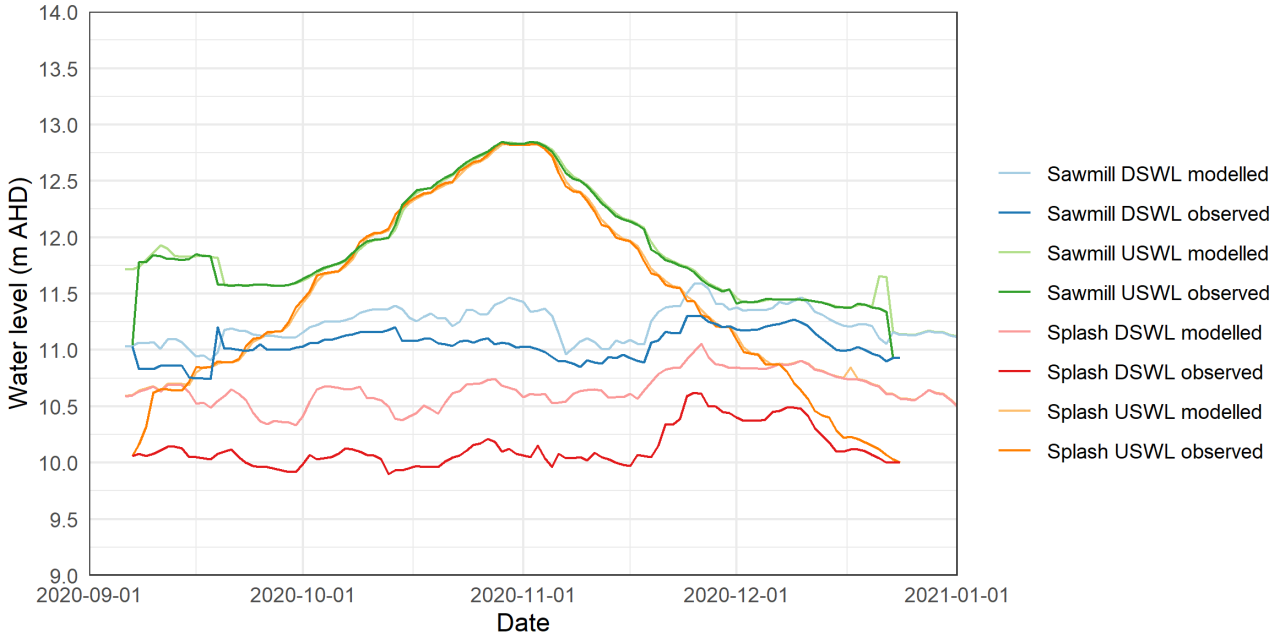


Figure 3.20. Katarapko Floodplain environmental regulator upstream and downstream water levels, observed versus modelled.

Table 3.2. Recommended gauging locations in Katarapko Floodplain for future operating events.

Site name	Site Number	Longitude	Latitude
Bank J	A4261258	140.58414	-34.31538
Bank N	A4261256	140.58791	-34.30841
Bank K	A4261257	140.583897	-34.313601
Bank A	A4261800	140.573045	-34.339261
Bank H	A4261801	140.58671	-34.31774
South Arm Road Crossing	A4261259	140.57606	-34.32133
Ngak Indau Inlet	A4261265	140.57109	-34.327958
US Log Crossing	A4261255	140.54791	-34.33548
Sawmill Creek	A4261247	140.54844	-34.33712
DS Log Crossing	A4261260	140.54171	-34.33494
US Splash Regulator	A4261260	140.528835	-34.35259
Katarapko Flow Site	A4261225	140.54456	-34.37056

3.4 Floodplain inundated area and volume relationships

3.4.1 2020 event operations

The modelled representation of the 2020 inundation events at each floodplain, with respect to daily exchange, inundated area (i.e. total wetted area, including permanent channels) and volume, are shown in Figure 3.21 and Figure 3.22 for Pike and Katarapko floodplains, respectively. Note that calculations of daily exchange were based on the modelled outflows and volumes, and therefore uncertainties in these figures, such as the outflow discrepancies identified at the Pike Environmental Regulator, may affect these values.

For Pike floodplain operations, the daily exchange was calculated at around 15% for much of the period, with a brief increase to above 20% at the start of the draining phase. Maximum inundated area and volume at the peak of the event, with a water level upstream of Pike environmental regulator of 15.28 m AHD, was modelled at approximately 990 ha and 11 470 ML, respectively.

At Katarapko floodplain, the peak operating height of 12.83 m AHD yielded a modelled maximum inundated area and volume of approximately 480 ha and 4630 ML, respectively. The daily exchange was maintained above 20% for the majority of the run, only dropping below 20% near the peak of the run (minimum above 12%) for an approximate duration of 1 week.

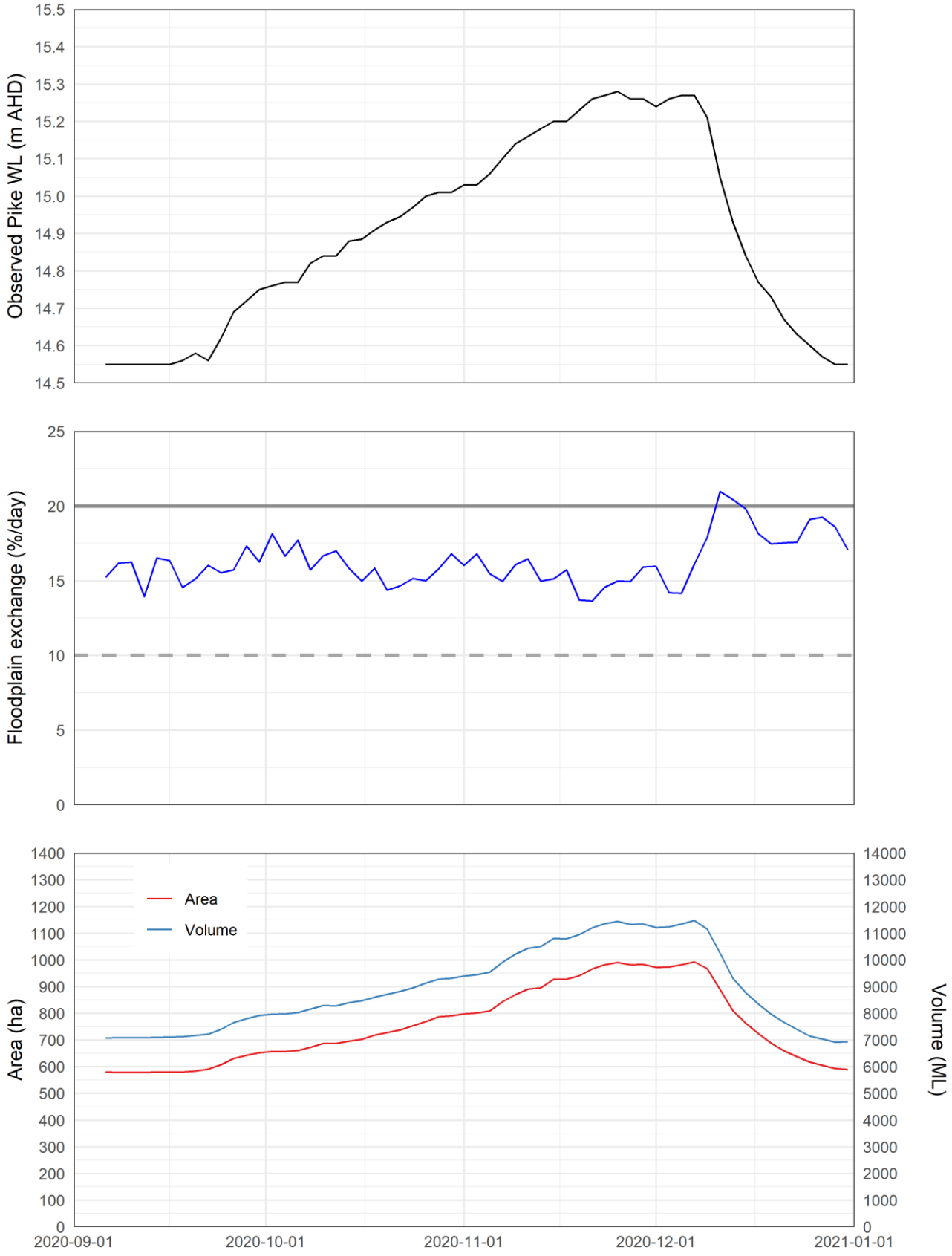


Figure 3.21. Modelled daily exchange, inundated area and volume at Pike floodplain for 2020 event simulation.

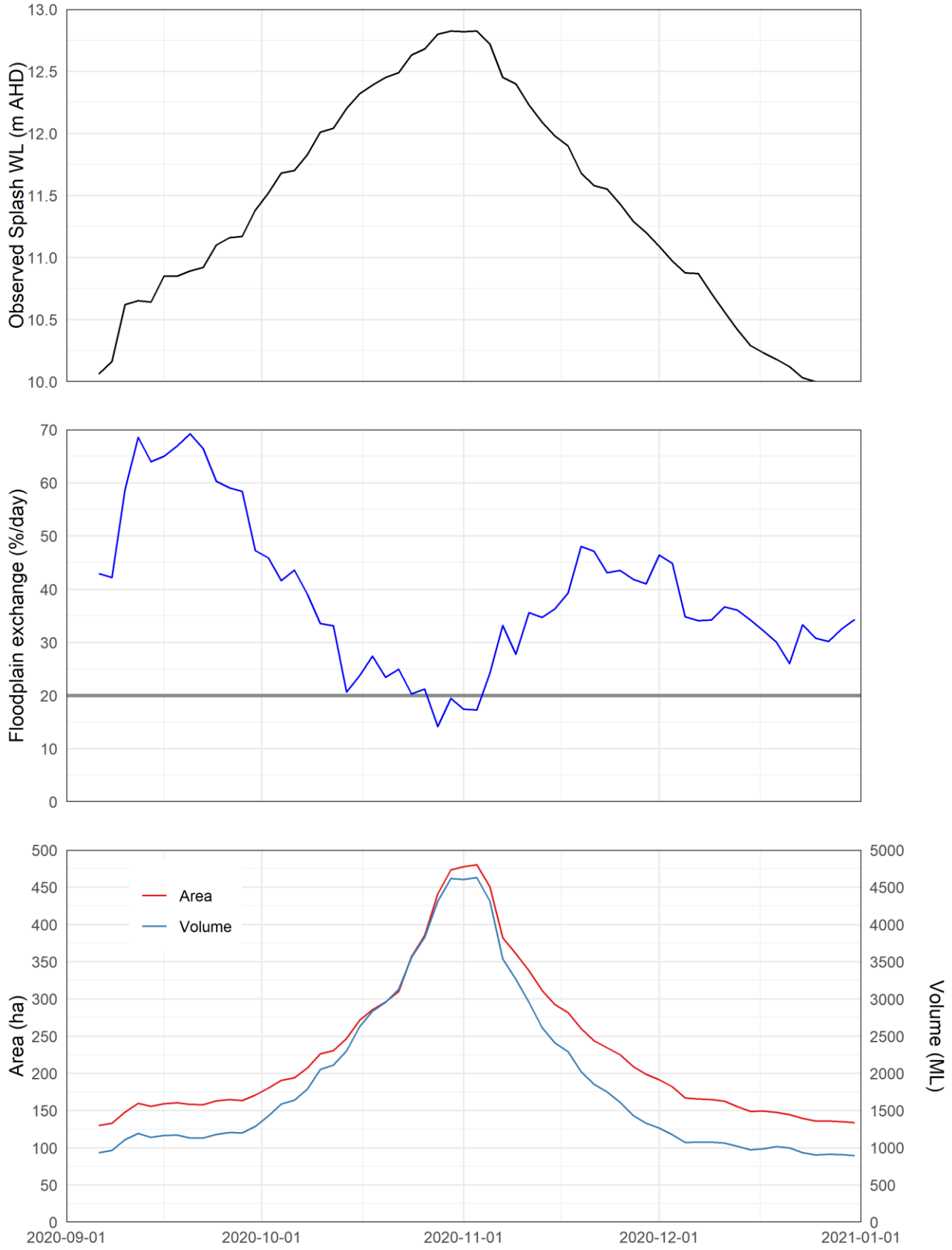


Figure 3.22. Modelled daily exchange, inundated area and storage volume at Katarapko floodplain for 2020 event simulation.

3.4.2 Normal operations

Total inflows to the impounded areas upstream of the blocking alignments at Pike and Katarapko floodplain were calculated within the defined flow paths (permanent or ephemeral) of the model, noting that any overbank flow and/or flows overtopping the blocking alignment may not be accounted for in the totals. Figure 3.23 shows the total inflows varying with river flow for Pike and Katarapko floodplains.

In Pike the total inflows remain relatively constant at over 1200 ML/d, for river flows up to around 35 000 to 40 000 ML/d. This is a result of the flows being exclusively diverted into the floodplain through Margaret Dowling and Deep Creek in the low river flow range, and the water level in the River Murray upstream of these inlets largely controlled by Lock 5 as opposed to influenced by increasing river flow. Above 40 000 ML/d the total inflows jump to 2500 to 3000 ML/d, which can be attributed to Banks B, B2 and C becoming inlets when the river level exceeds the Mundic level – modelled at approximately 14.8 to 14.9 m AHD under fully open inlet flows (refer to Figure 1.1 for infrastructure locations).

Another inflection point of the relationship between floodplain inflows and river flow is seen above approximately 70 000 ML/d, which can be attributed to ancillary structures along the blocking alignment (ancillary structures at Mundic North and South, and Snake Creek North and South) also beginning to pass flow. Above approximately 85 000 ML/d river flow, a reduction in total inflow with QSA is modelled. This can be attributed in part to Bank C transitioning back to an outflow flow path above QSA 90 000 ML/d, and also some reduction in inflows through Banks B and B2.

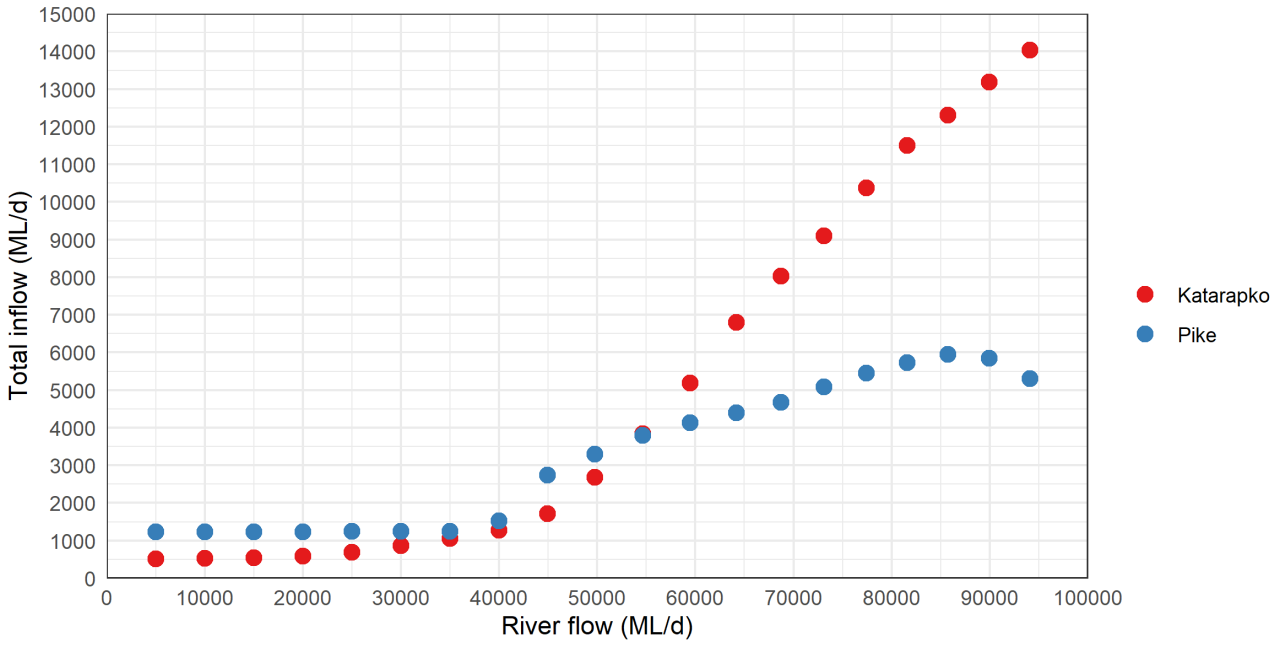


Figure 3.23. Variation of total flow through various inlets at Katarapko and Pike with River Murray flow (based on flow through 1D model branches).

The variation of modelled inundation extent of Pike Floodplain with River Murray flow for normal operations are shown in Figure 3.24 for inundated area, and Figure 3.25 for storage volume. The inundated areas and storage volumes of Mundic and Pike remained relatively constant up to a river flow of approximately 40 000 ML/d, due largely to the mid-pool level held at Pike Environmental regulator and the consistent total inflows modelled over this flow range (refer to Figure 3.23).

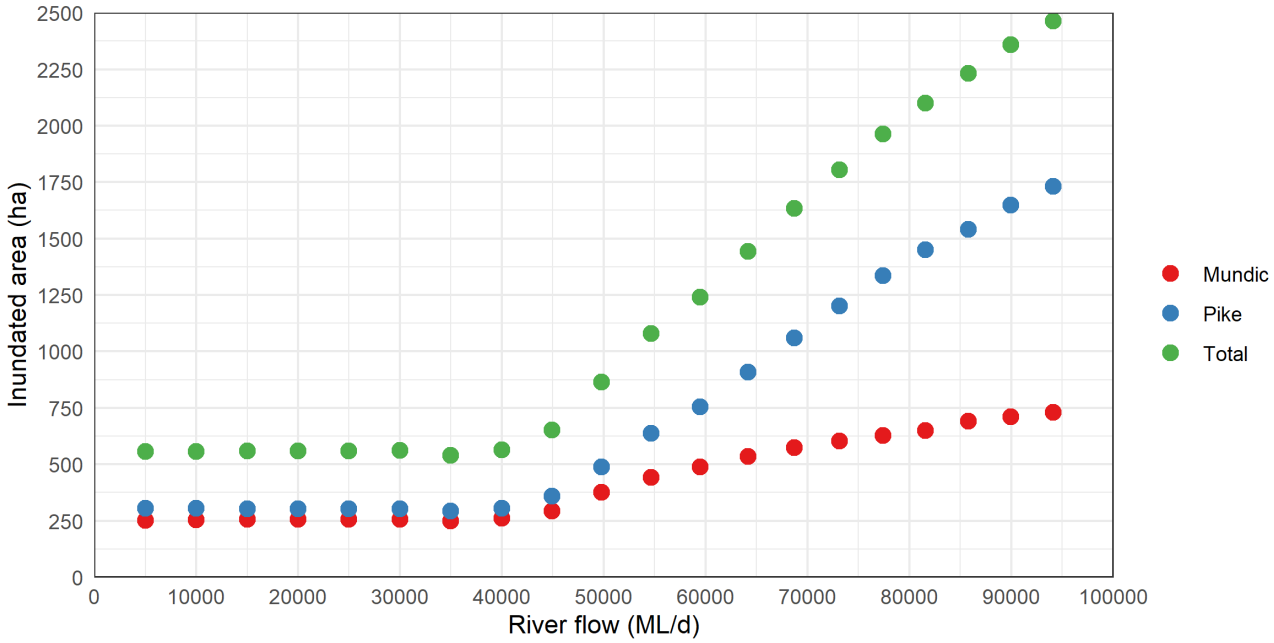


Figure 3.24. Variation of inundated area upstream of the Pike blocking alignment with River Murray flow.

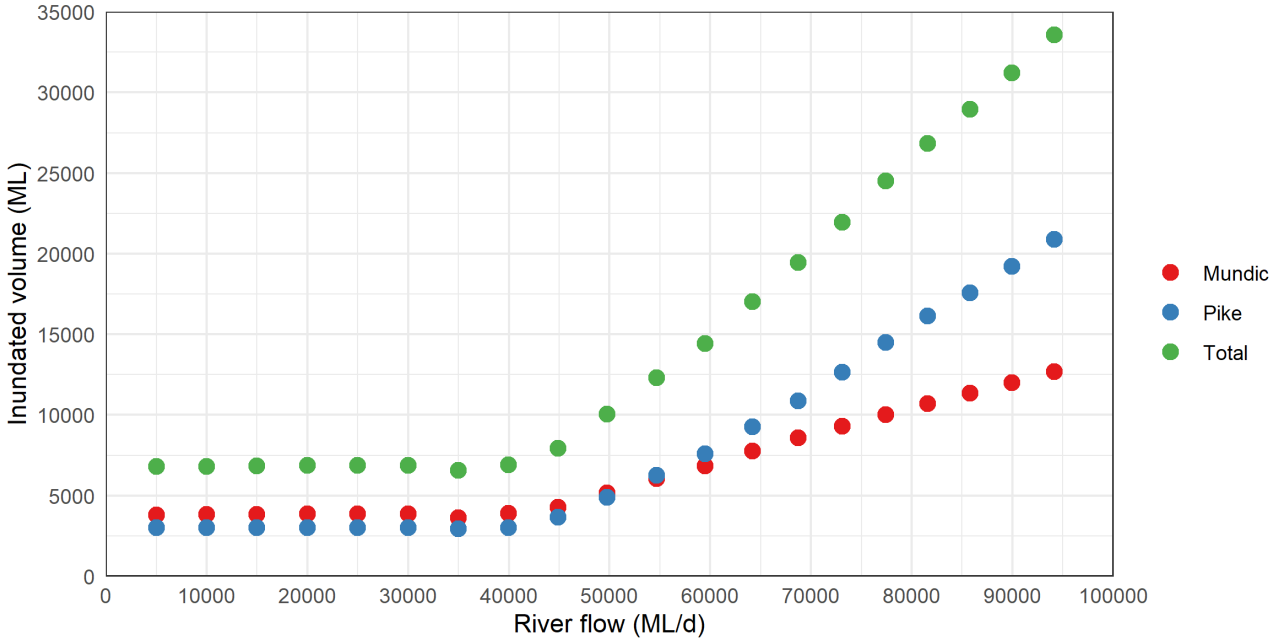


Figure 3.25. Variation of storage volume upstream of the Pike blocking alignment with River Murray flow.

In Katarapko, the inflows remained relatively constant at approximately 500 to 700 ML/d for QSA up to about 25 000 to 30 000 ML/d. These inflows are below the total maximum inflows at Pike under similar conditions. From approximately 30 000 ML/d QSA, Sawmill Creek (Figure 1.2) was modelled to switch from a floodplain outflow to an inflow location. From approximately 45 000 ML/d the rate of rise of inflows increases more rapidly with increasing QSA, as levels over Lock 4 begin to equalise. Once equalised, the Lock 4 upstream level begins to rise above normal pool with increasing river flow, thereby increasing the inflow capacity above Lock 4. Unlike at Pike, the total inflows at Katarapko continue to increase at a rapid rate with increasing QSA, which is a result of several flood runners upstream of Lock 4 progressively commencing to flow.

The variation of modelled inundation extent of Katarapko Floodplain with River Murray flow for normal operations, assuming fully open inlet structures at all river flows, are shown in Figure 3.26 for inundated area and Figure 3.27 for storage volume. The bulk of the water, from both an area and volume perspective, was shown to occur in the upper and lower sections of floodplain. Similar proportions of volume in each section were shown up to a flow of approximately 75 000 ML/d, above which the volume in the upper floodplain began to increase beyond the rate of the lower floodplain. However, the upper and lower floodplains had similar inundation area totals over the full range of flows modelled. Similarly, Piggy Creek and Car Park areas (Figure 2.3) also show similar proportions across the flow range, with only a relatively minor contribution to the overall floodplain inundation extent.

The changes in total inundated area and volume over the floodplain with QSA generally reflect the changes modelled for inflow capacity. Both area and volume increased at a gradual rate with river flow up to approximately 30 000 to 40 000 ML/d. The area inundated increased at a more rapid rate with river flow, at between approximately 40 000 to 70 000 ML/d, before the rate of increase reduced as river flows increased above 70 000 ML/d. Conversely, while floodplain volume also increased rapidly with river flow above 40 000 ML/d, the rate of increase with flow only marginally reduced above 70 000 ML/d. This difference in behaviour with area could be expected given the area available for inundation becomes limited by higher elevation terrain, whereas volume continues to increase for a given area due to increase in water level.

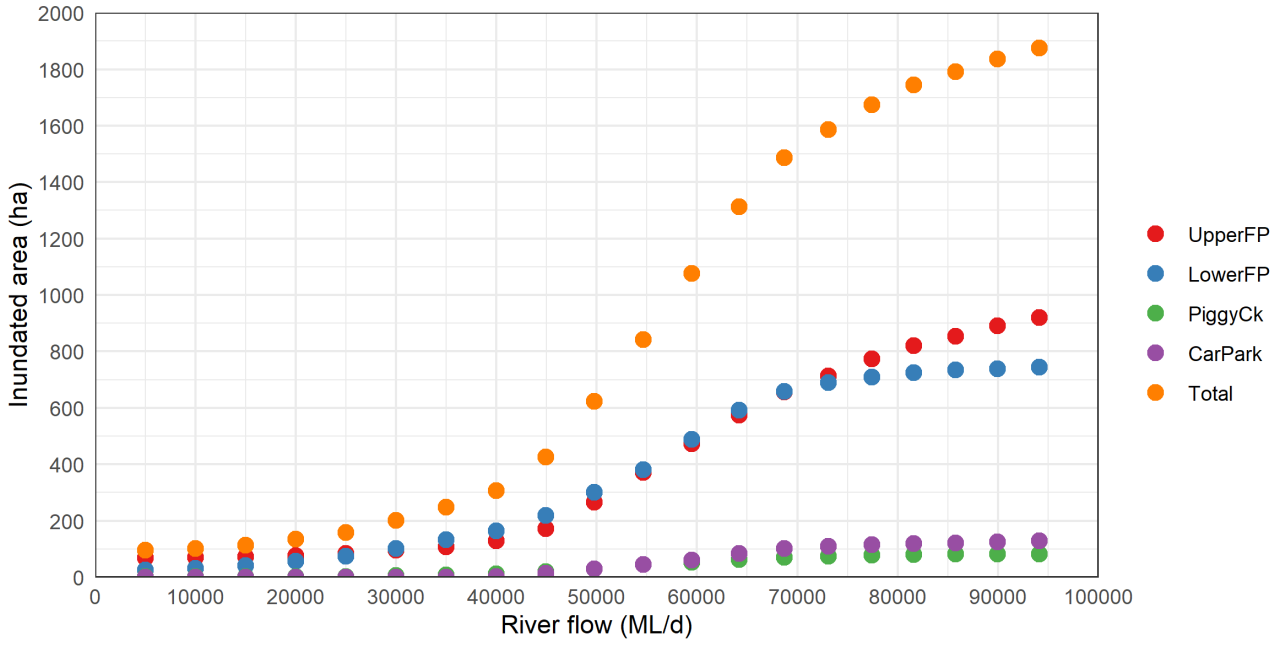


Figure 3.26. Variation of inundated area upstream of the Katarapko blocking alignment with River Murray flow.

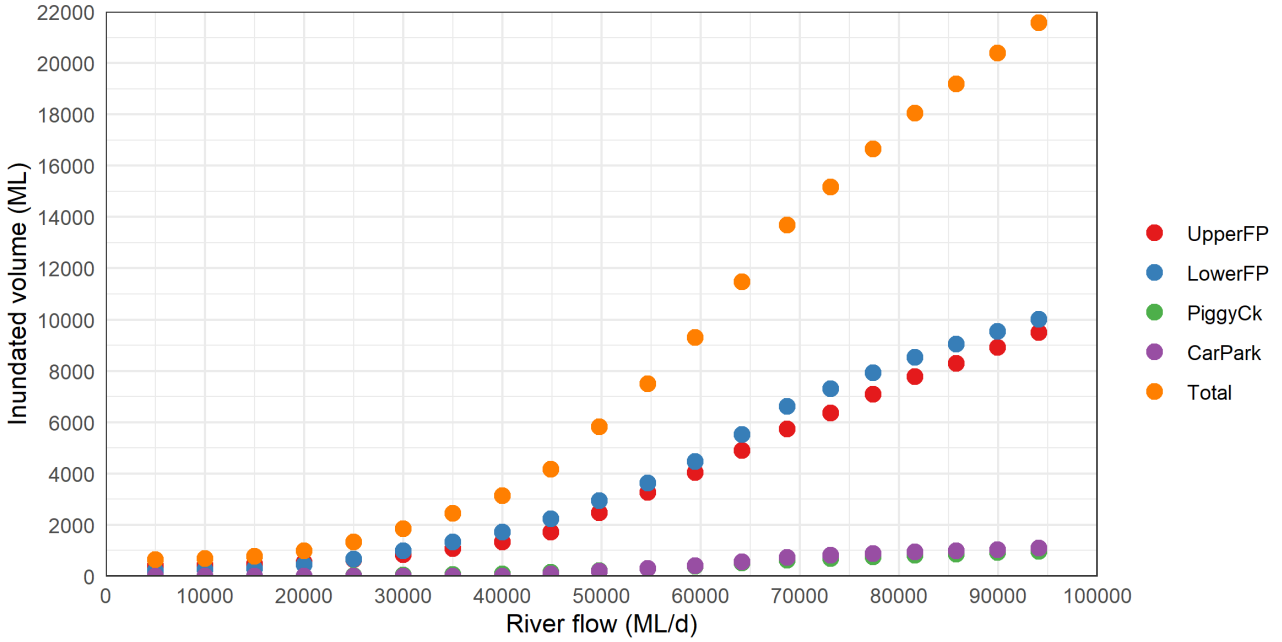


Figure 3.27. Variation of storage volume upstream of the Katarapko blocking alignment with River Murray flow.

3.4.3 Managed inundation operations

Modelled total inflows for Pike and Katarapko are shown in Figure 3.28 and Figure 3.29, respectively. Differentiation between Lock 5 and 4 WPLs are made in each case. The results for Pike showed that total inflows at each Lock 5 WPL were maximised at the normal Pike regulator operating height of 14.55 m AHD. At a normal operating pool level of 16.3 m AHD the maximum total inflow (assuming fully open inlets) was modelled at just under 1250 ML/d, while at top of piers operation (16.8 m AHD) at just over 1900 ML/d. At all WPLs the inflows gradually decreased with increasing Pike regulator height, due to the increasing impacts of rising tail water level creating backwater influences at each inlet creek.

For Katarapko, maximum total inflows were modelled to increase with increasing Lock 4 weir pool height. The total inflows were modelled at just over 500 ML/d at normal Lock 4 weir pool and normal level at The Splash, and over 1400 ML/d with a 60 cm raising to 13.8 m AHD and normal Splash level. A larger increase in inflow for Lock 4 level between 13.5 and 13.8 m AHD was modelled, compared to the increase between 13.2 and 13.5 m AHD. This difference was a result of more flood runners upstream of Lock 4 commencing to flow at the 13.8 m AHD WPL, compared to lower WPLs.

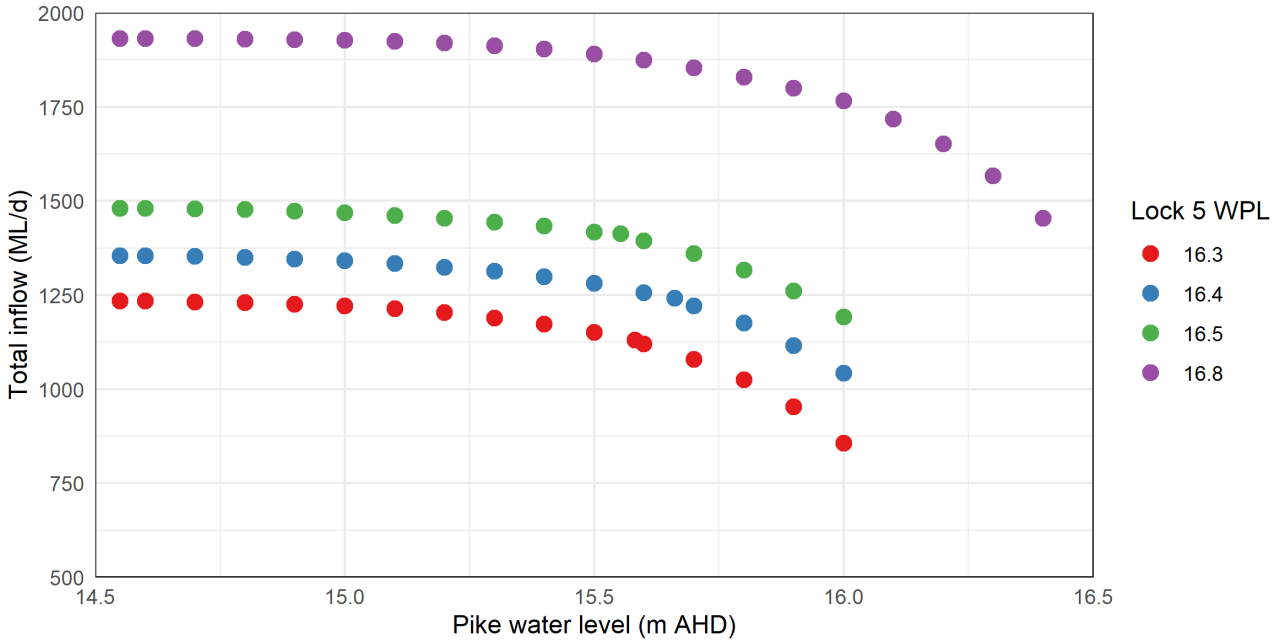


Figure 3.28. Pike Floodplain total inflow versus Pike water level at various Lock 5 weir pool levels and 10 000 ML/d QSA.

Similar to Pike, the total inflows showed a gradual decrease with increasing floodplain level upstream of The Splash regulator. Unlike at Pike however, the total inflows were maintained at relatively constant maximum values for much of the lower level range, up to approximately 12.5 m AHD (i.e. ~2.5 m rise in floodplain level), before reducing at a greater rate with further increase in the floodplain level.

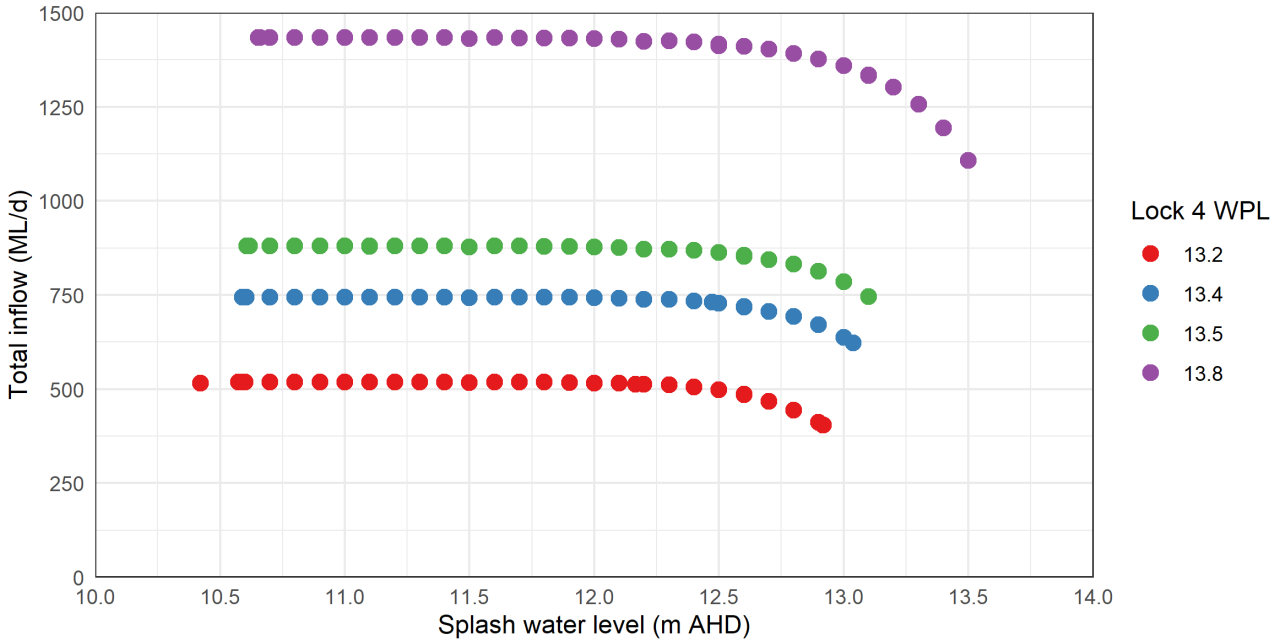


Figure 3.29. Katarapko Floodplain total inflow versus Splash water level at various Lock 4 weir pool levels and 10 000 ML/d QSA.

The variation of modelled inundated area and volume upstream of the blocking alignment for Pike is shown in Figure 3.30 and Figure 3.31, respectively. The inundated area and volume of Mundic and Pike sub-areas is shown, as well as the total impounded area/volume. The impact of Lock 5 level on inundated area and storage volume is

also differentiated in each plot. The results suggest that the largest differences in inundation between lock levels is at Pike regulator levels below approximately 15.5 m AHD, whereas the differences above this level appear to be minimal.

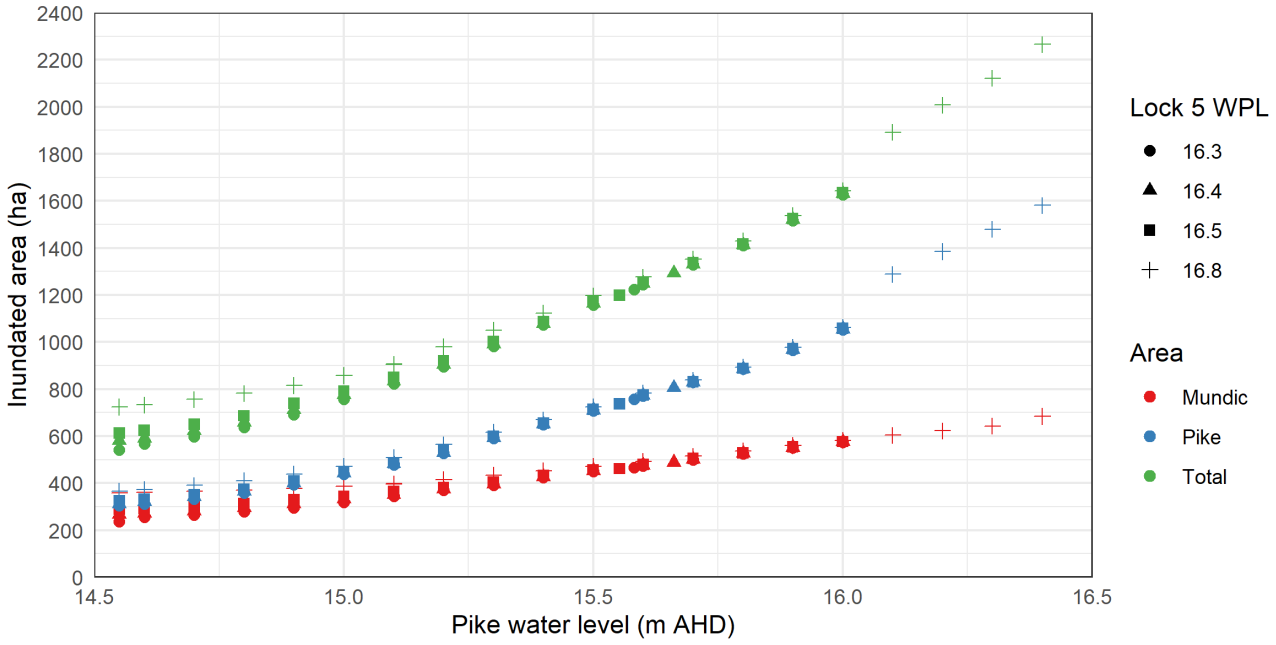


Figure 3.30. Pike Floodplain inundated area versus Pike water level at various Lock 5 weir pool levels and 10 000 ML/d QSA.

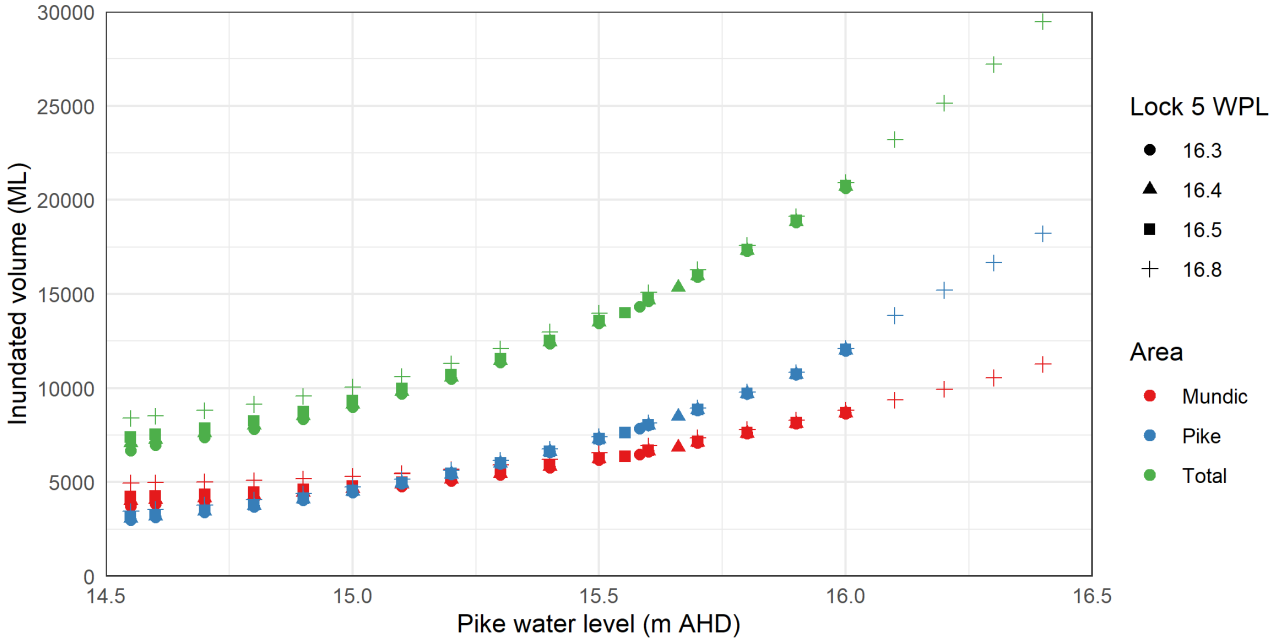


Figure 3.31. Pike Floodplain inundated volume versus Pike water level at various Lock 5 weir pool levels and 10 000 ML/d QSA.

Comparison of the updated relationships of water level upstream of Pike regulator and inundated area/volume with the previous modelling outputs suggests a close match, with only relatively minor differences. Figure 3.32 shows the results for a Lock 5 WPL of 16.8 m AHD and 10 000 ML/d River Murray flow. The updated model results showed a relatively consistent increase in the inundated area for a given floodplain height over the previous results. Volume was generally consistent between the updated and previous model results up to a Pike regulator

level of approximately 15.8 m AHD, with a marginally greater volume with the updated results at higher levels. These comparisons suggest that the main differences between previous and updated models are in relatively shallow areas of the floodplain, which have resulted in an increase in inundated area without impacting substantially on the impounded volume calculations.

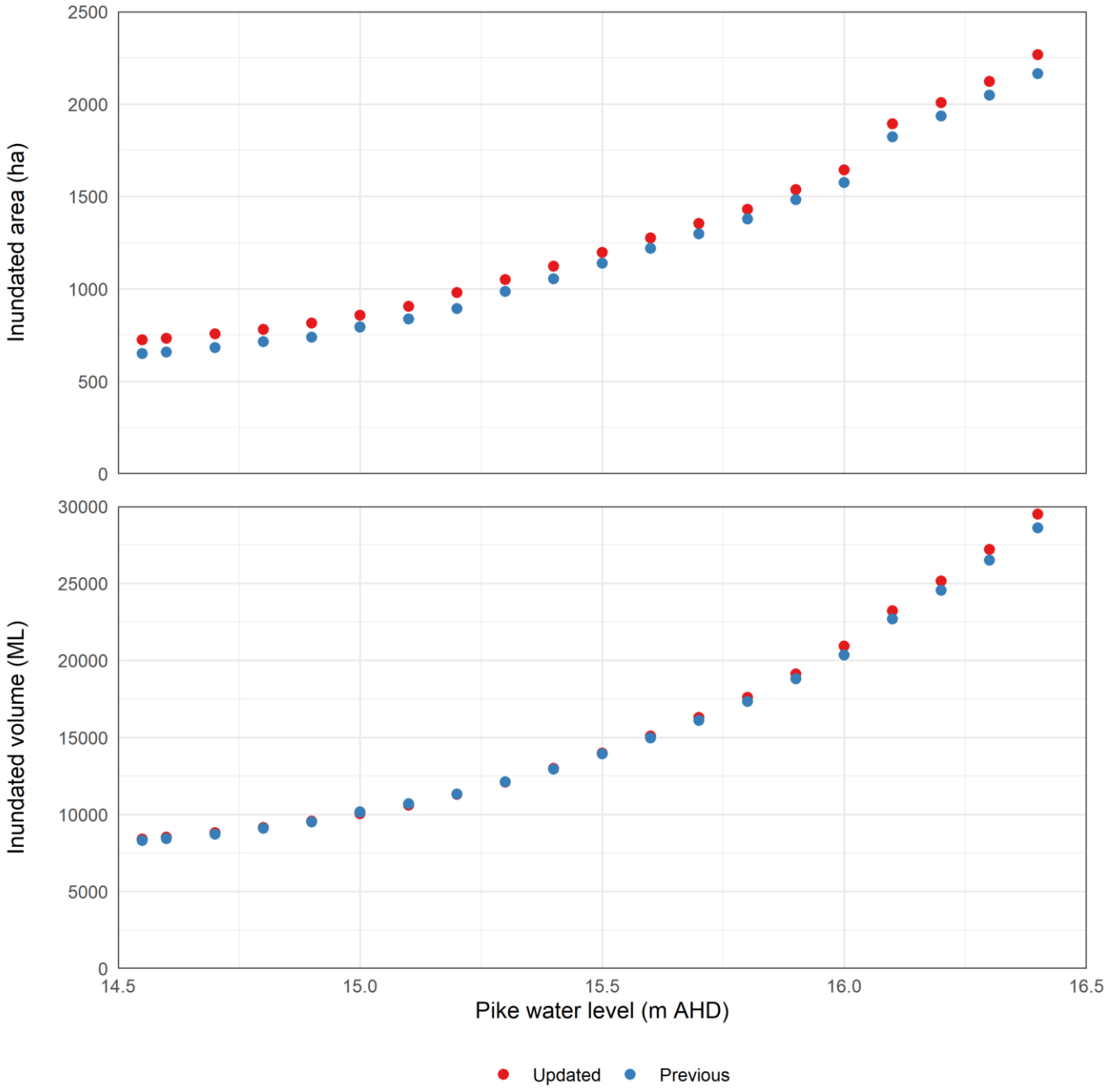


Figure 3.32. Comparison between updated and previous modelled results of Pike Floodplain inundated area and volume versus Pike regulator water level at Lock 5 weir pool level = 16.8 m AHD and 10 000 ML/d River Murray flow.

The variation of modelled inundated area and volume upstream of the blocking alignment for Katarapko floodplain is shown in Figure 3.33 and Figure 3.34, respectively. The inundated areas and volumes of the various sub-areas are shown, as well as the total impounded area/volume, differentiated by Lock 4 WPL. The results suggested a similar trend to Pike, with the largest differences in inundation between lock levels occurring at the lower floodplain levels, with the differences decreasing with increasing floodplain level. The lower Katarapko

floodplain showed the greatest difference in area and volume over the floodplain level range compared to the other sub-areas. Car Park and Piggy Creek results suggest similar contributions to the total floodplain inundated area and volume, with inundation commencing from around 12.4 m AHD in each case.

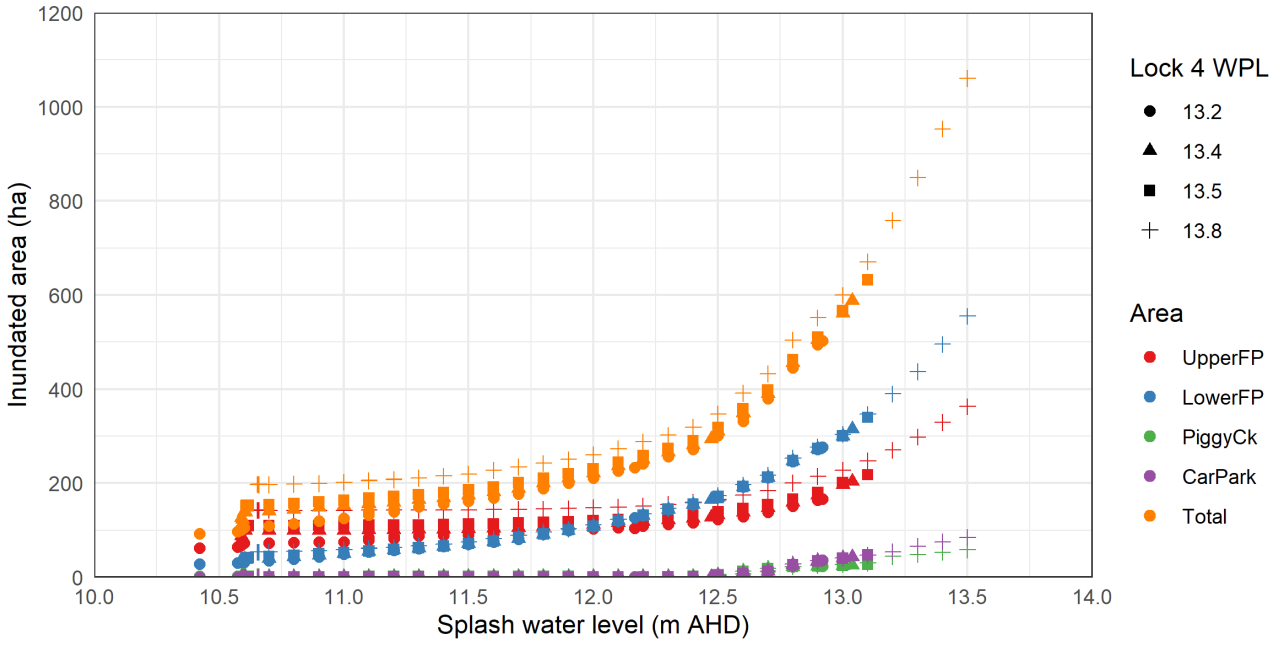


Figure 3.33. Katarapko Floodplain inundated area versus Splash water level at various Lock 4 weir pool levels and 10 000 ML/d QSA.

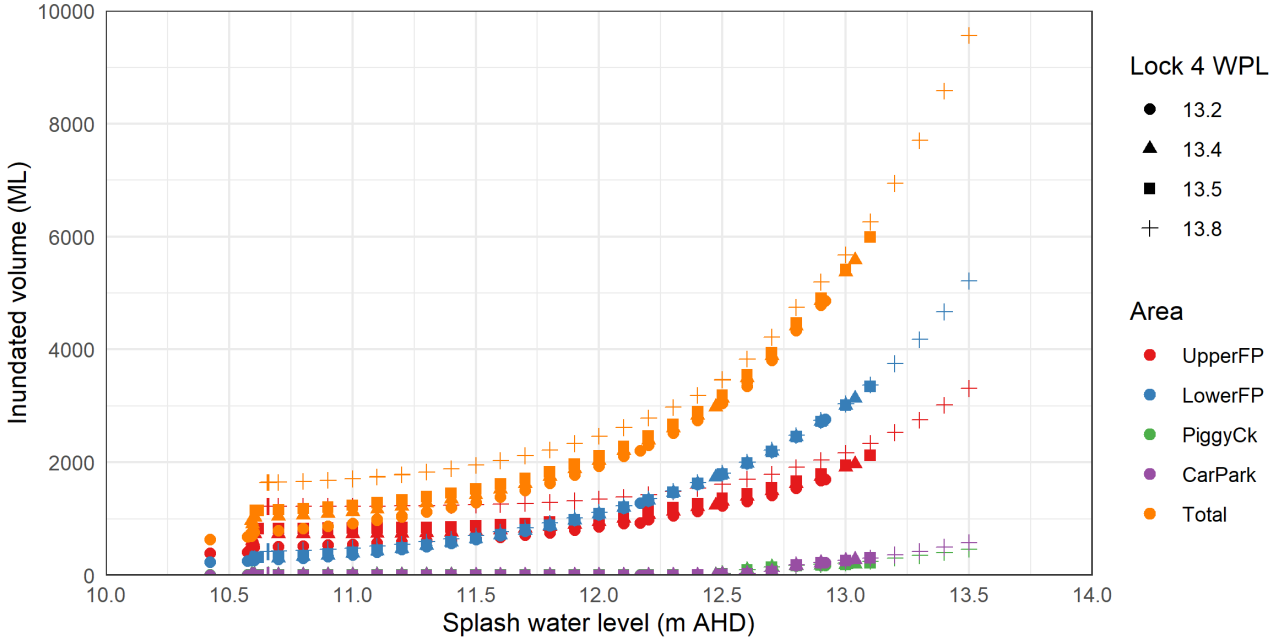


Figure 3.34. Katarapko Floodplain inundated volume versus Splash water level at various Lock 4 weir pool levels and 10 000 ML/d QSA.

Comparison of the updated relationships of The Splash water level and inundated area/volume with the previous modelling outputs suggests only relatively minor differences exist. Figure 3.35 shows the results for a Lock 4 WPL of 13.5 m AHD and 10 000 ML/d River Murray flow. The updated model results showed a marginally reduced total inundated area for a given floodplain height compared to the previous results up to a Splash water level of approximately 12.5 m AHD, while above this height the updated model showed a greater inundated area,

particularly around 12.8 to 12.9 m AHD at The Splash. Volume was also reduced from the updated model results compared to previous results up to approximately 12.5 m AHD at The Splash, but were comparable at higher levels. These differences may be at least partially related to the recalibrated Bank J inflow in the updated model, which was generally reduced compared to that predicted in the previous modelling, alongside the other model refinements. It should also be noted however that the previous Katarapko model reference the River Murray flow from approximately Lyrup (between Lock 4 and 5), whereas the updated model uses the flow downstream of Lock 6 and Chowilla Creek (i.e. approximated to QSA) and thus the flow used in the previous modelling would be equivalent to a greater QSA flow when losses are taken into account. Despite these differences, this comparison suggests that the updated relationships only a refinement than a major change on the previous outputs.

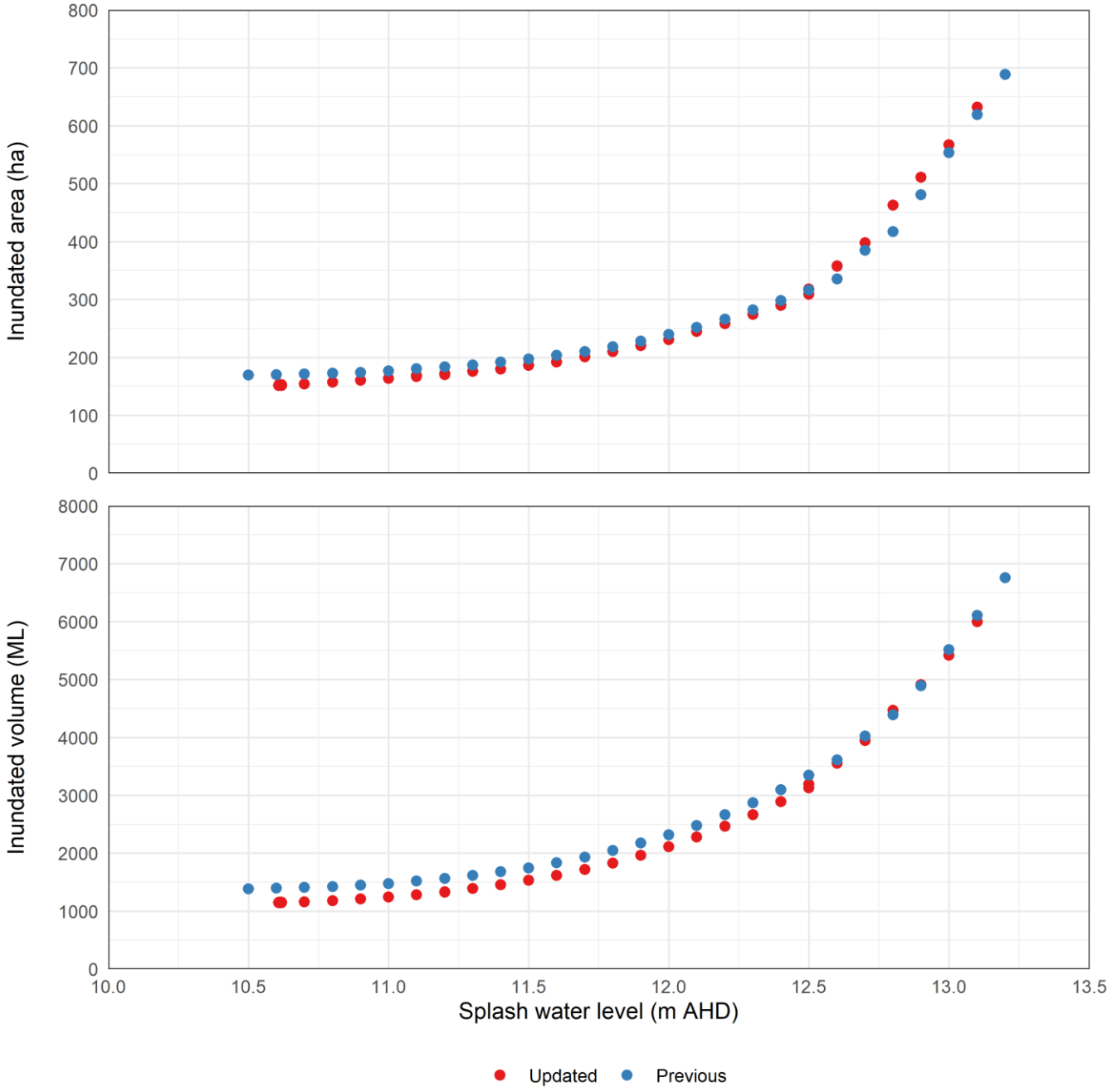


Figure 3.35. Comparison between updated and previous modelled results of Katarapko Floodplain inundated area and volume versus The Splash water level at Lock 4 weir pool level = 13.5 m AHD and 10 000 ML/d River Murray flow.

A calculation of modelled daily exchange for each floodplain at various floodplain water levels is shown in Figure 3.36 for Pike and Figure 3.37 for Katarapko. Note that these calculated values should be considered as approximations of the maximum daily exchange, assuming fully open inlet structures and steady state operation (i.e. no water level changes).

In each case, the daily exchange increases with the upstream weir pool level for a given floodplain height, owing to the increase in maximum inflows with increasing river level.

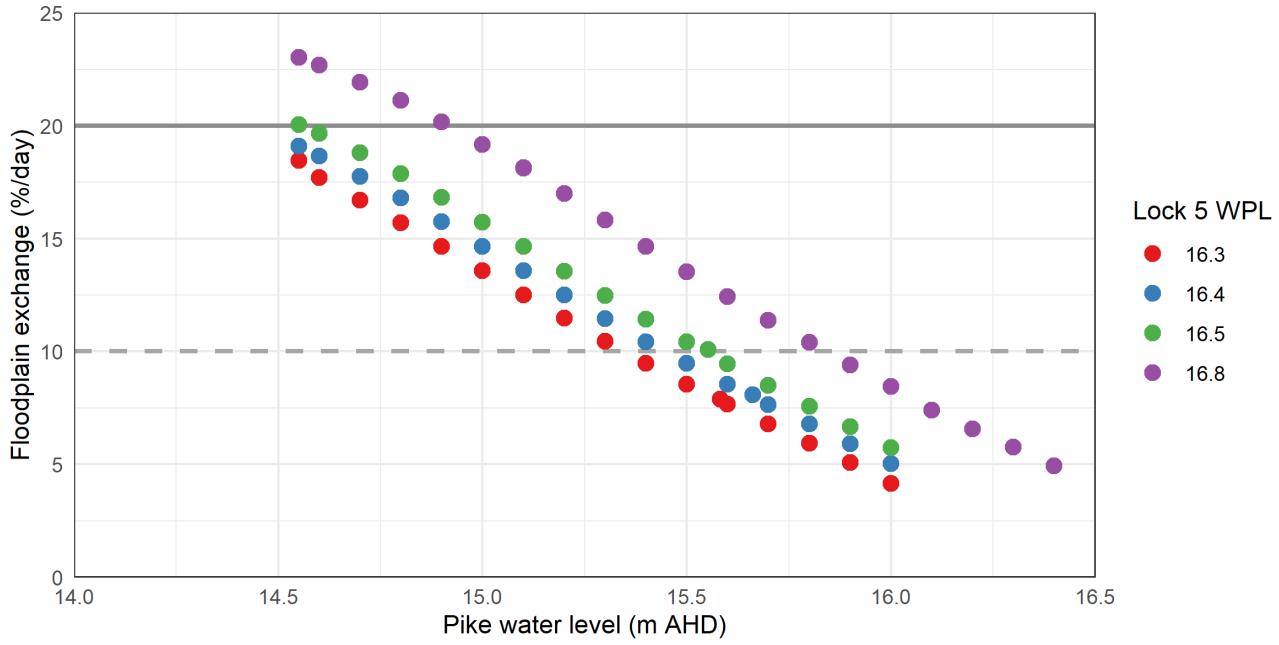


Figure 3.36. Pike floodplain approximate maximum daily exchange versus Pike regulator water level and Lock 5 weir pool level, at QSA of 10 GL/d.

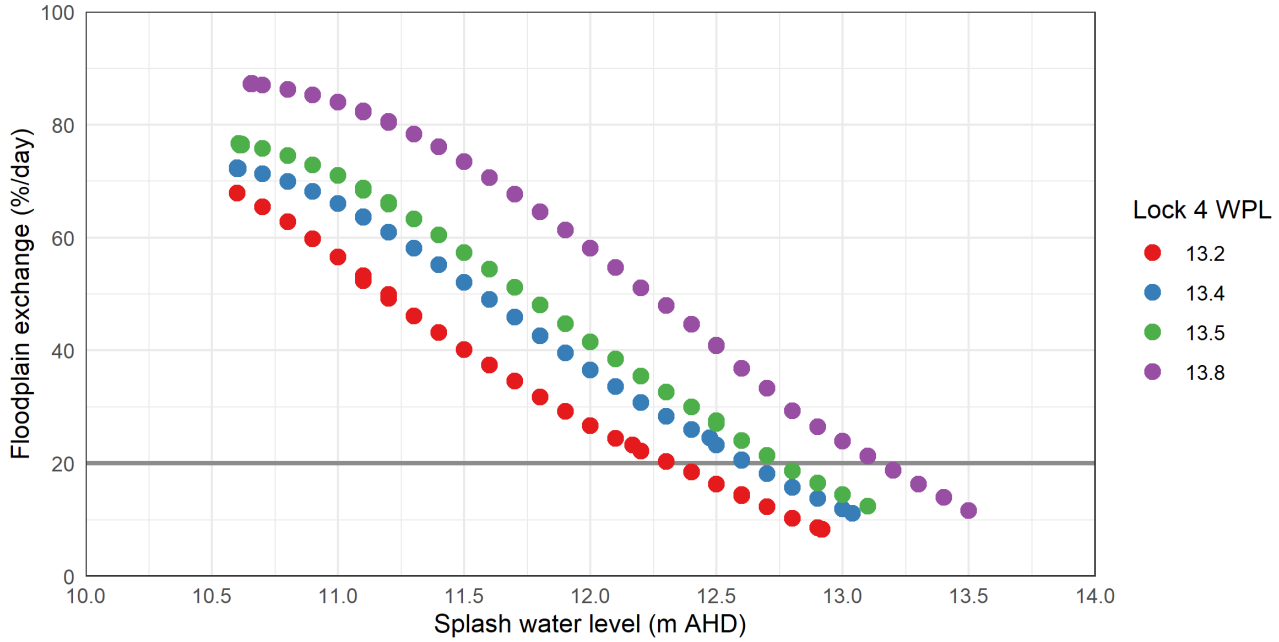


Figure 3.37. Katarapko floodplain approximate maximum daily exchange versus The Splash regulator level and Lock 4 weir pool level, at QSA of 10 GL/d.

3.5 Operating limits

Maximum floodplain operating levels that provide a steady state daily exchange of at least 10% for Pike, based on approximate QSA and Lock 5 WPL, is shown in Table 3.3. An alternative presentation of the data is presented in Table 3.4, showing the maximum Lock 5 WPL operating height for a given QSA (based on the maximum historical head difference over Lock 5), and corresponding maximum floodplain height providing a daily exchange above 10%. The results suggest that Lock 5 can be operated at top of piers level (16.8 m AHD) for QSA at and above approximately 5000 ML/d, with 15.8 m AHD the maximum Pike level to provide a 10% daily exchange.

Table 3.3. Maximum modelled water level at Pike regulator providing above 10% daily exchange for approximate QSA and Lock 5 WPL combination

QSA approximate	Lock 5 WPL (m AHD)	Pike U/S WL max (>10% exchange)
10 000	16.30	15.3
10 000	16.40	15.4
10 000	16.50	15.5
10 000	16.80	15.8

Table 3.4. Maximum Lock 5 WPL for a given QSA, and the corresponding maximum Pike regulator WL providing above a modelled 10% daily exchange

QSA approximate	Lock 5 WPL maximum allowed	Pike U/S WL max (>10% exchange)
4828	16.8	15.8
>5000	>16.8[1]	15.8

[1]Actual weir pool level cannot be raised above 16.8 m AHD, representing the top of piers level.

Maximum floodplain operating levels that provide a steady state daily exchange of at least 20% for Katarapko, based on approximate QSA and Lock 4 WPL, is shown in Table 3.5. Alternatively, the maximum Lock 4 WPL for a given QSA, with the corresponding maximum floodplain height giving a daily exchange above 20%, is presented in Table 3.6. The results suggested that the maximum floodplain level of 13.5 m AHD required a Lock 4 WPL of approximately 14.3 m AHD, marginally below the top of piers WPL (i.e. 14.34 m AHD). Based on maximum Lock 4 head difference, this required a QSA exceeding approximately 12 500 ML/d. At a Lock 4 WPL increase of approximately +60 cm, or 13.8 m AHD, the modelling suggested a QSA exceeding approximately 6000 ML/d was required, allowing a maximum floodplain level of approximately 13.1 m AHD to achieve over 20% daily exchange.

Note that the maximum allowed Lock 4 weir pool level in Table 3.6 refers to the anticipated head difference over the lock not exceeding the historical maximum. It does not however indicate any erosion issues that may be encountered downstream of the outlet structures with the extra floodplain inflows that high WPLs may generate, and would need to be considered in future planning if raising to top of piers at Lock 4 becomes feasible.

Table 3.5. Maximum modelled water level at The Splash regulator providing above 20% daily exchange for each approximate QSA and Lock 4 WPL combination

QSA approximate	Lock 4 WPL (m AHD)	Splash U/S WL max (>20% exchange)
10 000	13.2	12.3
10 000	13.4	12.6
10 000	13.5	12.7
10 000	13.8	13.1

Table 3.6. Maximum Lock 4 WPL for a given QSA based on maximum Lock 4 head difference (3.36 m), and the corresponding maximum Splash regulator WL providing above a modelled 20% daily exchange

QSA approximate	Lock 4 WPL maximum allowed (m AHD)	Splash U/S WL max (>20% exchange)
3907	13.54	12.8
5099	13.67	12.9
6306	13.78	13.1
12474	14.29	13.5
17600	14.34	13.5

4 Recommendations

The main areas for further model improvement in relation to the Pike and Katarapko floodplain areas include:

- Lock 3 to 4 weir pool: refinement the channel to improve the representation of downstream Lock 4 levels relative to river flows. This in turn will improve the comparison between observed and modelled levels downstream of The Splash environmental regulator, particularly at lower flows and levels.
- Mundic level: some refinement of the Mundic area, potentially including flow through the Mundic outlet channels, is necessary to increase the water level to match observations for various floodplain hydraulics.
- Investigate a display issue with the channel downstream (river side) of Bank B, which shows water passing through the channel in the 1D component but is not being projected into the 2D outputs.

To assist with future refinements of the model using floodplain operational data, gaugings should be performed at regular intervals at each floodplain during operational events (at least once a month, resourcing permitting, including capturing the peaks of each inundation event), with consistent locations measured at each round of gaugings to maximise the observed data available for modelling comparisons. Gauging sites as identified in Figure 1.1 and Figure 1.2 should be consistently targeted at each round of measurements where hydraulic conditions permit. Recommended gauging locations at Pike and Katarapko for future operating events to improve water accounting at each site are shown in Table 3.1 and Table 3.2, respectively.

Additional modelling should continue to be conducted over a range of different hydraulic conditions (e.g. varying WPLs, floodplain water levels, QSA) to further enhance the parameterisation of the River Murray Source model. This will also provide a more comprehensive set of data for refining operational limits tables, for ease of reference during operations planning.

Consideration should be given to refining the sub-areas in each floodplain considered in daily exchange calculations, e.g. Piggy Creek and Car Park areas, which are currently included in Katarapko calculations, but are not typically through-flow areas. Reducing volumes to only critical floodplain areas may enable greater floodplain heights to be targeted while not reducing confidence in the ability to avoid adverse water quality outcomes.

5 Conclusions

The Lock 3 to 6 hydraulic model, which was upgraded and calibrated by DHI (2020), was further refined and recalibrated following the 2020 inundation events. This has resulted in an improved, fit for purpose representation of floodplain hydraulics at each site, including a much improved representation of the flooding extents for the event target heights. With a single model now spanning from Lock 3 to 6, this provides a platform for a more integrated approach to modelling the operations at each floodplain into the future.

The recalibrated model has allowed refinements to be performed on the relationships between floodplain inundation extents and floodplain levels, while also providing greater confidence in the representation of total floodplain inflows over a variety of different hydraulic conditions. Continued modelling will allow these relationships to be further refined. Note that comparisons of the inundation area/volume relationships with those from the previous modelling suggest that the model changes have generally only been minor with regard to bulk floodplain statistics of total area and storage volume, as used in the Source model of the floodplains.

Simulation of the 2020 first operations events showed appropriate hydraulics were achieved at each site, with daily exchange at Katarapko maintained above 20% for the majority of the period, and similarly at around 15% for the Pike Floodplain.

Tables defining preliminary operating limits have been developed under a limited set of hydraulic conditions, which will continue to be developed for providing an easy to reference source of data for the initial stages of future event planning.

6 Appendices

A. Model updates

File versions

Latest file versions following current updates indicated below. The base model version naming has been prefixed with 'L3to6_Update' to identify the latest model updates, and provide a separation with the DHI updated model.

- Couple: V1-9
- MHYDRO: V1-91
    - .XNS11 (i.e. cross section file): V4-6
- M21FM: V1-9
    - .MESH (i.e. flexible mesh bathymetry file): V1-8
    - .DFS2 roughness file: V1-4
    - .MDF (i.e. mesh generator file): V1

MHYDRO file updates

New branches added, using 2 m DEM for cross-section profiling:

- Jane Eliza
    - Jane_Eliza_HouseBoatEscape – chainage 0-160, bed resistance = 0.028 (default)
    - Jane_Eliza_PondeRoad – ch. 0-165, bed resistance = 0.028 (default)
    - Jane_Eliza_BookmarkCreek – ch. 0-299.05, bed resistance = 0.028 (default)
    - Jane_Eliza_PiccaninnyLagoon – ch. 0-308.08, bed resistance = 0.028 (default)
- CarParkMid – ch. 0-601
- Kat inlets
    - Kat_MinorFR_1 – ch. 0-894, bed resistance = 0.04
    - Kat_MinorFR_2 – ch. 0-510, bed resistance = 0.04
    - Kat_MinorFR_3 – ch. 0-1001, bed resistance = 0.04
    - Kat_MinorFR_4 – ch. 0-495, bed resistance = 0.04
    - Kat_MinorFR_5 – ch. 0-200, bed resistance = 0.04
    - Kat_MinorFR_6 – ch. 0-191, bed resistance = 0.04
    - Kat_MinorFR_7 – ch. 0-809, bed resistance = 0.04
    - Kat_MinorFR_8 – ch. 0-678, bed resistance = 0.04. Weir defined at chainage 25 to represent bank.
    - Kat_MinorFR_9 – ch. 0-603, bed resistance = 0.04. Weir defined at chainage 25 to represent bank.
- Snake Creek
    - SnakeCk_MinFR1 – ch. 0-2391, bed resistance = 0.04
    - PiketoSnake_FR1 – ch. 0-627, bed resistance = 0.05
    - SnakeCk_SthFR – ch. 0-778, bed resistance = 0.05
- Mundic Creek
    - InnerMundFR_1 – ch. 0-1851, bed resistance = 0.05
    - InnerMundFR_2 – ch. 0-1089, bed resistance = 0.05
    - PikeNthLagoon1 – ch. 0-612, bed resistance = 0.06
    - PikeNthLagoon2 – ch. 0-1204, bed resistance = 0.06
- SplashtoPiggyFR – ch. 0-1467, bed resistance = 0.04
- Sawmill Creek

    - SawmillFR_W – ch. 0-850, bed resistance = 0.04. Link start branch to SAWMILL_CK, end branch to SplashtoPiggyFR.
    - SawmillFR_E – ch. 0-1103, bed resistance = 0.04. Link start branch to SAWMILL_CK
- Katarapko Northern Alignment
    - NAlignFR_W – ch. 0-1899, bed resistance = 0.04. Link end branch to upstream chainage of L4_FloodR_W.
    - NAlignFR_E – ch. 0-1848, bed resistance = 0.04. Link end branch to upstream chainage of L4_FloodR_E.

Branch and cross-section modifications:

- B_7_2 (Car Park outfall) – extended branch to north with additional cross-sections
- B_7_1 (Car Park inlet) – removed old structure (weir and pipes), replaced with trafficable ford
- MURRAY_L5_6 – realignment of branch centreline and update of cross-sections and minor branch linkages to improve 2D mapping projection
- Merreti – adjusted cross-sections with inclusion of controllable gate structure to align with recent channel upgrades.
- Woolpolool - adjusted cross-sections with inclusion of controllable gate structure to align with recent channel upgrades.
- 8, 8_1, 10 – remapped cross-sections based on DEM. Modified bed resistances to 0.65 for 8, 8_1 (Mundic North outlet) and 0.75 for 10 (Mundic South outlet.
- 5, 7 – adjusted cross-sections to improve representation of survey within channels (i.e. Swift and Wood Duck creeks, respectively). Modified bed resistances to 0.05 and 0.04, respectively.
- ECKERT_CK_1, Eckert_BankJ_S – adjusted cross-sections width and depth upstream of Bank J structure to improve representation of channel upgrades with Bank J construction. Added culverts and weir to chainage 130 in ECKERT_CK_1 to improve structure definition.
- Culv_N – Added weir to represent blocking bank (CulvN_track)
- Bank_C_N – Added weir to represent blocking bank (BankCN_track)
- Bank_C_S – Added weir to represent blocking bank (BankCS_track)

Additional bed resistance modifications:

- 19 (Snake Creek) – lowered bed resistance to n = 0.1 (from 0.2)
- Deep Creek – adjusted bed resistance to n = 0.065
- 15 (Rumpagunyah Creek) – Increase bed resistance to n = 0.06
- 4_1 (Tanyaca Creek) – lowered bed resistance in channel to n = 0.26
- Bank K/K_Sth – increase to n = 0.05
- Splash_1/2 – increase to n = 0.033
- Sawmill_Ck – increase to n = 0.065
- Eckert_Bank J_S – increase to n = 0.07

Structure additions and modifications:

- Bank J
    - Split existing gate structure specified with 3 bays (ECKERT_CK_1, ch. 110) into 3 separate gates to allow greater flexibility in independently modifying gate heights.
    - Added weir and culvert (ECKERT_CK_1, ch. 130) to provide enhanced representation of structure (previously only gate structure specified)
- Log Crossing
    - Split existing gate structure specified with 3 bays (ECKERT_CK_1, ch. 110) into 3 separate gates to allow greater flexibility in independently modifying gate heights.

M21FM file updates

Mesh modifications were conducted over several iterations to achieve the following (refer to Figure 6.1 and Figure 6.2 for comparison between initial and final mesh updates):

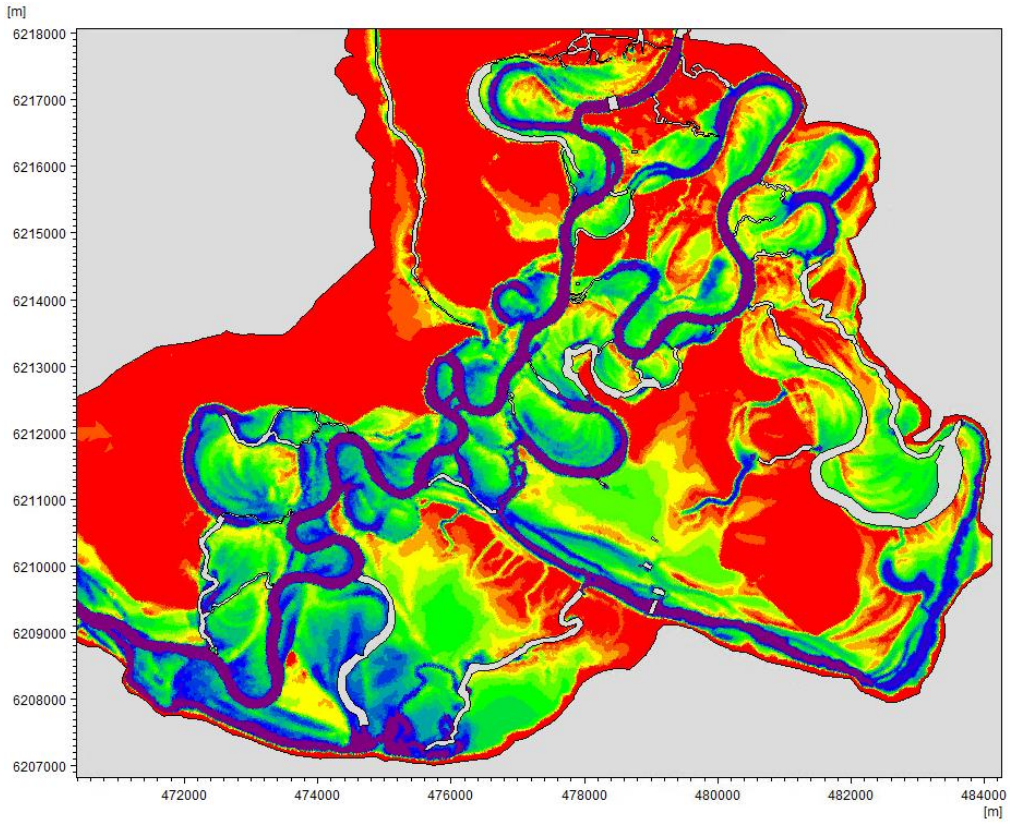
- Adjustments to the mesh structure, using the .MDF mesh generator file with definition of new arcs/polygons to generate the updated mesh, for the following purposes:
    - Exclusion of mesh coinciding with new 1D branch additions as indicated in the previous section.
    - Refinement of mesh detail with improved resolution to better represent certain landscape features as required, e.g. narrow flood runners.
- Manual adjustment of mesh elevations using the .MESH file, following the preceding mesh generation from .MDF file, for:
    - Connectivity considerations e.g. ensuring flow paths are correctly defined, free of artificial blockages; ensure high elevations in terrain are correctly defined to avoid conveyance of water below the required height.
    - At the ends of 1D branches/exclusion zones, to ensure elevations match between 1D and 2D coupling locations.

Modifications of dike structures representing blocking alignments at Pike and Katarapko:

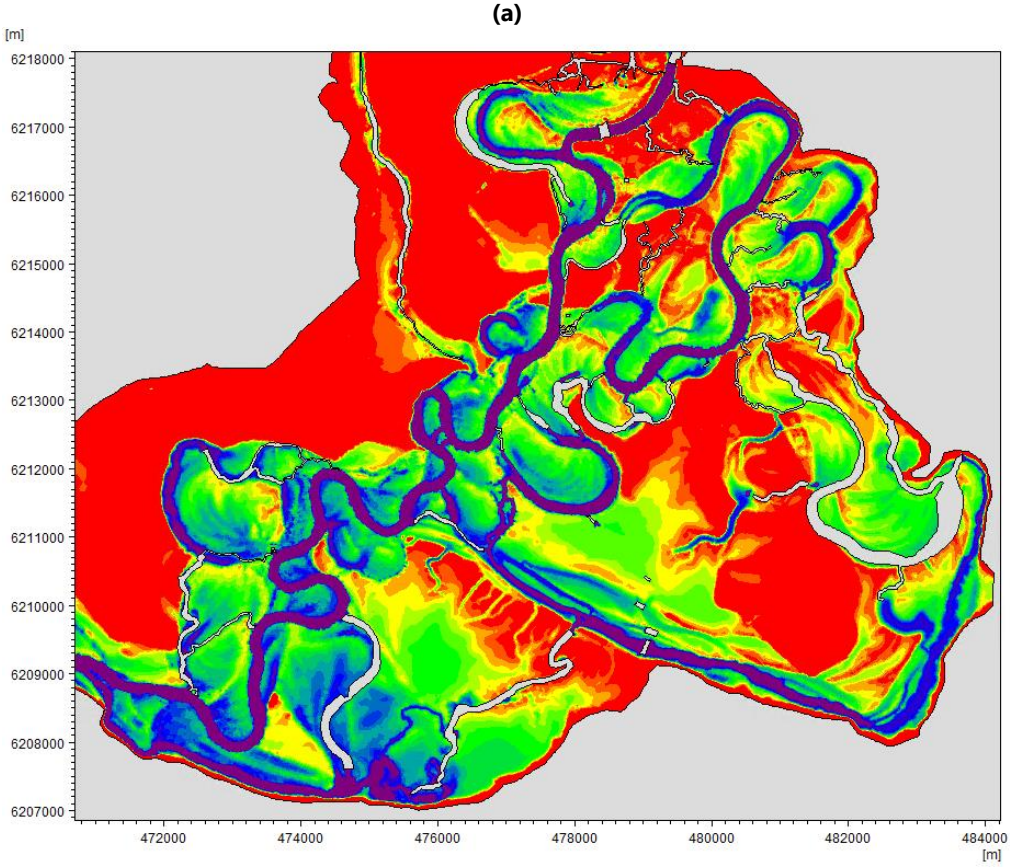
- Shift ends of various dike segments to contact with the excluded areas of the mesh (coinciding with 1D branches) to prevent bypass flows around structures e.g. right bank at Splash environmental regulator (Figure 6.3).
- Add short dike segments where missing e.g. Bank C flow paths (Figure 6.4).
- Re-added dike structures to Piggy Creek tiered watering area (Figure 6.5) to allow water to be properly retained in the area and prevent bypass flows back to Katarapko Creek.

Roughness map adjustments (refer to Figure 6.6 for spatial location of adjustments):

- Adjusted around Mundic outlets (i.e. branches 8, 8_1, 10) to match new/adjusted 1D bed resistances, noting that the 1D channel resistances source their values from those specified in MHDRO (location ‘a’ in Figure 6.6).
- Adjusted Pike lagoon and North Pike Lagoon bed roughness to n = 0.06 (location ‘b’ in Figure 6.6).
- Adjust SnakeCk_MinFR1 area roughness to n = 0.04 (location ‘c’ in Figure 6.6).
- Adjusted Tanyaca Creek roughness upstream of horseshoe to n = 0.28 (location ‘d’ in Figure 6.6).
- Adjusted bed roughness at Tanyaca horseshoe and connecting channel upstream of Rumpagunyah to n = 0.033 (location ‘e’ in Figure 6.6).
- Adjust connecting channel between Tanyaca outlet and Lower Pike to n = 0.35 (location ‘f’ in Figure 6.6).



(a)



(b)

Figure 6.1. Flexible mesh at Pike floodplain (a) initial, (b) updated.

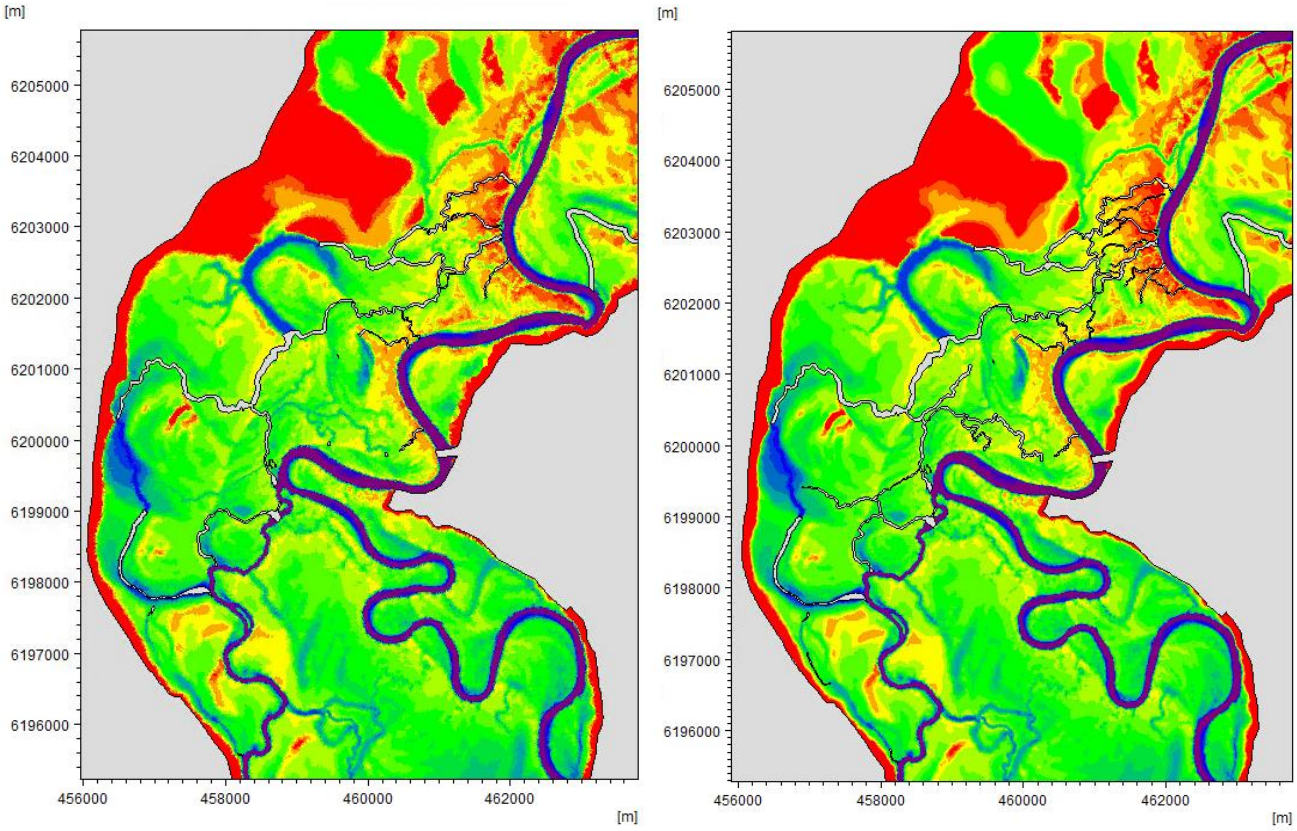


Figure 6.2. Flexible mesh at Katarapko floodplain (a) initial, (b) updated.

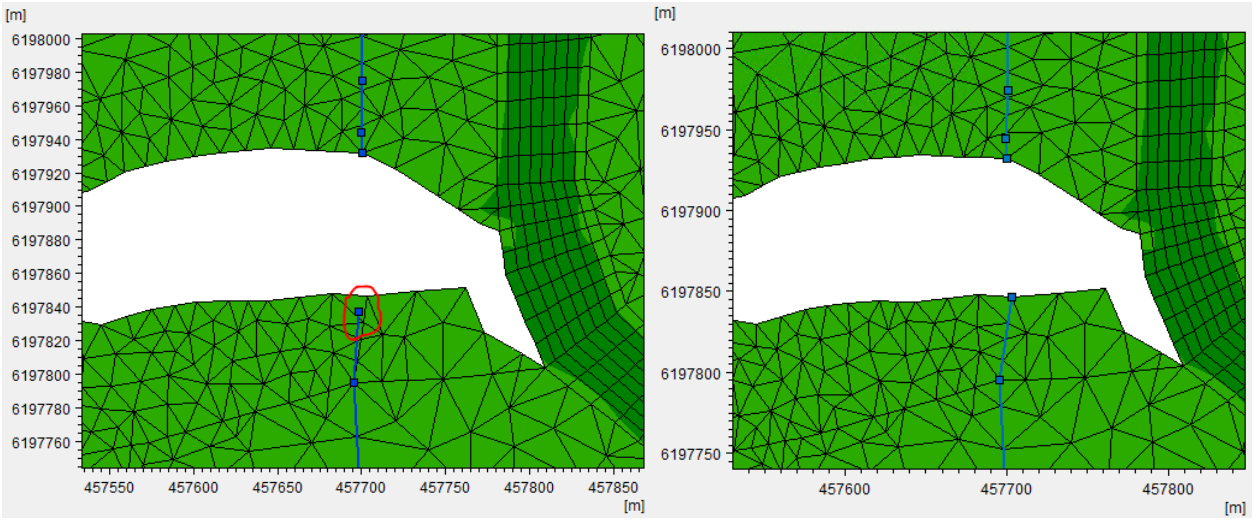
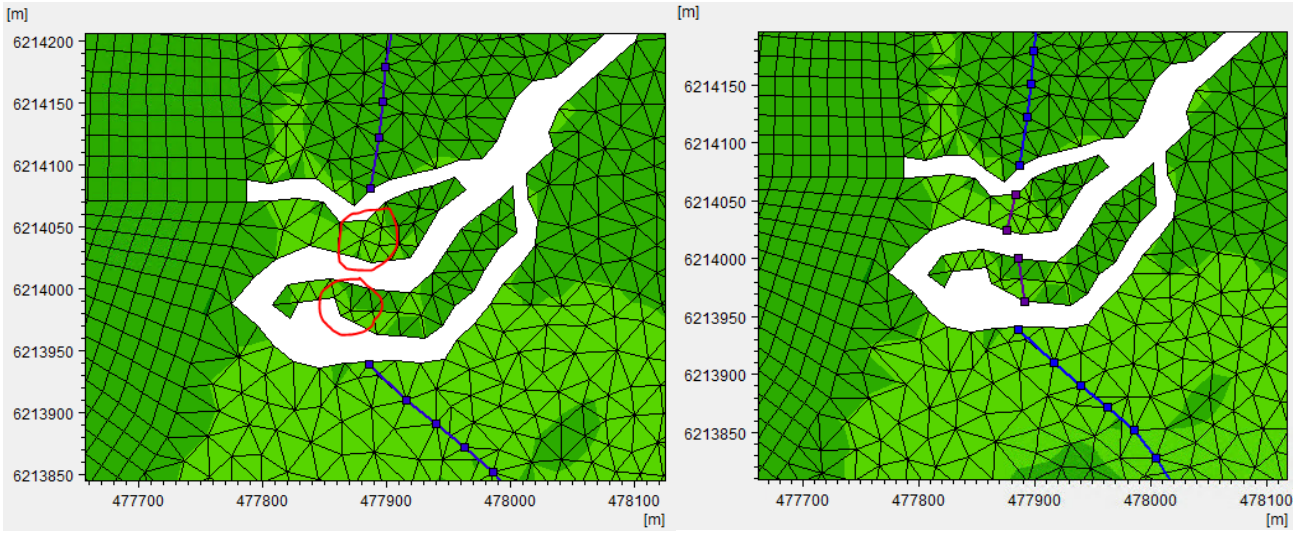
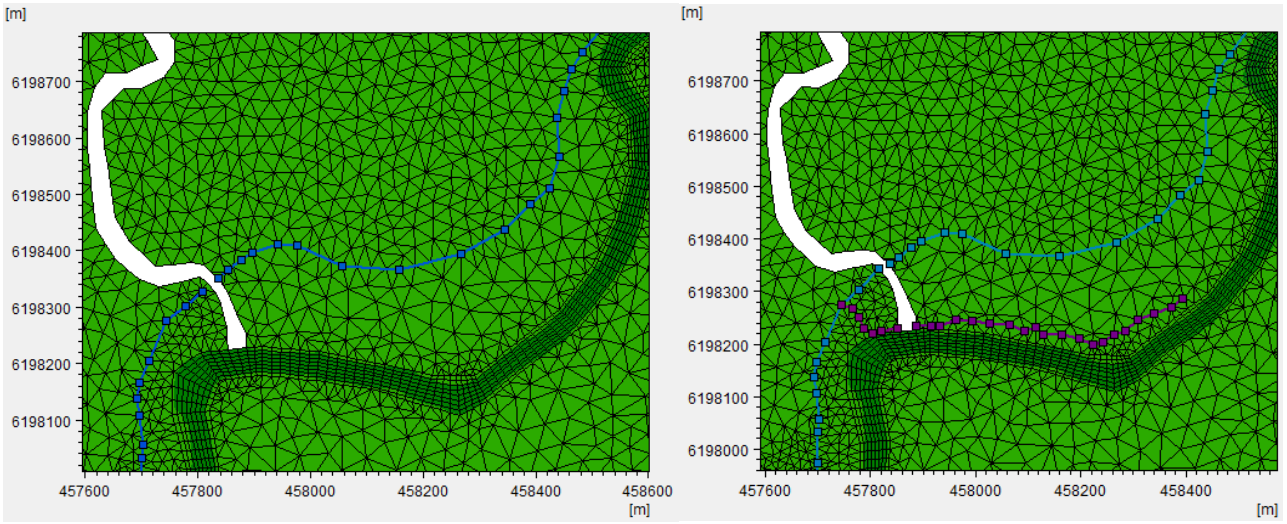


Figure 6.3. Modification of dike structure at right bank of The Splash, Katarapko Floodplain.



(a) **(b)**

Figure 6.4. Addition of dike segments at Bank C, Pike Floodplain.



(a) **(b)**

Figure 6.5. Addition of dike structures at Piggy Creek tiered watering site, Katarapko Floodplain.

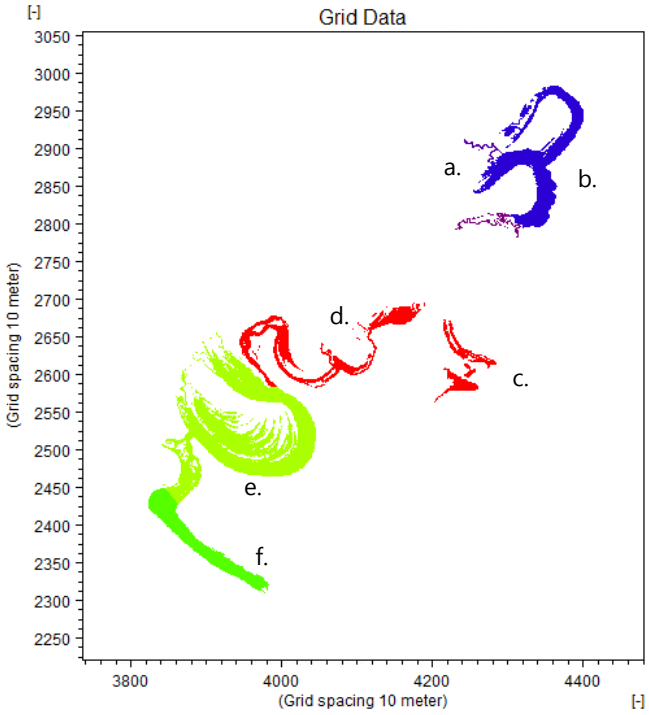
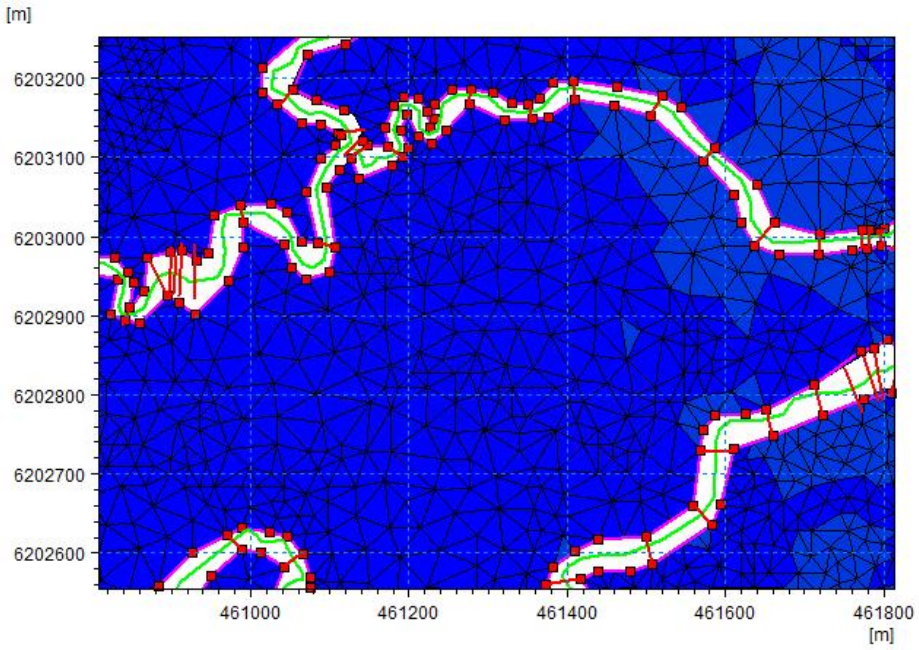


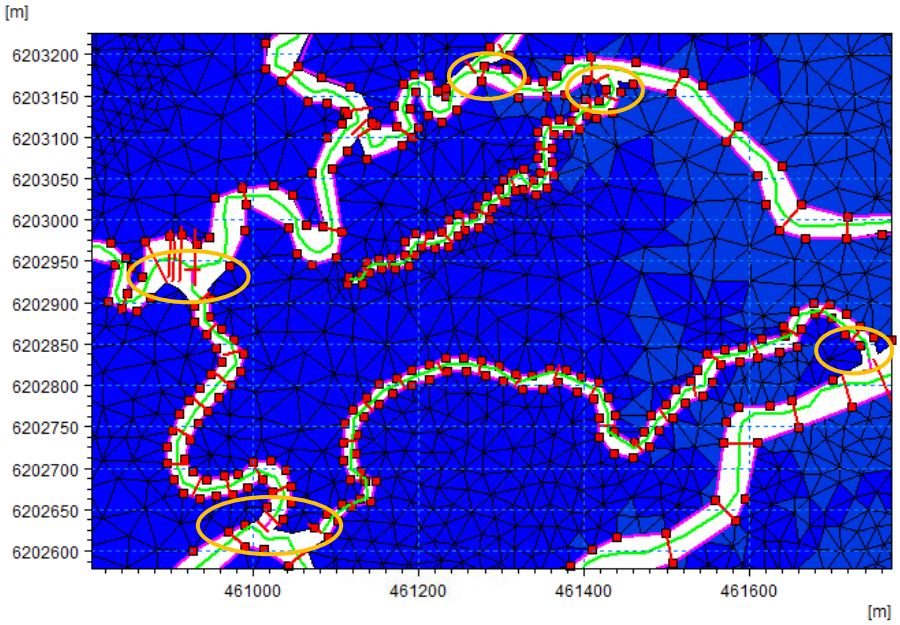
Figure 6.6. Adjusted bed roughness values at Pike Floodplain.

Couple file updates

- General adjustments:
  - Added standard and lateral links to all new 1D branches (e.g. Figure 6.7).
  - Adjusted existing lateral links to accommodate the addition of new connecting branches that intersect the existing links (e.g. Figure 6.7).
  - Minor realignment of some lateral links not appropriately defined at interface between mesh and excluded areas (e.g. Figure 6.8).
  - Adjustment of lateral link 'source' (i.e. priority source for weir calculation representing the channel bank) as required to ensure appropriate transfer of water between 1D and 2D branches e.g. branch 19 adjusted from 'HGH' source (i.e. highest elevation between 1D and 2D used to calculate weir dimensions) to 'M21' (i.e. 2D used to calculate the weir dimensions).
- Deep Creek – Pushed back start points of lateral links on each bank from chainage 55 to 122, to avoid bypassing of inlet structure.

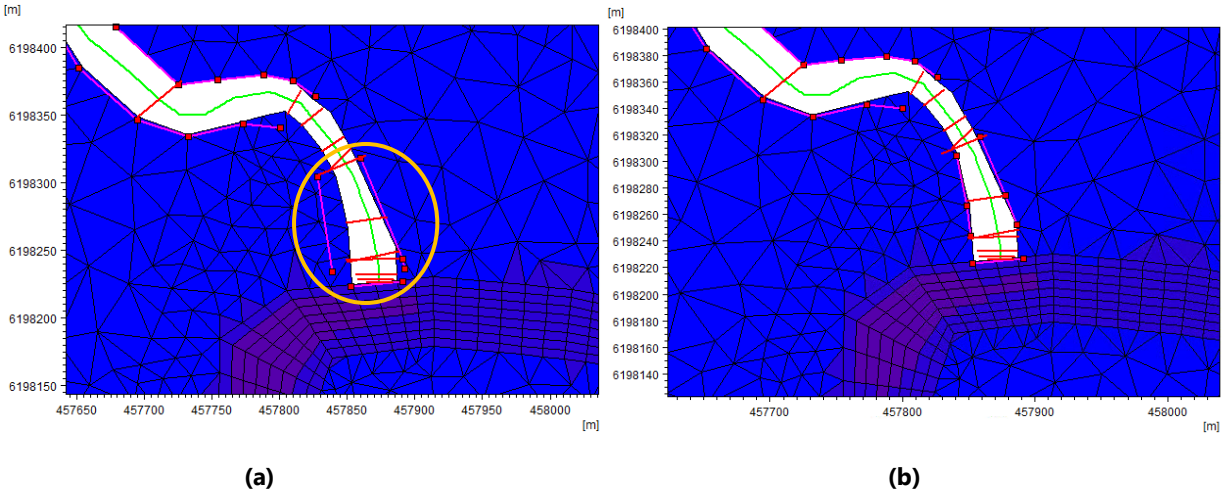


(a)



(b)

Figure 6.7. Adjustment of (a) existing lateral links to accommodate (b) new branches (adjustment locations circled in orange).



(a) **(b)**

Figure 6.8. Example of lateral link realignment at Piggy Creek outlet, from (a) existing to (b) adjusted links.

B. Updated hydraulic data

Table 6.1. Steady state in-channel hydraulic data for Pike Floodplain associated with inflows and outflows from impounded area.

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Bank B flow	Bank B2 flow	Bank C flow	Bank E overflow	Mundic North ancillary flow	Mundic South ancillary flow	Snake Creek South ancillary flow	Snake Creek North ancillary flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P1	10000	16.30	13.51	8603	13.20	9148	1234	1149	475	760	14.55	13.40	612	14.86	13.55	409	5	5	119	0	0	0	0	0
P2	10000	16.30	13.51	8604	13.20	9257	1233	1243	475	759	14.60	13.41	660	14.89	13.55	446	5	5	127	0	0	0	0	0
P3	10000	16.30	13.51	8604	13.20	9270	1232	1253	474	757	14.70	13.41	662	14.93	13.54	452	5	5	130	0	0	0	0	0
P4	10000	16.30	13.51	8604	13.20	9264	1229	1228	474	755	14.80	13.41	658	14.98	13.55	446	5	5	114	0	0	0	0	0
P5	10000	16.30	13.51	8613	13.20	9265	1226	1259	473	752	14.90	13.41	655	15.04	13.55	465	5	5	128	0	0	0	0	0
P6	10000	16.30	13.51	8622	13.20	9264	1221	1102	472	748	15.00	13.41	642	15.11	13.54	335	5	5	115	0	0	0	0	0
P7	10000	16.30	13.51	8639	13.20	9261	1213	1196	471	742	15.10	13.41	629	15.18	13.54	442	5	5	115	0	0	0	0	0
P8	10000	16.30	13.51	8643	13.20	9258	1203	1201	468	734	15.20	13.41	616	15.26	13.54	455	5	5	119	0	0	0	0	0
P9	10000	16.30	13.51	8667	13.20	9251	1189	1075	465	724	15.30	13.40	596	15.34	13.54	339	5	5	131	0	0	0	0	0
P10	10000	16.30	13.51	8679	13.20	9244	1172	1156	459	713	15.40	13.40	571	15.43	13.55	456	5	5	119	0	0	0	0	0
P11	10000	16.30	13.51	8707	13.20	9244	1150	1063	450	700	15.50	13.40	541	15.52	13.55	385	5	5	127	0	0	0	0	0
P12	10000	16.30	13.52	8735	13.20	9241	1120	1023	438	681	15.60	13.39	503	15.62	13.54	397	5	5	113	0	0	0	0	0
P13	10000	16.30	13.52	8785	13.20	9264	1078	943	423	656	15.70	13.39	457	15.71	13.55	349	5	5	126	0	0	0	0	0
P14	10000	16.30	13.52	8826	13.20	9285	1024	885	402	622	15.80	13.38	399	15.81	13.54	357	5	5	119	0	0	0	0	0
P15	10000	16.30	13.52	8902	13.20	9313	953	795	375	579	15.90	13.37	309	15.90	13.55	346	5	5	130	0	0	0	0	0
P16	10000	16.30	13.52	8997	13.20	9277	856	654	333	523	16.00	13.35	171	16.00	13.54	345	5	5	127	0	0	0	0	0
P17	10000	16.40	13.65	8450	13.40	8899	1354	1251	530	825	14.55	13.58	781	14.95	13.65	347	5	5	113	0	0	0	0	0
P18	10000	16.40	13.65	8450	13.40	8934	1354	1277	530	824	14.60	13.58	790	14.96	13.65	347	5	5	130	0	0	0	0	0
P19	10000	16.40	13.65	8445	13.40	8937	1352	1274	529	823	14.70	13.58	787	14.99	13.65	354	5	5	123	0	0	0	0	0
P20	10000	16.40	13.65	8457	13.40	8944	1349	1287	529	821	14.80	13.58	781	15.03	13.66	384	5	5	112	0	0	0	0	0
P21	10000	16.40	13.65	8475	13.40	8953	1346	1376	528	818	14.90	13.58	774	15.08	13.66	465	5	5	127	0	0	0	0	0
P22	10000	16.40	13.65	8493	13.40	8956	1341	1320	527	814	15.00	13.57	765	15.14	13.65	432	5	5	112	0	0	0	0	0
P23	10000	16.40	13.65	8493	13.40	8955	1334	1360	525	808	15.10	13.57	754	15.21	13.66	467	5	5	130	0	0	0	0	0
P24	10000	16.40	13.65	8498	13.40	8943	1324	1322	523	801	15.20	13.57	737	15.28	13.66	447	5	5	127	0	0	0	0	0
P25	10000	16.40	13.65	8517	13.40	8939	1312	1238	520	792	15.30	13.57	715	15.36	13.66	388	5	5	126	0	0	0	0	0
P26	10000	16.40	13.65	8528	13.40	8939	1299	1299	516	783	15.40	13.57	703	15.45	13.65	457	5	5	128	0	0	0	0	0

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Bank B flow	Bank B2 flow	Bank C flow	Bank E overflow	Mundic North ancillary flow	Mundic South ancillary flow	Snake Creek South ancillary flow	Snake Creek North ancillary flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P27	10000	16.40	13.66	8555	13.40	8937	1281	1177	509	772	15.50	13.57	687	15.53	13.65	365	5	5	115	0	0	0	0	0
P28	10000	16.40	13.66	8570	13.40	8944	1255	1255	499	756	15.60	13.56	658	15.62	13.66	465	5	5	121	0	0	0	0	0
P29	10000	16.40	13.66	8615	13.40	8967	1220	1087	487	734	15.70	13.56	618	15.72	13.65	344	5	5	114	0	0	0	0	0
P30	10000	16.40	13.66	8657	13.40	8956	1175	1120	469	706	15.80	13.56	551	15.81	13.66	432	5	5	127	0	0	0	0	0
P31	10000	16.40	13.66	8723	13.40	8991	1115	1067	446	669	15.90	13.55	474	15.91	13.65	468	5	5	115	0	0	0	0	0
P32	10000	16.40	13.66	8796	13.40	8971	1042	824	418	624	16.00	13.54	362	16.00	13.65	334	5	5	118	0	0	0	0	0
P33	10000	16.50	13.73	8296	13.50	8762	1481	1419	590	890	14.55	13.67	915	15.02	13.72	342	5	5	151	0	0	0	0	0
P34	10000	16.50	13.73	8304	13.50	8763	1480	1417	590	890	14.60	13.67	915	15.03	13.72	340	5	5	151	0	0	0	0	0
P35	10000	16.50	13.73	8299	13.50	8762	1479	1454	590	889	14.70	13.67	913	15.05	13.73	383	5	5	148	0	0	0	0	0
P36	10000	16.50	13.73	8305	13.50	8757	1476	1504	590	887	14.80	13.67	909	15.08	13.73	454	5	5	131	0	0	0	0	0
P37	10000	16.50	13.73	8310	13.50	8762	1473	1379	589	884	14.90	13.67	900	15.13	13.72	366	5	5	103	0	0	0	0	0
P38	10000	16.50	13.73	8314	13.50	8744	1468	1345	588	880	15.00	13.66	888	15.18	13.72	354	5	5	93	0	0	0	0	0
P39	10000	16.50	13.73	8325	13.50	8744	1461	1451	586	875	15.10	13.66	879	15.24	13.72	419	5	5	143	0	0	0	0	0
P40	10000	16.50	13.73	8327	13.50	8738	1453	1470	584	869	15.20	13.66	868	15.30	13.73	446	5	5	147	0	0	0	0	0
P41	10000	16.50	13.73	8341	13.50	8732	1444	1344	581	863	15.30	13.66	850	15.38	13.72	344	5	5	140	0	0	0	0	0
P42	10000	16.50	13.73	8346	13.50	8725	1433	1450	577	856	15.40	13.66	832	15.46	13.72	457	5	5	151	0	0	0	0	0
P43	10000	16.50	13.73	8366	13.50	8715	1417	1367	570	847	15.50	13.66	804	15.54	13.73	457	5	5	97	0	0	0	0	0
P44	10000	16.50	13.73	8388	13.50	8714	1393	1296	561	832	15.60	13.66	773	15.63	13.72	422	5	5	91	0	0	0	0	0
P45	10000	16.50	13.73	8425	13.50	8727	1360	1329	548	812	15.70	13.65	737	15.72	13.72	433	5	5	149	0	0	0	0	0
P46	10000	16.50	13.73	8462	13.50	8776	1316	1221	530	786	15.80	13.65	713	15.82	13.72	345	5	5	154	0	0	0	0	0
P47	10000	16.50	13.73	8522	13.50	8805	1261	1134	505	756	15.90	13.65	645	15.91	13.72	335	5	5	144	0	0	0	0	0
P48	10000	16.50	13.73	8595	13.50	8840	1191	1085	468	723	16.00	13.64	569	16.01	13.72	419	5	5	87	0	0	0	0	0
P49	10000	16.80	13.97	7728	13.80	8103	1932	1931	832	1100	14.55	13.94	1373	15.22	13.96	430	5	4	119	0	0	0	0	0
P50	10000	16.80	13.97	7730	13.80	8109	1932	1945	832	1100	14.60	13.94	1370	15.22	13.96	439	5	6	125	0	0	0	0	0
P51	10000	16.80	13.97	7725	13.80	8107	1931	1917	832	1099	14.70	13.94	1366	15.24	13.96	393	5	5	147	0	0	0	0	0
P52	10000	16.80	13.97	7737	13.80	8098	1930	1890	831	1099	14.80	13.94	1362	15.25	13.96	424	5	5	94	0	0	0	0	0
P53	10000	16.80	13.97	7737	13.80	8095	1928	1904	830	1098	14.90	13.94	1356	15.28	13.96	391	5	4	147	0	0	0	0	0
P54	10000	16.80	13.97	7720	13.80	8098	1926	1904	829	1097	15.00	13.94	1349	15.31	13.96	389	5	5	156	0	0	0	0	0
P55	10000	16.80	13.97	7730	13.80	8088	1924	1943	828	1096	15.10	13.94	1343	15.35	13.96	440	5	5	150	0	0	0	0	0

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Bank B flow	Bank B2 flow	Bank C flow	Bank E overflow	Mundic North ancillary flow	Mundic South ancillary flow	Snake Creek South ancillary flow	Snake Creek North ancillary flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P56	10000	16.80	13.97	7737	13.80	8085	1919	1833	825	1094	15.20	13.94	1340	15.40	13.95	367	5	6	116	0	0	0	0	0
P57	10000	16.80	13.97	7749	13.80	8079	1912	1911	822	1090	15.30	13.94	1329	15.46	13.96	439	5	6	132	0	0	0	0	0
P58	10000	16.80	13.97	7765	13.80	8083	1903	1812	818	1085	15.40	13.93	1314	15.53	13.96	373	5	6	115	0	0	0	0	0
P59	10000	16.80	13.97	7766	13.80	8087	1891	1824	813	1078	15.50	13.93	1301	15.60	13.95	394	5	4	119	0	0	0	0	0
P60	10000	16.80	13.97	7786	13.80	8078	1874	1788	806	1068	15.60	13.93	1279	15.68	13.95	362	5	6	136	0	0	0	0	0
P61	10000	16.80	13.97	7809	13.80	8088	1853	1849	797	1056	15.70	13.93	1253	15.76	13.96	428	5	5	158	0	0	0	0	0
P62	10000	16.80	13.97	7828	13.80	8111	1828	1813	786	1042	15.80	13.93	1228	15.84	13.96	441	5	6	133	0	0	0	0	0
P63	10000	16.80	13.97	7851	13.80	8128	1799	1776	770	1029	15.90	13.93	1188	15.93	13.96	423	5	5	156	0	0	0	0	0
P64	10000	16.80	13.97	7896	13.80	8160	1765	1768	750	1015	16.00	13.93	1164	16.02	13.95	435	5	5	158	0	0	1	0	0
P65	10000	16.80	13.97	7953	13.80	8231	1717	1556	724	993	16.10	13.93	1101	16.12	13.95	366	5	5	78	0	0	1	0	0
P66	10000	16.80	13.97	8012	13.80	8303	1652	1621	695	958	16.20	13.92	1038	16.21	13.96	412	5	5	159	0	0	2	0	0
P67	10000	16.80	13.97	8086	13.80	8410	1566	1514	657	909	16.30	13.92	950	16.31	13.96	398	5	5	154	0	0	2	0	0
P68	10000	16.80	13.97	8212	13.80	8385	1453	1350	609	845	16.40	13.92	825	16.40	13.95	435	5	5	77	0	0	2	0	0
P69	5000	16.30	13.29	3615	13.20	4247	1232	1147	474	758	14.55	13.32	663	14.88	13.45	366	5	5	108	0	0	0	0	0
P70	10000	16.30	13.51	8604	13.20	9246	1234	1174	475	759	14.55	13.41	666	14.88	13.55	384	5	5	113	0	0	0	0	0
P71	15000	16.30	13.78	13590	13.20	14225	1235	1116	475	760	14.55	13.55	666	14.88	13.69	347	5	5	93	0	0	0	0	0
P72	20000	16.30	14.06	18574	13.20	19172	1236	1193	476	760	14.55	13.72	670	14.88	13.86	356	5	4	158	0	0	0	0	0
P73	25000	16.30	14.33	23523	13.20	24097	1238	1207	478	760	14.55	13.91	673	14.89	14.06	368	5	4	156	0	0	0	0	0
P74	29999	16.30	14.60	28582	13.21	29087	1240	1206	479	760	14.55	14.11	678	14.89	14.26	426	5	5	92	0	0	0	0	0
P75	34996	16.30	14.85	33533	13.21	33988	1245	1167	482	763	14.55	14.31	506	14.79	14.46	381	5	182	93	0	0	0	0	0
P76	39990	16.30	15.06	38271	13.21	38647	1520	1485	483	761	14.55	14.50	698	14.90	14.65	397	12	-276	378	0	0	0	0	0
P77	44902	16.30	15.27	43256	13.36	43349	2738	2680	485	756	14.77	14.75	798	15.01	14.95	1882	-38	-630	-830	0	0	0	0	0
P78	49780	16.30	15.53	48383	13.71	48030	3289	3250	482	735	15.06	15.04	1139	15.26	15.21	2110	-186	-862	-1023	0	0	0	-1	0
P79	54658	16.30	15.75	53132	14.01	51676	3797	3723	471	708	15.30	15.27	1468	15.47	15.42	2255	-531	-967	-1119	0	0	0	-1	0
P80	59468	16.30	15.92	57964	14.21	54848	4134	4018	455	674	15.49	15.46	1740	15.65	15.60	2278	-728	-1064	-1211	0	0	0	-1	0
P81	64195	16.30	16.10	63430	14.41	57691	4393	4297	420	612	15.70	15.66	2074	15.83	15.79	2222	-869	-1116	-1236	0	-135	0	-5	0
P82	68732	16.40	16.24	68227	14.56	59017	4669	4594	458	638	15.86	15.81	2407	15.97	15.94	2183	-984	-1146	-1234	0	-195	-1	5	-13
P83	73127	16.55	16.37	72917	14.63	61392	5089	5026	503	741	15.99	15.93	2744	16.10	16.06	2227	-1142	-1182	-1213	0	-242	-1	55	-65
P84	77416	16.70	16.48	76931	14.73	61958	5451	5515	648	845	16.12	16.06	2999	16.21	16.18	2315	-1288	-1210	-1143	0	-263	0	201	-54

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Bank B flow	Bank B2 flow	Bank C flow	Bank E overflow	Mundic North ancillary flow	Mundic South ancillary flow	Snake Creek South ancillary flow	Snake Creek North ancillary flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P85	81601	16.85	16.59	80641	14.81	62397	5728	5872	761	960	16.24	16.17	3201	16.31	16.28	2435	-1428	-1246	-1044	0	-279	0	235	-10
P86	85774	16.95	16.68	84587	14.85	64332	5947	6176	841	1029	16.34	16.27	3361	16.40	16.37	2545	-1559	-1262	-962	0	-293	0	246	24
P87	89948	17.05	16.77	88118	14.91	64755	5841	6688	929	1112	16.44	16.36	3585	16.49	16.45	2779	-1588	-1234	-646	0	-332	0	260	65
P88	94142	17.15	16.85	90041	14.96	65375	5298	7439	1017	1199	16.54	16.45	3917	16.58	16.53	3118	-1463	-1230	31	0	-390	0	282	91
P89	5000	16.80	13.55	2724	13.50	3717	1925	1854	829	1097	15.00	13.63	1341	15.31	13.64	386	5	5	117	0	0	0	0	0
P90	10000	16.80	13.72	7736	13.50	8689	1926	1856	829	1097	15.00	13.69	1352	15.31	13.73	352	5	5	143	0	0	0	0	0
P91	15000	16.80	13.93	12735	13.50	13717	1928	1828	830	1098	15.00	13.81	1352	15.31	13.86	373	5	5	92	0	0	0	0	0
P92	20000	16.80	14.18	17688	13.50	18674	1929	1826	831	1098	15.00	13.95	1356	15.31	14.02	370	5	6	90	0	0	0	0	0
P93	25000	16.80	14.42	22530	13.50	23495	1931	1910	832	1099	15.00	14.10	1358	15.31	14.19	410	5	5	132	0	0	0	0	0
P94	29998	16.80	14.65	27353	13.50	28273	1932	1835	833	1099	15.00	14.27	1357	15.31	14.37	382	5	5	85	0	0	0	0	0
P95	34996	16.80	14.89	32491	13.51	33279	1934	1881	835	1099	15.00	14.45	1360	15.31	14.56	391	5	5	120	0	0	0	0	0
P96	39977	16.80	15.11	37563	13.51	38373	1936	1920	837	1099	15.00	14.64	1362	15.31	14.75	413	5	5	135	0	0	0	0	0
P97	44870	16.80	15.31	42424	13.51	43241	1939	1847	839	1099	15.00	14.80	1363	15.32	14.92	376	5	5	97	0	0	0	0	0
P98	49758	16.80	15.49	47121	13.51	47976	2111	2036	840	1098	15.00	14.96	1539	15.37	15.07	375	5	-173	118	0	0	0	0	0
P99	5000	16.80	13.55	2767	13.50	3700	1890	1758	813	1077	15.50	13.62	1277	15.60	13.64	340	5	5	131	0	0	0	0	0
P100	10000	16.80	13.72	7770	13.50	8670	1891	1774	813	1078	15.50	13.69	1279	15.60	13.72	337	5	5	148	0	0	0	0	0
P101	15000	16.80	13.93	12758	13.50	13686	1893	1850	814	1078	15.50	13.81	1285	15.60	13.86	417	5	5	137	0	0	0	0	0
P102	20000	16.80	14.18	17729	13.50	18648	1894	1829	815	1079	15.50	13.94	1285	15.60	14.02	380	5	4	155	0	0	0	0	0
P103	25000	16.80	14.42	22564	13.50	23465	1896	1821	816	1080	15.50	14.10	1285	15.60	14.19	372	5	4	155	0	0	0	0	0
P104	29998	16.80	14.65	27385	13.50	28241	1898	1848	818	1080	15.50	14.27	1285	15.60	14.37	415	5	5	138	0	0	0	0	0
P105	34996	16.80	14.89	32522	13.51	33243	1900	1821	820	1080	15.50	14.45	1294	15.60	14.56	384	5	5	133	0	0	0	0	0
P106	39977	16.80	15.11	37598	13.51	38341	1902	1852	822	1080	15.50	14.63	1296	15.60	14.75	405	5	5	142	0	0	0	0	0
P107	44870	16.80	15.31	42406	13.51	43221	2406	2348	844	1105	15.14	14.78	0	15.11	15.02	2343	5	-438	-19	0	0	0	0	0
P108	49758	16.80	15.49	47123	13.51	47952	2697	2628	842	1100	15.30	14.94	0	15.27	15.18	2628	-21	-609	-125	0	0	0	0	0
P109	5000	16.80	13.55	2884	13.50	3681	1765	1710	750	1015	16.00	13.60	1117	16.02	13.63	451	5	5	131	0	0	1	0	0
P110	10000	16.80	13.72	7901	13.50	8647	1766	1643	750	1015	16.00	13.68	1125	16.02	13.73	393	5	5	115	0	0	1	0	0
P111	15000	16.80	13.94	12888	13.50	13706	1767	1652	751	1016	16.00	13.80	1164	16.03	13.86	355	5	5	123	0	0	1	0	0
P112	20000	16.80	14.18	17854	13.50	18665	1768	1727	752	1017	16.00	13.94	1164	16.03	14.02	430	5	5	123	0	0	1	0	0
P113	25000	16.80	14.42	22689	13.50	23485	1770	1653	753	1017	16.00	14.09	1167	16.03	14.19	384	5	5	91	0	0	1	0	0

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Bank B flow	Bank B2 flow	Bank C flow	Bank E overflow	Mundic North ancillary flow	Mundic South ancillary flow	Snake Creek South ancillary flow	Snake Creek North ancillary flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P114	29998	16.80	14.66	27520	13.50	28256	1771	1707	754	1017	16.00	14.26	1166	16.03	14.37	402	5	5	128	0	0	1	0	0
P115	34996	16.80	14.89	32638	13.51	33264	1773	1692	756	1017	16.00	14.45	1170	16.03	14.56	387	5	5	125	0	0	1	0	0
P116	39977	16.80	15.11	37730	13.51	38353	1776	1705	758	1018	16.00	14.63	1170	16.03	14.75	391	5	5	133	0	0	1	0	0
P117	44870	16.80	15.31	42405	13.51	43259	2399	2349	844	1105	15.14	14.78	0	15.11	15.02	2344	5	-438	-12	0	0	0	0	0
P118	49758	16.80	15.49	47111	13.51	47950	2697	2628	842	1100	15.30	14.94	0	15.27	15.18	2628	-21	-608	-125	0	0	0	0	0

Table 6.2. Steady state in-channel hydraulic data for Pike Floodplain, lower Pike area.

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Swift Creek flow	Wood Duck creek flow	Rumpa-gunyah flow	Lower Pike flow	Lettons floodrunner flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P1	10000	16.30	13.51	8603	13.20	9148	1234	1149	475	760	14.55	13.40	612	14.86	13.55	409	32	24	189	907	0
P2	10000	16.30	13.51	8604	13.20	9257	1233	1243	475	759	14.60	13.41	660	14.89	13.55	446	30	18	210	932	0
P3	10000	16.30	13.51	8604	13.20	9270	1232	1253	474	757	14.70	13.41	662	14.93	13.54	452	30	18	211	934	0
P4	10000	16.30	13.51	8604	13.20	9264	1229	1228	474	755	14.80	13.41	658	14.98	13.55	446	30	18	209	933	0
P5	10000	16.30	13.51	8613	13.20	9265	1226	1259	473	752	14.90	13.41	655	15.04	13.55	465	30	19	208	931	0
P6	10000	16.30	13.51	8622	13.20	9264	1221	1102	472	748	15.00	13.41	642	15.11	13.54	335	31	21	204	925	0
P7	10000	16.30	13.51	8639	13.20	9261	1213	1196	471	742	15.10	13.41	629	15.18	13.54	442	32	23	199	919	0
P8	10000	16.30	13.51	8643	13.20	9258	1203	1201	468	734	15.20	13.41	616	15.26	13.54	455	34	25	194	915	0
P9	10000	16.30	13.51	8667	13.20	9251	1189	1075	465	724	15.30	13.40	596	15.34	13.54	339	35	28	185	903	0
P10	10000	16.30	13.51	8679	13.20	9244	1172	1156	459	713	15.40	13.40	571	15.43	13.55	456	37	31	176	894	0
P11	10000	16.30	13.51	8707	13.20	9244	1150	1063	450	700	15.50	13.40	541	15.52	13.55	385	39	33	163	881	0
P12	10000	16.30	13.52	8735	13.20	9241	1120	1023	438	681	15.60	13.39	503	15.62	13.54	397	41	37	147	862	0
P13	10000	16.30	13.52	8785	13.20	9264	1078	943	423	656	15.70	13.39	457	15.71	13.55	349	44	42	127	844	0
P14	10000	16.30	13.52	8826	13.20	9285	1024	885	402	622	15.80	13.38	399	15.81	13.54	357	48	47	97	821	0
P15	10000	16.30	13.52	8902	13.20	9313	953	795	375	579	15.90	13.37	309	15.90	13.55	346	52	52	52	783	0
P16	10000	16.30	13.52	8997	13.20	9277	856	654	333	523	16.00	13.35	171	16.00	13.54	345	55	56	-26	732	0
P17	10000	16.40	13.65	8450	13.40	8899	1354	1251	530	825	14.55	13.58	781	14.95	13.65	347	64	67	246	1058	0
P18	10000	16.40	13.65	8450	13.40	8934	1354	1277	530	824	14.60	13.58	790	14.96	13.65	347	63	66	249	1063	0

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Swift Creek flow	Wood Duck creek flow	Rumpa-gunyah flow	Lower Pike flow	Lettons floodrunner flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P19	10000	16.40	13.65	8445	13.40	8937	1352	1274	529	823	14.70	13.58	787	14.99	13.65	354	63	67	247	1062	0
P20	10000	16.40	13.65	8457	13.40	8944	1349	1287	529	821	14.80	13.58	781	15.03	13.66	384	64	68	246	1060	0
P21	10000	16.40	13.65	8475	13.40	8953	1346	1376	528	818	14.90	13.58	774	15.08	13.66	465	64	69	243	1059	0
P22	10000	16.40	13.65	8493	13.40	8956	1341	1320	527	814	15.00	13.57	765	15.14	13.65	432	66	71	241	1054	0
P23	10000	16.40	13.65	8493	13.40	8955	1334	1360	525	808	15.10	13.57	754	15.21	13.66	467	67	72	236	1048	0
P24	10000	16.40	13.65	8498	13.40	8943	1324	1322	523	801	15.20	13.57	737	15.28	13.66	447	68	74	229	1042	0
P25	10000	16.40	13.65	8517	13.40	8939	1312	1238	520	792	15.30	13.57	715	15.36	13.66	388	70	77	222	1035	0
P26	10000	16.40	13.65	8528	13.40	8939	1299	1299	516	783	15.40	13.57	703	15.45	13.65	457	71	78	219	1030	0
P27	10000	16.40	13.66	8555	13.40	8937	1281	1177	509	772	15.50	13.57	687	15.53	13.65	365	73	82	211	1022	0
P28	10000	16.40	13.66	8570	13.40	8944	1255	1255	499	756	15.60	13.56	658	15.62	13.66	465	76	86	201	1010	0
P29	10000	16.40	13.66	8615	13.40	8967	1220	1087	487	734	15.70	13.56	618	15.72	13.65	344	79	90	187	996	0
P30	10000	16.40	13.66	8657	13.40	8956	1175	1120	469	706	15.80	13.56	551	15.81	13.66	432	84	97	156	966	0
P31	10000	16.40	13.66	8723	13.40	8991	1115	1067	446	669	15.90	13.55	474	15.91	13.65	468	90	105	122	938	0
P32	10000	16.40	13.66	8796	13.40	8971	1042	824	418	624	16.00	13.54	362	16.00	13.65	334	95	112	68	891	0
P33	10000	16.50	13.73	8296	13.50	8762	1481	1419	590	890	14.55	13.67	915	15.02	13.72	342	67	71	283	1158	0
P34	10000	16.50	13.73	8304	13.50	8763	1480	1417	590	890	14.60	13.67	915	15.03	13.72	340	64	71	283	1159	0
P35	10000	16.50	13.73	8299	13.50	8762	1479	1454	590	889	14.70	13.67	913	15.05	13.73	383	66	70	283	1158	0
P36	10000	16.50	13.73	8305	13.50	8757	1476	1504	590	887	14.80	13.67	909	15.08	13.73	454	63	70	282	1157	0
P37	10000	16.50	13.73	8310	13.50	8762	1473	1379	589	884	14.90	13.67	900	15.13	13.72	366	64	70	280	1153	0
P38	10000	16.50	13.73	8314	13.50	8744	1468	1345	588	880	15.00	13.66	888	15.18	13.72	354	64	72	276	1148	0
P39	10000	16.50	13.73	8325	13.50	8744	1461	1451	586	875	15.10	13.66	879	15.24	13.72	419	69	77	272	1144	0
P40	10000	16.50	13.73	8327	13.50	8738	1453	1470	584	869	15.20	13.66	868	15.30	13.73	446	71	80	268	1140	0
P41	10000	16.50	13.73	8341	13.50	8732	1444	1344	581	863	15.30	13.66	850	15.38	13.72	344	73	81	263	1131	0
P42	10000	16.50	13.73	8346	13.50	8725	1433	1450	577	856	15.40	13.66	832	15.46	13.72	457	76	85	256	1123	0
P43	10000	16.50	13.73	8366	13.50	8715	1417	1367	570	847	15.50	13.66	804	15.54	13.73	457	76	87	248	1115	0
P44	10000	16.50	13.73	8388	13.50	8714	1393	1296	561	832	15.60	13.66	773	15.63	13.72	422	79	92	238	1101	0
P45	10000	16.50	13.73	8425	13.50	8727	1360	1329	548	812	15.70	13.65	737	15.72	13.72	433	85	99	224	1087	0
P46	10000	16.50	13.73	8462	13.50	8776	1316	1221	530	786	15.80	13.65	713	15.82	13.72	345	88	103	215	1078	0
P47	10000	16.50	13.73	8522	13.50	8805	1261	1134	505	756	15.90	13.65	645	15.91	13.72	335	94	112	189	1052	0
P48	10000	16.50	13.73	8595	13.50	8840	1191	1085	468	723	16.00	13.64	569	16.01	13.72	419	99	120	158	1024	0

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Swift Creek flow	Wood Duck creek flow	Rumpa-gunyah flow	Lower Pike flow	Lettons floodrunner flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P49	10000	16.80	13.97	7728	13.80	8103	1932	1931	832	1100	14.55	13.94	1373	15.22	13.96	430	51	-9	377	1427	0
P50	10000	16.80	13.97	7730	13.80	8109	1932	1945	832	1100	14.60	13.94	1370	15.22	13.96	439	53	-10	376	1427	0
P51	10000	16.80	13.97	7725	13.80	8107	1931	1917	832	1099	14.70	13.94	1366	15.24	13.96	393	53	-6	376	1426	0
P52	10000	16.80	13.97	7737	13.80	8098	1930	1890	831	1099	14.80	13.94	1362	15.25	13.96	424	50	-5	375	1425	0
P53	10000	16.80	13.97	7737	13.80	8095	1928	1904	830	1098	14.90	13.94	1356	15.28	13.96	391	52	-1	375	1424	0
P54	10000	16.80	13.97	7720	13.80	8098	1926	1904	829	1097	15.00	13.94	1349	15.31	13.96	389	53	2	373	1422	0
P55	10000	16.80	13.97	7730	13.80	8088	1924	1943	828	1096	15.10	13.94	1343	15.35	13.96	440	54	6	372	1420	0
P56	10000	16.80	13.97	7737	13.80	8085	1919	1833	825	1094	15.20	13.94	1340	15.40	13.95	367	53	9	372	1420	0
P57	10000	16.80	13.97	7749	13.80	8079	1912	1911	822	1090	15.30	13.94	1329	15.46	13.96	439	54	13	370	1417	0
P58	10000	16.80	13.97	7765	13.80	8083	1903	1812	818	1085	15.40	13.93	1314	15.53	13.96	373	55	18	367	1412	0
P59	10000	16.80	13.97	7766	13.80	8087	1891	1824	813	1078	15.50	13.93	1301	15.60	13.95	394	55	25	365	1410	0
P60	10000	16.80	13.97	7786	13.80	8078	1874	1788	806	1068	15.60	13.93	1279	15.68	13.95	362	59	34	360	1403	0
P61	10000	16.80	13.97	7809	13.80	8088	1853	1849	797	1056	15.70	13.93	1253	15.76	13.96	428	63	44	355	1397	0
P62	10000	16.80	13.97	7828	13.80	8111	1828	1813	786	1042	15.80	13.93	1228	15.84	13.96	441	66	54	348	1389	0
P63	10000	16.80	13.97	7851	13.80	8128	1799	1776	770	1029	15.90	13.93	1188	15.93	13.96	423	72	66	338	1377	0
P64	10000	16.80	13.97	7896	13.80	8160	1765	1768	750	1015	16.00	13.93	1164	16.02	13.95	435	76	75	332	1371	0
P65	10000	16.80	13.97	7953	13.80	8231	1717	1556	724	993	16.10	13.93	1101	16.12	13.95	366	83	89	315	1351	0
P66	10000	16.80	13.97	8012	13.80	8303	1652	1621	695	958	16.20	13.92	1038	16.21	13.96	412	95	108	297	1335	0
P67	10000	16.80	13.97	8086	13.80	8410	1566	1514	657	909	16.30	13.92	950	16.31	13.96	398	108	128	268	1306	0
P68	10000	16.80	13.97	8212	13.80	8385	1453	1350	609	845	16.40	13.92	825	16.40	13.95	435	119	148	227	1264	0
P69	5000	16.30	13.29	3615	13.20	4247	1232	1147	474	758	14.55	13.32	663	14.88	13.45	366	-100	-96	262	624	0
P70	10000	16.30	13.51	8604	13.20	9246	1234	1174	475	759	14.55	13.41	666	14.88	13.55	384	30	17	213	933	0
P71	15000	16.30	13.78	13590	13.20	14225	1235	1116	475	760	14.55	13.55	666	14.88	13.69	347	198	228	124	1362	0
P72	20000	16.30	14.06	18574	13.20	19172	1236	1193	476	760	14.55	13.72	670	14.88	13.86	356	378	453	-53	1944	0
P73	25000	16.30	14.33	23523	13.20	24097	1238	1207	478	760	14.55	13.91	673	14.89	14.06	368	599	730	-228	2619	0
P74	29999	16.30	14.60	28582	13.21	29087	1240	1206	479	760	14.55	14.11	678	14.89	14.26	426	852	1052	-345	3424	0
P75	34996	16.30	14.85	33533	13.21	33988	1245	1167	482	763	14.55	14.31	506	14.79	14.46	381	1092	1301	-467	4313	0
P76	39990	16.30	15.06	38271	13.21	38647	1520	1485	483	761	14.55	14.50	698	14.90	14.65	397	1339	1421	-573	5297	14
P77	44902	16.30	15.27	43256	13.36	43349	2738	2680	485	756	14.77	14.75	798	15.01	14.95	1882	1449	1295	-653	6588	65
P78	49780	16.30	15.53	48383	13.71	48030	3289	3250	482	735	15.06	15.04	1139	15.26	15.21	2110	1869	1264	-759	8017	248

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Swift Creek flow	Wood Duck creek flow	Rumpa-gunyah flow	Lower Pike flow	Lettons floodrunner flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P79	54658	16.30	15.75	53132	14.01	51676	3797	3723	471	708	15.30	15.27	1468	15.47	15.42	2255	2103	1170	-649	8885	571
P80	59468	16.30	15.92	57964	14.21	54848	4134	4018	455	674	15.49	15.46	1740	15.65	15.60	2278	2126	1094	-482	9526	795
P81	64195	16.30	16.10	63430	14.41	57691	4393	4297	420	612	15.70	15.66	2074	15.83	15.79	2222	1983	1011	-262	10214	1056
P82	68732	16.40	16.24	68227	14.56	59017	4669	4594	458	638	15.86	15.81	2407	15.97	15.94	2183	1786	895	-20	10903	1330
P83	73127	16.55	16.37	72917	14.63	61392	5089	5026	503	741	15.99	15.93	2744	16.10	16.06	2227	1643	795	180	11677	1637
P84	77416	16.70	16.48	76931	14.73	61958	5451	5515	648	845	16.12	16.06	2999	16.21	16.18	2315	1568	733	489	12443	1953
P85	81601	16.85	16.59	80641	14.81	62397	5728	5872	761	960	16.24	16.17	3201	16.31	16.28	2435	1553	722	1008	13200	2199
P86	85774	16.95	16.68	84587	14.85	64332	5947	6176	841	1029	16.34	16.27	3361	16.40	16.37	2545	1566	732	1381	13927	2333
P87	89948	17.05	16.77	88118	14.91	64755	5841	6688	929	1112	16.44	16.36	3585	16.49	16.45	2779	1581	739	1777	14610	2380
P88	94142	17.15	16.85	90041	14.96	65375	5298	7439	1017	1199	16.54	16.45	3917	16.58	16.53	3118	1579	728	2047	15086	2386
P89	5000	16.80	13.55	2724	13.50	3717	1925	1854	829	1097	15.00	13.63	1341	15.31	13.64	386	-150	-186	429	968	0
P90	10000	16.80	13.72	7736	13.50	8689	1926	1856	829	1097	15.00	13.69	1352	15.31	13.73	352	-17	-57	386	1280	0
P91	15000	16.80	13.93	12735	13.50	13717	1928	1828	830	1098	15.00	13.81	1352	15.31	13.86	373	196	226	369	1799	0
P92	20000	16.80	14.18	17688	13.50	18674	1929	1826	831	1098	15.00	13.95	1356	15.31	14.02	370	400	482	258	2371	0
P93	25000	16.80	14.42	22530	13.50	23495	1931	1910	832	1099	15.00	14.10	1358	15.31	14.19	410	623	753	97	3043	0
P94	29998	16.80	14.65	27353	13.50	28273	1932	1835	833	1099	15.00	14.27	1357	15.31	14.37	382	843	1030	44	3821	0
P95	34996	16.80	14.89	32491	13.51	33279	1934	1881	835	1099	15.00	14.45	1360	15.31	14.56	391	1067	1266	-172	4740	13
P96	39977	16.80	15.11	37563	13.51	38373	1936	1920	837	1099	15.00	14.64	1362	15.31	14.75	413	1355	1354	-452	5748	41
P97	44870	16.80	15.31	42424	13.51	43241	1939	1847	839	1099	15.00	14.80	1363	15.32	14.92	376	1676	1411	-665	6773	89
P98	49758	16.80	15.49	47121	13.51	47976	2111	2036	840	1098	15.00	14.96	1539	15.37	15.07	375	2001	1410	-766	7811	168
P99	5000	16.80	13.55	2767	13.50	3700	1890	1758	813	1077	15.50	13.62	1277	15.60	13.64	340	-144	-179	414	936	0
P100	10000	16.80	13.72	7770	13.50	8670	1891	1774	813	1078	15.50	13.69	1279	15.60	13.72	337	7	-47	372	1260	0
P101	15000	16.80	13.93	12758	13.50	13686	1893	1850	814	1078	15.50	13.81	1285	15.60	13.86	417	203	236	344	1768	0
P102	20000	16.80	14.18	17729	13.50	18648	1894	1829	815	1079	15.50	13.94	1285	15.60	14.02	380	406	490	225	2346	0
P103	25000	16.80	14.42	22564	13.50	23465	1896	1821	816	1080	15.50	14.10	1285	15.60	14.19	372	625	756	51	3025	0
P104	29998	16.80	14.65	27385	13.50	28241	1898	1848	818	1080	15.50	14.27	1285	15.60	14.37	415	847	1035	4	3801	0
P105	34996	16.80	14.89	32522	13.51	33243	1900	1821	820	1080	15.50	14.45	1294	15.60	14.56	384	1069	1271	-199	4720	13
P106	39977	16.80	15.11	37598	13.51	38341	1902	1852	822	1080	15.50	14.63	1296	15.60	14.75	405	1357	1357	-473	5728	41
P107	44870	16.80	15.31	42406	13.51	43221	2406	2348	844	1105	15.14	14.78	0	15.11	15.02	2343	1466	1264	-878	6609	96
P108	49758	16.80	15.49	47123	13.51	47952	2697	2628	842	1100	15.30	14.94	0	15.27	15.18	2628	1770	1273	-1006	7631	177

No.	QSA	Lock 5 U/S WL	Lock 5 D/S WL	Flow D/S Lock 5	Lock 4 U/S WL	Flow D/S Lock 4	Pike Total Inflow	Pike Total Outflow	Margaret Dowling Inflow	Deep Creek Inflow	Pike regulator U/S WL	Pike regulator D/S WL	Pike regulator outflow	Tanyaca U/S WL	Tanyaca D/S WL	Tanyaca regulator outflow	Swift Creek flow	Wood Duck creek flow	Rumpa-gunyah flow	Lower Pike flow	Lettons floodrunner flow
	ML/d	m AHD	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
P109	5000	16.80	13.55	2884	13.50	3681	1765	1710	750	1015	16.00	13.60	1117	16.02	13.63	451	-128	-158	373	853	0
P110	10000	16.80	13.72	7901	13.50	8647	1766	1643	750	1015	16.00	13.68	1125	16.02	13.73	393	32	-1	337	1214	0
P111	15000	16.80	13.94	12888	13.50	13706	1767	1652	751	1016	16.00	13.80	1164	16.03	13.86	355	216	255	295	1728	0
P112	20000	16.80	14.18	17854	13.50	18665	1768	1727	752	1017	16.00	13.94	1164	16.03	14.02	430	413	501	157	2312	0
P113	25000	16.80	14.42	22689	13.50	23485	1770	1653	753	1017	16.00	14.09	1167	16.03	14.19	384	629	762	-37	3004	0
P114	29998	16.80	14.66	27520	13.50	28256	1771	1707	754	1017	16.00	14.26	1166	16.03	14.37	402	853	1041	-76	3782	0
P115	34996	16.80	14.89	32638	13.51	33264	1773	1692	756	1017	16.00	14.45	1170	16.03	14.56	387	1077	1278	-252	4694	13
P116	39977	16.80	15.11	37730	13.51	38353	1776	1705	758	1018	16.00	14.63	1170	16.03	14.75	391	1364	1362	-516	5705	42
P117	44870	16.80	15.31	42405	13.51	43259	2399	2349	844	1105	15.14	14.78	0	15.11	15.02	2344	1467	1265	-877	6612	96
P118	49758	16.80	15.49	47111	13.51	47950	2697	2628	842	1100	15.30	14.94	0	15.27	15.18	2628	1770	1273	-1006	7631	177

Table 6.3. Steady state modelled inundated area, volume and daily exchange for Pike Floodplain, managed impounded area.

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Tanyaca U/S WL	Tanyaca regulator outflow	Mundic wetted area	Pike wetted area	Total wetted area	Mundic impounded volume	Pike impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ha	ha	ha	ML	ML	ML	%
P1	10000	16.30	13.20	1234	14.55	14.86	409	237	303	541	3706	2980	6686	17.2
P2	10000	16.30	13.20	1233	14.60	14.89	446	255	313	568	3848	3121	6969	17.8
P3	10000	16.30	13.20	1232	14.70	14.93	452	265	332	597	3987	3388	7375	17.0
P4	10000	16.30	13.20	1229	14.80	14.98	446	279	359	638	4135	3695	7830	15.7
P5	10000	16.30	13.20	1226	14.90	15.04	465	296	394	690	4311	4050	8361	15.1
P6	10000	16.30	13.20	1221	15.00	15.11	335	318	438	757	4530	4458	8988	12.3
P7	10000	16.30	13.20	1213	15.10	15.18	442	344	479	823	4784	4912	9696	12.3
P8	10000	16.30	13.20	1203	15.20	15.26	455	370	526	896	5073	5405	10478	11.5
P9	10000	16.30	13.20	1189	15.30	15.34	339	392	591	983	5395	5969	11364	9.5
P10	10000	16.30	13.20	1172	15.40	15.43	456	423	650	1073	5772	6590	12362	9.3
P11	10000	16.30	13.20	1150	15.50	15.52	385	450	708	1158	6174	7272	13447	7.9
P12	10000	16.30	13.20	1120	15.60	15.62	397	474	771	1245	6608	8019	14627	7.0
P13	10000	16.30	13.20	1078	15.70	15.71	349	500	829	1329	7074	8832	15906	5.9
P14	10000	16.30	13.20	1024	15.80	15.81	357	525	886	1411	7574	9702	17276	5.1

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Tanyaca U/S WL	Tanyaca regulator outflow	Mundic wetted area	Pike wetted area	Total wetted area	Mundic impounded volume	Pike impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ha	ha	ha	ML	ML	ML	%
P15	10000	16.30	13.20	953	15.90	15.90	346	551	966	1517	8102	10708	18810	4.2
P16	10000	16.30	13.20	856	16.00	16.00	345	574	1052	1627	8655	11969	20625	3.2
P17	10000	16.40	13.40	1354	14.55	14.95	347	268	313	581	4025	3067	7092	17.6
P18	10000	16.40	13.40	1354	14.60	14.96	347	271	321	592	4066	3187	7253	17.6
P19	10000	16.40	13.40	1352	14.70	14.99	354	282	342	623	4165	3449	7614	16.7
P20	10000	16.40	13.40	1349	14.80	15.03	384	294	365	660	4290	3744	8034	16.0
P21	10000	16.40	13.40	1346	14.90	15.08	465	311	401	712	4447	4093	8541	16.1
P22	10000	16.40	13.40	1341	15.00	15.14	432	333	442	775	4651	4498	9149	14.4
P23	10000	16.40	13.40	1334	15.10	15.21	467	352	483	835	4884	4942	9826	13.8
P24	10000	16.40	13.40	1324	15.20	15.28	447	375	529	905	5154	5431	10585	12.5
P25	10000	16.40	13.40	1312	15.30	15.36	388	397	594	991	5463	5992	11454	10.8
P26	10000	16.40	13.40	1299	15.40	15.45	457	427	652	1079	5834	6612	12447	10.4
P27	10000	16.40	13.40	1281	15.50	15.53	365	453	711	1164	6229	7293	13522	8.7
P28	10000	16.40	13.40	1255	15.60	15.62	465	477	773	1250	6656	8037	14693	8.5
P29	10000	16.40	13.40	1220	15.70	15.72	344	502	830	1333	7114	8847	15962	6.8
P30	10000	16.40	13.40	1175	15.80	15.81	432	527	886	1413	7602	9712	17315	6.5
P31	10000	16.40	13.40	1115	15.90	15.91	468	552	969	1521	8125	10727	18852	5.7
P32	10000	16.40	13.40	1042	16.00	16.00	334	576	1056	1631	8674	12028	20702	4.0
P33	10000	16.50	13.50	1481	14.55	15.02	342	288	325	613	4241	3149	7389	19.2
P34	10000	16.50	13.50	1480	14.60	15.03	340	292	333	625	4272	3263	7535	18.8
P35	10000	16.50	13.50	1479	14.70	15.05	383	299	351	650	4349	3515	7864	18.5
P36	10000	16.50	13.50	1476	14.80	15.08	454	313	374	686	4460	3801	8261	18.2
P37	10000	16.50	13.50	1473	14.90	15.13	366	329	410	739	4609	4148	8757	15.7
P38	10000	16.50	13.50	1468	15.00	15.18	354	343	449	792	4782	4549	9330	14.4
P39	10000	16.50	13.50	1461	15.10	15.24	419	364	486	850	5002	4979	9981	14.5
P40	10000	16.50	13.50	1453	15.20	15.30	446	382	538	920	5250	5466	10716	13.7
P41	10000	16.50	13.50	1444	15.30	15.38	344	406	598	1003	5551	6020	11571	11.6
P42	10000	16.50	13.50	1433	15.40	15.46	457	432	655	1087	5900	6635	12536	11.6
P43	10000	16.50	13.50	1417	15.50	15.54	457	457	713	1170	6283	7312	13595	10.1
P44	10000	16.50	13.50	1393	15.60	15.63	422	479	775	1254	6699	8053	14752	8.8

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Tanyaca U/S WL	Tanyaca regulator outflow	Mundic wetted area	Pike wetted area	Total wetted area	Mundic impounded volume	Pike impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ha	ha	ha	ML	ML	ML	%
P45	10000	16.50	13.50	1360	15.70	15.72	433	505	831	1336	7152	8861	16012	8.3
P46	10000	16.50	13.50	1316	15.80	15.82	345	529	888	1417	7641	9729	17370	7.0
P47	10000	16.50	13.50	1261	15.90	15.91	335	553	972	1525	8155	10751	18906	6.0
P48	10000	16.50	13.50	1191	16.00	16.01	419	577	1058	1634	8699	12057	20755	5.2
P49	10000	16.80	13.80	1932	14.55	15.22	430	358	366	724	4952	3443	8395	23.0
P50	10000	16.80	13.80	1932	14.60	15.22	439	360	373	733	4970	3548	8519	22.8
P51	10000	16.80	13.80	1931	14.70	15.24	393	365	391	756	5020	3784	8803	21.8
P52	10000	16.80	13.80	1930	14.80	15.25	424	371	411	782	5083	4057	9140	20.7
P53	10000	16.80	13.80	1928	14.90	15.28	391	377	438	816	5179	4387	9565	19.9
P54	10000	16.80	13.80	1926	15.00	15.31	389	386	471	858	5302	4746	10048	19.0
P55	10000	16.80	13.80	1924	15.10	15.35	440	397	508	905	5457	5152	10608	18.3
P56	10000	16.80	13.80	1919	15.20	15.40	367	415	564	980	5672	5630	11302	16.2
P57	10000	16.80	13.80	1912	15.30	15.46	439	434	616	1050	5925	6163	12088	15.8
P58	10000	16.80	13.80	1903	15.40	15.53	373	453	670	1123	6221	6759	12980	14.0
P59	10000	16.80	13.80	1891	15.50	15.60	394	472	725	1197	6558	7418	13977	13.0
P60	10000	16.80	13.80	1874	15.60	15.68	362	493	784	1276	6932	8145	15076	11.9
P61	10000	16.80	13.80	1853	15.70	15.76	428	515	838	1353	7351	8941	16292	11.3
P62	10000	16.80	13.80	1828	15.80	15.84	441	537	893	1431	7801	9792	17593	10.3
P63	10000	16.80	13.80	1799	15.90	15.93	423	560	978	1538	8292	10831	19122	9.3
P64	10000	16.80	13.80	1765	16.00	16.02	435	582	1062	1644	8812	12113	20926	8.4
P65	10000	16.80	13.80	1717	16.10	16.12	366	604	1289	1892	9363	13855	23217	6.7
P66	10000	16.80	13.80	1652	16.20	16.21	412	623	1385	2008	9943	15210	25153	6.4
P67	10000	16.80	13.80	1566	16.30	16.31	398	643	1480	2122	10551	16659	27209	5.6
P68	10000	16.80	13.80	1453	16.40	16.40	435	685	1581	2266	11273	18213	29486	4.6
P69	5000	16.30	13.20	1232	14.55	14.88	366	251	305	556	3787	3003	6790	16.9
P70	10000	16.30	13.20	1234	14.55	14.88	384	253	304	557	3813	3003	6815	17.2
P71	15000	16.30	13.20	1235	14.55	14.88	347	255	303	559	3838	3003	6841	16.3
P72	20000	16.30	13.20	1236	14.55	14.88	356	257	303	560	3855	3005	6860	17.4
P73	25000	16.30	13.20	1238	14.55	14.89	368	257	303	560	3861	3006	6867	17.6
P74	29999	16.30	13.21	1240	14.55	14.89	426	257	303	560	3865	3008	6872	17.5

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Tanyaca U/S WL	Tanyaca regulator outflow	Mundic wetted area	Pike wetted area	Total wetted area	Mundic impounded volume	Pike impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ha	ha	ha	ML	ML	ML	%
P75	34996	16.30	13.21	1245	14.55	14.79	381	248	292	541	3628	2924	6552	17.8
P76	39990	16.30	13.21	1520	14.55	14.90	397	260	304	564	3899	3019	6919	21.5
P77	44902	16.30	13.36	2738	14.77	15.01	1882	293	359	653	4277	3651	7928	33.8
P78	49780	16.30	13.71	3289	15.06	15.26	2110	376	487	863	5160	4898	10058	32.3
P79	54658	16.30	14.01	3797	15.30	15.47	2255	442	636	1079	6038	6261	12299	30.3
P80	59468	16.30	14.21	4134	15.49	15.65	2278	487	754	1241	6832	7580	14412	27.9
P81	64195	16.30	14.41	4393	15.70	15.83	2222	534	908	1442	7753	9253	17006	25.3
P82	68732	16.40	14.56	4669	15.86	15.97	2183	573	1060	1633	8578	10878	19456	23.6
P83	73127	16.55	14.63	5089	15.99	16.10	2227	604	1200	1804	9301	12635	21936	22.9
P84	77416	16.70	14.73	5451	16.12	16.21	2315	628	1336	1964	10023	14491	24514	22.5
P85	81601	16.85	14.81	5728	16.24	16.31	2435	650	1449	2099	10690	16129	26820	21.9
P86	85774	16.95	14.85	5947	16.34	16.40	2545	691	1540	2231	11360	17582	28942	21.3
P87	89948	17.05	14.91	5841	16.44	16.49	2779	711	1647	2358	12013	19194	31207	21.4
P88	94142	17.15	14.96	5298	16.54	16.58	3118	731	1732	2463	12693	20870	33563	22.2
P89	5000	16.80	13.50	1925	15.00	15.31	386	385	471	856	5291	4740	10031	18.5
P90	10000	16.80	13.50	1926	15.00	15.31	352	386	471	858	5299	4744	10043	18.5
P91	15000	16.80	13.50	1928	15.00	15.31	373	386	471	858	5301	4745	10045	18.2
P92	20000	16.80	13.50	1929	15.00	15.31	370	386	471	858	5303	4746	10048	18.2
P93	25000	16.80	13.50	1931	15.00	15.31	410	387	472	858	5306	4747	10053	19.0
P94	29998	16.80	13.50	1932	15.00	15.31	382	387	472	858	5308	4747	10055	18.3
P95	34996	16.80	13.51	1934	15.00	15.31	391	387	472	859	5310	4748	10059	18.7
P96	39977	16.80	13.51	1936	15.00	15.31	413	387	472	859	5314	4749	10063	19.1
P97	44870	16.80	13.51	1939	15.00	15.32	376	387	472	859	5316	4750	10067	18.3
P98	49758	16.80	13.51	2111	15.00	15.37	375	404	482	886	5520	4846	10365	19.6
P99	5000	16.80	13.50	1890	15.50	15.60	340	471	725	1196	6546	7411	13957	12.6
P100	10000	16.80	13.50	1891	15.50	15.60	337	471	725	1196	6547	7411	13958	12.7
P101	15000	16.80	13.50	1893	15.50	15.60	417	471	725	1196	6548	7412	13959	13.2
P102	20000	16.80	13.50	1894	15.50	15.60	380	471	725	1196	6549	7412	13962	13.1
P103	25000	16.80	13.50	1896	15.50	15.60	372	471	725	1196	6551	7413	13964	13.0
P104	29998	16.80	13.50	1898	15.50	15.60	415	472	725	1197	6553	7413	13966	13.2

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Tanyaca U/S WL	Tanyaca regulator outflow	Mundic wetted area	Pike wetted area	Total wetted area	Mundic impounded volume	Pike impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	m AHD	ML/d	m AHD	m AHD	ML/d	ha	ha	ha	ML	ML	ML	%
P105	34996	16.80	13.51	1900	15.50	15.60	384	472	725	1197	6554	7414	13968	13.0
P106	39977	16.80	13.51	1902	15.50	15.60	405	472	725	1197	6557	7415	13972	13.3
P107	44870	16.80	13.51	2406	15.14	15.11	2343	344	499	843	4671	5014	9685	24.2
P108	49758	16.80	13.51	2697	15.30	15.27	2628	386	582	969	5250	5891	11140	23.6
P109	5000	16.80	13.50	1765	16.00	16.02	451	582	1051	1632	8809	11892	20700	8.3
P110	10000	16.80	13.50	1766	16.00	16.02	393	582	1061	1643	8809	12095	20904	7.9
P111	15000	16.80	13.50	1767	16.00	16.03	355	582	1062	1644	8812	12111	20922	7.9
P112	20000	16.80	13.50	1768	16.00	16.03	430	582	1062	1644	8813	12111	20924	8.3
P113	25000	16.80	13.50	1770	16.00	16.03	384	582	1062	1644	8814	12112	20925	7.9
P114	29998	16.80	13.50	1771	16.00	16.03	402	582	1062	1644	8815	12112	20927	8.2
P115	34996	16.80	13.51	1773	16.00	16.03	387	582	1062	1644	8816	12112	20928	8.1
P116	39977	16.80	13.51	1776	16.00	16.03	391	582	1062	1644	8818	12112	20930	8.1
P117	44870	16.80	13.51	2399	15.14	15.11	2344	348	548	896	4680	5376	10056	23.4
P118	49758	16.80	13.51	2697	15.30	15.27	2628	388	619	1008	5253	6220	11474	22.9

Table 6.4. Steady state modelled percent reach for Pike Floodplain within range of 0.2 to 0.5 m/s.

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Reach 1	Reach 2	Reach 4	Reach 5	Reach 7	Reach 9	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 16	Reach 17	Reach 18	Reach 19	Reach 20	Reach 21	Reach 22	Reach 23	Reach 24	Reach 25	Reach 26
	ML/d	m AHD	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
P1	10000	16.30	13.20	1234	14.55	45	68	51	9	3	0	0	0	0	0	25	0	0	0	6	0	1	5	3	0	0	25
P2	10000	16.30	13.20	1233	14.60	45	68	51	9	3	0	0	0	0	0	25	0	0	0	6	0	2	6	4	0	0	32
P3	10000	16.30	13.20	1232	14.70	45	68	48	9	3	0	0	0	1	0	26	0	0	0	6	0	2	6	4	0	0	25
P4	10000	16.30	13.20	1229	14.80	45	69	45	7	2	0	0	0	1	0	25	0	0	0	6	0	2	6	4	0	0	25
P5	10000	16.30	13.20	1226	14.90	45	69	37	5	2	0	0	0	0	0	26	0	0	0	6	0	2	6	4	0	0	38
P6	10000	16.30	13.20	1221	15.00	45	69	32	4	1	0	0	0	0	0	25	0	0	0	6	0	2	6	4	0	0	25
P7	10000	16.30	13.20	1213	15.10	49	70	21	2	1	0	0	0	0	0	25	0	0	0	6	0	2	6	4	0	0	25
P8	10000	16.30	13.20	1203	15.20	49	70	13	0	0	0	0	0	0	0	25	0	0	0	7	0	1	5	3	0	0	32

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Reach 1	Reach 2	Reach 4	Reach 5	Reach 7	Reach 9	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 16	Reach 17	Reach 18	Reach 19	Reach 20	Reach 21	Reach 22	Reach 23	Reach 24	Reach 25	Reach 26
	ML/d	m AHD	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
P9	10000	16.30	13.20	1189	15.30	48	69	5	0	0	0	0	0	0	0	25	0	0	0	7	0	1	5	3	0	0	25
P10	10000	16.30	13.20	1172	15.40	48	69	1	0	0	0	0	0	0	0	25	0	0	0	7	0	1	5	3	0	0	24
P11	10000	16.30	13.20	1150	15.50	49	69	1	0	0	0	0	0	0	0	25	0	0	0	7	0	1	5	3	0	0	36
P12	10000	16.30	13.20	1120	15.60	46	69	0	0	0	0	0	0	0	0	25	0	0	0	7	0	0	5	3	0	0	18
P13	10000	16.30	13.20	1078	15.70	46	67	0	0	0	0	0	0	0	0	25	0	0	1	8	0	0	5	3	0	0	18
P14	10000	16.30	13.20	1024	15.80	41	61	0	0	0	0	0	0	0	0	25	0	0	1	8	0	0	5	2	0	0	24
P15	10000	16.30	13.20	953	15.90	37	55	0	0	0	0	0	0	0	0	25	0	0	1	9	1	0	4	2	0	0	18
P16	10000	16.30	13.20	856	16.00	29	47	0	0	0	0	0	0	0	0	25	0	0	1	9	4	0	4	2	0	0	18
P17	10000	16.40	13.40	1354	14.55	45	66	57	13	5	0	0	0	1	0	15	0	0	1	3	0	2	6	3	0	0	5
P18	10000	16.40	13.40	1354	14.60	45	66	55	13	5	0	0	0	1	0	15	0	0	1	3	0	2	6	3	0	0	5
P19	10000	16.40	13.40	1352	14.70	46	66	53	12	4	0	0	0	1	0	15	0	0	1	3	0	2	6	3	0	0	5
P20	10000	16.40	13.40	1349	14.80	46	66	51	11	3	0	0	0	0	0	15	0	0	1	3	0	2	6	3	0	0	5
P21	10000	16.40	13.40	1346	14.90	45	68	48	9	3	0	0	0	0	0	16	0	0	1	3	0	2	6	3	0	0	5
P22	10000	16.40	13.40	1341	15.00	43	69	43	7	2	0	0	0	0	0	16	0	0	1	3	0	1	6	3	0	0	5
P23	10000	16.40	13.40	1334	15.10	44	70	34	4	1	0	0	0	0	0	16	0	0	1	3	0	1	5	3	0	0	5
P24	10000	16.40	13.40	1324	15.20	45	70	26	2	1	0	0	0	0	0	16	0	0	1	3	0	1	5	3	0	0	5
P25	10000	16.40	13.40	1312	15.30	47	68	16	1	0	0	0	0	0	0	15	0	0	1	3	0	1	5	3	0	0	5
P26	10000	16.40	13.40	1299	15.40	49	69	8	0	0	0	0	1	0	0	16	0	0	1	3	0	1	5	3	0	0	5
P27	10000	16.40	13.40	1281	15.50	49	69	3	0	0	0	1	0	0	0	15	0	0	1	3	0	1	5	2	0	0	5
P28	10000	16.40	13.40	1255	15.60	48	70	1	0	0	0	1	0	0	0	16	0	0	1	4	0	1	5	2	0	0	5
P29	10000	16.40	13.40	1220	15.70	48	68	0	0	0	0	2	0	0	0	15	0	0	1	4	0	1	5	2	0	0	5
P30	10000	16.40	13.40	1175	15.80	44	64	0	0	0	0	0	0	0	0	16	0	0	2	4	0	0	4	2	0	0	5
P31	10000	16.40	13.40	1115	15.90	39	60	0	0	0	0	0	0	0	0	16	0	1	3	4	0	0	4	2	0	0	5
P32	10000	16.40	13.40	1042	16.00	36	53	0	0	0	0	0	0	0	0	16	0	1	4	5	1	0	3	2	0	0	5
P33	10000	16.50	13.50	1481	14.55	42	66	59	16	7	0	0	0	1	0	13	0	0	1	1	0	1	6	2	0	0	20
P34	10000	16.50	13.50	1480	14.60	42	66	59	16	7	0	0	0	1	0	12	0	0	1	1	0	1	6	2	0	0	24
P35	10000	16.50	13.50	1479	14.70	42	66	58	15	6	0	0	0	0	0	13	0	0	1	1	0	1	6	2	0	0	24
P36	10000	16.50	13.50	1476	14.80	42	67	56	13	5	0	0	0	0	0	13	0	0	1	1	0	1	6	2	0	0	10
P37	10000	16.50	13.50	1473	14.90	41	67	53	11	4	0	0	0	0	0	13	0	0	1	1	0	1	6	2	0	0	10

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Reach 1	Reach 2	Reach 4	Reach 5	Reach 7	Reach 9	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 16	Reach 17	Reach 18	Reach 19	Reach 20	Reach 21	Reach 22	Reach 23	Reach 24	Reach 25	Reach 26
	ML/d	m AHD	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
P38	10000	16.50	13.50	1468	15.00	42	68	51	10	3	0	0	0	0	0	13	0	0	1	1	0	1	6	2	0	0	5
P39	10000	16.50	13.50	1461	15.10	41	70	45	7	2	0	0	0	0	0	13	0	0	1	1	0	1	6	2	0	0	10
P40	10000	16.50	13.50	1453	15.20	43	71	37	5	2	0	0	0	0	0	13	0	0	1	1	0	1	6	2	0	0	14
P41	10000	16.50	13.50	1444	15.30	45	68	30	3	1	0	0	0	0	0	12	0	0	1	2	0	1	6	2	0	0	19
P42	10000	16.50	13.50	1433	15.40	47	70	17	1	1	0	0	0	0	0	13	0	0	1	2	0	1	6	2	0	0	24
P43	10000	16.50	13.50	1417	15.50	50	69	10	0	0	0	0	0	0	0	13	0	0	1	2	0	1	6	2	0	0	0
P44	10000	16.50	13.50	1393	15.60	48	70	3	0	0	0	0	0	0	0	13	0	0	1	2	0	1	5	2	0	0	0
P45	10000	16.50	13.50	1360	15.70	47	69	1	0	0	0	0	0	0	0	13	0	0	1	2	0	1	5	2	0	0	24
P46	10000	16.50	13.50	1316	15.80	44	66	0	0	0	0	2	0	0	0	12	0	0	1	2	0	1	4	2	0	0	24
P47	10000	16.50	13.50	1261	15.90	42	63	0	0	0	0	2	0	0	0	12	0	0	2	2	0	0	4	2	0	0	24
P48	10000	16.50	13.50	1191	16.00	39	58	0	0	0	0	3	0	0	0	13	0	1	3	3	0	0	4	2	0	0	0
P49	10000	16.80	13.80	1932	14.55	39	65	74	20	21	0	0	0	0	0	5	0	0	0	0	0	2	5	2	0	0	0
P50	10000	16.80	13.80	1932	14.60	39	65	73	20	20	0	0	0	0	0	5	0	0	0	0	0	2	5	2	0	0	5
P51	10000	16.80	13.80	1931	14.70	39	65	72	20	18	0	0	0	0	0	5	0	0	0	0	0	2	5	2	0	0	10
P52	10000	16.80	13.80	1930	14.80	40	65	69	19	15	0	0	0	0	0	5	0	0	0	0	0	1	5	2	0	0	0
P53	10000	16.80	13.80	1928	14.90	39	66	68	18	13	0	0	0	0	0	5	0	0	0	0	0	1	5	2	0	0	5
P54	10000	16.80	13.80	1926	15.00	40	66	66	17	12	0	0	0	0	0	5	0	0	0	0	0	1	5	2	0	0	5
P55	10000	16.80	13.80	1924	15.10	41	65	65	16	9	0	0	0	0	0	5	0	0	0	0	0	1	5	2	0	0	10
P56	10000	16.80	13.80	1919	15.20	43	65	60	14	7	0	0	1	0	0	5	0	0	0	0	0	1	5	2	0	0	5
P57	10000	16.80	13.80	1912	15.30	42	66	55	12	5	0	0	1	0	0	5	0	0	0	0	0	1	5	2	0	0	5
P58	10000	16.80	13.80	1903	15.40	44	66	46	10	4	0	1	0	0	0	5	0	0	0	0	0	1	4	2	0	0	0
P59	10000	16.80	13.80	1891	15.50	47	65	40	7	3	0	1	0	0	0	5	0	0	0	0	0	1	4	2	0	0	0
P60	10000	16.80	13.80	1874	15.60	49	66	28	4	2	0	1	0	0	0	5	0	0	0	0	0	1	4	2	0	0	5
P61	10000	16.80	13.80	1853	15.70	48	66	21	3	1	0	2	0	0	0	5	0	0	0	0	0	1	4	2	0	0	10
P62	10000	16.80	13.80	1828	15.80	49	66	10	1	1	0	2	0	0	0	5	0	0	0	0	0	1	4	2	0	0	5
P63	10000	16.80	13.80	1799	15.90	48	65	3	1	1	0	3	0	0	0	5	0	0	0	0	0	1	4	2	0	0	5
P64	10000	16.80	13.80	1765	16.00	49	62	0	0	0	0	4	0	0	0	5	0	0	0	0	0	1	4	2	0	0	10
P65	10000	16.80	13.80	1717	16.10	48	57	0	0	0	0	4	0	0	0	5	0	0	0	0	0	1	3	2	0	0	0
P66	10000	16.80	13.80	1652	16.20	47	53	0	0	0	0	4	0	0	0	5	0	0	1	0	0	1	3	2	0	0	10

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Reach 1	Reach 2	Reach 4	Reach 5	Reach 7	Reach 9	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 16	Reach 17	Reach 18	Reach 19	Reach 20	Reach 21	Reach 22	Reach 23	Reach 24	Reach 25	Reach 26
	ML/d	m AHD	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
P67	10000	16.80	13.80	1566	16.30	44	45	0	0	0	0	5	0	0	0	5	0	0	1	0	0	1	3	2	0	0	10
P68	10000	16.80	13.80	1453	16.40	40	41	0	0	0	0	5	0	0	0	5	0	0	1	0	0	0	2	2	0	0	0
P69	5000	16.30	3615	1232	14.55	41	63	52	10	3	0	0	0	1	0	37	0	6	9	2	0	9	3	2	0	0	27
P70	10000	16.30	8604	1234	14.55	41	63	52	10	3	0	0	0	1	0	25	0	0	0	6	0	2	6	4	0	0	18
P71	15000	16.30	13590	1235	14.55	41	63	52	10	3	0	0	0	1	0	14	0	9	16	16	3	0	16	10	0	0	0
P72	20000	16.30	18574	1236	14.55	41	63	52	10	3	0	0	0	1	0	9	1	14	26	27	32	0	42	24	0	0	10
P73	25000	16.30	23523	1238	14.55	41	63	52	10	4	1	0	0	1	0	4	0	16	35	38	57	0	58	47	0	0	0
P74	29999	16.30	28582	1240	14.55	41	63	52	10	4	3	0	0	1	0	0	1	17	40	48	66	1	65	60	0	0	9
P75	34996	16.30	33533	1245	14.55	39	64	41	6	2	4	0	2	1	0	0	1	17	43	54	75	8	68	68	4	0	9
P76	39990	16.30	38271	1520	14.55	40	63	52	11	4	5	0	0	0	0	0	1	19	43	58	76	10	69	71	8	0	31
P77	44902	16.30	43256	2738	14.77	40	63	55	11	4	6	1	4	43	42	63	12	14	42	67	80	15	70	75	35	0	62
P78	49780	16.30	48383	3289	15.06	42	67	58	13	6	6	0	2	29	38	58	14	15	44	66	81	15	68	76	42	0	74
P79	54658	16.30	53132	3797	15.30	47	66	56	13	7	6	0	2	29	34	53	15	18	55	71	76	18	61	80	39	1	73
P80	59468	16.30	57964	4134	15.49	48	62	46	12	10	6	0	1	25	31	43	18	21	61	75	71	23	57	83	40	2	73
P81	64195	16.30	63430	4393	15.70	41	56	38	9	11	6	2	1	22	21	37	21	23	62	79	63	26	55	85	39	3	73
P82	68732	16.40	68227	4669	15.86	41	53	34	7	11	5	3	1	17	15	35	23	24	57	80	52	28	54	86	42	3	73
P83	73127	16.55	72917	5089	15.99	41	53	27	5	12	6	4	1	14	13	37	24	23	57	81	38	30	53	88	42	3	71
P84	77416	16.70	76931	5451	16.12	46	50	17	3	12	6	4	1	14	12	39	23	24	56	83	22	31	51	89	41	6	67
P85	81601	16.85	80641	5728	16.24	47	47	9	1	12	6	5	0	12	12	44	23	25	58	84	9	32	49	89	41	7	44
P86	85774	16.95	84587	5947	16.34	48	44	3	1	11	6	5	0	11	12	49	23	27	58	84	4	36	47	90	40	10	39
P87	89948	17.05	88118	5841	16.44	50	43	2	0	10	6	5	0	13	13	55	25	32	59	82	3	48	44	89	38	12	17
P88	94142	17.15	90041	5298	16.54	50	43	1	0	9	6	5	0	16	14	63	25	37	59	78	2	52	43	89	42	12	15
P89	5000	16.80	2724	1925	15.00	39	66	65	17	11	0	0	0	0	0	17	0	6	10	0	0	23	3	2	0	0	15
P90	10000	16.80	7736	1926	15.00	39	66	65	17	12	0	0	0	0	0	13	0	0	0	0	0	9	8	4	0	0	10
P91	15000	16.80	12735	1928	15.00	38	66	65	17	12	0	0	0	0	0	9	0	6	8	4	0	3	24	11	0	0	0
P92	20000	16.80	17688	1929	15.00	38	66	65	17	12	0	0	0	0	0	4	0	12	19	16	2	0	49	25	0	0	0
P93	25000	16.80	22530	1931	15.00	38	66	65	17	12	1	0	0	0	0	0	0	15	32	26	14	0	58	46	0	0	0
P94	29998	16.80	27353	1932	15.00	38	66	65	17	12	2	0	0	0	0	0	0	15	37	36	48	1	64	59	0	0	0
P95	34996	16.80	32491	1934	15.00	38	66	65	17	12	4	0	0	0	0	0	0	15	38	44	63	6	66	65	0	0	19

No.	QSA	Lock 5 U/S WL	Lock 4 U/S WL	Pike Total Inflow	Pike regulator U/S WL	Reach 1	Reach 2	Reach 4	Reach 5	Reach 7	Reach 9	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 16	Reach 17	Reach 18	Reach 19	Reach 20	Reach 21	Reach 22	Reach 23	Reach 24	Reach 25	Reach 26
	ML/d	m AHD	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
P96	39977	16.80	37563	1936	15.00	38	66	65	17	12	5	0	0	0	0	0	1	19	44	51	69	8	68	69	4	0	18
P97	44870	16.80	42424	1939	15.00	38	66	65	17	12	6	0	0	0	0	0	1	16	44	56	75	13	70	74	3	0	7
P98	49758	16.80	47121	2111	15.00	39	64	71	18	16	7	0	0	0	0	0	1	16	47	59	79	16	69	77	3	0	7
P99	5000	16.80	2767	1890	15.50	47	67	39	5	3	0	0	0	0	0	16	0	6	10	0	0	19	3	2	0	0	10
P100	10000	16.80	7770	1891	15.50	47	67	39	5	3	0	0	0	0	0	13	0	0	0	0	0	7	7	4	0	0	14
P101	15000	16.80	12758	1893	15.50	47	67	39	5	3	0	0	0	0	0	9	0	7	10	4	0	2	23	10	0	0	0
P102	20000	16.80	17729	1894	15.50	47	67	40	5	3	0	0	0	0	0	4	0	12	19	17	2	0	48	24	0	0	5
P103	25000	16.80	22564	1896	15.50	47	67	40	5	3	1	0	0	0	0	0	0	15	32	26	19	0	58	45	0	0	4
P104	29998	16.80	27385	1898	15.50	47	67	40	5	3	2	0	0	0	0	0	0	15	37	36	50	1	63	58	0	0	0
P105	34996	16.80	32522	1900	15.50	47	67	40	5	3	4	0	0	0	0	0	0	15	38	45	64	6	66	65	0	0	19
P106	39977	16.80	37598	1902	15.50	47	67	40	6	3	5	0	0	0	0	0	1	19	44	52	69	8	68	69	4	0	18
P107	44870	16.80	42406	2406	15.14	42	64	0	0	0	6	1	4	47	50	72	17	14	40	71	84	15	69	73	17	0	7
P108	49758	16.80	47123	2697	15.30	37	66	0	0	0	7	0	3	47	50	72	19	15	45	70	87	18	68	76	26	0	7
P109	5000	16.80	2884	1765	16.00	50	59	0	0	0	0	4	0	0	0	17	0	4	9	0	0	12	3	1	0	0	10
P110	10000	16.80	7901	1766	16.00	50	58	0	0	0	0	4	0	0	0	13	0	0	0	0	0	4	6	3	0	0	10
P111	15000	16.80	12888	1767	16.00	50	58	0	0	0	0	4	0	0	0	9	0	8	10	4	0	1	21	9	0	0	0
P112	20000	16.80	17854	1768	16.00	50	58	0	0	0	0	4	0	0	0	4	0	12	21	18	4	0	47	23	0	0	0
P113	25000	16.80	22689	1770	16.00	50	58	0	0	0	1	4	0	0	0	0	0	15	32	27	28	0	57	45	0	0	0
P114	29998	16.80	27520	1771	16.00	50	58	0	0	0	2	4	0	0	0	0	0	15	37	36	55	1	63	58	0	0	0
P115	34996	16.80	32638	1773	16.00	50	59	0	0	0	4	4	0	0	0	0	0	16	38	46	66	7	66	64	0	0	19
P116	39977	16.80	37730	1776	16.00	50	58	0	0	0	5	4	0	0	0	0	1	19	44	53	70	8	68	69	4	0	18
P117	44870	16.80	42405	2399	15.14	42	64	0	0	0	6	1	4	47	50	72	17	14	40	71	84	15	69	73	16	0	7
P118	49758	16.80	47111	2697	15.30	37	66	0	0	0	7	0	4	47	50	72	20	15	45	70	87	18	68	76	26	0	7

Table 6.5. Steady state in-channel hydraulic data for Katarapko Floodplain associated with inflows and outflows from impounded area.

No.	QSA	Lock 4 U/S WL	Lock 4 D/S WL	Flow D/S Lock 4	Kat Total Inflow	Kat Total Outflow	Bank J inflow	Bank N inflow	Bank K inflow	Bank H inflow	Bank D inflow	Ngak Indau inflow	Bank A inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Sawmill ancillary east	Sawmill ancillary west	Piggy Creek outlet	Piggy Ck North inlet	Piggy Ck South inlet	Car Park outlet
	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
K1	10000	13.20	10.97	8050	516	463	508	1	3	0	0	4	0	10.42	444	11.50	19	0	0	0	0	0	0
K2	10000	13.20	11.06	9165	518	508	509	1	4	0	0	4	0	10.60	484	11.50	24	0	0	0	0	0	0
K3	10000	13.20	11.06	9260	519	509	510	1	4	0	0	4	0	10.70	484	11.50	25	0	0	0	0	0	0
K4	10000	13.20	11.06	9265	519	508	510	1	4	0	0	4	0	10.80	483	11.50	26	0	0	0	0	0	0
K5	10000	13.20	11.06	9250	519	508	510	1	4	0	0	4	0	10.90	481	11.50	27	0	0	0	0	0	0
K6	10000	13.20	11.06	9259	519	508	510	1	4	0	0	4	0	11.00	478	11.50	30	0	0	0	0	0	0
K7	10000	13.20	11.06	9220	518	507	510	1	4	0	0	4	0	11.10	475	11.50	32	0	0	0	0	0	0
K8	10000	13.20	11.06	9261	519	508	510	1	4	0	0	4	0	11.20	471	11.50	36	0	0	0	0	0	0
K9	10000	13.20	11.06	9140	518	506	509	1	4	0	0	4	0	11.30	464	11.50	42	0	0	0	0	0	0
K10	10000	13.20	11.07	9259	519	509	510	1	4	0	0	4	0	11.40	458	11.50	50	0	0	0	0	0	0
K11	10000	13.20	11.03	8641	517	507	508	1	4	0	0	4	0	11.50	446	11.50	60	0	0	0	0	0	0
K12	10000	13.20	11.07	9251	518	507	509	1	4	0	0	4	0	11.60	434	11.50	74	0	0	0	0	0	0
K13	10000	13.20	11.07	9251	518	507	509	1	4	0	0	4	0	11.70	417	11.50	90	0	0	0	0	0	0
K14	10000	13.20	11.07	9242	518	506	509	1	4	0	0	4	0	11.80	398	11.50	108	0	0	0	0	0	0
K15	10000	13.20	11.07	9243	518	505	509	1	4	0	0	4	0	11.90	375	11.50	130	0	0	0	0	0	0
K16	10000	13.20	11.04	8814	516	502	507	1	4	0	0	4	0	12.00	351	11.62	150	0	0	0	0	0	0
K17	10000	13.20	11.07	9239	516	501	507	1	4	0	0	4	0	12.10	351	11.91	150	0	0	0	0	0	0
K18	10000	13.20	11.04	8703	512	500	503	1	4	0	0	4	0	12.20	350	12.09	150	0	0	0	0	0	0
K19	10000	13.20	11.07	9238	511	495	502	1	4	0	0	4	0	12.30	344	12.23	150	0	0	0	0	0	0
K20	10000	13.20	11.07	9241	506	488	497	1	4	0	0	4	0	12.40	338	12.35	150	0	0	0	0	0	0
K21	10000	13.20	11.07	9239	498	465	489	1	4	0	0	4	0	12.50	315	12.47	150	0	0	1	0	0	0
K22	10000	13.20	11.07	9251	486	461	477	1	4	0	0	4	0	12.60	311	12.58	150	0	0	0	0	0	0
K23	10000	13.20	11.04	8795	467	431	459	1	4	0	0	4	0	12.70	280	12.69	150	0	0	0	0	0	0
K24	10000	13.20	11.07	9285	444	401	435	1	4	0	0	4	0	12.80	245	12.80	149	0	0	0	0	2	5
K25	10000	13.20	11.08	9307	412	378	403	1	4	0	0	4	0	12.90	35	12.88	150	0	0	0	0	188	5
K26	10000	13.40	11.04	8866	745	721	681	4	43	0	0	16	0	10.59	655	11.50	66	0	0	0	0	0	0
K27	10000	13.40	11.04	8851	744	741	681	4	43	0	0	16	0	10.60	672	11.50	69	0	0	0	0	0	0
K28	10000	13.40	11.05	8943	745	742	681	4	43	0	0	16	0	10.70	672	11.50	70	0	0	0	0	0	0

No.	QSA	Lock 4 U/S WL	Lock 4 D/S WL	Flow D/S Lock 4	Kat Total Inflow	Kat Total Outflow	Bank J inflow	Bank N inflow	Bank K inflow	Bank H inflow	Bank D inflow	Ngak Indau inflow	Bank A inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Sawmill ancillary east	Sawmill ancillary west	Piggy Creek outlet	Piggy Ck North inlet	Piggy Ck South inlet	Car Park outlet
	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
K29	10000	13.40	11.05	8953	745	742	681	4	43	0	0	16	0	10.80	672	11.50	70	0	0	0	0	0	0
K30	10000	13.40	11.05	8931	745	741	681	4	43	0	0	16	0	10.90	671	11.50	71	0	0	0	0	0	0
K31	10000	13.40	11.05	8954	745	741	681	4	43	0	0	16	0	11.00	670	11.50	72	0	0	0	0	0	0
K32	10000	13.40	11.04	8912	745	741	681	4	43	0	0	16	0	11.10	667	11.50	73	0	0	0	0	0	0
K33	10000	13.40	11.05	8955	745	741	681	4	43	0	0	16	0	11.20	665	11.50	76	0	0	0	0	0	0
K34	10000	13.40	11.04	8828	744	739	681	4	43	0	0	16	0	11.30	660	11.50	79	0	0	0	0	0	0
K35	10000	13.40	11.05	8943	745	740	681	4	43	0	0	16	0	11.40	655	11.50	85	0	0	0	0	0	0
K36	10000	13.40	11.00	8222	742	738	679	4	43	0	0	16	0	11.50	646	11.50	92	0	0	0	0	0	0
K37	10000	13.40	11.05	8940	744	739	681	4	43	0	0	16	0	11.60	637	11.50	102	0	0	0	0	0	0
K38	10000	13.40	11.05	8939	744	739	681	4	43	0	0	16	0	11.70	624	11.50	115	0	0	0	0	0	0
K39	10000	13.40	11.05	8930	744	737	680	4	43	0	0	16	0	11.80	606	11.50	130	0	0	0	0	0	0
K40	10000	13.40	11.05	8938	743	736	680	4	43	0	0	16	0	11.90	586	11.50	150	0	0	0	0	0	0
K41	10000	13.40	11.04	8773	743	733	679	4	43	0	0	16	0	12.00	583	11.83	150	0	0	0	0	0	0
K42	10000	13.40	11.05	8936	742	733	678	4	43	0	0	16	0	12.10	583	12.01	150	0	0	0	0	0	0
K43	10000	13.40	11.01	8267	738	728	675	4	43	0	0	16	0	12.20	579	12.15	150	0	0	0	0	0	0
K44	10000	13.40	11.05	8939	738	728	674	4	43	0	0	16	0	12.30	578	12.28	150	0	0	0	0	0	0
K45	10000	13.40	11.05	8944	734	721	671	4	43	0	0	16	0	12.40	572	12.39	150	0	0	0	0	0	0
K46	10000	13.40	11.05	8948	728	706	664	4	43	0	0	16	0	12.50	556	12.50	150	0	0	1	0	0	0
K47	10000	13.40	11.05	8962	720	701	656	4	43	0	0	16	0	12.60	551	12.60	150	0	0	0	0	0	0
K48	10000	13.40	11.01	8378	707	675	643	4	43	0	0	16	0	12.70	526	12.70	150	0	0	0	0	0	0
K49	10000	13.40	11.05	8956	692	660	629	4	44	0	0	16	0	12.80	490	12.80	151	0	0	0	0	15	5
K50	10000	13.40	11.06	8958	671	644	607	4	44	0	0	16	0	12.90	294	12.89	150	0	0	0	0	196	5
K51	10000	13.40	11.04	8575	637	607	574	4	43	0	0	16	0	13.00	96	12.98	150	0	0	0	0	356	5
K52	10000	13.50	11.03	8708	880	902	770	5	66	12	0	27	0	10.61	805	11.50	97	0	0	0	0	0	0
K53	10000	13.50	11.04	8753	880	903	770	5	66	12	0	27	0	10.70	806	11.50	98	0	0	0	0	0	0
K54	10000	13.50	11.04	8762	880	903	770	5	66	12	0	27	0	10.80	805	11.50	98	0	0	0	0	0	0
K55	10000	13.50	11.04	8732	880	902	770	5	66	12	0	27	0	10.90	804	11.50	98	0	0	0	0	0	0
K56	10000	13.50	11.04	8745	880	903	770	5	66	12	0	27	0	11.00	803	11.50	99	0	0	0	0	0	0
K57	10000	13.50	11.03	8707	880	902	770	5	66	12	0	27	0	11.10	801	11.50	101	0	0	0	0	0	0
K58	10000	13.50	11.04	8744	880	902	770	5	66	12	0	27	0	11.20	799	11.50	103	0	0	0	0	0	0

No.	QSA	Lock 4 U/S WL	Lock 4 D/S WL	Flow D/S Lock 4	Kat Total Inflow	Kat Total Outflow	Bank J inflow	Bank N inflow	Bank K inflow	Bank H inflow	Bank D inflow	Ngak Indau inflow	Bank A inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Sawmill ancillary east	Sawmill ancillary west	Piggy Creek outlet	Piggy Ck North inlet	Piggy Ck South inlet	Car Park outlet
	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
K59	10000	13.50	11.03	8620	880	901	770	5	66	12	0	27	0	11.30	795	11.50	106	0	0	0	0	0	0
K60	10000	13.50	11.04	8736	880	901	770	5	66	12	0	27	0	11.40	791	11.50	111	0	0	0	0	0	0
K61	10000	13.50	10.99	8014	878	900	768	5	65	12	0	27	0	11.50	783	11.50	117	0	0	0	0	0	0
K62	10000	13.50	11.04	8731	880	900	770	5	66	12	0	27	0	11.60	775	11.50	126	0	0	0	0	0	0
K63	10000	13.50	11.04	8732	880	900	769	5	66	12	0	27	0	11.70	763	11.50	136	0	0	0	0	0	0
K64	10000	13.50	11.04	8725	879	898	769	5	66	12	0	27	0	11.80	748	11.50	150	0	0	0	0	0	0
K65	10000	13.50	11.04	8725	879	897	768	5	66	12	0	27	0	11.90	747	11.79	150	0	0	0	0	0	0
K66	10000	13.50	11.03	8592	878	894	767	5	66	12	0	27	0	12.00	745	11.95	150	0	0	0	0	0	0
K67	10000	13.50	11.04	8721	877	893	766	5	66	12	0	27	0	12.10	743	12.09	150	0	0	0	0	0	0
K68	10000	13.50	10.99	7925	872	889	763	5	65	12	0	27	0	12.20	739	12.20	150	0	0	0	0	0	0
K69	10000	13.50	11.04	8725	872	887	761	5	66	12	0	27	0	12.30	737	12.32	150	0	0	0	0	0	0
K70	10000	13.50	11.04	8714	868	880	758	5	66	12	0	27	0	12.40	730	12.42	150	0	0	0	0	0	0
K71	10000	13.50	11.04	8718	863	865	752	5	66	12	0	27	0	12.50	715	12.52	150	0	0	1	0	0	0
K72	10000	13.50	11.04	8726	855	862	745	5	66	12	0	27	0	12.60	712	12.62	150	0	0	0	0	0	0
K73	10000	13.50	10.99	8000	843	841	734	5	65	12	0	27	0	12.70	690	12.72	150	0	0	0	0	0	0
K74	10000	13.50	11.04	8776	832	824	722	5	66	12	0	27	0	12.80	651	12.81	150	0	0	0	0	18	5
K75	10000	13.50	11.05	8774	812	812	702	5	66	12	0	27	0	12.90	456	12.90	150	0	0	0	0	201	5
K76	10000	13.50	11.05	8708	785	780	675	5	65	12	0	27	0	13.00	265	12.99	150	0	0	0	0	361	5
K77	10000	13.50	11.07	8840	746	738	637	5	64	12	0	27	0	13.10	68	13.08	150	0	2	0	0	513	5
K78	10000	13.80	11.01	8108	1435	1494	1005	11	165	108	61	77	7	10.66	1344	12.09	150	0	0	0	0	0	0
K79	10000	13.80	11.01	8086	1434	1495	1005	11	165	108	61	77	7	10.70	1345	12.09	150	0	0	0	0	0	0
K80	10000	13.80	11.01	8095	1434	1493	1005	11	165	108	61	77	7	10.80	1343	12.09	150	0	0	0	0	0	0
K81	10000	13.80	11.01	8080	1434	1492	1005	11	165	108	61	77	7	10.90	1342	12.10	150	0	0	0	0	0	0
K82	10000	13.80	11.01	8094	1434	1487	1005	11	165	108	61	77	7	11.00	1337	12.10	150	0	0	0	0	0	0
K83	10000	13.80	11.00	8047	1434	1495	1005	11	165	108	61	77	7	11.10	1345	12.10	150	0	0	0	0	0	0
K84	10000	13.80	11.01	8088	1434	1491	1005	11	165	108	61	77	7	11.20	1341	12.11	150	0	0	0	0	0	0
K85	10000	13.80	10.99	7982	1434	1500	1005	11	165	108	61	77	7	11.30	1350	12.12	150	0	0	0	0	0	0
K86	10000	13.80	11.01	8087	1434	1491	1005	11	165	108	61	77	7	11.40	1340	12.13	150	0	0	0	0	0	0
K87	10000	13.80	10.96	7490	1432	1489	1003	11	164	107	61	77	7	11.50	1339	12.15	149	0	0	0	0	0	0
K88	10000	13.80	11.01	8082	1434	1489	1004	11	165	108	61	77	7	11.60	1339	12.18	150	0	0	0	0	0	0

No.	QSA	Lock 4 U/S WL	Lock 4 D/S WL	Flow D/S Lock 4	Kat Total Inflow	Kat Total Outflow	Bank J inflow	Bank N inflow	Bank K inflow	Bank H inflow	Bank D inflow	Ngak Indau inflow	Bank A inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Sawmill ancillary east	Sawmill ancillary west	Piggy Creek outlet	Piggy Ck North inlet	Piggy Ck South inlet	Car Park outlet
	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
K89	10000	13.80	11.01	8079	1433	1489	1004	11	165	108	61	77	7	11.70	1339	12.21	151	0	0	0	0	0	0
K90	10000	13.80	11.00	8076	1433	1487	1004	11	165	108	61	77	7	11.80	1337	12.24	150	0	0	0	0	0	0
K91	10000	13.80	11.01	8075	1433	1487	1003	11	165	108	61	77	7	11.90	1337	12.29	150	0	0	0	0	0	0
K92	10000	13.80	10.99	7928	1431	1484	1002	11	164	108	61	77	7	12.00	1334	12.34	150	0	0	0	0	0	0
K93	10000	13.80	11.01	8082	1430	1483	1001	11	164	108	61	77	7	12.10	1333	12.40	150	0	0	0	0	0	0
K94	10000	13.80	10.94	7074	1424	1479	997	11	163	107	61	77	7	12.20	1329	12.46	150	0	0	0	0	0	0
K95	10000	13.80	11.01	8084	1426	1473	997	11	164	108	61	77	7	12.30	1323	12.53	150	0	0	0	0	0	0
K96	10000	13.80	11.00	8078	1422	1470	993	11	164	108	61	77	7	12.40	1320	12.60	150	0	0	0	0	0	0
K97	10000	13.80	11.00	8080	1417	1450	989	11	164	108	61	77	7	12.50	1299	12.67	150	0	0	1	0	0	0
K98	10000	13.80	11.00	8079	1411	1446	983	11	163	108	61	77	7	12.60	1297	12.74	150	0	0	0	0	0	0
K99	10000	13.80	11.00	8092	1403	1427	976	11	163	108	61	77	7	12.70	1277	12.81	150	0	0	0	0	0	0
K100	10000	13.80	11.00	8111	1392	1436	965	11	162	108	61	77	7	12.80	1286	12.89	150	0	0	0	0	0	0
K101	10000	13.80	11.00	8114	1377	1408	951	11	161	108	61	77	7	12.90	1258	12.97	150	0	0	0	0	0	0
K102	10000	13.80	11.00	8106	1359	1389	935	11	159	108	61	77	7	13.00	1240	13.04	150	0	0	0	0	0	0
K103	10000	13.80	11.00	8160	1334	1359	912	10	157	108	61	77	7	13.10	1209	13.13	150	0	0	0	0	0	0
K104	10000	13.80	11.00	8069	1302	1301	884	10	154	108	61	77	7	13.20	1151	13.22	150	0	0	0	0	0	0
K105	10000	13.80	11.01	8213	1256	1202	844	10	150	108	60	77	7	13.30	1053	13.31	150	0	0	0	0	0	0
K106	10000	13.80	11.02	8303	1194	1084	790	9	143	108	59	76	7	13.40	934	13.41	150	0	0	0	0	0	0
K107	10000	13.80	11.03	8385	1107	926	719	9	133	108	57	73	7	13.50	776	13.50	150	0	0	0	0	0	0
K108	5000	13.20	10.71	4247	507	497	501	1	1	0	0	4	0	10.15	452	11.03	45	0	0	0	0	0	0
K109	10000	13.20	11.06	9246	519	509	510	1	4	0	0	4	0	10.59	462	11.13	47	0	0	0	0	0	0
K110	15000	13.20	11.39	14225	538	532	523	2	10	0	0	4	0	10.83	488	11.36	44	0	0	0	0	0	0
K111	20000	13.20	11.71	19172	577	563	541	2	16	0	0	4	0	11.17	534	11.63	15	0	0	14	0	15	0
K112	25000	13.20	11.99	24097	691	671	565	2	22	0	0	4	0	11.55	623	11.88	-49	0	0	48	0	48	0
K113	29999	13.21	12.32	29087	860	836	597	3	29	0	0	4	0	11.90	729	12.19	-120	0	0	107	0	108	0
K114	34996	13.21	12.63	33988	1055	1027	629	3	36	1	0	4	0	12.20	853	12.48	-206	0	0	175	0	175	0
K115	39990	13.21	12.90	38647	1273	1253	655	4	46	0	0	5	0	12.45	1019	12.73	-316	0	0	233	4	243	0
K116	44902	13.36	13.16	43349	1712	1684	786	7	90	23	0	15	0	12.70	1381	12.98	-465	0	0	302	16	305	-4
K117	49780	13.71	13.41	48030	2686	2715	1087	14	213	166	47	65	1	12.95	2209	13.23	-480	-67	-86	447	115	346	58
K118	54658	14.01	13.60	51676	3842	3686	1626	23	370	408	154	157	40	13.14	3022	13.42	-402	-11	-35	423	199	375	241

No.	QSA	Lock 4 U/S WL	Lock 4 D/S WL	Flow D/S Lock 4	Kat Total Inflow	Kat Total Outflow	Bank J inflow	Bank N inflow	Bank K inflow	Bank H inflow	Bank D inflow	Ngak Indau inflow	Bank A inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Sawmill ancillary east	Sawmill ancillary west	Piggy Creek outlet	Piggy Ck North inlet	Piggy Ck South inlet	Car Park outlet
	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
K119	59468	14.21	13.76	54848	5182	5146	2126	32	528	650	237	271	111	13.32	4038	13.58	-323	-18	-39	488	265	398	620
K120	64195	14.41	13.90	57691	6804	7149	2722	16	734	907	349	403	305	13.51	5425	13.72	-274	-12	-23	657	282	343	1068
K121	68732	14.56	14.00	59017	8030	9264	3282	5	917	1082	466	515	477	13.67	6887	13.83	-155	58	75	770	261	202	1474
K122	73127	14.63	14.09	61392	9099	9225	3672	2	1035	1216	520	574	567	13.77	6762	13.92	-198	67	75	716	275	239	1604
K123	77416	14.73	14.16	61958	10379	8987	4125	3	1186	1425	639	661	712	13.85	6502	13.99	-154	97	116	695	293	188	1577
K124	81601	14.81	14.23	62397	11506	8772	4525	10	1298	1617	719	791	865	13.92	6320	14.06	-93	124	147	684	294	115	1496
K125	85774	14.85	14.29	64332	12299	8448	4800	13	1363	1767	750	867	959	13.99	6113	14.12	-87	136	154	666	302	92	1378
K126	89948	14.91	14.35	64755	13178	8230	5125	16	1440	1962	792	970	1101	14.05	6006	14.18	-8	160	179	650	270	40	1234
K127	94142	14.96	14.40	65375	14036	8104	5404	18	1510	2131	818	1070	1225	14.11	5923	14.23	65	179	197	634	234	6	1107
K128	5000	13.50	10.67	3717	868	890	762	5	63	11	0	27	0	10.50	795	11.50	95	0	0	0	0	0	0
K129	10000	13.50	11.03	8689	880	903	770	5	66	12	0	27	0	10.61	806	11.50	97	0	0	0	0	0	0
K130	15000	13.50	11.38	13717	900	924	783	6	70	15	0	27	0	10.84	822	11.50	102	0	0	0	0	0	0
K131	20000	13.50	11.69	18674	928	951	799	6	76	19	0	28	0	11.19	849	11.65	102	0	0	0	0	0	0
K132	25000	13.50	11.96	23495	962	984	819	6	83	25	0	28	0	11.54	889	11.89	95	0	0	0	0	0	0
K133	29998	13.50	12.29	28273	1000	1022	842	7	92	30	0	29	0	11.88	977	12.18	45	0	0	0	0	0	0
K134	34996	13.51	12.60	33279	1141	1151	869	8	103	37	0	30	0	12.18	1151	12.47	-95	0	0	0	0	0	0
K135	39977	13.51	12.90	38373	1319	1321	890	8	117	46	0	31	0	12.47	1321	12.75	-226	0	0	0	0	0	0
K136	44870	13.51	13.17	43241	1552	1554	901	9	132	61	0	32	0	12.71	1554	12.99	-417	0	0	0	0	0	0
K137	49758	13.51	13.40	47976	1799	1854	907	10	146	77	0	33	0	12.92	1856	13.19	-626	0	0	-1	0	0	0
K138	5000	13.50	10.67	3700	868	887	762	5	63	11	0	27	0	11.50	772	11.50	115	0	0	0	0	0	0
K139	10000	13.50	11.03	8670	880	900	770	5	66	12	0	27	0	11.50	783	11.50	117	0	0	0	0	0	0
K140	15000	13.50	11.38	13686	900	924	783	6	70	14	0	27	0	11.50	804	11.50	121	0	0	0	0	0	0
K141	20000	13.50	11.69	18648	927	951	799	6	76	19	0	28	0	11.50	835	11.66	116	0	0	0	0	0	0
K142	25000	13.50	11.96	23465	962	984	819	6	83	25	0	28	0	11.54	889	11.89	95	0	0	0	0	0	0
K143	29998	13.50	12.29	28241	1000	1025	842	7	92	30	0	29	0	11.88	979	12.18	46	0	0	0	0	0	0
K144	34996	13.51	12.60	33243	1140	1147	869	8	103	37	0	30	0	12.18	1147	12.47	-94	0	0	0	0	0	0
K145	39977	13.51	12.90	38341	1318	1319	891	8	117	46	0	31	0	12.46	1319	12.75	-225	0	0	0	0	0	0
K146	44870	13.51	13.16	43221	1551	1554	901	9	132	61	0	32	0	12.71	1555	12.99	-416	0	0	0	0	0	0
K147	49758	13.51	13.40	47952	1798	1847	907	10	146	77	0	33	0	12.92	1848	13.19	-625	0	0	-1	0	0	0
K148	5000	13.50	10.67	3681	851	851	745	5	63	11	0	27	0	12.50	701	12.52	150	0	0	1	0	0	0

No.	QSA	Lock 4 U/S WL	Lock 4 D/S WL	Flow D/S Lock 4	Kat Total Inflow	Kat Total Outflow	Bank J inflow	Bank N inflow	Bank K inflow	Bank H inflow	Bank D inflow	Ngak Indau inflow	Bank A inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Sawmill ancillary east	Sawmill ancillary west	Piggy Creek outlet	Piggy Ck North inlet	Piggy Ck South inlet	Car Park outlet
	ML/d	m AHD	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d	ML/d
K149	10000	13.50	11.03	8647	863	874	752	5	66	12	0	27	0	12.50	724	12.52	150	0	0	0	0	0	0
K150	15000	13.50	11.38	13706	882	894	766	6	70	15	0	27	0	12.50	744	12.53	150	0	0	0	0	-1	0
K151	20000	13.50	11.69	18665	910	926	783	6	76	18	0	28	0	12.50	775	12.53	151	0	0	0	0	0	0
K152	25000	13.50	11.96	23485	945	961	803	6	83	25	0	28	0	12.50	811	12.54	149	0	0	0	0	0	0
K153	29998	13.50	12.29	28256	987	1007	828	7	92	30	0	29	0	12.50	856	12.55	151	0	0	0	0	0	0
K154	34996	13.51	12.61	33264	1038	1060	860	8	103	37	0	30	0	12.50	911	12.56	150	0	0	0	0	0	0
K155	39977	13.51	12.90	38353	1291	1309	889	8	117	46	0	31	0	12.50	1309	12.75	-199	0	0	0	0	0	0
K156	44870	13.51	13.17	43259	1552	1569	900	9	132	61	0	32	0	12.72	1569	12.99	-418	0	0	0	0	0	0
K157	49758	13.51	13.40	47950	1797	1848	907	10	146	77	0	33	0	12.92	1849	13.19	-625	0	0	-1	0	0	0

Table 6.6. Steady state modelled inundated area, volume and daily exchange for Katarapko Floodplain, managed impounded area.

No.	QSA	Lock 4 U/S WL	Flow D/S Lock 4	Kat Total Inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Car Park wetted area	Lower FP wetted area	Piggy wetted area	Upper FP wetted area	Total wetted area	Car Park impounded volume	Lower FP impounded volume	Piggy impounded volume	Upper FP impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ha	ha	ha	ha	ha	ML	ML	ML	ML	ML	%
K1	10000	13.20	8050	516	10.42	444	11.50	19	0	29	2	62	93	0	237	9	390	637	73
K2	10000	13.20	9165	518	10.60	484	11.50	24	0	32	1	73	106	0	261	6	497	764	67
K3	10000	13.20	9260	519	10.70	484	11.50	25	0	35	1	73	109	0	278	6	509	793	64
K4	10000	13.20	9265	519	10.80	483	11.50	26	0	39	1	74	114	0	300	6	521	827	62
K5	10000	13.20	9250	519	10.90	481	11.50	27	0	43	1	75	119	0	328	5	534	868	59
K6	10000	13.20	9259	519	11.00	478	11.50	30	0	49	1	75	125	0	365	5	548	918	55
K7	10000	13.20	9220	518	11.10	475	11.50	32	0	53	1	78	133	0	408	5	562	974	52
K8	10000	13.20	9261	519	11.20	471	11.50	36	0	57	1	82	140	0	456	4	578	1038	49
K9	10000	13.20	9140	518	11.30	464	11.50	42	0	61	1	88	150	0	510	4	611	1125	45
K10	10000	13.20	9259	519	11.40	458	11.50	50	0	65	1	89	155	0	570	3	629	1202	42
K11	10000	13.20	8641	517	11.50	446	11.50	60	0	70	1	90	161	0	635	3	648	1287	39
K12	10000	13.20	9251	518	11.60	434	11.50	74	0	75	1	92	168	0	706	3	677	1386	37
K13	10000	13.20	9251	518	11.70	417	11.50	90	0	81	1	95	177	0	784	3	712	1499	34
K14	10000	13.20	9242	518	11.80	398	11.50	108	0	91	1	97	189	0	876	2	753	1631	31
K15	10000	13.20	9243	518	11.90	375	11.50	130	0	100	1	100	200	0	972	2	802	1776	28

No.	QSA	Lock 4 U/S WL	Flow D/S Lock 4	Kat Total Inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Car Park wetted area	Lower FP wetted area	Piggy wetted area	Upper FP wetted area	Total wetted area	Car Park impounded volume	Lower FP impounded volume	Piggy impounded volume	Upper FP impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ha	ha	ha	ha	ha	ML	ML	ML	ML	ML	%
K16	10000	13.20	8814	516	12.00	351	11.62	150	0	107	1	103	211	0	1076	2	854	1932	26
K17	10000	13.20	9239	516	12.10	351	11.91	150	0	120	1	106	226	0	1194	2	916	2112	24
K18	10000	13.20	8703	512	12.20	350	12.09	150	0	131	1	109	241	0	1322	2	982	2306	22
K19	10000	13.20	9238	511	12.30	344	12.23	150	0	144	1	113	257	0	1464	2	1053	2519	20
K20	10000	13.20	9241	506	12.40	338	12.35	150	0	155	1	116	272	1	1616	2	1128	2746	18
K21	10000	13.20	9239	498	12.50	315	12.47	150	3	170	5	123	301	16	1785	23	1225	3049	15
K22	10000	13.20	9251	486	12.60	311	12.58	150	7	192	12	129	341	29	1980	95	1320	3424	13
K23	10000	13.20	8795	467	12.70	280	12.69	150	12	212	19	138	380	56	2189	142	1420	3807	11
K24	10000	13.20	9285	444	12.80	245	12.80	149	25	246	22	152	445	172	2449	166	1547	4335	9
K25	10000	13.20	9307	412	12.90	35	12.88	150	35	272	23	164	494	219	2717	174	1676	4786	8
K26	10000	13.40	8866	745	10.59	655	11.50	66	0	37	2	84	123	0	288	9	611	908	79
K27	10000	13.40	8851	744	10.60	672	11.50	69	0	37	1	100	139	0	292	6	731	1029	72
K28	10000	13.40	8943	745	10.70	672	11.50	70	0	40	1	100	141	0	307	5	732	1044	71
K29	10000	13.40	8953	745	10.80	672	11.50	70	0	43	1	100	144	0	327	5	732	1065	70
K30	10000	13.40	8931	745	10.90	671	11.50	71	0	47	1	100	148	0	354	5	734	1092	68
K31	10000	13.40	8954	745	11.00	670	11.50	72	0	51	1	100	152	0	387	4	736	1127	66
K32	10000	13.40	8912	745	11.10	667	11.50	73	0	55	1	100	156	0	427	4	739	1170	63
K33	10000	13.40	8955	745	11.20	665	11.50	76	0	58	1	101	160	0	473	4	745	1221	61
K34	10000	13.40	8828	744	11.30	660	11.50	79	0	62	1	102	165	0	525	3	753	1281	58
K35	10000	13.40	8943	745	11.40	655	11.50	85	0	66	1	102	169	0	582	3	765	1349	55
K36	10000	13.40	8222	742	11.50	646	11.50	92	0	71	1	103	175	0	645	3	779	1426	52
K37	10000	13.40	8940	744	11.60	637	11.50	102	0	76	1	104	181	0	715	2	802	1519	49
K38	10000	13.40	8939	744	11.70	624	11.50	115	0	82	1	106	188	0	791	2	827	1621	46
K39	10000	13.40	8930	744	11.80	606	11.50	130	0	92	1	108	200	0	882	2	863	1747	42
K40	10000	13.40	8938	743	11.90	586	11.50	150	0	100	1	110	211	0	977	2	902	1881	39
K41	10000	13.40	8773	743	12.00	583	11.83	150	0	108	1	113	222	0	1082	2	952	2035	36
K42	10000	13.40	8936	742	12.10	583	12.01	150	0	120	1	116	236	0	1199	1	1009	2209	33
K43	10000	13.40	8267	738	12.20	579	12.15	150	0	131	1	119	251	0	1326	1	1069	2397	30
K44	10000	13.40	8939	738	12.30	578	12.28	150	0	144	1	122	266	0	1468	1	1137	2606	28
K45	10000	13.40	8944	734	12.40	572	12.39	150	0	155	1	126	281	1	1619	2	1210	2831	25

No.	QSA	Lock 4 U/S WL	Flow D/S Lock 4	Kat Total Inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Car Park wetted area	Lower FP wetted area	Piggy wetted area	Upper FP wetted area	Total wetted area	Car Park impounded volume	Lower FP impounded volume	Piggy impounded volume	Upper FP impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ha	ha	ha	ha	ha	ML	ML	ML	ML	ML	%
K46	10000	13.40	8948	728	12.50	556	12.50	150	3	170	5	133	310	16	1788	24	1306	3134	23
K47	10000	13.40	8962	720	12.60	551	12.60	150	7	192	12	138	350	29	1983	95	1394	3501	20
K48	10000	13.40	8378	707	12.70	526	12.70	150	12	212	19	147	391	63	2193	143	1494	3892	17
K49	10000	13.40	8956	692	12.80	490	12.80	151	27	247	22	160	456	178	2452	166	1619	4414	15
K50	10000	13.40	8958	671	12.90	294	12.89	150	35	273	23	175	505	219	2720	175	1751	4865	13
K51	10000	13.40	8575	637	13.00	96	12.98	150	41	300	25	197	562	260	3012	190	1910	5371	11
K52	10000	13.50	8708	880	10.61	805	11.50	97	0	41	2	110	153	0	316	8	828	1152	78
K53	10000	13.50	8753	880	10.70	806	11.50	98	0	44	1	109	154	0	329	4	827	1161	78
K54	10000	13.50	8762	880	10.80	805	11.50	98	0	47	1	109	157	0	349	4	828	1181	76
K55	10000	13.50	8732	880	10.90	804	11.50	98	0	49	1	110	160	0	373	4	831	1208	75
K56	10000	13.50	8745	880	11.00	803	11.50	99	0	52	1	110	163	0	404	4	833	1241	73
K57	10000	13.50	8707	880	11.10	801	11.50	101	0	56	1	110	167	0	442	3	836	1281	70
K58	10000	13.50	8744	880	11.20	799	11.50	103	0	59	1	110	170	0	486	3	840	1329	68
K59	10000	13.50	8620	880	11.30	795	11.50	106	0	63	2	111	176	0	536	7	848	1390	65
K60	10000	13.50	8736	880	11.40	791	11.50	111	0	66	1	112	180	0	591	7	857	1455	62
K61	10000	13.50	8014	878	11.50	783	11.50	117	0	71	1	113	186	0	653	6	872	1531	59
K62	10000	13.50	8731	880	11.60	775	11.50	126	0	77	1	114	192	0	722	6	889	1618	56
K63	10000	13.50	8732	880	11.70	763	11.50	136	0	85	1	115	201	0	802	6	911	1719	52
K64	10000	13.50	8725	879	11.80	748	11.50	150	0	92	1	117	210	0	888	5	938	1832	49
K65	10000	13.50	8725	879	11.90	747	11.79	150	0	101	1	118	220	0	983	5	977	1965	46
K66	10000	13.50	8592	878	12.00	745	11.95	150	0	109	1	120	230	0	1087	5	1021	2113	42
K67	10000	13.50	8721	877	12.10	743	12.09	150	0	121	1	123	245	0	1203	4	1073	2280	39
K68	10000	13.50	7925	872	12.20	739	12.20	150	0	132	1	126	258	0	1330	4	1129	2463	36
K69	10000	13.50	8725	872	12.30	737	12.32	150	0	144	1	129	274	0	1471	4	1193	2668	33
K70	10000	13.50	8714	868	12.40	730	12.42	150	0	155	1	133	290	1	1622	4	1266	2892	30
K71	10000	13.50	8718	863	12.50	715	12.52	150	3	171	5	139	318	16	1792	26	1358	3192	27
K72	10000	13.50	8726	855	12.60	712	12.62	150	7	192	12	146	358	29	1985	95	1445	3555	24
K73	10000	13.50	8000	843	12.70	690	12.72	150	13	213	19	154	398	63	2195	143	1545	3947	21
K74	10000	13.50	8776	832	12.80	651	12.81	150	27	248	22	166	463	178	2455	167	1667	4466	18
K75	10000	13.50	8774	812	12.90	456	12.90	150	35	273	23	180	511	220	2723	175	1794	4912	17

No.	QSA	Lock 4 U/S WL	Flow D/S Lock 4	Kat Total Inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Car Park wetted area	Lower FP wetted area	Piggy wetted area	Upper FP wetted area	Total wetted area	Car Park impounded volume	Lower FP impounded volume	Piggy impounded volume	Upper FP impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ha	ha	ha	ha	ha	ML	ML	ML	ML	ML	%
K76	10000	13.50	8708	785	13.00	265	12.99	150	41	300	25	201	567	260	3014	190	1953	5418	14
K77	10000	13.50	8840	746	13.10	68	13.08	150	47	340	28	218	632	306	3345	219	2125	5995	12
K78	10000	13.80	8108	1435	10.66	1344	12.09	150	0	54	2	142	197	0	419	8	1218	1645	91
K79	10000	13.80	8086	1434	10.70	1345	12.09	150	0	54	1	142	197	0	425	4	1219	1648	91
K80	10000	13.80	8095	1434	10.80	1343	12.09	150	0	55	1	142	198	0	439	4	1220	1663	90
K81	10000	13.80	8080	1434	10.90	1342	12.10	150	0	56	1	142	199	0	458	4	1221	1682	89
K82	10000	13.80	8094	1434	11.00	1337	12.10	150	0	59	1	142	202	0	483	4	1222	1708	87
K83	10000	13.80	8047	1434	11.10	1345	12.10	150	0	61	1	143	205	0	513	3	1224	1741	86
K84	10000	13.80	8088	1434	11.20	1341	12.11	150	0	64	1	142	207	0	549	3	1228	1780	84
K85	10000	13.80	7982	1434	11.30	1350	12.12	150	0	67	2	143	211	0	591	7	1232	1830	82
K86	10000	13.80	8087	1434	11.40	1340	12.13	150	0	71	1	143	215	0	641	7	1238	1886	79
K87	10000	13.80	7490	1432	11.50	1339	12.15	149	0	75	1	143	219	0	698	6	1246	1950	76
K88	10000	13.80	8082	1434	11.60	1339	12.18	150	0	82	1	144	227	0	766	6	1258	2030	73
K89	10000	13.80	8079	1433	11.70	1339	12.21	151	0	89	1	144	234	0	840	6	1272	2118	70
K90	10000	13.80	8076	1433	11.80	1337	12.24	150	0	96	1	145	242	0	923	5	1291	2219	67
K91	10000	13.80	8075	1433	11.90	1337	12.29	150	0	103	1	146	250	0	1014	5	1316	2335	64
K92	10000	13.80	7928	1431	12.00	1334	12.34	150	0	111	1	148	260	0	1114	5	1346	2465	60
K93	10000	13.80	8082	1430	12.10	1333	12.40	150	0	123	1	149	273	0	1228	4	1383	2616	57
K94	10000	13.80	7074	1424	12.20	1329	12.46	150	0	135	1	152	288	0	1354	4	1429	2787	53
K95	10000	13.80	8084	1426	12.30	1323	12.53	150	0	146	1	155	302	0	1492	4	1480	2976	49
K96	10000	13.80	8078	1422	12.40	1320	12.60	150	0	158	1	160	319	1	1641	4	1542	3187	46
K97	10000	13.80	8080	1417	12.50	1299	12.67	150	3	174	5	165	347	16	1810	29	1611	3465	42
K98	10000	13.80	8079	1411	12.60	1297	12.74	150	7	196	13	175	391	29	2006	97	1701	3833	38
K99	10000	13.80	8092	1403	12.70	1277	12.81	150	13	217	19	183	432	65	2217	146	1791	4219	34
K100	10000	13.80	8111	1392	12.80	1286	12.89	150	28	253	23	200	504	185	2478	170	1912	4745	30
K101	10000	13.80	8114	1377	12.90	1258	12.97	150	35	277	25	214	552	220	2745	193	2038	5197	27
K102	10000	13.80	8106	1359	13.00	1240	13.04	150	41	304	27	228	600	261	3036	218	2163	5678	24
K103	10000	13.80	8160	1334	13.10	1209	13.13	150	47	346	30	247	671	306	3373	246	2334	6260	22
K104	10000	13.80	8069	1302	13.20	1151	13.22	150	54	390	44	270	759	360	3750	306	2529	6945	19
K105	10000	13.80	8213	1256	13.30	1053	13.31	150	66	437	48	298	849	423	4177	352	2752	7703	16

No.	QSA	Lock 4 U/S WL	Flow D/S Lock 4	Kat Total Inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Car Park wetted area	Lower FP wetted area	Piggy wetted area	Upper FP wetted area	Total wetted area	Car Park impounded volume	Lower FP impounded volume	Piggy impounded volume	Upper FP impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ha	ha	ha	ha	ha	ML	ML	ML	ML	ML	%
K106	10000	13.80	8303	1194	13.40	934	13.41	150	75	495	53	329	953	497	4667	403	3014	8581	13
K107	10000	13.80	8385	1107	13.50	776	13.50	150	84	555	58	363	1061	580	5215	460	3309	9564	10
K108	5000	13.20	4247	507	10.15	452	11.03	45	0	26	1	68	95	0	217	2	414	633	79
K109	10000	13.20	9246	519	10.59	462	11.13	47	0	30	1	70	101	0	253	2	438	693	73
K110	15000	13.20	14225	538	10.83	488	11.36	44	0	40	1	72	113	0	306	3	470	779	68
K111	20000	13.20	19172	577	11.17	534	11.63	15	0	56	1	76	134	0	445	7	530	982	57
K112	25000	13.20	24097	691	11.55	623	11.88	-49	0	73	2	84	159	0	675	13	649	1337	50
K113	29999	13.21	29087	860	11.90	729	12.19	-120	0	101	5	96	202	0	979	33	838	1850	45
K114	34996	13.21	33988	1055	12.20	853	12.48	-206	0	132	8	108	248	0	1330	57	1066	2453	42
K115	39990	13.21	38647	1273	12.45	1019	12.73	-316	1	165	11	130	307	5	1718	83	1321	3127	40
K116	44902	13.36	43349	1712	12.70	1381	12.98	-465	14	219	20	172	425	80	2230	155	1708	4173	40
K117	49780	13.71	48030	2686	12.95	2209	13.23	-480	29	300	28	266	623	191	2951	222	2466	5830	47
K118	54658	14.01	51676	3842	13.14	3022	13.42	-402	46	381	45	371	843	293	3639	308	3255	7495	49
K119	59468	14.21	54848	5182	13.32	4038	13.58	-323	61	488	53	473	1076	397	4473	394	4044	9307	55
K120	64195	14.41	57691	6804	13.51	5425	13.72	-274	84	592	62	574	1312	555	5520	504	4900	11478	62
K121	68732	14.56	59017	8030	13.67	6887	13.83	-155	101	658	70	656	1486	729	6607	611	5746	13692	68
K122	73127	14.63	61392	9099	13.77	6762	13.92	-198	110	689	74	713	1587	824	7294	676	6367	15161	61
K123	77416	14.73	61958	10379	13.85	6502	13.99	-154	115	708	78	773	1674	882	7932	742	7091	16648	54
K124	81601	14.81	62397	11506	13.92	6320	14.06	-93	118	725	80	821	1744	937	8533	806	7780	18056	49
K125	85774	14.85	64332	12299	13.99	6113	14.12	-87	121	734	81	854	1790	985	9034	861	8297	19178	44
K126	89948	14.91	64755	13178	14.05	6006	14.18	-8	124	739	82	890	1835	1037	9534	915	8911	20397	40
K127	94142	14.96	65375	14036	14.11	5923	14.23	65	129	745	82	921	1876	1100	10012	966	9491	21568	38
K128	5000	13.50	3717	868	10.50	795	11.50	95	0	40	1	110	151	0	300	4	824	1129	79
K129	10000	13.50	8689	880	10.61	806	11.50	97	0	41	1	110	152	0	314	4	831	1149	79
K130	15000	13.50	13717	900	10.84	822	11.50	102	0	49	1	111	161	0	359	4	846	1209	76
K131	20000	13.50	18674	928	11.19	849	11.65	102	0	59	1	113	174	0	485	3	876	1365	70
K132	25000	13.50	23495	962	11.54	889	11.89	95	0	74	1	118	193	0	689	3	944	1636	60
K133	29998	13.50	28273	1000	11.88	977	12.18	45	0	100	1	124	225	0	972	3	1071	2046	50
K134	34996	13.51	33279	1141	12.18	1151	12.47	-95	0	131	1	135	267	0	1323	2	1269	2595	44
K135	39977	13.51	38373	1319	12.47	1321	12.75	-226	1	167	3	154	325	7	1749	15	1518	3288	40

No.	QSA	Lock 4 U/S WL	Flow D/S Lock 4	Kat Total Inflow	Splash U/S WL	Splash outflow	Sawmill U/S WL	Sawmill outflow	Car Park wetted area	Lower FP wetted area	Piggy wetted area	Upper FP wetted area	Total wetted area	Car Park impounded volume	Lower FP impounded volume	Piggy impounded volume	Upper FP impounded volume	Total impounded volume	Total daily exchange
	ML/d	m AHD	ML/d	ML/d	m AHD	ML/d	m AHD	ML/d	ha	ha	ha	ha	ha	ML	ML	ML	ML	ML	%
K136	44870	13.51	43241	1552	12.71	1554	12.99	-417	14	224	20	184	441	77	2261	158	1823	4319	36
K137	49758	13.51	47976	1799	12.92	1856	13.19	-626	37	288	27	224	577	230	2838	213	2168	5450	34
K138	5000	13.50	3700	868	11.50	772	11.50	115	0	72	1	114	187	0	650	6	870	1525	58
K139	10000	13.50	8670	880	11.50	783	11.50	117	0	72	1	114	187	0	651	5	876	1533	59
K140	15000	13.50	13686	900	11.50	804	11.50	121	0	72	1	114	187	0	652	5	887	1545	60
K141	20000	13.50	18648	927	11.50	835	11.66	116	0	72	1	116	188	0	655	5	906	1566	61
K142	25000	13.50	23465	962	11.54	889	11.89	95	0	74	1	118	193	0	687	4	944	1635	60
K143	29998	13.50	28241	1000	11.88	979	12.18	46	0	100	1	124	225	0	971	4	1070	2045	50
K144	34996	13.51	33243	1140	12.18	1147	12.47	-94	0	131	1	135	267	0	1321	3	1267	2592	44
K145	39977	13.51	38341	1318	12.46	1319	12.75	-225	1	167	3	154	324	6	1745	15	1516	3282	40
K146	44870	13.51	43221	1551	12.71	1555	12.99	-416	15	223	20	184	442	90	2260	158	1823	4331	36
K147	49758	13.51	47952	1798	12.92	1848	13.19	-625	37	287	27	224	576	230	2833	213	2165	5440	34
K148	5000	13.50	3681	851	12.50	701	12.52	150	4	171	10	139	325	17	1788	74	1359	3237	26
K149	10000	13.50	8647	863	12.50	724	12.52	150	5	171	11	140	327	17	1789	83	1362	3252	27
K150	15000	13.50	13706	882	12.50	744	12.53	150	5	171	11	140	328	18	1790	83	1369	3260	27
K151	20000	13.50	18665	910	12.50	775	12.53	151	5	172	11	141	329	18	1791	83	1377	3270	28
K152	25000	13.50	23485	945	12.50	811	12.54	149	5	172	11	142	330	19	1792	84	1389	3284	29
K153	29998	13.50	28256	987	12.50	856	12.55	151	5	172	11	143	331	20	1794	84	1404	3301	31
K154	34996	13.51	33264	1038	12.50	911	12.56	150	5	172	11	145	334	20	1796	84	1424	3324	32
K155	39977	13.51	38353	1291	12.50	1309	12.75	-199	6	174	11	155	346	21	1811	86	1535	3452	38
K156	44870	13.51	43259	1552	12.72	1569	12.99	-418	18	234	22	192	466	135	2288	163	1846	4431	35
K157	49758	13.51	47950	1797	12.92	1849	13.19	-625	37	287	27	224	576	230	2833	213	2165	5440	34

Table 6.7. Steady state modelled percent reach for Katarapko Floodplain within range of 0.2 to 0.5 m/s.

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K1	10000	13.20	516	10.42	48	50	24	77	0	3	37	1	0	0	0	9	37	0	0	2	3	65
K2	10000	13.20	518	10.60	48	51	26	76	0	3	30	1	0	0	0	38	48	0	0	2	3	66
K3	10000	13.20	519	10.70	48	51	26	76	0	3	26	1	0	0	0	38	48	0	0	2	3	66

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K4	10000	13.20	519	10.80	48	51	26	76	0	3	22	1	0	0	0	41	48	0	0	2	3	66
K5	10000	13.20	519	10.90	48	51	25	76	0	3	19	1	0	0	0	41	48	0	0	2	3	66
K6	10000	13.20	519	11.00	48	51	24	76	0	6	16	1	0	0	0	41	48	0	0	2	3	66
K7	10000	13.20	518	11.10	48	51	23	76	0	8	14	1	0	0	0	41	48	0	0	2	3	66
K8	10000	13.20	519	11.20	48	51	19	76	2	11	13	1	0	0	0	41	48	0	0	2	3	66
K9	10000	13.20	518	11.30	48	51	15	77	2	11	12	1	0	0	0	36	48	0	0	2	3	66
K10	10000	13.20	519	11.40	48	51	10	77	18	16	12	1	0	0	0	36	48	0	0	2	3	66
K11	10000	13.20	517	11.50	48	51	7	77	28	24	10	1	0	0	0	21	48	0	0	2	3	66
K12	10000	13.20	518	11.60	48	50	4	76	45	30	9	1	0	0	0	38	48	0	0	2	3	66
K13	10000	13.20	518	11.70	48	50	2	74	52	35	6	1	0	0	0	41	48	0	0	2	2	66
K14	10000	13.20	518	11.80	48	48	0	71	58	42	4	1	0	0	0	41	48	0	0	2	2	66
K15	10000	13.20	518	11.90	48	47	0	69	61	47	2	1	0	0	0	41	48	0	0	2	2	65
K16	10000	13.20	516	12.00	48	46	0	64	62	52	1	1	0	0	0	23	48	0	0	2	2	64
K17	10000	13.20	516	12.10	48	42	0	57	55	49	1	1	0	0	0	41	48	0	0	2	1	63
K18	10000	13.20	512	12.20	48	40	0	48	44	52	0	1	0	0	0	23	48	0	0	2	1	60
K19	10000	13.20	511	12.30	48	38	0	40	36	49	0	1	0	0	0	41	48	0	0	2	1	57
K20	10000	13.20	506	12.40	47	35	0	31	24	49	0	1	0	0	0	41	48	0	0	2	1	55
K21	10000	13.20	498	12.50	44	33	0	20	16	49	0	1	0	0	0	41	48	0	0	2	1	50
K22	10000	13.20	486	12.60	42	30	0	9	7	49	0	1	0	0	0	34	44	0	0	2	1	45
K23	10000	13.20	467	12.70	40	25	0	4	4	52	0	1	0	0	0	14	44	0	0	2	0	37
K24	10000	13.20	444	12.80	39	18	0	1	2	49	0	1	0	0	0	22	41	0	0	2	0	32
K25	10000	13.20	412	12.90	32	14	0	1	4	49	0	1	0	0	7	17	41	0	0	0	0	24
K26	10000	13.40	745	10.59	56	52	48	78	35	23	40	6	0	0	0	20	44	0	0	25	3	63
K27	10000	13.40	744	10.60	56	52	50	79	39	23	40	8	0	0	0	23	48	0	0	25	4	63
K28	10000	13.40	745	10.70	56	52	50	79	39	28	37	8	0	0	0	23	48	0	0	25	4	63
K29	10000	13.40	745	10.80	56	52	49	79	39	28	33	8	0	0	0	41	48	0	0	25	4	63
K30	10000	13.40	745	10.90	56	52	49	79	39	28	28	8	0	0	0	23	48	0	0	25	4	63
K31	10000	13.40	745	11.00	56	52	49	79	42	30	24	8	0	0	0	41	48	0	0	25	4	63
K32	10000	13.40	745	11.10	56	52	48	78	45	30	21	8	0	0	0	23	48	0	0	25	4	63
K33	10000	13.40	745	11.20	56	52	47	78	48	30	18	6	0	0	0	41	48	0	0	25	4	63

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K34	10000	13.40	744	11.30	56	53	45	78	50	32	16	8	0	0	0	20	48	0	0	25	4	63
K35	10000	13.40	745	11.40	56	52	43	79	53	32	15	6	0	0	0	36	48	0	0	25	4	63
K36	10000	13.40	742	11.50	56	52	39	80	53	35	14	8	0	0	0	21	48	0	0	25	4	63
K37	10000	13.40	744	11.60	56	52	36	80	54	42	13	6	0	0	0	38	48	0	0	25	4	62
K38	10000	13.40	744	11.70	56	53	30	80	58	42	12	6	0	0	0	41	48	0	0	25	4	62
K39	10000	13.40	744	11.80	56	53	24	78	61	47	11	3	0	0	0	41	48	0	0	25	4	61
K40	10000	13.40	743	11.90	56	53	13	76	64	52	9	3	0	0	0	41	48	0	0	25	4	60
K41	10000	13.40	743	12.00	56	52	5	74	59	52	8	3	0	0	0	23	48	0	0	25	3	60
K42	10000	13.40	742	12.10	55	51	3	72	49	52	7	3	0	0	0	41	48	0	0	25	2	60
K43	10000	13.40	738	12.20	56	50	1	68	38	53	5	4	0	0	0	23	48	0	0	25	2	59
K44	10000	13.40	738	12.30	55	50	0	65	28	52	3	3	0	0	0	41	48	0	0	26	2	58
K45	10000	13.40	734	12.40	55	45	0	57	22	52	2	4	0	0	0	41	48	0	0	26	2	58
K46	10000	13.40	728	12.50	55	42	0	51	15	52	2	4	0	0	0	41	48	0	0	26	1	56
K47	10000	13.40	720	12.60	54	39	0	41	9	52	1	3	0	0	0	34	44	0	0	26	1	54
K48	10000	13.40	707	12.70	51	35	0	29	6	52	0	3	0	0	0	14	44	0	0	26	2	49
K49	10000	13.40	692	12.80	49	31	0	19	5	52	0	1	0	0	0	22	48	0	0	26	1	44
K50	10000	13.40	671	12.90	48	27	0	12	6	52	0	1	0	0	8	17	41	0	0	26	0	38
K51	10000	13.40	637	13.00	45	22	0	5	9	52	0	1	0	0	13	17	39	0	0	26	0	33
K52	10000	13.50	880	10.61	56	53	60	81	55	37	44	15	0	0	0	20	48	0	0	33	12	60
K53	10000	13.50	880	10.70	56	53	60	81	55	37	42	14	0	0	0	23	48	0	0	33	12	60
K54	10000	13.50	880	10.80	56	53	60	81	56	37	38	14	0	0	0	23	48	0	0	33	12	60
K55	10000	13.50	880	10.90	56	53	59	81	57	37	35	14	0	0	0	23	48	0	0	33	12	60
K56	10000	13.50	880	11.00	56	53	59	81	55	39	31	14	0	0	0	23	48	0	0	33	12	60
K57	10000	13.50	880	11.10	56	53	58	81	55	42	27	14	0	0	0	23	48	0	0	33	12	60
K58	10000	13.50	880	11.20	56	53	58	81	55	42	24	14	0	0	0	23	48	0	0	33	12	60
K59	10000	13.50	880	11.30	56	54	57	81	55	42	20	14	0	0	0	20	48	0	0	33	12	60
K60	10000	13.50	880	11.40	56	53	56	81	57	42	17	13	0	0	0	20	48	0	0	33	12	60
K61	10000	13.50	878	11.50	56	53	54	81	59	48	16	15	0	0	0	21	48	0	0	33	12	61
K62	10000	13.50	880	11.60	56	53	51	82	63	49	15	12	0	0	0	21	48	0	0	33	13	60
K63	10000	13.50	880	11.70	56	54	48	81	62	49	14	12	0	0	0	21	48	0	0	33	12	60

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K64	10000	13.50	879	11.80	56	54	43	80	64	52	13	11	0	0	0	23	48	0	0	33	12	60
K65	10000	13.50	879	11.90	56	53	38	79	60	52	12	11	0	0	0	23	48	0	0	33	11	60
K66	10000	13.50	878	12.00	56	53	31	79	53	52	11	12	0	0	0	23	48	0	0	33	10	61
K67	10000	13.50	877	12.10	56	53	23	79	44	52	10	11	0	0	0	23	48	0	0	33	9	60
K68	10000	13.50	872	12.20	56	53	9	74	38	53	9	13	0	0	0	23	48	0	0	33	8	59
K69	10000	13.50	872	12.30	56	52	4	71	27	52	8	10	0	0	0	23	48	0	0	33	9	57
K70	10000	13.50	868	12.40	56	49	2	67	21	52	6	9	0	0	0	23	48	0	0	33	9	56
K71	10000	13.50	863	12.50	55	48	1	62	14	52	5	9	0	0	0	23	48	0	0	33	10	55
K72	10000	13.50	855	12.60	55	43	0	56	10	52	3	9	0	0	0	19	44	0	0	33	7	53
K73	10000	13.50	843	12.70	55	40	0	51	8	53	2	11	0	0	0	14	44	0	0	33	6	51
K74	10000	13.50	832	12.80	54	36	0	41	6	52	1	6	0	0	0	12	48	0	0	33	6	48
K75	10000	13.50	812	12.90	52	32	0	31	8	52	0	1	0	0	9	17	41	0	0	33	5	44
K76	10000	13.50	785	13.00	50	29	0	20	10	52	0	1	0	0	13	17	39	0	0	33	3	36
K77	10000	13.50	746	13.10	46	22	0	10	8	46	0	1	0	0	13	16	36	0	0	32	1	28
K78	10000	13.80	1435	10.66	52	47	76	80	44	53	50	32	0	0	0	20	32	0	0	58	44	60
K79	10000	13.80	1434	10.70	52	47	76	80	44	53	49	32	0	0	0	23	48	0	0	58	44	60
K80	10000	13.80	1434	10.80	52	47	76	80	44	53	48	31	0	0	0	23	48	0	0	58	44	60
K81	10000	13.80	1434	10.90	52	47	76	80	43	53	46	31	0	0	0	23	40	0	0	58	44	60
K82	10000	13.80	1434	11.00	52	47	76	80	43	53	43	31	0	0	0	23	48	0	0	58	44	60
K83	10000	13.80	1434	11.10	52	47	76	80	42	53	40	31	0	0	0	23	48	0	0	58	44	60
K84	10000	13.80	1434	11.20	52	47	75	80	40	53	39	31	0	0	0	23	48	0	0	58	44	60
K85	10000	13.80	1434	11.30	52	47	75	80	40	53	36	31	0	0	0	20	48	0	0	58	44	60
K86	10000	13.80	1434	11.40	52	47	75	80	38	53	34	30	0	0	0	20	48	0	0	58	44	60
K87	10000	13.80	1432	11.50	53	47	74	80	37	53	31	33	0	0	0	9	40	0	0	60	44	60
K88	10000	13.80	1434	11.60	53	46	73	80	38	53	29	30	0	0	0	21	40	0	0	58	44	60
K89	10000	13.80	1433	11.70	53	47	72	81	37	53	26	30	0	0	0	21	48	0	0	58	44	59
K90	10000	13.80	1433	11.80	53	47	71	81	34	53	22	30	0	0	0	23	40	0	0	58	43	58
K91	10000	13.80	1433	11.90	53	47	70	81	27	53	19	30	0	0	0	23	48	0	0	58	43	58
K92	10000	13.80	1431	12.00	53	47	69	82	23	53	18	30	0	0	0	23	48	0	0	58	43	58
K93	10000	13.80	1430	12.10	53	47	68	82	20	53	16	29	0	0	0	23	48	0	0	58	42	58

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K94	10000	13.80	1424	12.20	53	48	65	79	16	53	15	34	0	0	0	10	40	0	0	59	41	55
K95	10000	13.80	1426	12.30	53	47	62	78	13	53	14	28	0	0	0	23	48	0	0	58	39	54
K96	10000	13.80	1422	12.40	53	47	58	78	10	53	13	28	0	0	0	23	48	0	0	58	38	53
K97	10000	13.80	1417	12.50	53	47	52	78	10	53	12	28	0	0	0	23	48	0	0	58	35	52
K98	10000	13.80	1411	12.60	52	46	46	77	10	53	11	28	0	0	0	19	37	0	0	56	33	51
K99	10000	13.80	1403	12.70	51	44	40	74	11	53	10	28	0	0	0	13	44	0	0	56	31	50
K100	10000	13.80	1392	12.80	51	44	32	66	11	53	8	27	0	0	0	12	37	0	0	56	29	49
K101	10000	13.80	1377	12.90	52	42	25	60	12	53	7	27	0	0	0	13	44	0	0	57	25	48
K102	10000	13.80	1359	13.00	51	38	14	53	10	53	5	27	0	0	0	13	44	0	0	56	21	45
K103	10000	13.80	1334	13.10	50	35	3	45	8	53	3	27	0	0	0	12	44	0	0	56	20	43
K104	10000	13.80	1302	13.20	49	28	0	40	4	53	1	27	0	0	0	10	44	0	0	55	16	33
K105	10000	13.80	1256	13.30	47	22	0	30	3	53	0	22	0	0	0	9	44	0	0	53	12	27
K106	10000	13.80	1194	13.40	43	18	0	19	1	52	0	18	0	0	0	9	44	0	0	52	10	21
K107	10000	13.80	1107	13.50	38	13	0	7	0	52	0	12	0	0	0	9	44	0	0	43	5	16
K108	5000	13.20	507	10.15	44	49	29	69	31	31	44	6	0	0	0	10	0	0	0	0	2	55
K109	10000	13.20	519	10.59	45	49	30	69	30	15	30	1	0	0	0	41	45	0	0	2	2	56
K110	15000	13.20	538	10.83	45	50	30	68	22	0	21	1	0	0	0	66	58	0	0	7	2	57
K111	20000	13.20	577	11.17	46	50	23	69	0	0	15	1	0	0	13	80	89	9	0	9	2	57
K112	25000	13.20	691	11.55	49	50	6	69	3	0	14	1	0	0	21	48	79	11	0	11	1	58
K113	29999	13.21	860	11.90	50	51	3	68	29	1	12	2	0	0	31	38	66	5	0	14	2	59
K114	34996	13.21	1055	12.20	51	46	2	60	48	7	11	3	0	0	31	32	64	4	0	16	2	58
K115	39990	13.21	1273	12.45	53	42	2	48	44	17	10	3	0	0	30	23	66	3	0	18	2	54
K116	44902	13.36	1712	12.70	52	37	3	51	32	16	10	3	0	0	24	25	56	3	0	35	7	46
K117	49780	13.71	2686	12.95	48	37	32	51	4	13	13	9	1	0	20	32	52	3	0	65	31	39
K118	54658	14.01	3842	13.14	50	34	65	53	2	6	16	27	2	16	21	33	58	6	1	69	45	41
K119	59468	14.21	5182	13.32	54	32	75	49	5	0	21	50	3	5	19	42	52	9	1	73	53	42
K120	64195	14.41	6804	13.51	57	35	73	46	7	0	28	67	4	4	21	31	47	13	1	67	60	38
K121	68732	14.56	8030	13.67	62	35	70	57	12	0	32	67	3	14	18	24	37	18	0	65	60	40
K122	73127	14.63	9099	13.77	58	35	68	58	13	0	33	67	9	14	23	23	39	13	1	65	55	51
K123	77416	14.73	10379	13.85	57	41	65	68	16	0	35	67	31	14	23	24	46	9	2	57	63	62

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K124	81601	14.81	11506	13.92	58	46	65	72	22	0	36	67	50	14	20	23	47	8	6	56	65	67
K125	85774	14.85	12299	13.99	57	49	62	76	23	0	36	67	64	14	17	21	45	5	7	52	65	71
K126	89948	14.91	13178	14.05	58	54	60	79	28	0	37	67	74	15	17	17	55	2	10	49	65	74
K127	94142	14.96	14036	14.11	57	56	58	80	29	0	37	67	79	20	16	15	61	2	10	47	67	75
K128	5000	13.50	868	10.50	55	53	59	79	44	47	46	25	0	0	0	20	0	0	0	27	9	61
K129	10000	13.50	880	10.61	55	54	60	81	44	42	45	13	0	0	0	23	45	0	0	28	9	61
K130	15000	13.50	900	10.84	55	53	61	80	46	30	38	5	0	0	0	66	58	0	0	31	11	61
K131	20000	13.50	928	11.19	56	53	61	81	47	11	26	3	0	0	0	80	81	10	0	32	11	61
K132	25000	13.50	962	11.54	56	53	57	83	24	7	17	1	0	0	0	51	84	16	0	34	14	61
K133	29998	13.50	1000	11.88	54	54	47	82	0	0	15	1	0	0	0	45	71	16	0	38	16	58
K134	34996	13.51	1141	12.18	54	52	32	76	1	0	14	3	0	0	0	33	56	16	0	41	18	56
K135	39977	13.51	1319	12.47	51	49	13	71	15	0	13	3	0	0	0	27	47	5	0	47	19	54
K136	44870	13.51	1552	12.71	51	41	5	60	18	13	11	3	0	0	0	28	42	3	0	49	20	49
K137	49758	13.51	1799	12.92	50	35	3	44	17	23	10	5	0	0	0	27	34	3	0	55	17	42
K138	5000	13.50	868	11.50	54	53	53	80	53	49	15	20	0	0	0	20	0	0	0	27	9	60
K139	10000	13.50	880	11.50	55	54	54	80	61	45	15	10	0	0	0	23	45	0	0	28	9	61
K140	15000	13.50	900	11.50	55	53	55	81	63	35	16	4	0	0	0	66	58	0	0	31	11	61
K141	20000	13.50	927	11.50	56	53	57	82	53	22	16	3	0	0	0	80	81	9	0	32	10	61
K142	25000	13.50	962	11.54	56	53	57	83	25	7	17	1	0	0	0	51	84	16	0	34	14	61
K143	29998	13.50	1000	11.88	54	54	47	82	0	0	15	1	0	0	0	45	71	16	0	37	16	58
K144	34996	13.51	1140	12.18	54	52	32	76	1	0	14	3	0	0	0	33	56	15	0	41	18	56
K145	39977	13.51	1318	12.46	51	50	14	71	15	0	13	3	0	0	0	27	47	5	0	46	19	54
K146	44870	13.51	1551	12.71	51	41	5	60	18	13	12	3	0	0	0	28	42	3	0	49	20	49
K147	49758	13.51	1798	12.92	50	35	3	44	17	23	10	5	0	0	0	27	34	3	0	55	17	42
K148	5000	13.50	851	12.50	54	48	1	58	13	57	5	18	0	0	0	19	0	0	0	27	8	56
K149	10000	13.50	863	12.50	55	48	1	60	14	51	5	7	0	0	0	20	42	0	0	28	9	56
K150	15000	13.50	882	12.50	55	48	2	62	14	45	6	4	0	0	0	57	55	0	0	31	8	56
K151	20000	13.50	910	12.50	55	49	3	65	14	38	6	1	0	0	0	70	77	2	0	32	10	56
K152	25000	13.50	945	12.50	54	50	3	66	13	25	7	1	0	0	0	45	79	3	0	33	12	56
K153	29998	13.50	987	12.50	53	50	5	69	12	6	7	2	0	0	0	40	71	3	0	37	14	55

No.	QSA	Lock 4 U/S WL	Kat Total Inflow	Splash U/S WL	Reach 1	Reach 2	Reach 3	Reach 5	Reach 6	Reach 7	Reach 8	Reach 9	Reach 10	Reach 11	Reach 12	Reach 13	Reach 14	Reach 15	Reach 6	Reach 17	Reach 18	Reach 19
	ML/d	m AHD	ML/d	m AHD	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach	% reach
K154	34996	13.51	1038	12.50	53	51	11	71	10	0	8	3	0	0	0	30	56	3	0	41	17	55
K155	39977	13.51	1291	12.50	51	48	12	69	6	0	12	3	0	0	0	25	47	3	0	45	18	54
K156	44870	13.51	1552	12.72	51	41	5	57	17	13	11	3	0	0	0	28	42	3	0	49	20	48
K157	49758	13.51	1797	12.92	50	35	3	44	17	23	10	5	0	0	0	27	34	3	0	55	17	42

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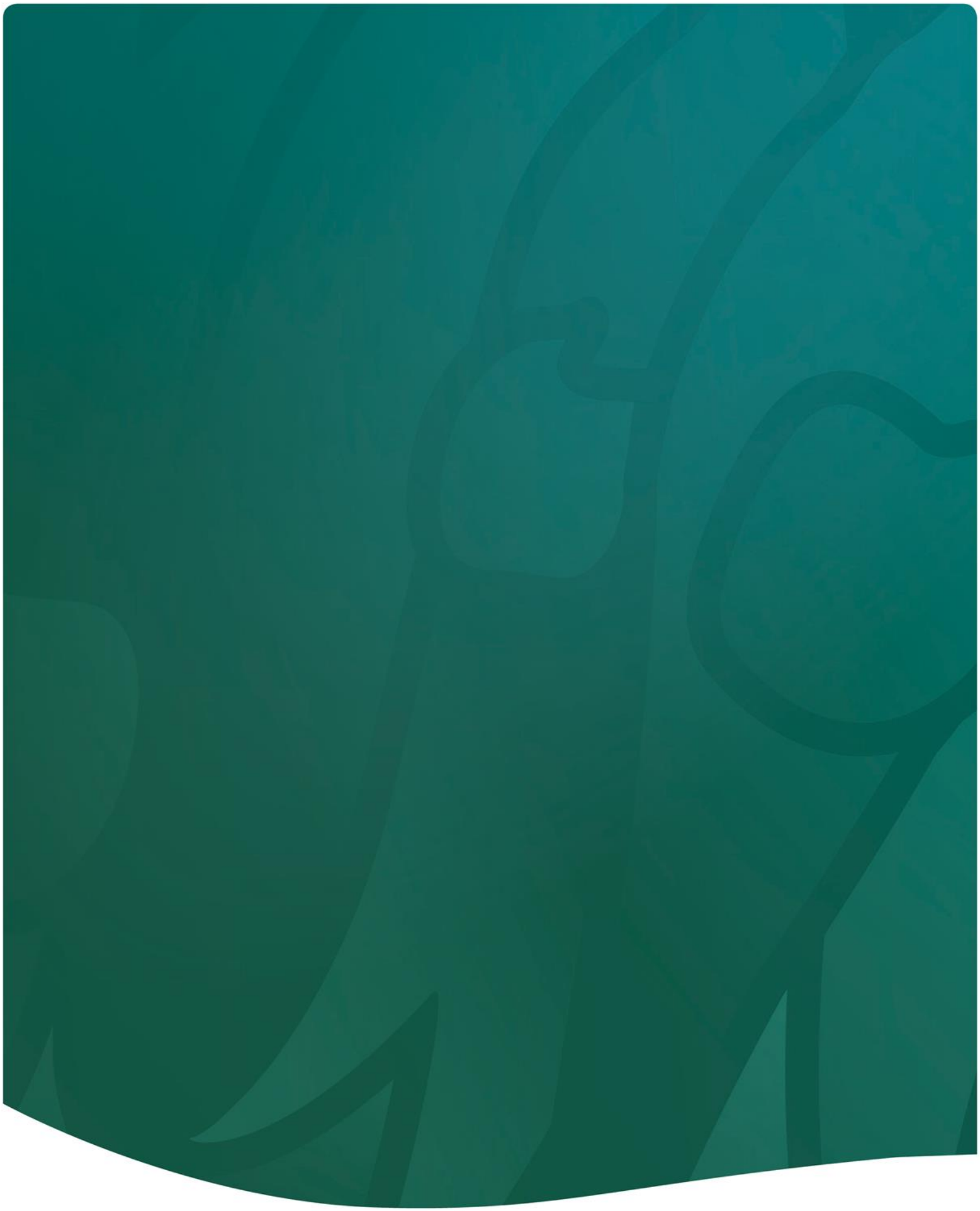

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