WATER RESOURCES OF SOUTH AFRICA, 2012 STUDY (WR2012)

Volume 5: SAMI Groundwater Module: Verification Studies, Default Parameters and Calibration Guide

K Sami

WATER RESEARCH COMMISSION

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WATER RESOURCES OF SOUTH AFRICA, 2012 STUDY (WR2012)

WR2012 SAMI Groundwater module: Verification Studies, Default Parameters and Calibration Guide

Report to the
Water Research Commission

by

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1. WR2012 Executive Summary (WRC Report No. TT 683/16)
2. WR2012 User Guide (WRC Report No. TT 684/16)
3. WR2012 Book of Maps (WRC Report No. TT 685/16)
4. WR2012 Calibration Accuracy (WRC Report No TT 686/16)
5. **WR2012 SAMI Groundwater module: Verification Studies, Default Parameters and Calibration Guide (WRC Report No. TT 687/16 – this report)**
6. WR2012 SALMOD: Salinity Modelling of the Upper Vaal, Middle Vaal and Lower Vaal sub-Water Management Areas (new Vaal Water Management Area) (WRC Report No. TT 688/16)
7. WRSM/Pitman User Manual (WRC Report No. TT 689/16)
8. WRSM/Pitman Theory Manual (WRC Report No. TT 690/16)
9. WRSM/Pitman Programmer's Code Manual WRC Report No. TT 691/16)

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EXECUTIVE SUMMARY

This report is a comprehensive account of the Sami surface water/groundwater methodology as part of the WRSM/Pitman model. One of the main objectives of this report was to re-evaluate the default groundwater parameters which were determined as part of the GRAII study and used in the WR2005 study. Verification studies were carried out on a number of catchments and as a result, some of the default groundwater parameters were modified. In order to make this a comprehensive report, a description and flowchart showing the structure of the Sami methodology was given. The model parameters utilized and derivation thereof were discussed together with guidelines. The surface water should first be calibrated using the Pitman methodology, following which the Sami methodology should be chosen in order to fine-tune the calibration. Following selection of default parameters, the groundwater-surface water interaction should be calibrated with the aid of graphs and statistics. Verification studies carried out on various catchments throughout the study area have been described with the aid of WRSM/Pitman graphs and statistics. Some limitations are given with a view to future improvement. The updated set of groundwater default parameters is given in Appendix A.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

DWS	Department of Water and Sanitation
GRAII	Groundwater Resource Assessment Study II
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
Pitman S	Soil moisture storage parameter
WMA	Water Management Area
WRSM/Pitman	Water Resources Simulation Model 2000, also referred to as the Pitman model
WR2005	Water Resources of South Africa 2005 study
WR2012	Water Resources of South Africa 2012 study

1. INTRODUCTION

Since the abstraction of groundwater may impact on the availability of surface water resources through baseflow depletion, the integrated and sustainable management and development of water resources requires an understanding and simulation of the interactions between groundwater and surface water. There are 1995 quaternary catchments, of which 1382 have baseflow, hence simulating these interactions is of great relevance, especially where groundwater abstraction has impacted on baseflow.

The quantification of such interactions is also necessary to avoid the pitfalls of double accounting of water resources. For example, hydrologists often consider baseflow as part of stream runoff, hence an allocatable surface resource. Geohydrologists often consider groundwater resources in terms of recharge, a large portion of which generates baseflow. Consequently, the simple addition of surface water runoff volumes and groundwater resources based on recharge (i.e. Harvest Potential) double accounts for the baseflow component.

1.1. Objectives

The objective of this report is to present:

- National default model parameters for WRSM/Pitman;
- Validation of default parameters across a variety of catchments;
- Results of the testing of parameters and calibration in selected catchments and
- Present a calibration to assist modellers with parameterising and calibrating WRSM/Pitman.

1.2. Methodology

The new default parameter set is based on GRAII data and has been upgraded since the WR2005 release by correction of unrealistic parameters in GRAII. The derivation of these parameters from GRAII is presented.

For the validation study, 65 groundwater regions exist in South Africa for which the default parameters need to be validated. Not all these regions could be validated during WR2012 due to time and budgetary constraints. Within the work undertaken in WR2012, a series of quaternaries from each of the GW regions in the western and southern Cape, and 2 in Limpopo, where interactions occur were selected. These quaternaries were selected by the availability of good gauging data (length and quality), and a host of interaction types. These quaternaries are shown in Table 1.

Table 1: Groundwater Region Details

GW Region	Name	Number of Quaternaries
8	Soutpansberg	13
19	Lowveld	21
36	Hantam	4
37	Tanqua Karoo	5
38	Western Upper Karoo	2
41	Western Great Karoo	7
48	NW Cape Range	24
49	SW Cape Range	7
50	Southern Cape Range	6
53	Ruensveld	8

57	Swartland	2
58	Outeniqua Coastal Foreland	1
59	SW Coastal sandveld	1
Total		101

The default parameters have also been utilised and verified in a wide range of catchments across other parts of the country during water resources studies undertaken for the DWA. These include:

- the Letaba and Luvuvhu catchments;
- the Mhlutuze basin;
- the Klein Dwars;
- the Mokolo basin;
- the Mogalakwena basin and
- the Lephalale basin.

2. DESCRIPTION OF THE MODEL

2.1. History of the Model

In 2003 the DWA embarked on the Phase II Groundwater Resource Assessment programme. The main objective of the programme was to develop methodologies and data that will support groundwater resource quantification per defined management unit. This programme was also tasked with supporting Integrated Water Resources Management, whose portfolio is to deliver relevant information on groundwater resources in support of Integrated Water Reserve Management. The Phase II programme comprised 5 projects, of which Project 3B, Groundwater-Surface Water Interactions, was one. The objective of this project was to review methods to quantify groundwater-surface water interactions and to develop a generic algorithm that can be applied to estimate groundwater-surface water interaction nationally on a quaternary catchment scale.

A methodology and algorithms were developed whereby the impacts on baseflow from groundwater abstraction and its proximity to river channels could be simulated. The methodology was incorporated into an MS-EXCEL environment. Subsequently, the software found application in simulating the potential impacts of groundwater abstraction on the time series of baseflow for use in systems models to determine the potential impacts on reservoir yields and resource reliability.

The model was encoded into the WRSM/Pitman model (also known just as the Pitman model) as part of WR2005, however, during the WR2005 study, groundwater abstractions were not included in the nationwide study, and a nationwide parameter set was not yet available.

2.2. Groundwater-Surface Water Interactions

The model attempts to simulate the following surface water and groundwater interactions:

BASEFLOW

- Interflow occurring from the unsaturated zone contributing to hydrograph recession following a large storm event, or discharge from perched water tables via temporary or perennial springs located above low permeability layers, which may cause prolonged baseflow following rain events, even when the regional water table is below the stream channel.

- Groundwater baseflow discharged from the regional aquifer to surface water as baseflow to river channels, either to perennial effluent or intermittent streams.

RIVER LOSSES

- Transmission losses of surface water when river stage is above the groundwater table in phreatic aquifers with a water table in contact with the river.
- Groundwater baseflow reduction and induced recharge caused by pumping of aquifer systems in the vicinity of rivers causing a flow reversal.

The distinction between the two baseflow components distinguishes that not all subsurface water pathways incur passage through the regional aquifer. Subsurface water which does not flow through the regional aquifer is not available to boreholes in terms of conventional groundwater resource assessment; hence a distinction needs to be made between groundwater baseflow originating from the regional aquifer and baseflow originating from other, more rapid, subsurface pathways (interflow). Baseflow can therefore be considered to consist of the portion of subsurface water which contributes to the low flow of streams. This can originate from either:

- the regional groundwater body (groundwater baseflow), that portion of the total water resource that can either be abstracted as ground water or surface water, or
- saturated soils, perched aquifers, high lying springs, excess recharge that is not accepted by the aquifer, processes that can be lumped as interflow.

Simulating baseflow for the correct reason is significant not only for hydrograph shape, but for simulating the impacts of abstraction. In catchments with significant relief and geological heterogeneities, a large part of the baseflow fraction originates as interflow and never passes through the regional aquifer, and hence does not form part of the groundwater resources as considered in the concept of the groundwater Harvest Potential. These catchments may have a very high recharge, but very limited groundwater resource potential. Such catchments must be simulated as being primarily interflow driven. In such catchments, baseflow to maintain instream flows is not attributed to discharge from the regional aquifers, since a large fraction originates as interflow. Groundwater abstraction may not impact at all on interflow from high lying springs, seeps, and perched water tables, hence would have no impact on the Ecological Reserve, or on the interflow component of baseflow in the river. Only the portion of recharge re-emerging as groundwater baseflow can be impacted by abstraction. High lying perched springs would remain unaffected, unless land use or vegetation changes result in a reduction of interflow.

Many publications note that baseflow during hydrograph recession is not linearly related to hydraulic conductance, and during periods of high recharge, leakage calculated by models using linear means is much greater than occurs in practice. This can be attributed to ignoring increased hydraulic resistance to flow as discharge increases. This suggests linear methods, as used in numerical flow models, do not provide a suitable avenue for modelling interactions in systems where large flow fluctuations occur, as in South African rivers. A more realistic approach to simulating interactions could be adopted by using non-linear equations whereby rapid increases in baseflow occur for small head changes when the head difference is small, but baseflow approaches some maximum value as the head difference becomes larger. This is the approach adopted by this methodology.

Simulation of interactions is relevant under conditions where groundwater abstraction takes place. The decline of water levels around pumping boreholes near surface water bodies creates gradients that capture some of the ambient groundwater that would have discharged as groundwater baseflow. At sufficiently high pumping rates these declines also induce flow out of the surface water body, a process known as induced recharge. Both these processes lead to streamflow depletion, which can significantly impact the ecology and yield of dams.

Under natural conditions, dynamic steady-state conditions exist whereby in wet years recharge exceeds discharge and in dry years the reverse take place. This results in a cycle of rising and falling aquifer water levels. Pumping upsets this principle and new equilibrium conditions are eventually reached by increasing recharge (through induced recharge) or decreasing discharge (baseflow depletion, reduced groundwater outflow from the catchment, or reduced evapotranspiration losses from groundwater due to a lowering of water levels). Once new equilibrium conditions are reached whereby pumping is balanced by baseflow depletion a water licence to abstract groundwater is equivalent to a right to divert streamflow. In general, the further away the abstraction point is from the river, the longer the time to achieve equilibrium conditions. However, until equilibrium is reached these two volumes are not the same and the difference results in aquifer storage depletion. Therefore groundwater abstraction MUST consider both aquifer storage depletion and baseflow depletion and abstractions must be allocated in terms of the portion that originates as aquifer storage and that which comes from streamflow depletion.

The length of time required for equilibrium to be reached between the surface water and groundwater flow depends on three factors: aquifer diffusivity, which is expressed as the ratio of aquifer storativity and transmissivity, the distance from the well to stream and the time of pumping. These are the three critical physical parameters affecting the impact of pumping on baseflows. In general, a tenfold increase in distance from a surface water course will result in a hundred fold increase in response time. Recharge is unimportant in terms of the magnitude of the impact on baseflow; however, it limits the pumping rate since the portion originating from the aquifer cannot exceed recharge.

2.3. Structure of model

The groundwater module is linked to the Pitman S variable (subsurface storage) which drives the groundwater module and replaces the former baseflow generation mechanisms. The components of the model include:

- calculating interflow from the percolating storage utilising the Pitman methodology;
- generating a time series of aquifer recharge from the Pitman S variable;
- incrementing a percolating storage by a lagged aquifer recharge, with any recharge in excess of percolating storage capacity being dumped to aquifer storage;
- incrementing aquifer storage from the percolating storage up to a maximum of the aquifer capacity. If any recharge in excess of the aquifer capacity occurs, it contributes to interflow;
- depleting aquifer storage by evapotranspiration from riverine areas and areas of shallow water table as a function of aquifer storage;
- depleting aquifer storage by groundwater outflow to other catchments as a function of aquifer storage;
- calculating groundwater baseflow or transmission losses in a non-linear manner as a function of groundwater storage and runoff volume and
- depleting groundwater storage and groundwater baseflow due to abstraction as a function of aquifer diffusivity, time since pumping started, distance, and recharge.

The structure of the methodology is shown in Figure 1

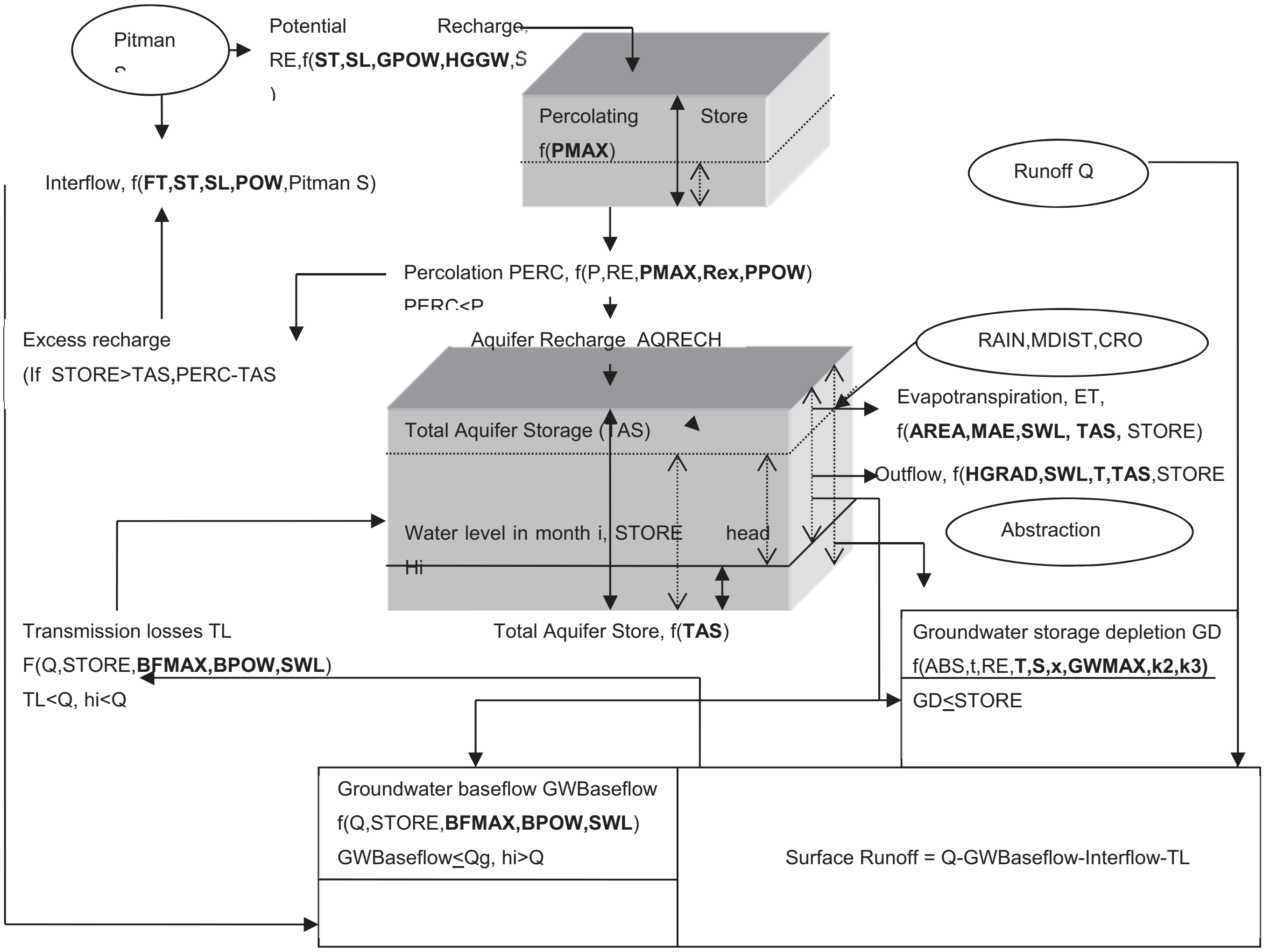

Figure 1: Structure of the new interaction methodology. Parameters are indicated in Bold.

2.4. Interflow from the Percolating Store

From the time series of Pitman S input to the model interflow is generated using the Pitman algorithm (eq. 1), with Qg being the interflow component.

$$Qg = FT\left(\frac{S - SL}{ST - SL}\right)^{POW} \tag{1}$$

And

S = variable of Pitman S (subsurface moisture storage in mm) for each month
POW = parameter of the ratio of actual soil storage to storage capacity
SL = parameter of minimum soil moisture storage below which there is no runoff
ST = parameter of maximum soil moisture storage
FT = parameter of the maximum baseflow expressed as a depth

For a description of these parameters, refer to Pitman et al, 2015 A.

Parameters for SL, ST, FT and POW retain the same meaning as the original Pitman model, which generated baseflow solely from eq. 1, with increasing FT generating more baseflow by interflow (figure 2).

If groundwater baseflow is to be generated rather than interflow, FT must be reduced. Increasing SL allows recharge and interflow to be generated only in months where the S variable is above SL. In general SL is increased to the point where no interflow is generated during dry periods if ephemeral conditions are required (figure 3), or FT is set to 0, where no perennial springs occur. (SL set to somewhat higher than S values during dry periods).

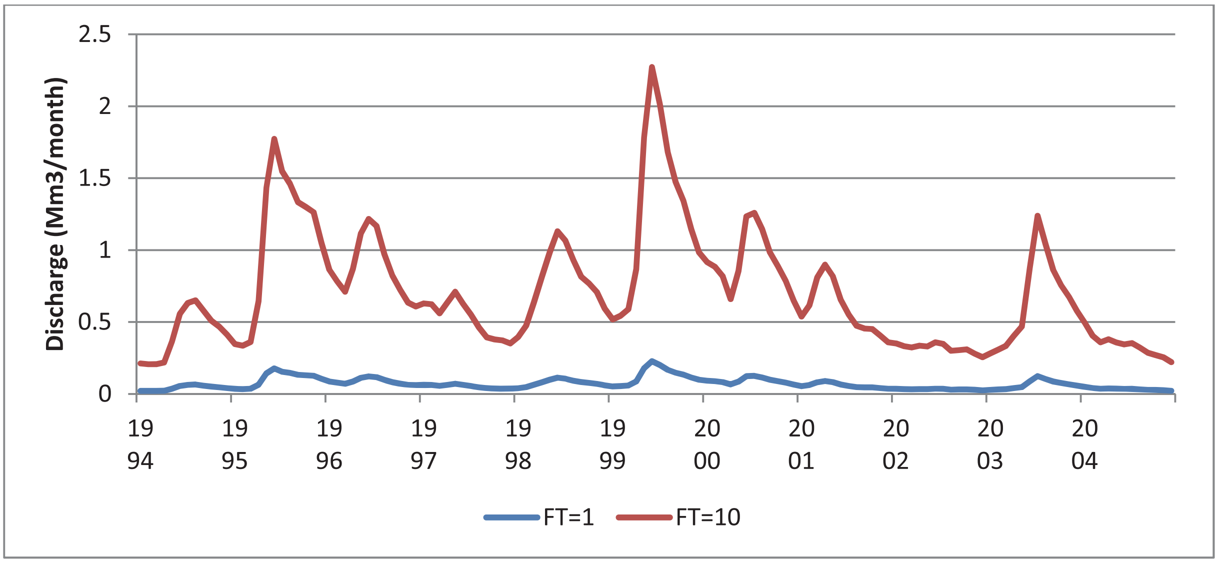

Figure 2: Interflow Hydrograph for FT=1 and FT =10

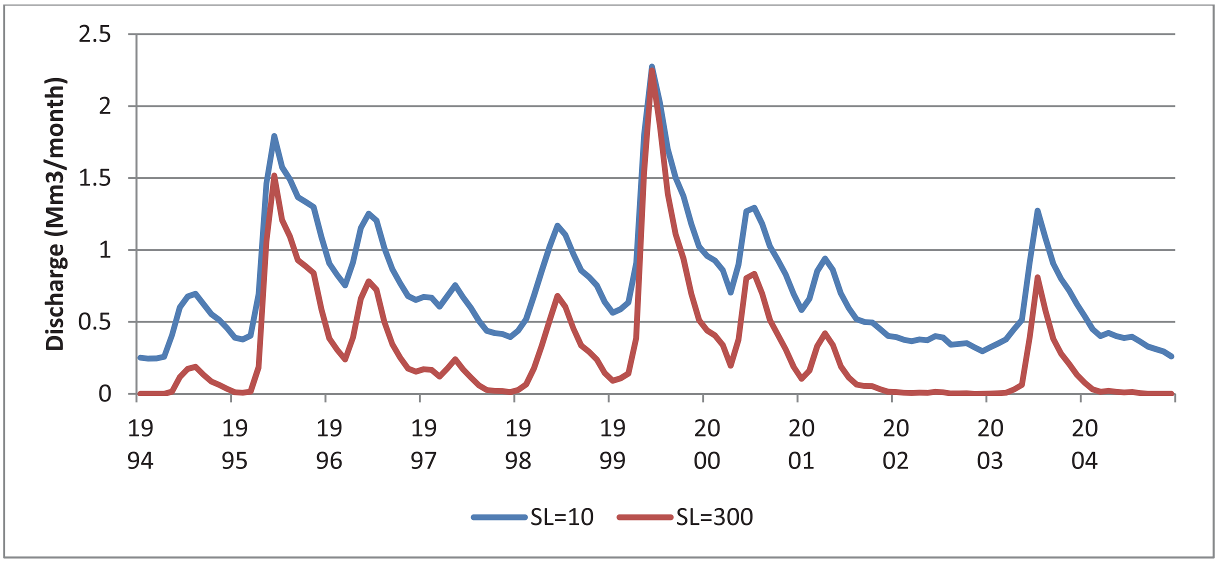

Figure 3: Interflow Hydrograph for SL=10 and SL=300

2.5. Estimation of Recharge

Monthly aquifer recharge is calculated from the Pitman S variable by:

$$RE = HGGW\left(\frac{S - SL}{ST - SL}\right)^{GPOW} \tag{2}$$

Where

RE = variable of potential aquifer recharge (mm)

HGGW = parameter of maximum recharge in mm at maximum soil moisture (ST)
S = Input data of soil moisture in mm
SL = Parameter of soil moisture threshold below which there is no recharge
GPOW = Parameter of the storage-recharge relationship

The output of the algorithm is a monthly time series of recharge.

The SL parameter controls the soil moisture threshold below which there is no recharge. The HGGW parameters controls the rate of recharge and the GPOW parameter can be considered to conceptually represent the changing recharge contribution area with respect to soil moisture status. A GPOW of 1 implies linearity between soil moisture status and recharge area.

Parameters for HGGW and GPOW could either be calibrated to achieve a fit with long term mean annual recharge measurements obtained from other methods, or initially parameters similar to POW and FT could be selected. Since the parameters have a similar basis, GPOW would lie between 1-3. Parameter values are regional in nature and have been found to need little or no calibration between quaternaries with similar conditions. The effect of reducing GPOW is to increase recharge, especially during dry conditions (Figure 4). Generally GPOW =1 in wet catchments with high recharge and shallow soils, like mountainous catchments, or in dolomites. In semi-arid catchments with low recharge and no baseflow, GPOW is equal to 3. GPOW is generally kept equal to Pitman POW and HGGW is calibrated until mean annual recharge estimates approximate published values. GPOW generally lies from 0-20% higher than POW.

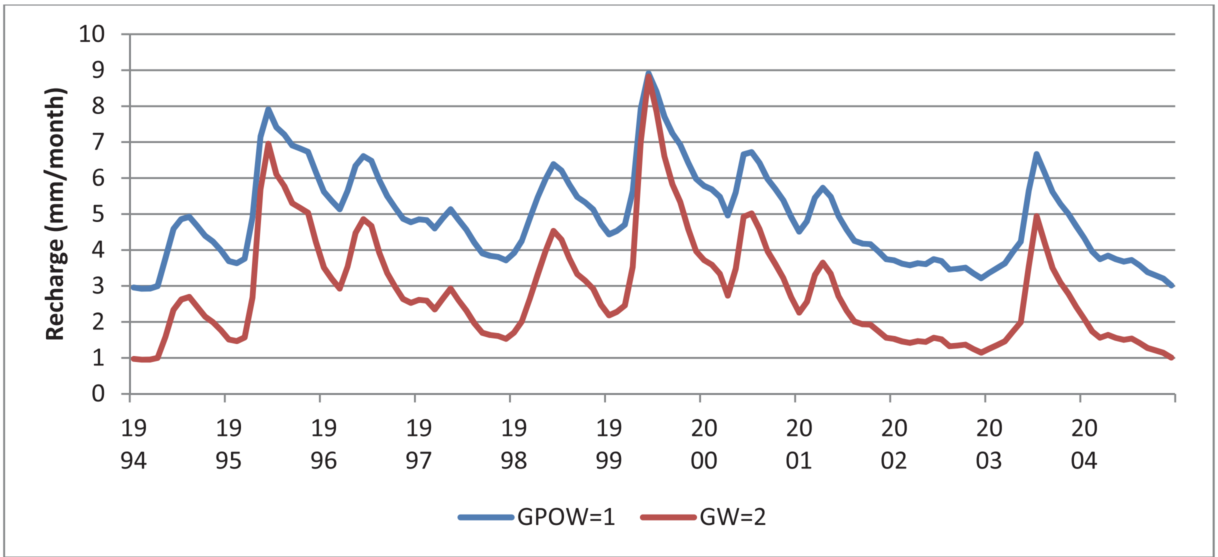

Figure 4: Recharge for GPOW=1 and GPOW=2

HGGW defines the maximum recharge rate and its effect is to increase recharge, especially during wet periods (Figure 5).

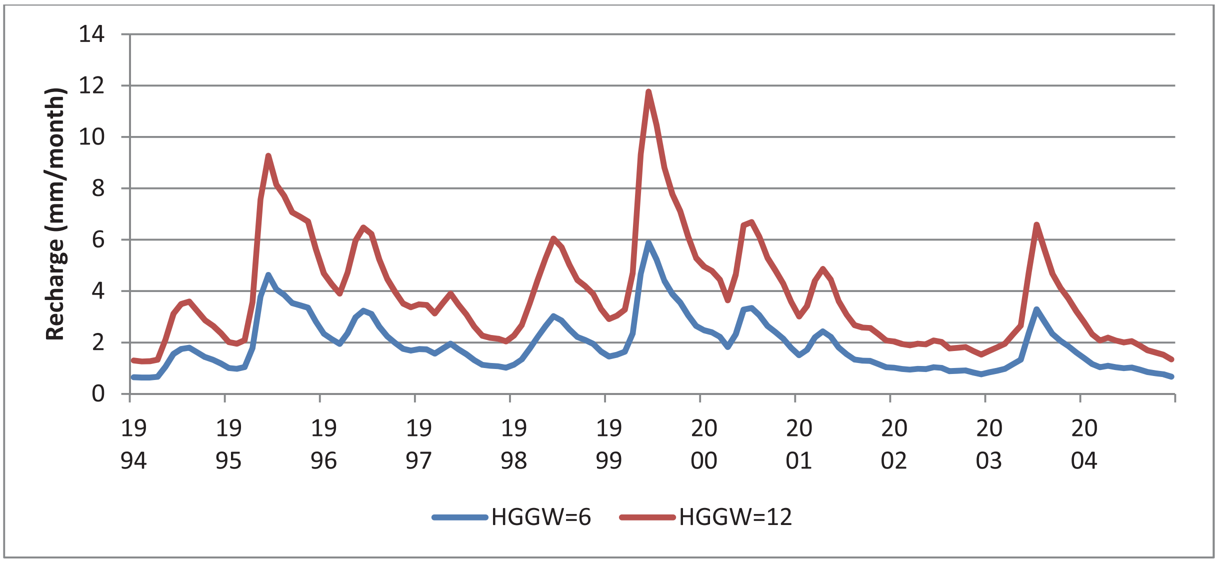

Figure 5: Recharge for HGGW=6 and HGGW=12

2.6. Percolating Storage Increments from Recharge

Since recharge calculated from the Pitman S variable is not lagged relative to rainfall, recharge is directly related to monthly rainfall. However, the lag between rainfall and recharge to the regional aquifer may be significant in some aquifers. Significant lags may also exist between recharge reaching the aquifer and baseflow generation where long travel times exist, such as in dolomites, with long lag times resulting in eyes that flow all year. Since the aquifer is a single cell, it is necessary to lag recharge so that baseflow is not all generated in the month when a large rain event occurs. If recharge were input directly to the regional aquifer, large unrealistic variations in groundwater baseflow could arise. Recharge therefore needs to be attenuated to account for natural lags that occur due to the percolation of water from the soil to the aquifer, and then by lags occurring between recharge and the generation of baseflow. Attenuation for the travel time from the soil to the regional aquifer is accomplished through a storage that conceptually represents the percolating zone between the soil and aquifer. Recharge is added to this zone, and then released to the aquifer at a slower rate.

Recharge from soil moisture RE is added to a percolating storage zone (P) by incrementing the percolating store by RE (figure 1). If recharge causes storage P to rise above PMAX, a parameter of maximum capacity of percolating storage, the excess recharge (EXRECH) is dumped directly to the aquifer store.
In each month P is incremented by recharge RE, and decremented by EXRECH and PERC, a variable of percolation from the percolating store to the aquifer storage, generating a time series of aquifer storage and percolating storage by:

$$PERC = RE_x \times \left(\frac{P}{PMAX}\right)^{PPOW} \times \frac{RE_x}{\overline{RE}} \qquad (3)$$

Where:

REx = time series variable of the moving average of recharge RE for x months (1-120 months)
P = variable of percolating storage
PPOW = parameter of the relationship between storage and percolation (<1)
RE = mean monthly recharge

PMAX is determined by the average static water level and time the storativity. The effect of increasing PSTORE is that large recharge events can be lagged through the percolating store, instead of being routed straight to the aquifer as EXRECH (Figure 6).

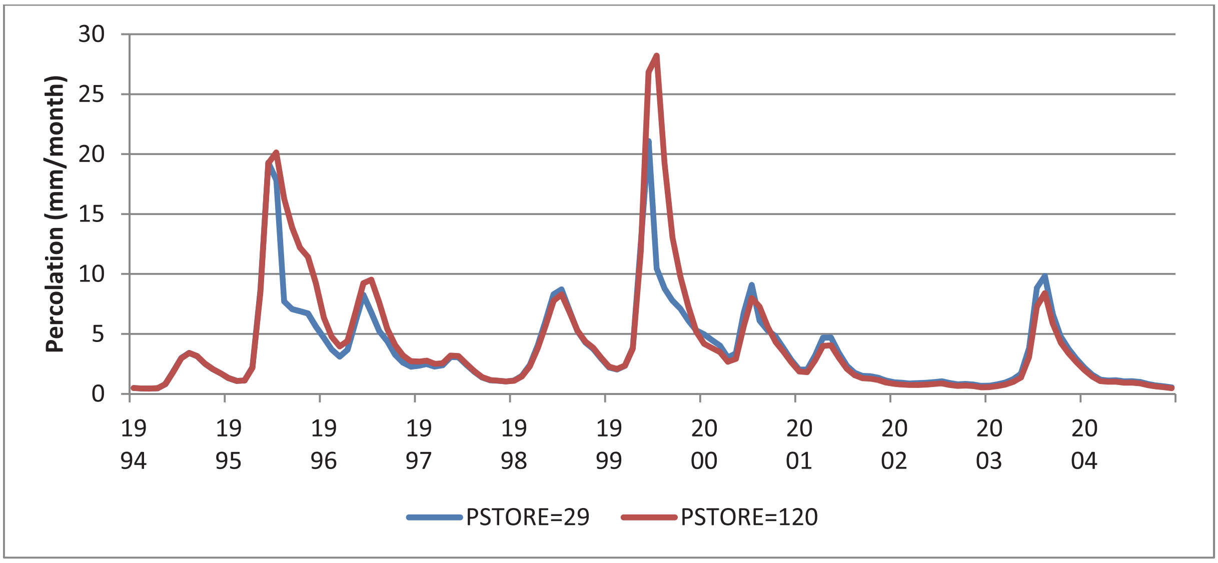

Figure 6: Percolation with PTORE=29 and PSTORE=120

The appropriate length of the moving average of recharge REx to utilise is dependent on the rate at which the recharge pulse is transmitted to the aquifer and is dependent on the potential volume of storage in the percolating zone. It can be estimated by PMAX divided by the average annual recharge times 0.5. Increasing the length of the moving average attenuates recharge, reducing peak recharge volumes.

The effect of REx is to lag percolation from the P store to the regional aquifer using a moving average of recharge. This lag is related to the level of storage relative to the maximum volume of the percolating zone, and the volume of Rex relative to mean monthly recharge. The effect of varying the months of REx on percolation is shown in figure 7. Percolation is attenuated so that peak recharge volumes are redistributed according to the moving average of recharge. In large dolomitic compartments, the months of lag can reach 120 months, which can be related by monthly eye hydrographs to the moving average of rainfall.

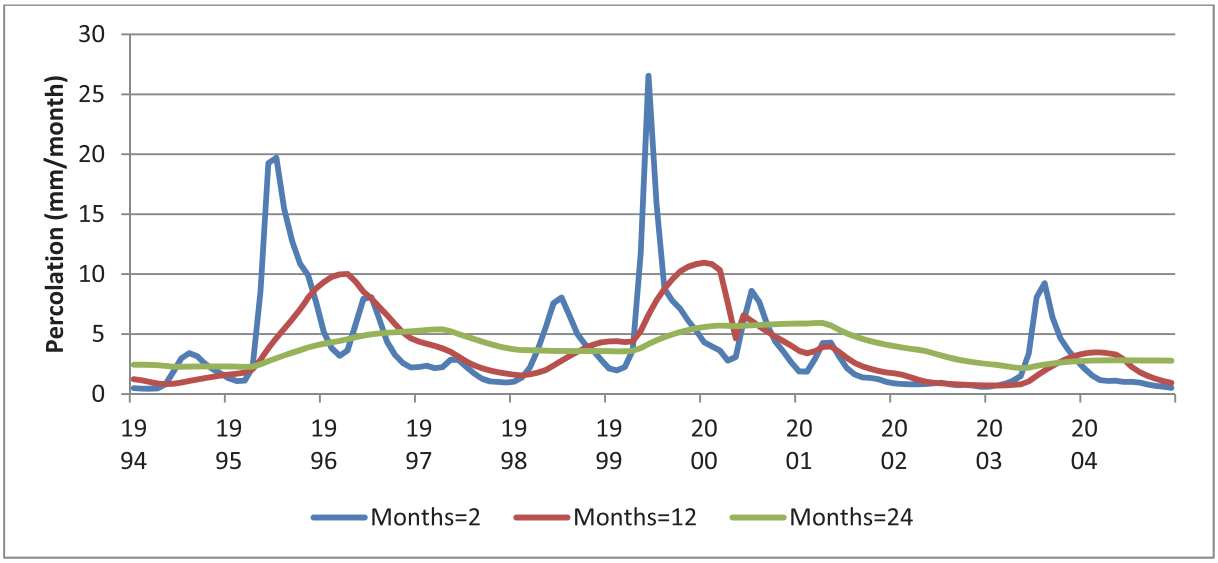

Figure 7: Percolation with Months =2, 12 and 24

The effect of increasing the months for the moving average of recharge is to lag percolation so that peaks of groundwater baseflow occur later than rainfall peaks, and are more attenuated. The difference between the timing of recharge and percolation to the regional aquifer (the month the baseflow will be generated) are shown in Figure 8 for a moving average of 12 months.

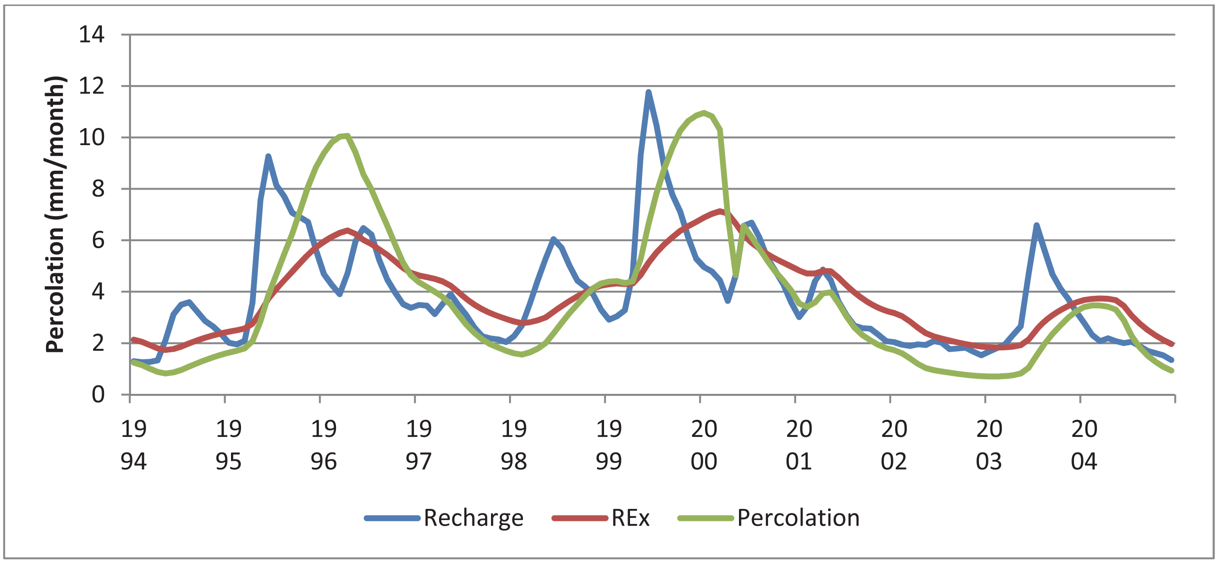

Figure 8: Recharge REx and percolation for months=12

Percolation PERC from the percolating storage is incremented directly to aquifer storage STORE.

2.7. Evapotranspiration from Shallow Groundwater

Where a shallow water table exists, and riverine vegetation or wetlands are thought to be sustained by groundwater, a routine to deplete groundwater storage is utilised.

Monthly rainfall, mean annual A-Pan evaporation, the percent monthly distribution of evaporation and the monthly Acocks Veld type crop factors are utilised, as is the area over which evapotranspiration can take place. Monthly evapotranspiration is calculated by the product of mean annual evaporation, monthly distribution and crop factor. Rainfall is subtracted from evapotranspiration to obtain evapotranspiration demand from groundwater. When rainfall exceeds evapotranspiration demand, evapotranspiration from groundwater is defaulted to 0, since it is assumed that the evapotranspiration demand will be met from soil moisture storage.

Evapotranspiration demand is multiplied by an aquifer storage factor to allow evaporation to decrease as groundwater storage is depleted. Evapotranspiration occurs at the maximum rate when groundwater storage is at or above total aquifer storage (TAS) and declines towards 0 as groundwater storage drops to a level below the stream channel, defined by a parameter of static water level.

Evapotranspiration from groundwater is therefore calculated by:

$$((MAE \times MDISTxCROP) - RAIN) \times AREA \times (STORE - SWL/(TAS - SWL) \qquad (4)$$

Where:

MAE = mean annual evaporation;
MDIST = monthly distribution fraction of evaporation;

CROP = monthly A pan crop factor for appropriate Acocks vegetation cover;
RAIN = input data of monthly rainfall;
AREA = riverine area where evapotranspiration from groundwater can take place;
SWL = parameter of static water level and
TAS =Total aquifer storage from GRA II total aquifer volume divided by area.

An error check is included to ensure evapotranspiration does not become negative if groundwater level drops below the static water level due to high levels of abstraction.

Evapotranspiration is subsequently decremented from groundwater storage.

TAS is obtained from GRA II database of total aquifer volume divided by area.

AREA can vary from 1% of the catchment in catchments with a very deep water table, to greater than 50% in flat catchments with a shallow water table and afforested or covered in bush. AREA is generally calibrated so that the calibrated recharge doesn't generate excessive baseflow. In ephemeral catchments, AREA must be high enough so that all the recharge is evaporated without generating baseflow.

SWL represents the aquifer storage level at which evapotranspiration terminates. It can vary from 40% of TAS to over 90%. Increasing SWL increases the volume of ET, especially during wet periods (Figure 9), hence increasing SWL can be utilised to prevent baseflow in ephemeral catchments.

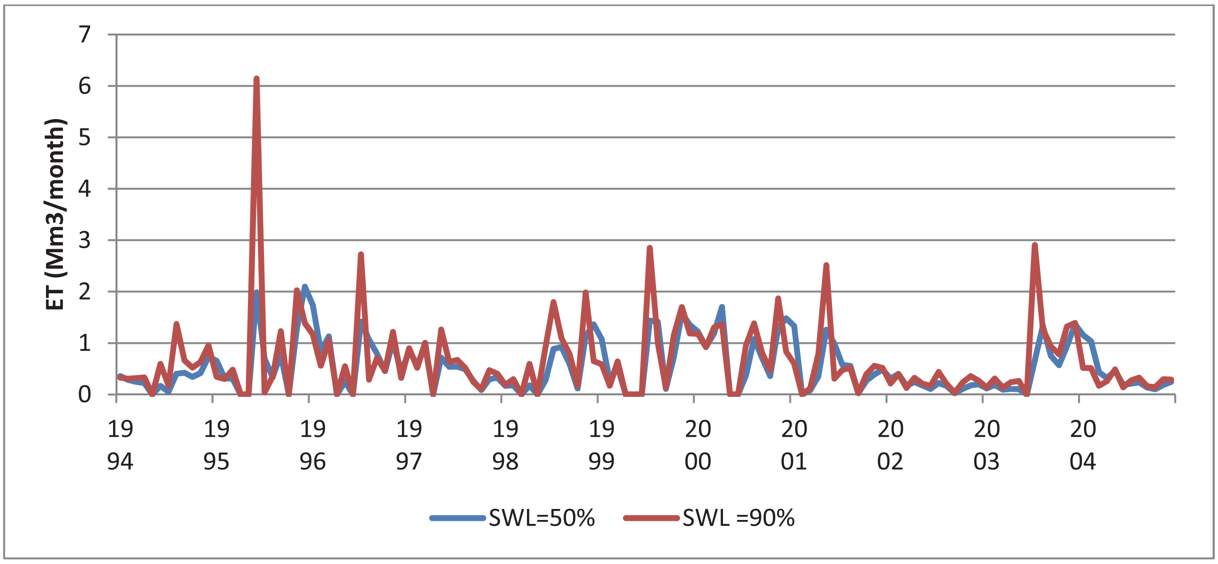

Figure 9: Evapotranspiration with SWL=50 and 90% of aquifer capacity.

2.8. Groundwater Outflow

Groundwater is allowed to flow out of a catchment to simulate underflow and regional groundwater flow that does not emerge in surface water courses within the catchment. These volumes are relatively small, except when simulating leakage from compartments across dykes, in which case outflow can be calibrated to match mean annual leakage from a compartment.
Groundwater outflow is calculated using the Darcian approach of the product of parameters of transmissivity T and the hydraulic gradient HG oriented out of the catchment (T*HG). The hydraulic gradient fluctuates as a function of aquifer storage. The maximum hydraulic gradient is defined by a parameter HGRAD. This gradient is the hydraulic gradient oriented out of the catchment. The maximum

value for HGRAD can be taken as the channel gradient. The hydraulic gradient HG is decremented as the groundwater storage drops to the Static Water Level by:

$$HG = HGRADx(STORE - SWL)/(TAS - SWL) \quad (5)$$

Where:

HGRAD= parameter of maximum hydraulic gradient

This format allows groundwater outflow to occur at a decreasing rate as the water level drops, until outflow stops when the static water level is reached. Groundwater outflow is allowed to become negative to simulate drawing in of water from adjacent catchments under conditions of large scale abstraction.

Groundwater outflow is decremented from groundwater storage.

2.9. Groundwater Baseflow and Transmission losses

After evapotranspiration and groundwater outflow have been decremented from groundwater storage, groundwater baseflow is calculated. Groundwater baseflow is calculated as a function of the head difference between groundwater and surface water.

Groundwater head in each month is calculated as the difference between STORE and the SWL parameter. Surface water head is calculated from the monthly runoff volume divided by catchment area. When groundwater head exceeds surface water head, as can occur during low flow months, groundwater baseflow is generated, simulating effluent conditions. These are decremented from groundwater storage. When surface water head exceeds groundwater head, as can occur during very wet months, temporary influent conditions arise and transmission losses to bank storage or to the aquifer are simulated. These are incremented to groundwater storage STORE.

This system allows head differences to vary month by month due to both groundwater storage and streamflow variations, thereby overcoming problems based on assuming unrealistic constant head conditions in the river, as employed by MODFLOW.

Groundwater baseflow (GWBaseflow) and transmission losses are calculated using a non-linear equation to account for the effects of hydraulic resistance:

$$GWBaseflow = (1 - e^{(HEAD \times BPOW)}) \times BFMAX \quad (6)$$

Where:

BFMAX= parameter of the maximum rate of groundwater baseflow
BPOW = relationship between head difference and baseflow

$$HEAD = STORE - SWL - \frac{RUNOFF}{CATCHMENT} \quad (7)$$

RUNOFF = Catchment runoff
CATCHMENT = Catchment area

If head is positive, transmission losses occur instead of baseflow, with a check that transmission losses cannot exceed runoff.

Equation 6 allows large increases in baseflow or transmission losses for small head changes when the head difference between surface and groundwater is small, but causes baseflow and transmission losses to approach the maximum value of BFMAX as the head difference becomes larger (Figure 10). As the head difference increases, the exchange of water thereby increases at an increasingly smaller rate.

Reducing BPOW allows baseflow to increase more rapidly with small changes of head. The power parameter BPOW is set as -0.05 by default. It can be altered to generate a more rapid and peaked groundwater response in catchments with a very shallow groundwater level and rapid response, such as shallow sandy aquifers. Decreasing BPOW generates a more rapid rising limb on the baseflow hydrograph with larger peaks (Figure 11).

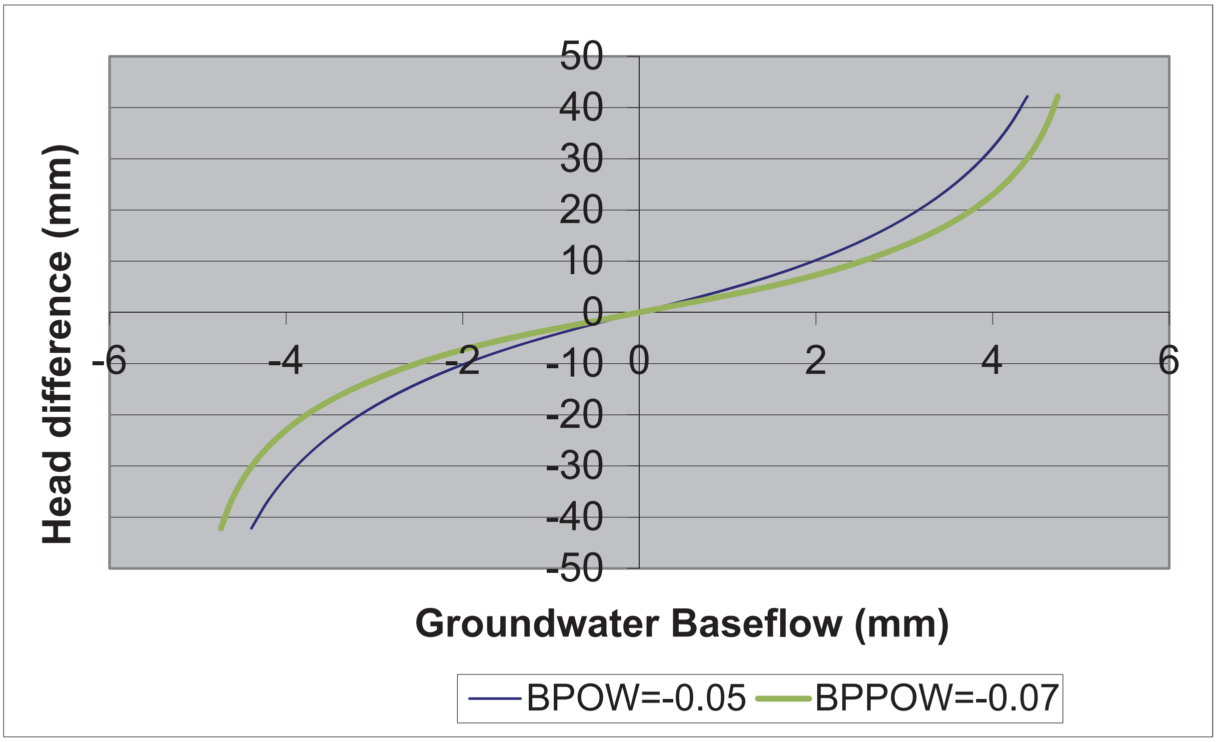

Figure 10: Relationship between groundwater baseflow (-ve) and difference in head (HEAD) between groundwater storage and surface water. +ve baseflow values imply influent conditions when transmission losses occur. Maximum baseflow has been set at 5 mm/month.

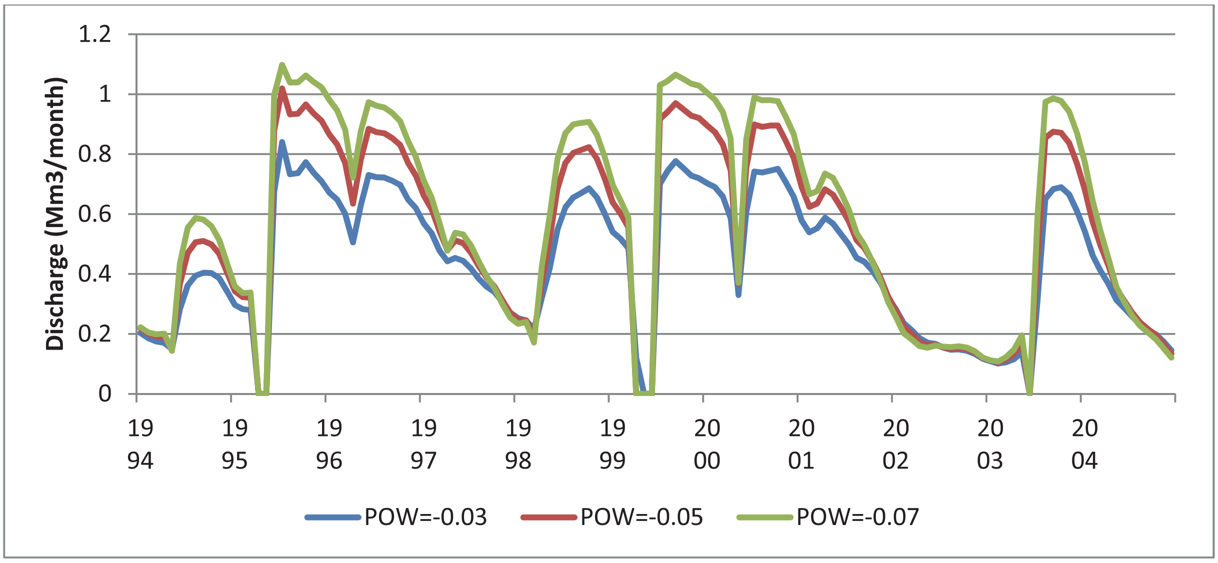

Figure 11: Groundwater baseflow with BPOW of -0.03 to -0.07

The parameters BFMAX and SWL can be calibrated by verifying that baseflow approximately matches observed runoff during the dry season, especially during drought periods. Total baseflow volumes can also be calibrated against quaternary low flows such as those estimated by Hughes, or by Pitman. Where no interactions occur, BFMAX could be set to 0, however this would impede transmission losses. In ephemeral catchments BMAX is set to a low value, like 0.5-1 mm, and ET AREA is calibrated to prevent baseflow generation.

Reducing the SWL increases the baseflow volume and allows for a less rapid baseflow recession (Figure 12). SWL is generally increased to 80-95% of TAS in ephemeral catchments.

Increasing BFMAX increases baseflow during wet periods and makes baseflow more peaked, but has less impact on low flows (Figure 13). Groundwater baseflow is best calibrated during the lowest dry season flow period on record, and the wettest dry season low flow on record so that the very low flows and the high baseflows can be achieved.

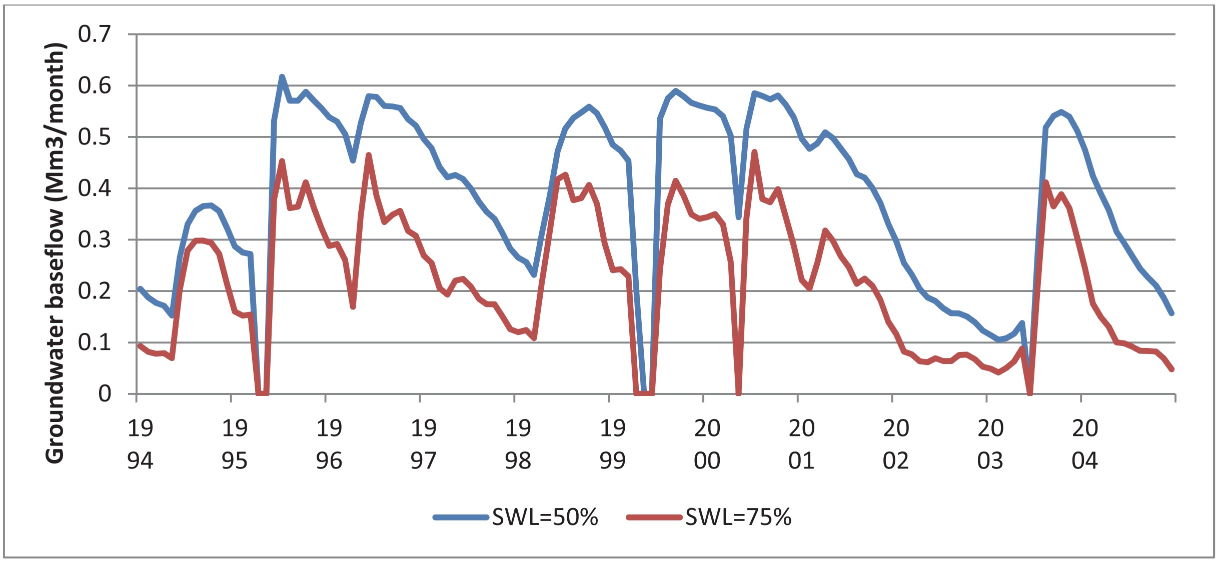

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Figure 12: Baseflow hydrograph for SWL = 50 and 75% of total aquifer storage

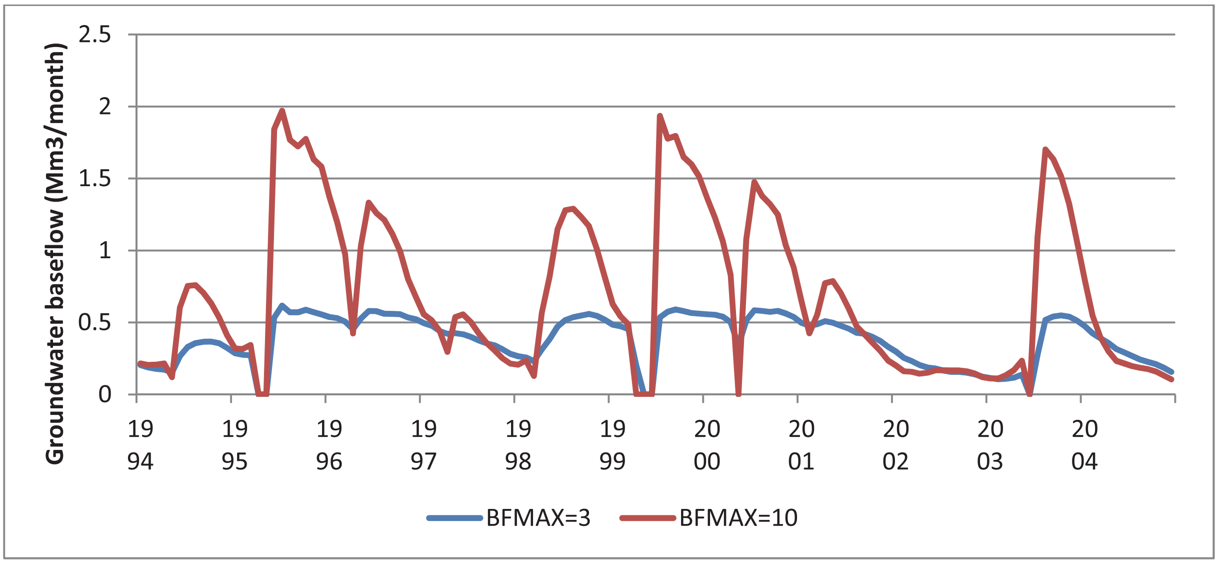


Figure 13: Baseflow with BFMAX = 3mm/month and 10 mm/month

2.10. Interflow and aquifer recharge

Interflow is calculated as the sum of interflow from the percolating store (2.4) and percolation PERC in excess of the total aquifer storage TAS when the aquifer STORE becomes full:

$$INTERFLOW = FT\left(\frac{S-SL}{ST-SL}\right)^{POW} + (PERC + STORE - TAS) \text{ If STORE>TAS} \qquad (8)$$

Consequently, when the aquifer is full, excess percolation is lost as interflow and does not increment groundwater storage. As a result, aquifer recharge may be somewhat less than potential recharge calculated by equation 2. Abstraction can increase recharge by lowering store and allowing more percolation to recharge the aquifer and reducing interflow.

Interflow can be lagged using the Pitman lag algorithm:

$$QLAG = QLAG_{t-1} + \left[\left(INTERFLOW_{t-1} - QLAG_{t-1}\right) * \left(\frac{1}{GL+0.5}\right)\right] + \left[\left(\frac{1}{GL+0.5} * 0.5\right) + \left(INTERFLOW - QLAG_{t-1}\right)\right] \quad (9)$$

Where

QLAG = Lagged interflow
GL = Pitman lag parameter
t-1 = denotes interflow from the previous month

The lag parameter has the effect of reducing peaks in interflow and attenuating them over a long duration (Figure 14).

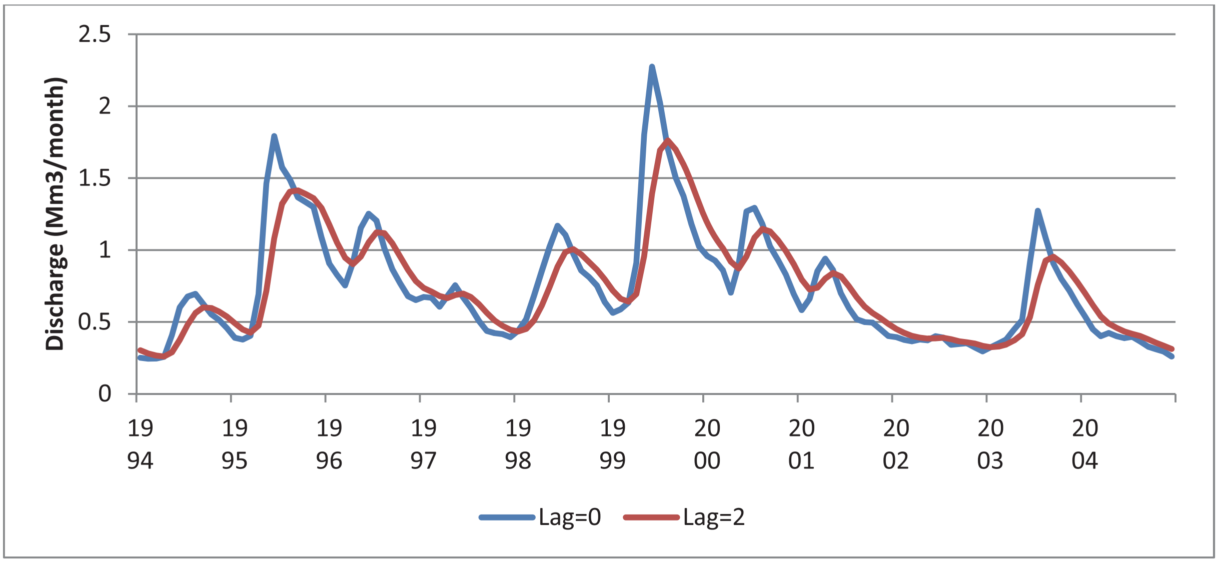


Figure 14: Interflow with lag =0 and lag = 2

2.11. Aquifer recharge

The sum of percolation (equation 3), recharge in excess of percolating store EXRECH, minus the percolation in excess of aquifer capacity is termed aquifer recharge, and represents the sum of recharge entering the regional aquifer and being available for abstraction, or to generate groundwater baseflow.

2.12. Groundwater Abstraction

It is assumed that all abstraction takes place from the regional aquifer, not from perched aquifers.

Groundwater abstraction can deplete both groundwater storage and groundwater baseflow in a non-linear fashion depending on the transmissivity and storativity of the aquifer, the distance from the stream channel and the time since pumping started and the volume of recharge in that month. The algorithms utilised are:

$$t' = \frac{4Tt}{x^2 S} \qquad \%GW = \frac{GWMAX}{(1 + e^{(k3 + k2 \times t')})} \tag{10}$$

Where

t' = variable of dimensionless time
t = time since pumping started
T = Transmissivity parameter
S = Storativity parameter
X = distance from river parameter
%GW = variable of % of abstraction originating from groundwater storage in each month, with the remainder being groundwater baseflow depletion
GWMax= Maximum % of abstraction that can be taken from groundwater storage
k3 and k2= calibrated curve fitting parameters with k2 =-3 to -8 and k3 calibrated so that at early times 100% of abstraction is from groundwater.

The impact of such an algorithm is shown in figure 15 for a borehole at various distances from the river. Over time, progressively more baseflow depletion occurs, however, this transition is distance dependent.

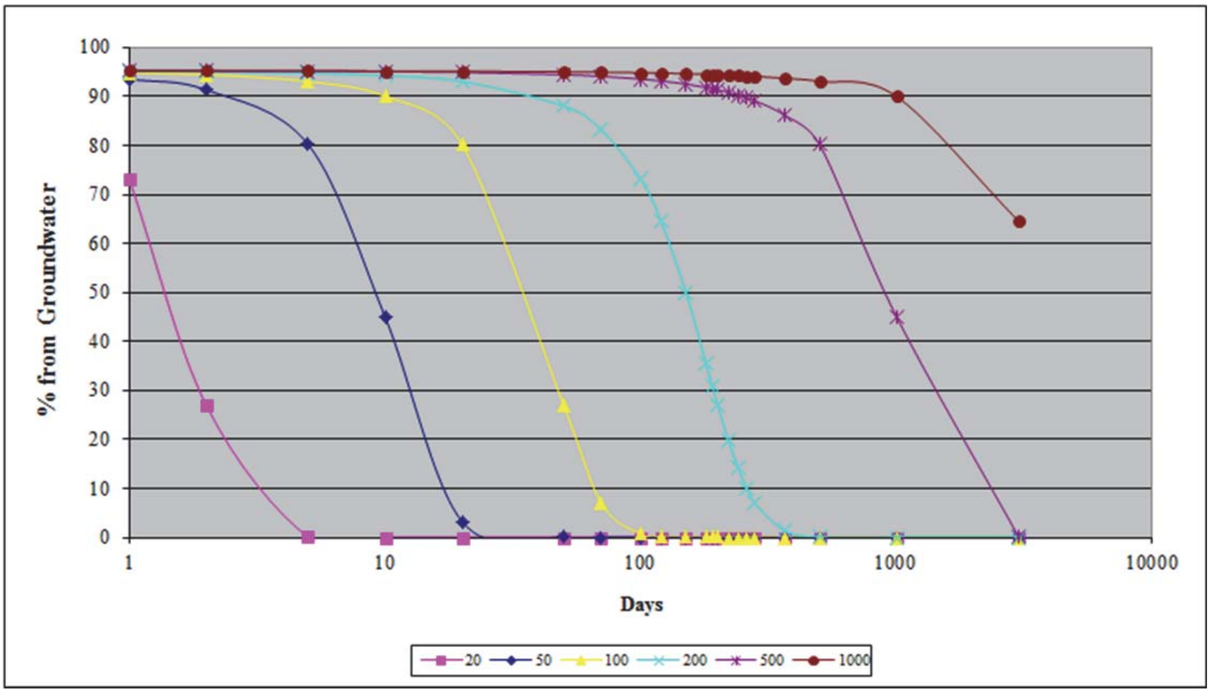


Figure 15: Impact of groundwater abstraction on baseflow depletion at various distances from the channel with a T of 10 m^2/d and S =0.005 and k2 =0.1

GWMAX has been removed as a parameter in WR2000 and is fixed at 100, however, the curve can be calibrated so that proportionally more water is removed from baseflow instead of groundwater storage by reducing k3. K3 =0 will result in 50% of abstraction removed from storage and 50% from baseflow generation. Increasing k2 will make the transition from groundwater storage to baseflow depletion more rapid (Figure 16).

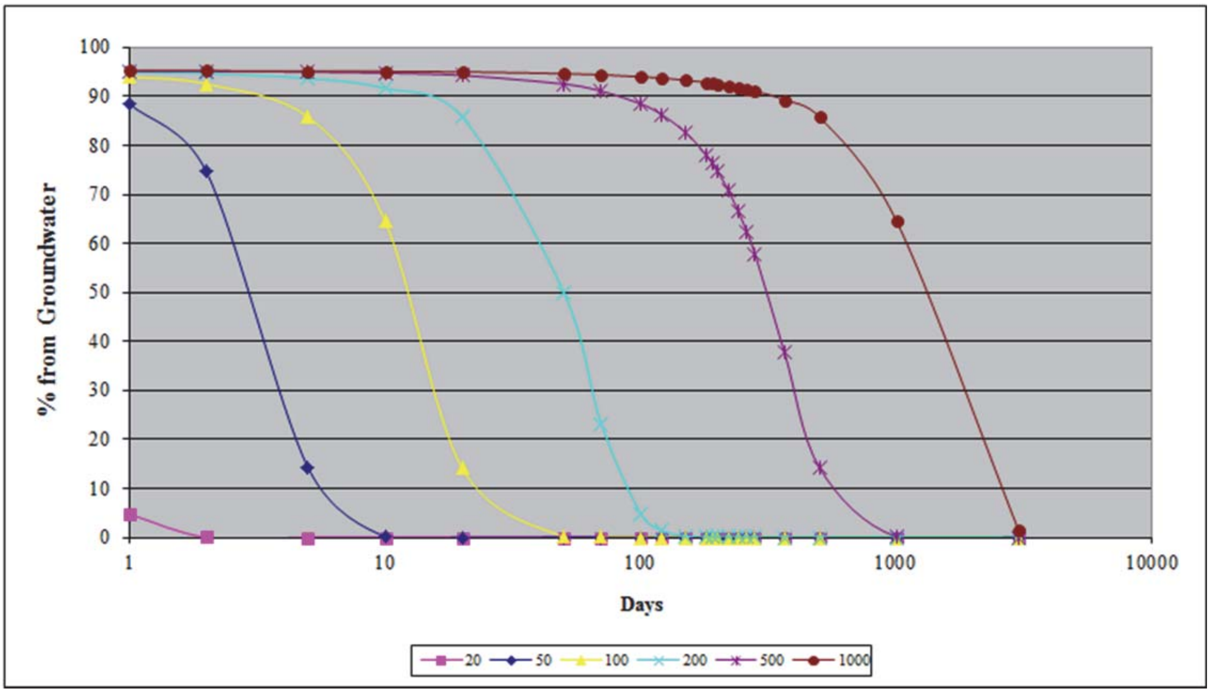


Figure 16: Impact of groundwater abstraction on baseflow depletion with k2 = 0.3

To take into account recharge that replenishes storage, thereby allowing proportionally more water to be taken from groundwater storage, the parameter for time t in equation 10 is modified by recharge, thereby allowing recharge to modify the impact on storage. This is achieved by:

$$if\ \frac{Recharge_i orPERC_i}{Meanmonthlyrecharge} < 1, then, t = (1 - \frac{Recharge_i orPERC_i}{meanmonthlyrecharge})x30 + t_{i-1} \tag{11}$$

$$if\ \frac{Recharge_i}{Meanmonthlyrecharge} > 1, then, t = t_{i-1} - (\frac{Recharge_i}{meanmonthlyrecharge} - 1)x30 \tag{12}$$

This algorithm allows an increased proportion of abstraction to be taken from groundwater store following recharge events exceeding the mean monthly recharge, and allows the transition to groundwater baseflow depletion to slow down during drier periods depending on the recharge volume.

The depletion of groundwater baseflow (depletion) is calculated by:

$$Depletion = \frac{100 - \%GW}{100} xAbstractionx \frac{Recharge_i orPERC_i}{Meanmonthlyrecharge} \tag{13}$$

The correction of depletion by the ratio of recharge to mean monthly recharge allows the portion of recharge above the mean monthly value to replenish the accumulated aquifer storage deficit. This accounts for the fact that groundwater baseflow does not become evident following recharge events after prolonged abstraction due for the need to rewater the aquifer to some extent before baseflow can occur.

The balance of abstraction volumes (abstraction-depletion) is taken from STORE. Depletion is subtracted from calculated groundwater baseflow (GWBaseflow), thereby depleting baseflow. If calculated baseflow depletion exceeds GWBaseflow, the excess is removed from groundwater storage (STORE). The volume taken from STORE would also cause increased transmission losses, due to a reduced groundwater HEAD.

2.13. Curtailment of borehole yield

An addition in WR2012 allows groundwater abstraction to be reduced as aquifer storage declines. This simulates conditions where boreholes begin to dry out as the water level drops, allows abstraction to be higher than recharge during wet periods, and decline in dry periods, and allows aquifer mining, with yields above recharge and dropping over time.

The algorithm to determine actual abstraction is

$$CURTAILQ = \left(STORE - \frac{(EXTINCT*TAS)}{(SUPPLY-EXTINCT)*TAS}\right) * GWQ \tag{14}$$

AND CURTAILQ $\leq$ GWQ

Where:

EXTINCT = fraction of STORE at which abstraction stops (dead storage);
SUPPLY = fraction of STORE above which abstraction is at full demand;
GWQ = groundwater demand and
CURTAILQ = Demand that is supplied.

Figure 17 shows how the demand that is supplied varies with storage, with the full demand which exceeds recharge being met only when the aquifer storage is more than 50% full, as can occur in very wet years, dropping down to less than 20% of demand when the aquifer level is low.

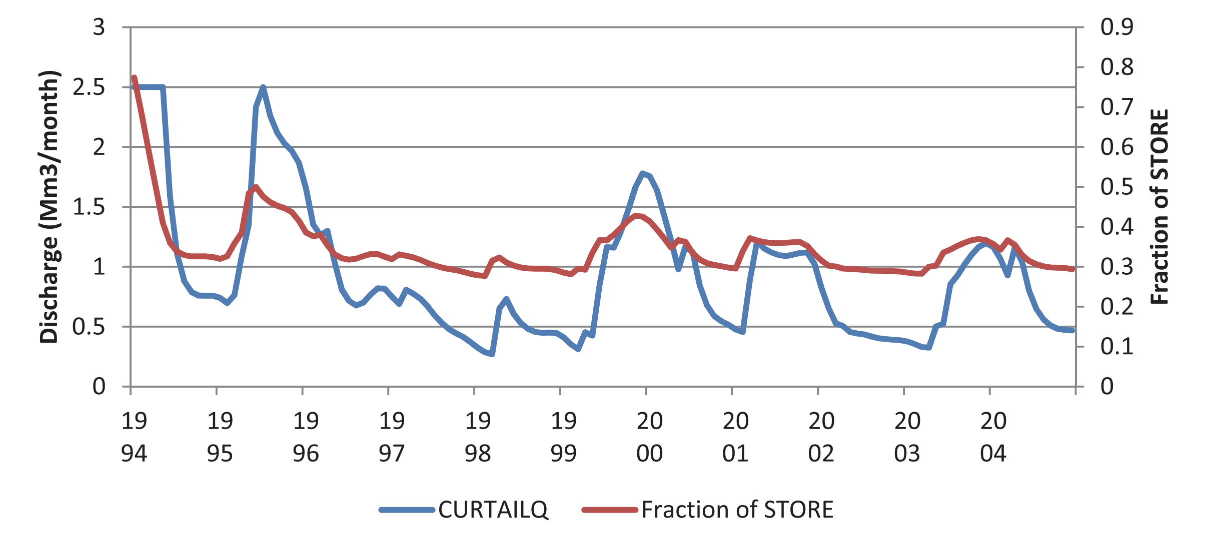


Figure 17: Demand supplied with GWQ = 2.5 Mm^3/month, EXTINCT = 0.25 and level =0.5.,

2.14. Assumptions and Limitations of the Groundwater Module

The proposed module for surface-groundwater interaction depends on several assumptions and encounters a number of limitations listed below:

- Baseflow depletion due to groundwater abstraction (2.12) as well as groundwater outflow from the catchment (2.8) is calculated using a Darcian approach, i.e. assuming a porous media (primary aquifer);
- the baseflow depletion calculation (2.8) assumes that all abstraction takes place from the regional aquifer, not from perched aquifers;
- since the baseflow depletion calculation (2.8) uses the weighted mean distance of abstraction points from the main channel, it is not applicable to assess the impact of a single groundwater abstraction point on baseflow. However, the cumulative effects of groundwater abstraction in the catchment can be addressed and
- the hydrogeological parameters of the model are determined with water balance approaches and averaged over a quaternary catchment scale. Though they might resemble hydrogeological parameter determined on a local scale during hydrogeological field investigations, they usually differ from these physically based local parameters and should not be interpreted as such.

3. MODEL PARAMETERS

3.1. Parameters utilised

The parameters of the model, data requirements and comments on the source of data are shown in Table 2.

Table 2: Model parameters

Item	Status[1]	Source	Function	Comment	Common Range
Climate and Catchment Data					
Catchment Area	D	WR2012	Volume and flux calculations	Set for each RU in the pitman model	Any
RAIN	T	WR2012	Controls evapotranspiration from STORE		N/A
MAE	T	WR2012	Affects groundwater evaporation rates	Generally obtained from regional WR2012 data and entered as mean monthly values and not calibrated	
A Pan factors (CROP)	D	WR2012	Affects temporal distribution of evapotranspiration	Monthly distribution based on Acocks vegetation type. Affects efficiency of evapotranspiration relative to A-pan data.	
Groundwater Abstraction (GWQ)	D	WARMS, land use survey	Affects baseflow depletion aquifer storage	Volume of groundwater abstraction	
Catchment Characteristics					
Aquifer thickness	D	NGDB, GRA2	Determines total aquifer storage (TAS). Affects evapotranspiration, groundwater baseflow, groundwater outflow and the generation of interflow as excess recharge	Based on difference between SWL and water strikes in an aquifer. Can be regionalised by geological domain. Increasing this value generally makes groundwater baseflow less responsive to recharge	5-400
Storativity	D	GRA2	Determines total aquifer storage (TAS). Affects evapotranspiration, groundwater baseflow, groundwater outflow and the generation of interflow as excess recharge. Impacts on transition from depletion of aquifer storage to baseflow depletion during abstraction	Increasing this value generally makes groundwater baseflow less responsive to recharge. It also results in a longer time delay before abstraction impacts on baseflow	0.002-0.03

Item	Status[1]	Source	Function	Comment	Common Range
Total aquifer storage (TAS)	C	N/A	Affects aquifer storage level at groundwater evapotranspiration and outflow reach their maximum rate	Calculated internally from Storativity times aquifer thickness	N/A
Initial groundwater store	I		Only affects first few months	Initial storage level of aquifer. Usually set equal to SWL or slightly higher	N/A
Static Water level (SWL)	P X		Controls aquifer storage level at which groundwater baseflow, evaporation and groundwater outflow terminate	Generally set to TAS – storativity x annual groundwater level fluctuation, half the storage within the weathered zone of the aquifer, then calibrated. Since TAS cannot be seen in the model, it can be manually calculated from S * aquifer thickness. It is generally more than 50% of TAS in shallow or weathered aquifers and higher in deep seated fractured aquifers with little baseflow. Increasing causes STORE to remain full and groundwater baseflow terminates more rapidly. Reducing results in more, less responsive and more persistent groundwater baseflow	40-95% of TAS
Maximum discharge rate (BFMAX)	P X		Affects groundwater baseflow. Controls groundwater baseflow volumes and maximum baseflow.	Calibrated regionally, or calculated from peak baseflow. It is set to a low value (0.5- 2 mm) in low permeability aquifers and to a high value (5-10 mm) in permeable aquifers: Increasing increases groundwater baseflow volume and peak rates	0.5-10
Discharge rate power (BPOW)	P		Affects linearity of head difference-groundwater baseflow relationship. Can be used to control the speed of response at which groundwater baseflow occurs at the maximum rate	Generally not calibrated. If increased results in groundwater baseflow approaching BFMAX rate more slowly with increasing STORE.	-0.01-0.1

Item	Status[1]	Source	Function	Comment	Common Range
Maximum hydraulic gradient (HGRAD)	P	Topographic maps, Google Earth	Controls rate of groundwater outflow from a runoff unit.	Generally set to the channel gradient or the hydraulic gradient oriented out of the catchment. Increasing cause groundwater outflow to increase	-0.00001-0.01
Groundwater Evaporation area (AREA)	P	Google Earth	Controls groundwater evapotranspiration as the area over which vegetation can abstract water from the regional aquifer.	Estimated measured from riverine vegetation area, such as perennial green areas. Generally set at 1-105% of catchment but can rise to over 50% in afforested catchments, or flat catchments covered by bushveld. Generally calibrated once recharge has been calibrated to reduce baseflow to match observed volumes. Increasing causes groundwater evapotranspiration to increase and baseflow to decrease	1-50% of catchment area
Months to average recharge (Rex)	D	GRA2	Controls rate at which recharge percolates to aquifer. Used to lag the time between recharge and the groundwater baseflow response.	Calculated from PMAX divided by mean monthly recharge times 0.5 to account for residual saturation. Recharge values are available from GRA II. Increasing causes recharge to be more attenuated and groundwater baseflow to be less responsive	1-132
Unsaturated storage capacity (PMAX)	D	GRA2	Controls rate at which recharge percolates to aquifer. Used to lag the time between recharge and the groundwater baseflow response	Calculated from median depth to water strike times storativity. Increasing causes recharge to be more attenuated and groundwater baseflow to be less responsive	10-400
Initial unsaturated storage	I		Initial storage level of unsaturated percolating storage.	Calibrated so that long simulation under virgin conditions results in little change in unsaturated percolating storage. If not calibrated impact on final results is minimal since change in storage over long time period has little impact on mean annual values. Generally set to 0.3-0.5 of PMAX	0.3-0.5 times PMAX

Item	Status[1]	Source	Function	Comment	Common Range
Transmissivity (T)	D	NGDB	Affects groundwater outflow and impact of abstraction on baseflow.	This parameter must be set to a regional median value, and not values obtained from test pumping of high yield boreholes. Generally 2-10. Increasing this value increases groundwater outflow and results in a more rapid baseflow depletion response to abstraction	1-3000
Borehole distance to river	D	Google earth, maps	Affects distribution of abstraction between groundwater baseflow and aquifer storage depletion	Based on weighted mean distance of abstraction points from main channel and not calibrated	10~
K2	P		Controls distribution of abstraction between groundwater baseflow and aquifer storage depletion. Controls duration over which abstraction removes water from groundwater storage	Increasing causes abstraction to deplete groundwater storage for a longer period before impacts on baseflow occur.	0.05-0.5
K3	P		Controls distribution of abstraction between groundwater baseflow and aquifer storage depletion. Controls shape of transition between groundwater storage and baseflow depletion.	Increasing causes more rapid transition to baseflow depletion and a lower % abstraction from groundwater storage.	-1- -0
Interflow Lag	P		Controls the attenuation of Interflow	Increasing causes interflow to be less peaked and of longer duration. Generally set to 0 except in wet catchments with steep topography where interflow from high lying springs is sustained.	0-2
Extinction Depth (EXTINCT)	P		Determines the aquifer storage level at which groundwater abstraction becomes 0	Functions like dead storage in a reservoir. Abstraction increases from 0 to the set groundwater abstraction at SUPPLY	0.1-0,5
Supply	P		Determines the aquifer storage level at which groundwater abstraction equals the	Abstraction increases from 0 to the set groundwater abstraction at SUPPLY	0.5-1

Item	Status[1]	Source	Function	Comment	Common Range
			set demand becomes 0		
Calibration Parameters					
POW	P	WR2012	Determines relationship between soil moisture and baseflow.	Generally obtained from regional WR2012 data. In catchments with no baseflow it is set to 0. In wet mountainous catchments with significant interflow it is set as low as 1. WR90 sets this parameter to 0. If FT=0, this parameter has no effect.	0-3
GPOW	P	WR2012	Affects potential recharge. Determines relationship between soil moisture and recharge. Used to control temporal distribution of recharge	This parameter is generally set equal to POW, unless there is no baseflow, in which case it is set to 1 to allow recharge by indirect pathways in dry catchments. Increasing reduces recharge with proportionally greater reductions at low soil moisture status.	1-3
SL	P		Determines soil moisture level at which interflow stops, hence controls interflow volumes.	Used as a threshold for interflow from the soil zone and set to allow interflow to stop or have very low value during dry periods. Decreasing value causes interflow to be more persistent and increases volumes	5-20% of ST
HGSL	P		Determines soil moisture level at which recharge stops, hence controls recharge volumes.	Used as a threshold for recharge from the soil zone and set to allow recharge to stop or have very low value during dry periods. Decreasing value causes recharge to be more persistent and increases volumes	5-20% of ST
ST	P	WR2012	Determines maximum soil moisture store.	Increasing ST increases recharge and reduces high flows. ST is generally lower than in WR90 in catchments where groundwater baseflow occurs since WR90 used high ST values to generate baseflow,	50-1000

Item	Status[1]	Source	Function	Comment	Common Range
				which are now generated from groundwater	
FT	P	WR2012	Controls rate of interflow from the soil zone.	In catchments with no interflow it is set to 0. It is used to generate only the portion of total baseflow from interflow hence must be less than the value used in the original Pitman model WR90. Increasing value cause interflow to increase and be more responsive	0-100
HGGW	P		Sets the maximum recharge rate. Controls rate of recharge to account for low vertical permeability layers.	The parameter is calibrated until interflow volumes and aquifer recharge volumes match known recharge volumes. Reducing the value generates less aquifer recharge and groundwater baseflow and more interflow	1-50

1 P = Parameter, I = Initial condition, C = calculated, T = time series input data X = calibrated, D = data

3.2. Derivation of default parameters

Utilising the GRA2 database, default parameters have been developed for South Africa. Many errors found in the GRA2 data base, especially rated to storativity. Storativity was revised and recalculated for each quaternary, based on equations for each hydrogeological region. The calculated parameters are shown in Appendix 1.

3.2.1. Storativity

Storativity S was recalculated by

$$S = \frac{a}{(1+e^{(c+GWL*b)}} \qquad (15)$$

Where
a, b and c = parameters which were regionalised per hydrogeological region to define a S vs depth curve and
GWL = mean groundwater depth in a quaternary

3.2.2. Total Aquifer Storage

Total aquifer storage was calculated from the revised figures for weathered zone storativity, deep seated fractured aquifer storativity, and weathered and fractured zone thicknesses by:

$$\big((ThickW * S) + (ThickF * Sf)\big) * Slope \qquad (16)$$

Where
Thickw and ThickF are the thicknesses of the weathered and fracture zone, S and Sf are the storativities of the weathered and fracture zone, and Slope is catchment slope factor.

3.2.3. Aquifer Thickness

Aquifer thickness was calculated from total aquifer storage by

$$^{TAS}/_{S} \qquad (17)$$

Where TAS is total aquifer thickness and S is storativity

3.2.4. Static water level

It was assumed the aquifer storage at the static water level was 50% of the potential storage of the weathered zone. This assumption may not be correct in some catchments, hence this parameter requires local calibration. The equation utilised was

$$TAS - (0.5 * S * thickW * Slope) \qquad (18)$$

3.2.5. Percolating Store

The capacity of the percolating store PSTORE was assumed to be dependent on the average groundwater level and the storativity. This may be an underestimate in mountainous catchments where deep water levels can exist in high lying areas. Half the storativity was utilised to account for unsaturated conditions:

$$(0.5 * S) + (0.5 * Sf) * GWL \quad (19)$$

3.2.6. Months to average recharge

It was assumed the lag between recharge and percolation to the aquifer is related to the size of percolating store relative to the recharge rate by:

$$\frac{PMAX}{Recharge} * 0.5 \quad (20)$$

Under arid conditions with indirect recharge, some percolating water may bypass the unsaturated zone and recharge the aquifer more rapidly, hence the calculation of the months over which to average recharge may be overestimated. In dolomites it has been found discharge is related to long term rainfall patterns, hence a value of up to 130 months may be necessary to generate long lag times in large compartments.

3.3. Guidelines for parameters

Guidelines for initial settings of calibration parameters are given in Table 3.

4. CALIBRATION GUIDE

When calibrating groundwater, calibration targets include matching recharge to accepted values, and matching baseflow volumes, so that calibration of baseflows fit for the correct reasons.

4.1. Recharge calibration

Recharge figures given in databases like GRA2 include recharge contributing to interflow and to the regional aquifer. For example, mountainous wet regions have a large recharge flux, yet little of it reaches the regional aquifer; most being lost as interflow and not accessible to boreholes in valley bottoms. To compare modelled results to established recharge values, the volumetric mean annual interflow must be converted to mm and added to aquifer recharge to obtain a comparable recharge. This is achieved by writing out the ".gwi" file and ".gwr" files.

Recharge is calibrated using the parameters GPOW, HGGW and SL

Recharge values to compare with model recharge are given in Appendix 1

4.2. Baseflow calibration

Once the correct recharge is achieved, calibration is achieved my matching low flows to observed flows and comparing baseflow volumes under naturalised conditions to other baseflow data such as Hughes and Pitman, given in Appendix 2.

Volumetric calibration is achieved by increasing evaporation area to lose sufficient groundwater, and by calibrating SWL and the maximum discharge rate.

4.3. Calibration statistics

To assist with calibration, the impact of parameters on calibration statistics were tabulated (refer to Table 4). These results are for specific parameter sets, in quaternaries where groundwater abstraction takes place, and may differ under other parameter combinations.

Table 3: Impact on calibration statistics of increasing parameter values. I = increase and D = decrease

Parameter	MAR	Log MAR	St dev	Log Std Dev	SI
GW abstraction	D	D	D	I	I
Aquifer thickness and S	I	I	I	D	D
Static water level	D	D	D	I	I
Maximum groundwater discharge	I	D	I	I	D
Hydraulic gradient	D	D	D	I	I
Evaporation area	D	D	D	I	I
Months to average recharge	D	I	D	D	I
Unsaturated storage capacity	D	D	I	I	I
Transmissivity	D	D	D	I	I
Borehole distance to river	I	I	D	D	D
K2	D	D	I	I	I
K3	D	D	I	I	I
Interflow lag	I	I	I	D	D
POW	D	D	D	I	I
GPOW	D	D	D	I	I
HGSL	D	D	D	I	I
ST	D	I	D	D	D
FT	I	I	I	D	D
HGGW	I	I	I	D	D

4.4. Calibration graphs

4.4.1. Mean Monthly Flows

The impact of increasing parameters on mean monthly flows is shown in Figures 18-29.

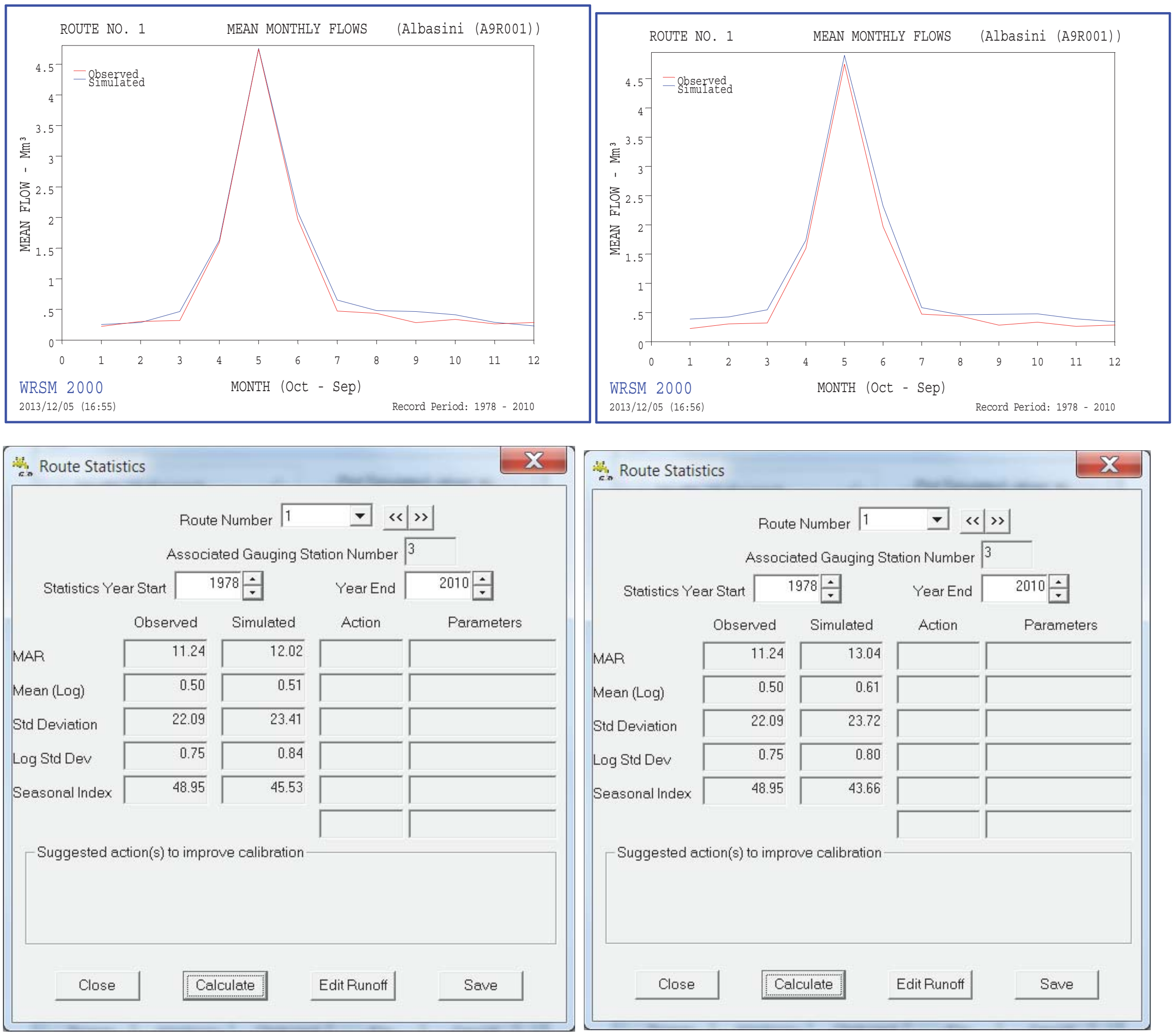


Figure 18: Aquifer thickness increased from 29 to 60 m. More persistent low flows broader curve, slightly increased peak

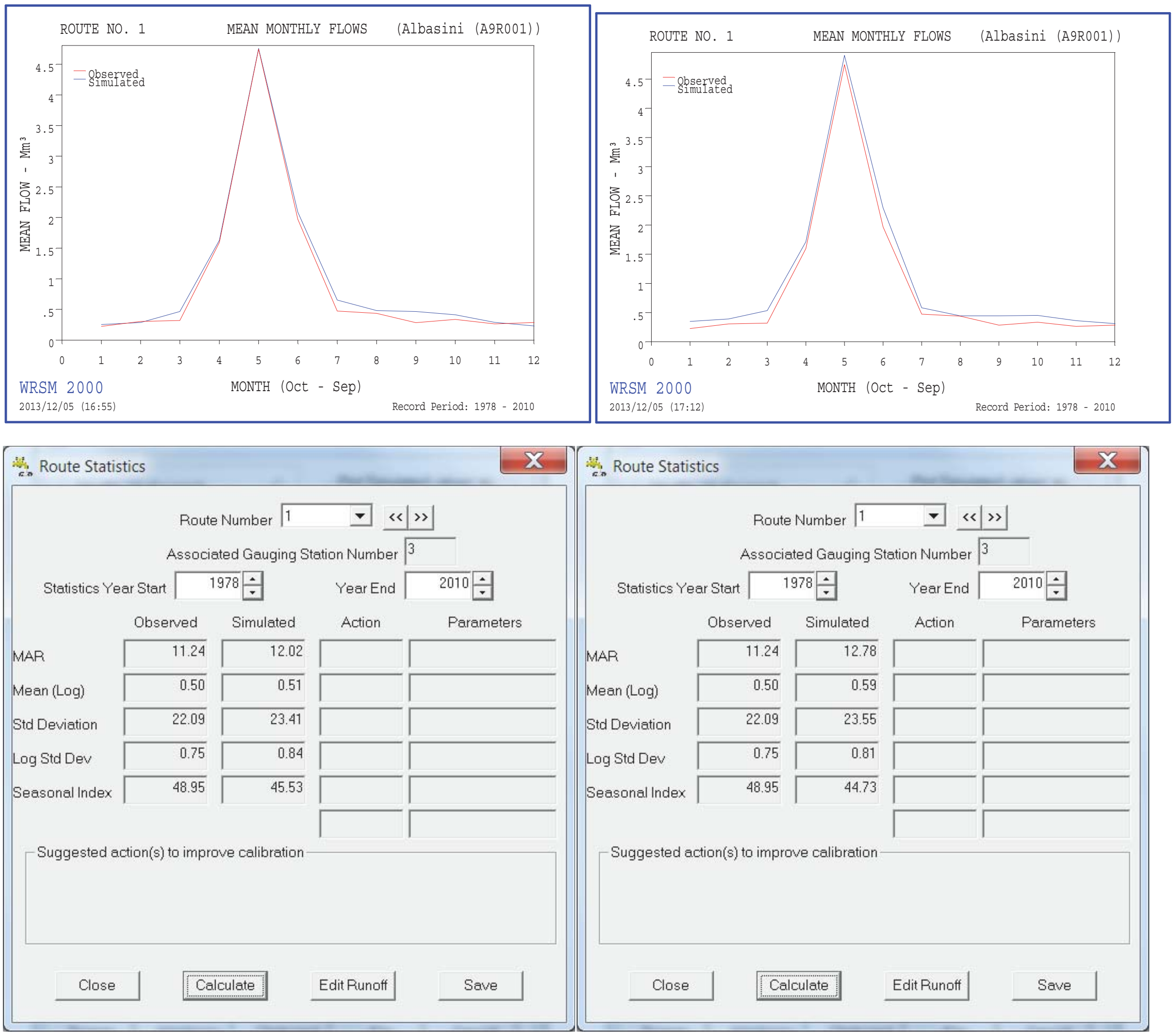


Figure 19: Static water level decreased from 55 mm to 25 mm. More persistent low flows broader curve slightly increased peak

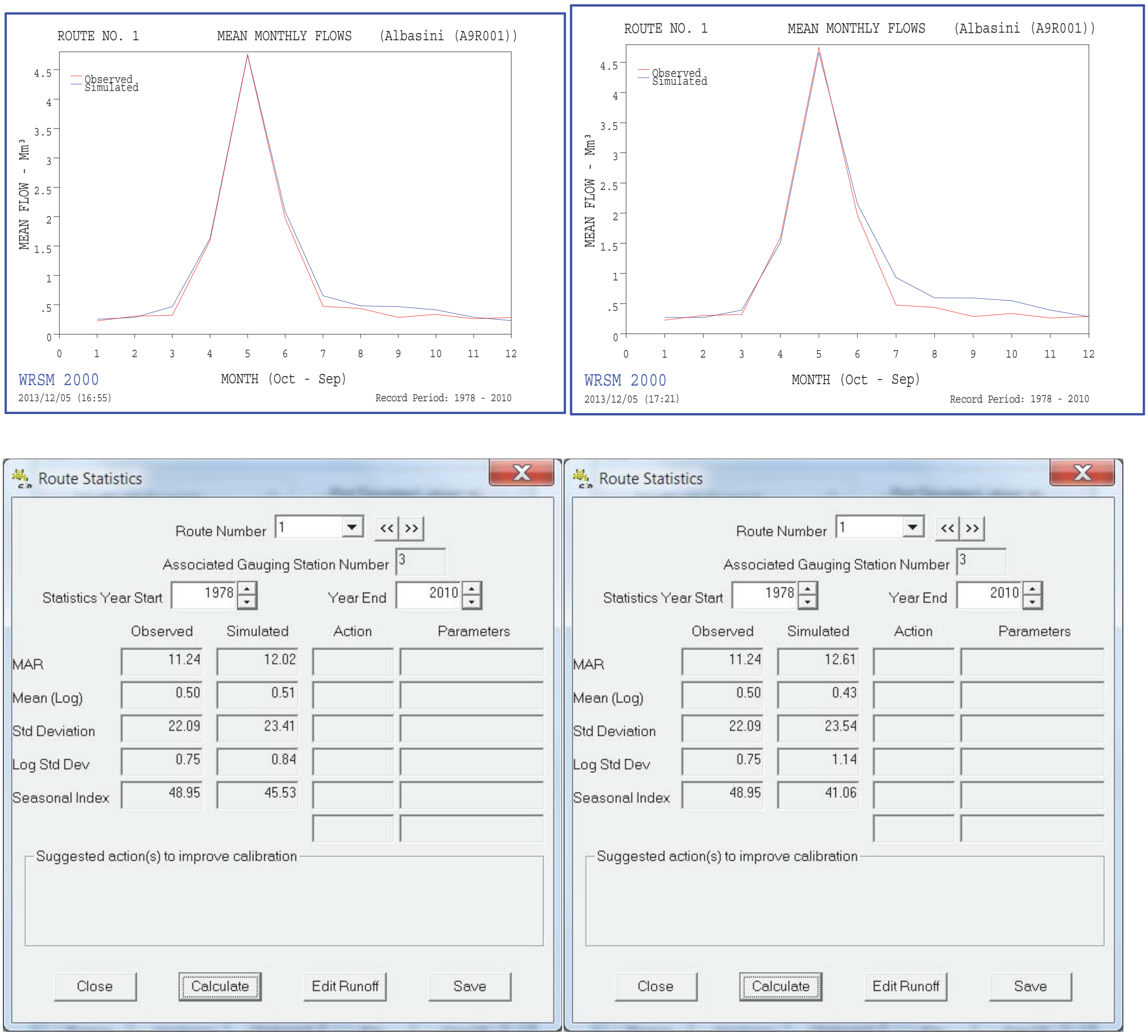


Figure 20: Maximum groundwater discharge increased from 4 mm to 10 mm. Increased low flows following the wet season

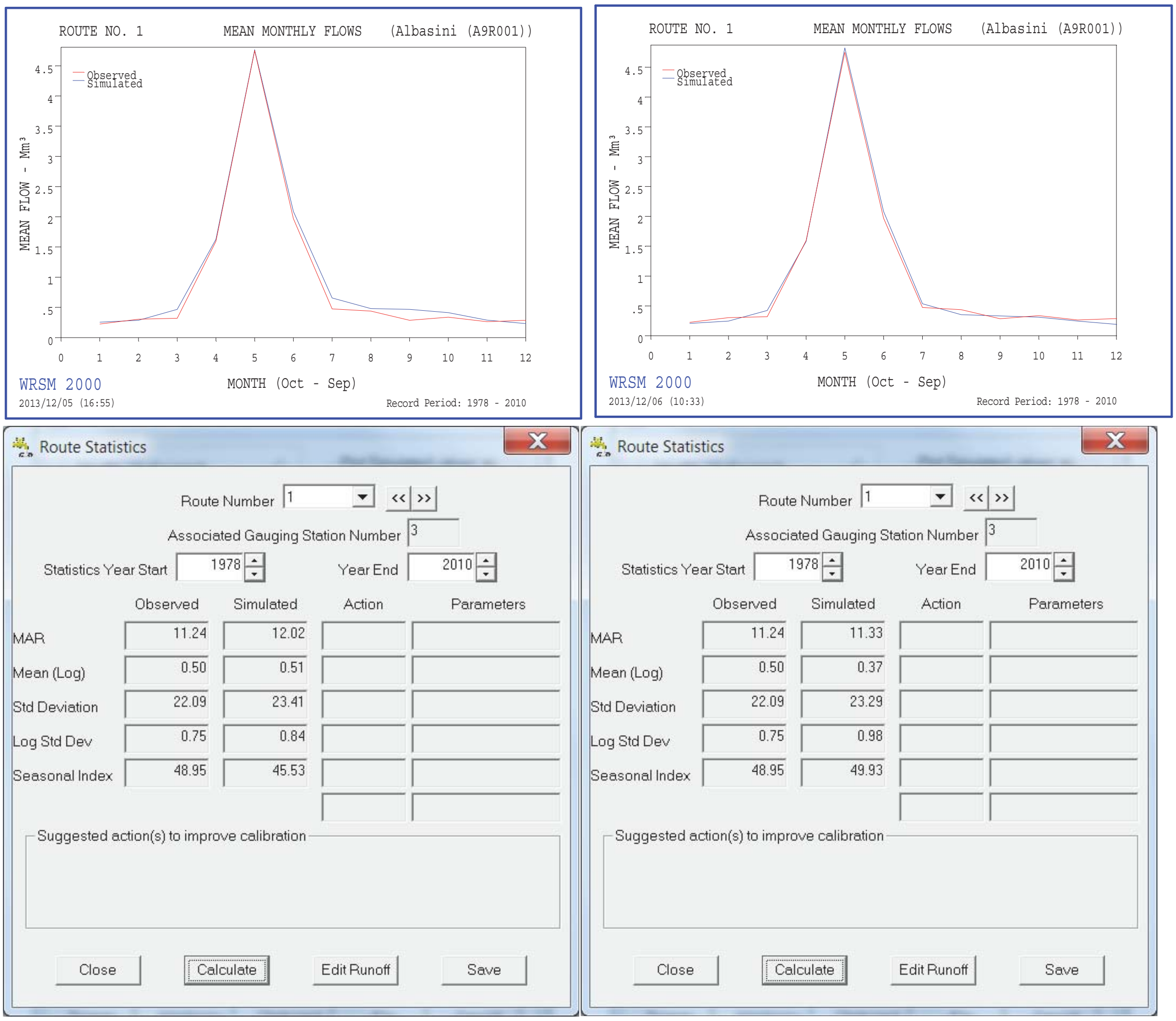


Figure 21 Groundwater evaporation area increased from 2.5% to 10% of catchment area, reduced groundwater baseflow and low flows after the wet season

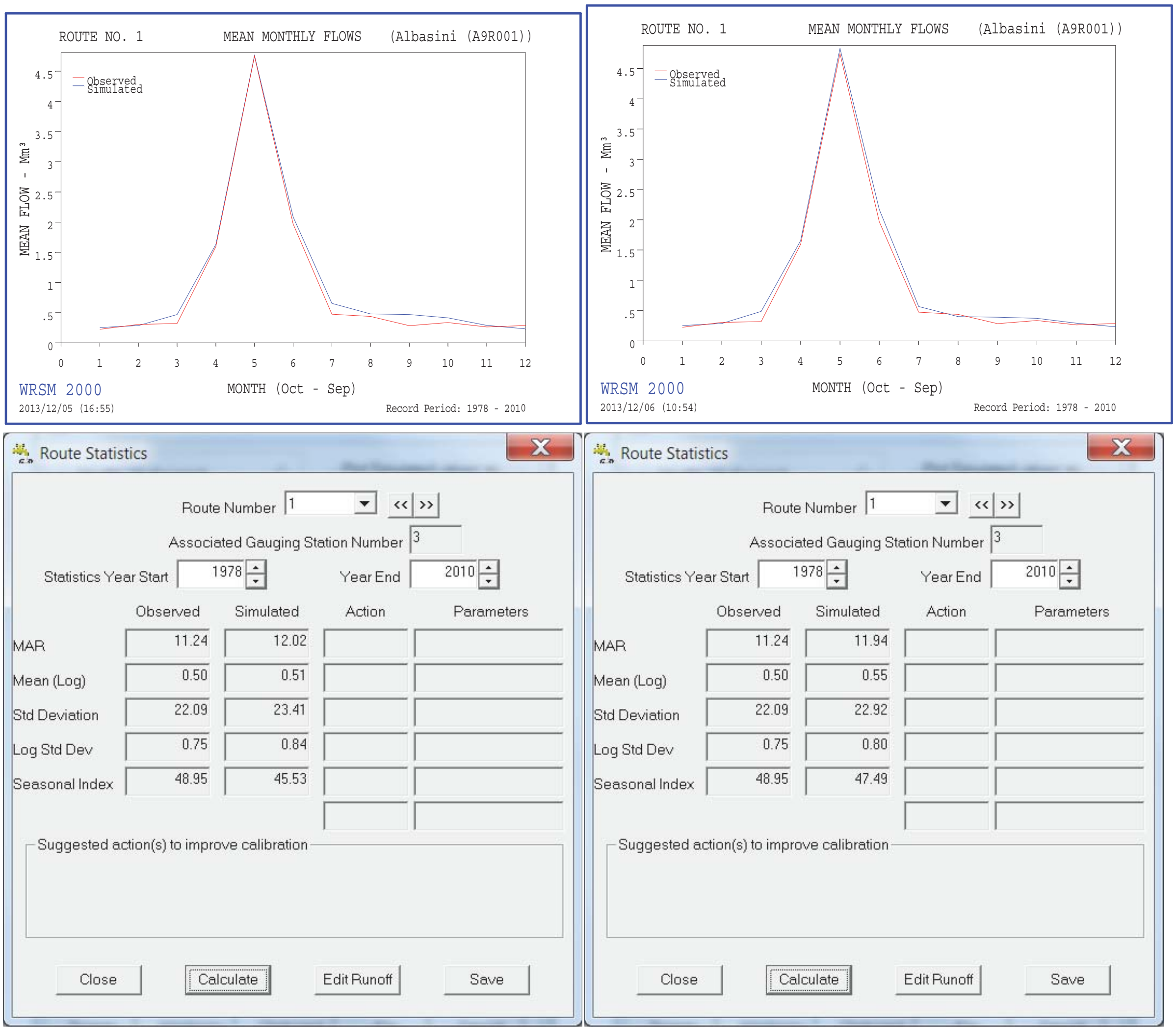


Figure 22: Months to average recharge increased from 4 to 12 months. Broadening of hydrograph and more persistent low flows

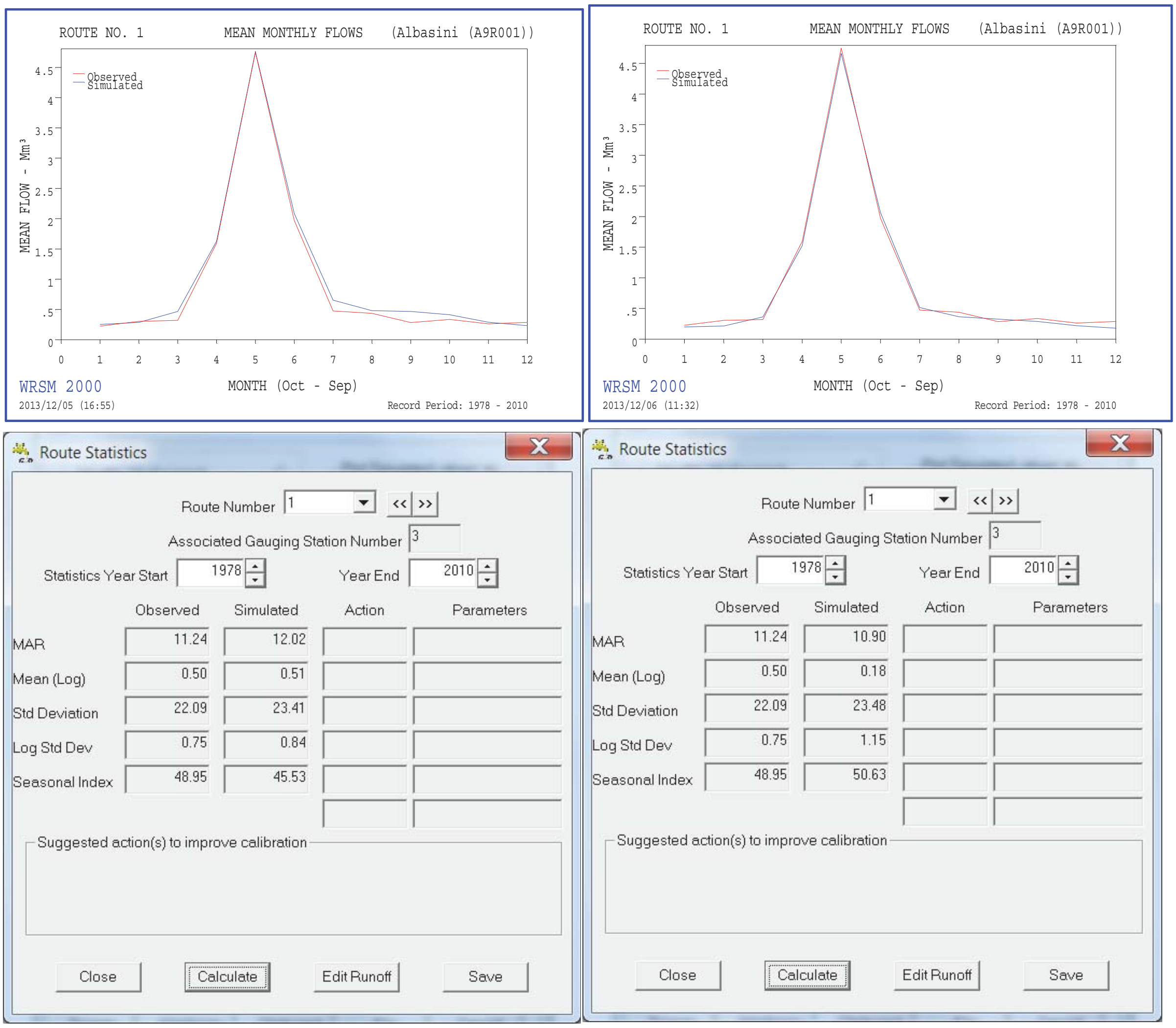


Figure 23: POW increased from 1 to 2. Reduction in low flows in hydrograph recession

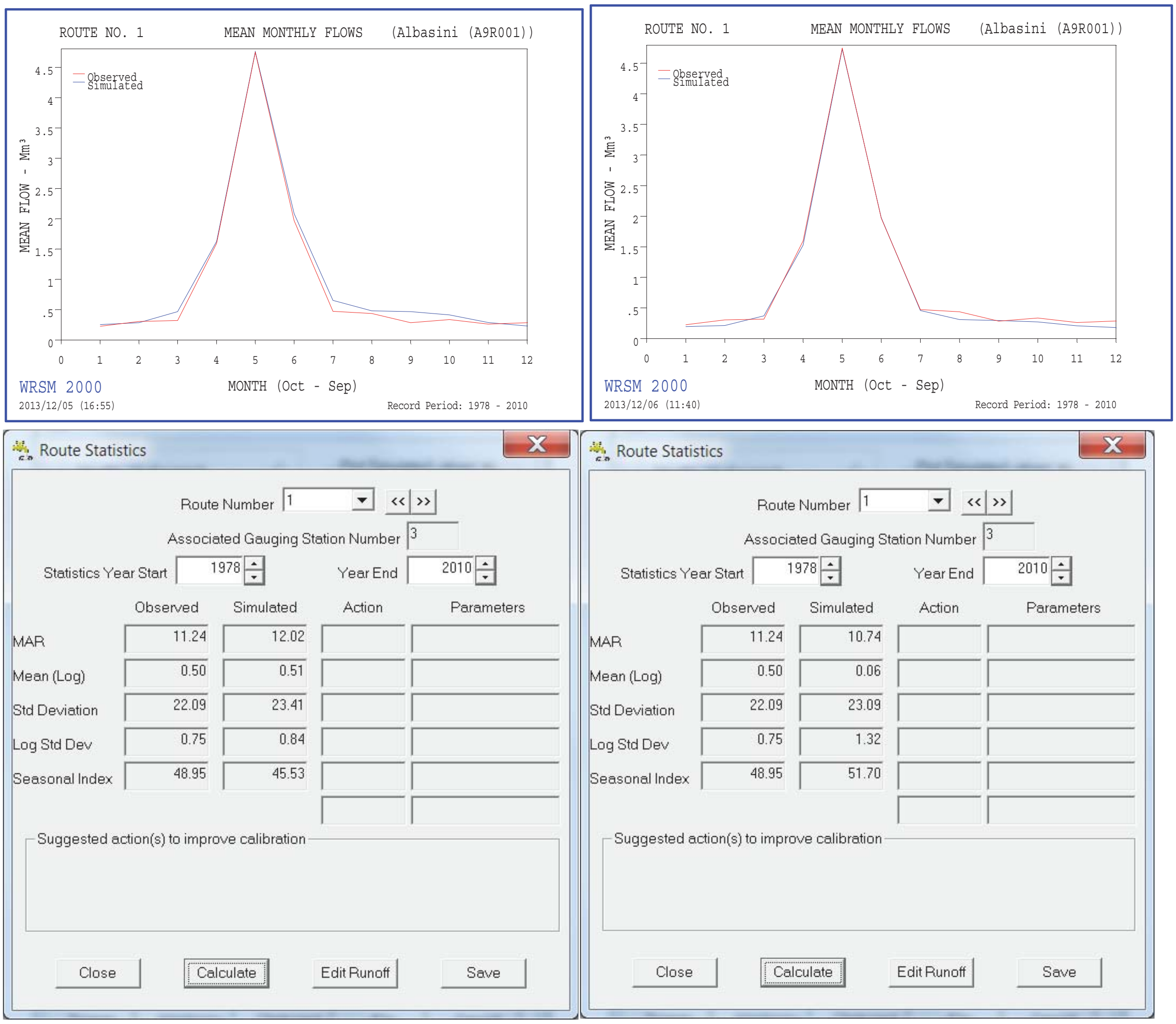


Figure 24: GPOW increased from 1 to 2. Significant reduction in low flow

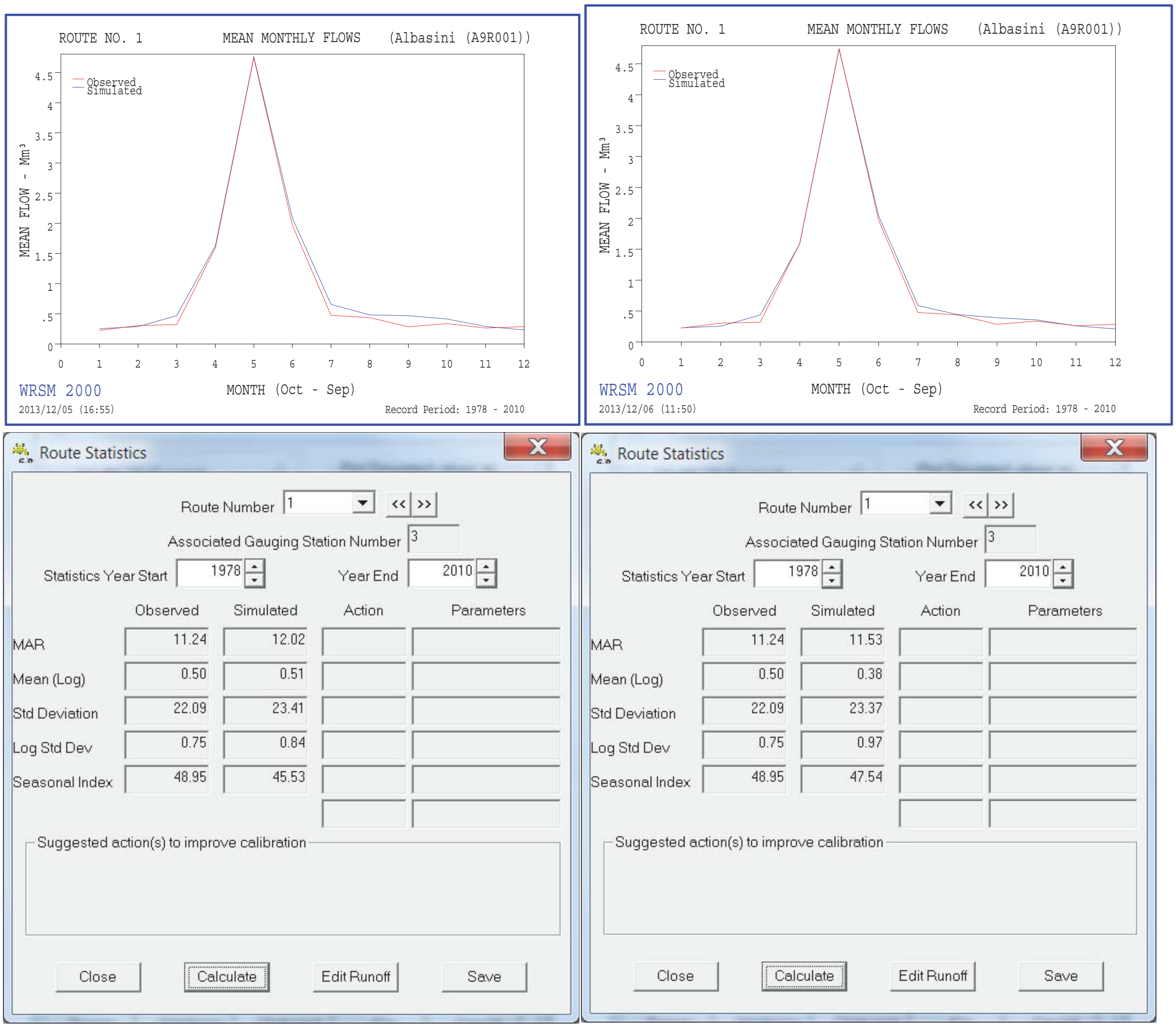


Figure 25: HGSL increased from 2.5% of ST to 10%. Reduced low flow after the wet season

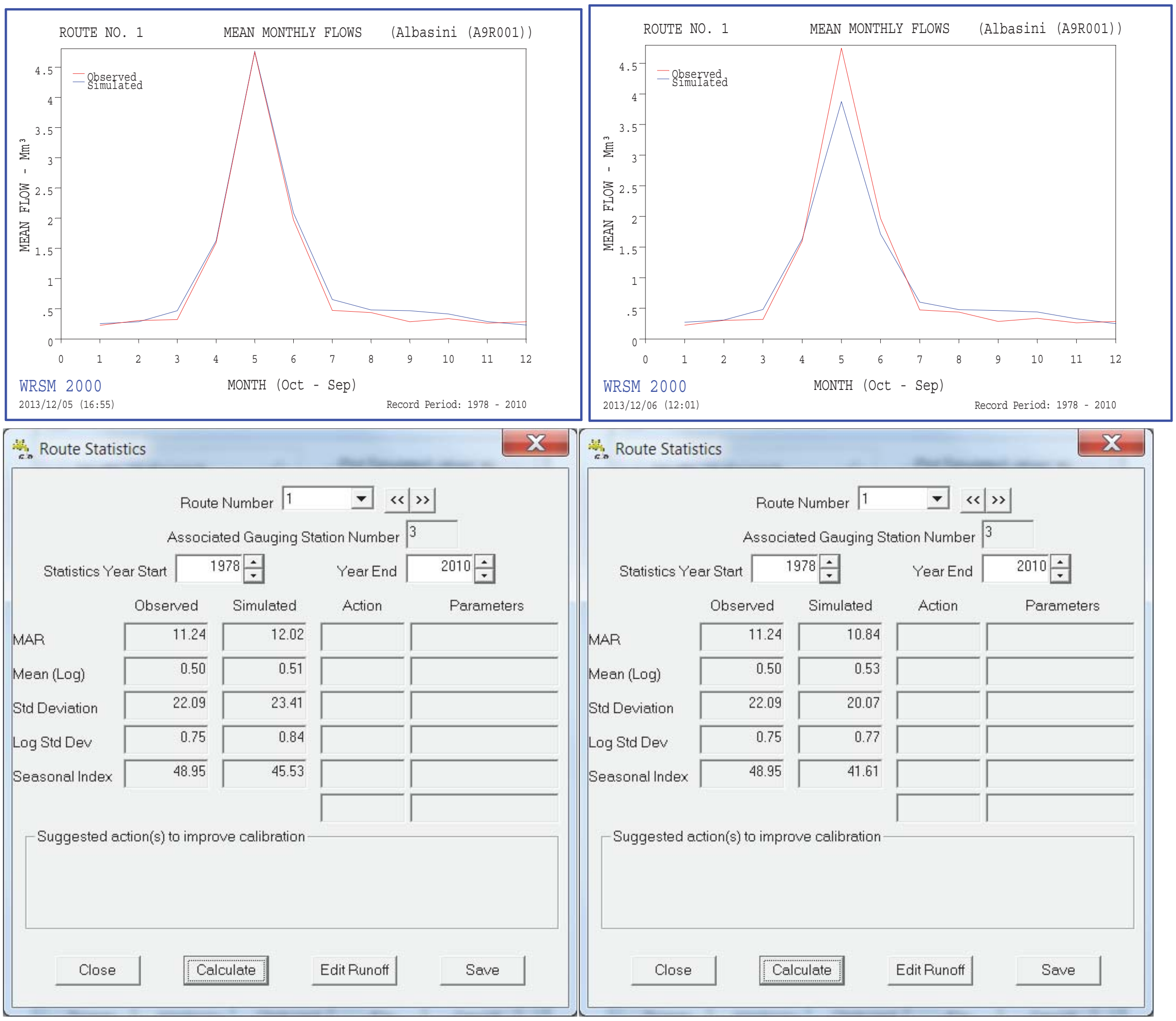


Figure 26: ST increased from 400 to 600. Reduced peaks and slightly increased low flows

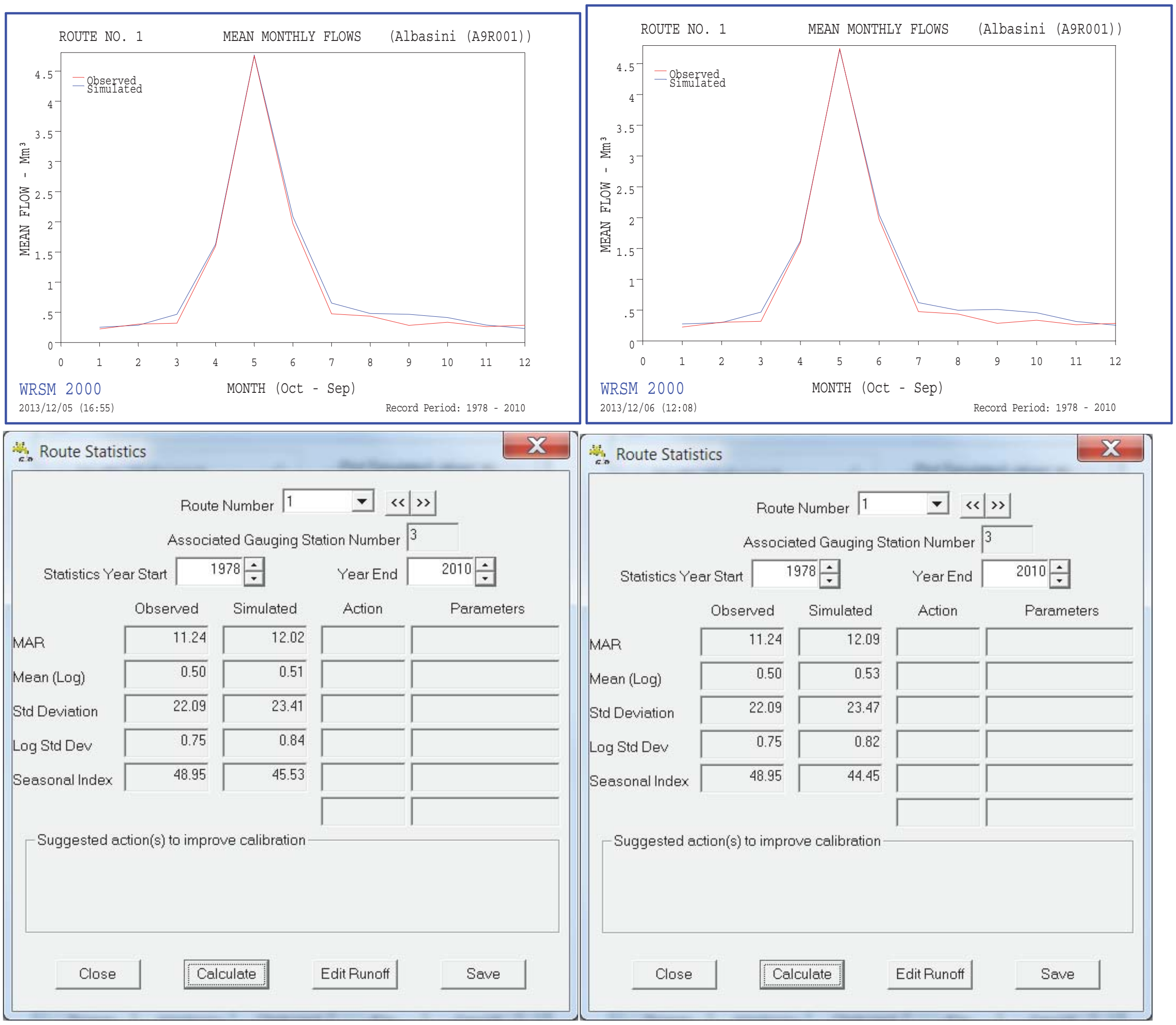


Figure 27: Interflow lag increased from 0 to 2. Less rapid recession of low flows. FT only =5 so impact of lagging interflow is muted

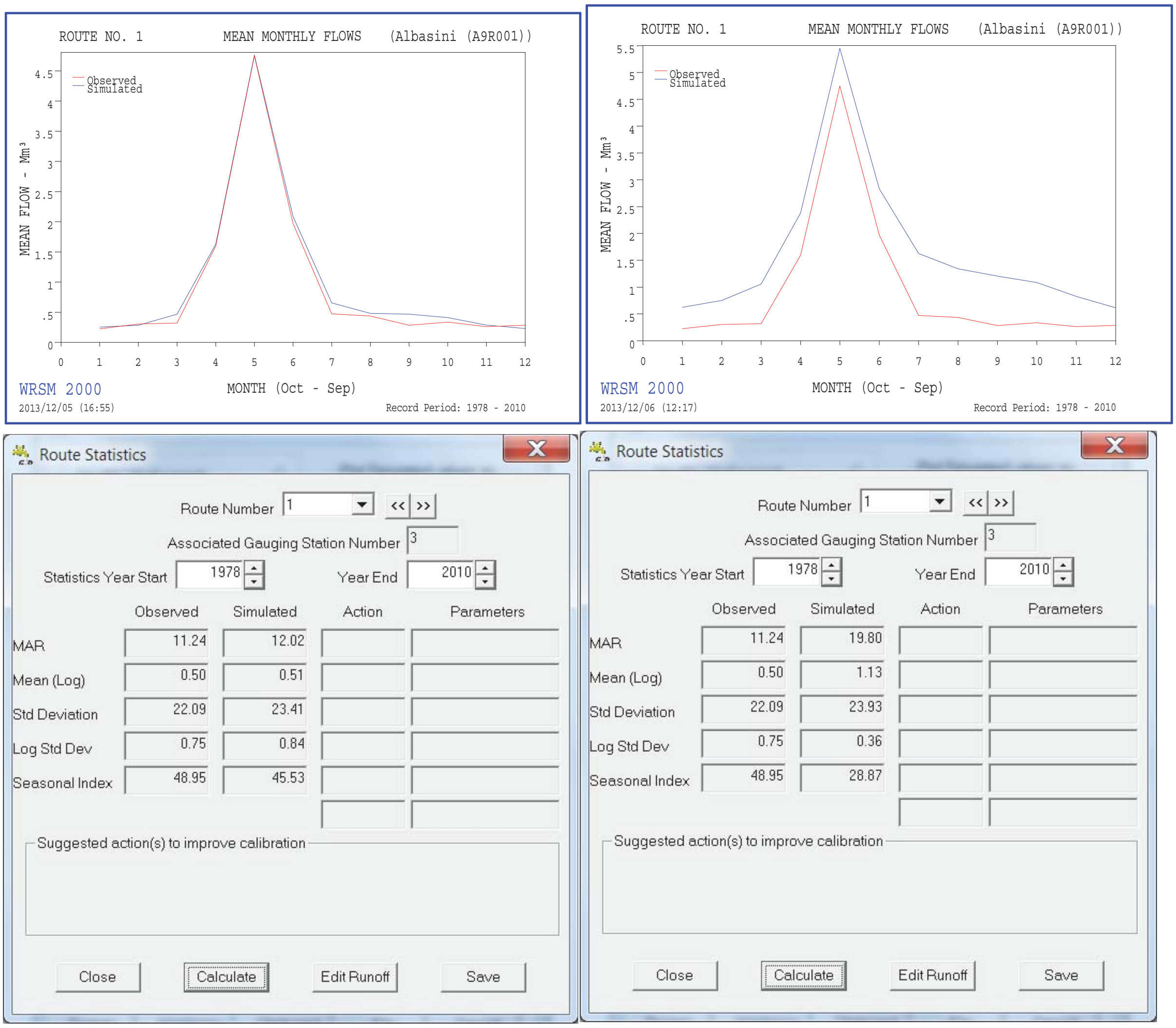


Figure 28: FT increased from 5 to 15. Increase in low flows

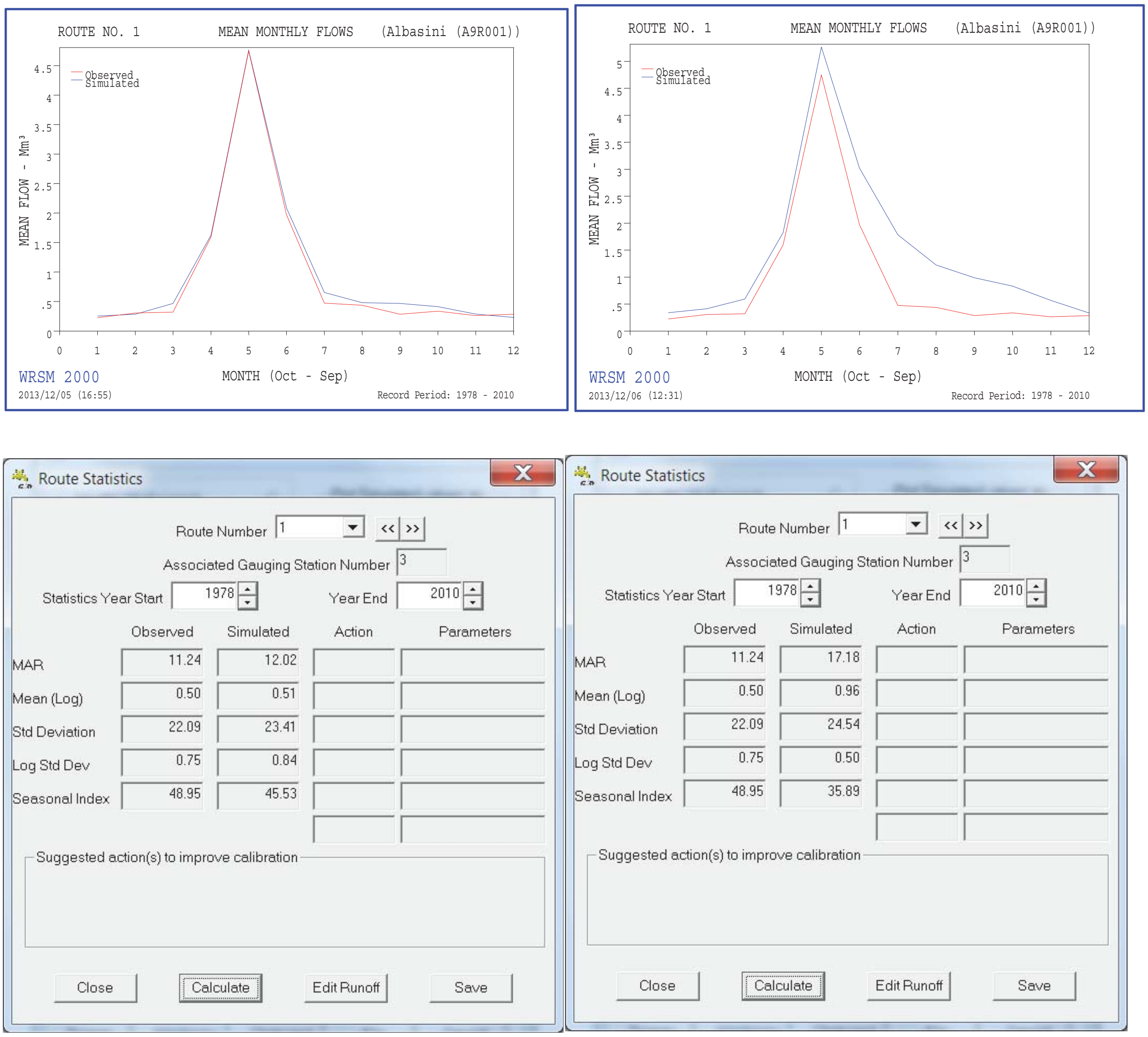


Figure 29: HGGW increased from 8 to 16. Increased low flows and longer duration baseflow recession

4.4.2. Monthly Flow histogram

The impact of groundwater parameters on the monthly flow histogram is shown in Figures 30-41.

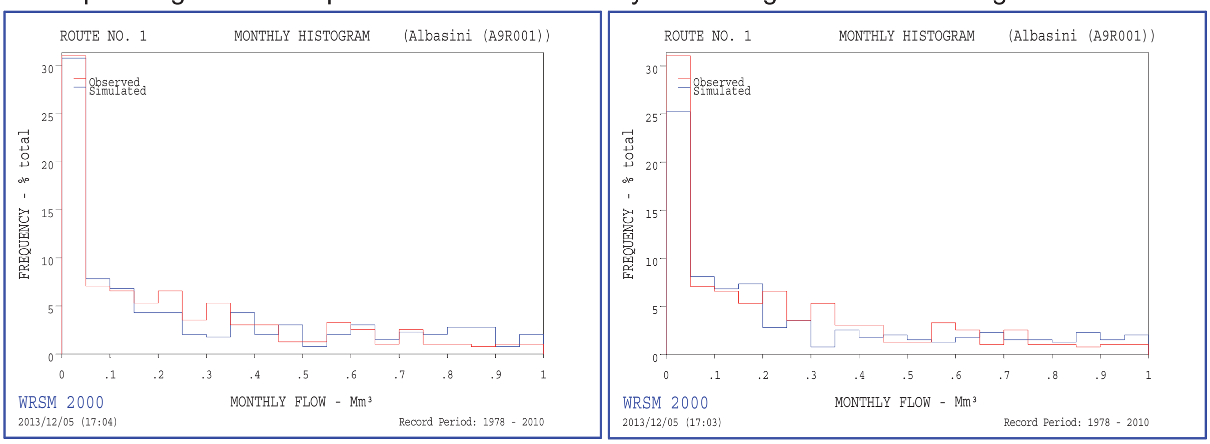


Figure 30: Aquifer thickness increased from 29 to 60 m. Reduced frequency of very low flows

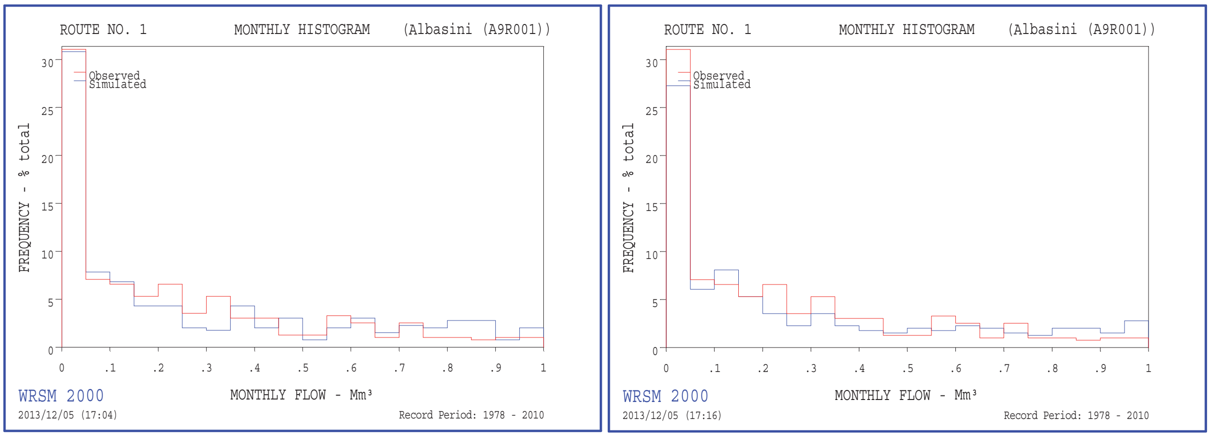


Figure 31: Static water level decreased from 55 mm to 25 mm. Reduced frequency of very low flows

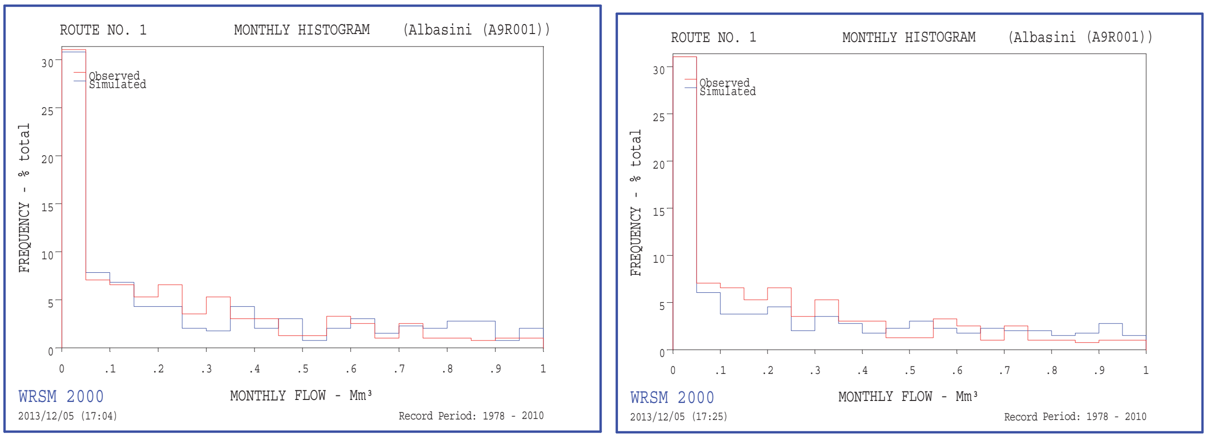


Figure 32: Maximum groundwater discharge increased from 4 mm to 10 mm. Increased low flows

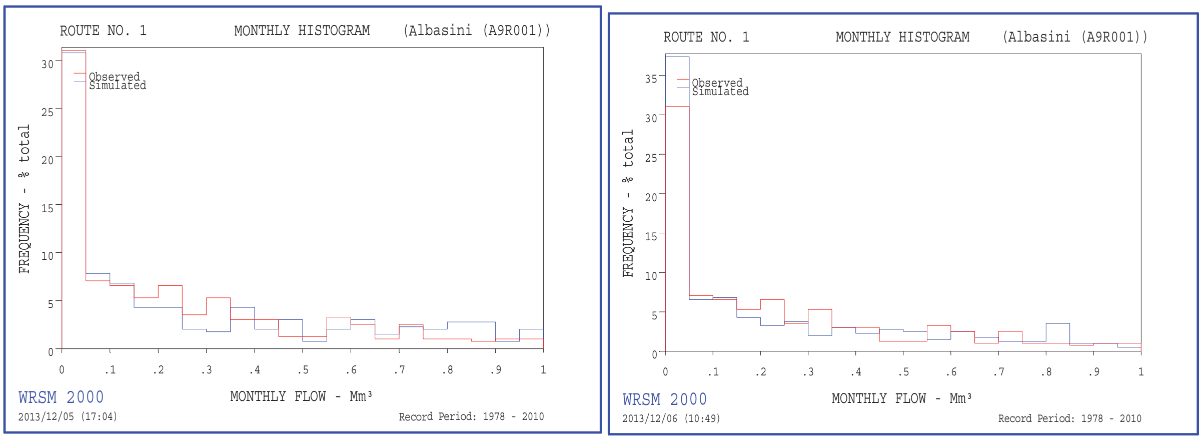
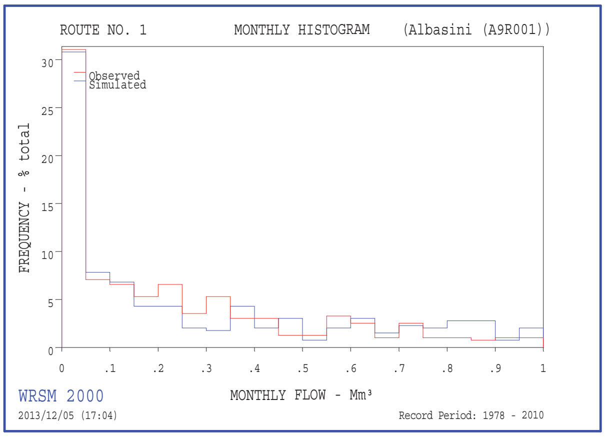


Figure 33: Groundwater evaporation area increased from 2.5% to 10% of catchment area. Reduced low flows, especially very low flows, increased frequency of very low flows



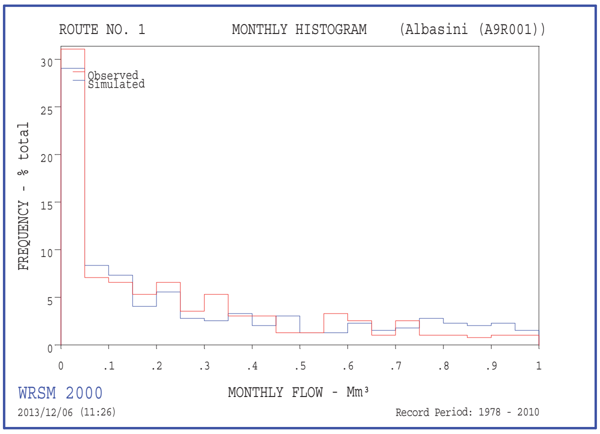
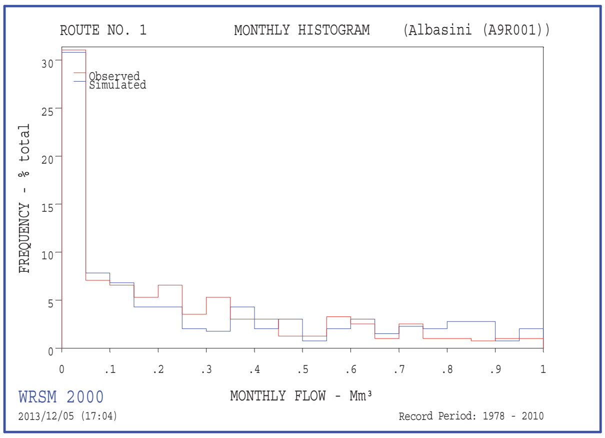


Figure 34: Months to average recharge increased from 4 to 12 months. Reduction in very low flows



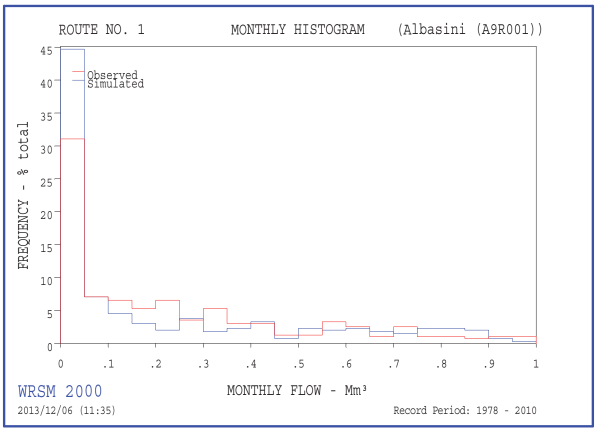
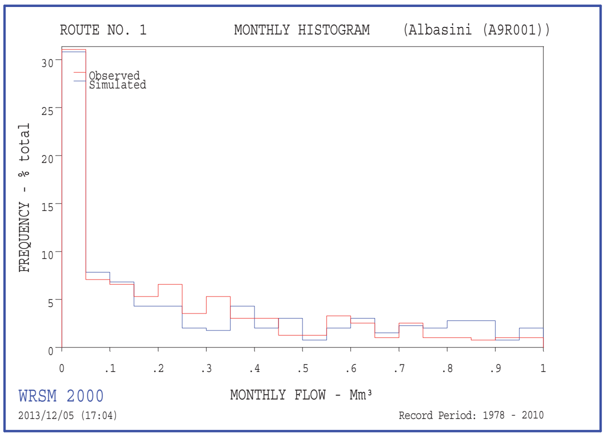


Figure 35: POW increased from 1 to 2. Reduction in very low flows. Increase in frequency of very low flows



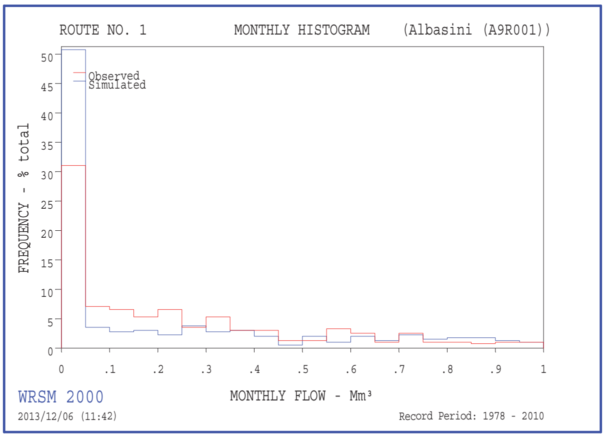


Figure 36: GPOW increased from 1 to 2. Reduced low flows and increase in frequency of very low flow

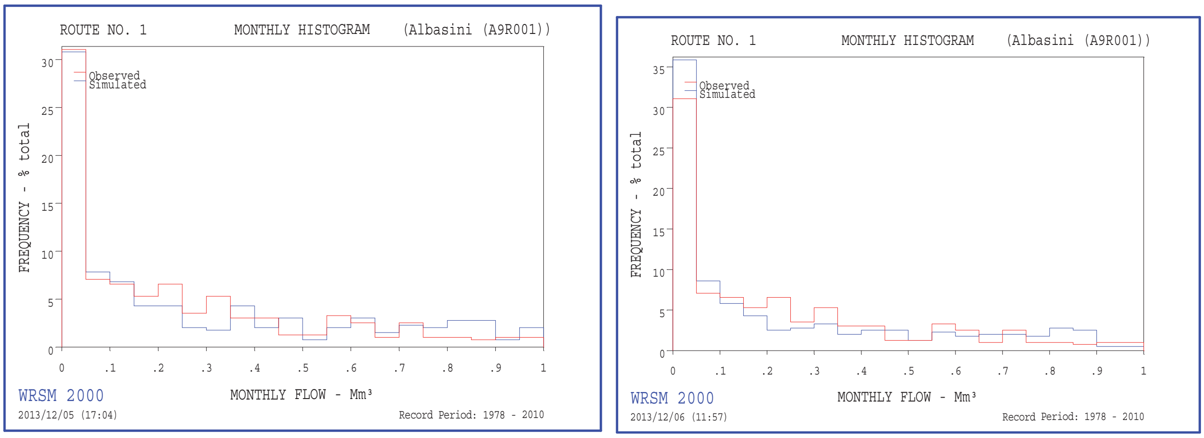


Figure 37: HGSL increased from 2.5% of ST to 10%. Increased frequency of very low flow

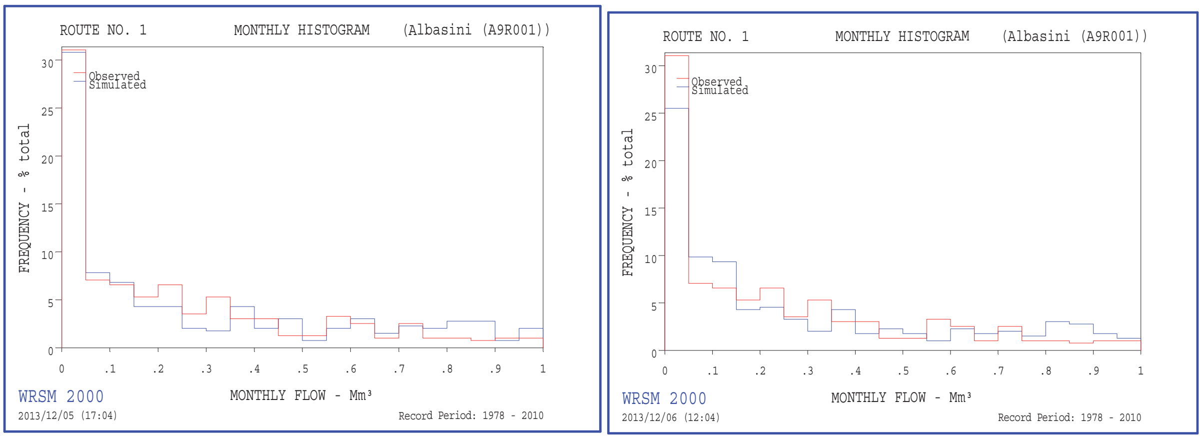


Figure 38: ST increased from 400 to 600. Reduced frequency of very low flows and increased low flows

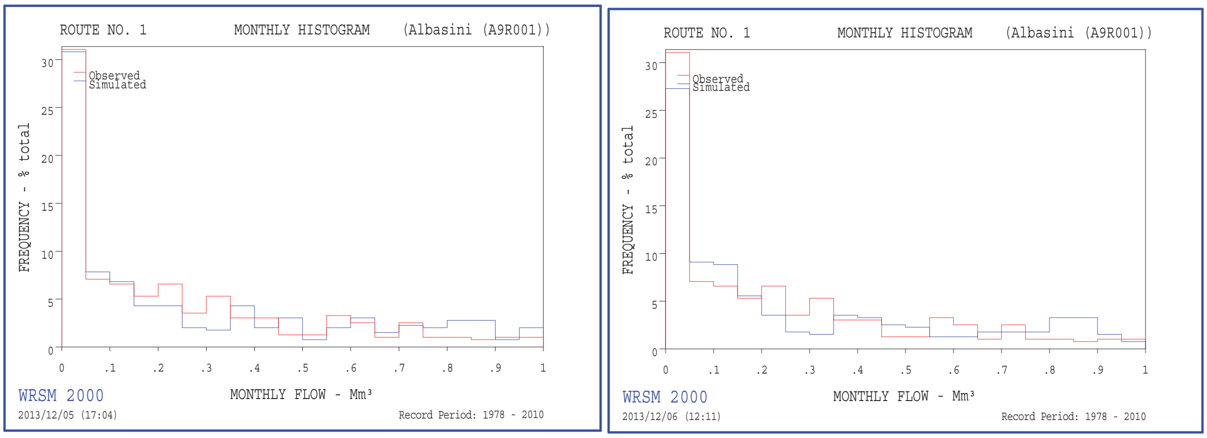


Figure 39: Interflow lag increased from 0 to 2. Reduced frequency of very low flows. FT only =5 so impact of lagging interflow is muted

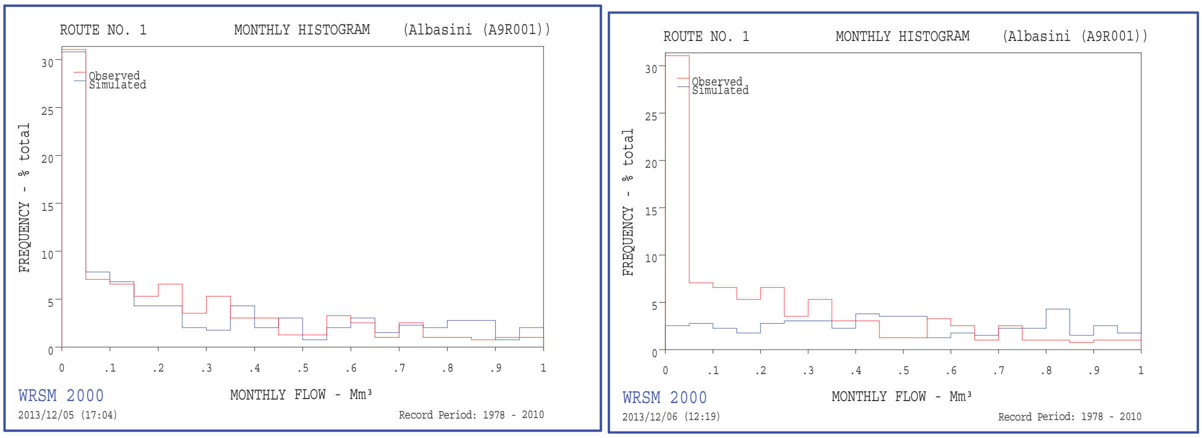


Figure 40: FT increased from 5 to 15. Increase in low flows. Reduced frequency of very low flows

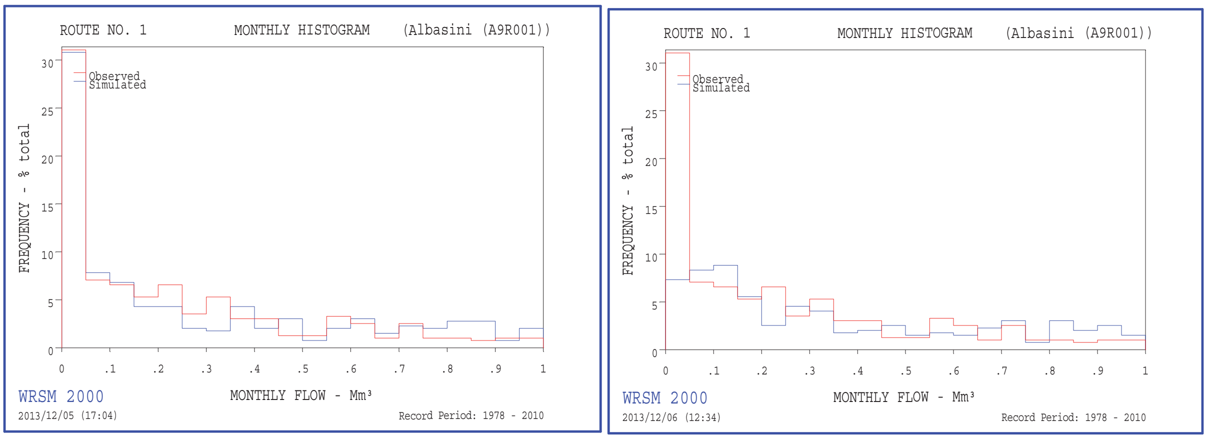


Figure 41: HGGW increased from 8 to 16. Reduced frequency of very low flows

4.4.3. Cumulative Frequency curve

The impact of groundwater parameters on the cumulative frequency curve is shown in Figures 42-53.

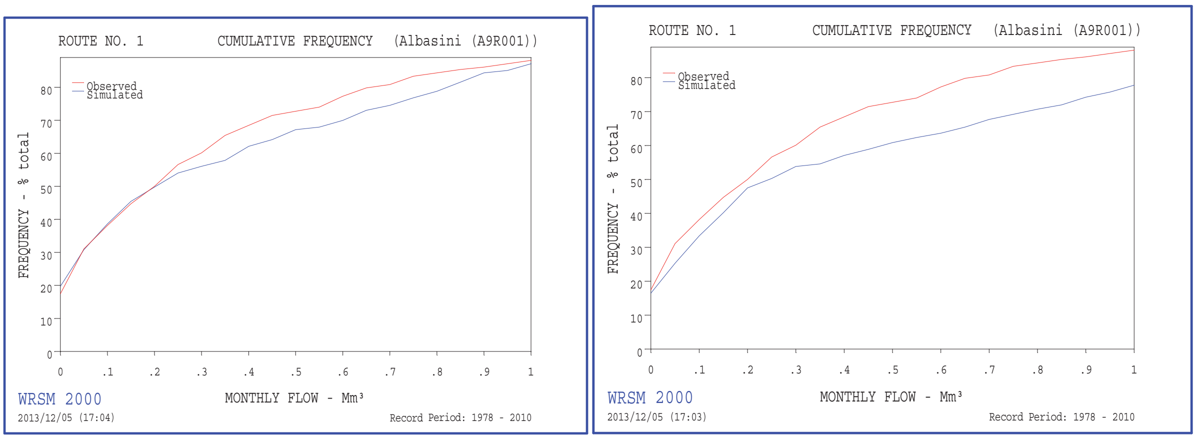


Figure 42: Aquifer thickness increased from 29 to 60 m. Reduced period of zero flow. Increase in higher low flows

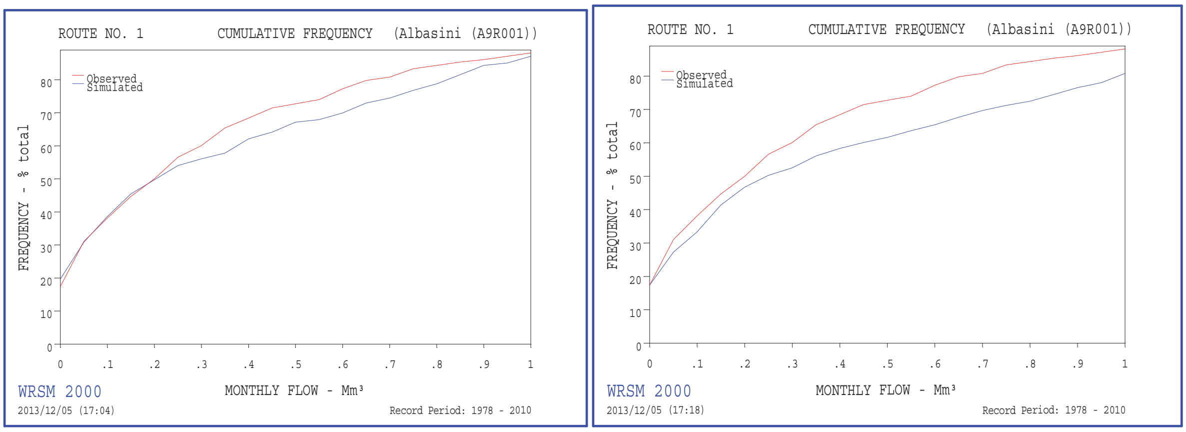


Figure 43: Static water level decreased from 55 mm to 25 mm. Reduced period of zero flow. Increase in higher low flows

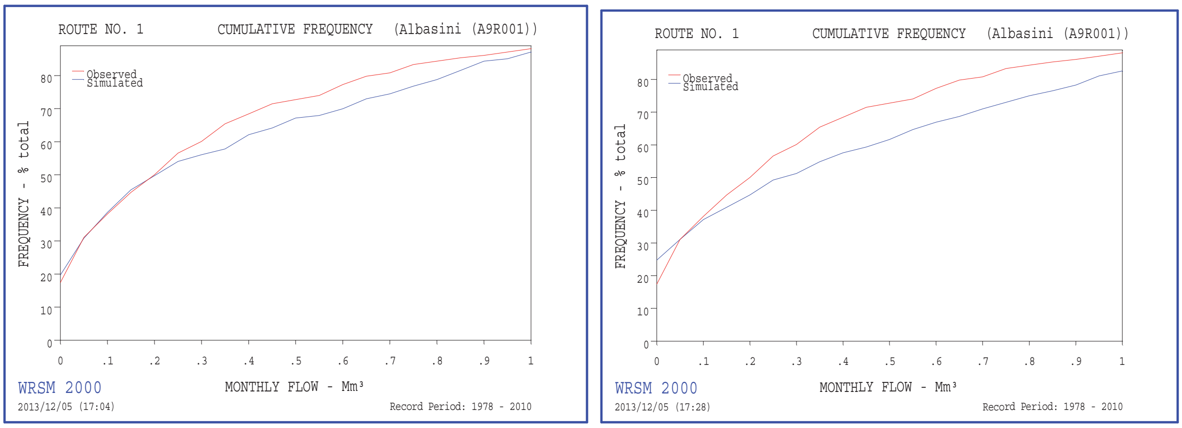


Figure 44: Maximum groundwater discharge increased from 4 mm to 10 mm. Increased period of zero flow and increase in other low flows

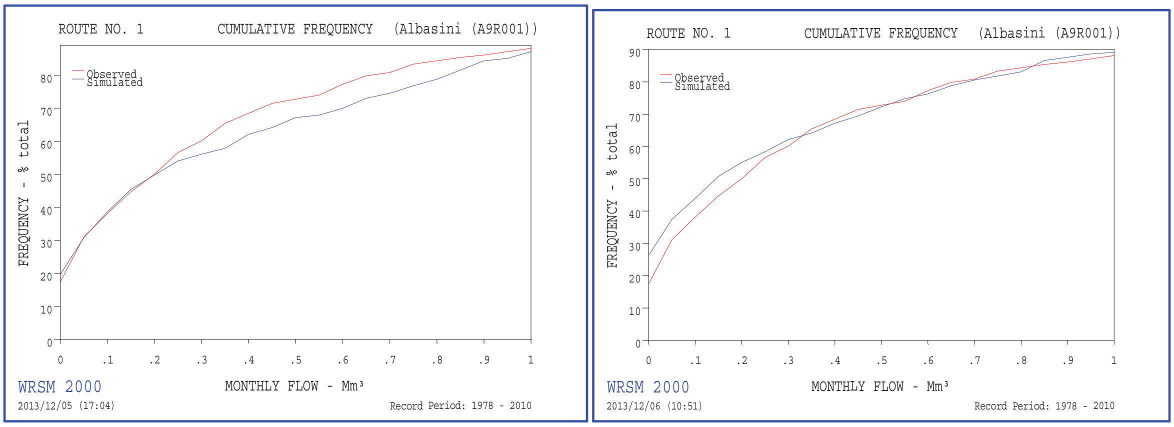


Figure 45: Groundwater evaporation area increased from 2.5% to 10% of catchment area. Increase in period of 0 flow and reduction of low flows

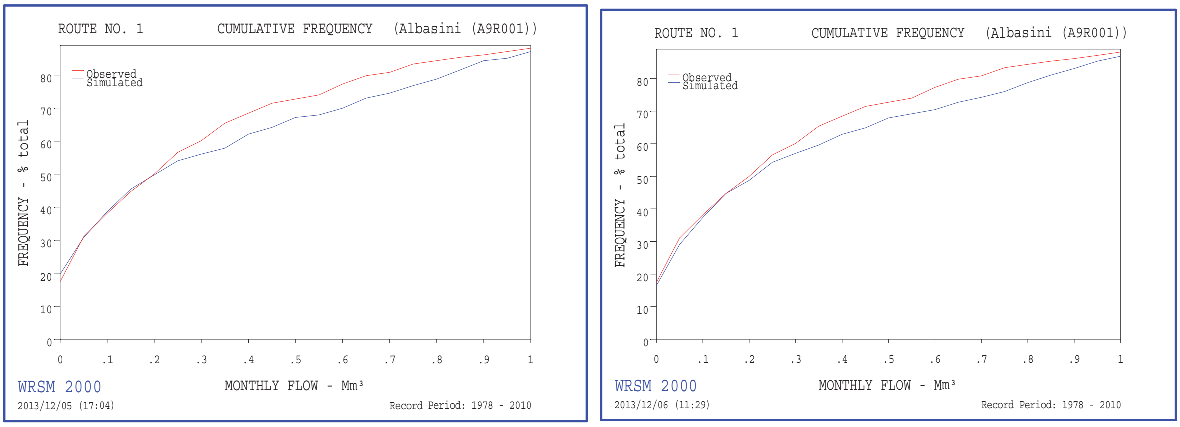


Figure 46: Months to average recharge increased from 4 to 12 months. Reduction in period of 0 flow and slightly increased very low flows.

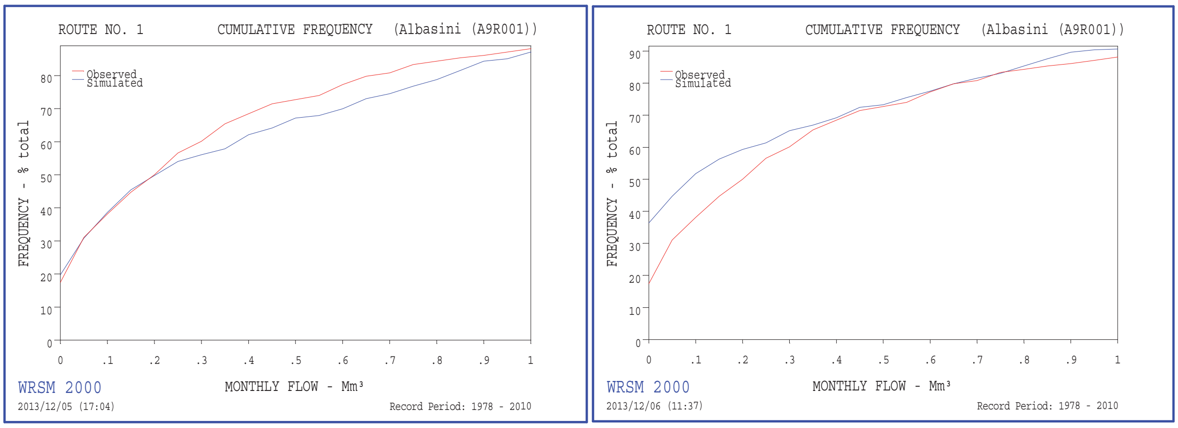


Figure 47: POW increased from 1 to 2. Large reduction in low flows and increase in period of zero flow

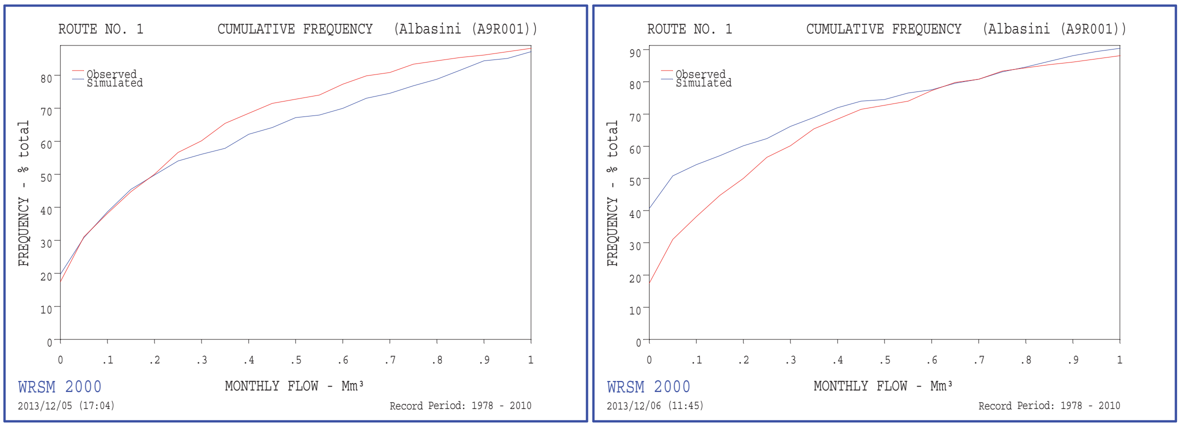


Figure 48: GPOW increased from 1 to 2. Increase in period of 0 flow and reduced low flow

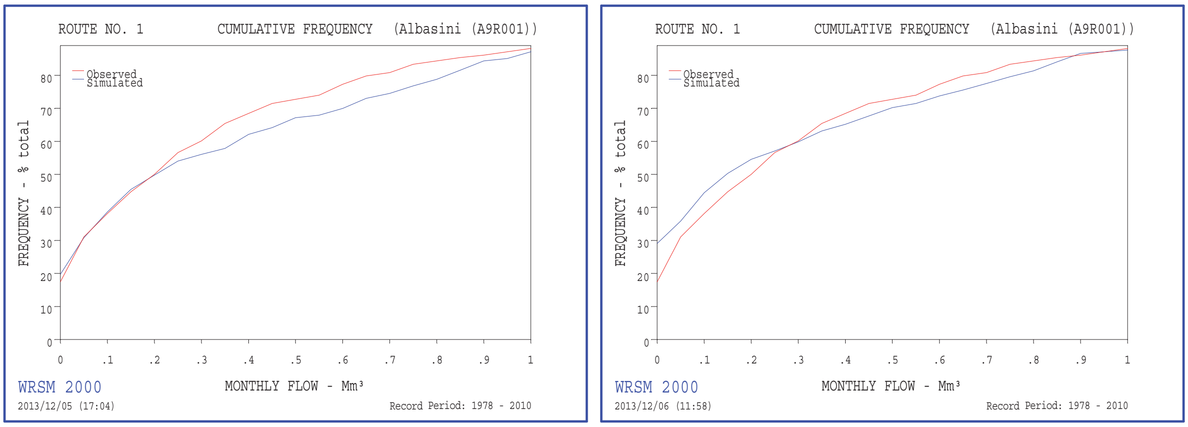


Figure 49: HGSL increased from 2.5% of ST to 10%.Redcued low flows, especially very low flows. Increased period of 0 flow

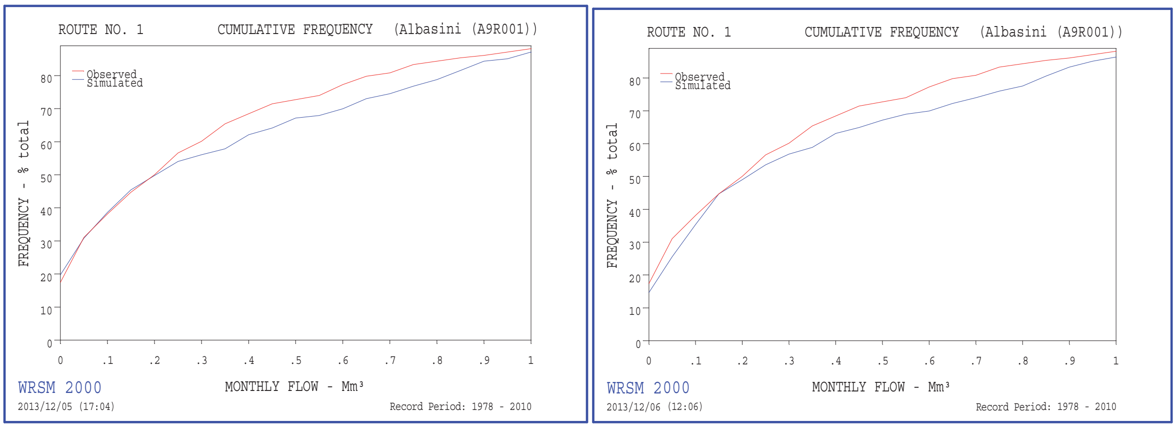


Figure 50: ST increased from 400 to 600. Increased low flows and reduced period of 0 flow

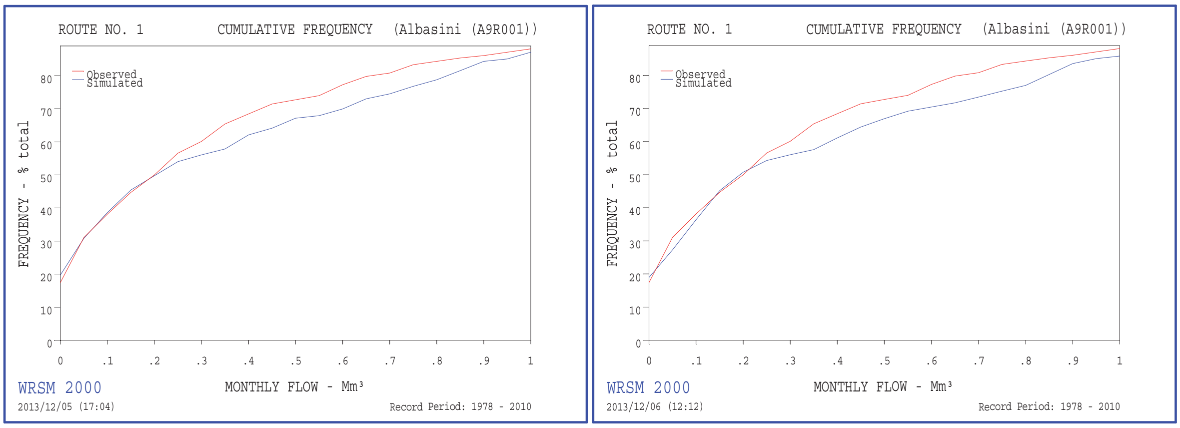


Figure 51: Interflow lag increased from 0 to 2. Reduced frequency of very low flows. FT only =5 so impact of lagging interflow is muted

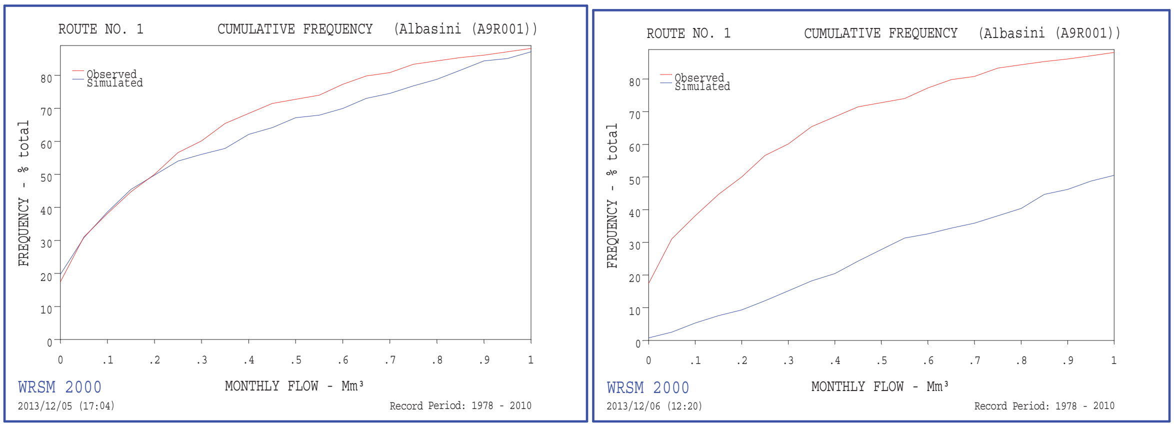


Figure 52: FT increased from 5 to 15. Increase in low flows

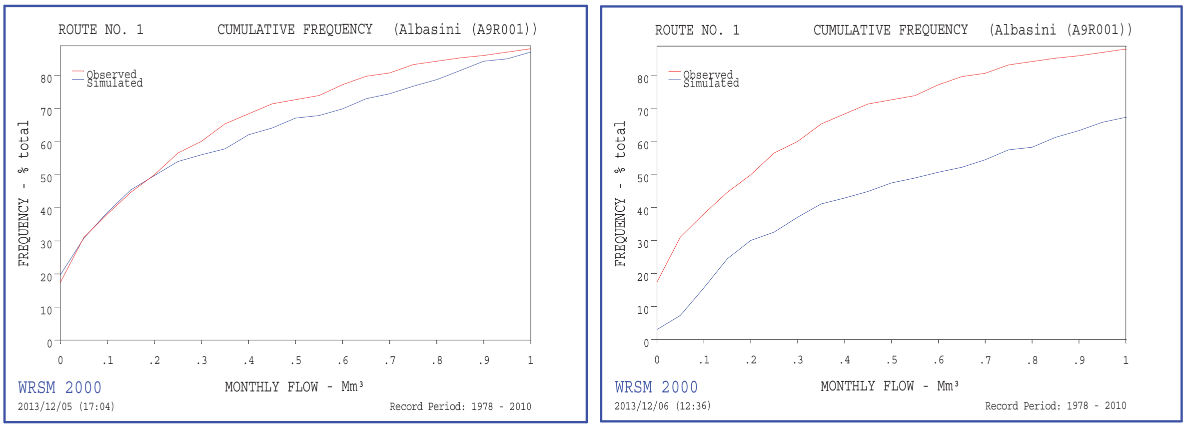


Figure 53: HGGW increased from 8 to 16. Increase in low flows

5. VERIFICATION STUDIES

5.1. Selected areas

South Africa is divided into 65 Groundwater regions (table 4), covering 1867 quaternary catchments of the 1949 quaternaries listed in WR2005. The catchments not included in a groundwater region lie in neighbouring countries. 53 of the regions contain quaternaries generating baseflow.

Of the 1949 quaternaries, 1546 generate baseflow, hence simulating interactions is of relevance to modelling surface runoff. 1395 quaternaries generate more than 1 mm/a of baseflow, 1071 generate more than 10 mm, and 224 generate more than 100 mm. The quaternaries generating baseflow are listed in Appendix 2. Their groundwater region is listed in Appendix 1.

Table 4: Groundwater regions. Names shown in bold contain quaternaries that generate baseflow

No.	Region Name	Lithology
1	**Makoppa Dome**	Predominantly granite, granodiorite, tonalite, gneiss, migmatite
2	**Waterberg Coal Basin**	Sandstone, siltstone, mudstone, shale; intruded by dolerite and includes patches of Letaba basalt north of the Soutpansberg
3	**Beauty-Messina Granulite Gneiss Belt**	Migmatite, gneiss; meta-quartzite, meta-pelite, marble,calc-silicate rocks, amphibolite; meta-anorthosite, serpentinite, meta-pyroxenite; porphyroblastic biotite gneiss
4	Limpopo Karoo Basin	Sandstone, siltstone, mudstone, shale; intruded by dolerite and includes patches of Letaba basalt north of the Soutpansberg
5	Soutpansberg Karoo Troughs	Mainly Mafic Basalt Lavas, and lesser sandstone, siltstone, mudstone, shale.
6	**Waterberg Plateau**	Compact, dominantly arenaceous strata
7	**Pietersburg Plateau**	Mainly acid, intermediate or alkaline intrusives
8	**Soutpansberg**	Assemblage of compact sedimentary and extrusive rocks – Quartzite, conglomerate, grit, sandstone, siltstone, mudstone, shale, basalt, trachy-andesite, tuff; diabase dykes / sills
9	**Western Bankeveld and Bushveld**	Compact sedimentary strata – quartzite, shale, conglomerate, iron formation, breccia, diamictite, limestone, dolomite, and where not shown separately as Vh, andesite; also includes Malmani dolomite north of Vredefort dome; diabase
10	**Zeerust-Delmas Karst Belt**	Dolomite, chert and subordinate limestone
11	**Middelburg Basin**	Compact, dominantly arenaceous strata – Pyroclastics, lava, quartzite, conglomerate, sandstone, siltstone; grit, shale, diabase sills
12	**Eastern-Northeastern Bankeveld**	Compact sedimentary strata – quartzite, shale, conglomerate, iron formation, breccia, diamictite, limestone, dolomite, and where not shown separately as Vh, andesite; also includes Malmani dolomite north of Vredefort dome; diabase
13	Springbok Flats	Compact arenaceous and argillaceous Karoo strata, Letaba mafic / basic lavas
14	**Western Bushveld Complex**	Mafic / ultramafic of basic / ultrabasic intrusives & Acid, intermediate or alkaline intrusives
15	**Eastern Bushveld Complex**	Eastern Bushveld Complex – Mafic / ultramafic of basic / ultrabasic intrusives & Acid, intermediate or alkaline intrusives
16	**Northern Bushveld Complex**	Northern Bushveld Complex – Mafic / ultramafic of basic / ultrabasic intrusives & Acid, intermediate or alkaline intrusives
17	**Central Highveld**	Compact sedimentary strata – quartzite, shale, conglomerate, iron formation, breccia, diamictite, limestone, dolomite, and where not shown separately as Vh, andesite; also includes Malmani dolomite north of Vredefort dome; Dolomite, chert and

No.	Region Name	Lithology
		sub-ordinate
18	**Western Highveld**	Western Highveld – Assemblage of compact sedimentary and extrusive rocks, i.e. Andesite, quartz porphyry, dacite, rhyolite, trachyte, ignimbrite, tuff, agglomerate, volcaniclastics, conglomerate, sandstone, arkose, quartzite, shale, chert
19	**Lowveld**	Acid, intermediate or alkaline intrusives
20	**Northern Lebombo**	Mafic / basic lavas, minor compact arenaceous and argillaceous Karoo strata
21	**Southern Lebombo**	Compact arenaceous and argillaceous Karoo strata, lesser Mafic / basic lavas
22	Eastern Kalahari	Porous unconsolidated to semi-consolidated Kalahari sediment, acid, intermediate or alkaline intrusives & dolomite, chert and subordinate limestone
23	Western Kalahari	Mainly compact tillite. (Dwyka Formation), porous unconsolidated to semi-consolidated Kalahari sediment & compact, dominantly arenaceous strata of Volop Gp
24	**Ghaap Plateau**	Dolomite, chert and subordinate limestone
25	**West Griqua Land**	Compact sedimentary strata- Mudstone, iron formation, riebeckite, jaspilite; diabase / dolerite dykes, Mafic / basic lavas, Compact, dominantly arenaceous strata, Dolomites
26	Bushmanland	Assemblage of compact sedimentary extrusive and intrusive rocks Gneiss, granite, metasediments, iron formation, calc-silicates, lava, tuff, volcaniclastic rocks, schist, amphibolite, granodiorite, charnockitic adamellite
27	Namaqualand	Assemblage of compact sedimentary extrusive and intrusive rocks
28	**Southeastern Highveld**	Compact arenaceous and argillaceous strata of Karoo Ecca and Adelaide Groups
29	Taung-Prieska Belt	Mainly compact tillite. (Dwyka Formation)
30	**Northeastern Pan Belt**	Compact, dominantly argillaceous strata of Ecca Gp
31	**Central Pan Belt**	Compact, dominantly argillaceous strata of Ecca Gp
32	**Southern Highveld**	Mudstone, shale, sandstone and dolerite – ADELAIDE AND TARKASTAD SUBGROUPS
33	**Northeastern Highland**	Compact arenaceous and argillaceous strata – MOLTENO, ELLIOT AND CLARENS FORMATIONS
34	**Northeastern Upper Karoo**	Mudstone, sandstone; intruded by dolerite dykes and sheets – ADELAIDE SUBGROUP and TARKASTAD SUBGROUP
35	Bushmanland Pan Belt	Ecca Shale; intruded by dolerite dykes and sheets, plus minor Dwyka Tillite to North
36	**Hantam**	Ecca Shale; intruded by dolerite dykes and sheets, plus minor Dwyka Tillite to West
37	**Tanqua Karoo**	Ecca Shale; intruded by dolerite dykes and sheets, plus minor Dwyka Tillite to West and Compact arenaceous and argillaceous strata of Adelaide SbGp

No.	Region Name	Lithology
38	Western Upper Karoo	Mudstone, sandstone; intruded by dolerite dykes and sheets of Adelaide SbGp and Shale of Ecca Gp
39	**Eastern Upper Karoo**	Mudstone, sandstone; intruded by dolerite dykes and sheets of Adelaide SbGp
40	**Southeastern Highland**	Sandstone, siltstone, mudstone, shale; intruded by dolerite dykes and sheets – MOLTENO, ELLIOT AND CLARENS FORMATIONS and Drakensberg Basalt
41	**Western Great Karoo**	Folded, compact arenaceous and argillaceous strata of Karoo Dwyka and Adelaide Groups
42	**Eastern Great Karoo**	Folded, compact arenaceous and argillaceous strata of Karoo Dwyka and Adelaide Groups
43	**Ciskeian Coastal Foreland and Middleveld**	Compact arenaceous and argillaceous strata of Adelaide and Tarkastad SubGPs, intruded dolerite dykes, sill & ring complexes
44	**Transkeian Coastal Foreland and Middleveld**	Wild Coast – Mudstone, sandstone; intruded by dolerite dykes and sheets (Adelaide & Tarkastad SBGp) & Shale (Ecca)
45	**Northwestern Middleveld**	KZN interior – Mudstone, sandstone; intruded by dolerite dykes and sheets (Adelaide & Tarkastad SBGp) & Shale (Ecca)
46	**Northeastern Middleveld**	Acid, intermediate or alkaline intrusives, Granite, granodiorite, tonalite, gneiss, migmatite, Ecca Shale & Dwyka Tillite.
47	**Kwazulu-Natal Coastal Foreland**	KZN Coast – Acid, intermediate or alkaline intrusives, Granite, granodiorite, tonalite, gneiss, migmatite & compact sedimentary rocks (Natal, Dwyka, Ecca, etc.)
48	**Northwestern Cape Mountain Ranges and Sandveld**	Piketberg – TMG Quartzites & minor Bokkeveld Shale
49	**Southwestern Cape Mountain Ranges**	Syntaxis – TMG Quartzites
50	**Southern Cape Mountain Ranges**	TMG-Witteberg Quartzite, Bokkeveld Shale & Sandstone,
51	**Oudtshoorn Basin**	Consolidated porous to compact sedimentary strata of Enon Fm & Kango Gp.
52	**Willowmore-Grahamstown Belt**	Folded Witteberg quartzite, Bokkeveld shale & sandstone.
53	**Ruensveld**	Shale, siltstone, sandstone – BOKKEVELD GROUP
54	**Intermontane Tulbagh-Ashton**	Schist, phyllite, phyllitic shale, shale, limestone, sandstone, greywacke, conglomerate, quartzite, greenstone – MALMESBURY GROUP; TYGERBERG, FRANSCHHOEK, KLIPHEUWEL FORMATIONS; BRIDGETOWN COMPLEX with

No.	Region Name	Lithology
	Valley	patches of conglomerate, sandstone – ENON FORMATION
55	Far Northwestern Coastal Hinterland	Quartzite, arkose, dolomite, diamictite, phyllite, schist, gneiss, andesite, basalt, tuff – GARIEP COMPLEX
56	Knersvlakte	Sandstone, shale, siltstone, limestone, dolomite, quartzite, schist – VAN RHYNSDORP GROUP
57	**Swartland**	Schist, phyllite, phyllitic shale, shale, limestone, sandstone, greywacke, conglomerate, quartzite, greenstone – MALMESBURY GROUP; TYGERBERG, FRANSCHHOEK, KLIPHEUWEL FORMATIONS; BRIDGETOWN COMPLEX
58	**Outenikwa Coastal Foreland**	Quartzite, phyllite, schist – KAAIMANS GROUP with patches of biotite granite – CAPE GRANITE SUITE, KUBOOS, GEORGE, WOODVILLE PLUTONS
59	**Southwestern Cape Coastal Sandveld**	Conglomerate, sandstone, aeolianite, sand, limestone, alluvium – VARIOUS COASTAL DEPOSITS; schist, phyllite, phyllitic shale, shale, limestone, sandstone, greywacke, conglomerate, quartzite, greenstone – MALMESBURY GROUP; TYGERBERG, FRANSCHHOEK, KLIPHEU
60	**Die Kelders**	Conglomerate, sandstone, aeolianite, sand, limestone, alluvium – VARIOUS COASTAL DEPOSITS
61	**Bredasdorp Coastal Belt**	Conglomerate, sandstone, aeolianite, sand, limestone, alluvium – VARIOUS COASTAL DEPOSITS
62	**Stilbaai Coastal Belt**	Conglomerate, sandstone, aeolianite, sand, limestone, alluvium – VARIOUS COASTAL DEPOSITS with shale, siltstone, sandstone of BOKKEVELD GROUP in north
63	**Lower Gamtoos Valley**	Conglomerate, sandstone – ENON FORMATION
64	**Algoa Basin**	Conglomerate, sandstone, mudstone, shale and subordinate basalt, tuff, breccia – UITENHAGE AND SUURBERG GROUPS
65	**Northern Zululand Coastal Plain**	Siltstone, sandstone, conglomerate – ZULULAND GROUP with aeolianite, sand, limestone, alluvium along coastline – VARIOUS COASTAL DEPOSITS

The model was applied to 101 quaternary catchments covering 13 of the 52 groundwater regions that generate baseflow (refer to Table 5). The location of these groundwater regions is shown in Figure 54.

Table 5: Quaternary catchments simulated in the verification study

Setup	WMA	GEOLOGY	Quaternary Catchment	Groundwater Region
1	14	Adelaide	D51A	38
		Adelaide	D51B	38
2	17	Witteberg,Dwyka, Ecca Gps, Adelaide	E22A	37
		Witteberg,Dwyka, Ecca Gps, Adelaide	E22B	37
		Wittberg, Dwyka Gps	E22D	37
		Witteberg, Dwyka, Ecca Gps	E22E	37
		Witteberg, Dwyka, Ecca Gps	E22F	37
		Bokkeveld, Witteberg, Dwyka Gps	E22c	48
		Witteberg, Dwyka Gps	E21L	48
3		Ecca gp	E40A	36
		Ecca gp	E40B	36
		TMG, dwyka Gps	E40C	36
		TMG	E40D	36
		Bokkveld, Dwyka	E24G	48
		Bokkeveld, Witteberg, Dwyka Gps	E24H	48
		TMG, Bokkeveld, Dwyka Gps	E24K	48
		TMG, Bokkveld Gps	E24J	48
		TMG	E24L	48
		TMG	E24M	48
4	16	Adelaide	J11A	41
		Adelaide	J11B	41
		Adelaide	J11C	41
		Adelaide	J11D	41
		Ecca/dwyka	J11E	41
		Ecca/dwyka	J11F	41
		Ecca/dwyka	J11G	41
5		TMG, Bokkeveld, Witteberg	J23E	50
6	17	TMG-Peninsula Fm	E10H	48
7	17	Malmesbury-Boland sub gp	G30B	57
8	19	TMG, Cape Granite	G10A	49
9		TMG, Franschoek Fm	G10B	49
		TMG, Franschoek Fm, cape granite,Moorreesburg Fm	G10C	57
10	18	TMG, Bokkeveld	G40C	49
11		TMG, Bokkeveld	G40D	49
12	17	Witteberg, dwyka	E21A	48
		Bokkeveld, Witteberg, Dwyka Gps	E21B	48
		Witteberg Gp	E21C	48
		TMG, Bokkeveld	E21D	48

Setup	WMA	GEOLOGY	Quaternary Catchment	Groundwater Region
		TMG, witteberg, Bokkeveld	E21E	48
		TMG, witteberg, Bokkeveld	E21F	48
		TMG, bokkeveld	E21G	48
		TMG	E21H	48
		TMG	E21J	48
		TMG	E21K	48
13	18	Bokkeveld	G50G	53
15		Bokkeveld	H10A	48
		TMG, Bokkeveld	H10B	48
14		TMG, Bokkeveld	H10Ca	48
15		TMG, Bokkeveld	H10Cb	48
	18	TMG	H10D	48
16		TMG, bokkeveld	H60A	49
17		TMG, bokkeveld	H60B	49
18		TMG, bokkeveld, Malmesbury	H60C	49
19		TMG, Bokkeveld, Witteberg	H60D	53
		TMG, Bokkeveld, Witteberg	H60E	53
	18	TMG, Bokkeveld, Witteberg	H60F	53
		TMG, Bokkeveld	H60G	53
		TMG, Bokkeveld, Witteberg, Malmesbury	H60H	53
		TMG, Bokkeveld, Witteberg	H60J	53
		TMG, Bokkeveld, Witteberg	H60K	53
20		TMG, Bokkeveld	H40A	50
		TMG, Bokkeveld	H40B	50
21	16	TMG, Kaaimans	K10C	50
		Kaaimans, Cape Granite, Enon	K10D	58
22		TMG, Kaaimans	K10E	50
		Kaaimans, Cape Granite, Enon	K10F	59
23		TMG, Kaaimans	K40B	50
DWA study	2	Goudplaats gneiss, Soutpansberg	A91A	8
		Goudplaats gneiss	A91B	19
		Goudplaats gneiss	A91C & F1	19
		Goudplaats gneiss	A91F	19
		Soutpansberg	A91D1	8
		Goudplaats gneiss	A91D3	8
		Goudplaats gneiss	A91D2 & D4	8
		Goudplaats gneiss,Soutpansberg	A91E	8
		Soutpansberg	A91G1 & 2	8
		Soutpansberg	A91G3	8
		Soutpansberg	A91G4 & 5	8
		Soutpansberg	A91H1	8
		Soutpansberg	A91H2	8
		Soutpansberg	A92A	8
		Soutpansberg	A92B	8
		Soutpansberg	A92C	8

Setup	WMA	GEOLOGY	Quaternary Catchment	Groundwater Region
		Granite and Gneiss	B81A	19
		Granite and Gneiss	B81B	19
		Granite and Gneiss	B81C	19
		Granite and Gneiss	B81D	19
		Granite and Gneiss	B81E	19
		Granite and Gneiss	B81F	19
		Granite and Gneiss	B81G	19
		Granite and Gneiss	B81H	19
		Granite and Gneiss	B81J	19
		Granite and Gneiss	B82A	19
		Granite and Gneiss	B82B	19
		Granite and Gneiss	B82C	19
		Granite and Gneiss	B82D	19
		Granite and Gneiss	B82E	19
		Granite and Gneiss	B82F	19
		Granite and Gneiss	B82G	19
		Granite and Gneiss	B82H	19
		Granite and Gneiss	B82J	19

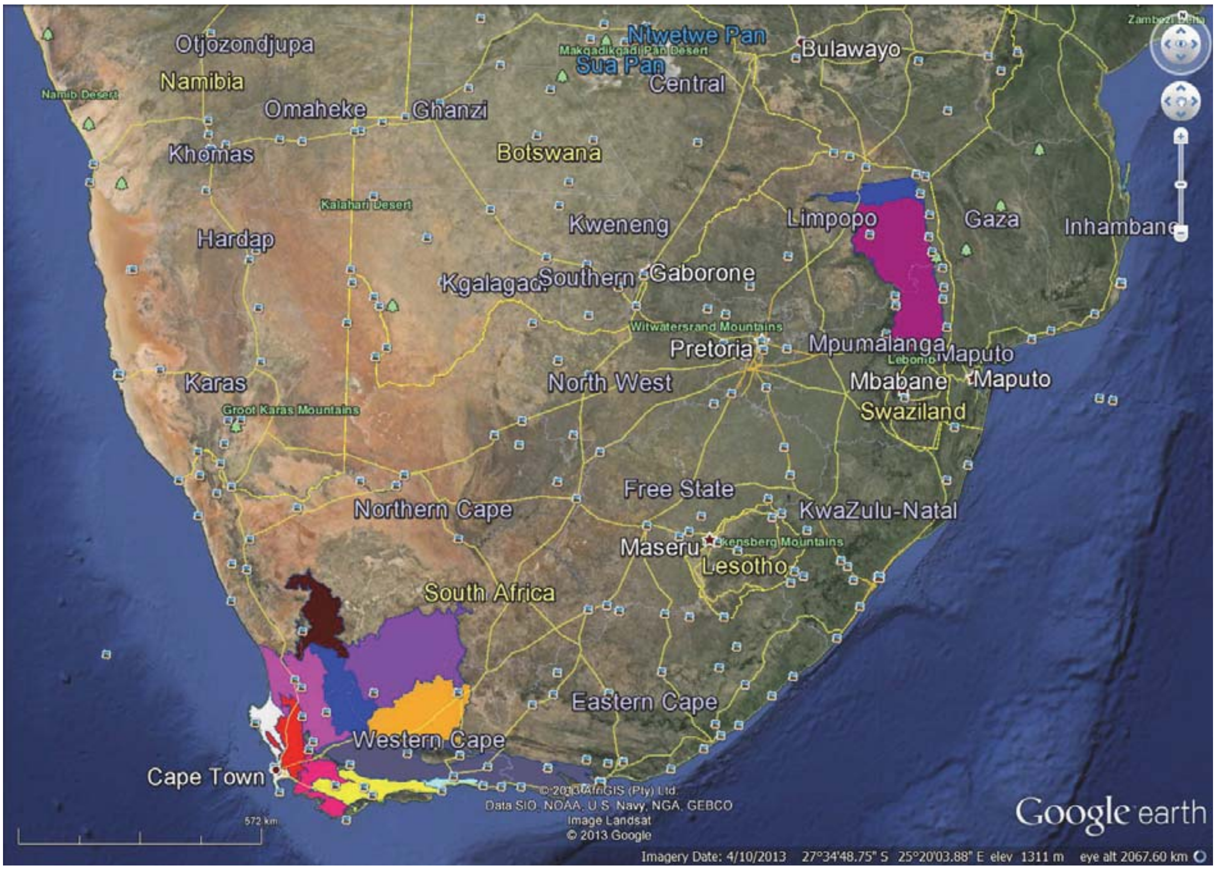


Figure 54: Groundwater regions in which quaternaries were simulated

5.2. Example of verification studies – Mountainous wet catchment B81A

The model was applied to the entire Letaba system as part of a DWA reconciliation project, and the results for B81A and the upper part of B81B to gauging weir to gauge B8H014 are shown here. The quaternaries are part of the headwater region of the Groot Letaba located upstream of Tzaneen. The catchment contains the Dap Naude and Ebenezer dams, which are highly stressed. B81A was split into the catchment Dap Naude (B81A1), the catchment above Ebenezeer and below Dap Naude (B81A2), and the portion below Ebenezer and above gauge B81H014 (Bb1B1).

5.2.1. Catchment characteristics

The Groot Letaba drains the eastern escarpment of Limpopo province, with the headwater region of B81A lying in the mountainous zone. The topography of the mountainous zone rises steeply from about 900 m in the vicinity of the towns Tzaneen, Duiwelskloof and Waterval to a general level of about 2 000 m in the vicinity of Haenertsburg and Dap Naude Dam. Hence the climate is wet and humid. The catchment is underlain by Goudplaats gneiss and younger granite intrusives. The regional aquifer is considered to consist of a composite of weathered granite and gneiss and underlying fractured rock.

5.2.2. Model set-up, climate and afforestation

The simulation was run from 1920 to 2010. Rainfall varies across the sub-areas according to elevation. Evaporation was entered as in the following Table 6.

Table 6: Evaporation and A-pan values

Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Evaporation	157	150	160	156	127	127	104	98	81	91	111	135
A-Pan	0.64	0.79	0.80	0.80	0.78	0.78	0.76	0.75	0.72	0.59	0.61	0.63

The subareas contain alien vegetation and afforestation, which were set up as child catchments as a time series based on available data (refer to Table 7).

The forestry, natural forest and alien vegetation that occur along the escarpment, impact on interflow and aquifer recharge.

The irrigation pattern is complex and has increased and decreased over time. Irrigation was set up as 16 irrigation modules, with areas in 2010 given in Table 6). 11 reservoir modules were utilised; 9 being for farm dams (refer to Table 6), and 2 modules for the Dap Naude and Ebenezer dams of 2.5 mcm and 69.14 mcm capacity respectively.

5.2.3. Groundwater inputs

Data from GRA II indicate that the weathered zone has an average depth of 52.77 m and the fractured aquifer zone a depth of 152 m. The average water level is 27.16 m, giving a weathered aquifer of 23.82 m. The average storativity of the weathered zone is 0.00327, and of the fractured zone 0.000194. Using equation 16 and 17, an aquifer capacity of 96.07 mm is calculated, and an aquifer thickness of 29.37 m is calculated. These are the values given in Appendix 1.

The length of the moving average of recharge and the unsaturated percolating storage and the static water level, as calculated by equations 20, 19 and 18 respectively are 2, 47.04 mm, 59.67 mm (Appendix 1). These parameters were entered for subareas B81A1 and A2. An initial maximum discharge rate of 4 mm was selected and a groundwater evaporation area of 1% of the subarea area. Since the aquifer is of low to moderate permeability, a transmissivity of 5 m^2/d was selected. Since groundwater abstraction is in valley bottoms close to the river channel, a distance of 100 m from the river was selected (Figure 55).

A similar process was used to derive parameters for B81B.

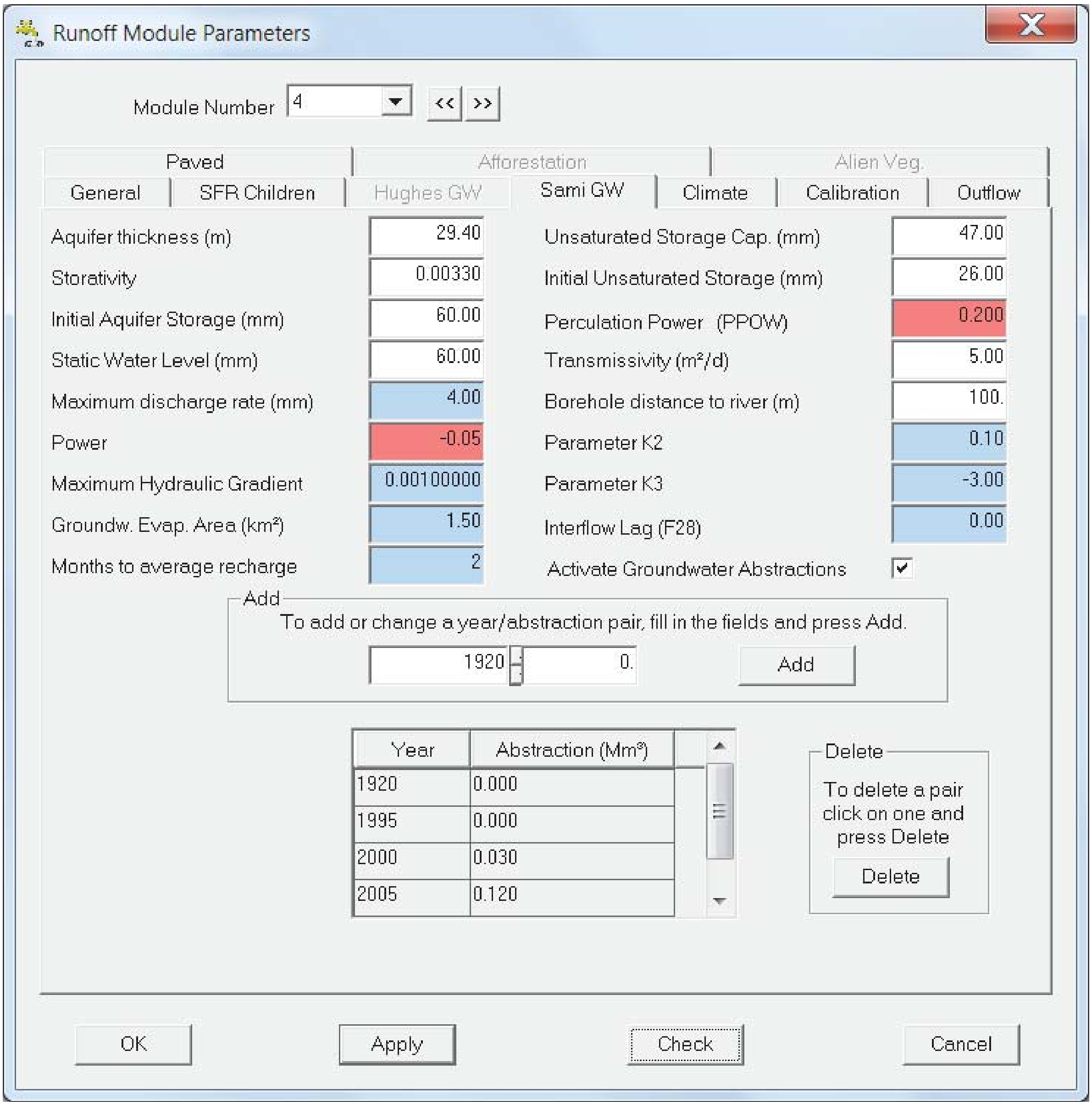


Figure 55: groundwater Inputs for B81A1 and A2.

5.2.4. Calibration parameters

GRAII lists recharge as being over 199 mm/a. On the steep slopes that generally exceed 15^o, recharge to these aquifers is rapidly discharged in the forms of springs, which provide baseflow to the rivers. These resources are not directly exploitable by the regional aquifers that occur in the valley bottoms. As a result, a large fraction of recharge generates interflow and cannot be directly exploited through boreholes.

Groundwater yields typically vary between 0.5 and 1.5 l/s. Up to 40% of boreholes are dry, indicating that the bulk of recharge does not enter the regional fractured aquifer, but is shed as interflow from shallow fractures above the regional water level. Consequently it can be concluded that aquifer recharge is low and baseflow must be simulated with a large interflow component.

The initial set up was the parameters utilized in WR2005 (Figures 56 and 57).

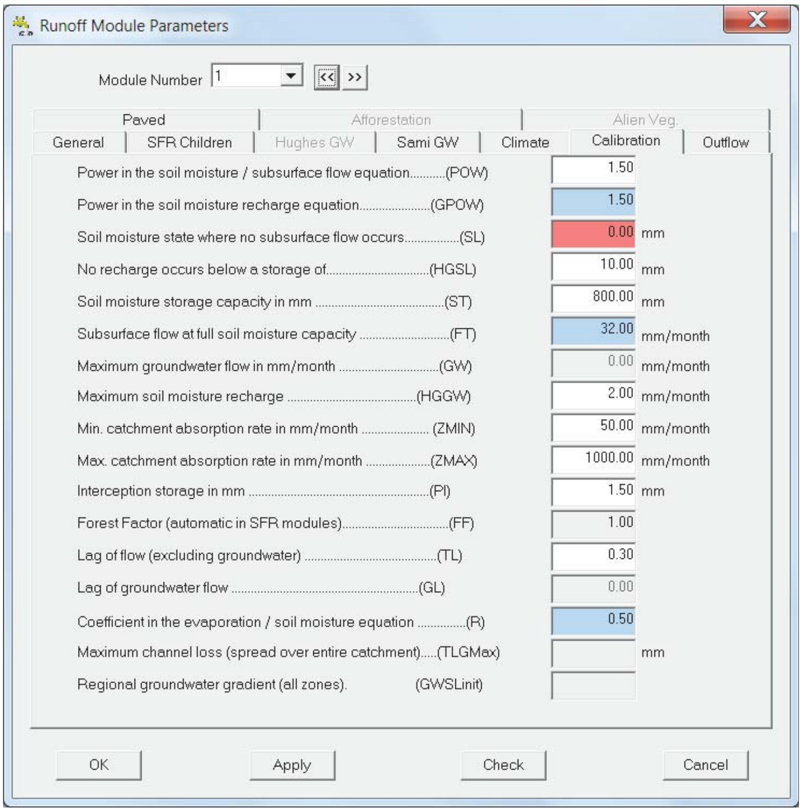


Figure 56 Initial parameter set for B81A1 and A2

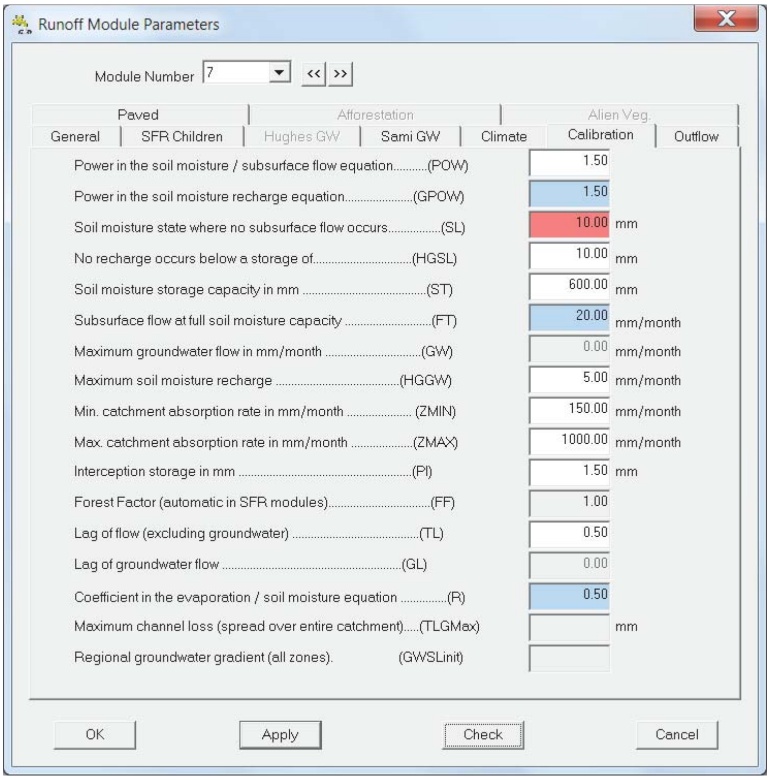


Figure 57: Initial parameter set for B81B

5.2.5. Calibration

The initial step is to run the set up under naturalised conditions and verify the water balance. This is achieved by writing out aquifer recharge, interflow and groundwater outflow (total baseflow. The mean annual figures are shown in Table 8. It can be seen that the recharge generated is comparable to GRAII values, slightly over simulated in B81A and under simulated in B81B. Baseflow is under simulated compared to the values given by Pitman and Hughes for B81B. Consequently, there is no need to get rid of recharge via more evapotranspiration.

If recharge had been under simulated, HGGW could be increased, or HGSL reduced. This would increase baseflow and if baseflow were too high, the evaporation area could be increased to get rid of excess baseflow.

Table 7: Catchment characteristics

GR	Geology	Quaternary Catchment	Catchment area		Forestry	Alien veg.	Irrigation	Farm dams		Evaporation	MAP
			Gross	Net	area	area	area	area	volume		
			(km^2)	(km^2)	(km^2)	(km^2)	(km^2)	(km^2)	(mcm)	mm	mm
19	Goudplaats gneiss and granites	B81A1	14.1	14.1	5.6-10.2					1497	1570
		B81A2	155.7	155.7	39.4-87.6	1-2.3	2.86	0.7	1.28	1497	1174
	Granites, Goudplaats gneiss	B81B1	124	124	16.7-39.6	1.2-2.4	20.80	0.33	0.51	1497	1147

Table 8: Simulated recharge and baseflow compared to other sources

QUAT	Area (km^2)	Fraction of Quaternary Catchment	Aquifer Recharge (mm/a)	Interflow (Mm^3/a)	Recharge (Mm^3/a)	GRAII Recharge (mm/a)	GRAII recharge (Mm^3)	Baseflow (Mm^3/a)	Pitman baseflow (Mm^3/a)	Hughes baseflow (Mm^3/a)
B81A1	14.1	0.083038869	14.95	3.43	3.640795	199	2.8059	3.56	33.6986	39.06773
B81A2	155.7	0.916961131	12.29	30.93	32.843553	199	30.9843	32.75		
B81B1	124	0.257796258	31.66	15.73	19.65584	163	20.212	16.45	18.4636	23.47072

The next step is to run the model under present conditions and compare the simulation to observed flows.

The results indicate that low flows are of insufficient duration during the recession period after the wet season and interflow does not begin soon enough in the beginning of the wet season, (Figure 58), low flow volumes of 1-5 Mm^3/month are too infrequent (Figure 59). The log of the MAR being too low also suggests low flows are too low (Figure 60). The MAR is also too low, suggesting peaks and volumes are underestimated, as seen in Figure 61. Figure 62, Ebenezer dam storage levels, show that inflows into the dam during dry periods are too high.

Options to improve the calibration are:

- reduce ST to increase peaks and runoff volumes;
- increase HGGW to increase groundwater baseflow and boost low flow volumes without the long recession of interflow;
- increase HGSL to reduce interflow and recharge during dry periods;
- increase maximum groundwater discharge to increase groundwater baseflow;
- increase FT to increase interflow;
- increase SWL to reduce groundwater baseflow during dry periods and
  reduce POW and GPOW to broaden the duration of interflow and recharge.

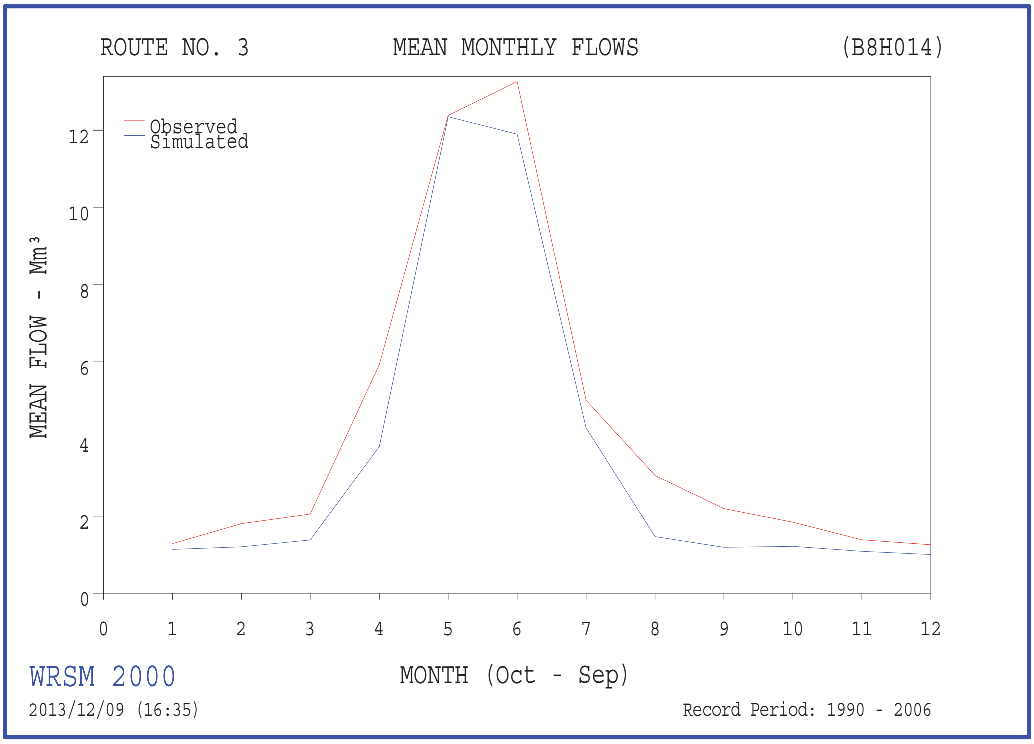


Figure 58: Initial mean monthly flow distribution

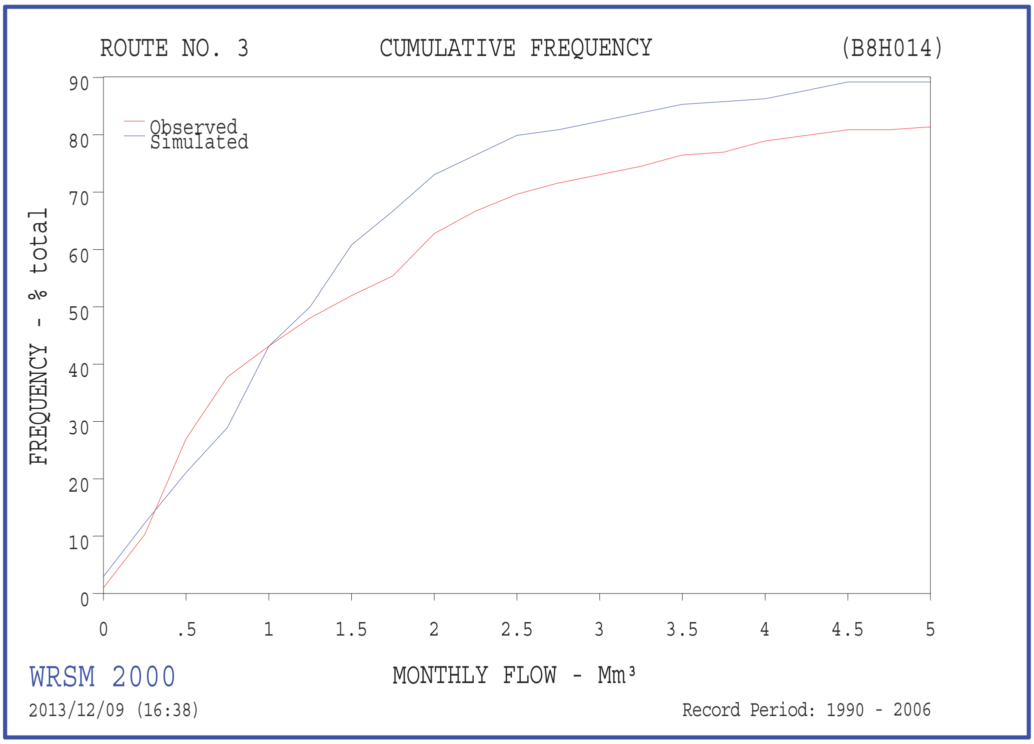


Figure 59: Initial cumulative frequency curve

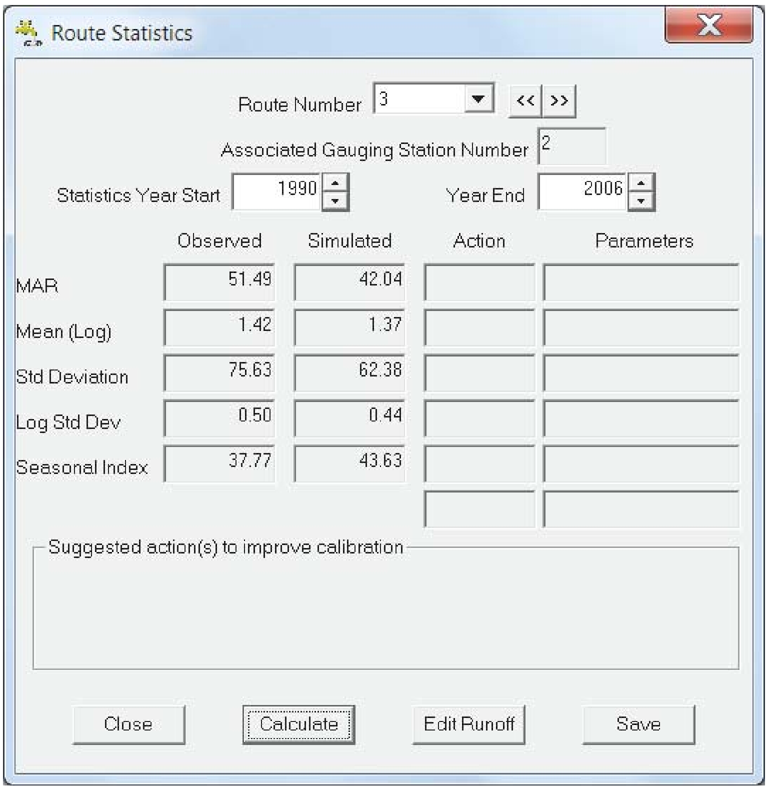


Figure 60: Initial flow statistics

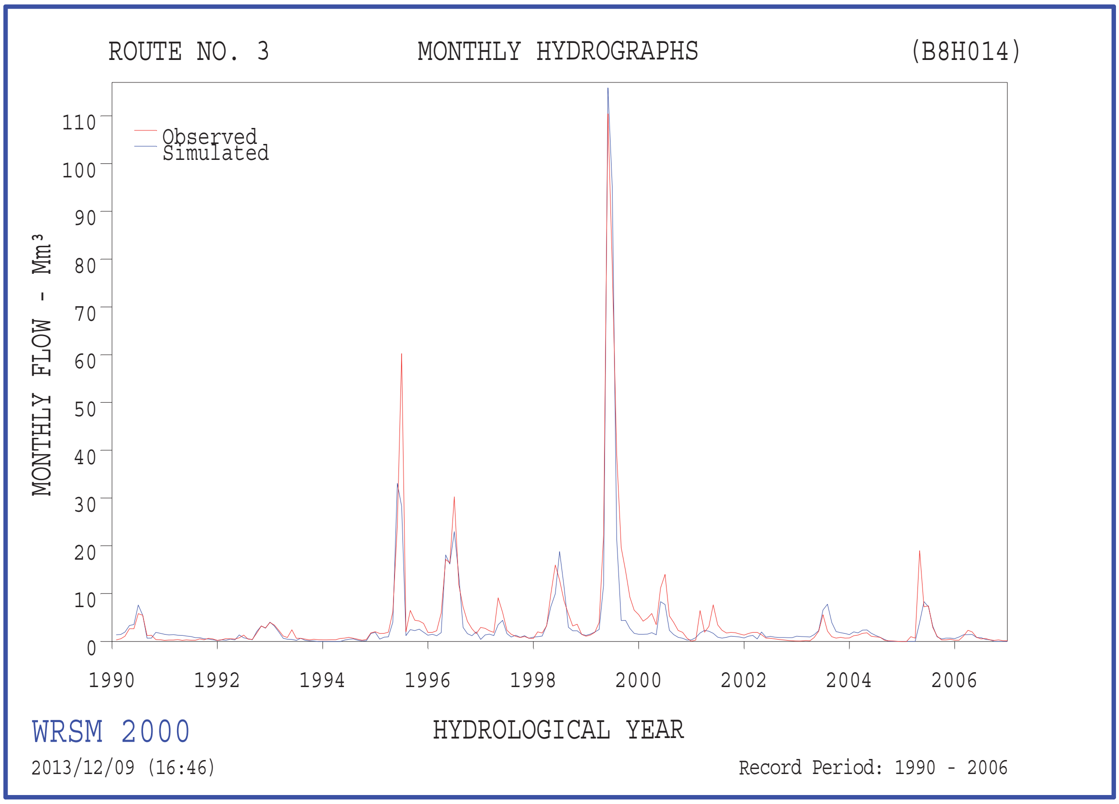


Figure 61: Initial monthly hydrograph

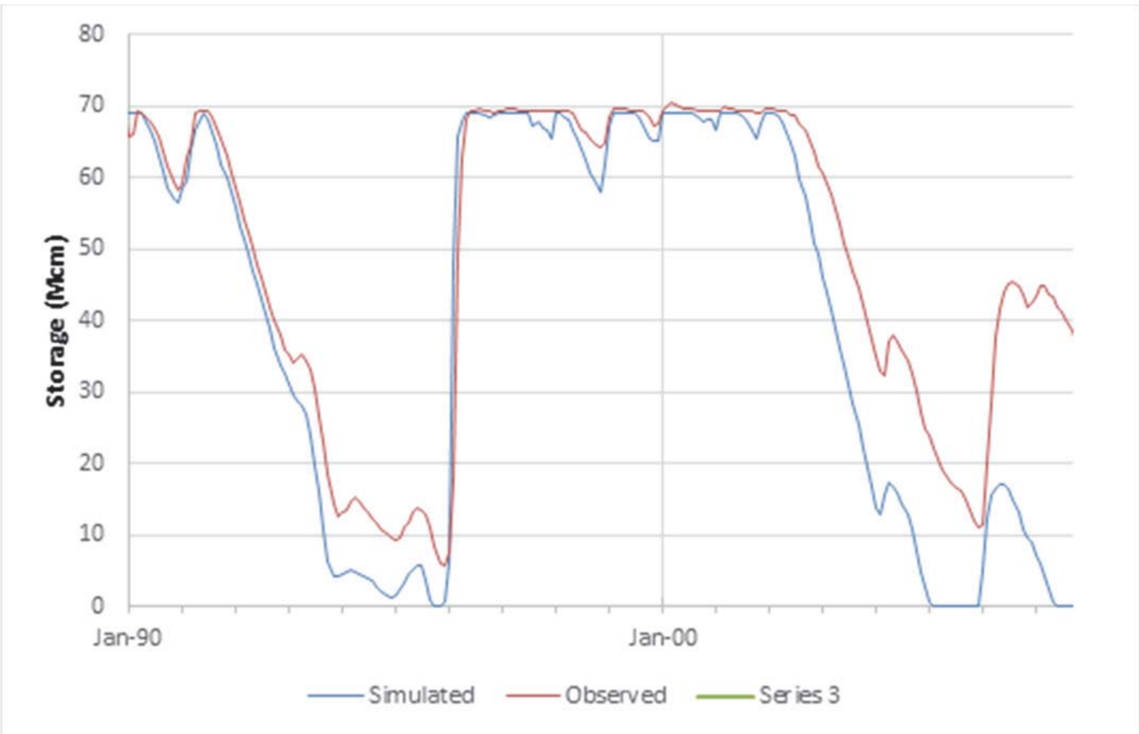


Figure 62: Initial simulated storage for Ebenezer dam

The following changes were undertaken:

- SWL decreased from 60 to 50 in the wetter more mountainous B81A to produce more sustained baseflow. SWL increased from 83 to 100 in B81B to reduce groundwater baseflow, the reason being this catchment has a deeper weathered aquifer hence more groundwater would be in storage after baseflow has ceased;

- Maximum groundwater discharge increased from 4 to 12 in B81A and from 4 to 8 in B81B. This would cause groundwater baseflow to recede more rapidly providing less baseflow in dry periods and more during wet periods;
- POW and GPOW were reduced from 1.5 to 1.25 in the more mountainous and wettest B81A1. The reason being in that region of steep slopes interflow and recharge could be initiated more rapidly;
- HGSL was increased from 10 to 20 in B81A and to 50 in B81B. This was to reduce baseflow proportionally more in very dry periods. The deeper weathered zone of B81B, with a higher fraction of granites, would have more clays, reducing percolation and interflow unless the soil zone is very wet;
- ST was reduced from 800 to 450 in B81A to provide more peaks. It is unlikely the soil zone stores much water in mountainous terrain and the original Pitman parameters had high ST in such terrains in order to simulate extended baseflow, since groundwater wasn't included in the model. ST was increased in B81B from 600 to 700;
- FT was increased from 32 to 40 in B81A to provide more interflow and the long recession visible in the mean monthly flow hydrograph;
- HGGW was increased from 2 to 12 in B81A to increase groundwater baseflow. HGGW was increased from 5 to 8 in B81B. The deeper weathered zone suggests recharge would be less rapid in this quaternary catchment;
- ZMIN and ZMAX were reduced from 50 and 1000 to 10 and 700 in B81A to provide a more rapid rising limb on the mean monthly hydrograph and
- The lag TL was increased from 0.3 to 0.4 to adjust the peak of the mean monthly hydrograph.

The results of the calibration are shown in Figures 63-68

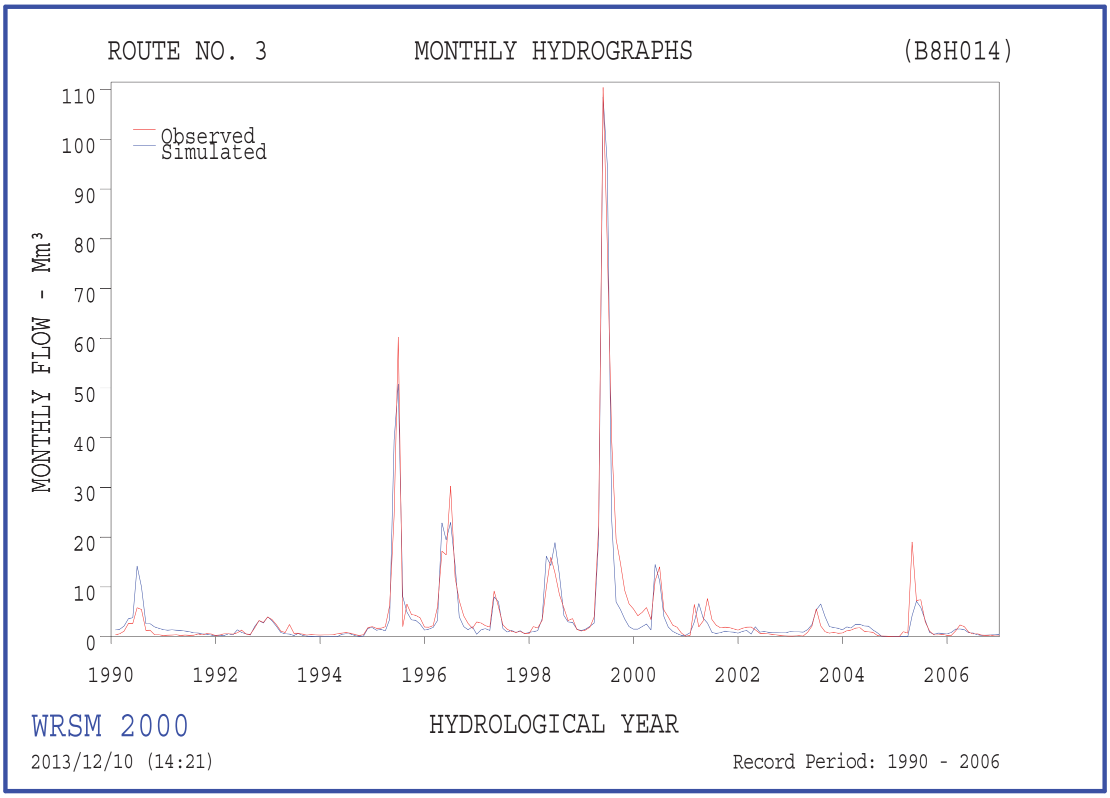


Figure 63: Final monthly flow hydrograph

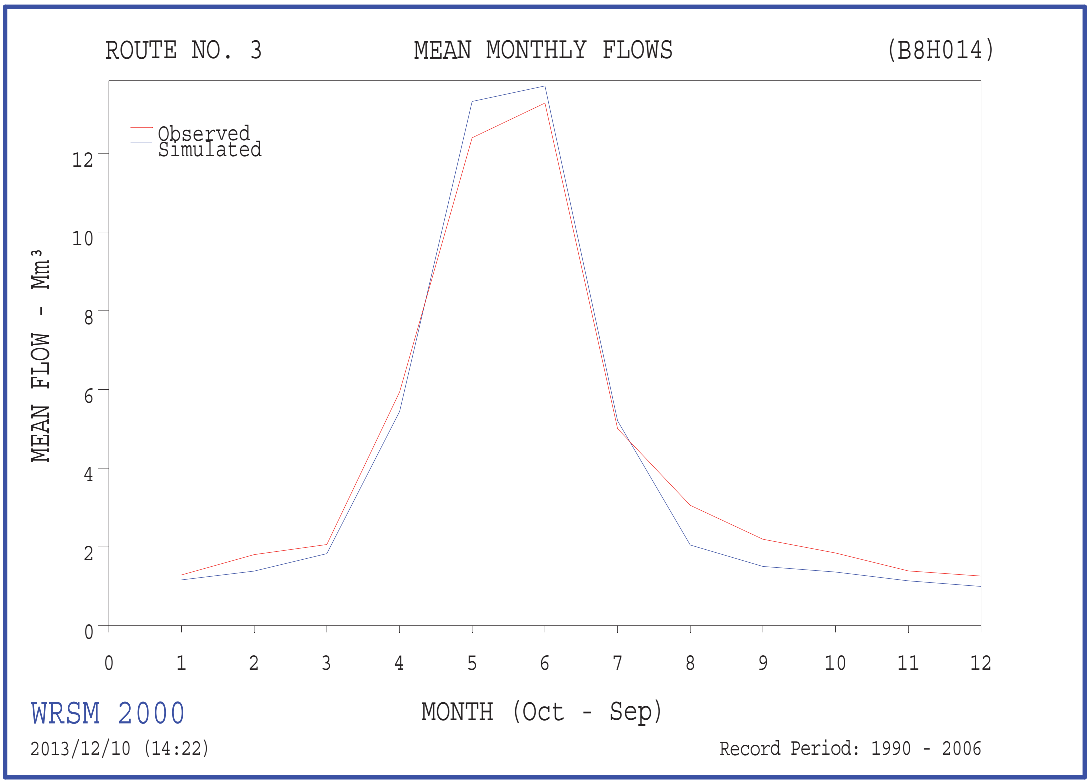


Figure 64: Final monthly flow distribution

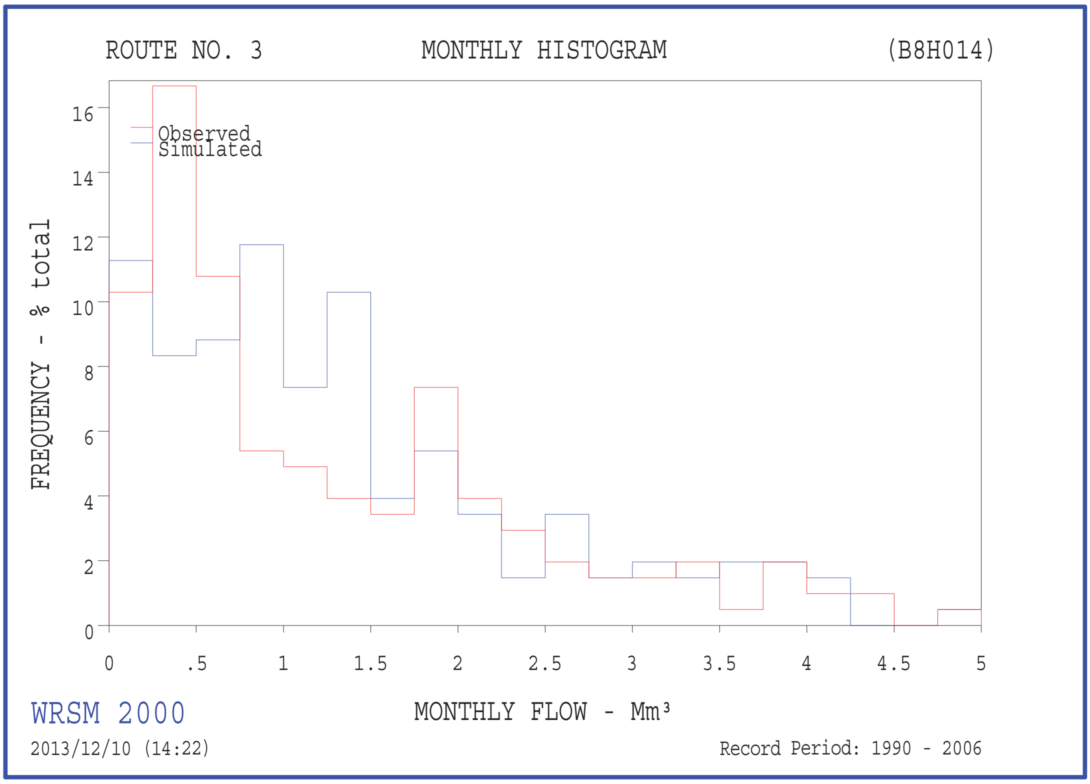


Figure 65: Final monthly flow histograph

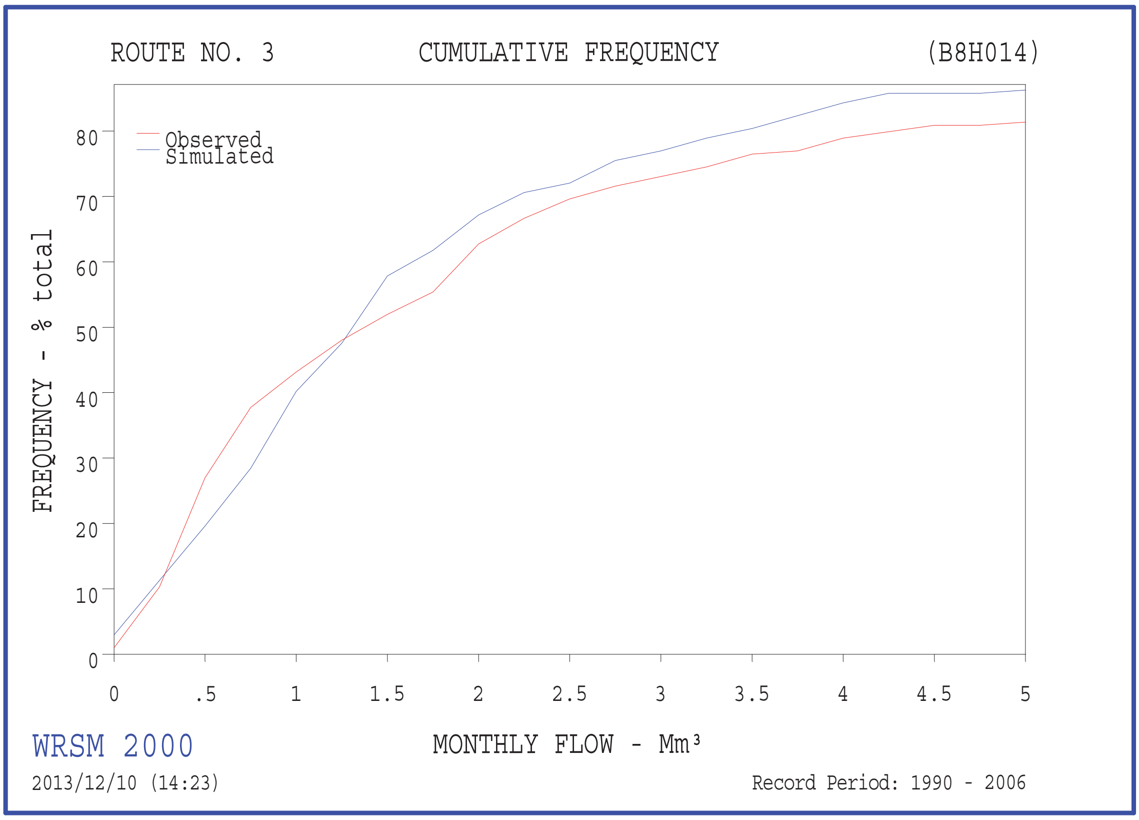


Figure 66: Final cumulative frequency curve

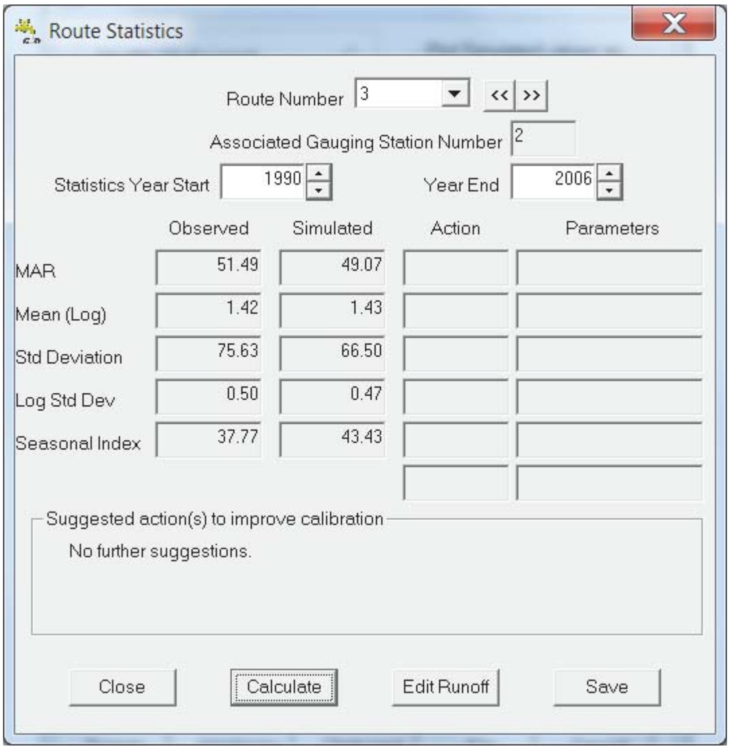


Figure 67: Final flow statistics

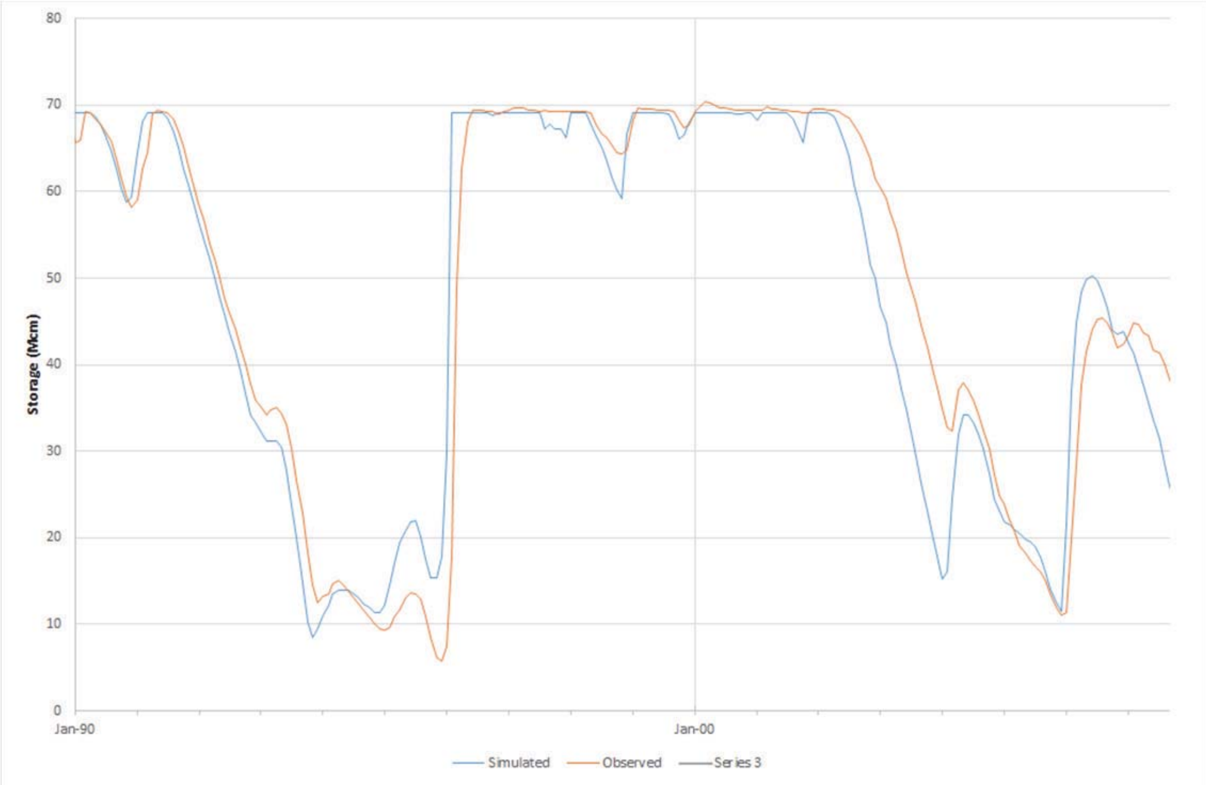


Figure 68: Final simulated Ebenezer dam storage levels

5.3. Example of verification studies – Ephemeral catchment- G30B

This catchment is part of the Olifants-Doring system. It is underlain by rocks of the Malmesbury-Boland Subgroup. It has an area of 658 km^2, over which 10% is covered by alien vegetation and 12.5 km^2 is irrigated. Rainfall is only 394 mm/a and the catchment is included as an example of generating ephemeral baseflow.

The initial setup was that utilised in WR2005 (Figures 69 and 70), except 1.5 Mm^3/a of groundwater based irrigation was included.

Figures 71-73, show that low flows are under simulated (log of mean MAR is too low and cumulative frequency curve indicates under simulation of low flows)

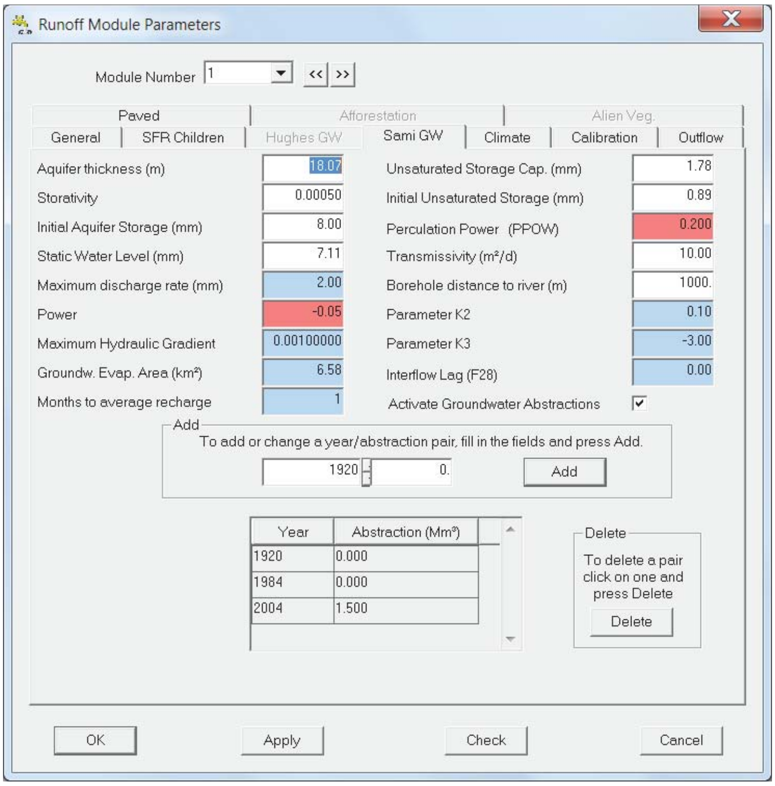


Figure 69: Initial setup up – G30B

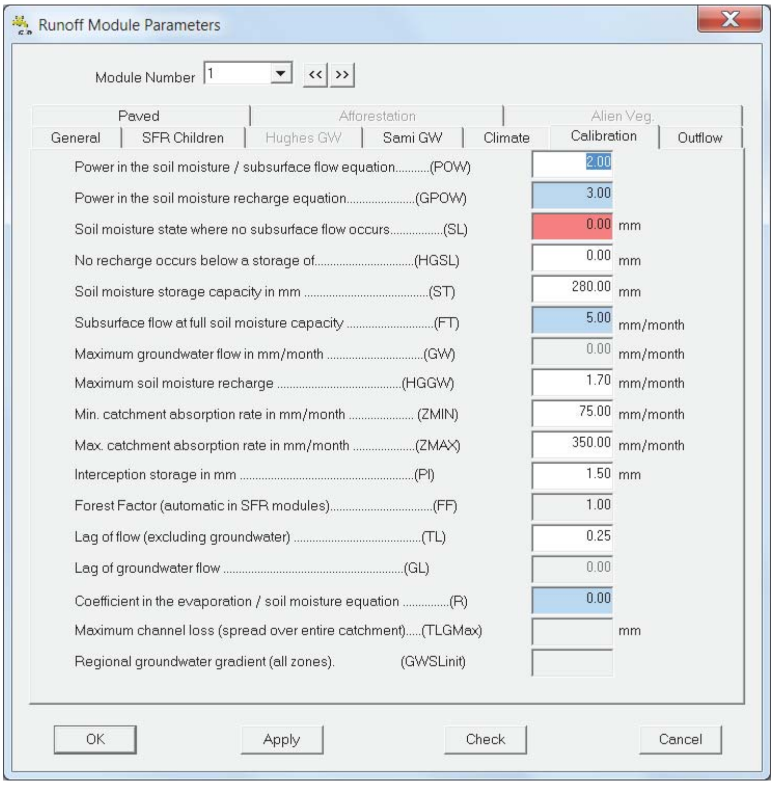


Figure 70: Initial calibration parameters G30B

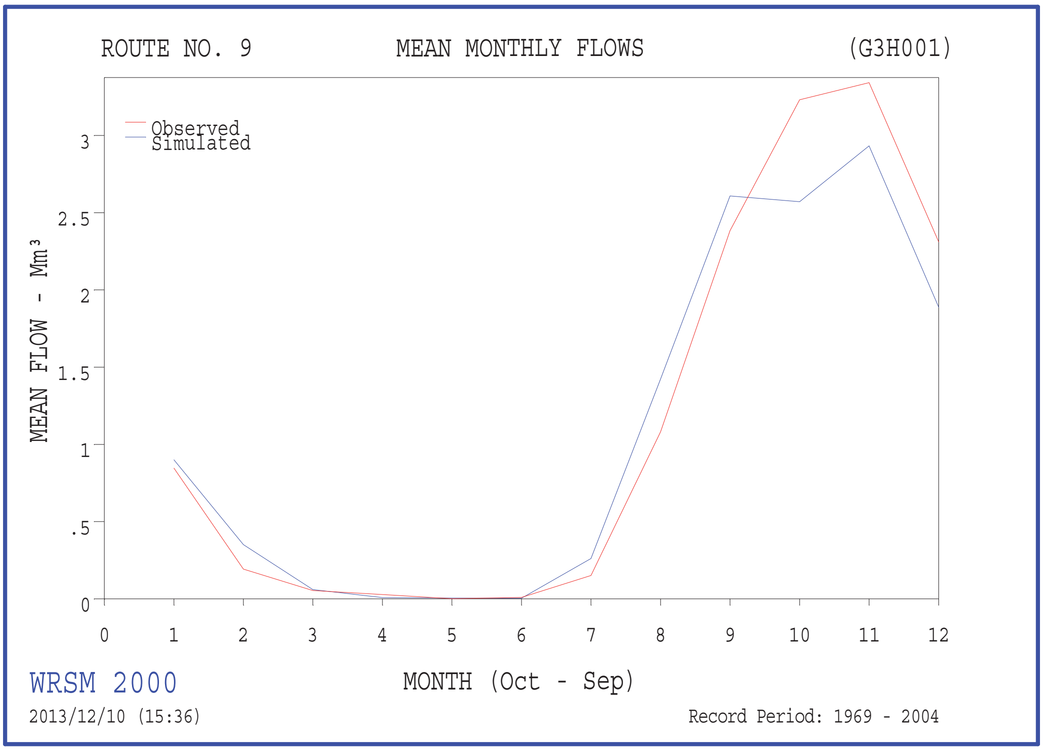


Figure 71: Initial mean monthly flows

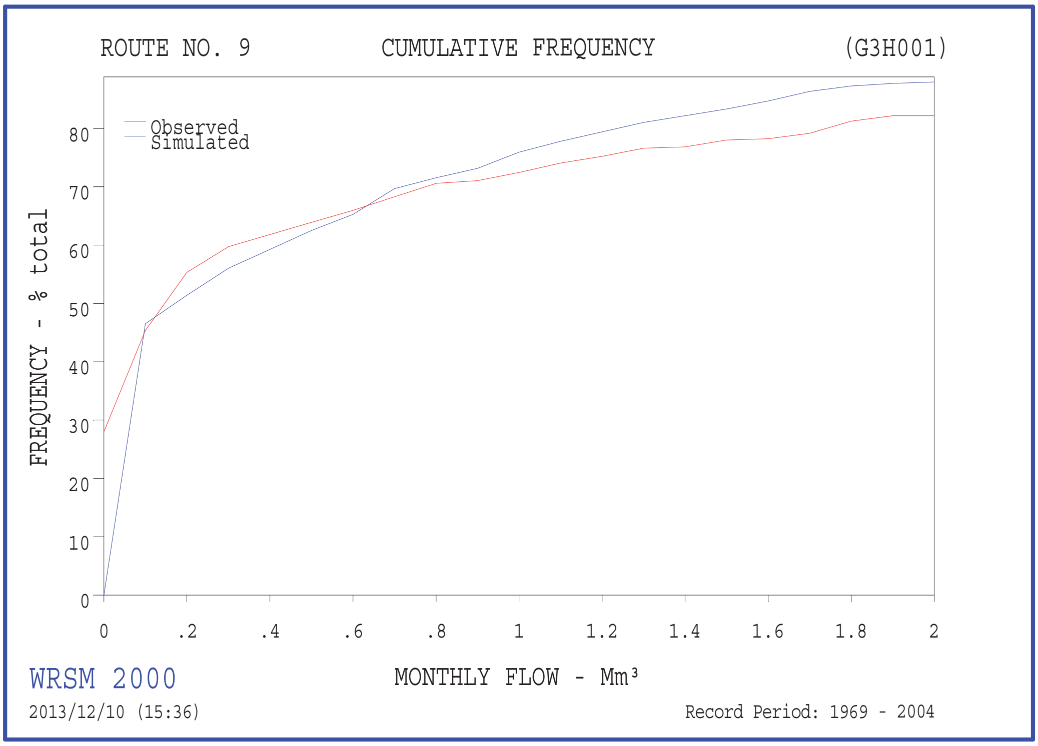


Figure 72: Initial cumulative frequency curve

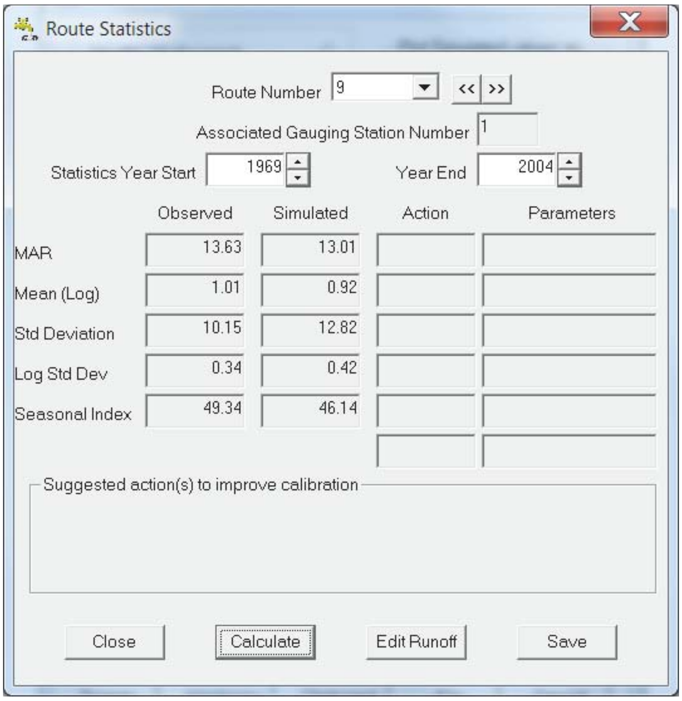


Figure 73: Initial flow statistics

The following was undertaken for calibration:

- new default parameters included in WR2012 were included (Appendix 1);
- the maximum groundwater discharge rate was increased to 4 and the static water level increased from 18 in Appendix 1 to 27 to reduce the duration of groundwater baseflow;
- The groundwater evaporation area was increased to 3% of catchment area from 1% to reduce groundwater baseflow;
- GPOW was reduced to 2 and HGGW increased to 5 to make recharge comparable to the figures in GRAII, (Appendix 2);
- HGSL was increased to 10 to reduce recharge and baseflow in dry periods;
- ST was reduced to 220 increase high flows and
- ZMIN and ZMAX were slightly altered to 90 and 340 to adjust the mean monthly flow graph.

The results are shown in Figures 74-77. Peaks may be over-simulated, but it is not known if the gauge is not capable of recording high flows. Increasing ST to reduce peaks resulted in the higher low flows of the cumulative frequency graph being under simulated. It is not possible to fit the 30% no flow period on the cumulative frequency curve as the model is set up with irrigation returns. Irrigation return flows are not subject to the transmission loss routine in the groundwater module since they generated within the irrigation module and transferred to the channel module. Eliminating return flows would require setting channel losses in the WRSM/Pitman model. Except for these zero flows, the very low flows of 0-0.1 Mm^3/month are adequately simulated (Figure 77).

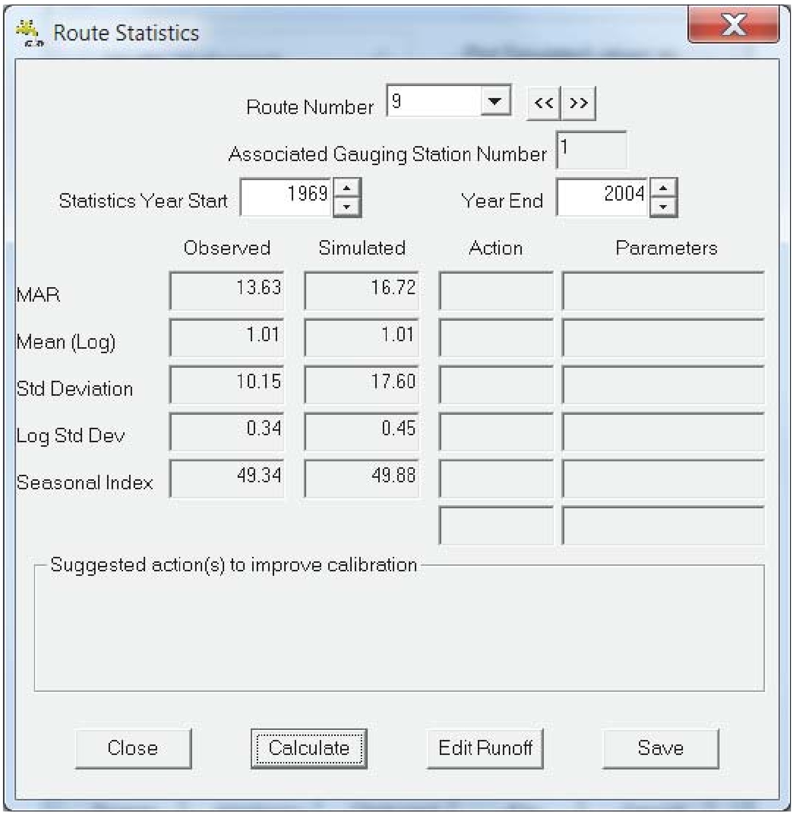


Figure 74: Final flow statistics

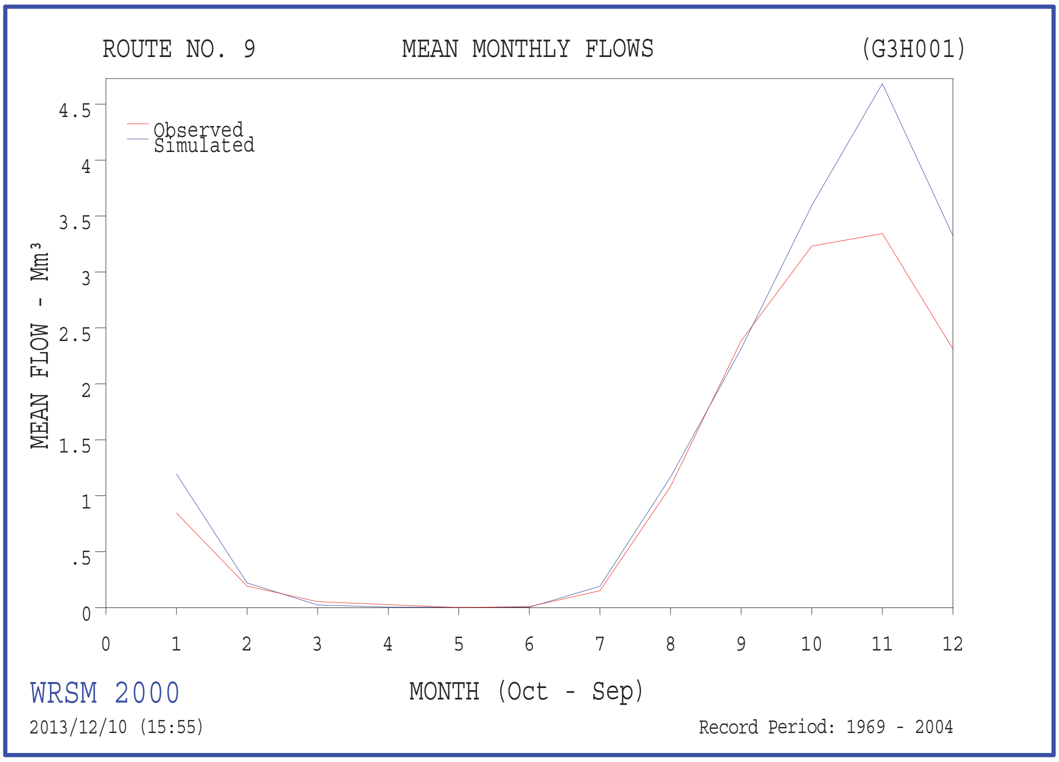


Figure 75: Final mean monthly flows

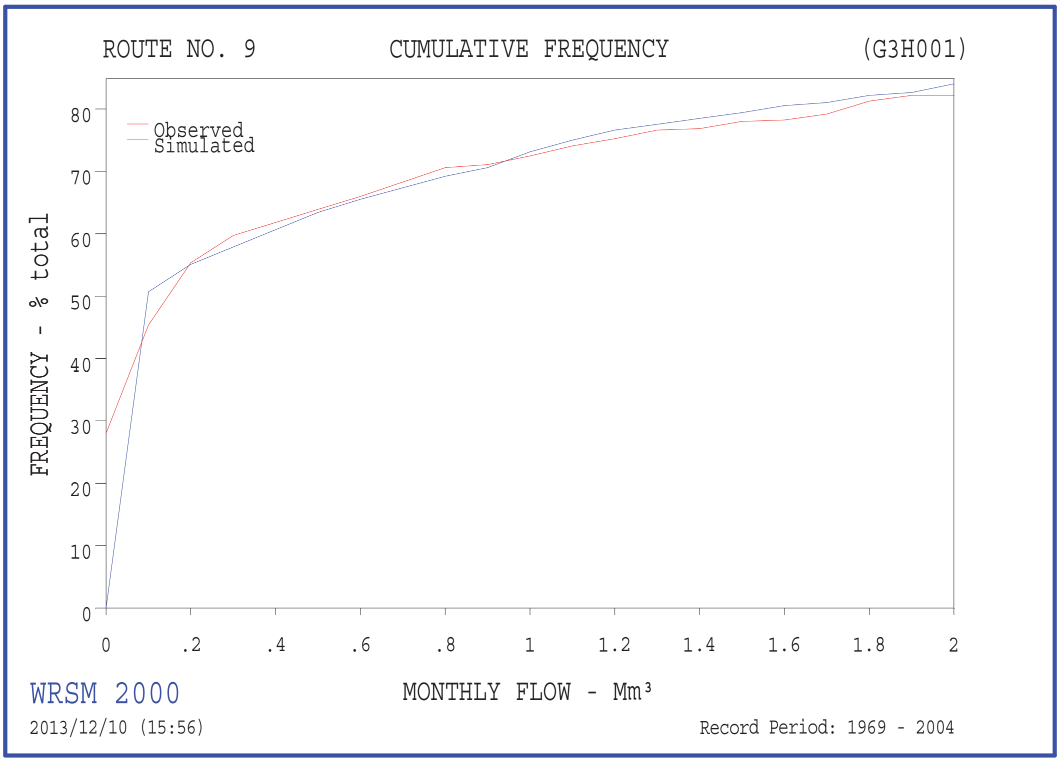


Figure 76: Final cumulative frequency curve

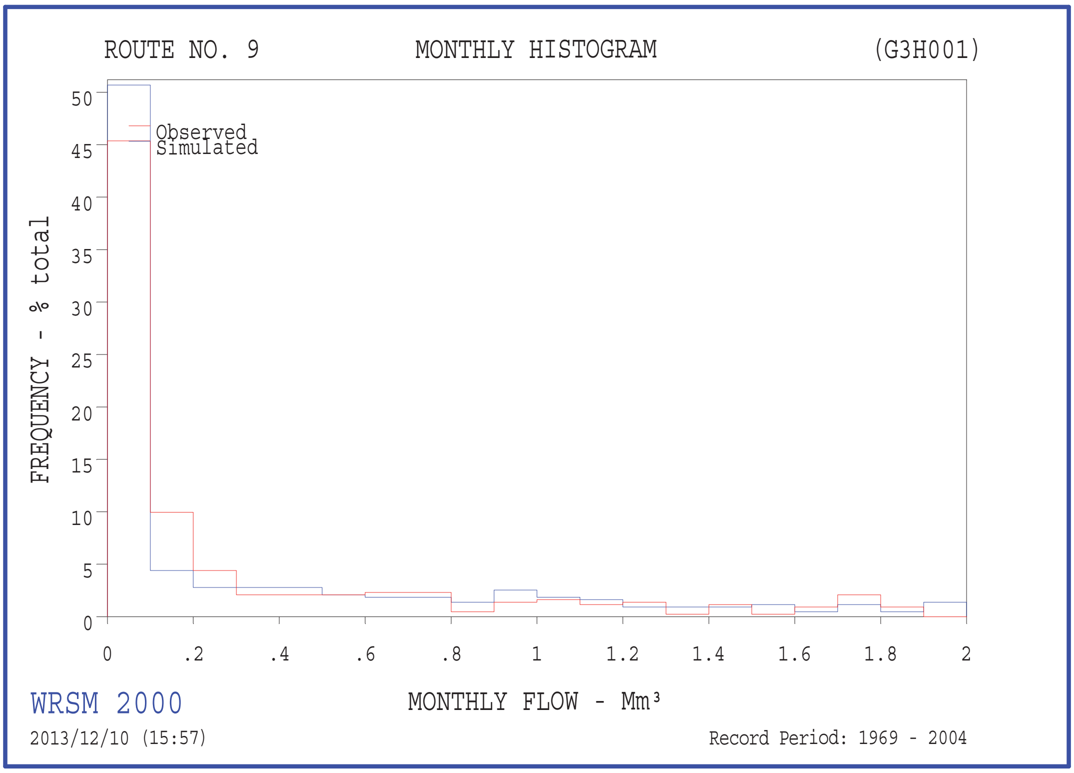


Figure 77: Final monthly flow histogram

5.4. Example of verification studies – Table Mountain Group – E10H

This catchment is part of the Olifants-Doring system. It is underlain by rocks of the Peninsula Formation of the Table Mountain Group. It has an area of 162 km^2, of which only 1% is covered by alien vegetation. There is no irrigation from surface water, hence the catchment consists of virgin Table Mountain Group conditions. Rainfall is 495 mm/a and the catchment is included as an example of generating baseflow from the Table Mountain Group.

The initial setup was that utilised in WR2005 (Figures 78 and 79), except 1.04 Mm^3/a of groundwater abstraction was included, and since it occurs in valley bottoms, the abstraction was assumed to be 500 m from the river.

Figures 80-82, show that very low flows in the dry season are under simulated, however, higher low flows are over-simulated. This suggests groundwater baseflow is too low and interflow is too high.

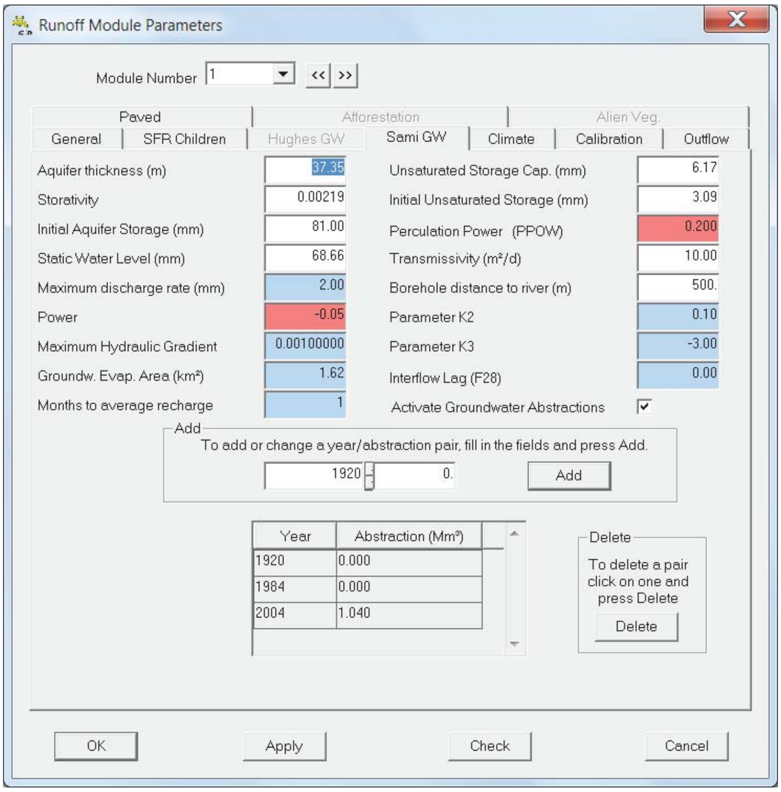


Figure 78: Initial setup up E10H

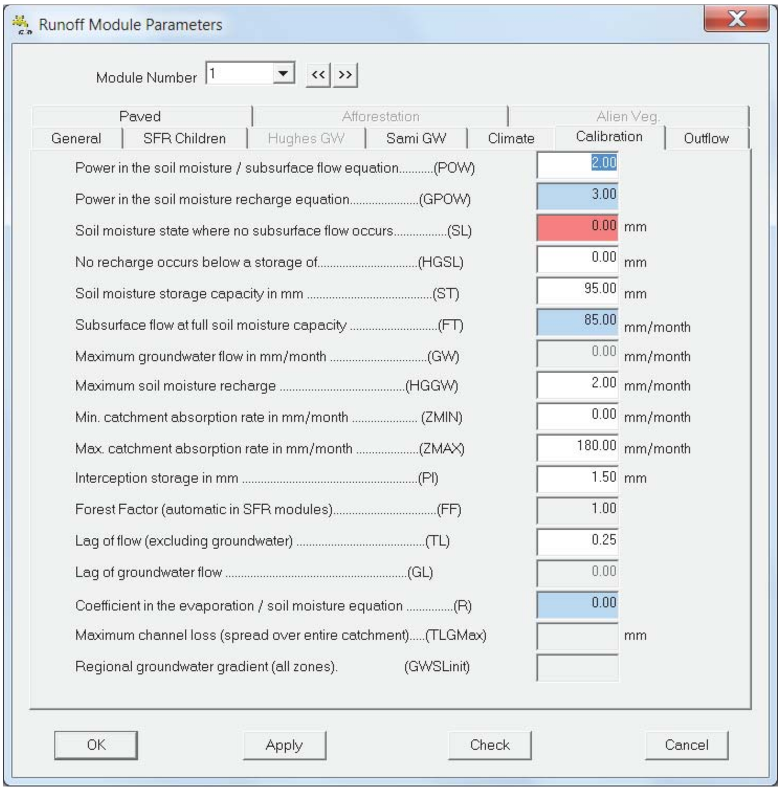


Figure 79: Initial calibration parameters E10H

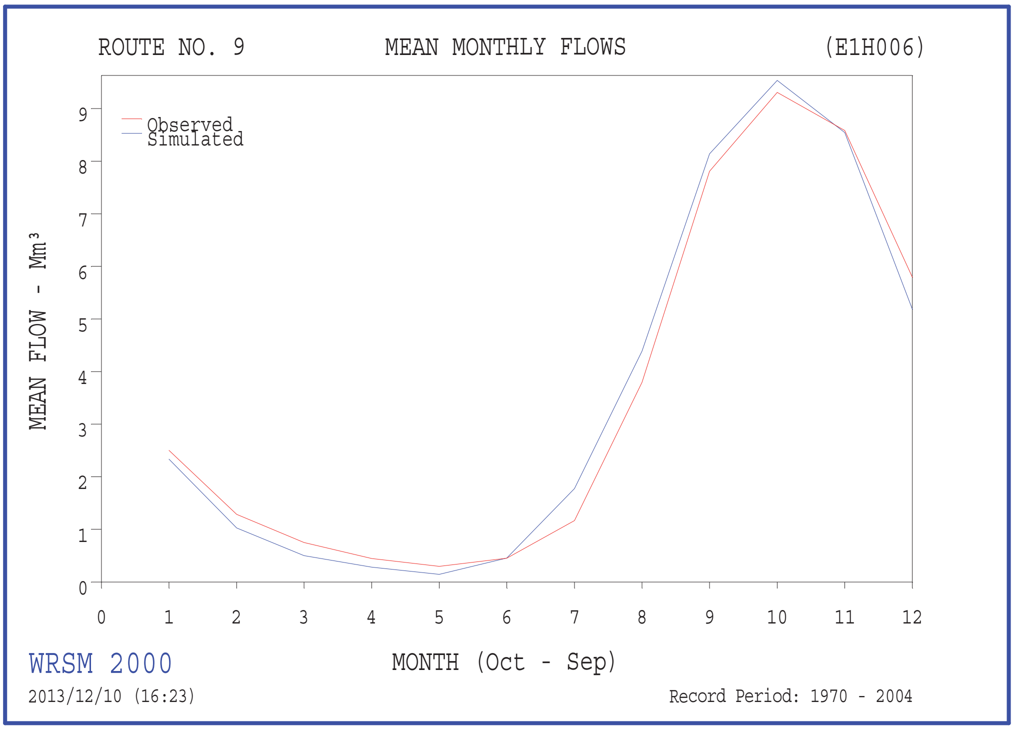


Figure 80: Initial mean monthly flows

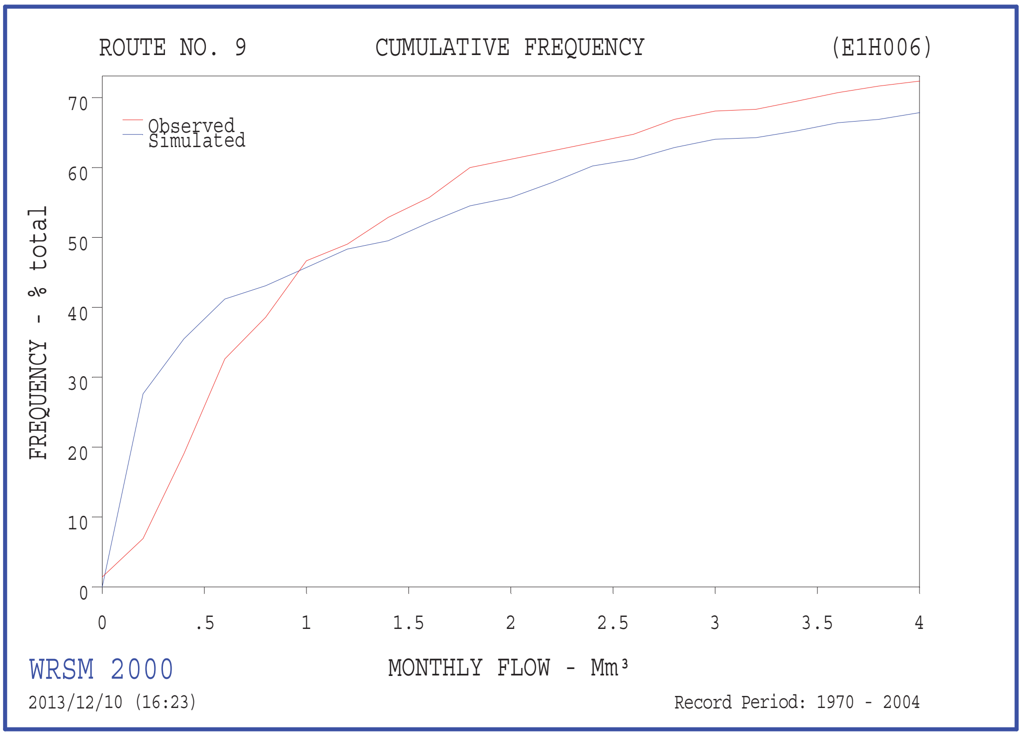


Figure 81: Initial cumulative frequency curve

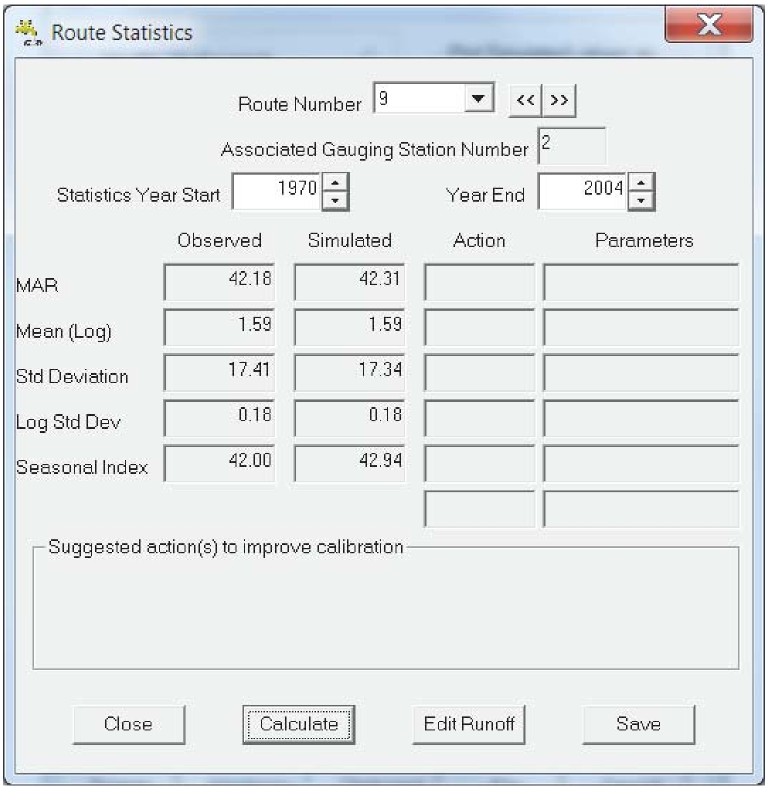


Figure 82: Initial flow statistics

The flowing was undertaken for calibration

- new default parameters included in WR2012 were included (Appendix 1);

- the maximum groundwater discharge rate was increased to 6 and the static water level increased from the default of 70 in Appendix 1 to 80 to reduce the duration of groundwater baseflow;
- The groundwater evaporation area was increased to 3 to reduce groundwater baseflow;
- Transmissivity was increased to 20 to be more representative of TMG aquifers;
- GPOW and POW were reduced to 1.5 and HGGW increased to 10 to make recharge comparable to the figures in GRAII2, (Appendix 2) and to allow recharge during drier periods, as is presumed to occur in TMG aquifers with little soil cover;
- HGSL was increased slightly to 5;
- FT was reduced to 65 to reduce interflow;
- ST was reduced to 80 to increase high flows and
- ZMIN was slightly altered to 5 to adjust the mean monthly flow graph.

The results are shown in Figures 74-77. Dry season low flows and the very low flow frequencies were improved, although higher low flows may still be too high. However, the monthly flow histogram (Figure 86) indicates the very low flows and higher low flows are adequately simulated and reducing interflow will impact on these. Reducing these higher flows will probably involve further calibration of ZMIN and ZMAX and the TL lag parameter.

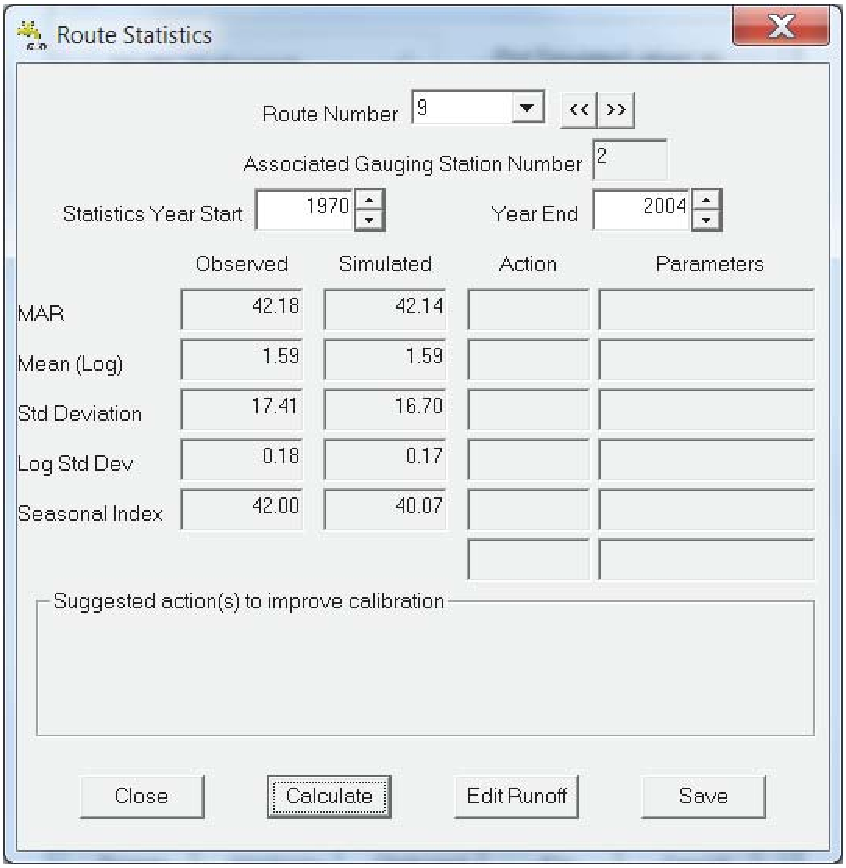


Figure 83: Final flow statistics

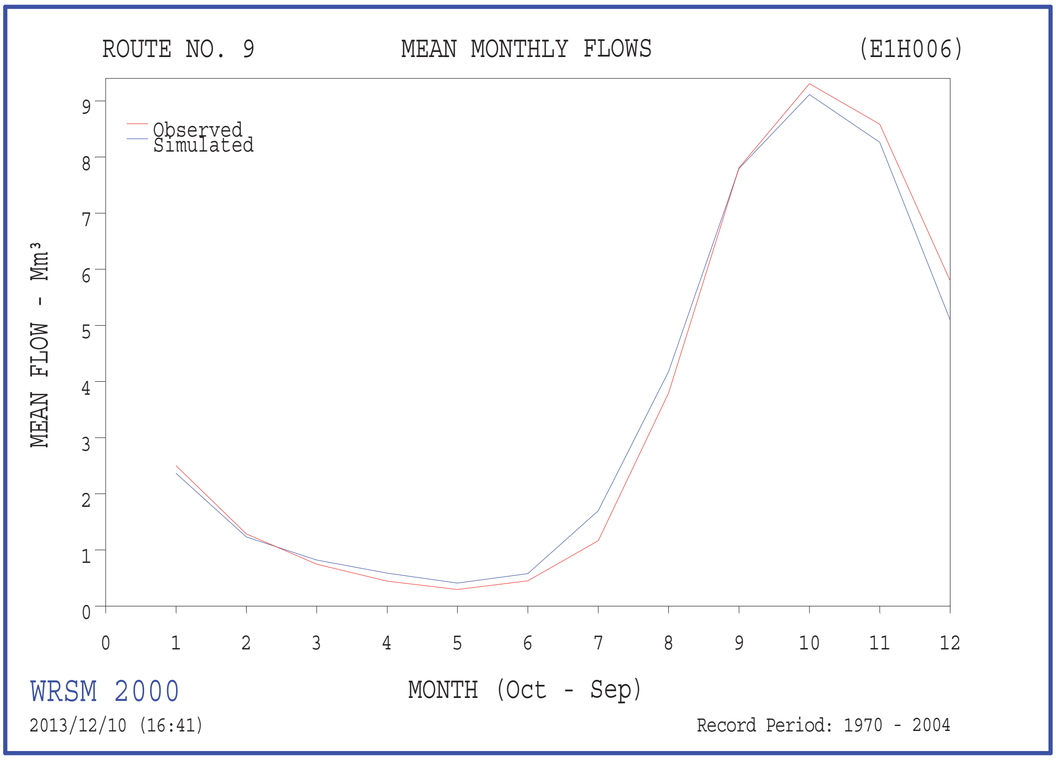


Figure 84: Final mean monthly flows

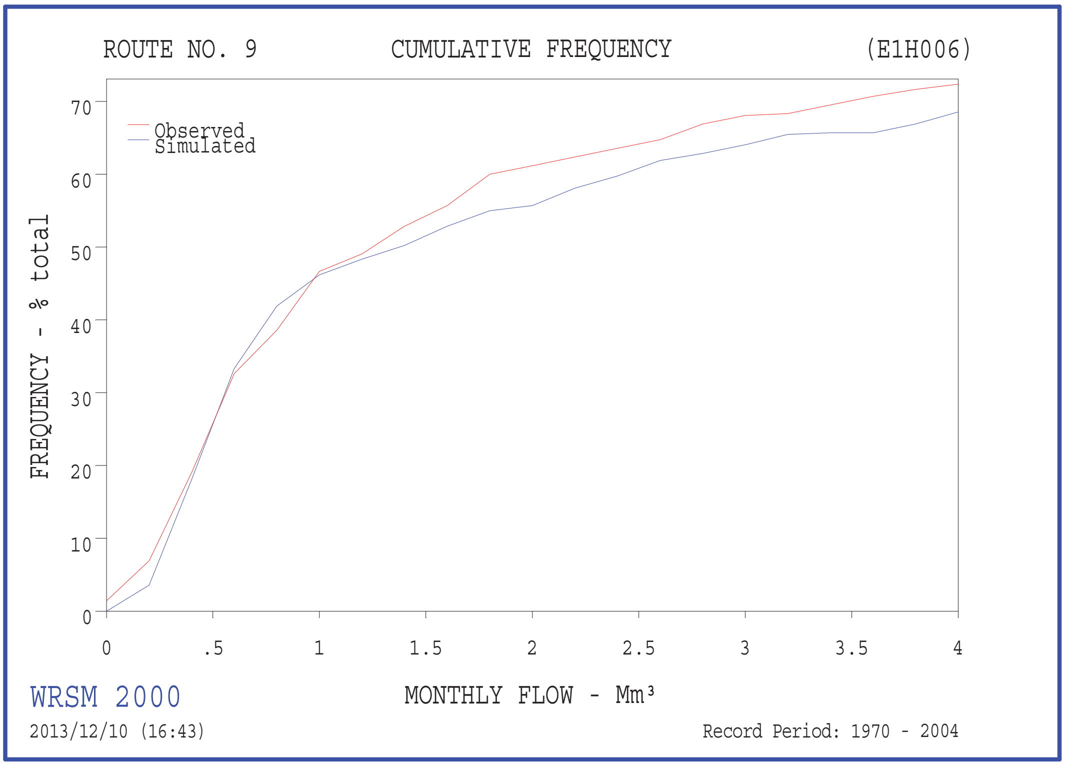


Figure 85: Final cumulative frequency curve

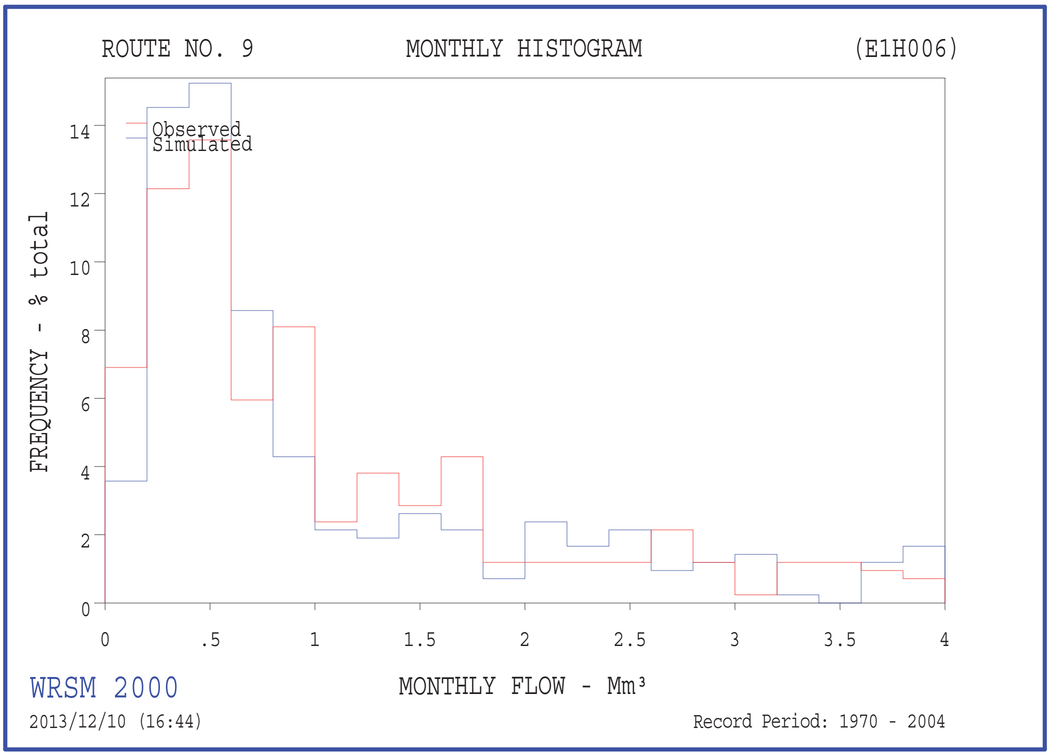


Figure 86: Final monthly flow histogram

5.5. Verification studies – Dolomites with heavy groundwater abstraction C24C

The dolomitic compartment drained by the Schoonspruit eye is 1585 km^2 in area and has been heavily utilised since the 1980s, to the extent that flow from the eye has been significantly depleted, which affects inflows into downstream dams supporting Rustenburg. Irrigation reached a peak abstraction of 41 Mm^3/a before declining to 36 Mm^3/a due to over abstraction. There is no surface drainage from the quaternary and the only discharge is via drainage from the eye. It has been monitored since 1970.

Since there is no surface runoff, the quaternary was not set up in WR2005. The quaternary was set up as one runoff unit with an MAP of 587 mm/a, using the default parameters in Appendix 1, and WRSM/Pitman model parameters in WR90 (Figures 87 and 88).

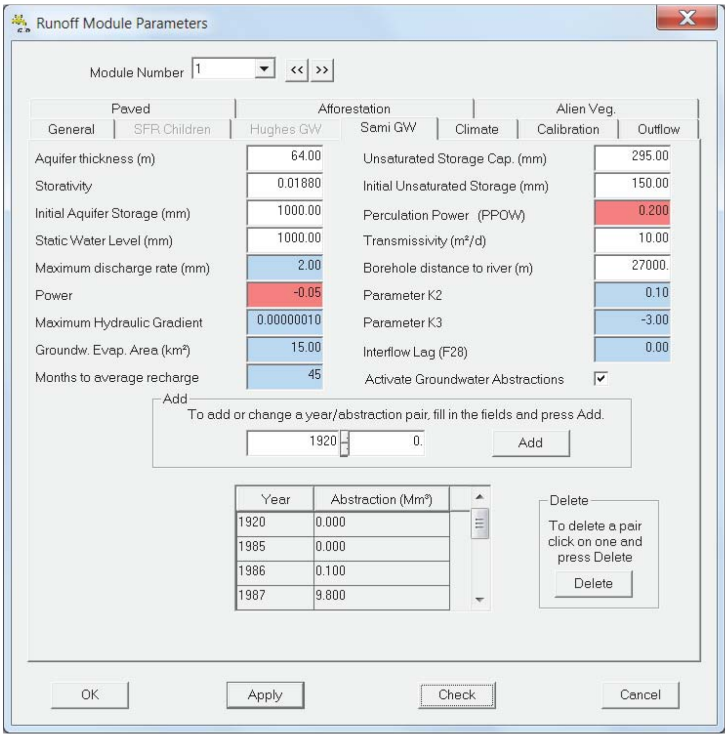


Figure 87: set up for Schoonspruit eye

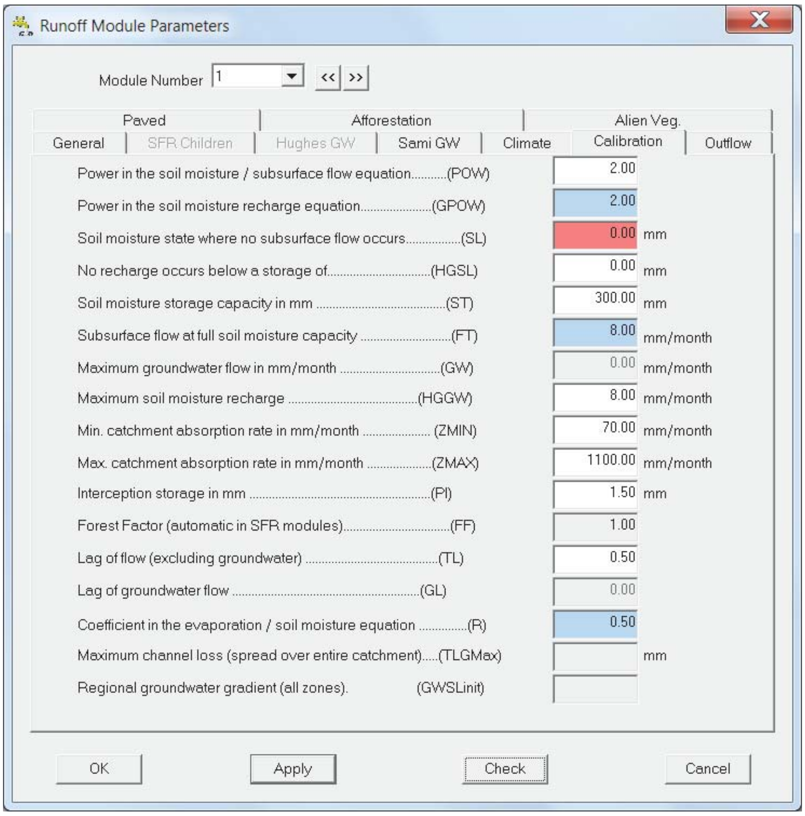


Figure 88: Parameters for Schoonspruit eye

The hydrograph shows a very poor fit (Figure 89). Since there is no interflow in the catchment and all flow is from the dolomitic compartment, FT should be set to zero (Figure 90).

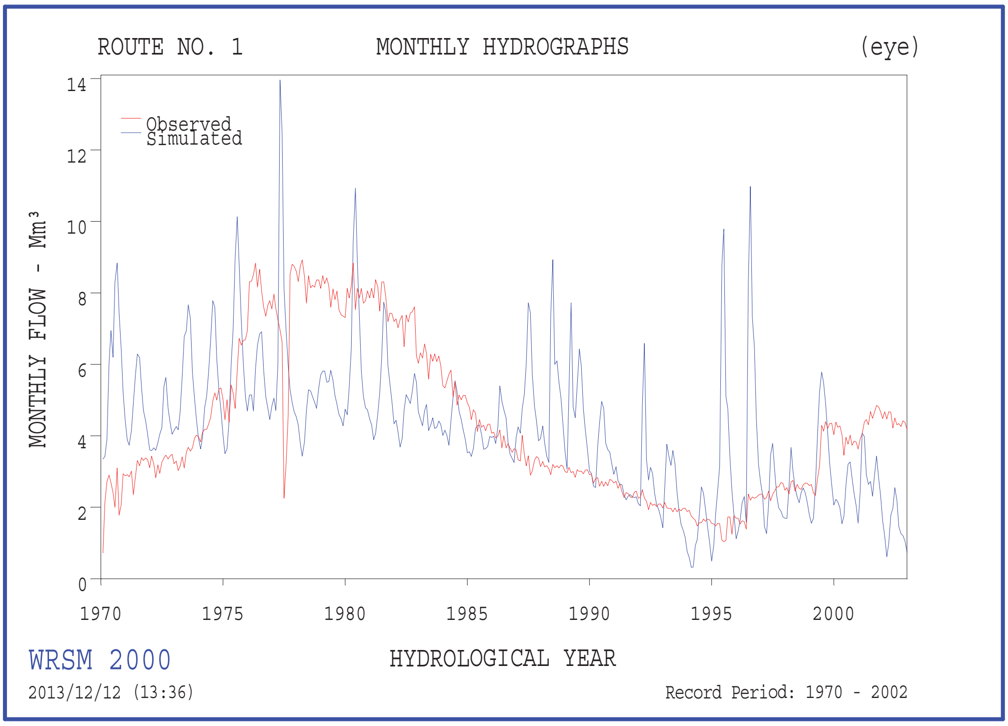


Figure 89: Simulation of Schoonspruit eye using defaults

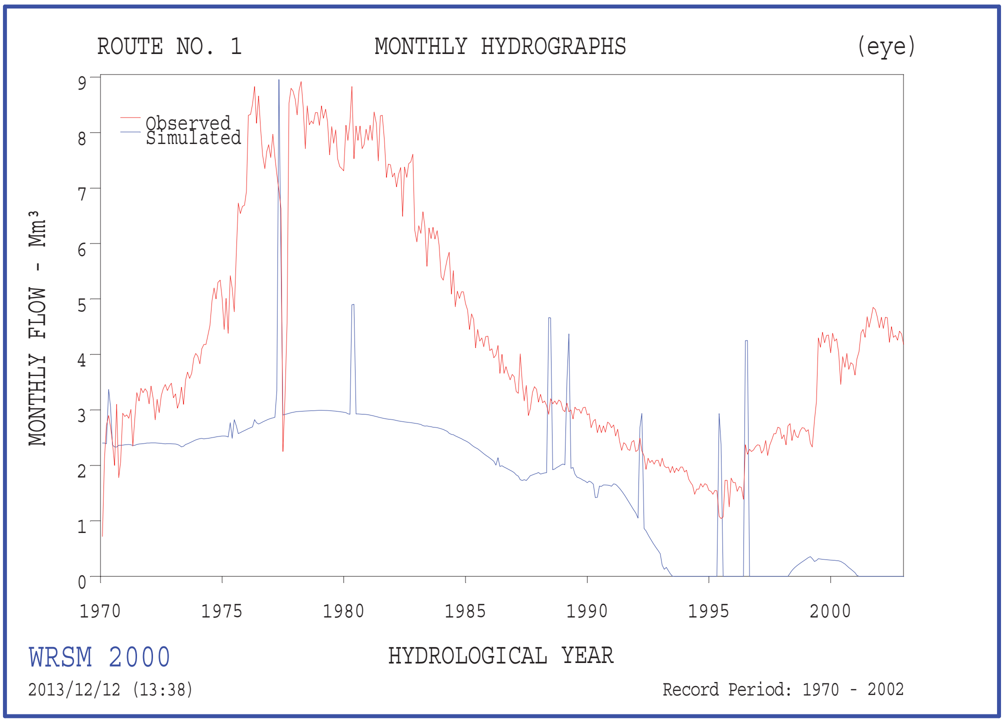


Figure 90: Default simulation of Schoonspruit eye by making FT=0

The following can be noted:

- Recharge is insufficient hence HGGW must be increased and
- Groundwater baseflow cannot meet the peak discharges, hence the maximum groundwater discharge must be significantly increased.

HGGW was increased to 27 and the maximum groundwater discharge to 12 (Figure 91). Although the baseflow trend is more correct, recharge volumes are too high compared to flow volumes and to flow at the eye. Recharge volumes need to be proportionally reduced to greater extent in the dry periods to stop getting increases in flow during dry periods, hence HGSL was increased to 50 and ZMIN and ZAX adjusted to 220 and 1200 to eliminate small peaks (Figure 92).

Recharge needs to be redistributed to have less peaks in wet periods and more recharge in dry seasons, hence GPOW was reduced to 1.25. ST also needs to be increased to eliminate short duration high peaks, hence it was increased to 450. Increasing ST requires increasing HGSL to maintain the correct volume of baseflow, which required HGSL to be raised to 145. The duration of peaks was also insufficient and they had to lagged, hence the months to average recharge was increased from 45 to 108, and the unsaturated storage increased to 800 to eliminate existing peaks that occur during large recharge events (figure 93). Other calibration undertaken included setting the transmissivity to a more realistic 100 m^2/d for dolomites and increasing the static water level to 1100 to improve the fit of the cumulative frequency curve and fit statistics (Figures 94 and 95).

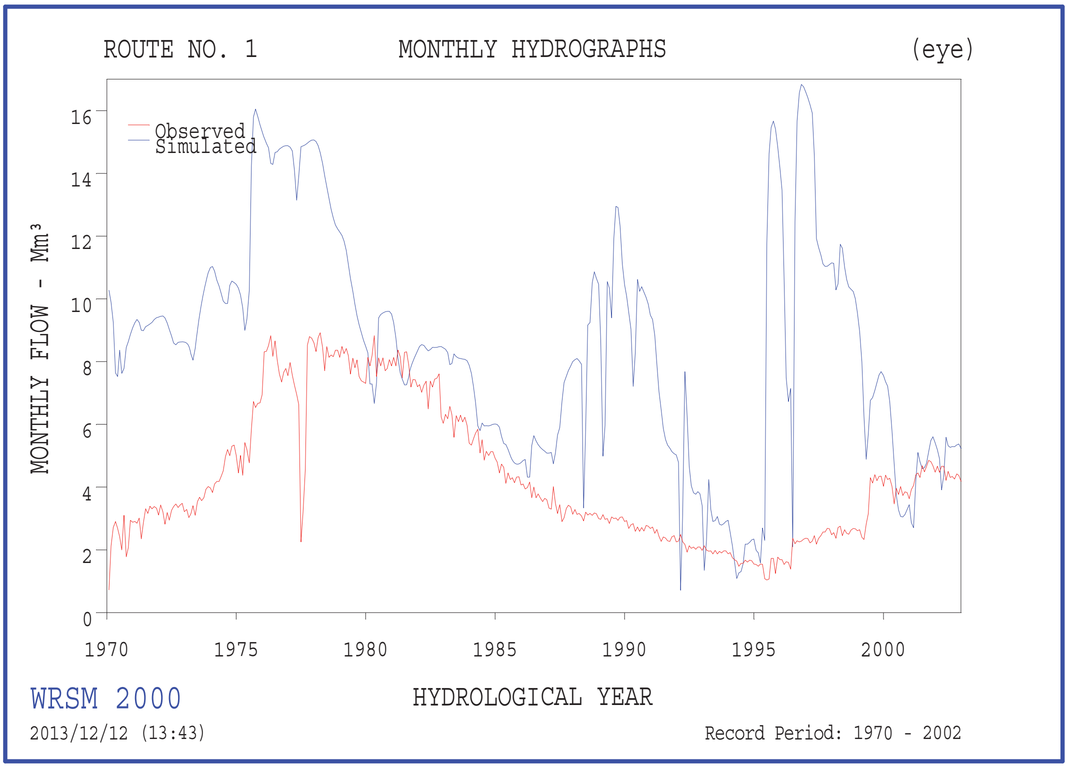


Figure 91: Schoonspruit eye with increased recharge

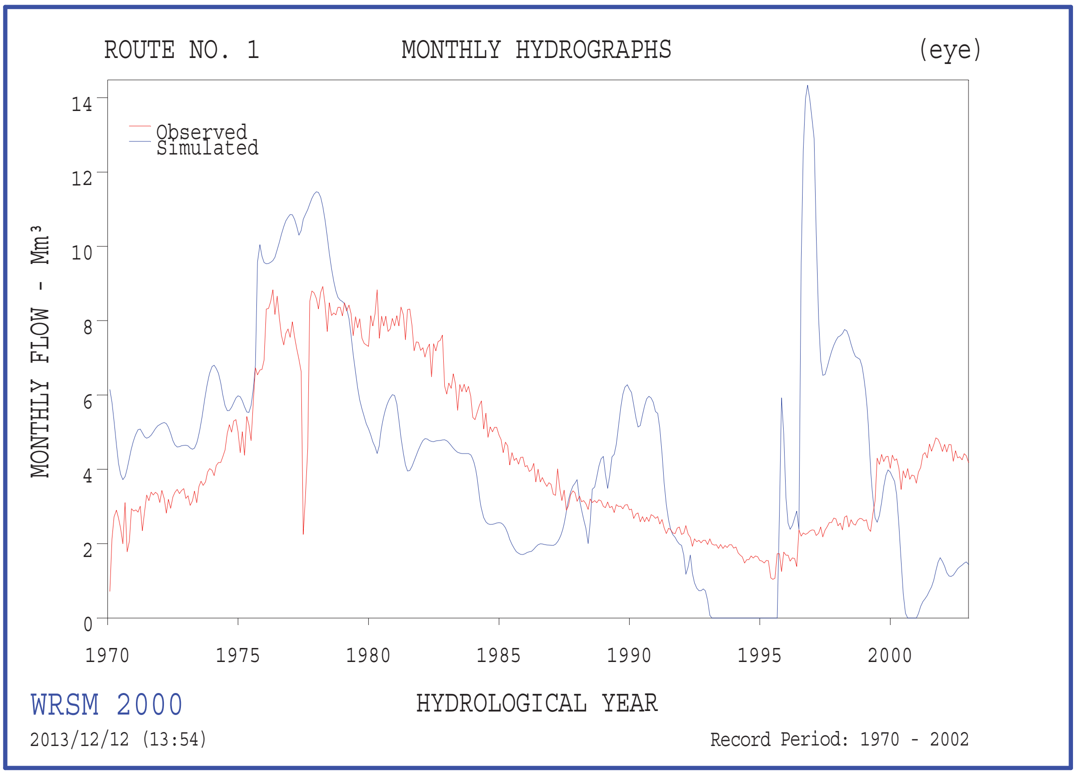


Figure 92: Schoonspruit eye by decreasing HGSL

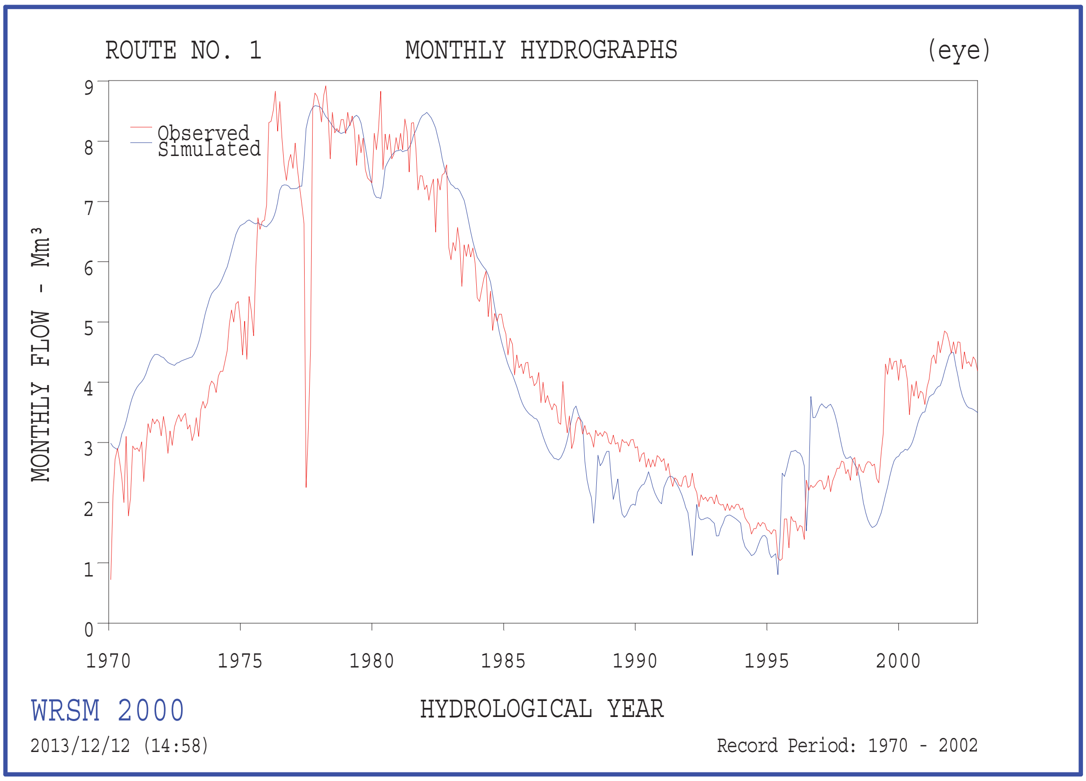


Figure 93: Final calibration of Schoonsrpuit eye

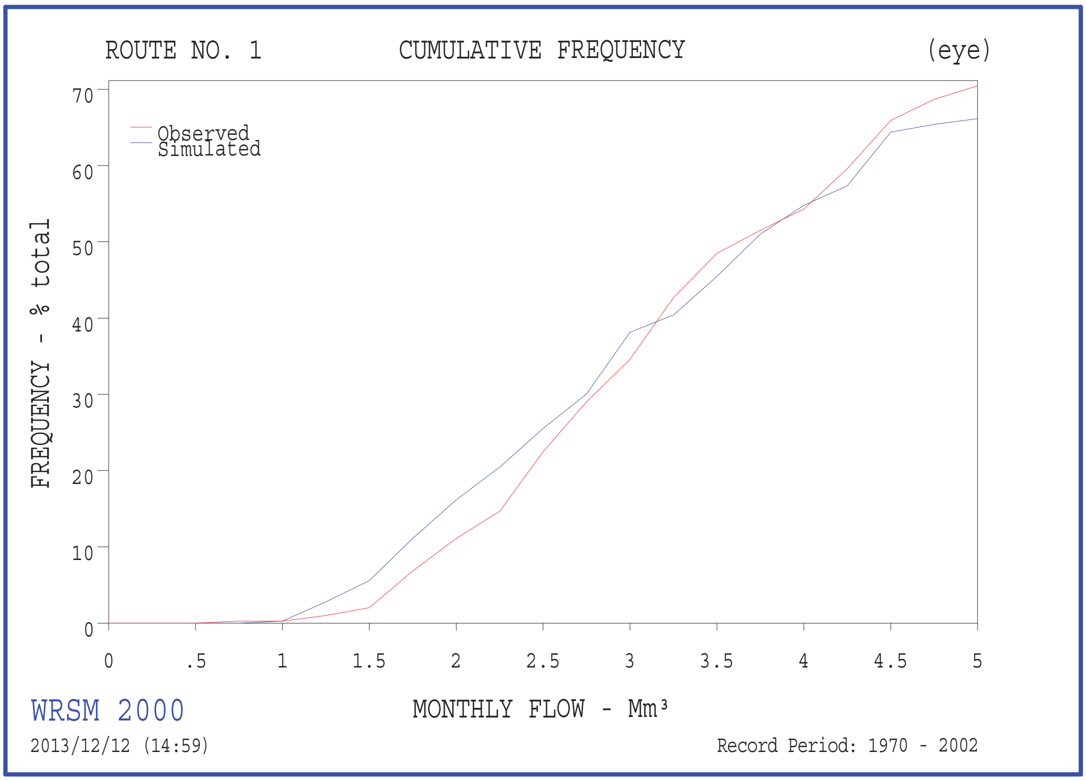


Figure 94: Schoonspruit cumulative frequency curve

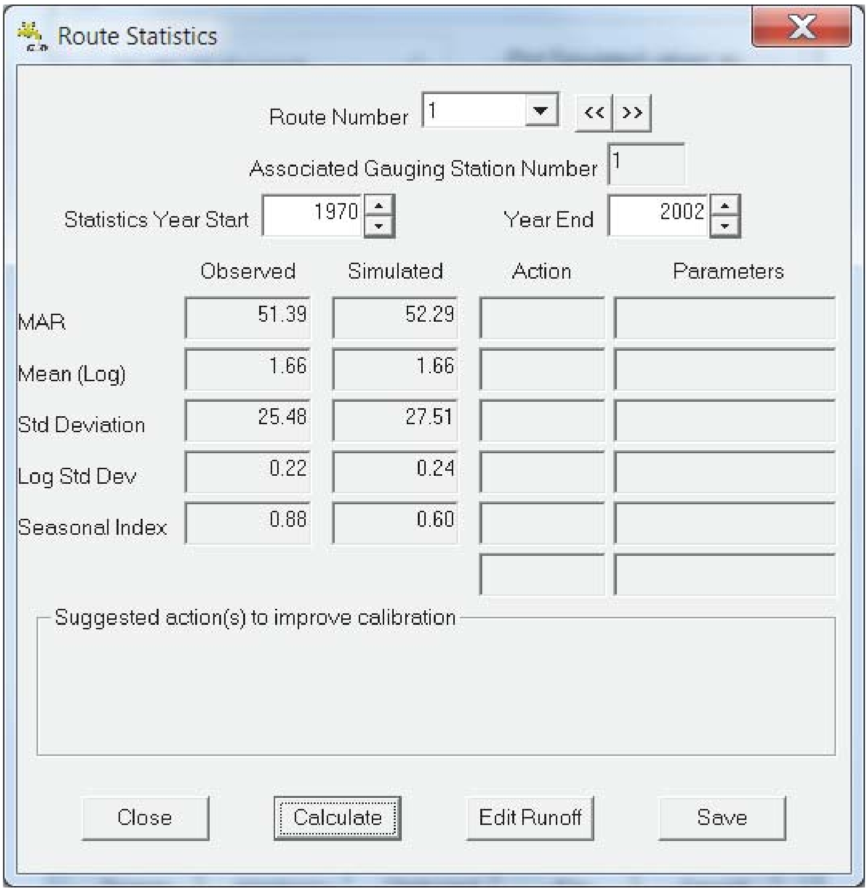


Figure 95: Schoonspruit fit statistics

5.6. Other Verification studies

The other 85 quaternaries simulated using the default setups in WR2005, except that groundwater abstraction data from GRAII was included. The catchments are shown in Table 10, the final parameter sets are shown in Table 11, the calibration results in Appendix 3, and comparisons against other data in Table 12. These set ups can be used as a starting point for simulations in other catchments of similar geology and topography. In some cases the MAR may be too high due to an over simulation of peaks. No attempt was made to verify the capacity of the gauges in terms of ability to gauge high flows, or to calibrate high flows since the study focussed on simulating baseflow from the Sami module. Further calibration of ZMIN, ZMAX and ST may be necessary to calibrate peaks.

Table 8: Basic information of verification study catchments

		Basic Information				Gauge
Setup	Quaternary Catchment					
		Catchment area				
		Gross	Net	Net	MAP	
		(km^2)	(km^2)	Combined	(mm)	
1	D51A	797	797	797	312	D5H011
	D51B	873	873	873	240	D5H011
2	E22A	750	750		251	E5H002
	E22B	638	638		248	E5H002
	E22D	496	496		226	E5H002
	E22E	1013	1013	2897	212	E5H002
	E22F	400	400	400	163	E5H002
	E22c	490	490	490	324	E5H002
	E21L	195	195	195	216	E5H002
3	*E40A*	941	941	***941***	236	E2H003
	E40B	707	707	468	241	E2H003
	E40C	530	530	530	285	E2H003
	E40D	544	544	544	284	E2H003
	E24G	633	633	633	174	E2H003
	E24H	483	483	483	190	E2H003
	E24K	652	652	652	238	E2H003
	E24J	1078	1078	1078	247	E2H003
	E24L	516	516	516	291	E2H003
	E24M	529	529	*529*	265	E2H003
4	J11A	438	438	438	295	J1R003
	J11B	738	738	738	252	J1R003
	J11C	292	292	292	204	J1R003
	J11D	801	801	801	240	J1R003
	J11E	812	812	812	188	J1R003
	J11F	344	344	344	209	J1R003
	J11G	604	604	604	167	J1R003
5	J23E	225	225	225	329	J2R003

		Basic Information				Gauge
Setup	Quaternary Catchment					
		Catchment area				
		Gross	Net	Net	MAP	
		(km^2)	(km^2)	Combined	(mm)	
6	E10H	162	162	162	495	E1H006
7	*G30B*	658	658	658	394	G3H001
8	G10A	172	172	172	1610	G1H003
9	G10B	126	126	126	1306	G1H020
	G10C	328	328	328	877	G1H020
10	G40C	145	145	145	1244	G4H005
11	G40D	327	327	327	899	G4H007
12	E21A	190	190	190	620	No gauge
	E21B	223	223	223	497	No gauge
	E21C	233	233	233	467	No gauge
	E21D	242	242	242	627	No gauge
	E21E	293	293	672	360	No gauge
	E21F	379	379		289	No gauge
	E21G	266	266	266	475	No gauge
	E21H	404	404	404	429	No gauge
	E21J	317	317	317	338	No gauge
	E21K	330	330	330	352	No gauge
13	G50G	380	380	380	393	G5H008
15	H10A	234	234	234	734.0	H11H003
	H10B	162	162	162	734.0	H1H003
14	H10Ca	53	53	53	1064.0	H1H003 H1H013
15	H10Cb	234	234	234	1064.0	H1H003
	H10D	97	97	97	2000.0	H1H006
16	H60A	73	73	73	2141	H6H008
17	H60B	210	210	210	1241	H6H007
18	H60C	217	217	217	994	H6R001
19	H60D	227	227	227	652	H6H009
	H60E	170	170	170	640	H6H009
	H60F	165	165	165	582	H6H009
	H60G	141	141	141	475	H6H009
	H60H	253	253	253	464	H6H009
	H60J	293	293	293	457	H6H009
	H60K	262	262	262	371	H6H009
20	H40A	184	184	184	426	H4R002
	H40B	241	241	241	578	H4R002
21	K10C	159	159	159	493	K1H004
	K10D	164	164	164	454	K1H004
22	K10E	133	133	133	679	K1H005
	K10F	106	106	106	502	K1H005

		Basic Information				Gauge
Setup	Quaternary Catchment					
		Catchment area				
		Gross	Net	Net	MAP	
		(km^2)	(km^2)	Combined	(mm)	
23	*K40B*	*112*	112	112	846	K4H001
24	A91A	232	232	232	696	A9R001
	A91B	275	275	275	620	A9R001
27	A91C & F1	830	374	374	866	A9H001
30	A91F		456	456	662	A9H001
	Total A91C & F		830	830		
25	A91D1	132	47	47	1287	A9H007
26	A91D3		16	16		A9H006
27	A91D2 & D4		69	69		A9H006
	Total A91D		132	132		A9H006
30	A91E	223	223	223	1078	
28	A91G1 & 2	406	107	107	950	A9H002
29	A91G3		62	62		A9H003
30	A91G4 & 5		237	237		
	Total A91G		406	406		
30	A91H1	450	175	175	722	A9H012
30	A91H2		275	275		A9H012
	Total A91H		450	450		
31	A92A	329	329	329	831	A9H004

Table 9: Parameters of verification study catchments

QUAT	WRSM/PITMAN MODEL PARAMETERS POW	SL (mm)	ST (mm)	FT (mm/m)	ZMIN (mm/m)	ZMAX (mm/m)	TL (mon-ths)	SAMI MODEL PARAMETERS GPOW	HGSL	HGGW	Aquifer Thick-ness (m)	Stora-tivity	Initial aquifer storage (mm)	Static water level (mm)	Static water level % of Capac-ity	Max-imum Dis-charge rate (mm/m)	Power	Maximum hydraulic gradient	Gw evap area km2	GW evap. area (%)	Months average Re-charge (mon-ths)	Unsat. storage capacity (mm)	Initial unsat. storage (mm)	Percol-ation power	Trans-Miss-ivity	Bore-hole Dist-ance to river (m)	Param-eter K2	Param-eter K3	Inter-flow lag (mon-ths)	GW Abstrac-tion Mm3/a
D51A	2.00	5	100	0	25	450	0.00	2.0	5	4.00	37.00	0.0020	65	70.0	94.6	0.5	-0.05	0.001	32	4.02	12	12	2	0.2	5	1000	0.1	-3	0	0.11
D51B	2.00	5	100	0	25	450	0.00	2.0	5	4.00	36.00	0.0020	65	70.0	97.2	0.5	-0.05	0.001	42	4.81	12	12	2	0.2	5	1000	0.1	-3	0	0.03
E22A E22B E22D E22E	2.00	10	150	2	15	300	0.25	2.0	10	4.00	60.00	0.0015	70	80.0	88.9	0.5	-0.05	0.001	88	3.04	15	14	3	0.2	10	1000	0.1	-3	0	0.19
E22F	2.00	10	150	2	15	300	0.25	2.0	10	3.00	66.00	0.0130	80	85.0	9.9	0.5	-0.05	0.001	16	4.00	60	15	2	0.2	10	1000	0.1	-3	0	0.012
E22c	2.00	10	150	2	15	300	0.25	2.0	10	4.00	70.00	0.0020	70	70.0	50.0	0.5	-0.05	0.001	15	3.06	11	16	4	0.2	10	1000	0.1	-3	0	0.21
E21L	2.00	10	150	2	15	300	0.25	2.0	10	3.00	70.00	0.0014	90	95.0	96.9	0.5	-0.05	0.001	8	4.10	36	18	2	0.2	10	1000	0.1	-3	0	0.004
E40A E40B	***2.00***	***5***	***100***	***0***	***15***	***350***	***0.25***	***2.0***	***5***	***6***	***48***	***0.0018***	***70***	***75***	86.8	***0.5***	***-0.05***	***0.001***	***50***	5.31	***12***	***12***	***2***	***0.2***	***10***	***1000***	***0.1***	***-3***	***0***	***2.650***
E40C E40D	2.00	***5***	***100***	***0***	***15***	***350***	***0.25***	***2.0***	***5***	***6***	***35***	***0.0012***	***30***	***35***	83.3	***0.5***	***-0.05***	***0.001***	***21***	3.96	***14***	***13***	***2***	***0.2***	***10***	***1000***	***0.1***	***-3***	***0***	***0.095***
E24G **E24H** **E24K**	2.00	5	100	0	0	350	0.25	2.0	5	3	70	0.0014	65	65	66.3	1.0	-0.05	0.001	35	5.53	15	17	2	0.2	10	1000	0.1	-3	0	0.008
E24J	2.00	5	100	0	0	350	0.25	2.0	5	5.00	73.00	0.0016	80	80.0	68.5	1	-0.05	0.001	21	1.95	15	16	5	0.2	10	1000	0.1	-3	0	1.46
E24L	2.00	5	100	10	0	350	0.25	2.0	5	6.00	75.00	0.0016	70	70.0	58.3	1	-0.05	0.001	10	1.94	8	17	5	0.2	10	1000	0.1	-3	0	2.43
E24M	***2.00***	***5***	***100***	***0***	***15***	***350***	***0.25***	***2.0***	***5***	***4.00***	***74.00***	***0.0014***	***80***	***80.0***	77.2	***1***	***-5***	***0.001***	***11***	2.08	***20***	***18***	***6.00***	***0.2***	***10***	***1000***	***0.1***	***-3***	***0***	*0.004*

	WRSM/PITMAN MODEL PARAMETERS							SAMI MODEL PARAMETERS																						
QUAT	POW	SL (mm)	ST (mm)	FT (mm/m)	ZMIN (mm/m)	ZMAX (mm/m)	TL (mon-ths)	GPOW	HGSL	HGGW	Aquifer Thick-ness (m)	Stora-tivity	Initial aquifer storage (mm)	Static water level (mm)	Static water level % of Capac-ity	Max-imum Dis-charge rate (mm/m)	Power	Maximum hydraulic gradient	Gw evap area km2	GW evap. area (%)	Months average Re-charge (mon-ths)	Unsat. storage capacity (mm)	Initial unsat. storage (mm)	Percol-ation power	Trans-Miss-ivity	Bore-hole Dist-ance to river (m)	Param-eter K2	Param-eter K3	Inter-flow lag (mon-ths)	GW Abstrac-tion Mm3/a
J11A	2.00	5.00	100	0	15	300	0.25	1.5	5	6.00	45.00	0.0036	140	140.0	86.4	1	-0.05	0.001	9	2.05	12	22	6	0.2	10	1000	0.1	-3	0	0.006
J11B	2.00	5.00	100	0	15	300	0.25	1.5	5	6.00	44.00	0.0035	130	135.0	87.7	1	-0.05	0.001	15	2.03	12	23	7	0.2	10	1000	0.1	-3	0	0.03
J11C	2.00	5.00	100	0	15	300	0.25	1.5	5	6.00	43.00	0.0031	120	120.0	90.0	1	-0.05	0.001	6	2.05	12	26	7	0.2	10	1000	0.1	-3	0	0.009
J11D	2.00	5.00	100	0	15	300	0.25	1.5	5	6.00	46.00	0.0036	140	150.0	90.6	1	-0.05	0.001	16	2.00	12	22	5	0.2	10	1000	0.1	-3	0	9.3
J11E	2.00	5.00	100	0	5	300	0.25	2.0	5	4.00	47.00	0.0035	145	155.0	94.2	0.5	-0.05	0.001	24	2.96	12	22	2	0.2	10	1000	0.1	-3	0	0.62
J11F	2.00	5.00	100	0	5	300	0.25	2.0	5	4.00	51.00	0.0032	145	155.0	95.0	0.5	-0.05	0.001	10.5	3.05	12	25	2	0.2	10	1000	0.1	-3	0	1.17
J11G	2.00	5.00	100	0	5	300	0.25	2.0	5	4.00	43.00	0.0030	110	120.0	93.0	0.5	-0.05	0.001	18	2.98	12	26	2	0.2	10	1000	0.1	-3	0	0.015
J23E	1.50	5	100	8	5	250	0.00	1.5	5	6.00	67.00	0.0016	95	95.0	88.6	3	-0.05	0.001	9	4.00	6	9	7	0.2	10	500	0.1	-3	0	2.43
E10H	1.50	5	80	65	5	180	0.25	1.5	5	10.00	62.00	0.0020	80	80.0	64.5	6	-0.05	0.001	3	1.85	2	12	6	0.2	20	500	0.1	-3	0	1.04
G30B	***2.00***	***10***	***220***	***5***	***90***	***340***	***0.25***	***2.0***	***5***	***5.00***	***40.00***	***0.0008***	***27***	***27.0***	84.4	***4***	***-0.05***	***0.001***	***19.5***	2.96	***3***	***7***	***2.00***	0.2	10	***1000***	***0.1***	***-3***	***0***	*1.5*
G10A	1.50	20	400	20	50	450	0.25	1.5	20	12.00	45.00	0.0022	70	70.0	70.7	5	-0.05	0.001	3.5	2.03	1	14	7	0.2	10	500	0.1	-3	1	0.03
G10B	1.50	10	250	30	0	350	0.00	1.5	10	15.00	46.00	0.0022	20	20.0	19.8	5	-0.05	0.001	1.25	0.99	1	16	8	0.2	10	500	0.1	-3	0	0.02
G10C	1.50	10	225	15	60	350	0.15	1.5	10	15.00	41.00	0.0012	10	10.0	20.3	3	-0.05	0.001	3.25	0.99	1	16	6	0.2	10	500	0.1	-3	0	0.58
G40C	1.50	0	160	60	0	225	0.40	1.5	0	10.00	52.00	0.0020	40	40.0	38.5	2	-0.05	0.001	1.45	1.00	1	50	20	0.2	10	500	0.1	-3	0	0.023
G40D	1.50	0	160	60	0	225	0.00	1.5	0	10.00	52.00	0.0021	80	80.0	73.3	8	-0.05	0.001	3.27	1.00	1	50	20	0.2	10	500	0.1	-3	1	0.006
E21A	2.00	10	250	20	0	350	0.25	2.0	10	4.00	78.00	0.0020	85	85.0	54.5	2	-0.05	0.001	4	2.11	2	15	4	0.2	10	1000	0.1	-3	0	
E21B	2.00	10	250	18	0	350	0.25	2.0	10	4.00	75.00	0.0020	76	76.0	50.7	2	-0.05	0.001	4.5	2.02	3	15	4	0.2	10	1000	0.1	-3	0	
E21C	***2.00***	***10***	***250***	***18***	***0***	350	***0.25***	***2.0***	***10***	***4.00***	***73.00***	***0.0020***	***77***	***77.0***	52.7	***2***	***-0.05***	***0.001***	***4.6***	1.97	***2***	***15***	***4.00***	0.2	10	***1000***	0.1	-3	0	
E21D	2.00	10	250	20	0	350	0.25	2.0	10	4.00	75.00	0.0020	87	87.0	58.0	2	-0.05	0.001	4.5	1.86	2	15	4	0.2	10	1000	0.1	-3	0	
E21E	2.00	10.00	250.00	18.00	0.00	350	0.25	2.00	10.00	4.00	74.00	0.00	78.00	78.00	52.7	2.00	-0.05	0.001	13.00	1.93	4.00	15.00	4.00	0.20	10.00	1000.00	0.10	-3.00	0.00	
E21F						350											-0.05	0.001												

QUAT	WRSM/PITMAN MODEL PARAMETERS							SAMI MODEL PARAMETERS																						
													Initial	Static	Static	Max-imum		Maximum	Gw	GW	Months	Unsat.	Initial			Bore-hole				GW
											Aquifer		aquifer	water	water	Dis-charge		hydraulic	evap	evap.	average	storage	unsat.	Percol-ation	Trans-	Dist-ance	Param-eter	Param-eter	Inter-flow	Abstrac-tion
QUAT	POW	SL	ST	FT	ZMIN	ZMAX	TL	GPOW	HGSL	HGGW	Thick-ness	Stora-tivity	storage	level	level	rate	Power	gradient	area	area	Re-charge	capacity	storage	power	Miss-ivity	to river	K2	K3	lag	
		(mm)	(mm)	(mm/m)	(mm/m)	(mm/m)	(mon-ths)				(m)		(mm)	(mm)	% of Capac-ity	(mm/m)			km2	(%)	(mon-ths)	(mm)	(mm)			(m)			(mon-ths)	Mm3/a
E21G	2.00	10	250	20	0	350	0.25	2.0	10	4.00	78.00	0.0020	89	89.0	57.1	2	-0.05	0.001	5	1.88	2	15	4	0.2	10	1000	0.1	-3	0	
E21H	2.00	10	250	20	0	350	0.25	2.0	10	6.00	66.00	0.0020	69	69.0	52.3	3	-0.05	0.001	8	1.98	2	15	4	0.2	10	1000	0.1	-3	0	
E21J	2.00	10	250	20	0	350	0.25	2.0	10	6.00	62.00	0.0020	60	60.0	48.4	5	-0.05	0.001	6	1.89	6	15	4	0.2	10	1000	0.1	-3	0	
E21K	2.00	10	250	20	0	350	0.25	2.0	10	6.00	69.00	0.0020	69	69.0	50.0	5	-0.05	0.001	6.6	2.00	5	15	4	0.2	10	1000	0.1	-3	0	
G50G	2.00	30	250	0	60	280	0.25	2.0	30	3.00	44.00	0.0030	125	125.0	94.7	1	-0.05	0.001	57	15.00	12	27	10	0.2	10	1000	0.1	-3	0	0.012
H10A	1.50	10	350	20	0	450	0.00	1.5	10	6.00	77.00	0.0017	80	80.0	61.1	5	-0.05	0.001	2.34	1.00	2	12	4	0.2	10	1000	0.1	-3	0	3.3
H10B	1.50	10	350	20	0	450	0.00	1.5	10	6.00	75.00	0.0018	80	80.0	59.3	5	-0.05	0.001	1.63	1.01	1	11	3	0.2	10	1000	0.1	-3	0	4.5
H10Ca	1.50	10	300	20	0	450	0.20	1.5	10	6.00	75.00	0.0017	80	80.0	62.7	5	-0.05	0.001	0.53	1.00	1	13	4	0.2	10	1000	0.1	-3	0	1.5
H10Cb	1.50	10	350	20	0	450	0.00	1.5	10	6.00	75.00	0.0017	80	80.0	62.7	5	-0.05	0.001	2.07	0.88	1	13	4	0.2	10	1000	0.1	-3	0	11.8
H10D	1.50	10	225	80	0	400	0.25	1.5	10	10.00	57.00	0.0018	50	50.0	48.7	5	-0.05	0.001	0.97	1.00	1	12	3	0.2	10	1000	0.1	-3	2	0.003
H60A	***1.00***	***10***	***400***	***50***	***0***	***350***	***0.00***	***1.0***	***10***	***6.00***	***50.00***	***0.0020***	***70***	***70.0***	70.0	***4***	***-0.005***	***0.001***	***0.73***	1.00	***1***	***11***	***4.00***	0.2	10	***1000***	***0.1***	***-3***	***1***	*0.001*
H60B	1.00	10	400	50	0	350	0.10	1.0	10	6.00	52.00	0.0020	60	70.0	67.3	4	-0.05	0.001	2.1	1.00	1	12	4	0.2	10	1000	0.1	-3	0	0.004
H60C	1.50	10	150	50	0	300	0.25	1.5	10	6.00	51.00	0.0019	70	70.0	72.2	3	-0.05	0.001	10	4.61	1	14	4	0.2	10	1000	0.1	-3	0	0.5
H60D	2.00	10	350	20	0	270	0.25	2.0	10	6.00	43.00	0.0029	70	70.0	56.1	3	-0.05	0.001	2.25	0.99	3	27	10	0.2	5	1000	0.1	-3	2	0.001
H60E	2.00	10	350	20	0	270	0.25	2.0	10	6.00	42.00	0.0030	70	70.0	55.6	3	-0.05	0.001	1.7	1.00	3	26	10	0.2	5	1000	0.1	-3	2	0.002
H60F	2.00	10	350	20	0	270	0.25	2.0	10	6.00	42.00	0.0030	70	70.0	55.6	3	-0.05	0.001	1.6	0.97	4	25	10	0.2	5	1000	0.1	-3	2	0.029
H60G	2.00	10	300	15	0	270	0.25	2.0	10	6.00	47.00	0.0030	80	80.0	56.7	3	-0.05	0.001	1.4	0.99	6	24	10	0.2	5	1000	0.1	-3	2	0.001
H60H	2.00	10	350	15	0	270	0.25	2.0	10	6.00	45.00	0.0030	75	75.0	55.6	3	-0.05	0.001	2.5	0.99	7	25	10	0.2	5	1000	0.1	-3	2	0.001
H60J	2.00	10	350	15	0	270	0.25	2.0	10	6.00	44.00	0.0029	70	70.0	54.9	3	-0.05	0.001	3	1.02	7	27	10	0.2	5	1000	0.1	-3	2	0.003
H60K	2.00	10	350	15	0	270	0.25	2.0	10	4.00	46.00	0.0030	75	75.0	54.3	3	-0.05	0.001	2.6	0.99	12	26	10	0.2	5	1000	0.1	-3	2	0.01
H40A	***1.50***	***10***	***400***	***1***	***30***	***500***	***0.25***	***1.5***	***10***	***6.00***	***77.00***	***0.0015***	***50***	***50.0***	43.3	***3***	***-0.05***	***0.001***	***9***	4.89	***5***	***15***	***5.00***	0.2	10	***1000***	***0.1***	***-3***	***1***	*0.004*

QUAT	WRSM/PITMAN MODEL PARAMETERS																													
	POW	SL (mm)	ST (mm)	FT (mm/m)	ZMIN (mm/m)	ZMAX (mm/m)	TL (mon-ths)																							
H40B	2.00	10	400	3	30	625	0.25																							
K10C	2.00	5	125	15	5	275	0.25																							
K10D	2.25	10	200	8	10	325	0.25																							
K10E	2.00	5	125	30	5	280	0.00																							
K10F	2.00	10	200	8	50	300	0.00																							
K40B	***2.00***	***0***	***125***	***25***	***0***	***255***	***0.00***																							
A91A	1.75	20	475	10	50	1000	0.00																							
A91B	2.00	20	425	4	100	1000	0.10																							
A91C & F1	2.00	20	425	4	100	1000	0.50																							
A91F	***2.00***	***20***	***425***	***4***	***50***	***800***	***0.50***																							
Total A91C & F																														
A91D1	2.50	10	800	9	0	800	0.70																							
A91D3	2.50	5	375	6	0	800	0.70																							
A91D2 & D4	2.50	10	400	6	0	800	0.50																							
Total A91D																														
A91E	2.00	20	425	8	100	1000	0.50																							
A91G1 & 2	1.50	5	150	80	25	900	0.40																							
A91G3	1.25	5	350	40	25	800	0.40																							
A91G4 & 5	2.00	15	350	4	50	900	0.40																							
Total																														

QUAT	SAMI MODEL PARAMETERS																						
	GPOW	HGSL	HGGW	Aquifer Thick-ness (m)	Stora-tivity	Initial aquifer storage (mm)	Static water level (mm)	Static water level % of Capac-ity	Max-imum Dis-charge rate (mm/m)	Power	Maximum hydraulic gradient	Gw evap area km2	GW evap. area (%)	Months average Re-charge (mon-ths)	Unsat. storage capacity (mm)	Initial unsat. storage (mm)	Percol-ation power	Trans-Miss-ivity	Bore-hole Dist-ance to river (m)	Param-eter K2	Param-eter K3	Inter-flow lag (mon-ths)	GW Abstrac-tion Mm3/a
H40B	2.0	10	6.00	68.00	0.0015	50	50.0	49.0	3	-0.05	0.001	2.4	1.00	3	15	5	0.2	10	1000	0.1	-3	1	0.8
K10C	2.0	5	5.00	56.00	0.0012	30	30.0	44.6	6	-0.05	0.001	1.6	1.01	5	19	5	0.2	10	1000	0.1	-3	2	0.002
K10D	2.3	10	5.00	20.00	0.0037	50	50.0	67.6	4	-0.05	0.001	4.8	2.93	24	50	10	0.2	10	1000	0.1	-3	2	0.002
K10E	2.0	5	6.00	52.00	0.0013	45	45.0	66.6	6	-0.05	0.001	1.33	1.00	1	17	5	0.2	10	1000	0.1	-3	0	0.002
K10F	2.0	10	8.00	24.00	0.0045	70	70.0	64.8	4	-0.05	0.001	4	3.77	12	53	10	0.2	10	1000	0.1	-3	0	0.002
K40B	***2.0***	***0***	***6.00***	***51.00***	***0.0015***	***27***	***27.0***	35.3	***6***	***-0.05***	***0.001***	***1.12***	1.00	***1***	***15***	***5.00***	0.2	10	***1000***	***0.1***	***-3***	***0***	*0*
A91A	1.8	20	7.00	29.00	0.0040	40	40.0	34.5	4	-0.05	0.001	2.3	0.99	4	30	10	0.2	5	1000	0.1	-3	0	1.5
A91B	2.0	20	7.00	31.00	0.0060	80	80.0	43.0	4	-0.05	0.001	2.7	0.98	12	71	35	0.2	5	1000	0.1	-3	0	2
A91C & F1	2.0	20	10.00	31.00	0.0067	100	100.0	48.1	6	-0.05	0.001	18	4.81	5	71	35	0.2	5	1000	0.1	-3	0	19.8
A91F	***2.0***	***7***	***7.00***	***34.00***	***0.0078***	***120***	***120.0***	45.2	***4***	-0.05	0.001	***22***	4.82	***12***	***70***	***35.00***	0.2	5	1000	0.1	-3	0	*1.5*
Total A91C & F										-0.05	0.001		0.00				0.2	5	1000	0.1	-3	0	
A91D1	2.5	10	16.00	29.00	0.0033	70	70.0	73.1	10	-0.05	0.001	4.7	10.00	1	31	10	0.2	5	1000	0.1	-3	2	4
A91D3	2.5	5	16.00	29.00	0.0033	60	60.0	62.7	10	-0.05	0.001	1.6	10.00	2	31	18	0.2	5	1000	0.1	-3	0	4
A91D2 & D4	2.5	10	16.00	29.00	0.0033	60	60.0	62.7	10	-0.05	0.001	7	10.14	2	31	10	0.2	5	1000	0.1	-3	1	1.7
Total A91D								!		-0.05	0.001		0.00				0.2	5	1000	0.1	-3	0	
A91E	2.0	20	10.00	29.00	0.0080	130	130.0	56.0	5	-0.05	0.001	22	9.87	3	67	33	0.2	5	1000	0.1	-3	1	0.45
A91G1 & 2	1.5	5	12.00	26.00	0.0042	60	60.0	54.9	8	-0.05	0.001	10	9.35	2	32	16	0.2	5	1000	0.1	-3	0	1
A91G3	1.3	5	16.00	26.00	0.0042	95	95.0	87.0	10	-0.05	0.001	6	9.68	1	32	16	0.2	5	1000	0.1	-3	0	0
A91G4 & 5	2.0	15	10.00	26.00	0.0042	80	80.0	73.3	5	-0.05	0.001	23	9.70	2	32	16	0.2	5	1000	0.1	-3	0	2.07
Total								!		-0.05	0.001		0.00				0.2	5	1000	0.1	-3	0	

	WRSM/PITMAN MODEL PARAMETERS							SAMI MODEL PARAMETERS																						
													Initial	Static	Static	Max-imum		Maximum	Gw	GW	Months	Unsat.	Initial			Bore-hole				GW
											Aquifer		aquifer	water	water	Dis-charge		hydraulic	evap	evap.	average	storage	unsat.	Percol-ation	Trans-	Dist-ance	Param-eter	Param-eter	Inter-flow	Abstrac-tion
QUAT	POW	SL	ST	FT	ZMIN	ZMAX	TL	GPOW	HGSL	HGGW	Thick-ness	Stora-tivity	storage	level	level	rate	Power	gradient	area	area	Re-charge	capacity	storage	power	Miss-ivity	to river	K2	K3	lag	
		(mm)	(mm)	(mm/m)	(mm/m)	(mm/m)	(mon-ths)				(m)		(mm)	(mm)	% of	(mm/m)			km2	(%)	(mon-ths)	(mm)	(mm)			(m)			(mon-ths)	Mm3/a
															Capac-ity															
A91G																														
A91H1	2.00	20	350	2	50	900	0.25	2.0	20	10.00	26.00	0.0042	80	80.0	73.3	5	-0.05	0.001	18	10.29	6	32	16	0.2	5	1000	0.1	-3	1	1.91
A91H2	2.00	20	400	2	50	900	0.25	2.0	20	10.00	26.00	0.0042	80	80.0	73.3	5	-0.05	0.001	55	20.00	6	32	16	0.2	10	1000	0.1	-3	0	1

Table 10: Results of verification study compared to other data

Quaternary Catchment	COMPARISON OF MAR			GRA II		Aquifer	GW	Interflow	Total	Pitman BF	Hughes BF
	MAR (WR90) (1920-1990)	MAR (WR2005) (1920-2004)	MAR (this study) (1920-2009)	Recharge	Recharge (this study)	Recharge	Baseflow		Baseflow		
		Net	Net								
		(mcm)	(mcm)	mm	mm	mm	Mm3	Mm3	Mm3	Mm3	Mm3
D51A	13.2		12.44	6.36	2.39	2.34	0.01	0.04	0.05	0.00	0.16
D51B				3.17	1.39	1.33	0.00	0.05	0.05	0.00	0.00
E22A				4.83							
E22B			29.41	4.56	4.01	2.04	0.15	1.48	1.63	0.00	0.38
E22D				2.68							
E22E	25.3	17.5		3.26							
E22F	1.0	0.6	1.31	1.50	0.98	0.73	0.00	0.10	0.10	0.00	0.00
E22C	13.4	12.2	14.36	9.24	5.54	4.44	1.18	0.54	1.72	0.00	0.85
E21L	1.3	0.5	1.59	2.75	1.90	1.44	0.00	0.09	0.09	0.00	0.00
E40A			13.67	4.94	2.79	2.79	0.12	0.00	0.12	0.00	0.11
E40B	13.4			4.98							
E40C				5.53	5.54	5.54	0.18	0.00	0.18	0.00	0.30
E40D	13.8		14.58	4.82							
E24G				0.21							
E24H				0.84	1.92	1.92	1.11	0.00	1.11	0.00	1.10
E24K	18.0		18.24	1.07							
E24J	20.3		22.76	6.93	5.31	5.31	1.93	0.00	1.93	0.00	2.10
E24L	23.4		21.96	15.06	22.30	8.37	1.55	7.19	8.74	3.66	6.77

Quaternary Catchment	COMPARISON OF MAR			GRA II		Aquifer	GW	Interflow	Total	Pitman BF	Hughes BF
	MAR (WR90) (1920-1990)	MAR (WR2005) (1920-2004)	MAR (this study) (1920-2009)	Recharge	Recharge (this study)	Recharge	Baseflow		Baseflow		
		Net	Net								
		(mcm)	(mcm)	mm	mm	mm	Mm3	Mm3	Mm3	Mm3	Mm3
E24M	9.8		10.79	5.17	5.53	5.53	0.65	0.00	0.65	0.00	0.00
J11A	6.7	6.3	6.53	6.44	5.34	5.34	0.46	0.00	0.46	0	0.51246
J11B	7.0	6.5	6.74	3.96	3.84	3.84	0.48	0.00	0.48	0	0.42804
J11C	1.4	1.3	1.31	0.59	2.43	2.43	0.06	0.00	0.06	0	0
J11D	6.5	6.1	6.23	4.36	3.62	3.62	0.41	0.00	0.41	0	0.37647
J11E	4.0	4.0	5.06	1.73	0.58	0.58	0.01	0.00	0.01	0	0
J11F	2.4	2.4	2.98	1.25	0.71	0.71	0.00	0.00	0.00	0	0
J11G	2.0	2.0	2.58	0.28	0.40	0.40	0.00	0.00	0.00	0	0
J23E	7.4	8.7	7.56	11.17	8.63	3.70	0.06	1.11	1.17	0.92	2.07
E10H	33.5	39.3	39.26	56.15	109.24	14.49	3.01	15.35	18.36	3.8394	9.03312
G30B	18.9	15.3	19.13	15.66	24.01	9.63	0.46	9.46	9.92	2.8294	5.71144
G10A	174.5	136.5	140.04	351.13	272.86	75.59	2.13	33.93	36.06	24.4928	64.17492
G10B	91.5	94.5	93	258.63	270.94	76.57	4.77	24.49	29.26	12.789	32.66676
G10C	146.8	96.7	110.18	138.22	193.87	72.22	6.23	39.90	46.13	19.2208	46.45136
G40C	105.6	102.8	109.16	292.21	274.52	35.69	1.51	34.63	36.14	15.6745	42.20225
G40D	142.4	156.2	161.63	178.98	241.20	29.30	6.29	69.29	75.58	21.1896	56.12301
E21A	34.9	35.4	33.38	57.98	50.53	8.42	1.18	8.00	9.18	4.636	10.8129
E21B	26.9	27.1	24.01	33.62	35.46	6.45	1.13	6.47	7.60	3.6572	8.18633
E21C	25.0	25.1	21.88	30.46	32.58	5.93	1.16	6.21	7.37	3.4484	7.58648
E21D	45.4	46.0	43.61	57.78	51.08	8.52	1.67	10.30	11.97	6.0258	14.16426

Quaternary Catchment	COMPARISON OF MAR			GRA II		Aquifer	GW	Interflow	Total	Pitman BF	Hughes BF
	MAR (WR90) (1920-1990)	MAR (WR2005) (1920-2004)	MAR (this study) (1920-2009)	Recharge	Recharge (this study)	Recharge	Baseflow		Baseflow		
		Net	Net								
		(mcm)	(mcm)	mm	mm	mm	Mm3	Mm3	Mm3	Mm3	Mm3
E21E	19.6	36.4	27.29	20.93	38.97	3.44	2.01	10.41	12.42	2.6956	5.98013
E21F	16.5			13.86	0.00				0.00	2.3498	5.08618
E21G	30.6	31.2	27.59	36.94	38.39	6.40	1.43	8.51	9.94	4.0432	9.55738
E21H	38.1	39.1	33.84	29.49	35.97	8.30	3.08	11.18	14.26	5.0904	11.92204
E21J	18.8	19.1	15.42	17.50	24.32	5.61	1.71	5.93	7.64	2.5994	5.77574
E21K	21.5	21.7	18.60	20.43	24.31	5.61	1.82	6.17	7.99	2.904	6.3492
G50G	6.6	4.8	4.53	5.79	3.17	3.17	0.02	0.00	0.02	0.836	2.128
H10A	39.3	35.50	42.47	54.01	73.11	16.87	4.46	13.16	17.62	4.8438	11.80062
H10B	46.6	24.56	29.43	90.09	73.10	16.87	3.09	9.11	12.20	5.9454	14.25276
H10Ca	69.2	60.11	20.88	82.19	113.17	25.25	1.23	4.66	5.89	8.736	21.3122
H10Cb			36.69		66.78	16.87	3.78	11.68	15.46		
H10D	50.4	128.53	131.68	155.83	440.32	44.34	1.74	38.41	40.15	6.3341	15.78093
H60A	88.1	108.7	106.33	389.39	407.96	38.78	0.39	26.95	27.34	11.8114	30.37968
H60B	118.4	149.8	142.74	181.79	302.22	29.51	2.12	57.27	59.39	15.141	39.4926
H60C	83.8	74.9	93.8	132.98	186.07	22.89	0.31	35.41	35.72	11.1755	27.9713
H60D	41.7	35.9	41.21	60.86	51.98	12.02	2.80	9.07	11.87	5.1529	13.34079
H60E	29.6	25.1	28.94	55.12	46.44	10.73	1.96	6.07	8.03	3.723	9.4061
H60F	23.3	19.6	23.05	45.61	41.07	9.49	1.70	5.21	6.91	2.8875	7.2732
H60G	11.7	10.3	11.92	28.64	27.12	7.76	1.15	2.73	3.88	1.4805	3.82674
H60H	19.7	17.4	19.7	27.56	24.18	6.91	1.89	4.37	6.26	2.4794	6.48945

Quaternary Catchment	COMPARISON OF MAR			GRA II		Aquifer	GW	Interflow	Total	Pitman BF	Hughes BF
	MAR (WR90) (1920-1990)	MAR (WR2005) (1920-2004)	MAR (this study) (1920-2009)	Recharge	Recharge (this study)	Recharge	Baseflow		Baseflow		
		Net	Net								
		(mcm)	(mcm)	mm	mm	mm	Mm3	Mm3	Mm3	Mm3	Mm3
H60J	22.0	19.5	22.03	26.27	23.65	6.76	2.12	4.95	7.07	2.7835	7.28105
H60K	11.6	10.5	11.73	13.44	13.49	2.84	0.99	2.79	3.78	1.3886	3.6549
H40A	6.5	6.4	2.87	19.93	11.40	9.77	0.95	0.30	1.25	0	0.45816
H40B	3.7	2.9	7.7	44.10	16.96	11.32	2.29	1.36	3.65	0.8676	1.51348
K10C	11.2	8.9	11.31	27.75	23.49	5.88	1.49	2.80	4.29	1.6695	4.36614
K10D	5.7	7.1	5.61	12.93	10.11	3.89	0.48	1.02	1.50	0.7216	2.11068
K10E	31.5	15.4	22.09	115.82	65.07	10.48	1.79	7.26	9.05	6.517	15.17131
K10F	4.9	5.8	4.11	18.86	17.02	6.55	0.53	1.11	1.64	1.1448	1.80518
K40B	26.8	27.3	28.47	126.35	75.66	14.59	2.52	6.84	9.36	7.672	14.38304
A91A	16.5	17.01	22.76	47.70	64.62	26.60	5.94	8.82	14.76	8.8856	8.88328
A91B	12	12.89	12.40	29.27	26.68	16.97	4.69	2.67	7.36	8.195	6.90525
A91C & F1	35.5	55.43	61.16	80.35	63.56	45.27	16.38	6.84	23.22	20.575	20.665
A91F	20	24.12	34.48	25.18	27.07	17.22	7.72	4.49	12.21	3.074	6.5366
Total A91C and F	55.5	79.55	95.64				24.10	11.33	35.43	23.65	27.20
A91D1	49.8	17.17	19.38		222.84	100.50	1.21	5.75	6.96		
A91D3		9.72	10.35		212.52	101.27	0.49	1.78	2.27		
A91D2 & D4		19.06	27.22		167.73	87.30	2.72	5.55	8.27		
Total A91D		45.95	56.95	173.79			4.42	13.08	17.5	18.0048	23.59236
A91E	56	68.97	57.69	117.94	96.05	52.51	9.14	9.71	18.85	24.0394	28.72686

Quaternary Catchment	COMPARISON OF MAR			GRA II		Aquifer	GW	Interflow	Total	Pitman BF	Hughes BF
	MAR (WR90) (1920-1990)	MAR (WR2005) (1920-2004)	MAR (this study) (1920-2009)	Recharge	Recharge (this study)	Recharge	Baseflow		Baseflow		
		Net	Net								
		(mcm)	(mcm)	mm	mm	mm	Mm3	Mm3	Mm3	Mm3	Mm3
A91G1 & 2		51.35	55.42		378.10	45.95	2.65	35.54	38.19		
A91G3	138.1	20.83	21.15	165.25	364.18	82.57	0.05	17.46	17.51		
A91G4 & 5		45.08	39.08		72.66	42.45	4.20	7.16	11.36		
Total A91G		117.26	115.65		148.18		6.9	60.16	67.06	65.2036	71.52908
A91H1		15.57	14.86		34.34	26.34	2.05	1.40	3.45		
A91H2	26.5	31.74	19.18	35.43	32.96	26.12	0.81	1.88	2.69		
Total A91H		47.31	34.04		7.29		2.86	3.28	6.14	3.24	7.866
A92A	118.5	126.99		156.00	0.00				0.00	56.0945	60.4044

6. SHORTCOMINGS AND LIMITATIONS

Several shortcomings have been identified during this study and since WR2005 was released. These are largely related to the interaction and integration of the various modules in WR2005, which were written by various authors. The shortcomings identified include:

- Irrigation return flows. Irrigation return flows are generated in the irrigation module and passed to the channel module, hence are not subject to the transmission losses routine in the Sami groundwater module. Consequently, where irrigation return flows are set, it is not possible to generate zero flows without using bed losses;
- Transmission losses. Only flows generated within a runoff unit are subject to transmission losses. Flows generated in upstream runoff units cannot be lost. This is problematic in catchments with significant alluvium recharged by flow generated upstream. Consequently, it is not possible to deplete flows to below those entering from upstream without utilising bed losses or a wetland module. Where transmission losses recharge a heavily utilised aquifer that depletes flow this is problematic as it cannot reduce flows and results in unrealistic depletion of aquifer storage;
- Bed losses, irrigation and wetland modules. These are not linked to the groundwater module hence losses to groundwater from these routines do not recharge the aquifer and are lost to the water balance;
- Bed loss routine. This routine utilises a fixed volume and is not flow or aquifer storage volume related;
- Groundwater outflow. Currently, runoff units cannot accept inflows, hence groundwater outflow from one runoff unit is lost to the water balance. Although these volumes are very small in relation to the water balance they can be important where significant groundwater abstraction draws in water across a divide, or induces leakage across a dyke from another groundwater compartment;
- Aquifer storage. In WRSM/Pitman, groundwater abstraction can meet demand at all aquifer storage levels. If large unrealistic groundwater abstraction is input, groundwater storage can go negative. Aquifer storage needs to be written out and inspected, to reduce abstraction where necessary. This doesn't allow for situations where abstraction is higher than recharge following wet periods and gradually declines as water levels drop to reduced yields and boreholes going dry. The curtailment routine (2.13) was introduced to overcome this problem and allow demands higher than the recharge rate, with abstraction curtailed by storage level and
- Recharge output. In WR2005 the text file written out as recharge is only aquifer recharge. It doesn't include the recharge component lost as interflow. To compare modelled recharge to other known values, the interflow component needs to be written out, converted to mm and added to recharge to compare recharge to figures such as in GRAII.

7. CONCLUSIONS

The following have been developed during this study:

- default parameters for South Africa, Lesotho and Swaziland;
- calibration guidelines for groundwater parameters;
- calibration guide based on the impacts of parameters on calibration targets;
- identification of current issues in WRSM/Pitman that hinder calibration and
- recommendations for future upgrades.

WRSM/Pitman has been successfully applied to 100 catchments across South Africa starting with the default groundwater parameters developed and default WR2005 network setups. The setups were calibrated on a regional basis to develop parameter sets which can be utilised in similar catchments.

A guideline has been developed to assist modellers with calibration.

Through use of the model in this study and several other studies for the DWA, short comings and limitations have been identified which will require future attention. Many of these shortcomings are related to the integration of the various modules in WRSM/Pitman.

REFERENCES

Bailey, AK and Pitman, WV (2015): WR2012 User Guide

Bailey, AK and Pitman, WV (2015): WR2012 Book of Maps

Middleton BJ and Bailey AK, (2005): Water Resources of South Africa, 2005 Study (WR2005).

Pitman WV, Kakebeeke JP and Bailey AK (2015 A): WRSM/Pitman : Water Resources Simulation Model for Windows : User Manual, December 2015.

Pitman WV and Bailey AK (2015 B): WRSM/Pitman : Water Resources Simulation Model for Windows : Theory Manual, December 2015.

Pitman WV and Bailey AK (2015 C): WRSM/Pitman : Water Resources Simulation Model for Windows : Course Manual, December 2015.

Pitman WV (2015): A Review of calibrations undertaken with the WRSM2000/Pitman model.

Pitman WV and Bailey AK (2015 D): WRSM/Pitman Model Analysis Overview

Pitman WV, Bailey AK and Nyland G (2015): WRSM/Pitman : Water Resources Simulation Model for Windows : Programmer's Code Manual, December 2015.

8. APPENDIX A – DEFAULT PARAMETERS

WRSM/Pitman model parameters are shown in Red

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
A10A	557.87	25.01	9	22.4	0.9599	0.03	0.07	0.5	0.0029	21.3	0.000637	190.8	61.21	175.04	145.86	43.72	12
A10B	1029.74	25.07	9	17.7	0.9807	0.03	0.07	0.5	0.0028	23.8	0.000129	180.6	31.35	89.27	56.09	37.32	14
A10C	275.65	31.30	1	18.9	0.9794	0.005	0.032	0.02	0.0013	26.5	9.42E-05	162.8	37.33	49.41	32.22	22.19	8
A21A	481.89	19.87	10	54.4	0.984	0.08	0.045	0.0001	0.0232	25.7	0.002446	200.4	46.01	1068.57	775.48	254.98	28
A21B	526.53	20.68	10	47.6	0.9771	0.08	0.045	0.0001	0.0226	29.1	0.003328	204.4	57.84	1308.77	986.67	268.33	34
A21C	760.98	14.97	17	42.4	0.9695	0.03	0.05	0.1	0.0090	41.2	0.000562	141.3	48.52	436.32	256.64	71.52	11
A21D	371.55	32.43	10	51.5	0.9739	0.08	0.045	0.0001	0.0151	19.3	0.002779	203.1	55.26	833.71	691.67	289.69	34
A21E	289.83	16.22	17	43.2	0.9651	0.03	0.05	0.1	0.0086	39.6	0.000658	144.5	48.92	420.93	256.37	75.12	11
A21F	1000.23	28.41	9	47.2	0.9682	0.03	0.07	0.5	0.0023	19.1	0.000856	194.3	88.53	203.58	182.32	44.83	6
A21G	160.53	20.98	10	66.6	0.957	0.08	0.045	0.0001	0.0224	25.3	0.002425	207.2	45.63	1022.54	751.70	260.46	25
A21H	513.73	16.08	10	40.3	0.9546	0.08	0.045	0.0001	0.0261	30.2	0.001563	192.1	39.81	1040.25	663.37	222.60	33
A21J	1150.19	15.33	14	26.5	0.9764	0.015	0.07	0.0001	0.0038	22.3	4.86E-05	129.4	23.38	89.35	47.75	29.67	7
A21K	864.17	15.81	14	27.4	0.9752	0.015	0.07	0.0001	0.0037	23.7	6.75E-05	140.0	25.54	95.18	52.20	30.00	7
A21L	212.81	23.80	14	11.1	0.9854	0.015	0.07	0.0001	0.0024	13.5	4.2E-05	134.0	15.63	37.27	21.40	28.88	16
A22A	705.90	20.70	9	34.1	0.9774	0.03	0.07	0.5	0.0037	26.2	0.000137	181.3	32.05	119.90	72.06	40.13	8
A22B	283.77	16.23	9	37.4	0.9738	0.03	0.07	0.5	0.0049	30.4	0.000137	177.1	34.45	168.54	96.05	40.80	7
A22C	514.92	17.87	9	28.2	0.9711	0.03	0.07	0.5	0.0044	28.7	0.000136	178.4	33.20	147.42	85.50	40.88	9
A22D	541.35	18.70	9	23.4	0.9754	0.03	0.07	0.5	0.0042	28.1	0.000136	179.3	33.03	139.51	81.69	40.77	11
A22E	811.79	20.16	9	26.6	0.9799	0.03	0.07	0.5	0.0039	24.8	0.000117	170.4	29.32	113.34	66.45	40.15	10
A22F	1688.32	23.08	14	15.9	0.9716	0.015	0.07	0.0001	0.0025	14.4	4.57E-05	135.5	16.38	40.75	23.38	29.23	12
A22G	498.60	19.94	9	32.3	0.9583	0.03	0.07	0.5	0.0039	26.4	0.000136	181.2	31.31	122.71	73.20	40.43	8
A22H	578.68	14.83	14	27.2	0.9724	0.015	0.07	0.0001	0.0039	23.6	5.74E-05	133.7	24.83	97.43	52.45	29.51	7
A22J	591.47	19.43	14	15.1	0.9833	0.015	0.07	0.0001	0.0031	17.8	4.2E-05	129.5	19.20	58.82	32.08	30.17	12
A23A	682.41	18.57	9	56.1	0.9738	0.03	0.07	0.5	0.0043	28.1	0.000154	179.2	33.67	143.33	85.06	40.95	5
A23B	814.16	17.56	14	24.9	0.9808	0.015	0.07	0.0001	0.0034	20.7	0.000573	128.4	41.57	141.12	106.67	34.84	9
A23C	491.01	25.95	14	9.4	0.9937	0.015	0.07	0.0001	0.0021	11.5	0.00011	185.2	21.02	44.09	32.13	28.64	19
A23D	144.83	21.61	9	85.4	0.97	0.03	0.07	0.5	0.0035	25.1	0.000633	187.8	56.98	201.54	158.41	45.05	4
A23E	490.45	17.63	14	25.5	0.9807	0.015	0.07	0.0001	0.0034	21.4	6.02E-05	137.7	23.35	78.98	43.55	30.34	8
A23F	564.65	21.66	14	11.8	0.9909	0.015	0.07	0.0001	0.0027	15.7	9.03E-05	167.5	21.09	56.95	35.97	30.22	16
A23G	951.45	19.62	14	21.8	0.9814	0.015	0.07	0.0001	0.0030	17.2	0.000275	193.4	34.15	103.53	77.87	32.43	9
A23H	1058.16	28.25	14	17.6	0.9806	0.015	0.07	0.0001	0.0018	10.7	7.33E-05	160.0	16.76	30.56	21.03	26.80	10
A23J	930.36	31.76	14	7.3	0.9912	0.015	0.07	0.0001	0.0015	6.8	8.92E-05	175.8	17.37	25.45	20.52	24.69	21
A23K	1130.79	26.38	14	10.9	0.9868	0.015	0.07	0.0001	0.0020	11.5	6.98E-05	156.5	16.60	33.93	22.35	27.88	16
A23L	328.80	42.08	14	9.3	0.9674	0.015	0.07	0.0001	0.0007	2.5	4.2E-05	145.0	10.29	7.71	6.80	16.65	11
A24A	493.16	26.97	14	11.3	0.9683	0.015	0.07	0.0001	0.0020	10.2	4.2E-05	137.3	12.70	25.05	15.31	27.17	15
A24B	709.13	33.43	14	19.4	0.9692	0.015	0.07	0.0001	0.0013	8.2	4.2E-05	139.2	12.24	16.13	10.90	22.73	8
A24C	801.47	22.38	14	15.3	0.9787	0.015	0.07	0.0001	0.0026	14.8	4.2E-05	132.7	16.56	42.91	24.18	29.46	12
A24D	1326.56	28.02	9	15.5	0.9824	0.03	0.07	0.5	0.0024	13.3	8.06E-05	158.6	18.40	43.42	27.99	34.18	14
A24E	687.71	26.87	14	8.7	0.9806	0.015	0.07	0.0001	0.0020	10.4	4.2E-05	137.1	13.04	25.88	15.76	27.22	19
A24F	590.72	28.87	9	17.8	0.9717	0.03	0.07	0.5	0.0022	13.6	9.36E-05	166.3	20.01	44.68	29.90	33.58	12
A24G	735.31	22.91	14	26.0	0.9555	0.015	0.07	0.0001	0.0025	15.2	0.000153	153.8	23.52	59.10	40.82	30.54	8
A24H	1338.24	27.40	6	28.2	0.9504	0.04	0.058	0.00001	0.0068	11.6	0.000544	214.4	27.38	185.68	148.32	100.36	22
A24J	2516.03	35.01	1	14.2	0.9828	0.005	0.032	0.02	0.0012	25.4	8.92E-05	160.3	36.57	44.30	29.18	22.77	10
A31A	631.91	26.74	9	26.7	0.9711	0.03	0.07	0.5	0.0026	20.2	0.001425	201.4	128.39	328.85	303.76	53.29	12
A31B	595.91	22.70	9	26.6	0.9618	0.03	0.07	0.5	0.0033	23.9	0.000137	183.7	30.25	99.97	62.06	39.07	9
A31C	485.00	21.04	10	31.4	0.9913	0.08	0.045	0.0001	0.0224	26.2	0.00517	236.3	80.16	1792.50	1501.68	289.64	56
A31D	703.87	21.10	9	29.1	0.9764	0.03	0.07	0.5	0.0037	25.8	0.002083	203.0	138.28	504.76	458.79	60.48	13
A31E	600.76	21.32	9	29.2	0.9679	0.03	0.07	0.5	0.0036	25.4	0.000137	182.2	31.23	112.47	68.29	39.84	9
A31F	701.56	22.52	9	29.9	0.9821	0.03	0.07	0.5	0.0033	24.5	0.000137	183.0	31.45	105.13	64.84	39.18	8
A31G	1425.11	22.89	9	26.2	0.9872	0.03	0.07	0.5	0.0033	23.9	0.000132	180.8	30.77	100.52	62.06	38.90	9
A31H	683.61	29.27	9	22.2	0.9805	0.03	0.07	0.5	0.0022	17.8	0.000137	189.4	29.16	63.43	44.41	33.84	10
A31J	844.14	29.49	9	22.1	0.9907	0.03	0.07	0.5	0.0021	17.9	0.000137	189.6	29.69	63.66	44.67	33.64	10
A32A	472.36	24.57	9	17.0	0.9903	0.03	0.07	0.5	0.0029	22.7	0.000137	184.8	30.99	91.10	58.06	37.80	14
A32B	640.94	28.63	9	13.1	0.983	0.03	0.07	0.5	0.0023	18.3	0.000134	187.2	28.83	65.40	45.03	34.38	16
A32C	901.73	30.43	9	18.1	0.9812	0.03	0.07	0.5	0.0020	16.7	0.000137	190.8	29.10	58.70	42.14	32.77	11
A32D	841.64	28.33	1	16.4	0.9778	0.005	0.032	0.02	0.0014	26.0	0.000108	169.1	38.02	53.92	35.88	21.62	8
A32E	2496.27	44.18	1	12.5	0.989	0.005	0.032	0.02	0.0010	17.1	8.21E-05	167.0	31.00	29.84	21.71	23.08	12
A41A	691.89	28.86	6	28.7	0.9535	0.04	0.058	0.00001	0.0063	10.3	0.001185	295.9	62.76	396.40	365.41	108.26	23
A41B	357.44	23.61	6	24.1	0.9643	0.04	0.058	0.00001	0.0081	13.4	0.001289	304.1	59.52	482.59	430.38	110.96	28
A41C	1110.70	24.03	6	14.8	0.9873	0.04	0.058	0.00001	0.0080	13.3	0.00101	261.7	45.95	365.48	313.27	107.70	44
A41D	1911.06	27.91	6	10.7	0.9902	0.04	0.058	0.00001	0.0066	13.5	0.001058	276.8	57.20	378.44	334.26	107.09	60
A41E	1933.78	24.31	2	7.8	0.991	0.05	0.07	0.02	0.0076	12.7	0.000416	173.0	22.02	166.99	119.16	97.24	76
A42A	573.42	17.98	6	27.8	0.9607	0.04	0.058	0.00001	0.0104	17.7	0.000894	242.9	37.01	385.84	297.24	101.75	22
A42B	521.61	18.10	6	31.8	0.963	0.04	0.058	0.00001	0.0104	18.7	0.001222	289.6	50.85	527.34	434.09	104.92	20
A42C	698.36	19.80	6	31.4	0.9502	0.04	0.058	0.00001	0.0096	16.1	0.001186	285.3	48.62	468.36	394.88	107.09	21
A42D	496.61	17.11	6	39.4	0.9549	0.04	0.058	0.00001	0.0108	19.5	0.001289	298.0	52.51	568.18	467.57	103.57	17
A42E	1007.25	20.42	6	29.9	0.9765	0.04	0.058	0.00001	0.0094	16.7	0.001289	300.8	56.70	531.39	455.08	108.85	23
A42F	1021.70	18.54	6	22.4	0.964	0.04	0.058	0.00001	0.0102	18.3	0.001289	299.2	54.17	551.18	461.56	106.29	29
A42G	1206.22	20.32	6	21.4	0.9566	0.04	0.058	0.00001	0.0094	16.4	0.001289	301.1	55.17	519.39	445.37	108.74	31
A42H	1056.65	24.95	6	15.0	0.973	0.04	0.058	0.00001	0.0076	12.2	0.001119	279.5	51.80	394.68	349.55	109.01	44
A42J	1810.51	26.18	2	7.5	0.9908	0.05	0.07	0.02	0.0068	10.6	0.000534	194.6	25.65	173.88	138.43	95.73	77
A50A	297.78	14.46	6	38.1	0.9625	0.04	0.058	0.00001	0.0121	22.2	0.001289	295.3	51.70	624.18	495.35	96.61	16
A50B	406.28	17.07	6	29.7	0.9601	0.04	0.058	0.00001	0.0108	19.6	0.001289	297.9	52.86	572.86	470.82	103.50	25

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
A50C	362.20	17.76	6	28.6	0.9682	0.04	0.058	0.00001	0.0105	19.1	0.001289	298.4	53.88	566.95	469.75	104.90	28
A50D	637.24	23.46	6	19.7	0.9601	0.04	0.058	0.00001	0.0082	13.5	0.001289	304.0	59.01	481.93	429.17	110.91	34
A50E	628.74	20.71	6	17.4	0.9638	0.04	0.058	0.00001	0.0093	14.7	0.001051	272.8	44.07	407.80	342.09	106.68	37
A50F	371.65	27.12	6	14.4	0.9759	0.04	0.058	0.00001	0.0069	8.9	0.001068	279.5	51.08	351.05	321.22	107.68	45
A50G	820.73	22.92	3	11.2	0.9896	0.01	0.06	0.001	0.0020	10.3	0.000615	219.3	76.41	154.06	143.77	30.16	17
A50H	1943.38	24.70	3	7.8	0.9904	0.01	0.06	0.001	0.0018	8.4	0.000542	210.8	69.49	128.55	120.82	29.54	23
A50J	1253.77	25.90	3	7.1	0.9915	0.01	0.06	0.001	0.0017	7.7	0.00048	204.8	63.49	110.74	104.04	28.79	25
A61A	381.41	16.03	6	31.1	0.9707	0.04	0.058	0.00001	0.0113	20.9	0.001289	296.6	53.05	600.42	485.86	101.07	20
A61B	362.39	14.32	6	30.1	0.9661	0.04	0.058	0.00001	0.0121	19.5	0.000909	237.6	36.03	437.49	323.11	93.44	19
A61C	586.58	13.95	16	28.0	0.9834	0.02	0.1	0.0001	0.0040	20.9	0.000379	187.9	38.19	151.77	110.90	30.35	7
A61D	455.85	14.61	16	27.1	0.9838	0.02	0.1	0.0001	0.0038	19.5	8.8E-05	153.2	22.67	85.43	49.34	28.16	7
A61E	547.22	17.77	16	19.3	0.9789	0.02	0.1	0.0001	0.0029	15.9	0.000161	153.2	23.86	69.08	46.60	27.14	9
A61F	788.97	19.11	16	28.4	0.9471	0.02	0.1	0.0001	0.0026	30.2	0.000571	105.4	50.67	130.57	93.77	30.08	7
A61G	926.68	16.21	16	22.4	0.9698	0.02	0.1	0.0001	0.0033	25.3	0.000192	110.5	30.73	101.48	61.05	28.32	8
A61H	585.36	14.69	6	32.3	0.9614	0.04	0.058	0.00001	0.0120	18.3	0.000812	218.4	31.82	380.61	275.57	93.81	18
A61J	817.63	16.42	6	28.7	0.9576	0.04	0.058	0.00001	0.0111	16.7	0.000839	229.1	32.54	362.33	273.14	98.33	21
A62A	427.59	18.71	6	25.9	0.9528	0.04	0.058	0.00001	0.0101	17.5	0.00124	292.1	50.88	513.98	429.53	106.10	25
A62B	710.00	18.10	6	20.0	0.9588	0.04	0.058	0.00001	0.0104	15.9	0.000933	243.7	36.24	375.80	296.88	102.31	31
A62C	384.87	17.53	6	17.0	0.9712	0.04	0.058	0.00001	0.0106	19.3	0.00127	295.1	52.95	562.74	463.33	104.27	38
A62D	602.96	19.35	6	16.8	0.9705	0.04	0.058	0.00001	0.0098	17.6	0.001283	299.1	54.97	540.02	456.20	107.46	39
A62E	620.66	15.60	7	13.8	0.9842	0.03	0.06	0	0.0085	39.5	0.000276	115.7	42.59	359.87	195.62	68.08	30
A62F	619.77	16.43	7	14.8	0.9828	0.03	0.06	0	0.0082	28.5	0.000245	122.1	31.62	257.76	143.60	69.00	29
A62G	627.05	18.98	6	13.2	0.9848	0.04	0.058	0.00001	0.0100	18.2	0.001171	280.4	50.31	502.36	412.87	105.86	49
A62H	871.18	16.79	7	12.6	0.9859	0.03	0.06	0	0.0080	33.4	0.000569	168.8	44.70	358.71	226.70	72.15	35
A62J	929.70	20.53	6	13.4	0.9787	0.04	0.058	0.00001	0.0093	16.6	0.001289	300.9	56.96	531.16	455.45	108.97	49
A63A	1927.74	27.24	3	9.4	0.9871	0.01	0.06	0.001	0.0016	7.7	0.000709	227.2	105.06	171.39	165.21	31.87	21
A63B	1504.72	24.88	3	7.5	0.9893	0.01	0.06	0.001	0.0018	9.0	0.000458	187.6	55.27	101.37	93.19	28.51	23
A63C	1318.46	24.12	3	6.2	0.9916	0.01	0.06	0.001	0.0019	8.4	0.00048	204.1	59.33	112.89	104.97	28.73	28
A63D	1318.98	22.22	3	10.6	0.9868	0.01	0.06	0.001	0.0021	12.2	0.000433	173.5	47.61	99.27	86.70	27.97	16
A63E	1989.07	21.18	4	6.9	0.9898	0.04	0.095	0.1	0.0043	5.7	0.000556	161.4	26.24	113.24	101.01	51.60	45
A71A	1144.35	16.67	7	14.6	0.9789	0.03	0.06	0	0.0081	40.0	0.000293	117.5	43.28	349.21	191.43	69.68	29
A71B	882.04	19.13	7	11.3	0.9766	0.03	0.06	0	0.0072	37.5	0.00029	120.0	41.31	298.57	166.31	71.91	39
A71C	1330.77	22.26	7	7.8	0.9817	0.03	0.06	0	0.0062	34.6	0.00029	122.9	39.55	247.12	141.08	72.77	56
A71D	891.87	27.00	7	2.7	0.9895	0.03	0.06	0	0.0050	30.2	0.00029	127.3	37.25	184.60	110.59	70.84	159
A71E	892.89	22.98	7	7.1	0.9876	0.03	0.06	0	0.0060	34.1	0.00029	123.4	39.52	238.61	137.00	72.70	62
A71F	682.85	22.94	7	6.3	0.9887	0.03	0.06	0	0.0060	34.2	0.00029	123.3	39.63	239.65	137.53	72.70	70
A71G	875.10	29.49	7	5.5	0.9821	0.03	0.06	0	0.0044	25.1	0.000278	129.8	32.78	143.23	89.33	68.52	76
A71H	1012.31	26.00	6	14.9	0.9621	0.04	0.058	0.00001	0.0073	22.1	0.000248	126.6	25.43	184.42	107.29	97.47	40
A71J	1161.90	26.70	5	11.0	0.9767	0.05	0.075	0.001	0.0059	10.3	0.000288	126.8	16.10	95.68	65.65	83.18	46
A71K	1669.09	19.71	3	5.7	0.9857	0.01	0.06	0.001	0.0023	13.3	0.000455	187.8	49.04	114.98	99.61	27.58	30
A71L	1760.65	17.95	3	5.4	0.9896	0.01	0.06	0.001	0.0025	12.2	0.000509	182.7	48.31	122.69	107.35	27.35	31
A72A	1907.79	27.06	7	10.5	0.9801	0.03	0.06	0	0.0049	23.9	0.000485	163.1	39.11	193.27	135.39	73.42	43
A72B	1554.42	26.30	3	5.8	0.9918	0.01	0.06	0.001	0.0017	8.7	0.000391	162.7	45.55	77.88	70.46	27.62	29
A80A	287.38	17.77	8	90.9	0.9112	0.02	0.09	0.001	0.0034	17.9	0.000193	119.6	22.60	75.93	48.48	31.56	3
A80B	251.32	21.29	8	48.2	0.9256	0.02	0.09	0.001	0.0026	15.0	0.000193	122.5	22.45	57.56	39.72	29.35	4
A80C	293.60	19.03	8	38.4	0.9223	0.02	0.09	0.001	0.0031	17.0	0.000193	120.5	22.68	69.29	45.37	30.90	5
A80D	127.71	23.12	8	36.0	0.9247	0.02	0.09	0.001	0.0022	13.2	0.000193	124.3	22.24	49.35	35.76	27.88	5
A80E	246.98	22.21	8	39.7	0.9291	0.02	0.09	0.001	0.0024	14.2	0.000194	123.2	22.54	53.74	38.00	28.64	5
A80F	629.72	23.22	5	12.4	0.9727	0.05	0.075	0.001	0.0074	13.9	0.00027	120.3	17.75	132.24	81.91	89.64	42
A80G	1228.12	18.01	3	9.6	0.9756	0.01	0.06	0.001	0.0025	17.3	0.000348	143.3	36.14	91.53	70.11	25.94	17
A80H	265.39	17.32	8	40.5	0.946	0.02	0.09	0.001	0.0035	19.1	0.000193	118.4	24.28	84.34	52.98	31.75	5
A80J	867.22	18.89	5	5.1	0.9785	0.05	0.075	0.001	0.0098	16.9	0.000346	138.0	21.30	207.79	127.26	95.38	112
A91A	232.31	22.01	8	47.7	0.9523	0.02	0.09	0.001	0.0024	20.6	0.000186	122.9	28.55	69.14	45.44	28.70	4
A91B	274.74	23.02	7	29.3	0.9774	0.03	0.06	0	0.0060	28.6	0.000176	123.6	31.50	189.79	105.54	71.38	15
A91C	249.67	20.83	7	80.4	0.9637	0.03	0.06	0	0.0067	29.5	0.000173	121.9	31.52	210.58	115.47	71.41	5
A91D	132.38	17.98	8	173.8	0.9366	0.02	0.09	0.001	0.0033	24.3	0.000184	119.5	28.97	95.79	58.20	31.38	1
A91E	223.09	15.91	7	117.9	0.9564	0.03	0.06	0	0.0083	27.1	0.000184	117.0	28.37	236.58	128.57	67.80	3
A91F	579.80	17.43	7	25.2	0.9815	0.03	0.06	0	0.0078	31.9	0.000175	118.0	33.91	264.58	142.45	69.52	17
A91G	405.79	14.70	8	165.3	0.9495	0.02	0.09	0.001	0.0042	21.6	0.000193	115.9	25.59	107.57	64.40	32.31	2
A91H	449.90	14.78	8	35.4	0.954	0.02	0.09	0.001	0.0042	21.8	0.000193	115.8	25.88	108.20	64.75	32.31	6
A91J	569.87	16.19	8	13.1	0.9697	0.02	0.09	0.001	0.0038	25.5	0.000234	108.4	31.28	118.11	71.35	32.46	15
A91K	667.02	15.28	20	6.0	0.9808	0.01	0.06	0.2	0.0025	34.9	0.000275	94.3	44.54	109.84	67.63	20.94	21
A92A	328.88	16.68	8	156.1	0.9285	0.02	0.09	0.001	0.0036	19.3	0.000193	118.2	23.77	86.59	53.88	31.99	2
A92B	564.99	14.84	8	45.0	0.9476	0.02	0.09	0.001	0.0042	21.5	0.000193	116.0	25.46	105.92	63.57	32.31	5
A92C	454.72	17.34	8	14.9	0.9702	0.02	0.09	0.001	0.0035	19.6	0.000242	115.8	26.81	92.97	60.05	32.17	13
A92D	802.38	16.66	5	3.1	0.9825	0.05	0.075	0.001	0.0111	19.7	0.000322	126.5	22.94	255.43	147.73	95.41	169
B11A	945.40	8.24	28	41.6	0.9838	0.015	0.08	0.1	0.0048	18.9	0.000101	153.6	21.85	104.46	59.89	20.13	3
B11B	435.35	8.09	28	51.1	0.9838	0.015	0.08	0.1	0.0048	19.1	0.000101	153.4	21.97	105.89	60.60	19.92	3
B11C	385.45	8.41	28	34.6	0.9829	0.015	0.08	0.1	0.0047	18.8	0.000101	153.7	21.68	102.73	59.03	20.35	4
B11D	550.94	8.89	28	38.7	0.9852	0.015	0.08	0.1	0.0046	18.3	0.000101	154.2	21.40	98.77	57.09	20.96	4
B11E	466.71	8.64	28	45.2	0.9881	0.015	0.08	0.1	0.0047	18.6	0.000101	153.8	21.72	101.63	58.52	20.65	3
B11F	428.33	10.88	28	46.8	0.9869	0.015	0.08	0.1	0.0041	16.4	0.000101	156.1	19.97	82.35	48.99	22.98	3
B11G	367.82	10.12	28	51.8	0.9855	0.015	0.08	0.1	0.0043	20.1	0.000623	143.5	40.21	173.14	130.59	24.94	3
B11H	245.99	10.17	28	54.0	0.9849	0.015	0.08	0.1	0.0043	19.9	0.000595	143.9	39.24	168.57	126.46	24.86	3
B11J	269.36	12.16	11	45.8	0.97	0.03	0.075	0.0001	0.0086	24.1	0.001752	119.9	47.09	404.93	304.33	62.92	9
B11K	378.34	12.58	11	45.2	0.9827	0.03	0.075	0.0001	0.0084	19.9	0.00103	136.6	36.01	302.59	220.44	59.36	8
B11L	241.78	12.61	11	48.1	0.9548	0.03	0.075	0.0001	0.0084	23.7	0.001841	118.8	47.51	398.81	303.79	64.51	9
B12A	405.29	9.30	28	46.3	0.9832	0.015	0.08	0.1	0.0045	17.9	0.000101	154.6	21.03	94.87	55.15	21.44	3
B12B	658.50	8.69	28	55.2	0.987	0.015	0.08	0.1	0.0047	19.3	9.72E-05	150.3	22.13	103.27	58.85	20.69	3

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
B12C	529.01	8.03	28	55.1	0.9863	0.015	0.08	0.1	0.0048	21.6	8.75E-05	141.3	23.80	115.14	63.66	19.77	3
B12D	362.28	10.01	28	53.7	0.9841	0.015	0.08	0.1	0.0043	23.1	0.000409	127.2	34.58	149.81	100.51	23.74	3
B12E	435.84	11.80	11	46.9	0.976	0.03	0.075	0.0001	0.0088	24.7	0.001657	118.4	45.96	402.70	297.13	61.50	8
B20A	574.29	15.05	28	43.4	0.9854	0.015	0.08	0.1	0.0032	19.8	0.000115	166.1	25.43	81.47	50.15	24.97	4
B20B	321.55	17.30	9	63.1	0.9834	0.03	0.07	0.5	0.0046	27.4	0.00018	176.5	33.72	154.81	92.99	41.27	4
B20C	363.69	15.31	9	87.1	0.9828	0.03	0.07	0.5	0.0052	31.6	0.000137	175.9	35.66	184.04	103.83	40.54	3
B20D	480.39	12.88	9	74.4	0.9811	0.03	0.07	0.5	0.0059	30.0	0.000814	151.6	49.91	295.85	208.47	43.41	4
B20E	619.88	10.18	28	41.7	0.9828	0.015	0.08	0.1	0.0043	17.0	0.000101	155.5	20.33	87.22	51.36	22.37	4
B20F	504.21	15.01	9	58.4	0.9826	0.03	0.07	0.5	0.0053	23.1	0.000362	162.1	33.70	176.98	117.35	42.12	5
B20G	522.45	13.41	11	46.4	0.9815	0.03	0.075	0.0001	0.0080	17.9	0.000819	142.3	31.77	255.22	184.80	59.36	8
B20H	562.51	11.51	11	44.4	0.9766	0.03	0.075	0.0001	0.0089	25.4	0.001819	117.2	48.17	428.65	318.38	61.69	9
B20J	407.45	11.81	15	44.3	0.9563	0.01	0.07	0.2	0.0026	24.6	0.000772	111.9	54.89	144.77	113.71	20.13	3
B31A	386.56	12.39	11	55.8	0.98	0.03	0.075	0.0001	0.0085	25.8	0.001634	124.6	48.78	414.28	306.90	62.73	7
B31B	385.09	11.73	15	31.7	0.9788	0.01	0.07	0.2	0.0026	25.2	0.000975	112.4	65.22	172.72	140.01	21.25	5
B31C	373.45	22.74	15	16.5	0.9819	0.01	0.07	0.2	0.0014	14.5	5.59E-05	130.1	19.21	27.45	17.29	16.88	7
B31D	557.64	18.46	15	20.6	0.9786	0.01	0.07	0.2	0.0018	18.6	5.73E-05	126.3	22.06	40.51	23.79	17.48	5
B31E	1382.44	19.10	13	19.7	0.9921	0.02	0.065	0.001	0.0045	18.3	0.00011	179.1	22.45	100.61	60.04	43.83	14
B31F	637.52	19.27	15	15.2	0.9872	0.01	0.07	0.2	0.0018	18.0	8E-05	150.0	24.53	43.00	27.42	17.66	7
B31G	433.21	16.81	15	25.8	0.9668	0.01	0.07	0.2	0.0020	20.0	4.36E-05	112.5	21.68	43.69	24.22	17.31	4
B31H	611.82	13.53	15	20.8	0.9852	0.01	0.07	0.2	0.0024	23.6	4.45E-05	109.7	25.26	60.91	32.86	16.61	5
B31J	1379.89	17.44	13	14.6	0.9891	0.02	0.065	0.001	0.0049	19.8	8.29E-05	151.3	22.16	107.85	60.12	43.16	18
B32A	801.44	13.08	11	45.2	0.9497	0.03	0.075	0.0001	0.0082	23.2	0.001578	117.9	43.61	356.65	266.63	63.83	9
B32B	613.85	10.66	15	47.7	0.9588	0.01	0.07	0.2	0.0028	24.9	0.000384	114.3	38.96	108.94	75.50	16.96	3
B32C	302.82	13.73	15	41.7	0.9508	0.01	0.07	0.2	0.0024	22.6	4.36E-05	109.9	23.39	55.76	30.16	16.67	3
B32D	521.14	13.84	15	34.5	0.96	0.01	0.07	0.2	0.0024	22.7	4.36E-05	109.8	23.75	56.32	30.46	16.71	3
B32E	203.21	13.33	15	42.7	0.9548	0.01	0.07	0.2	0.0024	23.1	4.36E-05	109.4	23.88	58.18	31.37	16.53	3
B32F	667.21	16.88	15	36.5	0.95	0.01	0.07	0.2	0.0020	19.6	4.36E-05	112.8	20.96	42.09	23.38	17.31	3
B32G	967.64	11.90	15	33.4	0.9763	0.01	0.07	0.2	0.0026	25.0	0.0001	107.8	28.43	74.65	42.61	16.22	3
B32H	693.91	12.66	15	30.4	0.9716	0.01	0.07	0.2	0.0025	24.1	4.36E-05	108.4	25.27	63.76	34.17	16.25	4
B32J	322.84	14.30	15	28.7	0.9726	0.01	0.07	0.2	0.0023	22.6	4.36E-05	109.9	23.97	55.44	30.05	16.85	4
B41A	764.48	10.21	12	52.1	0.9738	0.006	0.05	0.001	0.0022	32.6	0.000492	102.5	53.58	120.52	84.81	13.99	2
B41B	778.02	12.11	12	47.7	0.9595	0.006	0.05	0.001	0.0021	33.4	0.000581	94.3	56.92	120.53	86.55	16.34	3
B41C	302.43	14.78	15	45.4	0.9528	0.01	0.07	0.2	0.0023	23.0	0.000121	108.8	27.47	61.91	37.23	17.55	3
B41D	402.92	16.98	15	38.9	0.9403	0.01	0.07	0.2	0.0020	19.3	4.36E-05	113.2	20.48	40.89	22.76	17.32	3
B41E	237.07	22.48	15	33.3	0.9461	0.01	0.07	0.2	0.0015	14.2	4.36E-05	118.3	16.81	24.39	14.63	16.80	4
B41F	379.86	15.45	15	50.0	0.933	0.01	0.07	0.2	0.0022	27.8	0.000466	100.9	46.16	100.32	72.12	20.39	3
B41G	442.14	17.05	15	46.3	0.8989	0.01	0.07	0.2	0.0020	21.6	0.000242	109.1	31.33	62.32	43.01	19.01	3
B41H	410.33	21.64	15	35.0	0.9172	0.01	0.07	0.2	0.0015	14.7	5.18E-05	117.8	17.13	26.12	15.86	17.07	3
B41J	690.82	18.85	15	30.8	0.9109	0.01	0.07	0.2	0.0018	22.5	0.000381	107.1	41.15	73.90	55.52	20.51	4
B41K	635.20	22.12	12	32.2	0.9144	0.006	0.05	0.001	0.0015	32.2	0.001165	90.3	93.99	140.08	118.14	29.38	6
B42A	318.94	14.25	12	61.9	0.9437	0.006	0.05	0.001	0.0020	40.9	0.001165	81.6	84.08	165.87	127.81	22.36	3
B42B	213.75	16.29	12	78.7	0.9245	0.006	0.05	0.001	0.0018	38.1	0.001165	84.4	84.64	155.79	123.33	24.48	2
B42C	164.12	15.09	12	52.7	0.9547	0.006	0.05	0.001	0.0019	40.3	0.001165	82.2	86.17	165.23	128.34	23.27	3
B42D	154.59	15.88	12	104.7	0.8941	0.006	0.05	0.001	0.0019	37.4	0.001165	85.1	80.94	151.07	119.88	24.08	2
B42E	221.45	16.66	12	43.4	0.921	0.006	0.05	0.001	0.0018	37.5	0.001165	85.0	84.76	154.01	122.60	24.84	4
B42F	279.11	15.53	12	55.0	0.9353	0.006	0.05	0.001	0.0019	39.2	0.001165	83.3	84.72	160.06	125.42	23.72	3
B42G	327.26	14.96	12	49.8	0.8909	0.006	0.05	0.001	0.0019	37.9	0.001165	84.6	79.35	152.86	120.36	23.13	3
B42H	412.36	18.33	12	32.0	0.9301	0.006	0.05	0.001	0.0017	36.2	0.001163	86.3	88.17	151.03	122.18	26.35	5
B51A	311.46	21.97	15	25.1	0.9686	0.01	0.07	0.2	0.0015	15.0	4.36E-05	117.5	17.88	26.75	15.85	16.91	5
B51B	591.13	18.61	15	20.3	0.9741	0.01	0.07	0.2	0.0018	18.4	4.36E-05	114.1	20.57	37.45	21.15	17.35	6
B51C	638.08	16.07	15	18.7	0.9781	0.01	0.07	0.2	0.0021	21.0	4.36E-05	111.5	22.77	47.82	26.29	17.23	6
B51E	2926.88	18.06	13	13.0	0.9865	0.02	0.065	0.001	0.0047	19.9	0.00014	161.7	24.38	115.05	68.66	43.88	21
B51F	394.59	19.95	7	23.1	0.9603	0.03	0.06	0	0.0070	36.0	0.000344	119.3	40.27	280.37	159.89	72.87	19
B51G	590.69	19.61	15	13.0	0.9738	0.01	0.07	0.2	0.0017	22.3	0.000313	136.8	45.97	79.03	60.34	19.92	10
B51H	717.34	18.99	15	23.2	0.9653	0.01	0.07	0.2	0.0018	17.9	4.36E-05	114.6	19.96	35.55	20.19	17.33	5
B52A	566.12	19.38	15	9.5	0.9732	0.01	0.07	0.2	0.0017	19.0	0.000132	117.0	27.19	47.35	31.21	18.16	12
B52B	632.91	18.31	15	22.5	0.9491	0.01	0.07	0.2	0.0019	18.2	4.36E-05	114.3	19.82	36.71	20.72	17.35	5
B52C	200.45	16.38	7	22.2	0.959	0.03	0.06	0	0.0082	39.5	0.00035	115.6	42.66	348.53	193.69	69.79	20
B52D	340.98	20.60	12	12.4	0.954	0.006	0.05	0.001	0.0016	25.0	0.000573	102.8	59.48	93.82	75.01	22.15	11
B52E	450.78	19.36	15	18.8	0.9402	0.01	0.07	0.2	0.0017	17.0	4.36E-05	115.5	18.71	32.62	18.68	17.30	6
B52F	118.36	19.49	7	22.9	0.949	0.03	0.06	0	0.0071	36.2	0.000381	117.7	40.34	286.76	164.65	73.00	19
B52G	290.93	21.39	12	19.6	0.9129	0.006	0.05	0.001	0.0015	24.9	0.000691	101.8	64.65	99.06	81.65	23.77	8
B52H	563.27	21.59	7	29.1	0.9327	0.03	0.06	0	0.0064	33.6	0.00039	119.5	38.07	245.51	144.49	73.82	16
B52J	394.74	20.57	12	26.1	0.8955	0.006	0.05	0.001	0.0016	25.7	0.000725	101.2	64.68	102.14	83.95	23.70	6
B60A	209.42	17.19	12	264.0	0.8938	0.006	0.05	0.001	0.0018	36.1	0.001165	86.4	82.71	147.52	118.78	25.34	1
B60B	302.23	19.31	12	223.1	0.9035	0.006	0.05	0.001	0.0017	34.4	0.001139	88.9	86.39	142.85	117.17	26.96	1
B60C	94.11	19.37	12	269.9	0.9247	0.006	0.05	0.001	0.0017	34.9	0.001102	89.6	87.53	144.44	117.85	26.65	1
B60D	243.48	18.28	12	113.0	0.8861	0.006	0.05	0.001	0.0017	34.5	0.001109	89.7	81.93	140.60	114.35	25.82	2
B60E	83.43	15.36	12	107.5	0.8963	0.006	0.05	0.001	0.0019	37.9	0.001165	84.6	80.46	152.92	120.65	23.54	2
B60F	399.34	16.65	12	61.5	0.9225	0.006	0.05	0.001	0.0018	37.7	0.001165	84.8	84.93	154.36	122.77	24.83	3
B60G	448.05	19.38	12	45.1	0.9072	0.006	0.05	0.001	0.0016	34.6	0.001165	87.9	87.73	144.71	118.81	27.27	4
B60H	384.61	18.60	12	50.5	0.8956	0.006	0.05	0.001	0.0017	34.7	0.001163	87.9	85.00	144.23	117.89	26.59	4
B60J	675.88	18.83	19	26.9	0.9605	0.02	0.07	0.2	0.0036	32.4	0.000195	119.4	37.32	134.15	78.28	35.69	8
B71A	297.64	24.19	12	30.9	0.8986	0.006	0.05	0.001	0.0014	28.0	0.001057	95.4	90.97	125.35	107.99	29.45	6
B71B	274.31	27.22	12	22.5	0.8992	0.006	0.05	0.001	0.0012	22.9	0.000896	102.0	87.77	107.38	94.81	28.85	8
B71C	262.46	23.38	19	77.9	0.8603	0.01	0.07	0.2	0.0014	29.5	0.001165	93.0	93.21	128.12	110.68	29.69	3
B71D	227.16	20.56	12	42.5	0.8881	0.006	0.05	0.001	0.0016	32.8	0.001165	89.7	87.89	138.87	115.83	28.22	5
B71E	781.95	21.55	15	26.7	0.9315	0.01	0.07	0.2	0.0015	21.1	0.00042	108.1	47.21	72.40	57.36	21.06	5
B71F	540.77	17.48	12	61.0	0.8784	0.006	0.05	0.001	0.0018	35.2	0.001165	87.3	81.55	143.97	116.64	25.62	3

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
B71G	244.95	20.48	12	66.5	0.8817	0.006	0.05	0.001	0.0016	32.4	0.001125	91.4	85.71	135.83	113.23	27.74	3
B71H	329.68	18.44	19	34.5	0.9492	0.01	0.07	0.2	0.0018	32.7	0.000239	117.8	45.56	83.76	55.24	19.15	4
B71J	78.49	17.68	19	8.8	0.9784	0.01	0.07	0.2	0.0019	34.1	0.000172	118.4	43.77	84.02	51.96	18.49	13
B72A	534.06	17.56	19	53.4	0.9449	0.01	0.07	0.2	0.0019	33.5	0.000303	114.4	48.60	93.93	63.34	19.63	3
B72B	331.72	20.41	19	10.1	0.9822	0.01	0.07	0.2	0.0016	31.5	0.000172	121.0	43.38	71.18	45.80	18.49	11
B72C	334.73	19.28	19	11.2	0.9816	0.01	0.07	0.2	0.0018	32.6	0.000172	119.9	43.54	76.28	48.25	18.54	10
B72D	922.25	23.13	19	6.4	0.9841	0.01	0.07	0.2	0.0014	28.9	0.000172	123.6	43.41	60.56	40.73	18.13	17
B72E	320.09	16.20	19	58.0	0.9484	0.01	0.07	0.2	0.0021	35.7	0.000452	108.3	56.12	117.06	81.76	20.55	3
B72F	81.21	15.35	19	77.9	0.8765	0.01	0.07	0.2	0.0022	36.3	0.000964	92.3	67.52	147.51	112.74	24.17	2
B72G	47.90	16.53	19	32.0	0.982	0.01	0.07	0.2	0.0020	35.2	0.000172	117.3	44.26	90.62	55.20	18.34	4
B72H	385.68	20.51	19	20.2	0.9843	0.01	0.07	0.2	0.0016	31.5	0.000172	121.0	43.54	71.01	45.74	18.49	6
B72J	537.38	20.23	19	18.1	0.9797	0.01	0.07	0.2	0.0017	31.6	0.000172	120.9	43.25	71.70	46.03	18.51	7
B72K	965.91	19.26	19	8.9	0.9854	0.01	0.07	0.2	0.0018	32.8	0.000172	119.7	43.85	76.90	48.58	18.54	13
B73A	164.47	19.19	19	104.7	0.9357	0.01	0.07	0.2	0.0018	31.3	0.000245	119.0	44.80	78.90	53.08	19.24	2
B73B	687.70	24.20	19	8.1	0.9873	0.01	0.07	0.2	0.0013	27.9	0.000172	124.5	43.74	57.21	39.17	17.91	13
B73C	879.99	16.70	19	11.4	0.9842	0.01	0.07	0.2	0.0020	35.2	0.000172	117.3	44.45	90.14	54.98	18.37	10
B73D	687.05	20.05	19	11.5	0.9857	0.01	0.07	0.2	0.0017	32.0	0.000172	120.8	43.73	73.26	46.86	18.52	10
B73E	430.55	25.63	19	18.9	0.986	0.01	0.07	0.2	0.0012	26.5	0.000172	126.0	43.93	52.65	37.00	17.56	6
B73F	506.78	18.37	19	17.4	0.9854	0.01	0.07	0.2	0.0018	34.4	0.000185	114.6	45.26	83.54	52.23	18.65	7
B73G	733.21	15.04	20	13.2	0.9837	0.01	0.06	0.2	0.0025	39.8	0.000224	97.8	47.74	119.01	70.27	20.43	10
B73H	301.82	15.94	20	7.4	0.984	0.01	0.06	0.2	0.0024	41.1	0.000259	86.4	49.64	118.80	70.39	21.14	18
B73J	253.39	17.86	20	8.5	0.9811	0.01	0.06	0.2	0.0022	39.2	0.000259	88.3	48.65	106.55	64.48	21.87	16
B81A	169.07	27.16	19	199.2	0.9348	0.03	0.07	0.2	0.0033	23.8	0.000194	128.3	29.37	96.07	59.67	47.04	2
B81B	481.25	22.31	19	162.6	0.9088	0.03	0.07	0.2	0.0044	27.8	0.00025	121.7	31.57	138.83	83.23	51.84	2
B81C	208.40	19.80	19	51.6	0.9575	0.03	0.07	0.2	0.0051	31.3	0.000172	121.2	33.85	172.60	96.27	52.18	7
B81D	478.80	19.09	19	56.6	0.9213	0.03	0.07	0.2	0.0053	31.7	0.00037	114.9	36.52	194.08	116.60	54.24	6
B81E	664.92	18.78	19	29.8	0.9677	0.03	0.07	0.2	0.0054	32.6	0.000172	119.9	35.25	190.69	105.31	52.40	11
B81F	1199.72	17.36	19	14.9	0.9844	0.03	0.07	0.2	0.0059	34.6	0.000172	117.9	37.45	219.56	119.75	52.38	22
B81G	512.46	17.75	19	26.8	0.9658	0.03	0.07	0.2	0.0057	33.6	0.000172	118.9	35.86	205.75	112.74	52.43	12
B81H	667.71	18.51	19	10.0	0.9878	0.03	0.07	0.2	0.0055	33.6	0.000172	118.9	36.83	202.28	111.23	52.42	32
B81J	567.00	15.89	19	12.6	0.9882	0.03	0.07	0.2	0.0064	36.2	0.000172	116.3	38.85	247.26	133.51	51.92	25
B82A	466.58	22.00	19	35.8	0.9353	0.03	0.07	0.2	0.0045	28.6	0.000174	124.1	31.28	140.15	80.18	51.20	9
B82B	406.35	21.09	19	43.3	0.9422	0.03	0.07	0.2	0.0047	29.4	0.000172	123.1	31.89	150.79	85.36	51.67	8
B82C	299.67	18.32	19	42.8	0.9478	0.03	0.07	0.2	0.0056	32.4	0.000172	120.1	34.19	189.85	104.71	52.44	8
B82D	631.69	22.52	19	22.0	0.9739	0.03	0.07	0.2	0.0043	29.2	0.000172	123.3	33.22	144.29	82.47	50.84	14
B82E	423.37	23.82	19	26.1	0.9652	0.03	0.07	0.2	0.0040	27.8	0.000174	124.8	32.02	128.60	74.77	49.90	12
B82F	759.81	22.48	19	29.6	0.9682	0.03	0.07	0.2	0.0044	29.1	0.000172	123.4	32.87	143.07	81.80	50.86	11
B82G	920.15	18.48	19	12.0	0.9841	0.03	0.07	0.2	0.0055	33.5	0.000172	119.0	36.60	201.41	110.76	52.43	27
B82H	748.66	18.41	19	10.8	0.9874	0.03	0.07	0.2	0.0055	33.7	0.000172	118.8	36.88	203.76	111.96	52.43	30
B82J	793.75	14.88	19	15.2	0.9909	0.03	0.07	0.2	0.0067	37.3	0.000172	115.2	39.87	268.19	143.90	51.31	21
B83A	1250.02	13.20	19	13.9	0.9878	0.03	0.07	0.2	0.0074	38.9	0.000174	113.1	41.07	302.18	160.78	49.72	22
B83B	438.79	10.65	19	20.7	0.9926	0.03	0.07	0.2	0.0084	43.0	0.000196	102.6	45.02	377.97	198.96	45.74	14
B83C	596.01	11.96	20	14.0	0.9889	0.03	0.06	0.2	0.0086	44.5	0.000246	86.6	46.46	397.95	209.50	52.67	24
B83D	783.71	14.30	20	18.1	0.9844	0.03	0.06	0.2	0.0077	41.1	0.000231	94.5	43.22	334.12	177.78	56.93	21
B83E	311.81	16.17	20	15.5	0.9767	0.03	0.06	0.2	0.0071	40.6	0.000259	86.9	42.71	303.39	162.67	59.54	26
B90A	692.17	16.26	20	10.6	0.9864	0.03	0.06	0.2	0.0071	36.9	0.000246	92.7	39.61	280.26	151.36	59.52	35
B90B	753.47	16.83	19	11.3	0.9897	0.03	0.07	0.2	0.0060	30.9	0.00018	116.6	34.01	205.47	113.11	52.34	28
B90C	534.24	15.58	19	11.8	0.9901	0.03	0.07	0.2	0.0065	36.5	0.000172	116.0	39.23	254.03	136.88	51.76	27
B90D	446.44	13.44	19	10.2	0.9907	0.03	0.07	0.2	0.0073	38.3	0.000199	105.4	40.85	296.79	158.79	50.17	29
B90E	472.56	16.05	20	9.5	0.9922	0.03	0.06	0.2	0.0071	41.3	0.000259	86.2	44.11	315.11	168.61	59.41	38
B90F	817.85	17.66	19	13.9	0.9895	0.03	0.07	0.2	0.0058	34.5	0.000172	118.0	37.61	216.78	118.42	52.42	23
B90G	697.27	10.92	19	18.2	0.9902	0.03	0.07	0.2	0.0083	42.9	0.000201	101.1	44.94	372.09	196.12	46.32	16
B90H	887.49	12.19	20	17.2	0.9918	0.03	0.06	0.2	0.0085	45.2	0.000259	82.3	47.27	400.76	210.94	53.27	19
C11A	719.41	10.68	28	51.8	0.982	0.015	0.08	0.1	0.0042	16.5	0.000101	156.0	19.94	83.15	49.34	22.81	3
C11B	534.66	8.80	28	47.6	0.9802	0.015	0.08	0.1	0.0046	18.3	0.000101	154.1	21.27	98.64	56.98	20.85	3
C11C	448.76	9.89	28	45.1	0.9743	0.015	0.08	0.1	0.0044	17.2	0.000101	155.3	20.24	88.29	51.82	22.08	3
C11D	371.74	7.95	28	42.1	0.9722	0.015	0.08	0.1	0.0049	19.0	0.000101	153.5	21.58	104.83	59.99	19.72	3
C11E	1154.73	9.96	28	35.4	0.9778	0.015	0.08	0.1	0.0043	17.1	0.000101	155.4	20.31	88.28	51.84	22.15	4
C11F	929.07	9.24	28	38.0	0.9779	0.015	0.08	0.1	0.0045	17.9	0.000101	154.6	20.85	94.37	54.86	21.38	4
C11G	431.72	9.46	28	34.8	0.9796	0.015	0.08	0.1	0.0045	17.7	0.000101	154.8	20.75	92.73	54.06	21.63	4
C11H	1102.82	8.01	28	30.7	0.9846	0.015	0.08	0.1	0.0048	19.2	0.000101	153.3	22.05	106.77	61.04	19.81	4
C11J	1000.59	9.34	28	30.5	0.9801	0.015	0.08	0.1	0.0045	17.8	0.000101	154.7	20.86	93.90	54.64	21.49	5
C11K	339.96	7.61	28	28.2	0.9894	0.015	0.08	0.1	0.0049	19.7	0.000101	152.8	22.58	111.72	63.53	19.21	5
C11L	946.92	8.61	28	27.7	0.9858	0.015	0.08	0.1	0.0047	18.6	0.000101	153.9	21.65	101.47	58.43	20.61	5
C11M	795.22	9.55	28	21.9	0.9875	0.015	0.08	0.1	0.0044	17.7	0.000101	154.8	20.98	93.32	54.41	21.72	6
C12A	484.08	11.04	28	17.1	0.9817	0.015	0.08	0.1	0.0041	16.2	0.000101	156.3	19.68	80.38	47.98	23.10	9
C12B	478.42	9.58	28	23.3	0.985	0.015	0.08	0.1	0.0044	17.7	0.000101	154.8	20.87	92.65	54.06	21.76	6
C12C	665.58	9.72	28	21.2	0.9827	0.015	0.08	0.1	0.0044	17.5	0.000101	155.0	20.67	91.04	53.25	21.91	7
C12D	898.36	7.83	28	30.5	0.9857	0.015	0.08	0.1	0.0049	19.4	0.000101	153.1	22.24	108.71	62.01	19.55	4
C12E	497.29	7.93	28	28.4	0.9908	0.015	0.08	0.1	0.0049	19.4	0.000101	153.1	22.37	108.79	62.09	19.69	5
C12F	834.13	6.63	28	30.1	0.9805	0.015	0.08	0.1	0.0052	21.8	0.000122	151.2	24.83	129.41	73.79	17.69	4
C12G	570.41	8.05	28	32.4	0.9741	0.015	0.08	0.1	0.0048	29.5	0.000271	147.1	36.79	177.80	108.29	20.53	4
C12H	355.11	8.87	28	25.2	0.979	0.015	0.08	0.1	0.0046	22.6	0.000171	151.4	27.62	127.60	76.45	21.25	5
C12J	344.26	9.93	28	21.0	0.9876	0.015	0.08	0.1	0.0044	17.4	0.000101	155.1	20.71	90.14	52.84	22.12	7
C12K	478.73	8.97	28	37.8	0.9792	0.015	0.08	0.1	0.0046	25.7	0.000221	149.4	32.16	147.75	90.02	21.60	4
C12L	886.48	9.46	28	30.7	0.9824	0.015	0.08	0.1	0.0045	22.1	0.000171	151.9	27.43	122.61	74.07	21.96	5
C13A	593.53	12.06	28	40.6	0.9639	0.015	0.08	0.1	0.0038	15.0	0.000101	156.4	18.44	70.96	43.12	23.80	4
C13B	615.02	9.91	28	29.3	0.9716	0.015	0.08	0.1	0.0044	17.1	0.000101	155.4	20.12	87.65	51.49	22.10	5
C13C	836.17	13.74	28	38.7	0.9503	0.015	0.08	0.1	0.0035	13.2	0.000101	159.1	16.95	58.89	37.11	24.57	4

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
C13D	894.59	10.95	28	30.1	0.9668	0.015	0.08	0.1	0.0041	16.1	0.000101	156.1	19.29	79.19	47.25	23.04	5
C13E	602.15	12.25	28	30.0	0.9628	0.015	0.08	0.1	0.0038	14.7	0.000101	157.8	18.21	69.27	42.34	23.91	5
C13F	610.58	10.87	28	23.8	0.9733	0.015	0.08	0.1	0.0041	16.2	0.000101	156.3	19.49	80.38	47.91	22.97	6
C13G	434.02	11.66	28	25.4	0.9717	0.015	0.08	0.1	0.0039	15.4	0.000101	157.1	18.88	74.34	44.91	23.55	6
C13H	588.39	12.03	28	18.0	0.9799	0.015	0.08	0.1	0.0039	15.2	0.000101	157.3	18.92	72.91	44.27	23.79	8
C21A	706.61	8.38	28	32.7	0.9862	0.015	0.08	0.1	0.0047	19.2	0.000107	153.4	22.39	106.25	61.24	20.34	4
C21B	430.57	9.51	9	43.6	0.9711	0.03	0.07	0.5	0.0071	37.2	0.000414	142.1	44.11	314.45	185.79	35.87	5
C21C	437.85	10.07	28	42.8	0.9749	0.015	0.08	0.1	0.0043	30.8	0.000321	146.5	40.60	175.29	110.54	23.37	4
C21D	445.83	16.68	10	39.2	0.9829	0.08	0.045	0.0001	0.0257	21.6	0.00219	188.2	37.02	949.83	677.42	232.23	36
C21E	628.23	14.90	28	34.8	0.9862	0.015	0.08	0.1	0.0032	17.8	0.000932	168.7	65.45	211.58	183.27	31.03	6
C21F	426.56	11.15	9	43.5	0.9699	0.03	0.07	0.5	0.0065	41.8	0.000512	139.6	51.18	333.88	201.63	39.23	6
C21G	462.44	11.92	17	40.0	0.9726	0.03	0.05	0.1	0.0100	41.7	0.000521	139.9	47.66	475.71	273.30	62.60	10
C22A	548.41	21.05	10	46.0	0.9826	0.08	0.045	0.0001	0.0224	35.8	0.000562	146.7	38.80	867.41	474.19	241.21	32
C22B	391.46	13.43	10	40.7	0.9831	0.08	0.045	0.0001	0.0283	37.7	0.000474	142.9	39.44	1115.11	590.86	192.96	29
C22C	465.20	11.27	10	42.9	0.9782	0.08	0.045	0.0001	0.0301	38.6	0.000459	141.5	39.89	1199.60	631.54	171.98	24
C22D	345.21	18.84	10	40.9	0.971	0.08	0.045	0.0001	0.0240	37.6	0.000562	144.9	39.77	954.09	516.58	231.28	34
C22E	532.14	15.70	10	43.3	0.979	0.08	0.045	0.0001	0.0264	38.2	0.000519	143.4	40.15	1061.01	566.96	211.55	30
C22F	440.17	12.53	28	35.5	0.9852	0.015	0.08	0.1	0.0037	26.4	0.000283	150.5	37.20	139.13	90.58	25.20	5
C22G	830.36	15.49	28	25.1	0.991	0.015	0.08	0.1	0.0031	12.3	0.000108	160.3	17.66	55.00	36.04	24.96	6
C22H	454.15	21.06	17	39.9	0.9839	0.03	0.05	0.1	0.0072	35.9	0.000562	146.6	46.56	335.21	208.13	81.72	13
C22J	668.74	16.77	17	42.1	0.9887	0.03	0.05	0.1	0.0084	40.0	0.000558	142.6	48.88	412.46	245.53	75.41	11
C22K	433.81	12.77	28	38.5	0.9906	0.015	0.08	0.1	0.0037	18.5	0.000162	155.3	25.12	92.58	58.78	24.57	4
C23A	257.97	15.43	28	22.4	0.9938	0.015	0.08	0.1	0.0031	12.0	0.000101	160.5	17.09	53.44	34.81	24.91	7
C23B	701.09	11.93	28	36.1	0.9869	0.015	0.08	0.1	0.0039	26.2	0.000272	150.0	36.28	140.64	90.45	24.74	5
C23C	1068.67	11.23	17	39.7	0.9748	0.03	0.05	0.1	0.0102	43.9	0.000543	138.2	49.97	510.41	291.81	60.39	10
C23D	510.12	32.72	10	50.0	0.9857	0.08	0.045	0.0001	0.0149	24.4	0.000562	157.9	29.93	446.75	267.10	253.40	31
C23E	849.94	36.35	10	38.8	0.9871	0.08	0.045	0.0001	0.0130	18.9	0.001371	178.3	37.14	484.44	362.85	261.99	41
C23F	1323.66	30.17	10	43.2	0.9877	0.08	0.045	0.0001	0.0164	17.5	0.002532	214.8	50.15	820.79	678.94	285.14	40
C23G	613.09	18.14	10	42.7	0.9859	0.08	0.045	0.0001	0.0245	38.8	0.000592	144.2	41.64	1021.17	552.65	227.79	32
C23H	451.23	13.89	10	44.7	0.9867	0.08	0.045	0.0001	0.0279	43.0	0.000562	139.5	45.23	1261.43	669.37	197.63	27
C23J	890.33	16.63	17	39.8	0.9815	0.03	0.05	0.1	0.0085	40.2	0.000562	142.2	48.66	412.63	245.53	75.17	12
C23K	395.95	12.17	17	44.6	0.9848	0.03	0.05	0.1	0.0099	44.6	0.000562	137.9	51.65	511.27	293.77	63.66	9
C23L	1211.04	15.89	17	38.4	0.9827	0.03	0.05	0.1	0.0087	40.9	0.000562	141.6	49.19	428.22	253.19	73.64	12
C24A	838.96	16.49	10	34.7	0.9864	0.08	0.045	0.0001	0.0258	40.4	0.000562	142.1	42.95	1108.09	593.40	217.41	38
C24B	529.58	19.75	30	25.9	0.9906	0.02	0.07	0.0001	0.0040	25.4	0.000373	168.4	40.63	163.01	112.59	43.30	10
C24C	1349.85	26.30	10	39.7	0.9879	0.08	0.045	0.0001	0.0188	20.6	0.003656	224.1	63.47	1190.58	999.97	294.69	45
C24D	364.26	15.25	17	44.0	0.9838	0.03	0.05	0.1	0.0089	31.6	0.000512	136.9	38.81	345.62	207.25	71.80	10
C24E	925.39	14.32	17	30.9	0.9868	0.03	0.05	0.1	0.0092	29.8	0.001583	156.5	55.94	514.55	379.50	77.20	16
C24F	2019.90	13.07	18	27.0	0.9893	0.01	0.1	0.0001	0.0021	20.4	0.002048	162.3	174.56	371.91	350.37	27.30	7
C24G	985.26	11.30	17	28.6	0.9864	0.03	0.05	0.1	0.0102	27.3	0.000303	126.1	30.62	311.96	174.85	59.28	13
C24H	839.77	13.05	18	29.8	0.9847	0.01	0.1	0.0001	0.0021	24.0	0.000282	127.8	40.31	85.98	60.74	15.76	4
C24J	2109.42	11.18	30	32.6	0.991	0.02	0.07	0.0001	0.0063	16.2	0.000117	157.8	18.96	119.01	68.65	35.72	7
C25A	863.45	10.24	18	30.6	0.9916	0.01	0.1	0.0001	0.0026	12.6	7.69E-05	119.8	15.90	42.02	25.58	13.92	3
C25B	1887.67	26.22	30	20.9	0.994	0.02	0.07	0.0001	0.0028	5.0	8.78E-05	205.9	11.51	31.68	24.83	37.23	11
C25C	1209.65	12.92	30	29.6	0.9917	0.02	0.07	0.0001	0.0058	13.7	8.66E-05	185.7	16.36	94.28	55.12	37.78	8
C25D	1202.46	12.25	18	22.7	0.9902	0.01	0.1	0.0001	0.0023	11.1	7.73E-05	133.3	15.53	35.28	22.75	14.38	4
C25E	1536.10	11.27	18	18.1	0.9929	0.01	0.1	0.0001	0.0024	11.8	7.64E-05	127.1	15.67	38.34	23.99	14.22	5
C25F	2218.25	14.88	30	15.5	0.9929	0.02	0.07	0.0001	0.0052	12.3	8.79E-05	194.7	15.49	80.82	48.90	39.47	16
C31A	1402.24	16.81	10	24.9	0.99	0.08	0.045	0.0001	0.0256	21.2	0.00327	191.0	45.16	1154.13	886.27	242.23	59
C31B	1742.95	10.69	18	22.0	0.9932	0.01	0.1	0.0001	0.0026	13.6	0.000466	124.3	36.06	92.16	74.86	16.16	5
C31C	1635.12	11.93	18	21.6	0.9922	0.01	0.1	0.0001	0.0023	10.5	7.45E-05	117.0	14.12	32.88	20.76	14.33	4
C31D	1493.27	11.05	18	21.9	0.9941	0.01	0.1	0.0001	0.0025	15.2	0.000343	123.2	32.00	79.64	60.80	15.64	5
C31E	2958.11	12.89	18	17.1	0.9935	0.01	0.1	0.0001	0.0022	11.0	7.53E-05	118.7	15.09	32.60	20.74	14.41	6
C31F	1787.16	18.15	18	12.6	0.9903	0.01	0.1	0.0001	0.0014	4.8	7.32E-05	123.6	11.19	15.67	12.31	13.37	7
C32A	1403.35	18.52	18	12.4	0.993	0.01	0.1	0.0001	0.0014	27.1	8.21E-05	136.2	35.07	47.56	29.33	13.32	7
C32B	2997.30	18.90	18	13.6	0.9918	0.01	0.1	0.0001	0.0013	43.1	0.000325	137.7	76.46	100.40	72.35	15.47	7
C32C	1657.01	15.94	18	13.7	0.9919	0.01	0.1	0.0001	0.0017	9.8	6.65E-05	123.7	14.54	24.55	16.36	13.99	7
C32D	4133.91	14.93	24	17.1	0.991	0.03	0.03	0.0001	0.0117	51.1	0.000822	120.4	59.07	690.91	394.51	93.44	33
C33A	2855.22	12.66	24	14.0	0.9927	0.03	0.03	0.0001	0.0122	41.8	0.000631	118.3	47.60	580.01	327.05	81.13	35
C33B	2830.55	9.75	24	15.6	0.9938	0.03	0.03	0.0001	0.0128	56.4	0.000903	112.8	63.92	819.58	460.36	66.88	26
C33C	4140.95	12.51	24	12.1	0.9906	0.03	0.03	0.0001	0.0122	56.2	0.000981	114.3	64.79	791.64	451.39	82.55	41
C41A	1077.74	16.87	33	22.4	0.9806	0.008	0.09	0.0001	0.0014	20.2	4.17E-05	95.3	22.55	32.43	18.16	12.48	4
C41B	1004.81	15.70	33	25.8	0.9756	0.008	0.09	0.0001	0.0016	21.3	5.32E-05	96.4	23.95	37.52	21.26	12.71	3
C41C	1094.65	14.83	33	25.6	0.9778	0.008	0.09	0.0001	0.0017	22.2	3.62E-05	92.3	23.66	39.44	21.35	12.63	3
C41D	1154.57	14.03	33	15.7	0.9861	0.008	0.09	0.0001	0.0018	23.1	2.57E-05	89.4	24.10	42.51	22.39	12.56	5
C41E	391.29	18.33	32	8.6	0.9867	0.02	0.07	0.001	0.0043	18.9	2.57E-05	93.6	19.21	83.33	42.85	39.99	29
C41F	555.47	19.09	32	5.8	0.988	0.02	0.07	0.001	0.0042	16.3	3.79E-05	115.5	17.12	71.19	37.76	40.06	42
C41G	271.78	21.02	32	6.1	0.9873	0.02	0.07	0.001	0.0037	16.1	2.71E-05	98.7	16.56	61.79	32.22	39.51	39
C41H	887.38	20.79	30	11.2	0.99	0.02	0.07	0.0001	0.0038	8.3	7.83E-05	187.4	12.06	45.62	30.07	40.15	22
C41J	555.49	12.63	30	14.5	0.9913	0.02	0.07	0.0001	0.0058	17.5	7.16E-05	167.7	19.34	113.05	62.47	37.37	16
C42A	694.70	15.75	33	31.1	0.9716	0.008	0.09	0.0001	0.0016	21.1	8.11E-05	102.0	25.66	40.04	24.03	12.93	3
C42B	726.48	16.10	33	21.7	0.9783	0.008	0.09	0.0001	0.0015	20.9	3.81E-05	93.9	22.79	34.68	19.09	12.55	4
C42C	793.34	18.75	33	24.1	0.9784	0.008	0.09	0.0001	0.0012	18.3	4.05E-05	97.0	21.01	26.25	15.05	12.09	3
C42D	662.51	19.72	32	12.1	0.9832	0.02	0.07	0.001	0.0040	17.5	2.57E-05	95.0	17.78	71.39	36.90	39.85	20
C42E	750.37	17.13	32	15.9	0.9843	0.02	0.07	0.001	0.0046	20.0	2.7E-05	92.7	20.26	93.79	48.12	39.88	16
C42F	733.70	19.36	32	9.8	0.9857	0.02	0.07	0.001	0.0041	17.9	2.57E-05	94.5	18.21	74.63	38.51	39.91	25
C42G	555.01	24.25	32	7.6	0.9854	0.02	0.07	0.001	0.0031	13.3	2.57E-05	99.0	13.89	42.98	22.74	37.82	33
C42H	445.00	32.94	32	7.0	0.9881	0.02	0.07	0.001	0.0018	7.5	2.57E-05	105.3	8.89	16.11	9.40	30.26	26
C42J	1013.93	36.65	32	9.7	0.9914	0.02	0.07	0.001	0.0014	4.2	2.98E-05	114.8	6.50	9.28	6.34	26.69	17

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
C42K	668.01	39.30	32	6.1	0.9896	0.02	0.07	0.001	0.0012	2.7	2.98E-05	116.2	5.57	6.68	5.05	24.16	25
C42L	510.84	23.03	32	8.3	0.9935	0.02	0.07	0.001	0.0033	9.4	6.21E-05	158.0	12.26	40.73	25.24	38.98	28
C43A	1490.74	14.82	30	9.8	0.9931	0.02	0.07	0.0001	0.0052	12.5	8.85E-05	199.2	15.80	82.68	50.10	39.43	25
C43B	723.34	25.92	30	8.3	0.9946	0.02	0.07	0.0001	0.0028	4.6	8.59E-05	202.7	10.80	30.26	23.80	37.43	28
C43C	912.51	14.73	30	13.6	0.9932	0.02	0.07	0.0001	0.0053	12.7	8.88E-05	199.8	15.95	83.84	50.73	39.38	18
C43D	1475.43	15.73	30	11.4	0.9928	0.02	0.07	0.0001	0.0050	11.7	8.88E-05	200.8	15.15	75.64	46.68	39.95	22
C51A	675.15	9.58	34	11.9	0.9862	0.01	0.06	0.0001	0.0036	27.5	2.57E-05	85.0	27.75	99.94	51.05	17.37	9
C51B	1691.22	9.83	34	12.2	0.9809	0.01	0.06	0.0001	0.0036	27.1	2.57E-05	85.4	27.22	97.08	49.62	17.66	9
C51C	623.91	10.14	34	7.8	0.9901	0.01	0.06	0.0001	0.0035	27.1	2.57E-05	85.4	27.44	96.73	49.45	17.99	14
C51D	921.57	13.61	34	11.7	0.9873	0.01	0.06	0.0001	0.0031	23.6	2.57E-05	88.9	24.02	73.60	37.93	21.03	11
C51E	806.02	12.59	34	7.5	0.9888	0.01	0.06	0.0001	0.0032	24.6	2.57E-05	87.7	25.05	80.07	41.15	20.29	16
C51F	876.14	11.76	31	6.2	0.987	0.008	0.1	0.0001	0.0019	19.4	3.85E-05	101.2	21.15	39.90	21.87	11.32	11
C51G	1834.50	6.31	34	12.8	0.9862	0.01	0.06	0.0001	0.0041	30.6	2.6E-05	82.0	30.74	124.96	63.53	12.90	7
C51H	1780.86	10.22	31	8.3	0.9827	0.008	0.1	0.0001	0.0021	17.5	4.54E-05	107.7	19.46	41.21	23.00	11.05	8
C51J	1050.85	14.75	31	9.2	0.9856	0.008	0.1	0.0001	0.0015	10.0	5.2E-05	119.4	13.92	20.75	13.43	11.37	8
C51K	3627.87	11.81	31	9.5	0.9908	0.008	0.1	0.0001	0.0019	11.5	5.53E-05	122.5	14.95	28.08	17.40	11.42	8
C51L	2029.25	17.46	29	8.6	0.99	0.008	0.08	0.0001	0.0016	22.8	2.65E-05	138.6	24.82	39.39	21.51	14.08	10
C51M	1517.64	23.32	29	6.5	0.9906	0.008	0.08	0.0001	0.0011	12.6	3.52E-05	140.3	17.05	18.28	11.58	12.91	12
C52A	936.71	12.28	34	16.7	0.9817	0.01	0.06	0.0001	0.0032	24.8	2.57E-05	87.7	24.99	80.89	41.56	20.04	8
C52B	949.36	13.12	34	20.6	0.9807	0.01	0.06	0.0001	0.0031	23.9	2.57E-05	88.6	24.18	75.63	38.93	20.68	7
C52C	600.32	12.36	34	15.2	0.9818	0.01	0.06	0.0001	0.0032	24.7	2.57E-05	87.8	24.94	80.48	41.35	20.10	8
C52D	471.27	15.75	34	15.5	0.9859	0.01	0.06	0.0001	0.0028	21.4	2.57E-05	91.1	21.96	61.46	31.89	22.24	9
C52E	897.08	16.21	34	5.9	0.9857	0.01	0.06	0.0001	0.0027	20.3	2.72E-05	93.1	20.92	57.39	29.94	22.46	23
C52F	687.77	17.41	34	14.1	0.9845	0.01	0.06	0.0001	0.0026	19.7	2.6E-05	93.0	20.29	52.80	27.59	22.88	10
C52G	1788.59	18.23	31	9.3	0.9892	0.008	0.1	0.0001	0.0011	8.0	4.91E-05	119.7	13.10	14.58	10.20	10.59	7
C52H	2372.87	16.36	31	8.4	0.9913	0.008	0.1	0.0001	0.0013	7.0	5.51E-05	124.6	12.20	15.90	11.36	11.12	8
C52J	1922.35	15.76	31	14.1	0.9902	0.008	0.1	0.0001	0.0014	12.8	4.41E-05	111.5	16.20	22.21	13.54	11.15	5
C52K	4330.64	14.20	31	8.4	0.992	0.008	0.1	0.0001	0.0016	8.8	5.57E-05	123.2	13.15	20.48	13.65	11.45	9
C52L	2403.89	14.85	31	9.5	0.9915	0.008	0.1	0.0001	0.0015	8.8	5.48E-05	125.8	13.37	19.75	13.29	11.38	8
C60A	859.40	13.88	31	30.1	0.979	0.008	0.1	0.0001	0.0016	23.0	7.21E-05	98.6	26.90	42.97	24.97	11.59	3
C60B	1021.66	12.36	32	27.1	0.9824	0.02	0.07	0.001	0.0059	24.6	2.71E-05	88.6	24.57	145.51	73.94	36.76	9
C60C	1047.43	14.21	32	18.6	0.9851	0.02	0.07	0.001	0.0054	22.9	2.64E-05	90.2	22.95	123.88	63.11	38.52	13
C60D	644.71	15.39	32	15.3	0.9871	0.02	0.07	0.001	0.0051	21.7	2.69E-05	91.8	21.88	111.07	56.75	39.27	16
C60E	663.91	15.09	32	16.0	0.986	0.02	0.07	0.001	0.0052	22.1	2.57E-05	90.4	22.23	114.62	58.46	39.11	15
C60F	659.14	17.61	32	13.0	0.9871	0.02	0.07	0.001	0.0045	19.6	2.63E-05	93.8	19.84	89.52	45.98	39.95	19
C60G	781.60	21.39	30	12.4	0.9891	0.02	0.07	0.0001	0.0037	8.6	7.29E-05	176.6	11.98	43.79	28.26	39.89	20
C60H	1232.02	32.19	30	10.2	0.993	0.02	0.07	0.0001	0.0019	1.7	7.56E-05	189.8	9.19	17.47	15.86	31.82	19
C60J	958.94	20.56	30	25.4	0.9907	0.02	0.07	0.0001	0.0038	7.3	8.88E-05	205.2	11.96	45.84	31.95	40.32	10
C70A	612.49	10.56	32	29.4	0.985	0.02	0.07	0.001	0.0065	16.7	0.000101	155.8	18.84	121.73	68.65	34.64	7
C70B	659.76	12.95	32	22.8	0.9839	0.02	0.07	0.001	0.0058	14.3	0.000101	158.2	16.83	96.78	56.28	37.89	10
C70C	886.93	14.01	30	21.8	0.9874	0.02	0.07	0.0001	0.0055	13.3	0.000101	159.1	16.08	87.72	51.83	38.92	11
C70D	674.60	12.48	30	19.6	0.9873	0.02	0.07	0.0001	0.0059	14.8	0.000101	157.7	17.32	102.02	58.91	37.39	12
C70E	692.85	10.47	30	27.6	0.9922	0.02	0.07	0.0001	0.0065	32.5	0.000343	145.2	39.81	258.45	153.90	35.77	8
C70F	564.34	11.88	30	24.1	0.9905	0.02	0.07	0.0001	0.0061	20.2	0.000174	153.9	24.38	147.92	87.26	37.07	10
C70G	901.20	13.15	30	23.4	0.9904	0.02	0.07	0.0001	0.0057	14.4	9.96E-05	156.6	17.02	96.94	56.20	38.12	10
C70H	250.58	14.22	30	22.6	0.9904	0.02	0.07	0.0001	0.0054	15.1	0.000131	158.2	18.78	101.38	60.99	39.30	11
C70J	520.65	12.79	17	29.7	0.9893	0.03	0.05	0.1	0.0097	39.2	0.000482	146.3	45.94	445.28	257.50	65.08	14
C70K	890.64	15.06	30	26.8	0.9935	0.02	0.07	0.0001	0.0052	19.0	0.000196	180.0	25.65	132.57	83.84	40.40	10
C81A	381.91	12.09	33	55.3	0.9475	0.008	0.09	0.0001	0.0020	14.9	0.000101	157.0	21.56	43.48	29.28	12.80	2
C81B	575.47	15.36	33	41.5	0.9568	0.008	0.09	0.0001	0.0016	11.6	0.000101	160.8	20.86	33.49	24.55	13.11	2
C81C	249.74	17.41	33	35.0	0.9532	0.008	0.09	0.0001	0.0014	9.7	0.000101	162.5	20.61	28.48	22.09	12.91	3
C81D	194.78	17.93	33	37.9	0.943	0.008	0.09	0.0001	0.0013	13.1	0.000115	142.2	23.92	31.77	23.58	12.94	3
C81E	642.42	15.54	33	29.0	0.9663	0.008	0.09	0.0001	0.0016	11.6	0.000101	160.9	21.14	33.48	24.63	13.10	3
C81F	688.04	16.05	33	68.3	0.9141	0.008	0.09	0.0001	0.0015	16.3	0.00012	123.5	23.80	36.35	24.95	13.22	2
C81G	434.48	14.27	33	42.1	0.9465	0.008	0.09	0.0001	0.0017	16.2	0.000114	140.6	24.01	41.64	28.38	13.19	2
C81H	357.85	13.08	33	29.2	0.971	0.008	0.09	0.0001	0.0019	14.9	0.000105	153.5	22.79	42.94	29.26	13.01	3
C81J	391.57	13.04	33	27.2	0.9804	0.008	0.09	0.0001	0.0019	14.2	0.000102	158.2	22.26	42.06	28.90	12.98	3
C81K	359.06	14.28	28	29.2	0.9798	0.015	0.08	0.1	0.0034	12.9	0.000101	159.6	17.40	58.48	37.17	24.72	6
C81L	793.44	14.22	28	40.4	0.9467	0.015	0.08	0.1	0.0034	12.6	0.000101	159.8	16.49	55.64	35.49	24.70	4
C81M	1091.65	14.93	28	29.9	0.9703	0.015	0.08	0.1	0.0032	12.2	0.000101	160.3	16.72	53.95	34.87	24.85	5
C82A	581.74	14.06	28	31.9	0.9626	0.015	0.08	0.1	0.0034	12.9	0.000101	159.6	17.02	57.98	36.78	24.66	5
C82B	492.97	15.28	28	27.9	0.9746	0.015	0.08	0.1	0.0032	11.9	0.000101	160.6	16.65	52.56	34.22	24.89	6
C82C	353.05	13.42	28	29.6	0.9787	0.015	0.08	0.1	0.0035	13.8	0.000101	158.7	17.94	63.56	39.66	24.46	5
C82D	571.57	11.78	28	28.6	0.9821	0.015	0.08	0.1	0.0039	15.4	0.000101	157.1	19.17	74.94	45.29	23.63	5
C82E	622.06	13.87	28	26.8	0.9725	0.015	0.08	0.1	0.0034	13.3	0.000101	159.2	17.46	60.19	37.95	24.61	6
C82F	483.11	11.97	28	21.8	0.9789	0.015	0.08	0.1	0.0039	15.2	0.000101	157.3	18.92	73.15	44.38	23.75	7
C82G	580.33	12.34	28	24.3	0.9788	0.015	0.08	0.1	0.0038	14.9	0.000101	157.7	18.67	70.65	43.15	23.96	6
C82H	782.08	11.17	28	18.8	0.9807	0.015	0.08	0.1	0.0041	16.0	0.000101	156.5	19.55	79.26	47.41	23.20	8
C83A	745.51	16.50	33	37.7	0.9559	0.008	0.09	0.0001	0.0015	20.0	0.000132	113.0	28.77	42.52	28.39	13.28	3
C83B	250.46	14.62	33	35.0	0.9649	0.008	0.09	0.0001	0.0017	20.0	0.000126	121.1	28.00	47.38	31.03	13.29	3
C83C	827.53	13.26	28	31.3	0.9812	0.015	0.08	0.1	0.0036	16.0	0.000108	148.4	20.05	71.71	43.70	24.44	5
C83D	464.59	14.68	28	31.5	0.9731	0.015	0.08	0.1	0.0033	14.9	0.000109	147.1	19.28	63.20	39.42	24.86	5
C83E	426.00	11.93	28	31.1	0.981	0.015	0.08	0.1	0.0039	15.3	0.000102	157.0	19.06	73.89	44.77	23.73	5
C83F	874.80	10.14	28	32.3	0.9838	0.015	0.08	0.1	0.0043	17.1	0.000101	155.2	20.40	87.78	51.63	22.32	5
C83G	694.85	10.74	28	29.1	0.9811	0.015	0.08	0.1	0.0042	16.4	0.000101	156.1	19.87	82.57	49.05	22.87	5
C83H	546.70	11.90	28	22.2	0.9818	0.015	0.08	0.1	0.0039	15.3	0.000101	157.2	19.07	74.03	44.84	23.71	7
C83J	221.54	10.62	28	23.4	0.9845	0.015	0.08	0.1	0.0042	16.6	0.000101	155.9	20.07	83.99	49.78	22.76	6
C83K	547.63	10.74	28	23.2	0.9848	0.015	0.08	0.1	0.0042	16.5	0.000101	156.0	20.00	83.12	49.35	22.86	6
C83L	825.45	13.81	28	20.3	0.987	0.015	0.08	0.1	0.0035	13.5	0.000101	159.0	17.95	62.10	39.01	24.59	8

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
C83M	1099.99	12.23	28	21.2	0.9869	0.015	0.08	0.1	0.0038	15.4	0.000106	157.2	19.52	74.35	45.43	23.93	7
C91A	2545.08	14.28	18	12.7	0.9948	0.01	0.1	0.0001	0.0019	9.1	7.7E-05	133.7	14.32	27.69	18.97	14.36	7
C91B	4676.02	17.36	30	12.6	0.9945	0.02	0.07	0.0001	0.0046	8.3	8.38E-05	174.4	11.47	52.46	33.50	40.45	20
C91C	3133.25	14.32	30	8.6	0.9913	0.02	0.07	0.0001	0.0054	13.0	8.86E-05	198.9	16.17	86.85	52.16	39.08	28
C91D	2693.97	16.41	30	8.9	0.9909	0.02	0.07	0.0001	0.0048	9.6	8.47E-05	179.2	12.65	60.93	37.99	40.20	28
C91E	1506.61	15.63	18	8.4	0.991	0.01	0.1	0.0001	0.0017	11.8	7.05E-05	149.4	17.76	30.78	20.61	14.09	11
C92A	3913.57	14.15	24	10.3	0.9875	0.03	0.03	0.0001	0.0119	58.2	0.000974	116.4	66.95	794.12	453.06	90.85	53
C92B	1975.14	17.32	24	7.7	0.9888	0.03	0.03	0.0001	0.0112	45.9	0.000705	126.6	53.32	596.48	342.38	103.00	81
C92C	1953.71	13.21	24	9.5	0.9888	0.03	0.03	0.0001	0.0121	60.4	0.001132	112.4	70.13	846.20	486.03	87.16	55
D11A	278.22	17.41	33	142.9	0.8921	0.008	0.09	0.0001	0.0014	17.6	0.000132	114.9	25.46	35.17	24.35	13.17	1
D11B	236.33	18.11		126.4	0.8484					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11C	291.46	17.84		114.8	0.8689					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11D	318.56	18.71		94.0	0.8478					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11E	322.32	18.42		62.7	0.856					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11F	413.00	16.72		72.5	0.8558					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11G	319.70	18.33		76.0	0.8941					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11H	358.33	21.90		65.1	0.8625					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11J	439.57	20.91		51.9	0.8744					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D11K	380.86	19.38		48.7	0.8799					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D12A	369.11	14.75	40	36.9	0.9304	0.01	0.055	0.1	0.0029	11.8	0.000139	140.7	17.35	49.74	33.95	22.17	4
D12B	385.12	12.31	40	51.5	0.8911	0.01	0.055	0.1	0.0031	13.6	0.000139	138.9	17.53	55.22	36.20	20.24	3
D12C	342.94	13.60	40	30.3	0.9321	0.01	0.055	0.1	0.0030	13.0	0.000139	139.5	18.10	54.26	36.15	21.34	5
D12D	355.29	19.39	40	18.5	0.9573	0.01	0.055	0.1	0.0024	7.8	0.000139	144.7	15.52	36.87	28.05	24.37	8
D12E	711.95	15.15	40	21.7	0.9557	0.01	0.055	0.1	0.0028	12.0	0.000136	139.4	17.91	50.55	34.33	22.41	7
D12F	803.17	14.17	34	15.3	0.9711	0.01	0.06	0.0001	0.0030	18.5	7.37E-05	112.2	20.68	61.91	34.97	21.73	9
D13A	474.83	10.50	40	63.5	0.8843	0.01	0.055	0.1	0.0034	15.0	0.000139	137.5	18.26	61.52	39.19	18.41	2
D13B	532.94	11.92	40	60.6	0.8888	0.01	0.055	0.1	0.0032	13.6	0.000137	136.8	17.34	55.42	36.04	19.87	3
D13C	516.85	11.61	40	48.0	0.8957	0.01	0.055	0.1	0.0032	14.2	0.000139	138.3	18.05	58.35	37.77	19.58	3
D13D	635.09	18.71	40	42.4	0.9023	0.01	0.055	0.1	0.0024	8.0	0.000139	144.6	14.59	35.64	26.87	24.16	4
D13E	1030.91	14.64	40	56.4	0.9032	0.01	0.055	0.1	0.0029	11.6	0.000139	140.9	16.59	47.78	32.72	22.10	3
D13F	969.94	15.16	40	42.5	0.9062	0.01	0.055	0.1	0.0028	11.2	0.000139	141.3	16.45	46.42	32.09	22.44	4
D13G	1124.89	14.54	40	31.2	0.9206	0.01	0.055	0.1	0.0029	11.9	0.000139	140.6	17.20	49.72	33.84	22.03	5
D13H	1144.15	10.85	40	18.9	0.9584	0.01	0.055	0.1	0.0033	16.0	0.000139	136.5	20.75	69.00	43.58	18.79	6
D13J	1166.99	12.83	40	19.0	0.9446	0.01	0.055	0.1	0.0031	13.9	0.000139	138.6	18.98	58.61	38.39	20.70	7
D13K	397.16	11.68	40	51.0	0.8968	0.01	0.055	0.1	0.0032	14.2	0.000139	138.3	18.05	58.20	37.71	19.65	3
D13L	681.58	12.26	40	22.1	0.965	0.01	0.055	0.1	0.0032	14.7	0.000139	137.8	20.05	63.27	40.86	20.20	6
D13M	678.01	15.60	34	15.9	0.9647	0.01	0.06	0.0001	0.0028	14.3	0.000106	126.6	18.38	51.77	32.34	22.80	9
D14A	764.44	15.31	34	11.6	0.9688	0.01	0.06	0.0001	0.0029	20.5	3.76E-05	97.1	21.12	60.24	31.89	22.12	12
D14B	323.95	14.50	40	16.3	0.9498	0.01	0.055	0.1	0.0029	12.4	0.000139	140.1	18.12	52.48	35.47	22.00	9
D14C	721.54	12.21	40	14.0	0.9555	0.01	0.055	0.1	0.0032	15.8	0.000124	131.6	20.04	63.36	39.50	20.06	9
D14D	679.79	13.89	34	11.0	0.9603	0.01	0.06	0.0001	0.0030	16.5	0.000101	123.4	19.76	59.86	35.91	21.74	12
D14E	663.29	11.93	34	8.1	0.9751	0.01	0.06	0.0001	0.0033	24.7	2.85E-05	89.5	24.87	81.66	42.07	19.75	15
D14F	540.95	12.52	40	14.1	0.9551	0.01	0.055	0.1	0.0031	20.4	6.81E-05	107.5	21.68	67.73	37.36	19.99	9
D14G	605.42	14.79	40	15.7	0.9569	0.01	0.055	0.1	0.0029	15.8	9.63E-05	121.7	19.02	54.46	32.84	21.89	9
D14H	697.09	13.24	34	7.4	0.9802	0.01	0.06	0.0001	0.0031	23.0	3.56E-05	92.9	23.55	73.29	38.26	20.84	17
D14J	514.88	12.19	34	8.9	0.976	0.01	0.06	0.0001	0.0032	24.7	2.57E-05	87.8	24.77	80.49	41.35	19.96	14
D14K	633.89	10.67	34	10.8	0.9796	0.01	0.06	0.0001	0.0035	26.3	2.57E-05	86.1	26.39	91.08	46.62	18.56	11
D15A	436.87	15.32		72.4	0.8722					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D15B	393.29	5.71		73.5	0.8516					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D15C	275.87	8.85		65.3	0.8995					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D15D	436.91	2.24		70.8	0.8878					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D15E	618.75	7.64		57.6	0.902					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D15F	352.42	15.71		37.3	0.9449					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D15G	484.74	13.32	40	32.8	0.9452	0.01	0.055	0.1	0.0030	7.8	0.000139	144.7	13.61	41.25	30.13	21.11	4
D15H	360.77	16.55	40	23.7	0.9555	0.01	0.055	0.1	0.0027	7.8	0.000139	144.7	14.62	39.02	29.12	23.24	6
D16A	159.18	18.10	33	128.3	0.9042	0.008	0.09	0.0001	0.0013	17.6	0.000132	114.9	26.33	34.55	24.13	13.07	1
D16B	248.04	18.68		108.4	0.878					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D16C	437.19	19.74		51.6	0.8643					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D16D	338.98	20.40	45	92.7	0.8647	0.01	0.065	0.0001	0.0021	16.0	9.32E-05	120.2	18.42	38.65	24.17	22.35	2
D16E	433.52	22.62	45	56.6	0.8637	0.01	0.065	0.0001	0.0019	16.3	8.8E-05	112.3	18.65	34.87	21.70	22.13	2
D16F	276.38	25.42	45	68.5	0.8604	0.01	0.065	0.0001	0.0016	16.3	8.8E-05	112.3	19.32	31.07	19.78	21.56	2
D16G	289.36	28.08	45	63.6	0.8751	0.01	0.065	0.0001	0.0014	16.3	8.8E-05	112.3	20.50	28.46	18.55	20.73	2
D16H	344.22	24.95		46.2	0.8691					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D16J	373.57	29.70		54.2	0.8658					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D16K	328.70	33.92	45	58.3	0.8968	0.01	0.065	0.0001	0.0010	16.2	9.03E-05	115.7	23.92	23.76	16.57	18.38	2
D16L	532.72	29.81		40.8	0.8664					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D16M	752.81	23.03		49.8	0.8746					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17A	638.03	17.50		79.1	0.8697					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17B	441.77	18.02		81.4	0.8747					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17C	524.62	20.71		62.8	0.8649					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17D	748.03	21.84		53.8	0.8802					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17E	604.76	25.14		50.4	0.8592					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17F	581.99	26.02		40.3	0.8566					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17G	848.46	22.41		39.7	0.8626					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17H	851.03	19.27		42.2	0.853					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17J	436.78	30.91		52.3	0.8871					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17K	383.14	22.42		48.0	0.887					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D17L	589.94	24.46	40	49.0	0.864	0.01	0.055	0.1	0.0019	10.2	0.00013	142.4	17.18	32.77	24.37	24.92	4
D17M	528.19	26.42		38.1	0.8623					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
D18A	599.06	18.43		45.9	0.8834					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D18B	327.09	25.57	40	47.1	0.8842	0.01	0.055	0.1	0.0018	5.0	0.000138	146.4	14.23	25.84	21.83	24.97	3
D18C	465.41	18.08		48.3	0.875					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D18D	765.95	8.22		51.9	0.8689					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D18E	375.67	23.68	40	52.4	0.8778	0.01	0.055	0.1	0.0020	5.0	0.000138	146.4	13.34	26.35	22.02	25.01	3
D18F	445.74	23.95		43.0	0.8737					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D18G	491.59	16.42	40	62.0	0.8606	0.01	0.055	0.1	0.0027	5.1	0.000138	146.8	10.88	29.19	23.33	23.16	3
D18H	383.59	17.99		53.1	0.8629					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D18J	858.56	13.67	40	50.2	0.8811	0.01	0.055	0.1	0.0030	11.8	0.000139	140.7	16.19	48.42	32.82	21.39	3
D18K	934.99	12.90	40	58.7	0.8643	0.01	0.055	0.1	0.0031	11.8	0.000139	140.7	15.72	48.42	32.66	20.76	3
D18L	609.58	11.75	40	42.7	0.9033	0.01	0.055	0.1	0.0032	11.8	0.000139	140.7	16.18	52.07	34.86	19.71	3
D21A	309.32	18.09	33	86.4	0.8767	0.008	0.09	0.0001	0.0013	17.6	0.000132	114.9	25.52	33.52	23.41	13.07	1
D21B	393.66	18.71	33	95.5	0.8631	0.008	0.09	0.0001	0.0013	17.6	0.000132	114.9	25.61	32.08	22.59	12.95	1
D21C	211.58	19.58	33	70.8	0.9031	0.008	0.09	0.0001	0.0012	16.9	0.000132	115.6	27.05	31.71	22.74	12.77	2
D21D	251.48	17.87	33	63.3	0.8961	0.008	0.09	0.0001	0.0013	17.6	0.000132	114.9	25.95	34.63	24.13	13.11	2
D21E	268.33	19.09	33	47.3	0.9236	0.008	0.09	0.0001	0.0012	16.9	0.000132	115.6	27.25	33.15	23.64	12.88	2
D21F	479.55	16.24	33	42.3	0.9469	0.008	0.09	0.0001	0.0015	20.2	0.000132	112.3	28.43	42.82	28.45	13.30	2
D21G	278.09	17.13	33	45.6	0.95	0.008	0.09	0.0001	0.0014	19.2	0.000132	113.3	28.36	40.01	27.12	13.21	2
D21H	380.85	18.31	33	52.0	0.9395	0.008	0.09	0.0001	0.0013	16.9	0.000132	115.6	27.01	34.88	24.61	13.03	2
D21J	359.34	18.03		91.1	0.8653					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D21K	325.91	15.90		94.5	0.8596					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D21L	304.23	16.42	33	69.1	0.9093	0.008	0.09	0.0001	0.0015	16.9	0.000132	115.6	24.74	36.76	25.31	13.28	2
D22A	635.44	15.58	33	37.8	0.9668	0.008	0.09	0.0001	0.0016	21.2	0.000113	107.7	27.94	44.13	27.94	13.19	3
D22B	457.05	16.12	33	45.4	0.9522	0.008	0.09	0.0001	0.0015	20.4	0.000132	111.1	28.62	43.47	28.74	13.31	2
D22C	485.45	17.20	33	52.1	0.9547	0.008	0.09	0.0001	0.0014	20.3	0.000132	111.1	29.38	41.22	27.61	13.20	2
D22D	627.72	17.18	33	39.1	0.9699	0.008	0.09	0.0001	0.0014	20.3	0.000132	111.1	29.84	41.92	28.07	13.20	3
D22E	498.06	16.30		74.3	0.8762					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D22F	632.76	17.42	33	52.1	0.9452	0.008	0.09	0.0001	0.0014	20.3	0.000132	111.1	29.25	40.38	27.12	13.17	2
D22G	969.31	17.59	33	37.5	0.9687	0.008	0.09	0.0001	0.0014	19.3	0.000128	112.5	28.89	39.37	26.66	13.11	3
D22H	540.92	15.70	33	52.3	0.9546	0.008	0.09	0.0001	0.0016	19.2	0.000132	113.3	27.48	43.03	28.65	13.33	2
D22J	651.73	16.39		60.7	0.9145					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D22K	323.66	17.02		53.8	0.9298					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D22L	376.39	16.81	33	46.0	0.9601	0.008	0.09	0.0001	0.0014	19.2	0.000132	113.3	28.41	41.04	27.70	13.25	2
D23A	607.99	16.10	33	45.4	0.9503	0.008	0.09	0.0001	0.0015	20.7	0.00049	96.2	49.11	74.71	59.75	16.19	3
D23B	596.92	14.19		44.8	0.9432					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
D23C	861.05	16.28	34	34.8	0.9758	0.01	0.06	0.0001	0.0027	20.7	4.92E-05	96.2	21.88	59.84	32.23	22.67	4
D23D	564.94	14.80	34	30.9	0.9787	0.01	0.06	0.0001	0.0029	22.2	2.57E-05	90.3	22.53	65.66	33.97	21.76	5
D23E	702.17	15.35	34	29.6	0.9753	0.01	0.06	0.0001	0.0028	20.7	0.00049	96.2	36.32	103.44	74.71	25.61	6
D23F	351.64	17.24	34	27.7	0.9708	0.01	0.06	0.0001	0.0026	20.7	0.00049	96.2	37.54	98.44	72.10	26.83	6
D23G	511.57	19.20	34	22.8	0.9728	0.01	0.06	0.0001	0.0024	20.7	0.00049	96.2	39.22	94.18	70.02	27.76	8
D23H	776.12	11.10	34	15.6	0.9841	0.01	0.06	0.0001	0.0034	26.0	2.57E-05	86.5	26.21	88.95	45.57	18.98	8
D23J	533.65	13.60	34	18.8	0.9776	0.01	0.06	0.0001	0.0031	23.4	2.57E-05	89.2	23.57	72.27	37.25	21.02	7
D24A	309.91	18.74	34	21.6	0.9672	0.01	0.06	0.0001	0.0025	12.2	0.00009	123.2	16.17	39.66	25.19	23.82	7
D24B	470.46	19.15	34	17.9	0.9689	0.01	0.06	0.0001	0.0024	12.2	9.04E-05	123.2	16.30	39.24	25.01	23.91	9
D24C	398.15	15.55	34	16.5	0.9687	0.01	0.06	0.0001	0.0028	21.3	2.57E-05	91.2	21.43	60.49	31.38	22.15	9
D24D	598.46	12.40	34	12.8	0.9834	0.01	0.06	0.0001	0.0032	24.7	2.57E-05	87.9	24.98	80.44	41.33	20.14	10
D24E	489.08	13.06	34	13.1	0.9764	0.01	0.06	0.0001	0.0031	23.9	2.57E-05	88.6	24.05	75.40	38.81	20.64	10
D24F	567.04	15.91	34	14.3	0.9691	0.01	0.06	0.0001	0.0028	20.7	2.81E-05	92.6	21.00	58.37	30.45	22.34	10
D24G	626.00	14.17	34	13.1	0.9773	0.01	0.06	0.0001	0.0030	22.2	3.22E-05	92.7	22.71	68.01	35.46	21.44	10
D24H	735.75	11.49	34	12.5	0.9806	0.01	0.06	0.0001	0.0033	25.5	2.57E-05	87.0	25.68	85.82	44.00	19.35	10
D24J	1032.36	11.39	34	11.2	0.9739	0.01	0.06	0.0001	0.0034	25.4	2.57E-05	87.1	25.41	85.25	43.72	19.25	11
D24K	876.35	7.14	34	16.5	0.9821	0.01	0.06	0.0001	0.0039	29.8	2.57E-05	82.4	29.81	117.60	59.84	14.18	6
D24L	510.57	6.75	34	17.4	0.9758	0.01	0.06	0.0001	0.0040	30.0	2.57E-05	82.5	29.76	119.06	60.56	13.60	5
D31A	1158.76	8.72	31	13.6	0.9877	0.008	0.1	0.0001	0.0024	23.8	7.05E-05	101.8	26.48	62.48	34.78	10.59	5
D31B	994.92	7.57	39	12.8	0.9833	0.01	0.095	0.00001	0.0033	34.2	8.37E-05	85.1	35.76	117.18	62.09	12.71	6
D31C	676.17	8.05	39	10.4	0.9825	0.01	0.095	0.00001	0.0032	31.1	8.02E-05	89.7	32.81	104.23	55.65	13.11	8
D31D	1107.29	9.25	31	13.7	0.9829	0.008	0.1	0.0001	0.0023	15.5	6.03E-05	115.4	18.20	41.34	24.09	10.78	5
D31E	968.45	8.48	39	19.8	0.9648	0.01	0.095	0.00001	0.0031	39.2	9.29E-05	75.5	40.02	123.62	65.20	13.49	5
D32A	714.69	9.00	39	11.0	0.9666	0.01	0.095	0.00001	0.0030	42.1	9.77E-05	70.5	42.95	128.12	67.39	13.87	8
D32B	580.95	9.19	39	13.7	0.9592	0.01	0.095	0.00001	0.0029	41.5	9.79E-05	71.4	42.12	124.10	65.40	13.99	7
D32C	849.02	8.33	39	10.4	0.9765	0.01	0.095	0.00001	0.0031	43.2	9.75E-05	69.3	44.28	138.09	72.35	13.40	8
D32D	849.61	8.90	39	10.1	0.9724	0.01	0.095	0.00001	0.0030	42.5	9.78E-05	70.9	43.53	130.72	68.73	13.81	9
D32E	1155.25	8.77	39	4.5	0.9859	0.01	0.095	0.00001	0.0030	43.1	9.75E-05	69.4	44.70	135.44	71.05	13.71	19
D32F	1441.22	7.01	39	7.1	0.989	0.01	0.095	0.00001	0.0034	45.0	9.75E-05	67.5	46.41	157.54	82.03	12.24	11
D32G	1043.89	8.81	39	10.3	0.9786	0.01	0.095	0.00001	0.0030	42.6	9.76E-05	70.3	43.95	132.79	69.75	13.74	9
D32H	571.81	9.14	39	7.9	0.9843	0.01	0.095	0.00001	0.0030	42.7	9.75E-05	69.9	44.29	130.93	68.82	13.96	11
D32J	1112.53	9.50	39	7.7	0.9835	0.01	0.095	0.00001	0.0029	42.3	9.75E-05	70.2	43.94	126.82	66.78	14.17	11
D32K	823.43	9.69	39	11.9	0.9779	0.01	0.095	0.00001	0.0028	41.9	9.75E-05	70.6	43.33	123.38	65.06	14.28	8
D33A	592.13	9.01	31	13.3	0.9819	0.008	0.1	0.0001	0.0023	15.1	5.94E-05	116.2	17.73	40.97	23.87	10.68	5
D33B	1016.52	8.51	31	11.7	0.9862	0.008	0.1	0.0001	0.0024	13.8	5.69E-05	118.7	16.38	39.22	22.94	10.43	6
D33C	804.13	10.30	31	9.6	0.9879	0.008	0.1	0.0001	0.0021	12.2	5.7E-05	119.7	15.22	32.03	19.38	11.13	7
D33D	950.02	11.87	31	8.8	0.9905	0.008	0.1	0.0001	0.0019	10.5	5.69E-05	122.0	14.10	26.36	16.61	11.44	8
D33E	1551.73	16.27	31	7.3	0.9906	0.008	0.1	0.0001	0.0013	6.2	5.69E-05	126.3	11.53	15.15	11.13	11.15	10
D33F	861.25	11.41	31	9.5	0.9912	0.008	0.1	0.0001	0.0019	11.0	5.68E-05	121.5	14.45	28.00	17.42	11.37	8
D33G	1403.48	17.90	29	7.5	0.9906	0.008	0.08	0.0001	0.0015	21.6	2.77E-05	138.4	23.87	36.82	20.31	14.05	12
D33H	1052.20	20.60	29	7.0	0.9878	0.008	0.08	0.0001	0.0013	25.0	1.73E-05	144.9	26.57	34.30	18.38	13.48	12
D33J	862.86	16.95	29	7.8	0.9933	0.008	0.08	0.0001	0.0016	30.3	1.44E-05	142.1	31.38	51.44	26.74	14.01	11
D33K	487.01	15.99	29	8.9	0.9895	0.008	0.08	0.0001	0.0017	31.2	1.44E-05	141.3	32.04	55.81	28.91	14.04	10
D34A	793.28	6.84	39	12.3	0.9719	0.01	0.095	0.00001	0.0034	44.3	9.73E-05	68.2	44.96	154.24	80.35	12.06	6

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
D34B	705.44	9.75	39	11.1	0.9676	0.01	0.095	0.00001	0.0028	41.4	9.75E-05	73.9	42.47	120.52	63.75	14.30	8
D34C	759.98	8.35	39	9.2	0.9786	0.01	0.095	0.00001	0.0031	43.2	9.75E-05	69.6	44.41	138.34	72.49	13.41	9
D34D	598.88	7.66	39	9.9	0.9804	0.01	0.095	0.00001	0.0033	44.0	9.75E-05	68.5	45.14	146.97	76.76	12.85	8
D34E	518.82	8.85	39	12.0	0.9775	0.01	0.095	0.00001	0.0030	42.7	9.75E-05	69.8	43.91	132.31	69.48	13.77	7
D34F	691.33	9.15	39	9.8	0.9843	0.01	0.095	0.00001	0.0030	42.7	9.75E-05	69.8	44.28	130.78	68.74	13.96	9
D34G	948.85	9.48	39	16.3	0.9711	0.01	0.095	0.00001	0.0029	39.0	9.37E-05	75.4	40.21	116.18	61.52	14.14	6
D35A	254.37	4.45	39	20.8	0.9781	0.01	0.095	0.00001	0.0040	46.8	9.67E-05	65.7	47.34	187.43	96.82	9.02	3
D35B	260.08	9.73	39	12.9	0.9772	0.01	0.095	0.00001	0.0028	41.7	9.7E-05	70.8	43.10	122.41	64.56	14.29	7
D35C	943.03	11.99	39	7.9	0.9766	0.01	0.095	0.00001	0.0024	39.4	9.79E-05	73.5	41.35	100.26	53.65	15.13	12
D35D	586.25	11.03	39	8.7	0.9825	0.01	0.095	0.00001	0.0026	40.8	9.75E-05	71.7	42.69	110.83	58.85	14.86	11
D35E	312.01	12.72	39	10.0	0.9804	0.01	0.095	0.00001	0.0023	39.0	9.75E-05	73.5	41.27	94.94	50.98	15.25	10
D35F	557.22	5.02	39	17.3	0.9835	0.01	0.095	0.00001	0.0038	46.6	9.74E-05	65.9	47.51	181.92	94.12	9.86	4
D35G	551.68	9.72	39	9.9	0.9755	0.01	0.095	0.00001	0.0028	41.7	9.75E-05	70.8	43.06	122.38	64.56	14.29	9
D35H	498.14	7.91	39	13.7	0.9841	0.01	0.095	0.00001	0.0032	43.9	9.75E-05	68.6	45.27	145.13	75.86	13.06	6
D35J	1001.15	8.34	39	12.0	0.9704	0.01	0.095	0.00001	0.0031	42.5	9.76E-05	70.9	43.43	135.34	71.03	13.41	7
D35K	673.98	7.22	39	12.3	0.9811	0.01	0.095	0.00001	0.0033	44.4	9.75E-05	68.1	45.53	152.51	79.51	12.44	7
D41A	4294.93	20.65	18	21.1	0.9915	0.01	0.1	0.0001	0.0011	53.7	0.001946	188.5	376.55	423.71	393.74	31.72	9
D41B	6234.22	28.56	22	10.3	0.9906	0.005	0.025	0.03	0.0016	104.2	0.000198	193.3	126.79	204.22	121.08	25.83	16
D41C	3903.44	51.36	22	6.3	0.9919	0.005	0.025	0.03	0.0011	91.4	0.000144	219.6	120.24	127.37	79.37	30.90	30
D41D	4368.66	36.33	22	7.9	0.9926	0.005	0.025	0.03	0.0014	110.0	0.000146	206.9	130.56	183.63	106.83	28.20	22
D41E	4483.39	92.66	22	4.6	0.9909	0.005	0.025	0.03	0.0004	54.2	0.000146	263.3	141.21	61.69	49.95	27.02	35
D41F	6001.21	73.64	22	5.1	0.9938	0.005	0.025	0.03	0.0007	73.4	0.000146	244.1	126.23	84.23	59.88	29.96	36
D41G	4304.84	35.37	22	7.9	0.9921	0.005	0.025	0.03	0.0014	91.7	0.000467	185.1	150.90	215.91	150.80	33.56	26
D41H	8644.77	84.63	22	4.4	0.9945	0.005	0.025	0.03	0.0005	62.4	0.000149	254.8	134.06	70.21	53.96	28.46	39
D41J	3873.63	29.37	22	7.1	0.9822	0.005	0.025	0.03	0.0016	69.2	0.000118	162.7	79.78	126.75	72.78	25.06	22
D41K	4212.77	38.62	22	6.9	0.9856	0.005	0.025	0.03	0.0013	88.7	0.00027	192.7	125.36	169.14	110.18	31.26	28
D41L	5374.85	24.86	22	11.5	0.9889	0.005	0.025	0.03	0.0017	92.4	0.000528	165.9	141.89	243.11	164.87	27.86	15
D41M	2625.87	60.13	22	4.7	0.9899	0.005	0.025	0.03	0.0009	78.3	0.000272	222.5	144.85	128.58	94.20	34.85	45
D42A	10272.51	62.21	23	2.0	0.9906	0.005	0.018	0.0001	0.0012	44.8	0.000744	192.7	159.87	196.69	169.37	61.42	188
D42B	3197.44	50.69	23	0.3	0.9889	0.005	0.018	0.0001	0.0014	56.2	0.000744	181.3	148.72	213.04	173.25	55.17	1290
D42C	18095.62	90.70	23	1.3	0.9914	0.005	0.018	0.0001	0.0008	25.4	0.000657	222.6	202.53	165.56	155.26	66.85	305
D42D	16208.70	46.38	23	0.9	0.9905	0.005	0.018	0.0001	0.0015	60.7	0.000729	176.8	144.43	218.54	173.06	51.98	332
D42E	4207.57	31.24	26	0.0	0.988	0.004	0.04	0.1	0.0008	68.3	0.00023	169.2	114.06	93.96	66.17	16.45	7423
D51A	796.93	11.82	37	6.4	0.9716	0.006	0.06	0.0001	0.0020	34.7	4.71E-05	133.3	36.78	72.76	39.43	11.97	12
D51B	873.05	11.76	37	3.2	0.959	0.006	0.06	0.0001	0.0020	34.3	4.71E-05	133.2	35.91	71.23	38.62	11.94	23
D51C	522.10	10.46	37	0.8	0.98	0.006	0.06	0.0001	0.0021	36.3	4.71E-05	131.3	38.48	80.36	43.21	11.17	84
D52A	377.57	12.14	37	7.9	0.9598	0.006	0.06	0.0001	0.0020	34.2	4.67E-05	134.1	35.89	70.11	38.06	12.14	10
D52B	659.96	13.61	37	5.1	0.9604	0.006	0.06	0.0001	0.0018	32.6	4.7E-05	135.1	34.63	63.70	34.89	12.83	16
D52C	465.33	12.53	37	1.4	0.9711	0.006	0.06	0.0001	0.0019	34.0	4.71E-05	133.5	36.16	69.52	37.81	12.34	52
D52D	638.27	14.08	37	4.2	0.9612	0.006	0.06	0.0001	0.0018	32.2	4.7E-05	135.4	34.34	61.93	34.02	13.02	19
D52E	608.54	11.08	37	3.1	0.9707	0.006	0.06	0.0001	0.0020	35.5	4.68E-05	132.1	37.43	76.26	41.13	11.55	23
D52F	1145.71	12.15	36	1.8	0.9841	0.005	0.05	0.0001	0.0018	46.5	2.99E-05	123.2	47.79	84.25	43.94	10.89	37
D53A	1938.54	22.37	26	0.3	0.9921	0.004	0.04	0.1	0.0011	72.4	2.23E-05	159.6	75.13	81.15	42.34	12.33	232
D53B	1713.19	20.82	26	0.3	0.9933	0.004	0.04	0.1	0.0011	76.2	2.34E-05	161.3	78.97	89.18	46.46	12.00	255
D53C	1899.29	14.50	26	1.0	0.9918	0.004	0.04	0.1	0.0013	82.3	2.34E-05	155.2	84.31	113.41	58.51	9.92	61
D53D	1841.78	19.69	26	0.1	0.9929	0.004	0.04	0.1	0.0012	70.6	2.01E-05	149.5	72.69	84.80	43.89	11.68	954
D53E	825.86	20.80	26	0.2	0.9897	0.004	0.04	0.1	0.0011	75.9	2.34E-05	161.6	78.44	88.64	46.19	12.00	339
D53F	8036.76	21.20	35	0.1	0.9912	0.0065	0.07	0.0001	0.0012	51.1	1.11E-05	122.0	51.73	62.16	31.75	12.85	593
D53G	4745.55	23.79	26	0.1	0.9935	0.004	0.04	0.1	0.0010	57.7	1.56E-05	139.2	59.42	61.54	31.85	12.51	1005
D53H	1589.36	24.65	26	0.0	0.9922	0.004	0.04	0.1	0.0010	72.3	2.34E-05	165.2	75.51	76.23	40.03	12.73	#DIV/0!
D53J	454.91	25.20	26	0.0	0.9868	0.004	0.04	0.1	0.0010	71.3	2.34E-05	166.1	74.26	73.73	38.78	12.81	#DIV/0!
D54A	1517.94	11.80	35	1.2	0.9848	0.0065	0.07	0.0001	0.0020	56.9	1.52E-05	115.0	56.92	112.66	57.19	11.77	59
D54B	4051.36	11.92	35	2.9	0.986	0.0065	0.07	0.0001	0.0020	53.0	2.11E-05	117.9	53.50	105.25	53.85	11.85	25
D54C	1342.22	11.14	35	0.8	0.9886	0.0065	0.07	0.0001	0.0020	60.7	1.1E-05	111.8	60.57	123.75	62.48	11.44	83
D54D	5069.69	18.43	35	0.6	0.992	0.0065	0.07	0.0001	0.0014	55.7	1.2E-05	122.2	56.30	78.98	40.22	13.04	125
D54E	3325.58	14.37	35	0.5	0.9841	0.0065	0.07	0.0001	0.0017	56.3	1.24E-05	116.0	56.21	97.85	49.63	12.59	152
D54F	3808.55	14.59	35	0.6	0.9907	0.0065	0.07	0.0001	0.0017	57.4	1.1E-05	115.1	57.56	99.06	50.16	12.64	137
D54G	4502.65	27.82	26	0.1	0.9929	0.004	0.04	0.1	0.0009	58.7	1.82E-05	151.4	61.29	56.19	29.46	13.01	666
D55A	1871.65	12.65	38	5.1	0.9768	0.006	0.06	0.000001	0.0019	34.1	4.78E-05	133.2	36.58	69.99	38.11	12.40	15
D55B	1259.38	10.74	38	2.7	0.9835	0.006	0.06	0.000001	0.0021	36.3	4.87E-05	130.7	38.74	80.04	43.15	11.35	25
D55C	760.39	12.90	38	3.9	0.9843	0.006	0.06	0.000001	0.0019	34.2	4.77E-05	133.1	36.93	69.94	38.10	12.52	20
D55D	1888.71	12.33	38	2.4	0.9868	0.006	0.06	0.000001	0.0019	34.7	4.71E-05	132.8	37.43	72.55	39.36	12.24	31
D55E	2240.27	12.38	38	1.4	0.9831	0.006	0.06	0.000001	0.0019	34.5	4.72E-05	132.9	37.15	71.87	39.02	12.27	51
D55F	2631.09	12.39	38	1.8	0.9878	0.006	0.06	0.000001	0.0019	34.7	4.69E-05	132.8	37.50	72.53	39.35	12.27	43
D55G	1292.84	12.64	38	1.5	0.9883	0.006	0.06	0.000001	0.0019	34.5	4.71E-05	133.0	37.28	71.36	38.77	12.40	50
D55H	1151.23	11.99	38	1.2	0.9849	0.006	0.06	0.000001	0.0020	35.0	4.71E-05	132.5	37.56	73.82	39.98	12.07	63
D55J	1998.36	11.67	38	1.3	0.9834	0.006	0.06	0.000001	0.0020	35.3	4.7E-05	132.2	37.77	75.20	40.65	11.89	55
D55K	1247.03	11.96	38	0.7	0.9844	0.006	0.06	0.000001	0.0020	35.0	4.71E-05	132.5	37.57	73.92	40.03	12.05	107
D55L	1241.69	11.78	38	1.4	0.9848	0.006	0.06	0.000001	0.0020	37.9	4.3E-05	130.1	40.15	79.58	42.54	11.92	52
D55M	1812.64	12.00	35	0.8	0.9877	0.0065	0.07	0.0001	0.0020	54.2	1.92E-05	117.2	54.66	107.14	54.68	11.87	94
D56A	510.16	9.20	37	6.1	0.9781	0.006	0.06	0.0001	0.0022	37.5	4.72E-05	128.8	39.36	86.29	46.12	10.30	11
D56B	518.62	9.75	41	4.8	0.9692	0.01	0.05	0.001	0.0038	36.6	4.71E-05	129.4	37.04	140.84	73.37	18.77	23
D56C	920.47	10.44	38	3.5	0.9737	0.006	0.06	0.000001	0.0021	36.5	4.65E-05	132.2	38.36	80.17	43.08	11.15	19
D56D	620.76	11.67	38	1.5	0.9789	0.006	0.06	0.000001	0.0020	35.1	4.71E-05	132.4	37.39	74.44	40.27	11.89	48
D56E	665.59	11.51	41	2.3	0.967	0.01	0.05	0.001	0.0036	34.8	4.73E-05	132.6	35.33	127.12	66.59	20.97	55
D56F	1038.42	12.10	38	1.6	0.9784	0.006	0.06	0.000001	0.0020	34.6	4.71E-05	132.9	37.02	72.43	39.27	12.12	47
D56G	651.18	12.62	38	1.4	0.9833	0.006	0.06	0.000001	0.0019	34.3	4.71E-05	133.2	36.94	70.78	38.47	12.38	53
D56H	447.29	12.17	38	1.1	0.9804	0.006	0.06	0.000001	0.0020	34.6	4.71E-05	132.9	37.09	72.35	39.24	12.16	68
D56J	930.83	11.68	38	1.0	0.9838	0.006	0.06	0.000001	0.0020	35.2	4.71E-05	132.3	37.75	75.14	40.63	11.89	73

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
D57A	853.29	11.17	35	0.8	0.9918	0.0065	0.07	0.0001	0.0020	60.8	1.1E-05	111.7	60.94	124.36	62.79	11.46	82
D57B	2273.91	10.92	35	1.0	0.9899	0.0065	0.07	0.0001	0.0021	58.8	1.41E-05	113.2	59.01	121.88	61.73	11.35	66
D57C	636.59	12.28	35	0.4	0.9922	0.0065	0.07	0.0001	0.0019	59.7	1.1E-05	112.8	59.92	115.86	58.54	11.94	194
D57D	4443.77	13.72	35	0.3	0.993	0.0065	0.07	0.0001	0.0018	58.4	1.1E-05	114.1	58.65	105.51	53.38	12.42	230
D57E	1957.43	16.46	35	0.2	0.993	0.0065	0.07	0.0001	0.0016	62.1	1.42E-05	127.3	62.81	98.03	49.91	12.96	437
D58A	763.30	11.68	35	1.0	0.9847	0.0065	0.07	0.0001	0.0020	41.1	3.85E-05	127.6	42.95	85.49	45.16	11.85	69
D58B	1131.12	11.00	36	2.0	0.9816	0.005	0.05	0.0001	0.0018	60.1	1.11E-05	112.1	59.70	109.20	55.21	10.12	31
D58C	2520.26	12.38	36	0.7	0.9915	0.005	0.05	0.0001	0.0017	59.6	1.1E-05	112.8	59.77	104.58	52.91	10.90	96
D61A	1463.91	10.21	39	5.8	0.9804	0.01	0.095	0.00001	0.0027	41.6	9.85E-05	71.8	43.35	119.16	63.05	14.54	16
D61B	1196.41	11.50	39	4.8	0.9816	0.01	0.095	0.00001	0.0025	40.3	9.75E-05	72.2	42.29	106.23	56.57	15.00	19
D61C	1168.50	11.83	39	6.0	0.989	0.01	0.095	0.00001	0.0025	38.8	9.56E-05	74.7	41.24	101.15	54.10	15.08	16
D61D	650.10	13.06	39	4.1	0.9887	0.01	0.095	0.00001	0.0022	39.1	9.81E-05	73.9	41.84	93.84	50.51	15.29	23
D61E	1089.57	10.43	39	5.4	0.9795	0.01	0.095	0.00001	0.0027	41.4	9.85E-05	72.1	43.08	116.64	61.79	14.63	17
D61F	872.87	11.46	39	3.2	0.9839	0.01	0.095	0.00001	0.0025	40.6	9.85E-05	73.7	42.78	107.73	57.44	15.00	28
D61G	743.30	11.11	39	3.9	0.9854	0.01	0.095	0.00001	0.0026	40.8	9.75E-05	71.7	42.84	110.61	58.75	14.88	23
D61H	1085.20	11.11	39	4.9	0.98	0.01	0.095	0.00001	0.0026	40.6	9.75E-05	71.9	42.41	109.52	58.20	14.88	19
D61J	1557.43	12.32	39	3.8	0.9848	0.01	0.095	0.00001	0.0024	29.3	8.14E-05	92.6	31.97	75.69	41.56	15.09	24
D61K	1606.76	14.22	31	4.7	0.9871	0.008	0.1	0.0001	0.0016	16.3	6.79E-05	110.9	20.87	32.43	19.93	11.54	15
D61L	1014.47	12.84	31	7.4	0.9844	0.008	0.1	0.0001	0.0017	25.4	7.87E-05	96.4	29.29	50.81	29.14	11.64	10
D61M	941.67	12.51	31	6.3	0.9785	0.008	0.1	0.0001	0.0018	15.3	6.46E-05	113.4	19.03	33.87	20.52	11.54	12
D62A	2240.44	12.95	31	5.3	0.9889	0.008	0.1	0.0001	0.0017	10.3	5.8E-05	121.7	14.22	24.46	15.72	11.51	14
D62B	3114.05	15.02	31	4.3	0.991	0.008	0.1	0.0001	0.0015	14.0	4.72E-05	128.8	18.03	26.27	16.15	11.30	16
D62C	2126.04	10.68	39	7.4	0.9792	0.01	0.095	0.00001	0.0027	34.6	8.88E-05	82.2	36.58	97.36	52.25	14.68	12
D62D	2396.81	6.91	39	11.9	0.9865	0.01	0.095	0.00001	0.0034	37.6	8.74E-05	79.8	39.14	133.66	70.27	12.10	7
D62E	1920.13	9.55	31	8.2	0.9875	0.008	0.1	0.0001	0.0022	12.9	5.7E-05	119.5	15.77	35.08	20.90	10.89	8
D62F	1697.51	7.42	31	11.6	0.989	0.008	0.1	0.0001	0.0026	14.9	5.69E-05	117.6	17.31	44.68	25.64	9.78	6
D62G	2545.34	13.85	31	6.3	0.9908	0.008	0.1	0.0001	0.0016	20.9	3.58E-05	131.5	23.60	37.80	21.23	11.34	11
D62H	2060.87	14.45	29	4.2	0.9907	0.008	0.08	0.0001	0.0019	46.9	4.02E-05	140.2	49.40	94.63	50.11	14.13	21
D62J	2197.81	18.06	29	4.7	0.9914	0.008	0.08	0.0001	0.0015	29.2	1.46E-05	143.3	30.33	46.30	24.18	13.92	18
D71A	1207.83	14.92	24	6.9	0.9864	0.03	0.03	0.0001	0.0117	45.3	0.000582	127.2	50.95	595.95	334.45	91.61	80
D71B	2871.32	17.55	24	7.4	0.9812	0.03	0.03	0.0001	0.0111	54.8	0.000504	128.0	59.46	662.37	362.84	102.19	83
D71C	1590.19	19.65	29	4.4	0.9866	0.008	0.08	0.0001	0.0014	31.8	2.79E-05	143.7	34.28	47.15	25.55	13.79	19
D71D	1711.92	21.35	25	4.1	0.9791	0.005	0.035	0.1	0.0015	43.6	6.98E-05	141.2	49.14	73.71	41.68	16.76	25
D72A	1395.96	21.65	29	3.5	0.9795	0.008	0.08	0.0001	0.0012	42.2	3.84E-05	148.1	46.01	55.35	30.46	13.44	24
D72B	2568.01	23.33	25	3.1	0.9733	0.005	0.035	0.1	0.0014	55.9	9.05E-05	144.0	63.29	90.40	51.54	17.72	35
D72C	2774.92	26.28	25	1.9	0.9815	0.005	0.035	0.1	0.0013	60.3	6.33E-05	155.0	66.46	88.10	48.86	18.25	57
D73A	3234.86	20.09	25	8.6	0.9841	0.005	0.035	0.1	0.0015	56.5	0.000104	136.0	64.64	99.98	56.98	16.59	12
D73B	3718.95	34.96	25	5.5	0.9738	0.005	0.035	0.1	0.0011	45.7	0.000179	153.8	69.95	73.54	50.15	21.50	24
D73C	6218.07	69.03	23	3.5	0.9837	0.005	0.018	0.0001	0.0011	34.4	0.000593	199.7	137.84	154.38	135.46	59.13	102
D73D	4290.51	45.46	23	0.5	0.985	0.005	0.018	0.0001	0.0015	56.2	0.000386	181.3	100.38	153.64	111.27	43.56	559
D73E	3866.76	41.88	26	0.3	0.989	0.004	0.04	0.1	0.0006	60.7	0.000439	176.8	192.48	111.56	94.16	21.33	461
D73F	4630.01	22.49	26	0.1	0.9878	0.004	0.04	0.1	0.0011	74.1	2.35E-05	163.4	76.72	82.58	43.19	12.37	904
D81A	2310.45	31.38	26	0.0	0.9875	0.004	0.04	0.1	0.0008	65.3	2.34E-05	172.2	69.31	56.85	30.41	13.24	#DIV/0!
D81B	851.05	29.03	26	0.1	0.9722	0.004	0.04	0.1	0.0009	66.5	2.34E-05	171.0	69.09	61.02	32.45	13.16	722
D81C	2681.58	22.79	26	0.5	0.9878	0.004	0.04	0.1	0.0011	77.5	0.000293	160.0	119.97	127.99	87.15	15.49	201
D81D	1823.26	31.33	26	0.0	0.9867	0.004	0.04	0.1	0.0008	65.2	2.34E-05	172.3	69.17	56.82	30.40	13.23	16870
D81E	1287.28	25.02	26	0.1	0.9762	0.004	0.04	0.1	0.0010	70.6	2.34E-05	166.9	72.78	72.67	38.24	12.78	1364
D81F	1838.74	32.23	26	0.0	0.979	0.004	0.04	0.1	0.0008	63.9	2.34E-05	173.6	67.50	53.88	28.93	13.24	1667
D81G	2005.44	32.88	26	0.1	0.9771	0.004	0.04	0.1	0.0008	63.1	2.34E-05	174.4	66.75	52.17	28.08	13.24	1240
D82A	1908.74	49.32	26	0.0	0.9584	0.004	0.04	0.1	0.0004	46.1	2.34E-05	191.4	53.77	24.05	14.17	11.60	2399
D82B	4872.58	36.45	26	0.0	0.9909	0.004	0.04	0.1	0.0007	55.8	2.12E-05	169.7	60.41	42.04	22.80	13.07	#DIV/0!
D82C	3990.60	51.12	26	0.0	0.986	0.004	0.04	0.1	0.0004	45.7	2.34E-05	191.8	55.63	23.33	13.87	11.32	84759
D82D	2960.79	33.51	26	0.3	0.9775	0.004	0.04	0.1	0.0008	39.3	3.58E-05	186.3	46.96	35.97	21.24	13.43	240
D82E	939.25	21.19	27	0.7	0.9432	0.008	0.055	0.1	0.0018	26.0	4.88E-05	187.1	29.41	51.77	30.20	19.17	173
D82F	1035.55	27.65	27	0.1	0.941	0.008	0.055	0.1	0.0013	18.7	4.94E-05	193.8	24.45	32.30	20.66	18.95	1079
D82G	591.21	32.94	27	0.0	0.9258	0.008	0.055	0.1	0.0010	13.4	4.94E-05	199.1	21.29	21.94	15.53	17.79	#DIV/0!
D82H	818.86	33.55	27	0.0	0.9137	0.008	0.055	0.1	0.0010	14.4	4.24E-05	179.5	20.07	20.08	13.52	17.50	#DIV/0!
D82J	1377.48	30.50	27	0.0	0.9093	0.008	0.055	0.1	0.0012	16.3	4.63E-05	187.7	21.61	25.01	16.45	18.35	#DIV/0!
D82K	913.00	36.36	55	0.0	0.9347	0.02	0.07	0.5	0.0009	19.0	1.53E-05	101.5	19.35	17.58	9.52	16.80	9743
D82L	747.76	38.78	55	0.4	0.9804	0.02	0.07	0.5	0.0008	18.4	1.23E-05	94.1	19.48	15.05	8.09	15.22	203
E10A	133.73	13.16	48	124.8	0.88	0.005	0.04	0.0001	0.0019	64.8	0.000126	192.3	68.52	127.24	74.27	13.04	1
E10B	201.96	10.47	48	104.6	0.8903	0.005	0.04	0.0001	0.0020	68.4	0.000127	189.1	71.65	142.17	81.75	11.05	1
E10C	192.47	11.91	48	74.1	0.872	0.005	0.04	0.0001	0.0019	64.9	0.000122	189.1	67.16	128.66	74.43	12.13	1
E10D	234.91	11.39	48	58.1	0.8334	0.005	0.04	0.0001	0.0019	62.4	0.000124	193.1	62.31	120.90	70.44	11.75	2
E10E	365.78	11.82	48	39.9	0.882	0.005	0.04	0.0001	0.0019	66.3	0.000126	190.4	69.49	133.39	77.25	12.09	2
E10F	385.79	12.06	48	38.1	0.8867	0.005	0.04	0.0001	0.0019	67.2	0.000127	190.3	70.80	135.10	78.23	12.27	2
E10G	508.35	12.66	48	39.4	0.9055	0.005	0.04	0.0001	0.0019	67.8	0.000127	189.7	72.99	137.23	79.49	12.70	3
E10H	162.16	11.44	48	56.2	0.8264	0.005	0.04	0.0001	0.0019	62.5	0.000127	195.0	62.18	120.49	70.45	11.81	2
E10J	468.34	16.33	48	19.2	0.9404	0.005	0.04	0.0001	0.0017	66.8	0.000127	190.7	76.08	130.21	76.46	15.01	6
E10K	235.35	23.99	48	9.0	0.9407	0.005	0.04	0.0001	0.0014	61.5	0.000101	174.8	69.92	96.84	56.75	17.83	12
E21A	189.97	12.19	48	58.0	0.9397	0.005	0.04	0.0001	0.0019	70.5	0.000127	187.0	77.99	148.35	85.30	12.37	2
E21B	223.28	15.68	48	33.6	0.9261	0.005	0.04	0.0001	0.0017	66.5	0.000127	191.0	74.44	129.56	75.99	14.64	3
E21C	233.18	13.98	48	30.5	0.9091	0.005	0.04	0.0001	0.0018	66.8	0.000127	190.7	72.84	132.48	77.22	13.60	3
E21D	241.87	9.69	48	57.8	0.9125	0.005	0.04	0.0001	0.0020	71.0	0.000127	186.5	75.44	152.49	87.02	10.41	2
E21E	292.83	11.38	48	20.9	0.9189	0.005	0.04	0.0001	0.0019	69.6	0.000127	187.9	75.26	146.07	83.97	11.76	4
E21F	378.56	16.49	48	13.9	0.9155	0.005	0.04	0.0001	0.0017	64.9	0.000127	192.6	72.51	123.56	72.95	15.09	7
E21G	266.06	10.23	48	36.9	0.9332	0.005	0.04	0.0001	0.0020	71.7	0.000127	185.8	77.88	155.42	88.69	10.85	2
E21H	404.31	15.07	48	29.5	0.8613	0.005	0.04	0.0001	0.0018	62.6	0.000127	194.9	65.97	116.66	68.96	14.28	3
E21J	316.65	18.66	48	17.5	0.8382	0.005	0.04	0.0001	0.0016	58.3	0.000127	199.2	62.02	99.74	60.44	16.18	6

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
E21K	330.28	16.95	48	20.4	0.8895	0.005	0.04	0.0001	0.0017	62.7	0.000127	194.8	68.82	115.84	68.89	15.34	5
E21L	194.91	23.53	48	2.7	0.9108	0.005	0.04	0.0001	0.0014	58.1	0.000127	199.4	69.33	97.28	60.14	18.00	39
E22A	750.34	11.43	37	4.8	0.9558	0.006	0.06	0.0001	0.0020	58.9	2.89E-05	180.3	58.78	118.12	61.55	11.65	15
E22B	637.62	15.22	37	4.6	0.9615	0.006	0.06	0.0001	0.0017	56.5	2.77E-05	183.8	57.17	98.23	51.56	13.29	18
E22C	489.51	18.01	48	9.2	0.9262	0.005	0.04	0.0001	0.0016	62.5	0.000113	192.6	70.24	114.94	67.58	15.76	11
E22D	495.72	22.48	37	2.7	0.9661	0.006	0.06	0.0001	0.0012	54.0	6.01E-05	191.6	61.19	75.65	43.39	14.57	33
E22E	1013.21	16.26	37	3.3	0.9634	0.006	0.06	0.0001	0.0016	58.9	5.29E-05	185.4	62.49	102.63	56.04	13.78	25
E22F	400.44	21.16	37	1.5	0.9647	0.006	0.06	0.0001	0.0013	57.5	7.77E-05	191.3	66.36	87.33	50.83	14.75	59
E22G	367.00	22.55	37	0.5	0.958	0.006	0.06	0.0001	0.0012	57.6	9.18E-05	193.6	69.02	85.06	51.04	14.93	172
E23A	761.61	8.92	37	8.1	0.9454	0.006	0.06	0.0001	0.0022	60.1	1.48E-05	177.3	57.93	128.37	65.42	9.95	8
E23B	704.99	10.18	37	6.3	0.9418	0.006	0.06	0.0001	0.0021	58.5	1.48E-05	178.7	56.30	118.86	60.68	10.82	11
E23C	317.69	10.32	37	5.8	0.9413	0.006	0.06	0.0001	0.0021	58.4	1.47E-05	179.1	56.11	117.83	60.16	10.91	12
E23D	750.17	12.02	37	4.9	0.9488	0.006	0.06	0.0001	0.0020	57.3	1.48E-05	180.0	55.70	109.30	55.91	11.89	15
E23E	564.15	15.48	37	8.4	0.9251	0.006	0.06	0.0001	0.0017	52.8	1.47E-05	184.8	50.29	85.44	43.98	13.26	10
E23F	472.73	14.68	37	1.0	0.9839	0.006	0.06	0.0001	0.0018	56.9	1.47E-05	180.5	57.49	101.06	51.84	13.01	78
E23G	747.49	12.90	37	2.9	0.9676	0.006	0.06	0.0001	0.0019	57.7	1.47E-05	179.8	57.18	108.28	55.42	12.31	26
E23H	660.08	10.84	37	4.9	0.9524	0.006	0.06	0.0001	0.0021	58.7	1.47E-05	178.8	57.10	117.46	59.98	11.23	14
E23J	894.83	14.91	37	1.2	0.9809	0.006	0.06	0.0001	0.0017	56.5	1.47E-05	181.0	56.95	99.16	50.89	13.09	70
E23K	571.69	17.79	37	0.0	0.9856	0.006	0.06	0.0001	0.0015	53.9	1.47E-05	183.6	54.90	84.28	43.47	13.79	2003
E24A	254.66	14.61	48	20.1	0.8784	0.005	0.04	0.0001	0.0018	63.7	0.000127	193.8	68.04	121.76	71.66	14.00	5
E24B	467.64	18.30	48	6.1	0.9179	0.005	0.04	0.0001	0.0016	63.4	0.000126	194.1	72.04	116.98	69.75	16.01	16
E24C	783.88	16.76	37	4.4	0.9425	0.006	0.06	0.0001	0.0016	52.4	1.47E-05	184.9	51.03	81.99	42.28	13.59	20
E24D	997.38	16.56	37	2.2	0.9639	0.006	0.06	0.0001	0.0016	54.6	2.07E-05	183.7	54.89	88.99	46.33	13.60	39
E24E	671.17	17.74	37	2.1	0.958	0.006	0.06	0.0001	0.0015	55.4	3.73E-05	185.8	57.34	88.22	47.42	13.98	42
E24F	582.30	14.97	37	3.3	0.9484	0.006	0.06	0.0001	0.0017	54.9	1.7E-05	183.1	53.81	93.46	48.21	13.12	24
E24G	632.71	22.61	48	0.2	0.9725	0.005	0.04	0.0001	0.0014	60.2	0.000103	193.2	71.95	103.67	61.53	17.45	503
E24H	482.51	19.69	48	0.8	0.9464	0.005	0.04	0.0001	0.0016	61.7	0.000108	192.4	70.92	110.87	65.23	16.45	117
E24J	1077.74	18.98	48	6.9	0.9276	0.005	0.04	0.0001	0.0016	63.6	0.000127	193.9	73.25	116.76	69.77	16.33	15
E24K	651.95	30.50	48	1.1	0.9568	0.005	0.04	0.0001	0.0011	50.0	9.26E-05	198.7	63.29	72.13	44.87	18.79	104
E24L	515.78	19.89	48	15.1	0.9463	0.005	0.04	0.0001	0.0016	63.8	0.000127	193.5	75.32	117.11	70.15	16.72	8
E24M	528.54	24.50	48	5.2	0.9489	0.005	0.04	0.0001	0.0014	60.2	0.000122	193.6	73.60	100.43	61.46	18.21	21
E31A	2865.23	32.68	36	0.0	0.993	0.005	0.05	0.0001	0.0008	42.7	1.4E-05	139.5	44.77	36.55	19.25	13.57	7755
E31B	1476.30	16.85	36	0.4	0.9876	0.005	0.05	0.0001	0.0015	45.1	1.21E-05	97.5	45.29	68.15	34.66	12.78	180
E31C	1572.12	22.88	36	0.0	0.987	0.005	0.05	0.0001	0.0012	38.7	1.31E-05	105.7	39.33	47.51	24.44	13.97	16120
E31D	839.21	30.49	27	0.0	0.9873	0.008	0.055	0.1	0.0012	23.4	3.28E-05	157.8	27.53	31.87	18.49	18.15	#DIV/0!
E31E	477.89	21.94	36	0.0	0.9716	0.005	0.05	0.0001	0.0013	32.0	3.12E-05	146.4	34.61	43.32	23.88	14.07	#DIV/0!
E31F	524.81	18.76	36	0.0	0.9732	0.005	0.05	0.0001	0.0014	42.5	1.24E-05	100.5	42.21	59.37	30.29	13.31	66519
E31G	1237.88	30.84	36	0.0	0.9879	0.005	0.05	0.0001	0.0009	25.6	3.35E-05	163.5	31.41	27.69	16.55	14.11	29183
E31H	726.07	29.72	27	0.0	0.9689	0.008	0.055	0.1	0.0012	26.6	3.77E-05	165.7	30.80	36.96	21.51	18.39	18708
E32A	1117.75	10.26	36	4.4	0.9512	0.005	0.05	0.0001	0.0019	49.6	1.21E-05	92.9	47.77	89.43	45.25	9.67	14
E32B	828.25	13.27	36	1.4	0.9585	0.005	0.05	0.0001	0.0017	47.2	1.21E-05	95.3	45.88	77.96	39.53	11.36	49
E32C	638.07	11.77	36	3.1	0.9629	0.005	0.05	0.0001	0.0018	48.9	1.21E-05	93.6	47.66	85.07	43.08	10.57	21
E32D	615.81	15.51	36	0.6	0.9711	0.005	0.05	0.0001	0.0016	48.1	1.13E-05	95.1	47.36	74.66	37.85	12.31	132
E32E	1001.15	18.07	56	1.7	0.9588	0.003	0.055	0.001	0.0008	60.0	6.49E-06	87.7	58.23	47.16	23.85	7.38	26
E33A	1354.74	38.41	27	0.0	0.9819	0.008	0.055	0.1	0.0008	25.8	3.3E-05	166.2	32.14	25.36	15.38	15.79	2168
E33B	701.90	38.39	56	0.1	0.987	0.003	0.055	0.001	0.0003	58.0	1.51E-06	94.4	57.68	18.67	9.41	6.24	276
E33C	980.13	27.52	56	1.9	0.971	0.003	0.055	0.001	0.0005	67.7	1.51E-06	84.7	65.97	35.68	17.90	7.46	25
E33D	1558.95	37.51	56	0.2	0.9758	0.003	0.055	0.001	0.0003	51.6	8.37E-06	109.6	52.97	17.90	9.40	6.50	237
E33E	1282.27	38.65	56	0.5	0.9772	0.003	0.055	0.001	0.0003	48.2	1.06E-05	115.8	50.87	16.26	8.73	6.38	74
E33F	724.74	26.35	56	5.2	0.9583	0.003	0.055	0.001	0.0006	64.1	1.52E-05	100.5	63.95	36.45	18.96	7.71	10
E33G	894.30	39.80	56	2.8	0.9666	0.003	0.055	0.001	0.0003	53.3	3.33E-05	126.0	64.92	19.61	11.83	6.67	15
E33H	718.47	38.42	56	1.0	0.979	0.003	0.055	0.001	0.0003	40.6	4.88E-05	159.6	63.35	20.48	14.05	7.15	41
E40A	940.99	11.66	36	4.9	0.9623	0.005	0.05	0.0001	0.0018	48.9	1.25E-05	95.7	47.66	85.38	43.27	10.51	13
E40B	707.48	9.86	36	5.0	0.9629	0.005	0.05	0.0001	0.0019	50.6	1.21E-05	94.8	49.30	93.47	47.29	9.41	12
E40C	530.02	15.97	36	5.5	0.9722	0.005	0.05	0.0001	0.0016	46.5	1.17E-05	99.6	45.89	71.22	36.18	12.48	14
E40D	543.97	31.36	36	4.8	0.9303	0.005	0.05	0.0001	0.0009	29.3	1.2E-05	115.4	28.75	24.80	13.04	13.71	17
F10A	458.47	34.53	55	0.0	0.9036	0.02	0.07	0.5	0.0010	20.7	1.23E-05	91.8	19.74	20.26	10.64	17.93	#DIV/0!
F10B	1084.91	37.76	55	0.3	0.9645	0.02	0.07	0.5	0.0008	19.0	1.23E-05	93.5	19.71	16.31	8.71	15.86	317
F10C	1173.40	42.67	55	0.7	0.983	0.02	0.07	0.5	0.0006	14.6	1.23E-05	97.9	16.31	9.68	5.44	12.93	108
F20A	1116.95	35.25	27	0.0	0.9452	0.008	0.055	0.1	0.0009	11.8	4.87E-05	198.8	21.04	19.39	14.27	17.10	2337
F20B	512.48	35.09	27	0.1	0.9752	0.008	0.055	0.1	0.0009	14.6	3.99E-05	172.0	21.45	19.92	13.30	17.00	819
F20C	611.03	37.03	55	0.0	0.9616	0.02	0.07	0.5	0.0009	19.1	1.49E-05	100.1	19.99	17.37	9.40	16.36	2517
F20D	452.05	36.61	55	0.9	0.9874	0.02	0.07	0.5	0.0009	20.6	1.23E-05	91.9	21.59	19.29	10.20	16.58	111
F20E	432.41	36.63	55	0.9	0.9808	0.02	0.07	0.5	0.0009	19.9	1.47E-05	99.1	21.11	18.84	10.13	16.62	112
F30A	1950.89	22.09	27	0.2	0.9504	0.008	0.055	0.1	0.0017	24.2	4.94E-05	188.4	28.18	47.73	28.29	19.25	597
F30B	1459.93	28.03	27	0.0	0.9793	0.008	0.055	0.1	0.0013	30.8	4.32E-05	187.7	36.28	47.09	27.52	18.80	26193
F30C	1651.25	10.92	27	1.4	0.9333	0.008	0.055	0.1	0.0027	34.2	4.94E-05	178.3	34.98	92.83	50.53	14.76	63
F30D	973.60	12.39	27	0.1	0.9332	0.008	0.055	0.1	0.0025	32.7	4.94E-05	179.8	33.82	84.98	46.64	15.87	727
F30E	1257.22	13.67	27	0.3	0.9412	0.008	0.055	0.1	0.0024	31.8	4.94E-05	180.7	33.43	79.98	44.20	16.69	399
F30F	1464.58	23.68	27	0.0	0.937	0.008	0.055	0.1	0.0016	22.2	4.94E-05	190.3	26.35	41.62	25.22	19.29	4388
F30G	977.13	34.28	27	0.6	0.973	0.008	0.055	0.1	0.0010	13.6	4.66E-05	191.2	22.16	21.40	15.03	17.36	175
F40A	1015.27	48.52	27	1.5	0.9836	0.008	0.055	0.1	0.0005	1.8	4.92E-05	210.0	23.25	10.99	10.57	12.66	54
F40B	403.28	27.27	27	0.2	0.9616	0.008	0.055	0.1	0.0013	19.3	4.94E-05	193.2	25.39	34.13	21.66	19.00	653
F40C	606.69	20.82	27	1.9	0.9498	0.008	0.055	0.1	0.0018	25.2	4.94E-05	187.3	28.89	51.67	30.23	19.13	61
F40D	738.53	41.85	27	1.3	0.9802	0.008	0.055	0.1	0.0007	5.7	4.94E-05	206.8	20.68	13.74	11.88	14.94	70
F40E	1061.95	24.85	27	1.9	0.9438	0.008	0.055	0.1	0.0015	21.1	4.94E-05	191.4	25.91	38.84	23.89	19.25	64
F40F	681.30	41.26	27	1.0	0.984	0.008	0.055	0.1	0.0007	6.2	4.94E-05	206.3	20.75	14.20	12.12	15.14	89
F40G	347.32	23.37	27	1.9	0.9573	0.008	0.055	0.1	0.0016	23.0	4.94E-05	189.5	27.61	44.22	26.60	19.29	61
F40H	513.11	38.19	27	0.9	0.9781	0.008	0.055	0.1	0.0008	9.1	4.94E-05	203.4	21.25	16.95	13.39	16.18	106

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
F50A	1303.30	18.80	27	0.4	0.9413	0.008	0.055	0.1	0.0019	31.8	4.47E-05	174.8	33.68	65.58	36.47	18.73	307
F50B	602.51	14.82	27	1.1	0.917	0.008	0.055	0.1	0.0023	31.3	4.81E-05	179.0	32.12	73.51	40.70	17.31	99
F50C	438.16	16.99	27	1.3	0.9467	0.008	0.055	0.1	0.0021	37.9	4.05E-05	163.4	38.88	81.58	43.92	18.16	82
F50D	685.98	20.54	27	2.1	0.9715	0.008	0.055	0.1	0.0018	28.4	4.73E-05	181.6	32.17	58.23	33.28	19.07	57
F50E	486.04	12.46	27	3.5	0.9048	0.008	0.055	0.1	0.0025	31.7	4.94E-05	180.8	31.88	79.88	43.99	15.91	28
F50F	574.18	16.38	27	2.3	0.9584	0.008	0.055	0.1	0.0021	29.8	4.94E-05	183.1	32.61	70.10	39.39	18.02	48
F50G	774.31	39.52	27	0.9	0.9802	0.008	0.055	0.1	0.0007	8.0	4.94E-05	204.6	21.07	15.74	12.83	15.73	109
F60A	572.03	42.06	27	0.8	0.983	0.008	0.055	0.1	0.0007	5.6	4.94E-05	206.9	20.82	13.69	11.87	14.87	116
F60B	319.44	25.16	27	1.5	0.9674	0.008	0.055	0.1	0.0015	21.6	4.94E-05	190.9	27.05	40.00	24.57	19.23	75
F60C	620.97	25.28	27	1.6	0.969	0.008	0.055	0.1	0.0015	21.5	4.94E-05	191.3	27.08	39.85	24.51	19.22	75
F60D	480.11	32.87	27	1.0	0.973	0.008	0.055	0.1	0.0010	14.2	4.94E-05	198.3	23.06	23.84	16.69	17.81	103
F60E	796.73	45.17	56	0.9	0.9845	0.003	0.055	0.001	0.0002	37.6	1.74E-05	133.8	46.94	10.83	6.56	5.60	38
G10A	171.78	7.34	49	351.1	0.8417	0.005	0.035	0.0001	0.0022	47.3	0.000113	115.2	44.81	97.71	54.32	8.42	1
G10B	125.97	6.87	49	258.6	0.8217	0.005	0.035	0.0001	0.0022	48.6	0.000143	113.9	46.02	101.28	57.32	8.05	1
G10C	328.07	7.86	57	138.2	0.9193	0.003	0.06	0.01	0.0011	42.2	2.35E-05	120.3	41.05	47.04	24.82	4.59	1
G10D	687.55	9.61	57	57.8	0.9518	0.003	0.06	0.01	0.0011	41.0	1.23E-05	121.5	40.33	43.25	22.34	5.21	1
G10E	394.10	12.05	54	57.7	0.9121	0.01	0.05	1	0.0017	38.3	5.61E-05	167.3	40.04	67.12	37.84	10.44	2
G10F	539.36	9.21	57	37.7	0.9588	0.003	0.06	0.01	0.0011	42.1	1.34E-05	121.7	41.76	45.47	23.52	5.08	1
G10G	185.58	12.07	54	140.8	0.858	0.01	0.05	1	0.0017	64.5	0.000125	192.0	67.64	113.32	66.99	10.87	1
G10H	674.52	17.84	57	14.5	0.9655	0.003	0.06	0.01	0.0008	34.8	1.65E-05	131.6	36.35	27.64	14.87	6.93	3
G10J	867.51	10.86	57	20.2	0.9636	0.003	0.06	0.01	0.0010	41.3	1.63E-05	125.0	41.71	42.60	22.28	5.63	2
G10K	1175.89	13.79	57	14.9	0.96	0.003	0.06	0.01	0.0009	46.2	7.98E-05	130.6	55.39	50.20	30.10	6.80	3
G10L	1754.55	10.21	57	18.3	0.9875	0.003	0.06	0.01	0.0010	44.1	6.55E-05	109.0	50.28	52.68	29.87	5.68	2
G10M	2004.22	10.47	59	16.4	0.9859	0.07	0.06	1	0.0115	46.5	0.000125	96.6	46.84	537.96	274.93	60.80	23
G21A	524.34	9.46	59	31.2	0.9796	0.07	0.06	1	0.0121	46.0	0.0001	100.9	45.88	554.36	282.15	57.61	12
G21B	304.61	9.65	59	34.2	0.9865	0.07	0.06	1	0.0120	46.4	0.000106	99.5	46.63	557.98	284.21	58.26	11
G21C	244.22	10.09	57	27.5	0.9655	0.003	0.06	0.01	0.0011	40.9	1.17E-05	121.6	40.79	42.93	22.15	5.37	2
G21D	484.05	10.26	57	23.6	0.9748	0.003	0.06	0.01	0.0010	42.4	3.89E-05	115.4	45.49	47.56	25.97	5.56	2
G21E	530.76	9.80	57	33.7	0.9768	0.003	0.06	0.01	0.0011	41.6	1.17E-05	120.9	41.94	44.65	23.01	5.27	1
G21F	242.39	9.35	59	34.4	0.9737	0.07	0.06	1	0.0121	44.1	6.24E-05	109.5	43.53	528.84	267.75	57.07	10
G22A	238.81	6.77	59	112.2	0.9126	0.07	0.06	1	0.0138	46.5	0.000126	96.0	43.26	596.02	303.52	47.08	3
G22B	109.19	7.08	59	143.4	0.8471	0.07	0.06	1	0.0136	42.6	0.000126	99.9	36.87	500.53	255.59	48.51	3
G22C	254.20	6.97	59	62.9	0.9772	0.07	0.06	1	0.0137	48.4	0.000105	97.6	48.08	656.34	333.20	47.91	5
G22D	247.40	5.92	59	101.0	0.9783	0.07	0.06	1	0.0144	50.4	0.000126	92.1	50.06	718.59	364.96	42.85	3
G22E	271.60	7.61	57	50.2	0.9802	0.003	0.06	0.01	0.0012	46.7	7.33E-05	105.0	52.30	60.47	34.01	4.68	1
G22F	65.69	7.84	57	349.1	0.8243	0.003	0.06	0.01	0.0011	43.4	8.49E-05	119.1	43.06	49.36	28.85	4.83	1
G22G	106.36	7.92	57	69.7	0.9437	0.003	0.06	0.01	0.0011	42.2	1.17E-05	120.3	40.96	46.82	24.07	4.57	1
G22H	227.33	8.01	57	68.9	0.9461	0.003	0.06	0.01	0.0011	42.9	2.84E-05	116.7	43.39	49.42	26.28	4.68	1
G22J	128.53	9.38	57	176.6	0.9118	0.003	0.06	0.01	0.0011	41.7	5.28E-05	116.0	43.14	46.66	26.12	5.32	1
G22K	79.82	11.06	57	122.6	0.92	0.003	0.06	0.01	0.0010	40.4	5.2E-05	115.7	42.67	43.23	24.39	5.89	1
G30A	759.65	11.34	59	14.4	0.9834	0.07	0.06	1	0.0110	57.9	0.000126	133.7	58.42	642.41	329.50	63.05	27
G30B	658.43	15.80	57	15.7	0.954	0.003	0.06	0.01	0.0008	37.8	2.29E-05	133.8	39.60	32.95	17.93	6.75	3
G30C	351.20	14.90	48	23.1	0.9367	0.005	0.04	0.0001	0.0018	65.8	0.000119	185.5	73.26	130.12	75.41	14.12	4
G30D	534.45	14.86	57	22.4	0.9483	0.003	0.06	0.01	0.0009	50.6	6.4E-05	156.0	58.94	51.05	30.26	6.91	2
G30E	351.98	20.46	48	12.7	0.9612	0.005	0.04	0.0001	0.0015	64.3	0.000126	192.6	77.08	117.97	70.65	16.95	9
G30F	776.22	19.10	48	14.0	0.9678	0.005	0.04	0.0001	0.0016	66.3	0.000127	191.2	78.91	125.37	74.40	16.38	7
G30G	646.80	22.02	48	9.7	0.9735	0.005	0.04	0.0001	0.0015	63.7	0.000127	193.8	78.33	114.76	69.33	17.52	12
G30H	1077.46	37.07	48	4.4	0.9779	0.005	0.04	0.0001	0.0009	49.3	0.000127	208.2	76.07	70.36	48.08	19.49	27
G40A	71.54	13.61	49	215.6	0.9132	0.005	0.035	0.0001	0.0019	46.2	0.000122	116.3	48.96	93.78	53.37	13.87	1
G40B	123.69	14.36	49	160.6	0.8554	0.005	0.035	0.0001	0.0019	45.1	0.000152	117.4	46.63	87.87	51.55	14.62	1
G40C	144.57	11.36	49	292.2	0.9045	0.005	0.035	0.0001	0.0020	49.5	0.000142	113.0	51.98	104.45	59.49	12.22	1
G40D	327.08	14.05	49	179.0	0.9091	0.005	0.035	0.0001	0.0019	48.6	0.000152	113.9	52.49	99.60	57.64	14.40	1
G40E	277.58	13.04	49	39.9	0.9222	0.005	0.035	0.0001	0.0019	48.9	0.000136	111.6	52.29	101.40	57.70	13.53	3
G40F	422.46	16.25	53	27.3	0.9405	0.01	0.05	0.001	0.0031	44.1	8.61E-05	109.7	44.41	136.42	72.65	25.66	6
G40G	208.47	12.30	49	65.0	0.9323	0.005	0.035	0.0001	0.0020	51.0	0.000148	111.0	55.34	109.02	62.15	13.02	2
G40H	98.10	11.90	49	70.3	0.9124	0.005	0.035	0.0001	0.0020	50.5	0.000152	112.0	53.86	107.00	61.25	12.72	2
G40J	168.50	15.79	49	42.1	0.9178	0.005	0.035	0.0001	0.0018	47.2	0.000149	114.9	51.95	94.88	55.29	15.59	3
G40K	429.15	16.20	53	19.7	0.9466	0.01	0.05	0.001	0.0031	44.4	8.44E-05	109.3	44.84	137.98	73.36	25.61	8
G40L	385.80	18.91	60	34.2	0.9451	0.07	0.06	1	0.0074	41.0	0.000131	121.5	40.79	302.09	158.56	71.26	13
G40M	393.46	23.78	49	27.5	0.9448	0.005	0.035	0.0001	0.0015	41.2	0.000151	121.3	50.39	76.37	46.86	19.82	5
G50A	244.87	31.49	49	29.8	0.9729	0.005	0.035	0.0001	0.0012	35.1	0.000152	127.4	49.25	61.39	40.09	22.02	5
G50B	339.28	22.97	49	18.7	0.9575	0.005	0.035	0.0001	0.0015	42.5	0.000152	120.0	51.98	80.36	48.89	19.50	7
G50C	421.40	22.09	49	20.6	0.9845	0.005	0.035	0.0001	0.0016	42.3	0.000141	120.2	52.20	82.43	49.58	19.00	6
G50D	572.41	18.58	53	9.7	0.9605	0.01	0.05	0.001	0.0028	43.3	9.31E-05	111.5	45.11	127.64	68.80	27.15	17
G50E	313.24	17.01	53	16.0	0.9731	0.01	0.05	0.001	0.0030	43.4	0.000118	117.4	46.74	139.85	76.66	26.44	10
G50F	294.51	17.86	61	23.6	0.9859	0.06	0.06	1	0.0067	41.2	0.000119	121.2	42.73	286.88	150.54	61.02	16
G50G	380.11	17.98	53	5.8	0.9746	0.01	0.05	0.001	0.0029	43.4	7.59E-05	109.1	45.09	130.32	69.19	26.67	33
G50H	889.67	25.42	53	6.5	0.9659	0.01	0.05	0.001	0.0022	35.5	7.91E-05	118.0	38.36	84.00	46.51	28.83	27
G50J	518.67	26.46	61	11.8	0.9844	0.06	0.06	1	0.0042	31.4	0.000105	129.3	34.13	143.26	78.29	56.92	30
G50K	166.06	53.46	61	17.2	0.9515	0.06	0.06	1	0.0009	6.4	9.63E-05	152.0	21.92	19.29	16.61	26.10	10
H10A	233.67	12.91	48	54.0	0.9308	0.005	0.035	0.2	0.0017	69.3	0.000127	188.3	77.42	132.60	77.40	11.88	2
H10B	162.46	11.58	48	90.1	0.9045	0.005	0.035	0.2	0.0018	69.1	0.000127	188.4	74.71	131.92	76.75	10.95	1
H10C	259.60	13.55	48	82.2	0.9184	0.005	0.035	0.2	0.0017	67.3	0.000126	190.0	74.90	126.40	74.22	12.29	1
H10D	96.96	10.45	48	155.8	0.7873	0.005	0.035	0.2	0.0018	59.6	0.000124	196.6	57.49	104.12	61.63	10.11	1
H10E	84.81	8.46	49	278.7	0.8162	0.005	0.035	0.0001	0.0021	46.3	0.000132	116.2	43.64	93.07	52.80	9.58	1
H10F	247.88	11.14	54	109.3	0.8855	0.01	0.05	1	0.0017	40.9	8.73E-05	147.8	42.78	74.47	42.94	10.18	1
H10G	270.43	7.17	54	108.7	0.9158	0.01	0.05	1	0.0020	46.2	9.32E-05	139.3	48.12	98.43	55.16	7.66	1
H10H	187.49	8.77	54	136.5	0.8786	0.01	0.05	1	0.0019	45.8	8.68E-05	186.1	47.60	91.32	52.75	8.79	1
H10J	213.78	6.16	49	293.7	0.8171	0.005	0.035	0.0001	0.0022	47.4	0.000123	116.5	43.98	98.14	54.94	7.26	1

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
H10K	193.55	7.71	49	204.1	0.8101	0.005	0.035	0.0001	0.0022	48.3	0.000149	115.2	45.59	98.69	56.29	8.92	1
H10L	95.79	9.47	49	23.5	0.9404	0.005	0.035	0.0001	0.0021	45.3	8.87E-05	142.0	48.25	100.81	56.32	10.31	3
H20A	140.46	18.92	50	14.9	0.9275	0.005	0.035	0.2	0.0015	54.1	0.000188	203.4	74.05	109.95	72.69	15.82	7
H20B	124.39	19.28	50	50.0	0.8982	0.005	0.035	0.2	0.0015	52.0	0.000188	205.5	70.28	103.40	69.04	16.00	2
H20C	80.57	17.67	50	37.4	0.9157	0.005	0.035	0.2	0.0015	64.3	0.000127	193.2	73.49	112.48	67.45	14.64	3
H20D	100.67	17.51	50	84.1	0.7798	0.005	0.035	0.2	0.0015	50.0	0.000159	207.5	55.72	85.62	55.66	14.84	2
H20E	95.20	11.18	50	145.8	0.7669	0.005	0.035	0.2	0.0018	51.7	0.000174	205.8	55.01	98.00	62.70	10.93	1
H20F	116.58	19.39	50	72.5	0.8263	0.005	0.035	0.2	0.0015	48.2	0.000185	209.3	61.61	90.42	61.17	16.01	2
H20G	85.08	17.81	50	52.4	0.8035	0.005	0.035	0.2	0.0015	40.3	0.000141	204.2	47.56	72.54	47.83	14.84	2
H20H	89.03	13.17	54	12.1	0.9689	0.01	0.05	1	0.0016	33.9	2.87E-05	176.9	35.94	57.50	31.21	10.72	6
H30A	284.24	16.82	50	20.1	0.9053	0.005	0.035	0.2	0.0016	54.9	0.000188	202.6	71.72	112.06	73.26	14.72	5
H30B	315.00	13.33	50	17.5	0.9065	0.005	0.035	0.2	0.0017	58.3	0.000188	199.2	72.84	123.57	78.74	12.56	5
H30C	327.14	14.23	50	31.5	0.897	0.005	0.035	0.2	0.0017	57.0	0.000188	200.5	71.50	118.79	76.28	13.15	3
H30D	127.10	13.58	50	28.7	0.8603	0.005	0.035	0.2	0.0017	54.8	0.000188	202.7	66.54	112.24	72.50	12.73	3
H30E	153.76	11.98	50	18.0	0.9086	0.005	0.035	0.2	0.0017	39.7	6.03E-05	156.4	40.98	71.70	40.13	10.85	4
H40A	184.39	18.32	50	19.9	0.9479	0.005	0.035	0.2	0.0015	56.1	0.000188	201.4	76.94	115.92	75.89	15.52	5
H40B	240.54	18.43	50	44.1	0.8798	0.005	0.035	0.2	0.0015	52.1	0.000188	205.4	68.41	102.78	68.37	15.57	3
H40C	271.79	19.57	54	15.0	0.9345	0.01	0.05	1	0.0012	34.6	8.12E-05	171.1	42.98	52.23	32.60	12.68	6
H40D	181.76	17.24	53	25.2	0.8975	0.01	0.05	0.001	0.0030	45.3	0.000152	117.2	46.05	136.66	76.30	26.88	7
H40E	285.43	13.46	53	27.2	0.9142	0.01	0.05	0.001	0.0034	49.1	0.000152	113.4	49.57	167.34	91.52	23.75	6
H40F	339.92	16.08	53	3.5	0.9332	0.01	0.05	0.001	0.0031	47.9	0.000152	114.6	49.96	154.33	85.27	26.06	45
H40G	263.37	15.20	53	14.3	0.9161	0.01	0.05	0.001	0.0032	47.9	0.000152	114.6	48.84	155.55	85.73	25.35	11
H40H	207.91	16.08	54	23.3	0.9023	0.01	0.05	1	0.0014	40.9	0.000109	153.1	47.56	67.26	41.14	12.24	4
H40J	203.58	12.33	54	19.5	0.9088	0.01	0.05	1	0.0017	42.9	9.29E-05	153.9	46.83	77.61	45.30	10.79	4
H40K	270.56	13.34	53	11.2	0.9052	0.01	0.05	0.001	0.0034	47.6	0.00013	113.9	47.02	159.37	86.40	23.48	13
H40L	158.92	11.43	53	12.7	0.9392	0.01	0.05	0.001	0.0036	39.4	5.09E-05	160.9	39.15	141.20	74.45	20.90	10
H50A	264.50	14.24	53	6.6	0.9247	0.01	0.05	0.001	0.0033	45.4	9.19E-05	110.4	44.84	147.48	78.43	24.08	23
H50B	430.59	16.24	53	12.1	0.9397	0.01	0.05	0.001	0.0031	44.1	8.22E-05	114.1	44.34	136.24	72.53	25.62	13
H60A	72.64	9.97	49	389.4	0.8658	0.005	0.035	0.0001	0.0021	49.7	0.000152	112.8	50.15	103.72	59.26	11.07	1
H60B	210.00	10.46	49	181.8	0.8868	0.005	0.035	0.0001	0.0020	50.6	0.000152	111.9	52.24	106.96	61.00	11.50	1
H60C	216.89	13.54	49	133.0	0.8921	0.005	0.035	0.0001	0.0019	48.1	0.000152	114.4	51.01	97.87	56.67	14.01	1
H60D	226.84	17.77	53	60.9	0.9075	0.01	0.05	0.001	0.0029	42.6	0.000112	114.6	42.69	124.34	67.98	26.87	3
H60E	170.48	16.24	53	55.1	0.8965	0.01	0.05	0.001	0.0031	43.2	0.000106	113.3	42.19	129.62	70.19	25.81	3
H60F	164.94	15.31	53	45.6	0.8876	0.01	0.05	0.001	0.0032	43.6	0.000112	113.7	42.22	133.94	72.60	25.14	4
H60G	141.21	14.35	53	28.6	0.9584	0.01	0.05	0.001	0.0033	46.1	7.59E-05	106.4	46.59	152.71	80.22	24.06	6
H60H	252.98	15.83	53	27.6	0.9376	0.01	0.05	0.001	0.0031	45.0	9.55E-05	110.1	45.36	141.39	75.62	25.42	7
H60J	293.13	17.65	53	26.3	0.9347	0.01	0.05	0.001	0.0029	43.3	0.0001	112.4	44.11	128.99	69.77	26.70	7
H60K	262.21	16.98	53	13.4	0.9584	0.01	0.05	0.001	0.0030	44.5	9.12E-05	110.0	45.88	137.40	73.51	26.20	13
H60L	230.29	21.55	53	12.3	0.9637	0.01	0.05	0.001	0.0025	39.8	8.34E-05	113.6	41.99	106.58	57.85	28.25	15
H70A	223.78	27.14	53	21.5	0.9616	0.01	0.05	0.001	0.0020	34.4	8.04E-05	122.3	37.70	77.12	43.29	28.85	10
H70B	153.09	26.75	53	156.3	0.9211	0.01	0.05	0.001	0.0021	36.0	0.000103	142.3	39.67	82.42	47.98	29.17	2
H70C	287.40	18.21	50	16.3	0.904	0.005	0.035	0.2	0.0015	53.3	0.000188	204.2	71.16	107.50	71.08	15.46	6
H70D	170.43	22.98	50	120.5	0.9002	0.005	0.035	0.2	0.0013	42.4	0.000143	173.5	54.88	73.57	47.99	17.05	1
H70E	156.84	27.02	50	184.1	0.9029	0.005	0.035	0.2	0.0012	37.9	0.000132	166.8	50.63	61.08	40.44	18.08	1
H70F	120.85	29.42	53	103.0	0.959	0.01	0.05	0.001	0.0019	32.8	8.6E-05	129.2	37.15	69.33	39.99	28.72	2
H70G	651.90	41.76	53	5.1	0.9684	0.01	0.05	0.001	0.0011	20.1	7.59E-05	132.3	28.30	31.18	20.45	24.59	30
H70H	400.06	56.15	53	7.7	0.9596	0.01	0.05	0.001	0.0006	6.5	7.59E-05	146.0	24.91	14.17	12.41	18.10	15
H70J	551.05	34.66	53	6.3	0.9725	0.01	0.05	0.001	0.0015	27.0	7.63E-05	125.5	32.50	48.79	29.05	27.34	28
H70K	147.41	40.24	53	20.4	0.9693	0.01	0.05	0.001	0.0012	16.7	0.000109	135.8	28.37	33.44	23.91	25.92	8
H80A	149.04	14.89	50	113.0	0.9021	0.005	0.035	0.2	0.0016	56.1	0.000188	201.4	71.45	116.87	75.50	13.58	1
H80B	122.96	18.37	50	200.5	0.885	0.005	0.035	0.2	0.0015	46.8	0.000148	173.7	56.56	85.11	53.96	15.18	1
H80C	284.84	17.15	53	14.4	0.9558	0.01	0.05	0.001	0.0030	44.9	8.88E-05	119.7	46.32	137.87	74.02	26.29	11
H80D	230.73	13.41	53	11.4	0.9806	0.01	0.05	0.001	0.0034	48.2	7.59E-05	104.3	49.55	167.56	87.66	23.18	13
H80E	373.47	13.54	53	22.1	0.9767	0.01	0.05	0.001	0.0034	38.3	0.000139	114.2	42.05	141.61	78.56	23.73	7
H80F	206.76	24.16	62	28.5	0.9688	0.03	0.05	0.001	0.0069	22.6	0.000172	129.9	25.01	172.53	97.09	85.39	18
H90A	179.09	12.07	50	113.5	0.9032	0.005	0.035	0.2	0.0017	55.1	0.000158	174.5	64.07	111.89	68.41	11.49	1
H90B	118.18	12.88	50	123.4	0.8892	0.005	0.035	0.2	0.0017	58.1	0.000188	199.4	71.08	121.84	77.58	12.25	1
H90C	217.58	11.45	53	16.9	0.9603	0.01	0.05	0.001	0.0036	50.2	8.59E-05	111.6	50.80	183.11	96.16	21.13	8
H90D	602.12	17.06	53	17.4	0.9748	0.01	0.05	0.001	0.0030	36.1	0.00013	116.6	40.16	119.93	67.32	26.58	10
H90E	498.79	42.02	62	19.2	0.9685	0.03	0.05	0.001	0.0033	7.8	0.000172	144.6	14.92	48.75	36.42	72.26	23
J11A	437.62	11.62	41	6.4	0.9527	0.01	0.05	0.001	0.0036	43.8	0.000137	99.7	45.40	162.76	87.90	21.63	20
J11B	737.83	12.67	41	4.0	0.9503	0.01	0.05	0.001	0.0035	42.6	0.000139	100.1	44.30	153.50	83.35	22.83	36
J11C	292.19	16.43	41	0.6	0.9548	0.01	0.05	0.001	0.0031	39.3	0.000139	103.2	42.03	128.31	70.99	26.21	264
J11D	801.20	11.59	41	4.4	0.9555	0.01	0.05	0.001	0.0036	44.0	0.000138	99.2	45.69	163.94	88.50	21.59	31
J11E	812.21	12.09	41	1.7	0.9539	0.01	0.05	0.001	0.0035	44.9	0.000143	108.6	47.04	166.08	90.43	22.21	77
J11F	344.41	14.75	41	1.2	0.9288	0.01	0.05	0.001	0.0032	47.6	0.000161	146.2	50.93	164.68	93.25	25.03	120
J11G	604.26	15.95	41	0.3	0.9572	0.01	0.05	0.001	0.0031	40.1	0.00014	104.9	42.91	133.15	73.60	25.87	433
J11H	651.42	13.72	50	7.3	0.8841	0.005	0.035	0.2	0.0017	56.3	0.000188	200.7	69.57	116.96	75.13	12.82	11
J11J	449.84	13.75	50	12.9	0.9032	0.005	0.035	0.2	0.0017	57.6	0.000188	199.9	72.20	121.30	77.61	12.84	6
J11K	515.90	14.84	50	5.3	0.9457	0.005	0.035	0.2	0.0016	59.3	0.000188	198.2	77.58	127.04	81.13	13.55	16
J12A	180.84	18.55	50	18.4	0.9132	0.005	0.035	0.2	0.0015	61.6	0.000136	195.9	72.52	108.65	66.53	15.16	5
J12B	250.99	17.93	50	6.1	0.9372	0.005	0.035	0.2	0.0015	57.4	0.000177	200.1	75.62	115.01	74.07	15.22	16
J12C	366.03	20.21	50	3.8	0.9412	0.005	0.035	0.2	0.0014	56.4	0.000168	200.8	75.13	108.02	69.86	16.23	26
J12D	830.85	17.98	50	8.5	0.9464	0.005	0.035	0.2	0.0015	56.4	0.000188	201.1	76.92	116.86	76.30	15.34	11
J12E	355.66	14.71	50	6.0	0.9225	0.005	0.035	0.2	0.0016	58.2	0.000188	199.3	74.68	122.67	78.61	13.47	14
J12F	709.90	14.47	50	8.5	0.9474	0.005	0.035	0.2	0.0017	59.7	0.000188	197.9	77.85	128.60	81.91	13.31	10
J12G	760.87	14.16	50	7.6	0.9098	0.005	0.035	0.2	0.0017	57.7	0.000188	199.9	73.03	121.52	77.84	13.11	10
J12H	549.37	16.35	50	7.8	0.932	0.005	0.035	0.2	0.0016	57.1	0.000188	200.2	75.42	119.16	77.11	14.45	12
J12J	548.92	14.72	50	8.6	0.9359	0.005	0.035	0.2	0.0016	58.6	0.000188	198.9	76.15	125.06	80.01	13.47	10

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
J12K	516.63	15.61	50	5.2	0.9566	0.005	0.035	0.2	0.0016	59.4	0.000188	198.1	78.97	126.99	81.29	14.02	17
J12L	757.62	17.81	50	14.8	0.9385	0.005	0.035	0.2	0.0015	56.0	0.000188	201.5	75.83	115.66	75.59	15.26	8
J12M	483.01	17.80	50	6.8	0.9464	0.005	0.035	0.2	0.0015	56.4	0.000188	201.0	76.83	117.21	76.47	15.25	14
J13A	518.00	15.96	50	8.0	0.942	0.005	0.035	0.2	0.0016	57.9	0.000188	199.8	76.66	122.26	78.81	14.23	8
J13B	401.82	14.40	50	7.8	0.935	0.005	0.035	0.2	0.0017	59.2	0.000188	198.3	76.38	126.38	80.60	13.27	11
J13C	435.08	14.77	50	6.8	0.9272	0.005	0.035	0.2	0.0016	58.3	0.000188	199.2	75.21	123.38	79.04	13.50	12
J21A	854.37	12.70	41	4.6	0.9671	0.01	0.05	0.001	0.0035	43.3	0.000139	99.3	45.68	158.13	85.72	22.86	30
J21B	530.33	14.14	41	1.0	0.9849	0.01	0.05	0.001	0.0033	42.7	0.000139	99.8	46.20	152.48	83.06	24.31	158
J21C	526.08	15.56	41	0.2	0.9899	0.01	0.05	0.001	0.0031	41.5	0.000139	101.0	45.51	143.14	78.51	25.55	685
J21D	649.58	12.74	41	0.4	0.9916	0.01	0.05	0.001	0.0035	44.4	0.000139	98.2	47.91	165.65	89.58	22.90	357
J21E	504.41	14.72	41	0.5	0.9888	0.01	0.05	0.001	0.0032	42.3	0.000139	100.2	46.08	149.17	81.46	24.84	281
J22A	436.09	11.73	41	7.2	0.9294	0.01	0.05	0.001	0.0036	42.5	0.000139	100.0	43.13	154.08	83.48	21.77	19
J22B	321.61	11.88	41	3.7	0.944	0.01	0.05	0.001	0.0036	43.1	0.000138	99.6	44.30	157.50	85.25	21.94	36
J22C	364.33	10.65	41	3.3	0.9644	0.01	0.05	0.001	0.0037	45.2	0.000139	97.3	47.08	174.07	93.55	20.43	39
J22D	680.46	10.92	41	1.7	0.9733	0.01	0.05	0.001	0.0037	45.4	0.000139	97.1	47.72	174.93	94.02	20.77	74
J22E	833.86	13.36	41	1.4	0.9721	0.01	0.05	0.001	0.0034	42.9	0.000139	99.6	45.69	154.77	84.10	23.55	99
J22F	295.88	13.66	41	0.4	0.9885	0.01	0.05	0.001	0.0034	43.3	0.000139	99.2	46.88	157.23	85.41	23.86	383
J22G	566.79	14.15	41	5.4	0.9558	0.01	0.05	0.001	0.0033	41.4	0.000138	101.2	43.61	143.89	78.64	24.32	28
J22H	807.33	12.69	41	5.3	0.9604	0.01	0.05	0.001	0.0035	43.1	0.000139	99.4	45.18	156.49	84.87	22.85	26
J22J	377.62	11.31	41	2.1	0.9775	0.01	0.05	0.001	0.0036	45.2	0.000139	97.3	47.85	173.26	93.23	21.26	60
J22K	479.07	11.39	41	0.7	0.9879	0.01	0.05	0.001	0.0036	45.5	0.000139	97.0	48.65	175.70	94.50	21.35	197
J23A	762.08	14.60	41	0.4	0.9895	0.01	0.05	0.001	0.0033	42.4	0.000139	100.2	46.22	150.24	82.00	24.73	417
J23B	782.21	15.32	41	0.6	0.9845	0.01	0.05	0.001	0.0032	41.5	0.000139	101.0	45.24	143.47	78.64	25.36	239
J23C	514.35	15.94	41	0.5	0.9784	0.01	0.05	0.001	0.0031	40.7	0.000139	101.8	44.29	137.50	75.66	25.85	314
J23D	707.74	14.66	41	1.2	0.964	0.01	0.05	0.001	0.0032	42.2	0.000141	105.9	45.16	146.46	80.43	24.81	129
J23E	225.11	15.65	50	11.2	0.8769	0.005	0.035	0.2	0.0016	52.8	0.000185	197.4	66.23	106.39	69.19	14.02	8
J23F	477.59	16.46	41	3.7	0.9493	0.01	0.05	0.001	0.0030	43.9	0.000153	131.1	47.94	146.17	82.59	26.36	43
J23G	240.57	18.31	41	0.0	0.9824	0.01	0.05	0.001	0.0029	38.5	0.000139	104.0	42.75	122.13	68.16	27.43	#DIV/0!
J23H	264.19	17.30	41	4.9	0.9229	0.01	0.05	0.001	0.0030	43.7	0.000158	144.2	47.47	140.54	80.79	26.98	34
J23J	228.63	18.55	50	9.8	0.8564	0.005	0.035	0.2	0.0015	50.2	0.000187	206.3	65.08	97.50	65.30	15.63	10
J24A	925.98	12.83	41	2.6	0.9552	0.01	0.05	0.001	0.0034	42.6	0.000138	100.1	44.51	153.39	83.31	23.00	55
J24B	767.73	15.89	41	0.6	0.9768	0.01	0.05	0.001	0.0031	40.6	0.000139	101.9	44.14	137.25	75.53	25.81	251
J24C	861.27	17.12	41	0.2	0.9747	0.01	0.05	0.001	0.0030	39.3	0.000139	103.2	43.02	128.19	71.07	26.69	815
J24D	926.09	18.39	41	0.1	0.9687	0.01	0.05	0.001	0.0028	37.9	0.000139	104.6	41.69	118.77	66.41	27.47	2540
J24E	862.17	16.68	41	0.6	0.9502	0.01	0.05	0.001	0.0030	39.9	0.000142	113.6	42.99	130.11	72.71	26.42	224
J24F	282.36	13.27	50	5.3	0.871	0.005	0.035	0.2	0.0017	55.9	0.000187	200.3	67.96	115.46	74.07	12.51	14
J25A	353.65	16.14	50	7.2	0.8488	0.005	0.035	0.2	0.0016	49.4	0.000265	188.5	68.57	108.87	75.59	14.95	15
J25B	396.86	11.54	50	10.4	0.8751	0.005	0.035	0.2	0.0018	56.2	0.00023	190.4	70.93	125.37	81.87	11.52	7
J25C	180.56	15.31	50	6.1	0.8987	0.005	0.035	0.2	0.0016	55.3	0.000198	199.5	71.68	116.09	75.82	13.92	14
J25D	210.39	19.43	51	14.3	0.906	0.01	0.03	0.5	0.0025	42.3	0.000459	145.7	62.29	157.58	109.09	29.04	15
J25E	286.55	16.85	51	3.7	0.945	0.01	0.03	0.5	0.0027	50.7	0.000356	163.8	68.45	183.38	119.23	25.56	42
J31A	446.82	21.28	50	18.4	0.9354	0.005	0.035	0.2	0.0014	53.0	0.000186	203.6	74.91	104.86	70.16	16.87	6
J31B	200.50	20.58	50	8.2	0.9469	0.005	0.035	0.2	0.0014	54.1	0.000188	203.4	76.61	109.13	72.66	16.59	13
J31C	167.90	17.43	50	12.9	0.9299	0.005	0.035	0.2	0.0015	63.0	0.000156	177.9	75.31	115.93	70.84	14.77	7
J31D	303.59	16.81	50	6.7	0.9556	0.005	0.035	0.2	0.0016	58.0	0.000188	199.5	78.30	122.37	79.10	14.71	14
J32A	415.20	15.99	42	0.2	0.9885	0.016	0.07	0.001	0.0039	45.9	0.000151	116.5	49.83	196.08	106.71	32.67	1140
J32B	642.79	15.76	42	0.0	0.9766	0.016	0.07	0.001	0.0040	46.0	0.00015	116.9	49.25	196.17	106.65	32.57	2431
J32C	734.49	15.39	42	0.0	0.9884	0.016	0.07	0.001	0.0041	46.6	0.000151	115.9	50.27	204.14	110.70	32.42	9053
J32D	301.66	16.06	42	0.0	0.981	0.016	0.07	0.001	0.0039	45.6	0.000151	116.9	49.14	192.73	105.00	32.70	23053
J32E	971.00	15.85	52	2.5	0.941	0.005	0.045	0.0001	0.0016	75.4	0.000103	130.4	78.70	129.42	71.05	13.85	34
J33A	449.45	15.93	50	11.1	0.9173	0.005	0.035	0.2	0.0016	55.5	0.000222	191.4	75.36	120.27	79.62	14.48	8
J33B	590.81	15.51	50	15.7	0.9049	0.005	0.035	0.2	0.0016	52.0	0.000301	176.5	76.86	123.90	85.99	14.84	6
J33C	428.08	15.10	50	7.1	0.9116	0.005	0.035	0.2	0.0016	70.1	0.000115	140.5	72.92	118.71	66.69	13.15	12
J33D	258.93	14.13	52	15.5	0.8816	0.005	0.045	0.0001	0.0017	68.7	0.000143	151.1	71.54	123.82	71.41	13.24	6
J33E	328.77	16.42	51	25.1	0.9049	0.01	0.03	0.5	0.0027	48.8	0.000354	166.1	63.88	172.73	112.97	25.11	7
J33F	365.77	15.81	51	12.7	0.9441	0.01	0.03	0.5	0.0027	45.8	0.000505	130.5	65.95	180.71	121.45	25.66	16
J34A	252.13	24.17	50	13.9	0.9224	0.005	0.035	0.2	0.0013	49.1	0.000188	208.4	73.08	95.03	65.57	17.98	8
J34B	341.53	19.54	50	19.3	0.9208	0.005	0.035	0.2	0.0015	53.4	0.000188	204.1	73.35	107.24	71.27	16.12	5
J34C	318.93	20.16	50	32.4	0.9105	0.005	0.035	0.2	0.0014	52.2	0.000188	205.3	71.90	103.51	69.31	16.40	4
J34D	354.28	21.80	50	13.0	0.9282	0.005	0.035	0.2	0.0014	51.8	0.000188	205.7	74.01	102.24	69.05	17.11	9
J34E	258.06	21.32	50	10.6	0.9382	0.005	0.035	0.2	0.0014	52.7	0.000188	204.8	75.26	105.23	70.66	16.91	10
J34F	320.09	18.57	50	10.3	0.9385	0.005	0.035	0.2	0.0015	50.9	0.000304	176.9	81.47	121.99	86.20	16.72	11
J35A	427.55	14.09	51	18.8	0.9066	0.01	0.03	0.5	0.0028	46.6	0.000474	137.6	63.04	179.27	119.20	23.38	9
J35B	651.45	17.99	50	13.9	0.9356	0.005	0.035	0.2	0.0015	53.6	0.000243	189.8	78.65	119.45	81.34	15.85	7
J35C	264.64	19.91	50	7.2	0.9247	0.005	0.035	0.2	0.0014	52.1	0.00022	197.3	75.81	109.82	74.95	16.61	14
J35D	507.23	13.76	51	18.3	0.9266	0.01	0.03	0.5	0.0029	46.3	0.000522	125.5	64.10	183.62	122.18	23.30	9
J35E	215.29	15.02	51	5.6	0.9593	0.01	0.03	0.5	0.0028	47.4	0.000511	127.3	67.88	189.22	125.80	24.78	30
J35F	500.36	17.31	51	14.4	0.9334	0.01	0.03	0.5	0.0027	45.9	0.000452	144.0	65.75	174.37	117.54	26.86	15
J40A	453.61	18.49	50	23.7	0.9161	0.005	0.035	0.2	0.0015	54.0	0.000188	203.5	72.84	109.28	72.15	15.61	5
J40B	221.99	20.59	50	26.6	0.8899	0.005	0.035	0.2	0.0014	50.7	0.000188	206.8	69.40	98.85	66.71	16.59	4
J40C	436.29	20.89	58	35.1	0.922	0.025	0.065	0.001	0.0051	43.2	0.000124	160.1	43.41	221.91	120.11	54.68	11
J40D	654.97	30.18	53	13.8	0.9632	0.01	0.05	0.001	0.0018	28.4	7.11E-05	124.3	32.07	58.03	33.27	28.38	14
J40E	553.78	35.55	53	13.3	0.9684	0.01	0.05	0.001	0.0014	18.9	0.000127	134.1	29.72	42.96	29.70	27.94	13
K10A	179.33	29.25	53	12.9	0.9695	0.01	0.05	0.001	0.0019	27.1	9.88E-05	124.3	32.59	61.25	36.58	28.93	15
K10B	171.30	29.78	58	12.5	0.9598	0.025	0.065	0.001	0.0032	18.6	1.74E-05	120.6	18.50	58.30	30.15	47.18	24
K10C	159.04	28.78	50	27.8	0.9154	0.005	0.035	0.2	0.0012	37.7	0.000145	190.6	56.41	64.93	45.07	18.64	5
K10D	163.97	26.80	58	12.9	0.9554	0.025	0.065	0.001	0.0037	20.3	1.33E-05	119.4	19.81	73.79	37.65	50.08	26
K10E	132.57	23.37	50	115.8	0.8931	0.005	0.035	0.2	0.0013	40.0	0.000133	180.5	51.93	68.93	45.20	17.06	1
K10F	106.28	22.75	58	18.9	0.9588	0.025	0.065	0.001	0.0046	24.3	1.34E-05	115.5	23.63	109.59	55.54	52.90	17

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
K20A	169.02	22.34	58	127.3	0.924	0.025	0.065	0.001	0.0047	33.2	7.71E-05	149.6	32.92	155.98	83.32	53.79	3
K30A	196.69	21.88	58	144.9	0.942	0.025	0.065	0.001	0.0049	31.0	5.78E-05	138.8	30.74	149.25	78.40	53.74	3
K30B	139.70	20.92	58	156.1	0.9346	0.025	0.065	0.001	0.0051	31.7	5.87E-05	138.7	31.12	158.83	83.22	54.00	3
K30C	190.73	20.47	58	154.1	0.914	0.025	0.065	0.001	0.0052	34.8	8.26E-05	151.7	34.03	177.81	94.63	54.31	3
K30D	178.83	19.57	58	108.7	0.9115	0.025	0.065	0.001	0.0055	38.4	9.79E-05	158.4	37.58	205.48	109.81	54.47	4
K40A	87.49	19.69	50	119.9	0.9099	0.005	0.035	0.2	0.0015	49.8	0.00017	195.4	66.04	96.19	63.18	16.01	1
K40B	111.57	18.87	50	126.3	0.906	0.005	0.035	0.2	0.0015	42.3	0.000121	170.0	50.88	75.62	47.13	15.17	1
K40C	99.61	19.63	58	186.1	0.9177	0.025	0.065	0.001	0.0055	40.0	0.000106	162.4	39.59	215.88	115.85	54.56	2
K40D	131.23	20.08	58	139.9	0.9448	0.025	0.065	0.001	0.0053	29.3	3.14E-05	122.7	28.35	151.04	77.34	53.81	3
K40E	268.29	24.43	50	95.2	0.9286	0.005	0.035	0.2	0.0013	43.8	0.000157	192.6	62.33	80.48	54.25	17.69	2
K50A	235.44	29.52	50	122.0	0.9007	0.005	0.035	0.2	0.0011	43.1	0.000188	214.4	70.99	80.10	58.18	19.43	1
K50B	203.95	35.70	50	121.8	0.9397	0.005	0.035	0.2	0.0010	38.9	0.000188	218.6	77.17	73.35	55.97	20.32	1
K60A	161.45	22.98	50	43.5	0.8795	0.005	0.035	0.2	0.0013	48.1	0.000188	209.4	68.14	91.35	62.97	17.56	3
K60B	143.17	37.38	50	64.4	0.8511	0.005	0.035	0.2	0.0009	33.9	0.000188	223.6	68.33	61.91	48.83	20.45	2
K60C	160.80	44.47	50	69.8	0.9014	0.005	0.035	0.2	0.0007	29.7	0.000188	227.8	79.16	58.28	48.42	20.55	2
K60D	292.48	47.14	50	85.3	0.8631	0.005	0.035	0.2	0.0007	26.3	0.000188	231.2	77.83	52.89	45.19	20.44	2
K60E	100.27	50.70	50	60.9	0.9421	0.005	0.035	0.2	0.0006	25.3	0.000188	232.2	91.21	55.60	48.35	20.22	3
K60F	242.07	47.47	50	55.9	0.9435	0.005	0.035	0.2	0.0007	28.3	0.000188	229.2	87.09	58.60	49.61	20.43	3
K60G	168.85	48.24	50	64.6	0.9558	0.005	0.035	0.2	0.0007	27.9	0.000188	229.6	89.39	58.76	49.99	20.38	2
K70A	171.53	44.41	50	83.5	0.9157	0.005	0.035	0.2	0.0007	30.3	0.000188	227.2	80.71	59.53	49.31	20.55	2
K70B	107.04	29.33	50	203.5	0.8878	0.005	0.035	0.2	0.0011	43.5	0.000188	214.0	70.10	79.48	57.58	19.39	1
K80A	147.14	23.91	50	283.2	0.8899	0.005	0.035	0.2	0.0013	47.7	0.000188	209.8	69.28	90.66	62.86	17.90	1
K80B	208.99	21.07	50	270.4	0.888	0.005	0.035	0.2	0.0014	50.1	0.000188	207.4	69.09	97.22	65.91	16.80	1
K80C	190.51	20.30	50	232.0	0.9127	0.005	0.035	0.2	0.0014	52.7	0.000188	204.8	72.54	104.05	69.59	16.47	1
K80D	174.11	19.34	50	206.6	0.9357	0.005	0.035	0.2	0.0015	54.2	0.000188	203.3	75.02	110.21	72.97	16.03	1
K80E	267.09	15.18	50	86.3	0.9605	0.005	0.035	0.2	0.0016	60.0	0.000188	197.5	79.59	129.31	82.47	13.75	1
K80F	223.79	14.29	50	67.6	0.9756	0.005	0.035	0.2	0.0017	61.7	0.000188	195.8	81.78	135.68	85.78	13.20	2
K90A	213.54	20.70	50	59.7	0.8951	0.005	0.035	0.2	0.0014	50.8	0.000188	206.7	69.93	99.34	67.05	16.64	2
K90B	149.60	16.68	50	70.0	0.9272	0.005	0.035	0.2	0.0016	56.4	0.000188	201.1	74.65	117.03	76.03	14.64	2
K90C	266.99	19.72	50	24.0	0.9486	0.005	0.035	0.2	0.0015	54.8	0.000188	202.7	76.81	111.79	73.95	16.20	5
K90D	215.24	18.04	50	39.0	0.9647	0.005	0.035	0.2	0.0015	57.4	0.000188	200.1	79.31	120.30	78.28	15.37	3
K90E	173.35	16.98	50	42.8	0.9798	0.005	0.035	0.2	0.0016	59.2	0.000188	198.3	81.44	126.74	81.62	14.81	3
K90F	249.98	19.50	50	39.9	0.9695	0.005	0.035	0.2	0.0015	56.3	0.000188	201.2	79.62	116.52	76.58	16.10	3
K90G	287.26	21.80	50	33.7	0.9692	0.005	0.035	0.2	0.0014	52.0	0.000159	184.3	70.92	97.97	63.18	16.79	4
L11A	930.16	11.11	42	5.2	0.9758	0.016	0.07	0.001	0.0050	50.2	0.000151	112.3	52.28	263.11	139.81	28.80	34
L11B	874.98	9.29	42	7.5	0.9638	0.016	0.07	0.001	0.0055	51.2	0.000151	111.3	52.28	286.60	151.38	26.18	22
L11C	568.22	10.04	42	7.3	0.9629	0.016	0.07	0.001	0.0053	50.6	0.000151	111.8	51.83	274.50	145.36	27.34	23
L11D	1286.39	11.91	42	6.3	0.9622	0.016	0.07	0.001	0.0048	48.5	0.00015	114.0	50.10	242.58	129.51	29.74	29
L11E	455.66	8.84	42	6.8	0.9621	0.016	0.07	0.001	0.0056	51.7	0.000151	110.8	52.62	294.57	155.31	25.40	23
L11F	745.05	11.58	42	5.4	0.9725	0.016	0.07	0.001	0.0049	49.4	0.000151	112.8	51.42	253.00	134.76	29.37	33
L11G	2024.39	13.43	42	2.0	0.9922	0.016	0.07	0.001	0.0045	48.6	0.000151	113.8	52.05	233.74	125.37	31.17	94
L12A	905.63	18.35	42	0.0	0.9938	0.016	0.07	0.001	0.0035	43.9	0.000151	118.6	48.71	168.82	93.28	33.18	4534
L12B	518.66	15.84	42	0.3	0.9943	0.016	0.07	0.001	0.0040	46.4	0.000151	116.1	50.53	200.46	108.93	32.61	704
L12C	1067.59	16.31	42	0.0	0.993	0.016	0.07	0.001	0.0039	45.9	0.000151	116.6	50.05	193.71	105.58	32.78	25209
L12D	869.88	17.57	42	0.0	0.9928	0.016	0.07	0.001	0.0036	44.5	0.000151	118.0	49.09	177.58	97.61	33.10	152732
L21A	609.34	12.16	42	5.5	0.9755	0.016	0.07	0.001	0.0048	49.0	0.00015	113.2	51.29	245.36	130.99	30.00	34
L21B	756.26	11.71	42	4.7	0.9739	0.016	0.07	0.001	0.0049	49.5	0.000151	113.0	51.56	252.19	134.38	29.51	38
L21C	1033.52	11.06	42	8.7	0.9685	0.016	0.07	0.001	0.0050	49.8	0.000151	112.6	51.52	260.01	138.22	28.73	20
L21D	864.57	16.14	42	11.5	0.9481	0.016	0.07	0.001	0.0039	44.0	0.000151	118.5	46.09	179.96	98.44	32.73	18
L21E	712.30	14.56	42	7.3	0.9601	0.016	0.07	0.001	0.0042	46.0	0.000151	116.6	48.11	203.96	110.42	31.97	27
L21F	576.13	14.78	42	5.1	0.9683	0.016	0.07	0.001	0.0042	46.2	0.000151	116.4	48.77	204.50	110.74	32.09	38
L22A	1072.42	11.68	42	4.1	0.9778	0.016	0.07	0.001	0.0049	49.7	0.000151	112.8	51.98	254.58	135.60	29.48	44
L22B	474.59	13.61	42	3.3	0.9663	0.016	0.07	0.001	0.0045	47.2	0.000151	115.3	49.40	219.88	118.33	31.31	59
L22C	759.64	14.90	42	3.6	0.9748	0.016	0.07	0.001	0.0042	46.4	0.000151	116.1	49.35	205.60	111.32	32.16	54
L22D	530.41	17.83	42	4.6	0.9635	0.016	0.07	0.001	0.0036	43.2	0.000151	119.2	46.49	165.75	91.53	33.13	44
L23A	516.04	18.34	42	0.0	0.9947	0.016	0.07	0.001	0.0035	43.9	0.000151	118.6	48.83	169.37	93.57	33.18	7688
L23B	818.14	20.34	42	2.0	0.9813	0.016	0.07	0.001	0.0031	41.4	0.000151	121.1	46.36	143.88	80.89	33.09	97
L23C	890.61	20.51	42	0.0	0.9936	0.016	0.07	0.001	0.0031	41.6	0.000151	120.9	47.22	145.12	81.61	33.06	#DIV/0!
L23D	664.60	24.02	42	0.4	0.9812	0.016	0.07	0.001	0.0025	38.5	0.000149	124.9	45.04	113.02	65.65	31.92	475
L30A	360.76	18.66	52	3.6	0.9537	0.005	0.045	0.0001	0.0015	80.0	8.12E-05	122.5	82.55	124.49	66.99	14.83	26
L30B	377.98	19.13	42	0.3	0.9564	0.016	0.07	0.001	0.0033	54.2	0.000126	122.4	56.28	186.83	100.80	32.97	742
L30C	237.24	20.13	42	1.6	0.921	0.016	0.07	0.001	0.0031	62.2	0.000106	126.1	61.19	192.11	102.20	32.67	128
L30D	551.70	18.91	52	2.3	0.9462	0.005	0.045	0.0001	0.0015	79.2	8.12E-05	123.3	81.24	121.54	65.51	14.91	39
L40A	762.65	22.02	42	0.0	0.9875	0.016	0.07	0.001	0.0028	40.0	0.000151	122.6	45.94	129.53	73.88	32.70	4368
L40B	593.81	22.09	42	0.9	0.938	0.016	0.07	0.001	0.0028	51.4	0.000124	126.2	53.49	150.25	82.48	32.39	207
L50A	466.40	17.10	52	6.9	0.9559	0.005	0.045	0.0001	0.0016	79.3	9.18E-05	133.3	83.17	131.64	71.66	14.32	12
L50B	556.86	22.57	52	0.3	0.9187	0.005	0.045	0.0001	0.0013	73.5	8.12E-05	129.0	74.76	99.38	54.50	15.92	340
L60A	677.18	18.31	42	0.6	0.9871	0.016	0.07	0.001	0.0035	43.6	0.000151	118.9	48.17	167.37	92.52	33.18	334
L60B	671.03	21.38	42	0.0	0.9538	0.016	0.07	0.001	0.0029	48.3	0.000133	124.4	51.44	150.45	83.13	32.69	4693
L70A	581.55	19.83	52	2.3	0.9646	0.005	0.045	0.0001	0.0015	77.6	9.18E-05	130.4	82.81	120.34	65.95	15.32	41
L70B	440.57	22.54	52	0.2	0.9499	0.005	0.045	0.0001	0.0013	75.9	8.12E-05	127.7	79.53	105.83	57.84	15.91	350
L70C	661.84	22.60	52	2.3	0.956	0.005	0.045	0.0001	0.0013	73.2	9.71E-05	140.1	79.75	105.91	59.46	16.10	39
L70D	535.80	21.13	52	1.4	0.9395	0.005	0.045	0.0001	0.0014	73.9	9.04E-05	131.7	77.50	107.99	59.59	15.68	54
L70E	701.66	22.56	64	1.9	0.9539	0.0055	0.05	0.00001	0.0013	81.5	6.23E-05	126.4	83.29	112.05	59.78	15.87	46
L70F	306.40	23.31	52	7.4	0.9138	0.005	0.045	0.0001	0.0013	64.1	0.000123	160.1	72.46	93.97	56.00	16.56	14
L70G	469.72	26.35	50	14.1	0.8838	0.005	0.035	0.2	0.0012	46.4	0.000182	208.0	68.28	83.85	58.65	18.58	8
L81A	332.13	18.79	50	17.1	0.8971	0.005	0.035	0.2	0.0015	52.5	0.000188	205.0	70.28	104.67	69.61	15.76	6
L81B	261.15	17.41	50	10.3	0.8921	0.005	0.035	0.2	0.0015	53.8	0.000188	203.7	70.13	108.01	71.08	15.04	10
L81C	332.09	21.70	50	11.5	0.8918	0.005	0.035	0.2	0.0014	49.6	0.000188	207.9	69.38	96.10	65.46	17.06	11

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
L81D	307.67	24.47	50	9.0	0.8834	0.005	0.035	0.2	0.0013	46.9	0.000188	210.6	68.53	88.40	61.67	18.08	14
L82A	269.19	35.17	50	19.8	0.8938	0.005	0.035	0.2	0.0010	38.0	0.000188	219.5	72.15	69.63	53.24	20.27	7
L82B	404.70	32.81	50	28.2	0.8841	0.005	0.035	0.2	0.0010	39.4	0.000188	218.1	69.96	72.12	54.17	19.99	5
L82C	362.07	24.57	50	30.6	0.8857	0.005	0.035	0.2	0.0013	47.1	0.000188	210.4	68.91	88.67	61.84	18.11	4
L82D	590.83	19.36	50	28.4	0.8877	0.005	0.035	0.2	0.0015	51.5	0.000188	206.1	69.12	101.50	67.94	16.03	3
L82E	365.03	21.92	50	19.9	0.9005	0.005	0.035	0.2	0.0014	50.2	0.000188	207.3	70.63	97.28	66.17	17.16	6
L82F	168.61	24.50	50	13.7	0.9204	0.005	0.035	0.2	0.0013	48.9	0.000188	208.6	72.97	94.06	65.06	18.09	9
L82G	265.33	21.81	50	13.2	0.9101	0.005	0.035	0.2	0.0014	50.7	0.000188	206.8	71.72	99.05	67.20	17.11	8
L82H	229.92	23.91	50	10.3	0.8896	0.005	0.035	0.2	0.0013	47.5	0.000188	210.0	69.04	90.38	62.74	17.89	11
L82J	163.98	24.58	50	13.1	0.9205	0.005	0.035	0.2	0.0013	48.9	0.000188	208.6	73.07	94.01	65.03	18.12	9
L90A	515.89	29.72	63	17.7	0.9247	0.007	0.025	0.0001	0.0023	41.9	0.000154	190.9	50.77	114.56	70.89	35.82	12
L90B	365.81	21.50	63	37.4	0.9288	0.007	0.025	0.0001	0.0026	47.5	0.00012	160.0	50.99	131.64	74.70	29.03	5
L90C	317.99	22.88	63	39.1	0.9507	0.007	0.025	0.0001	0.0025	44.9	8.35E-05	136.1	46.97	118.62	64.72	29.85	5
M10A	264.35	20.72	50	19.4	0.8808	0.005	0.035	0.2	0.0014	51.0	0.000185	205.9	68.47	97.19	65.33	16.62	6
M10B	392.88	19.87	50	22.7	0.9166	0.005	0.035	0.2	0.0015	53.0	0.000188	204.4	72.87	105.68	70.44	16.27	5
M10C	429.93	20.70	64	24.0	0.9448	0.0055	0.05	0.00001	0.0014	68.3	0.000127	177.1	79.22	114.19	67.68	16.23	5
M10D	306.50	21.15	64	14.7	0.9795	0.0055	0.05	0.00001	0.0014	88.1	5.52E-05	143.1	91.80	130.17	68.96	15.58	7
M20A	365.08	27.52	50	36.0	0.9782	0.005	0.035	0.2	0.0012	51.2	0.000179	204.4	80.10	95.36	65.53	18.84	4
M20B	309.18	24.40	50	44.1	0.9522	0.005	0.035	0.2	0.0013	48.0	0.000147	179.4	65.06	84.09	54.58	17.56	3
M30A	257.84	26.10	64	11.1	0.9432	0.0055	0.05	0.00001	0.0012	74.3	8.02E-05	155.7	80.07	93.94	52.86	16.36	9
M30B	308.28	25.79	64	9.2	0.9811	0.0055	0.05	0.00001	0.0012	94.9	1.1E-05	127.6	94.23	111.94	56.66	15.46	11
N11A	699.86	10.79	42	11.6	0.9348	0.016	0.07	0.001	0.0051	48.4	0.000151	114.2	48.38	247.29	131.69	28.39	15
N11B	774.07	13.57	42	10.9	0.9261	0.016	0.07	0.001	0.0045	45.3	0.000151	117.3	45.62	203.50	109.94	31.28	18
N12A	737.61	11.36	42	12.8	0.94	0.016	0.07	0.001	0.0050	48.0	0.00015	114.2	48.37	240.55	128.34	29.11	14
N12B	799.67	12.24	42	11.3	0.9589	0.016	0.07	0.001	0.0048	48.2	0.000151	114.6	49.66	236.63	126.59	30.09	16
N12C	656.40	14.10	42	12.5	0.9243	0.016	0.07	0.001	0.0043	44.7	0.000151	117.8	45.07	195.64	106.02	31.67	16
N13A	553.79	16.86	42	11.7	0.9329	0.016	0.07	0.001	0.0038	42.6	0.000151	119.9	44.20	166.06	91.46	32.95	18
N13B	482.10	19.03	42	10.3	0.9228	0.016	0.07	0.001	0.0033	40.1	0.000151	122.4	42.12	140.66	78.84	33.20	20
N13C	491.28	17.38	42	5.0	0.9561	0.016	0.07	0.001	0.0037	43.2	0.000151	119.3	45.99	168.04	92.61	33.06	41
N14A	505.07	22.01	42	0.7	0.9868	0.016	0.07	0.001	0.0028	40.0	0.000151	122.5	45.90	129.48	73.85	32.70	284
N14B	388.69	17.96	42	1.6	0.9882	0.016	0.07	0.001	0.0035	44.0	0.000151	118.5	48.49	171.71	94.68	33.15	128
N14C	655.25	19.51	42	9.8	0.943	0.016	0.07	0.001	0.0033	40.4	0.000151	121.9	43.47	141.29	79.31	33.18	21
N14D	366.43	16.84	42	4.8	0.9638	0.016	0.07	0.001	0.0038	44.0	0.000151	118.5	46.97	176.66	96.93	32.94	41
N21A	457.38	16.38	42	2.3	0.9846	0.016	0.07	0.001	0.0039	45.4	0.000151	117.1	49.22	189.77	103.57	32.81	88
N21B	387.75	14.71	42	17.3	0.8951	0.016	0.07	0.001	0.0042	42.6	0.000151	119.9	42.00	176.69	96.43	32.06	12
N21C	751.10	18.21	42	4.3	0.977	0.016	0.07	0.001	0.0035	43.3	0.000151	119.1	47.32	165.30	91.42	33.17	47
N21D	559.74	20.10	42	2.0	0.9781	0.016	0.07	0.001	0.0031	41.4	0.000151	121.1	46.19	145.28	81.56	33.12	104
N22A	606.73	15.18	42	4.6	0.9697	0.016	0.07	0.001	0.0041	45.9	0.000151	116.6	48.61	199.64	108.34	32.31	43
N22B	642.54	18.37	42	0.4	0.9772	0.016	0.07	0.001	0.0035	44.2	0.000149	119.7	48.22	166.94	92.16	33.17	482
N22C	398.75	15.32	42	3.8	0.9723	0.016	0.07	0.001	0.0041	45.9	0.000151	116.6	48.80	198.96	108.02	32.38	52
N22D	344.04	14.34	42	6.6	0.9584	0.016	0.07	0.001	0.0043	46.0	0.000151	116.5	48.04	205.96	111.39	31.83	30
N22E	342.26	17.99	42	1.6	0.9727	0.016	0.07	0.001	0.0035	45.2	0.000147	119.6	48.76	172.32	94.70	33.12	128
N23A	537.07	21.50	42	2.0	0.9688	0.016	0.07	0.001	0.0029	39.6	0.00015	123.0	44.49	129.22	73.57	32.84	99
N23B	245.32	18.24	42	1.9	0.9741	0.016	0.07	0.001	0.0035	43.5	0.00015	119.3	47.41	165.34	91.39	33.17	102
N24A	665.77	16.28	42	1.3	0.9894	0.016	0.07	0.001	0.0039	45.7	0.000151	116.8	49.75	192.79	105.10	32.78	149
N24B	665.72	16.97	42	1.6	0.982	0.016	0.07	0.001	0.0037	44.7	0.000151	117.7	48.58	181.47	99.44	32.98	116
N24C	797.37	15.58	42	2.6	0.9742	0.016	0.07	0.001	0.0040	45.7	0.000151	116.8	48.77	196.11	106.63	32.50	76
N24D	383.95	17.19	42	1.0	0.9827	0.016	0.07	0.001	0.0037	44.6	0.000151	118.0	48.54	179.22	98.34	33.02	204
N30A	848.90	15.89	42	13.6	0.9321	0.016	0.07	0.001	0.0040	43.4	0.000151	119.1	44.67	176.71	96.72	32.63	15
N30B	736.60	15.03	42	7.1	0.948	0.016	0.07	0.001	0.0041	45.0	0.000151	117.4	46.76	193.46	105.12	32.24	28
N30C	346.29	16.42	42	5.4	0.9553	0.016	0.07	0.001	0.0038	43.9	0.000151	118.6	46.33	178.27	97.67	32.82	37
N40A	667.72	19.29	52	7.2	0.8835	0.005	0.045	0.0001	0.0015	68.0	9.13E-05	128.6	67.12	99.24	54.81	15.14	13
N40B	1209.66	22.45	64	3.5	0.9428	0.0055	0.05	0.00001	0.0014	81.1	6.35E-05	136.9	82.51	111.42	59.81	15.87	28
N40C	579.94	22.12	64	14.7	0.917	0.0055	0.05	0.00001	0.0014	80.8	5.58E-05	128.9	78.95	107.98	57.29	15.74	7
N40D	668.74	26.31	64	11.3	0.9488	0.0055	0.05	0.00001	0.0012	84.3	3.72E-05	130.8	84.00	97.75	51.18	15.80	9
N40E	510.07	28.34	64	4.6	0.9557	0.0055	0.05	0.00001	0.0011	79.7	5.1E-05	138.8	82.44	88.50	47.63	15.93	20
N40F	761.44	36.04	64	9.9	0.9681	0.0055	0.05	0.00001	0.0008	83.7	1.1E-05	138.8	82.92	64.58	33.03	14.24	9
P10A	125.50	22.82	52	16.9	0.9588	0.005	0.045	0.0001	0.0013	76.2	8.12E-05	126.3	80.48	106.11	57.97	15.97	6
P10B	508.32	23.57	52	14.6	0.9346	0.005	0.045	0.0001	0.0013	73.2	8.14E-05	128.9	76.05	97.80	53.81	16.11	7
P10C	280.66	19.77	52	5.8	0.9501	0.005	0.045	0.0001	0.0015	37.2	9.63E-05	142.0	44.24	64.40	38.70	15.34	16
P10D	563.91	24.65	52	6.8	0.9363	0.005	0.045	0.0001	0.0012	52.4	8.85E-05	138.5	58.29	72.27	41.88	16.38	15
P10E	466.33	34.22	64	9.1	0.9505	0.0055	0.05	0.00001	0.0008	74.7	4.56E-05	138.0	78.06	65.73	35.85	15.18	11
P10F	469.14	35.75	52	12.5	0.9544	0.005	0.045	0.0001	0.0008	69.1	6.17E-05	139.0	75.76	63.17	35.68	16.01	8
P10G	344.05	38.38	52	13.5	0.9496	0.005	0.045	0.0001	0.0008	62.3	7.59E-05	141.7	72.70	54.87	32.54	15.94	8
P20A	452.11	46.17	52	25.2	0.9604	0.005	0.045	0.0001	0.0006	69.1	2.62E-05	149.0	73.15	40.70	22.23	13.45	4
P20B	334.49	51.72	64	20.7	0.9571	0.0055	0.05	0.00001	0.0004	67.3	1.21E-05	154.9	69.04	26.61	14.20	10.28	4
P30A	175.75	27.75	52	17.2	0.9313	0.005	0.045	0.0001	0.0011	69.8	8.12E-05	132.7	74.04	82.52	46.27	16.59	6
P30B	402.69	31.74	52	12.6	0.9594	0.005	0.045	0.0001	0.0010	67.9	8.12E-05	134.6	76.00	73.48	41.98	16.63	8
P30C	69.68	29.64	52	16.8	0.9499	0.005	0.045	0.0001	0.0010	75.2	5.85E-05	133.8	78.53	81.88	44.66	16.32	7
P40A	311.61	26.56	52	18.0	0.942	0.005	0.045	0.0001	0.0012	71.6	8.12E-05	130.9	76.06	88.34	49.18	16.51	6
P40B	264.31	26.58	52	16.6	0.9612	0.005	0.045	0.0001	0.0012	73.1	8.12E-05	129.4	78.94	91.63	50.87	16.51	6
P40C	350.55	24.16	52	22.7	0.9598	0.005	0.045	0.0001	0.0013	81.4	5.86E-05	127.6	83.78	105.63	56.40	15.94	5
P40D	247.43	21.29	52	27.1	0.9694	0.005	0.045	0.0001	0.0014	78.9	8.06E-05	123.8	83.47	115.71	62.69	15.62	4
Q11A	382.21	9.98	43	13.9	0.9533	0.015	0.04	0.3	0.0050	26.3	0.000103	141.0	27.87	138.80	76.34	25.37	11
Q11B	375.46	10.83	43	6.4	0.9759	0.015	0.04	0.3	0.0049	26.0	0.000103	141.5	28.31	137.81	76.03	26.91	26
Q11C	361.56	10.20	43	12.0	0.9561	0.015	0.04	0.3	0.0050	26.1	0.000103	141.1	27.79	137.59	75.75	25.78	13
Q11D	481.16	9.66	43	6.1	0.9783	0.015	0.04	0.3	0.0050	27.2	0.000103	140.3	29.46	147.97	81.07	24.76	25
Q12A	626.86	17.51	43	4.9	0.9675	0.015	0.04	0.3	0.0040	19.2	0.000104	148.1	22.30	89.93	52.39	36.22	46
Q12B	637.15	15.34	43	9.2	0.9566	0.015	0.04	0.3	0.0043	21.3	0.000103	145.8	23.71	101.82	58.11	33.73	23

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
Q12C	428.10	14.99	43	4.8	0.9806	0.015	0.04	0.3	0.0043	22.1	0.000103	145.4	25.06	108.69	61.70	33.28	43
Q13A	1031.04	14.69	43	6.0	0.9813	0.015	0.04	0.3	0.0044	22.4	0.000103	145.1	25.32	110.76	62.73	32.88	33
Q13B	240.04	12.55	43	5.1	0.98	0.015	0.04	0.3	0.0046	24.4	0.000103	143.1	27.08	125.74	70.11	29.80	35
Q13C	454.33	13.94	43	6.9	0.9654	0.015	0.04	0.3	0.0045	22.8	0.000103	144.7	25.21	112.63	63.53	31.86	28
Q14A	485.98	9.05	43	15.1	0.9484	0.015	0.04	0.3	0.0051	27.2	0.000103	139.8	28.45	145.24	79.46	23.56	10
Q14B	725.31	9.58	43	14.9	0.9592	0.015	0.04	0.3	0.0050	26.8	0.000103	140.7	28.48	143.33	78.63	24.61	10
Q14C	834.84	10.52	43	6.9	0.9705	0.015	0.04	0.3	0.0049	26.2	0.000103	141.3	28.27	138.79	76.48	26.36	23
Q14D	408.32	10.58	43	3.2	0.9765	0.015	0.04	0.3	0.0049	26.3	0.000103	141.2	28.60	140.16	77.20	26.47	50
Q14E	342.82	11.55	43	3.6	0.9752	0.015	0.04	0.3	0.0048	25.3	0.000103	142.2	27.70	132.24	73.28	28.16	48
Q21A	600.23	11.02	43	11.4	0.9277	0.015	0.04	0.3	0.0048	25.2	0.000104	142.2	26.18	126.77	70.27	27.26	15
Q21B	380.39	12.59	43	4.6	0.9742	0.015	0.04	0.3	0.0046	24.3	0.000103	143.2	26.76	124.12	69.26	29.86	40
Q22A	518.02	10.58	43	9.5	0.9496	0.015	0.04	0.3	0.0049	25.9	0.000104	141.6	27.40	134.29	74.13	26.47	17
Q22B	219.70	11.21	43	5.8	0.9592	0.015	0.04	0.3	0.0048	25.1	0.000103	142.4	26.97	129.92	72.01	27.58	29
Q30A	394.44	13.36	43	15.1	0.8946	0.015	0.04	0.3	0.0045	21.9	0.000104	145.6	22.55	102.43	57.97	31.02	13
Q30B	481.89	13.79	43	8.3	0.9464	0.015	0.04	0.3	0.0045	22.5	0.000103	145.0	24.45	109.71	61.94	31.65	23
Q30C	420.40	15.52	43	8.8	0.9637	0.015	0.04	0.3	0.0043	21.2	0.000103	146.3	23.80	101.69	58.13	33.95	24
Q30D	310.88	15.47	43	10.7	0.9412	0.015	0.04	0.3	0.0043	20.8	0.000103	146.7	22.88	97.88	56.07	33.89	19
Q30E	325.78	15.97	43	11.2	0.9221	0.015	0.04	0.3	0.0042	19.8	0.000103	147.7	21.57	90.99	52.53	34.50	19
Q41A	229.58	14.36	43	31.9	0.9086	0.015	0.04	0.3	0.0044	21.0	0.000103	146.5	22.23	98.12	55.93	32.45	7
Q41B	433.89	13.43	43	20.2	0.9142	0.015	0.04	0.3	0.0045	21.9	0.000103	145.6	23.10	104.67	59.20	31.13	10
Q41C	333.08	14.13	43	14.3	0.938	0.015	0.04	0.3	0.0044	21.9	0.000103	145.6	23.74	105.51	59.80	32.13	14
Q41D	295.24	13.26	43	12.6	0.9279	0.015	0.04	0.3	0.0046	22.4	0.000103	145.1	23.88	108.72	61.31	30.88	15
Q42A	445.52	16.40	43	13.7	0.931	0.015	0.04	0.3	0.0042	19.2	0.000105	147.5	21.31	88.78	51.61	35.02	16
Q42B	375.64	15.62	43	13.5	0.9389	0.015	0.04	0.3	0.0043	20.6	0.000103	146.8	22.67	96.59	55.41	34.07	16
Q43A	705.52	15.95	43	8.0	0.9562	0.015	0.04	0.3	0.0042	19.7	0.000107	146.3	22.33	94.24	54.59	34.51	27
Q43B	802.62	13.95	43	8.2	0.9777	0.015	0.04	0.3	0.0045	23.0	0.000103	144.5	25.78	115.13	64.86	31.87	24
Q44A	425.44	13.79	43	12.7	0.9174	0.015	0.04	0.3	0.0045	21.8	0.000103	145.7	23.10	103.67	58.74	31.64	15
Q44B	448.88	13.66	43	8.6	0.9649	0.015	0.04	0.3	0.0045	23.0	0.000103	144.5	25.43	114.50	64.45	31.46	22
Q44C	254.17	15.47	43	10.6	0.9416	0.015	0.04	0.3	0.0043	20.8	0.000103	146.7	22.87	97.87	56.07	33.89	20
Q50A	639.56	15.60	43	14.3	0.9189	0.015	0.04	0.3	0.0043	20.1	0.000103	147.5	21.77	92.80	53.40	34.05	15
Q50B	402.91	18.07	43	15.0	0.903	0.015	0.04	0.3	0.0040	17.5	0.000103	150.0	19.35	76.76	45.37	36.78	15
Q50C	197.88	23.82	43	10.4	0.9163	0.015	0.04	0.3	0.0033	12.4	0.000103	155.1	15.80	52.67	33.67	40.93	24
Q60A	315.55	13.67	43	26.2	0.8995	0.015	0.04	0.3	0.0045	21.5	0.000103	146.0	22.33	100.52	57.04	31.47	8
Q60B	369.43	19.17	43	25.0	0.8774	0.015	0.04	0.3	0.0038	16.0	0.000103	151.5	17.57	67.47	40.60	37.80	10
Q60C	131.48	21.77	43	15.4	0.9147	0.015	0.04	0.3	0.0036	14.2	0.000103	153.3	17.11	60.75	37.61	39.78	16
Q70A	251.21	26.53	43	8.0	0.9425	0.015	0.04	0.3	0.0031	10.3	0.000103	157.2	14.75	45.14	30.21	41.97	32
Q70B	457.68	24.02	43	5.1	0.9613	0.015	0.04	0.3	0.0033	13.0	0.000103	154.5	17.09	56.60	35.97	41.03	49
Q70C	249.52	23.33	43	3.9	0.9631	0.015	0.04	0.3	0.0034	13.6	0.000103	153.9	17.65	59.73	37.51	40.69	62
Q80A	356.53	14.84	43	19.4	0.9081	0.015	0.04	0.3	0.0044	20.8	0.000104	146.6	22.08	96.19	55.01	33.09	11
Q80B	449.58	12.91	43	15.1	0.9325	0.015	0.04	0.3	0.0046	22.9	0.000103	144.6	24.41	112.23	63.08	30.35	12
Q80C	281.19	15.58	43	18.6	0.9091	0.015	0.04	0.3	0.0043	20.2	0.000104	147.2	21.66	92.39	53.14	34.03	11
Q80D	417.82	19.38	43	15.9	0.9374	0.015	0.04	0.3	0.0038	17.2	0.000104	150.3	19.95	76.14	45.37	37.99	15
Q80E	364.41	22.71	43	4.4	0.9604	0.015	0.04	0.3	0.0034	14.2	0.000103	153.3	18.04	62.24	38.72	40.35	55
Q80F	700.94	21.63	43	3.4	0.971	0.015	0.04	0.3	0.0036	16.8	0.000106	150.5	20.61	73.50	44.49	39.71	71
Q80G	266.28	22.06	43	3.2	0.9637	0.015	0.04	0.3	0.0035	18.3	0.000102	151.2	21.88	76.99	45.93	39.95	75
Q91A	477.53	26.36	43	3.7	0.9564	0.015	0.04	0.3	0.0031	16.0	0.000101	154.6	20.16	62.05	38.52	41.90	68
Q91B	514.61	23.53	43	7.1	0.9503	0.015	0.04	0.3	0.0034	21.6	0.0001	150.8	24.75	83.26	48.81	40.75	35
Q91C	484.97	19.42	43	9.0	0.9597	0.015	0.04	0.3	0.0038	35.4	9.68E-05	141.7	37.40	142.56	77.87	37.95	24
Q92A	324.05	16.01	43	43.4	0.8919	0.015	0.04	0.3	0.0042	19.1	0.000103	148.4	20.27	85.36	49.51	34.55	5
Q92B	324.45	16.77	43	28.1	0.9081	0.015	0.04	0.3	0.0041	18.8	0.000103	148.7	20.47	84.34	49.14	35.42	8
Q92C	600.63	17.33	43	25.6	0.9004	0.015	0.04	0.3	0.0041	18.0	0.000103	149.5	19.68	79.77	46.84	36.03	9
Q92D	248.65	16.95	43	27.3	0.9082	0.015	0.04	0.3	0.0041	18.6	0.000103	148.9	20.30	83.23	48.59	35.62	8
Q92E	287.00	19.58	43	6.8	0.9574	0.015	0.04	0.3	0.0038	17.1	0.000103	150.4	20.33	77.12	45.99	38.16	34
Q92F	665.28	26.52	43	3.3	0.9675	0.015	0.04	0.3	0.0031	10.6	0.000103	156.9	15.38	47.10	31.39	41.97	76
Q92G	884.43	18.06	43	10.7	0.9513	0.015	0.04	0.3	0.0040	18.5	0.000103	149.0	21.27	84.43	49.53	36.77	21
Q93A	336.63	23.96	43	8.5	0.9279	0.015	0.04	0.3	0.0033	12.6	0.000103	154.9	16.15	53.58	34.21	41.00	30
Q93B	392.19	22.31	43	10.1	0.949	0.015	0.04	0.3	0.0035	31.1	9.72E-05	146.0	33.41	116.68	65.07	40.04	24
Q93C	413.48	22.38	43	12.2	0.9485	0.015	0.04	0.3	0.0035	16.7	0.000102	152.2	20.08	69.98	42.38	40.15	20
Q93D	489.68	22.53	52	18.3	0.9429	0.005	0.045	0.0001	0.0013	63.7	8.54E-05	132.0	68.01	90.54	50.58	15.96	6
Q94A	258.91	11.93	43	58.1	0.9081	0.015	0.04	0.3	0.0047	23.1	0.000103	144.4	23.86	112.72	63.13	28.79	4
Q94B	147.42	15.54	43	43.8	0.9013	0.015	0.04	0.3	0.0043	19.9	0.000103	147.6	21.11	90.15	51.95	33.98	5
Q94C	135.19	16.31	43	44.4	0.9006	0.015	0.04	0.3	0.0042	19.1	0.000103	148.4	20.48	85.51	49.66	34.90	5
Q94D	212.02	14.85	43	32.4	0.9146	0.015	0.04	0.3	0.0044	20.7	0.000103	146.8	22.10	96.24	55.05	33.10	7
Q94E	227.72	16.23	43	34.8	0.9119	0.015	0.04	0.3	0.0042	19.5	0.000103	148.0	21.08	88.23	51.08	34.81	7
Q94F	734.15	16.96	43	14.2	0.9465	0.015	0.04	0.3	0.0041	19.5	0.000103	148.1	21.96	89.99	52.23	35.63	16
R10A	137.81	13.60	43	61.7	0.9055	0.015	0.04	0.3	0.0045	21.7	0.000103	145.8	22.65	102.14	57.89	31.38	4
R10B	222.20	11.97	43	60.2	0.8997	0.015	0.04	0.3	0.0047	22.9	0.000103	144.6	23.46	110.70	62.07	28.86	3
R10C	125.48	13.68	43	50.6	0.9248	0.015	0.04	0.3	0.0045	22.0	0.000103	145.5	23.47	105.62	59.75	31.49	4
R10D	178.44	12.64	43	42.8	0.9217	0.015	0.04	0.3	0.0046	22.9	0.000103	144.6	24.08	111.57	62.67	29.93	5
R10E	198.17	17.80	43	15.4	0.9587	0.015	0.04	0.3	0.0040	18.9	0.000103	148.6	21.76	87.04	50.87	36.51	15
R10F	70.72	11.63	43	78.0	0.8971	0.015	0.04	0.3	0.0048	23.3	0.000103	144.2	23.69	112.84	63.10	28.29	3
R10G	168.94	13.78	43	29.9	0.9378	0.015	0.04	0.3	0.0045	22.3	0.000103	145.2	24.05	107.91	60.99	31.64	7
R10H	243.30	16.88	43	12.5	0.9516	0.015	0.04	0.3	0.0041	19.6	0.000103	147.9	22.21	91.22	52.88	35.54	18
R10J	178.79	21.55	43	10.2	0.9486	0.015	0.04	0.3	0.0036	15.1	0.000103	152.4	18.54	66.30	40.61	39.63	24
R10K	602.74	18.40	43	11.7	0.9547	0.015	0.04	0.3	0.0039	18.2	0.000103	149.3	21.14	83.06	48.89	37.10	20
R10L	394.74	17.55	43	15.0	0.9491	0.015	0.04	0.3	0.0040	18.9	0.000103	148.6	21.58	86.92	50.74	36.26	15
R10M	174.17	16.42	43	28.0	0.9656	0.015	0.04	0.3	0.0042	20.3	0.000103	147.2	23.11	96.21	55.44	35.03	8
R20A	139.40	14.47	43	69.7	0.9259	0.015	0.04	0.3	0.0044	21.3	0.000103	146.2	22.90	100.80	57.39	32.59	3
R20B	154.74	14.56	43	29.1	0.958	0.015	0.04	0.3	0.0044	22.0	0.000103	145.5	24.37	106.98	60.68	32.72	7

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
R20C	121.03	14.57	43	38.9	0.9525	0.015	0.04	0.3	0.0044	21.9	0.000103	145.6	24.10	105.79	60.05	32.73	6
R20D	258.32	15.66	43	17.2	0.9685	0.015	0.04	0.3	0.0043	21.1	0.000103	146.4	23.88	101.60	58.12	34.12	12
R20E	249.45	14.96	43	25.0	0.9634	0.015	0.04	0.3	0.0043	21.7	0.000103	145.8	24.27	105.36	59.93	33.24	8
R20F	260.92	18.26	43	27.0	0.9562	0.015	0.04	0.3	0.0039	18.4	0.000103	149.1	21.32	84.11	49.42	36.97	9
R20G	103.23	18.64	43	45.4	0.9592	0.015	0.04	0.3	0.0039	18.0	0.000103	149.5	21.10	82.30	48.55	37.32	5
R30A	427.26	17.62	43	65.1	0.9619	0.015	0.04	0.3	0.0040	19.1	0.000103	148.4	22.05	88.66	51.70	36.33	4
R30B	527.89	18.39	43	46.3	0.9584	0.015	0.04	0.3	0.0039	18.3	0.000103	149.2	21.34	83.88	49.32	37.09	5
R30C	507.07	16.25	43	30.0	0.9549	0.015	0.04	0.3	0.0042	20.4	0.000103	147.1	22.90	95.82	55.16	34.83	7
R30D	150.97	18.28	43	43.3	0.9558	0.015	0.04	0.3	0.0039	18.3	0.000103	149.2	21.24	83.75	49.24	36.99	6
R30E	471.58	16.10	43	26.4	0.9633	0.015	0.04	0.3	0.0042	20.6	0.000103	146.9	23.35	98.10	56.35	34.66	8
R30F	209.17	17.96	43	43.3	0.9619	0.015	0.04	0.3	0.0040	18.8	0.000103	148.7	21.79	86.73	50.75	36.68	6
R40A	334.41	20.67	43	37.4	0.9668	0.015	0.04	0.3	0.0037	16.3	0.000103	151.2	19.83	72.82	43.96	39.01	7
R40B	326.09	17.50	43	18.9	0.9609	0.015	0.04	0.3	0.0040	19.2	0.000103	148.3	22.13	89.26	51.98	36.21	12
R40C	195.87	18.14	43	27.5	0.9652	0.015	0.04	0.3	0.0040	18.7	0.000103	148.8	21.75	86.12	50.48	36.85	8
R50A	393.79	17.62	43	20.8	0.9674	0.015	0.04	0.3	0.0040	19.2	0.000103	148.3	22.27	89.54	52.18	36.32	11
R50B	412.32	19.53	43	20.1	0.9681	0.015	0.04	0.3	0.0038	20.2	0.000102	148.9	23.42	88.99	51.87	38.10	12
S10A	257.65	11.78	40	19.7	0.9532	0.01	0.055	0.1	0.0032	15.0	0.000139	137.5	19.96	64.15	41.17	19.74	7
S10B	398.68	12.07	40	25.9	0.9291	0.01	0.055	0.1	0.0032	16.6	0.00013	139.4	20.74	65.92	41.41	19.97	5
S10C	236.38	11.06	40	24.5	0.9429	0.01	0.055	0.1	0.0033	20.6	0.00012	139.9	24.24	80.00	47.90	18.91	5
S10D	316.80	15.54	40	28.8	0.9259	0.01	0.055	0.1	0.0028	20.3	0.000103	147.2	23.88	66.40	40.23	22.40	5
S10E	240.43	16.93	43	22.7	0.9263	0.015	0.04	0.3	0.0041	18.9	0.000103	148.6	20.99	86.09	50.15	35.60	10
S10F	301.00	10.68	40	26.4	0.9378	0.01	0.055	0.1	0.0033	17.9	0.000131	137.8	21.83	73.02	44.99	18.57	5
S10G	377.32	14.94	40	26.0	0.9271	0.01	0.055	0.1	0.0028	20.5	0.000105	146.4	23.97	68.23	41.23	22.05	6
S10H	472.99	17.72	43	16.8	0.9447	0.015	0.04	0.3	0.0040	18.7	0.000103	148.8	21.27	85.23	49.87	36.44	13
S10J	324.08	16.39	43	22.5	0.9467	0.015	0.04	0.3	0.0042	20.0	0.000103	147.5	22.43	93.44	53.93	34.99	10
S20A	298.10	11.90	40	26.1	0.9471	0.01	0.055	0.1	0.0032	15.2	0.000137	138.0	20.03	64.07	40.99	19.85	5
S20B	446.84	11.94	40	28.5	0.9332	0.01	0.055	0.1	0.0032	17.4	0.000128	139.7	21.47	68.59	42.63	19.83	5
S20C	552.11	14.32	40	29.9	0.9421	0.01	0.055	0.1	0.0029	19.9	0.000111	144.4	23.93	69.77	42.42	21.68	5
S20D	309.62	15.93	43	31.1	0.9249	0.015	0.04	0.3	0.0042	19.9	0.000103	147.6	21.73	91.75	52.92	34.45	7
S31A	408.87	11.39	40	17.1	0.9537	0.01	0.055	0.1	0.0033	16.8	0.000134	137.9	21.39	69.71	43.64	19.33	7
S31B	400.09	13.98	40	16.3	0.9451	0.01	0.055	0.1	0.0030	19.6	0.000113	143.7	23.77	70.25	42.83	21.45	8
S31C	605.91	15.06	43	14.3	0.9497	0.015	0.04	0.3	0.0043	20.9	0.000105	145.9	23.17	100.29	57.42	33.39	14
S31D	330.99	18.71	43	19.1	0.9254	0.015	0.04	0.3	0.0039	15.0	0.000112	148.6	17.89	69.66	42.55	37.47	12
S31E	440.48	18.74	43	11.2	0.9588	0.015	0.04	0.3	0.0039	17.8	0.000104	149.4	20.93	81.40	48.14	37.42	21
S31F	225.65	18.80	43	17.9	0.9402	0.015	0.04	0.3	0.0039	17.7	0.000103	149.8	20.35	79.04	46.79	37.47	13
S31G	239.93	16.22	43	14.4	0.9503	0.015	0.04	0.3	0.0042	20.2	0.000103	147.3	22.63	94.77	54.61	34.79	15
S32A	324.34	13.68	43	27.4	0.926	0.015	0.04	0.3	0.0045	22.0	0.000103	145.5	23.49	105.73	59.82	31.49	7
S32B	559.40	13.36	43	11.8	0.9552	0.015	0.04	0.3	0.0045	23.0	0.000103	144.5	25.14	114.15	64.20	31.03	16
S32C	525.63	14.66	43	12.3	0.9473	0.015	0.04	0.3	0.0044	21.6	0.000103	145.9	23.72	103.85	59.06	32.85	17
S32D	307.25	14.13	43	50.2	0.9314	0.015	0.04	0.3	0.0044	21.7	0.000103	145.8	23.34	103.74	58.88	32.13	5
S32E	295.08	15.67	43	38.0	0.9239	0.015	0.04	0.3	0.0043	20.2	0.000103	147.3	21.95	93.38	53.72	34.14	6
S32F	327.07	14.76	43	26.0	0.9255	0.015	0.04	0.3	0.0044	21.1	0.000103	146.4	22.71	99.11	56.55	32.99	8
S32G	237.89	15.73	43	19.9	0.9301	0.015	0.04	0.3	0.0042	20.4	0.000103	147.1	22.30	94.69	54.41	34.21	11
S32H	344.69	15.01	43	12.9	0.9551	0.015	0.04	0.3	0.0043	21.5	0.000103	146.0	23.89	103.53	58.96	33.31	16
S32J	238.62	15.93	43	19.3	0.9464	0.015	0.04	0.3	0.0042	20.4	0.000103	147.1	22.74	96.02	55.20	34.45	11
S32K	398.96	17.20	43	15.0	0.9472	0.015	0.04	0.3	0.0041	19.2	0.000103	148.3	21.76	88.56	51.53	35.89	15
S32L	286.79	17.68	43	15.0	0.9441	0.015	0.04	0.3	0.0040	18.6	0.000103	148.9	21.20	85.07	49.79	36.39	15
S32M	406.77	15.97	43	27.7	0.9229	0.015	0.04	0.3	0.0042	19.9	0.000103	147.6	21.73	91.67	52.86	34.50	8
S40A	446.32	16.27	43	18.7	0.9506	0.015	0.04	0.3	0.0042	20.1	0.000103	147.4	22.60	94.49	54.47	34.86	12
S40B	438.48	15.72	43	26.2	0.9435	0.015	0.04	0.3	0.0042	20.5	0.000103	147.0	22.73	96.57	55.44	34.20	8
S40C	326.89	16.02	43	29.6	0.9157	0.015	0.04	0.3	0.0042	19.7	0.000103	147.8	21.32	89.80	51.89	34.56	7
S40D	120.80	18.11	43	27.9	0.915	0.015	0.04	0.3	0.0040	17.6	0.000103	149.9	19.67	77.96	46.06	36.82	8
S40E	502.35	18.36	43	26.6	0.9214	0.015	0.04	0.3	0.0039	17.6	0.000103	149.9	19.88	78.20	46.23	37.06	9
S40F	335.46	17.26	43	31.6	0.9126	0.015	0.04	0.3	0.0041	18.5	0.000103	149.0	20.33	82.59	48.32	35.95	7
S50A	223.97	19.30	40	36.6	0.9002	0.01	0.055	0.1	0.0024	7.3	0.000139	145.2	14.20	33.85	25.99	24.35	4
S50B	333.56	16.35	40	47.2	0.8935	0.01	0.055	0.1	0.0027	9.9	0.000139	142.6	15.41	41.47	29.57	23.13	3
S50C	383.37	15.27	40	29.5	0.9448	0.01	0.055	0.1	0.0028	11.6	0.000139	140.9	17.50	49.16	33.82	22.51	5
S50D	395.48	11.77	40	39.4	0.9301	0.01	0.055	0.1	0.0032	18.8	0.000123	140.4	22.47	72.22	44.13	19.64	4
S50E	447.92	12.64	43	45.0	0.9205	0.015	0.04	0.3	0.0046	20.1	0.000114	142.7	21.72	100.61	57.82	30.00	5
S50F	86.83	14.07	43	32.0	0.9517	0.015	0.04	0.3	0.0045	22.3	0.000103	145.2	24.39	108.58	61.43	32.04	6
S50G	501.17	15.43	43	28.2	0.953	0.015	0.04	0.3	0.0043	21.0	0.000103	146.4	23.41	100.28	57.34	33.84	8
S50H	374.84	16.17	43	25.2	0.953	0.015	0.04	0.3	0.0042	20.3	0.000103	147.2	22.78	95.52	55.00	34.74	9
S50J	685.12	16.04	43	38.4	0.9289	0.015	0.04	0.3	0.0042	20.0	0.000103	147.5	21.90	92.18	53.17	34.59	6
S60A	327.53	15.63	43	82.5	0.9491	0.015	0.04	0.3	0.0043	20.8	0.000103	146.7	23.12	98.47	56.42	34.09	3
S60B	264.04	14.31	43	51.1	0.9605	0.015	0.04	0.3	0.0044	22.3	0.000103	145.2	24.66	109.05	61.72	32.38	4
S60C	215.85	15.50	43	35.5	0.9442	0.015	0.04	0.3	0.0043	20.7	0.000103	146.8	22.93	98.03	56.17	33.93	6
S60D	265.32	14.73	43	28.8	0.9521	0.015	0.04	0.3	0.0044	21.7	0.000103	145.8	23.91	104.48	59.41	32.94	7
S60E	214.74	14.29	43	39.0	0.9185	0.015	0.04	0.3	0.0044	21.4	0.000103	146.1	22.79	100.85	57.35	32.35	5
S70A	339.11	14.85	43	44.3	0.9215	0.015	0.04	0.3	0.0044	20.8	0.000103	146.7	22.39	97.51	55.73	33.10	5
S70B	267.29	18.49	43	52.9	0.9208	0.015	0.04	0.3	0.0039	17.5	0.000103	150.0	19.79	77.55	45.90	37.18	5
S70C	197.55	13.62	43	35.6	0.9603	0.015	0.04	0.3	0.0045	22.9	0.000103	144.6	25.17	113.49	63.91	31.40	6
S70D	513.62	12.56	43	39.9	0.9579	0.015	0.04	0.3	0.0046	24.0	0.000103	143.5	26.04	120.91	67.55	29.81	5
S70E	480.66	13.69	43	54.5	0.9418	0.015	0.04	0.3	0.0045	22.4	0.000103	145.1	24.27	109.17	61.64	31.51	4
S70F	358.65	16.72	43	64.0	0.9357	0.015	0.04	0.3	0.0041	19.4	0.000103	148.1	21.60	89.13	51.72	35.37	4
T11A	329.71	16.84	40	39.0	0.9329	0.01	0.055	0.1	0.0026	10.2	0.000139	142.5	16.52	43.57	30.99	23.38	4
T11B	414.69	15.78	40	41.3	0.9241	0.01	0.055	0.1	0.0028	11.0	0.000139	141.6	16.76	46.14	32.14	22.82	4
T11C	385.49	16.05	43	57.6	0.9143	0.015	0.04	0.3	0.0042	47.9	0.000111	128.9	46.87	197.23	105.16	34.66	4
T11D	342.56	13.84	40	59.3	0.9152	0.01	0.055	0.1	0.0030	23.8	0.00013	136.4	27.20	80.81	48.52	21.46	3
T11E	232.85	15.04	40	73.9	0.9007	0.01	0.055	0.1	0.0028	25.0	0.000128	137.0	28.07	79.59	47.69	22.28	2

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
T11F	275.17	13.85	43	67.8	0.9212	0.015	0.04	0.3	0.0045	46.9	0.000114	127.7	46.21	207.00	110.18	31.80	3
T11G	290.79	15.82	43	48.9	0.9445	0.015	0.04	0.3	0.0042	58.3	0.000105	124.2	57.94	245.41	128.84	34.33	5
T11H	216.18	15.09	43	47.0	0.9374	0.015	0.04	0.3	0.0043	58.6	0.000105	123.9	57.75	249.81	130.97	33.42	5
T12A	278.84	14.01	43	52.2	0.9091	0.015	0.04	0.3	0.0045	38.9	0.000119	131.4	38.51	171.72	92.94	32.07	4
T12B	229.79	16.66	43	37.1	0.9471	0.015	0.04	0.3	0.0041	57.5	0.000105	125.0	57.47	237.61	124.99	35.31	6
T12C	283.65	14.48	43	35.3	0.957	0.015	0.04	0.3	0.0044	59.8	0.000104	122.5	60.02	264.15	138.20	32.61	6
T12D	320.34	16.25	43	35.8	0.9595	0.015	0.04	0.3	0.0042	58.7	0.000105	123.8	59.28	247.98	130.19	34.84	6
T12E	412.07	14.87	43	41.0	0.959	0.015	0.04	0.3	0.0044	59.9	0.000105	122.5	60.29	262.41	137.34	33.13	5
T12F	346.15	15.71	43	43.5	0.9468	0.015	0.04	0.3	0.0042	58.5	0.000105	124.0	58.28	247.61	129.94	34.20	5
T12G	276.27	14.45	43	38.1	0.9598	0.015	0.04	0.3	0.0044	60.5	0.000105	122.0	60.82	267.88	140.06	32.58	6
T13A	287.47	16.03	43	49.2	0.9377	0.015	0.04	0.3	0.0042	57.4	0.000105	125.1	56.73	238.82	125.54	34.58	5
T13B	285.29	14.93	43	44.7	0.9452	0.015	0.04	0.3	0.0043	59.1	0.000105	123.4	58.62	254.72	133.46	33.21	5
T13C	318.27	12.67	43	46.5	0.9419	0.015	0.04	0.3	0.0046	61.0	0.000105	121.5	60.07	278.04	145.00	29.99	4
T13D	357.34	10.48	43	80.7	0.9003	0.015	0.04	0.3	0.0049	60.0	0.000104	122.3	56.38	277.03	144.27	26.30	2
T13E	167.51	10.32	43	105.9	0.9184	0.015	0.04	0.3	0.0049	58.6	0.000104	122.7	56.23	277.52	144.64	26.00	2
T20A	480.80	16.85	40	114.7	0.9221	0.01	0.055	0.1	0.0026	53.5	0.000106	127.5	54.06	142.58	77.53	23.11	2
T20B	405.19	17.23	40	96.3	0.9422	0.01	0.055	0.1	0.0026	56.7	0.000105	125.8	58.24	151.26	81.82	23.27	2
T20C	319.73	17.13	44	63.7	0.9539	0.015	0.07	0.0001	0.0035	57.5	0.000105	125.0	58.42	203.02	107.74	30.65	3
T20D	387.56	16.20	44	51.9	0.9442	0.015	0.07	0.0001	0.0037	58.0	0.000105	124.5	58.10	212.18	112.23	30.42	4
T20E	349.42	15.23	44	72.2	0.9185	0.015	0.07	0.0001	0.0038	57.1	0.000105	125.4	55.62	213.70	112.87	30.06	3
T20F	443.02	12.68	44	60.4	0.9416	0.015	0.07	0.0001	0.0044	61.1	0.000105	121.4	60.23	263.43	137.69	28.40	3
T20G	212.93	10.70	44	124.4	0.8924	0.015	0.07	0.0001	0.0048	59.8	0.000105	122.7	55.72	268.31	139.88	26.32	2
T31A	221.31	33.69	40	62.8	0.8997	0.01	0.055	0.1	0.0012	29.4	0.000105	137.4	36.91	45.86	29.44	22.71	3
T31B	283.96	34.06	44	53.0	0.9499	0.015	0.07	0.0001	0.0013	41.2	0.000105	141.3	50.22	63.56	38.79	23.34	3
T31C	290.58	30.53	40	54.0	0.9251	0.01	0.055	0.1	0.0014	31.1	0.000112	140.8	38.93	56.25	35.43	23.76	3
T31D	352.51	30.42	44	47.0	0.9548	0.015	0.07	0.0001	0.0016	45.0	0.000105	137.5	51.54	82.18	47.95	25.84	4
T31E	508.67	25.72	40	49.1	0.9305	0.01	0.055	0.1	0.0018	36.7	0.00011	134.5	41.78	75.32	44.52	24.60	4
T31F	604.67	22.39	40	46.3	0.9565	0.01	0.055	0.1	0.0021	52.6	0.000105	129.8	56.57	118.20	65.59	24.56	4
T31G	208.39	20.33	44	52.9	0.9283	0.015	0.07	0.0001	0.0029	53.0	0.000105	129.5	53.50	155.81	84.19	30.67	4
T31H	616.25	21.52	40	55.4	0.9104	0.01	0.055	0.1	0.0022	50.1	0.000105	131.7	51.44	111.61	62.12	24.48	3
T31J	506.45	19.56	44	57.0	0.9023	0.015	0.07	0.0001	0.0030	52.3	0.000105	130.2	51.24	155.86	84.07	30.77	4
T32A	347.07	20.91	44	58.7	0.9401	0.015	0.07	0.0001	0.0028	53.1	0.000105	129.4	54.44	153.40	83.06	30.56	4
T32B	306.48	20.16	44	61.7	0.9276	0.015	0.07	0.0001	0.0029	53.2	0.000105	129.3	53.59	157.59	85.06	30.70	4
T32C	372.92	17.74	44	61.2	0.9248	0.015	0.07	0.0001	0.0034	55.4	0.000105	127.1	54.91	184.60	98.44	30.75	4
T32D	350.18	19.96	44	54.5	0.9175	0.015	0.07	0.0001	0.0030	53.0	0.000105	129.5	52.76	156.93	84.68	30.72	4
T32E	382.06	17.29	44	71.0	0.8998	0.015	0.07	0.0001	0.0034	53.9	0.000105	128.6	52.01	179.14	95.62	30.68	3
T32F	296.70	15.78	44	84.5	0.8898	0.015	0.07	0.0001	0.0037	54.9	0.000105	127.6	52.01	194.21	103.04	30.28	3
T32G	437.75	15.50	44	95.8	0.922	0.015	0.07	0.0001	0.0038	56.9	0.000105	125.6	55.67	210.89	111.49	30.17	2
T32H	452.16	14.48	44	89.4	0.8589	0.015	0.07	0.0001	0.0040	53.9	0.000105	128.6	49.18	196.47	104.01	29.67	2
T33A	671.93	23.84	40	49.4	0.9242	0.01	0.055	0.1	0.0020	10.2	0.00013	142.4	18.13	35.55	26.31	24.92	4
T33B	601.90	25.79	40	48.6	0.9101	0.01	0.055	0.1	0.0018	1.5	0.000134	145.7	11.28	20.28	19.03	24.90	4
T33C	366.92	21.69	40	43.8	0.9238	0.01	0.055	0.1	0.0022	5.3	0.000138	146.3	13.60	29.29	23.97	24.85	4
T33D	461.00	24.54	40	39.9	0.9318	0.01	0.055	0.1	0.0019	2.7	0.000138	149.4	12.69	24.13	21.70	25.02	4
T33E	267.13	22.34	40	42.6	0.9142	0.01	0.055	0.1	0.0021	28.0	0.000121	139.7	33.01	69.13	42.32	24.75	4
T33F	437.04	21.73	40	54.6	0.8987	0.01	0.055	0.1	0.0021	44.1	0.000109	134.5	45.75	98.35	55.76	24.54	3
T33G	502.54	21.14	40	50.7	0.9155	0.01	0.055	0.1	0.0022	51.5	0.000105	131.0	52.83	116.52	64.53	24.41	3
T33H	516.02	19.00	44	46.4	0.9213	0.015	0.07	0.0001	0.0031	53.8	0.000105	128.7	53.52	167.94	90.16	30.80	4
T33J	456.45	17.60	44	48.4	0.877	0.015	0.07	0.0001	0.0034	52.2	0.000105	130.3	49.28	166.98	89.46	30.73	4
T33K	169.08	16.16	44	73.4	0.8392	0.015	0.07	0.0001	0.0037	51.4	0.000105	131.1	46.26	169.23	90.36	30.41	3
T34A	241.50	21.00	40	80.7	0.8739	0.01	0.055	0.1	0.0022	5.7	0.000139	146.8	12.99	28.83	23.31	24.75	2
T34B	246.08	21.76	40	73.6	0.8855	0.01	0.055	0.1	0.0021	5.1	0.000138	146.8	12.86	27.63	22.80	24.87	3
T34C	281.94	21.90	40	64.2	0.8955	0.01	0.055	0.1	0.0021	5.0	0.000138	146.4	12.93	27.59	22.83	24.88	3
T34D	341.43	19.19	40	76.6	0.8981	0.01	0.055	0.1	0.0024	13.3	0.000134	143.1	19.17	45.91	31.58	24.27	2
T34E	268.16	19.71	40	81.6	0.9011	0.01	0.055	0.1	0.0023	7.0	0.000139	145.5	14.11	33.05	25.62	24.46	2
T34F	237.70	18.87	40	80.5	0.891	0.01	0.055	0.1	0.0024	10.6	0.000136	143.9	16.67	40.45	28.97	24.19	2
T34G	358.03	18.83	40	83.3	0.9078	0.01	0.055	0.1	0.0024	34.3	0.000118	136.0	37.12	90.26	52.45	24.01	2
T34H	590.13	20.95	40	82.4	0.9251	0.01	0.055	0.1	0.0022	52.3	0.000105	130.2	54.06	120.20	66.39	24.38	2
T34J	296.29	19.49	44	36.0	0.9251	0.015	0.07	0.0001	0.0031	53.6	0.000105	128.9	53.70	163.99	88.23	30.77	6
T34K	332.94	17.86	44	45.0	0.875	0.015	0.07	0.0001	0.0033	52.6	0.000105	129.9	49.57	165.53	88.70	30.76	5
T35A	475.11	17.81	40	91.6	0.901	0.01	0.055	0.1	0.0025	8.7	0.000139	143.8	14.96	37.94	27.96	23.82	2
T35B	395.67	14.68	40	92.7	0.8992	0.01	0.055	0.1	0.0029	11.5	0.000139	141.0	16.47	47.37	32.48	22.12	2
T35C	306.14	11.47	40	101.7	0.8979	0.01	0.055	0.1	0.0033	14.3	0.000139	138.2	18.14	58.98	38.10	19.43	2
T35D	347.76	15.49	40	76.0	0.9398	0.01	0.055	0.1	0.0028	11.3	0.000139	141.2	17.23	47.99	33.20	22.64	2
T35E	491.79	16.45	40	97.4	0.9088	0.01	0.055	0.1	0.0027	47.1	0.000111	130.0	47.65	127.72	70.40	22.96	2
T35F	358.67	11.94	40	82.7	0.9144	0.01	0.055	0.1	0.0032	14.2	0.000139	138.3	18.47	58.98	38.27	19.89	2
T35G	574.50	13.18	40	63.0	0.948	0.01	0.055	0.1	0.0030	14.9	0.000138	138.5	20.06	61.13	39.61	20.99	2
T35H	519.30	14.83	40	86.1	0.9172	0.01	0.055	0.1	0.0029	35.9	0.00012	133.0	38.02	108.69	61.67	22.09	2
T35J	188.36	17.13	40	106.3	0.9284	0.01	0.055	0.1	0.0026	54.6	0.000105	127.1	55.47	144.63	78.53	23.24	2
T35K	624.79	17.51	44	76.9	0.9489	0.015	0.07	0.0001	0.0034	56.9	0.000105	125.6	57.62	196.10	104.28	30.72	3
T35L	340.12	15.95	44	55.1	0.9212	0.015	0.07	0.0001	0.0037	56.7	0.000105	125.8	55.52	205.46	108.78	30.34	4
T35M	304.53	14.96	44	74.8	0.8845	0.015	0.07	0.0001	0.0039	55.5	0.000105	127.0	52.08	202.94	107.34	29.93	3
T36A	461.96	15.35	44	96.8	0.8562	0.015	0.07	0.0001	0.0038	53.3	0.000105	129.2	48.68	185.90	98.73	30.11	2
T36B	264.41	12.64	47	152.3	0.8845	0.008	0.03	0.0001	0.0033	57.2	8.7E-05	125.3	53.58	174.14	91.89	21.10	1
T40A	208.14	16.35	44	119.0	0.9105	0.015	0.07	0.0001	0.0036	55.9	0.000105	126.6	54.21	196.35	104.20	30.47	2
T40B	277.73	20.51	44	109.1	0.9247	0.015	0.07	0.0001	0.0029	52.6	0.000105	129.9	52.98	152.80	82.68	30.64	2
T40C	237.02	18.93	44	94.3	0.9353	0.015	0.07	0.0001	0.0031	54.9	0.000105	127.6	55.28	174.12	93.30	30.80	2
T40D	371.52	27.89	47	89.1	0.9169	0.008	0.03	0.0001	0.0024	45.7	7.27E-05	136.8	45.65	110.37	59.75	34.73	3
T40E	484.97	31.71	47	87.0	0.927	0.008	0.03	0.0001	0.0022	42.4	5.61E-05	140.1	42.58	94.91	51.10	36.23	3
T40F	334.75	28.37	47	133.6	0.9442	0.008	0.03	0.0001	0.0024	46.2	5.61E-05	136.3	46.66	111.68	59.45	34.75	2

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
T40G	300.49	28.87	47	121.9	0.9529	0.008	0.03	0.0001	0.0024	46.3	5.61E-05	136.2	47.20	111.78	59.53	35.00	2
T51A	327.34	39.35	44	138.0	0.882	0.015	0.07	0.0001	0.0009	31.8	9.91E-05	141.2	41.79	37.50	24.92	19.61	1
T51B	210.00	31.24	44	122.2	0.9374	0.015	0.07	0.0001	0.0015	43.2	0.000104	138.4	49.44	74.86	44.18	25.28	2
T51C	461.42	24.24	44	90.6	0.9321	0.015	0.07	0.0001	0.0023	49.4	0.000105	133.2	51.66	120.05	66.51	29.43	2
T51D	141.33	28.12	44	128.8	0.9139	0.015	0.07	0.0001	0.0018	44.3	0.000103	135.0	47.35	87.06	49.88	27.30	2
T51E	255.45	21.04	44	92.8	0.9332	0.015	0.07	0.0001	0.0028	52.6	0.000104	129.4	53.62	149.97	81.28	30.53	3
T51F	306.20	37.77	44	107.1	0.9176	0.015	0.07	0.0001	0.0010	34.1	9.77E-05	136.6	43.55	43.37	27.81	20.65	1
T51G	255.29	34.35	44	97.3	0.9276	0.015	0.07	0.0001	0.0012	40.0	0.000105	142.5	48.23	59.95	36.88	23.14	2
T51H	519.22	20.18	44	89.8	0.9184	0.015	0.07	0.0001	0.0029	52.7	0.000105	129.8	52.65	154.63	83.54	30.69	3
T51J	264.65	23.91	44	81.6	0.9245	0.015	0.07	0.0001	0.0024	49.4	0.000105	133.1	51.13	121.11	66.98	29.57	3
T52A	381.79	24.07	44	87.9	0.9303	0.015	0.07	0.0001	0.0023	49.6	0.000104	132.7	51.61	121.10	67.00	29.50	3
T52B	255.39	21.98	44	81.1	0.9353	0.015	0.07	0.0001	0.0027	52.1	0.000105	130.4	53.49	141.82	77.29	30.29	3
T52C	260.47	21.86	44	73.0	0.9239	0.015	0.07	0.0001	0.0027	51.1	0.000104	131.3	51.93	138.60	75.64	30.32	3
T52D	529.95	25.37	47	46.5	0.9228	0.008	0.03	0.0001	0.0025	48.0	8.06E-05	134.7	48.20	122.78	66.40	33.33	5
T52E	232.58	19.65	44	86.2	0.9344	0.015	0.07	0.0001	0.0030	54.2	0.000105	128.3	54.80	165.84	89.18	30.76	3
T52F	416.84	18.34	44	87.0	0.9241	0.015	0.07	0.0001	0.0033	54.7	0.000105	127.8	54.35	176.86	94.60	30.79	3
T52G	220.71	21.11	44	88.4	0.9089	0.015	0.07	0.0001	0.0028	51.1	0.000105	131.4	50.92	141.90	77.19	30.52	3
T52H	343.60	31.44	47	55.3	0.9332	0.008	0.03	0.0001	0.0022	42.9	8.19E-05	139.6	44.79	100.42	55.55	36.53	4
T52J	366.81	39.28	47	56.6	0.901	0.008	0.03	0.0001	0.0019	34.4	5.61E-05	148.1	34.93	65.77	36.63	38.08	5
T52K	425.10	36.94	47	64.3	0.9463	0.008	0.03	0.0001	0.0020	38.3	7.37E-05	144.3	41.29	81.99	46.02	38.04	4
T52L	178.37	35.32	47	79.5	0.9288	0.008	0.03	0.0001	0.0021	39.0	5.61E-05	143.5	39.88	82.13	44.81	37.35	3
T52M	312.52	34.41	47	70.3	0.903	0.008	0.03	0.0001	0.0021	39.0	5.61E-05	143.5	38.69	81.29	44.28	37.12	4
T60A	545.93	22.77	47	101.5	0.9353	0.008	0.03	0.0001	0.0027	51.2	7.07E-05	131.3	51.12	137.24	72.96	31.37	2
T60B	526.98	15.82	44	108.8	0.9148	0.015	0.07	0.0001	0.0037	56.3	0.000105	126.2	54.77	204.01	108.04	30.30	2
T60C	362.59	17.45	47	120.4	0.9068	0.008	0.03	0.0001	0.0030	54.4	7.41E-05	128.1	52.23	155.46	82.03	26.61	2
T60D	415.13	22.31	47	144.2	0.9548	0.008	0.03	0.0001	0.0027	52.6	5.61E-05	129.9	52.83	143.14	75.05	30.85	2
T60E	197.88	13.00	44	103.6	0.9212	0.015	0.07	0.0001	0.0043	59.6	0.000105	122.9	57.62	248.08	129.96	28.66	2
T60F	463.24	11.73	44	119.9	0.9288	0.015	0.07	0.0001	0.0046	60.9	9.1E-05	121.6	58.81	269.48	139.88	27.42	2
T60G	359.42	14.59	47	169.6	0.9287	0.008	0.03	0.0001	0.0031	58.2	5.61E-05	124.3	56.14	176.17	91.32	23.30	1
T60H	323.55	12.45	47	225.6	0.9446	0.008	0.03	0.0001	0.0033	61.4	6.22E-05	121.1	60.19	196.31	101.71	20.68	1
T60J	293.81	11.24	47	167.2	0.9316	0.008	0.03	0.0001	0.0033	61.9	7.75E-05	120.6	60.32	200.99	104.85	19.16	1
T60K	242.59	11.30	47	174.6	0.9181	0.008	0.03	0.0001	0.0033	60.9	8.48E-05	121.6	58.73	195.47	102.47	19.28	1
T70A	314.05	14.31	44	79.0	0.9238	0.015	0.07	0.0001	0.0040	58.6	0.000105	123.9	57.13	230.23	121.10	29.57	3
T70B	277.09	12.98	44	137.2	0.9128	0.015	0.07	0.0001	0.0043	58.9	0.000105	123.6	56.49	243.41	127.60	28.65	2
T70C	197.61	13.01	44	111.4	0.9106	0.015	0.07	0.0001	0.0043	58.7	0.000105	123.8	56.21	241.83	126.80	28.67	2
T70D	333.57	11.23	44	156.0	0.9193	0.015	0.07	0.0001	0.0047	60.8	0.000105	121.7	58.37	274.06	142.88	26.95	2
T70E	228.15	13.96	44	71.3	0.9419	0.015	0.07	0.0001	0.0041	59.8	0.000105	122.7	59.23	243.00	127.54	29.36	3
T70F	264.70	11.81	44	111.7	0.9163	0.015	0.07	0.0001	0.0046	60.1	0.000105	122.4	57.63	263.05	137.39	27.58	2
T70G	268.85	10.87	44	123.6	0.9284	0.015	0.07	0.0001	0.0048	61.9	0.000105	120.6	59.90	286.13	148.92	26.53	2
T80A	213.60	9.96	44	132.8	0.9411	0.015	0.07	0.0001	0.0050	63.6	0.000105	118.9	62.16	309.90	160.80	25.36	2
T80B	234.09	10.74	44	112.5	0.9437	0.015	0.07	0.0001	0.0048	63.1	0.000105	119.4	61.98	297.92	154.85	26.37	2
T80C	314.38	11.23	44	68.5	0.9383	0.015	0.07	0.0001	0.0047	62.2	0.000105	120.3	60.85	285.71	148.75	26.95	3
T80D	280.95	10.70	44	119.3	0.9533	0.015	0.07	0.0001	0.0048	63.4	0.000105	119.1	62.91	302.92	157.39	26.32	2
T90A	328.48	10.76	43	47.7	0.9617	0.015	0.04	0.3	0.0049	26.4	0.000103	141.4	28.28	137.91	75.97	26.79	4
T90B	402.96	10.18	43	106.1	0.9442	0.015	0.04	0.3	0.0050	26.0	0.000103	141.6	27.36	135.54	74.67	25.73	2
T90C	367.13	10.06	43	87.2	0.9468	0.015	0.04	0.3	0.0050	26.0	0.000103	141.5	27.42	136.25	75.04	25.51	2
T90D	374.32	9.53	43	71.3	0.9436	0.015	0.04	0.3	0.0050	26.4	0.000103	141.1	27.62	139.22	76.48	24.50	3
T90E	412.09	9.43	43	88.5	0.9511	0.015	0.04	0.3	0.0051	26.7	0.000103	140.8	28.13	142.18	78.00	24.31	2
T90F	282.87	8.61	43	115.0	0.9643	0.015	0.04	0.3	0.0052	27.9	0.000103	139.6	29.56	152.67	83.29	22.67	2
T90G	461.18	9.37	43	86.7	0.9606	0.015	0.04	0.3	0.0051	27.0	0.000103	140.5	28.70	145.28	79.61	24.19	2
U10A	418.12	23.17	45	162.9	0.8692	0.01	0.065	0.0001	0.0018	16.2	9.03E-05	115.7	19.05	34.57	21.82	22.08	1
U10B	392.07	25.65	45	137.3	0.8677	0.01	0.065	0.0001	0.0016	14.5	9.29E-05	121.2	18.76	29.79	19.78	21.56	1
U10C	266.95	24.41	45	119.2	0.8993	0.01	0.065	0.0001	0.0017	16.2	9.13E-05	117.3	20.28	34.44	22.04	21.85	2
U10D	336.97	24.36	45	112.0	0.9142	0.01	0.065	0.0001	0.0017	16.5	9.41E-05	121.0	21.22	36.16	23.28	21.89	2
U10E	327.12	22.57	45	117.0	0.9084	0.01	0.065	0.0001	0.0019	18.1	9.41E-05	119.4	21.89	41.03	25.62	22.21	2
U10F	378.94	21.56	45	86.4	0.9186	0.01	0.065	0.0001	0.0020	19.4	9.42E-05	118.3	22.99	45.43	27.83	22.32	2
U10G	353.05	19.30	45	93.0	0.9305	0.01	0.065	0.0001	0.0022	21.6	9.41E-05	115.9	24.68	54.79	32.47	22.32	2
U10H	457.71	20.30	45	85.3	0.9115	0.01	0.065	0.0001	0.0021	20.3	9.41E-05	117.3	23.26	49.06	29.56	22.36	2
U10J	505.00	21.19	45	70.1	0.9058	0.01	0.065	0.0001	0.0020	25.1	8.72E-05	120.7	27.48	55.36	32.44	22.27	2
U10K	364.33	23.26	47	44.1	0.9325	0.008	0.03	0.0001	0.0027	32.0	7.82E-05	125.1	33.28	88.47	48.80	31.83	5
U10L	307.17	22.36	47	46.4	0.8869	0.008	0.03	0.0001	0.0027	45.9	5.96E-05	132.5	43.32	117.24	62.12	30.92	4
U10M	280.02	20.84	47	68.4	0.9043	0.008	0.03	0.0001	0.0028	51.4	5.61E-05	131.1	48.88	136.31	71.48	29.64	3
U20A	293.29	22.13	45	127.3	0.9361	0.01	0.065	0.0001	0.0019	19.1	9.41E-05	118.4	23.28	44.65	27.54	22.26	2
U20B	352.92	21.94	45	92.1	0.9483	0.01	0.065	0.0001	0.0019	19.5	9.41E-05	118.0	23.91	46.33	28.43	22.28	2
U20C	278.87	19.60	45	86.4	0.9447	0.01	0.065	0.0001	0.0022	21.6	9.41E-05	115.9	25.15	54.97	32.63	22.34	2
U20D	338.21	19.83	45	93.1	0.9419	0.01	0.065	0.0001	0.0022	21.3	9.41E-05	116.2	24.86	53.70	32.00	22.35	2
U20E	389.84	18.83	45	67.1	0.9429	0.01	0.065	0.0001	0.0023	22.3	9.41E-05	115.2	25.53	58.04	34.13	22.28	3
U20F	434.74	20.13	47	67.5	0.949	0.008	0.03	0.0001	0.0028	41.4	7.11E-05	123.4	42.19	119.29	63.81	29.18	3
U20G	493.72	28.33	47	53.2	0.9303	0.008	0.03	0.0001	0.0024	40.7	6.19E-05	135.0	41.13	98.54	53.16	34.81	4
U20H	219.65	17.64	45	93.7	0.9332	0.01	0.065	0.0001	0.0024	23.2	9.41E-05	114.3	25.84	62.32	36.17	22.10	2
U20J	678.39	25.62	47	60.3	0.9362	0.008	0.03	0.0001	0.0025	31.9	7.54E-05	127.8	33.40	84.63	46.83	33.43	4
U20K	270.87	35.71	47	62.7	0.9176	0.008	0.03	0.0001	0.0020	38.4	5.61E-05	144.1	38.90	79.39	43.41	37.45	4
U20L	328.46	31.68	47	51.5	0.9096	0.008	0.03	0.0001	0.0022	41.8	5.61E-05	140.7	41.22	91.95	49.57	36.22	5
U20M	359.78	21.87	47	89.6	0.9442	0.008	0.03	0.0001	0.0027	52.4	5.61E-05	130.1	51.98	142.04	74.47	30.50	3
U30A	375.62	33.48	47	75.9	0.9204	0.008	0.03	0.0001	0.0021	40.4	5.61E-05	142.1	40.58	87.03	47.19	36.84	3
U30B	221.96	29.51	47	92.2	0.9551	0.008	0.03	0.0001	0.0023	45.7	5.61E-05	136.8	46.77	109.27	58.30	35.31	3
U30C	241.62	38.23	47	78.2	0.9302	0.008	0.03	0.0001	0.0019	36.5	5.61E-05	146.0	37.89	73.07	40.35	37.94	3
U30D	180.98	36.23	47	86.8	0.9685	0.008	0.03	0.0001	0.0020	40.0	5.61E-05	142.5	42.56	85.87	46.81	37.57	3
U30E	291.36	35.50	47	85.5	0.9584	0.008	0.03	0.0001	0.0021	40.3	5.61E-05	142.2	42.39	86.94	47.29	37.40	3

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
U40A	317.06	19.46	47	87.8	0.9468	0.008	0.03	0.0001	0.0029	41.4	7.19E-05	122.4	42.11	120.63	64.48	28.57	2
U40B	388.41	25.74	47	48.6	0.951	0.008	0.03	0.0001	0.0025	42.3	6.4E-05	130.9	43.42	109.77	58.86	33.36	5
U40C	263.52	25.83	47	53.8	0.9527	0.008	0.03	0.0001	0.0025	49.4	5.61E-05	133.1	49.86	125.80	66.46	33.31	4
U40D	266.54	32.98	47	54.0	0.9093	0.008	0.03	0.0001	0.0022	40.5	5.61E-05	142.0	40.20	87.16	47.20	36.68	5
U40E	318.13	35.40	47	52.0	0.9114	0.008	0.03	0.0001	0.0021	38.5	5.61E-05	144.0	38.66	79.46	43.41	37.37	5
U40F	289.76	26.31	47	45.1	0.9384	0.008	0.03	0.0001	0.0025	48.1	5.61E-05	134.4	48.00	119.93	63.50	33.61	5
U40G	252.79	34.02	47	55.7	0.9059	0.008	0.03	0.0001	0.0021	39.3	5.61E-05	143.2	39.00	82.65	44.97	37.00	5
U40H	361.20	35.67	47	64.1	0.9178	0.008	0.03	0.0001	0.0020	38.4	5.61E-05	144.1	38.84	79.34	43.38	37.44	4
U40J	279.28	31.50	47	81.8	0.9471	0.008	0.03	0.0001	0.0022	43.4	5.61E-05	139.1	44.43	99.49	53.44	36.15	3
U50A	302.11	30.54	47	86.6	0.9631	0.008	0.03	0.0001	0.0023	45.2	5.61E-05	137.3	46.74	106.86	57.14	35.76	3
U60A	104.94	14.87	45	87.3	0.9137	0.01	0.065	0.0001	0.0028	25.3	9.41E-05	112.2	26.63	73.39	41.52	21.19	2
U60B	315.53	24.26	47	60.4	0.9445	0.008	0.03	0.0001	0.0026	39.2	6.9E-05	128.1	40.20	104.74	56.54	32.44	4
U60C	364.51	27.49	47	53.0	0.934	0.008	0.03	0.0001	0.0024	46.7	5.61E-05	135.8	46.56	113.51	60.32	34.28	4
U60D	184.80	20.20	47	90.4	0.9354	0.008	0.03	0.0001	0.0028	53.6	5.61E-05	128.9	52.56	148.40	77.58	29.09	2
U60E	280.29	23.24	47	81.3	0.9378	0.008	0.03	0.0001	0.0027	51.0	5.61E-05	131.5	50.43	134.10	70.51	31.56	3
U60F	263.93	13.45	47	105.3	0.9533	0.008	0.03	0.0001	0.0032	60.6	5.61E-05	121.9	59.81	191.59	99.06	21.92	2
U70A	114.47	16.41	45	95.8	0.9193	0.01	0.065	0.0001	0.0026	23.9	9.41E-05	113.6	25.83	66.16	37.99	21.78	2
U70B	272.11	20.44	47	57.0	0.9395	0.008	0.03	0.0001	0.0028	46.1	6.49E-05	126.1	46.02	129.33	68.51	29.39	4
U70C	350.15	23.57	47	60.9	0.9149	0.008	0.03	0.0001	0.0026	49.5	5.61E-05	133.0	47.85	126.41	66.62	31.79	4
U70D	208.33	22.30	47	91.5	0.9358	0.008	0.03	0.0001	0.0027	51.4	5.61E-05	131.1	50.65	137.23	72.06	30.84	3
U70E	86.90	20.64	47	103.0	0.962	0.008	0.03	0.0001	0.0028	54.4	5.61E-05	128.1	54.79	153.39	80.16	29.47	2
U70F	59.85	19.75	47	107.8	0.9658	0.008	0.03	0.0001	0.0028	55.9	5.61E-05	126.6	56.43	160.73	83.79	28.69	2
U80A	158.59	24.65	47	114.0	0.9566	0.008	0.03	0.0001	0.0026	50.5	5.61E-05	132.0	51.03	131.91	69.50	32.55	2
U80B	338.94	28.98	47	45.6	0.9179	0.008	0.03	0.0001	0.0024	44.7	5.61E-05	137.8	44.04	104.07	55.58	35.05	5
U80C	202.30	25.23	47	89.2	0.9315	0.008	0.03	0.0001	0.0026	48.6	5.61E-05	133.9	48.02	122.66	64.83	32.93	3
U80D	120.79	23.27	47	118.7	0.9611	0.008	0.03	0.0001	0.0027	52.3	5.61E-05	130.2	52.88	140.54	73.78	31.58	2
U80E	415.03	25.11	47	57.1	0.9222	0.008	0.03	0.0001	0.0026	47.9	5.66E-05	134.1	46.89	120.08	63.54	32.86	4
U80F	137.45	23.81	47	97.4	0.9444	0.008	0.03	0.0001	0.0026	50.5	5.61E-05	132.0	50.36	132.39	69.69	31.97	3
U80G	261.34	24.59	47	83.7	0.9378	0.008	0.03	0.0001	0.0026	49.6	5.61E-05	132.9	49.22	127.38	67.19	32.51	3
U80H	243.88	22.51	47	103.4	0.9497	0.008	0.03	0.0001	0.0027	52.3	5.61E-05	130.2	52.21	140.89	73.91	31.01	2
U80J	371.44	24.38	47	55.2	0.9247	0.008	0.03	0.0001	0.0026	49.4	5.61E-05	133.1	48.30	125.54	66.23	32.37	4
U80K	183.84	19.97	47	93.3	0.9372	0.008	0.03	0.0001	0.0028	53.8	5.61E-05	128.7	52.85	149.91	78.34	28.88	2
U80L	107.66	19.31	47	104.8	0.9509	0.008	0.03	0.0001	0.0029	55.3	5.61E-05	127.2	54.96	157.90	82.35	28.27	2
V11A	206.92	18.13	45	210.5	0.8645	0.01	0.065	0.0001	0.0024	21.0	9.38E-05	115.8	22.17	52.17	30.78	22.18	1
V11B	252.64	18.38	45	227.2	0.83	0.01	0.065	0.0001	0.0023	19.6	9.23E-05	115.3	20.03	46.57	27.70	22.21	1
V11C	252.46	18.51	45	140.9	0.9181	0.01	0.065	0.0001	0.0023	21.7	9.52E-05	115.8	24.35	56.21	33.17	22.25	1
V11D	265.93	18.30	45	70.2	0.9483	0.01	0.065	0.0001	0.0023	22.9	9.41E-05	114.8	26.09	60.88	35.56	22.21	2
V11E	192.63	19.50	45	150.1	0.9014	0.01	0.065	0.0001	0.0022	20.8	9.41E-05	116.7	23.25	51.07	30.48	22.34	1
V11F	160.69	17.45	45	47.2	0.9639	0.01	0.065	0.0001	0.0024	24.2	9.41E-05	113.3	27.55	67.05	38.67	22.06	3
V11G	313.49	23.56	45	213.1	0.8423	0.01	0.065	0.0001	0.0018	16.0	9.32E-05	120.2	18.75	33.34	21.39	22.04	1
V11H	132.93	20.84	45	103.5	0.9117	0.01	0.065	0.0001	0.0021	19.7	9.41E-05	117.8	22.93	47.04	28.57	22.35	2
V11J	144.04	18.26	45	68.8	0.9528	0.01	0.065	0.0001	0.0023	23.1	9.41E-05	114.4	26.40	61.75	36.00	22.21	2
V11K	246.76	14.84	45	56.2	0.9394	0.01	0.065	0.0001	0.0028	26.0	9.41E-05	111.5	27.98	77.21	43.53	21.18	3
V11L	311.69	15.80	45	45.5	0.967	0.01	0.065	0.0001	0.0026	25.8	9.41E-05	111.7	28.83	76.04	43.10	21.57	3
V11M	154.32	12.83	45	48.5	0.9503	0.01	0.065	0.0001	0.0030	28.2	9.41E-05	109.3	30.03	90.93	50.35	20.03	3
V12A	307.06	10.84	45	66.8	0.954	0.01	0.065	0.0001	0.0033	30.2	9.41E-05	107.4	31.73	104.94	57.29	18.44	2
V12B	293.28	9.57	45	61.2	0.9503	0.01	0.065	0.0001	0.0035	31.3	9.41E-05	106.2	32.48	113.48	61.49	17.16	2
V12C	154.79	9.31	45	55.7	0.9627	0.01	0.065	0.0001	0.0035	32.0	9.41E-05	105.5	33.50	118.30	63.93	16.88	2
V12D	235.96	14.28	45	85.0	0.9199	0.01	0.065	0.0001	0.0028	26.1	9.41E-05	111.4	27.41	77.66	43.65	20.90	2
V12E	324.36	11.73	45	48.1	0.9586	0.01	0.065	0.0001	0.0032	29.5	9.41E-05	108.0	31.34	99.68	54.71	19.21	3
V12F	332.44	11.13	45	45.3	0.9738	0.01	0.065	0.0001	0.0033	30.5	9.41E-05	107.0	32.73	106.90	58.35	18.70	3
V12G	505.90	10.42	45	45.1	0.9682	0.01	0.065	0.0001	0.0034	31.0	9.41E-05	106.5	32.94	110.95	60.33	18.04	3
V13A	231.70	21.96	45	178.1	0.8422	0.01	0.065	0.0001	0.0019	16.3	8.8E-05	112.3	18.04	34.90	21.61	22.21	1
V13B	293.78	19.93	45	89.9	0.9272	0.01	0.065	0.0001	0.0021	20.9	9.41E-05	116.6	24.14	51.87	31.02	22.36	2
V13C	255.65	18.80	45	60.5	0.9477	0.01	0.065	0.0001	0.0023	22.4	9.41E-05	115.1	25.77	58.66	34.46	22.28	3
V13D	283.38	17.70	45	66.3	0.9517	0.01	0.065	0.0001	0.0024	23.7	9.41E-05	113.9	26.75	64.30	37.25	22.11	2
V13E	280.88	14.23	45	45.3	0.9764	0.01	0.065	0.0001	0.0028	27.6	9.41E-05	109.9	30.48	86.55	48.32	20.87	3
V14A	223.89	13.22	45	41.1	0.9666	0.01	0.065	0.0001	0.0030	28.3	9.41E-05	109.2	30.68	91.27	50.60	20.28	3
V14B	170.14	13.18	45	40.9	0.9535	0.01	0.065	0.0001	0.0030	27.8	9.41E-05	109.7	29.84	88.93	49.39	20.26	3
V14C	195.19	16.36	45	46.2	0.9585	0.01	0.065	0.0001	0.0026	25.1	9.41E-05	112.4	28.01	71.88	41.01	21.76	3
V14D	631.79	22.43	45	33.9	0.9596	0.01	0.065	0.0001	0.0019	19.3	9.41E-05	118.2	24.17	45.62	28.15	22.23	4
V14E	286.56	21.15	45	44.9	0.9278	0.01	0.065	0.0001	0.0020	19.9	9.41E-05	117.6	23.53	47.51	28.89	22.34	3
V20A	267.10	23.67	45	126.5	0.9231	0.01	0.065	0.0001	0.0018	17.4	9.41E-05	120.1	21.99	38.86	24.65	22.03	2
V20B	190.26	23.67	45	114.0	0.9415	0.01	0.065	0.0001	0.0018	17.7	9.41E-05	119.8	22.68	40.09	25.35	22.03	2
V20C	187.87	22.57	45	113.0	0.9521	0.01	0.065	0.0001	0.0019	18.9	9.41E-05	118.6	23.69	44.39	27.51	22.21	2
V20D	299.24	24.63	45	67.5	0.9596	0.01	0.065	0.0001	0.0017	17.2	9.41E-05	120.4	22.93	38.49	24.68	21.83	2
V20E	598.68	22.56	45	42.8	0.9494	0.01	0.065	0.0001	0.0019	18.9	9.41E-05	118.6	23.60	44.25	27.42	22.21	4
V20F	153.86	18.27	45	75.7	0.9538	0.01	0.065	0.0001	0.0023	23.1	9.41E-05	114.4	26.42	61.74	36.01	22.21	2
V20G	253.65	18.00	45	47.2	0.9283	0.01	0.065	0.0001	0.0024	22.7	9.41E-05	114.8	25.35	60.05	35.04	22.16	3
V20H	603.38	26.58	45	38.1	0.9232	0.01	0.065	0.0001	0.0015	18.3	9E-05	123.9	23.72	35.79	23.04	21.25	4
V20J	313.98	26.08	47	44.5	0.9076	0.008	0.03	0.0001	0.0025	30.7	7.54E-05	128.9	31.41	78.84	43.83	33.72	5
V31A	621.72	14.94	47	69.2	0.9532	0.008	0.03	0.0001	0.0031	26.3	9.41E-05	111.3	28.22	88.01	49.00	23.99	3
V31B	505.32	13.35	45	57.9	0.9503	0.01	0.065	0.0001	0.0030	27.7	9.41E-05	109.8	29.62	87.58	48.70	20.37	3
V31C	395.90	12.88	45	51.9	0.9381	0.01	0.065	0.0001	0.0030	27.9	9.41E-05	109.8	29.34	88.63	49.16	20.06	3
V31D	467.13	11.78	45	47.4	0.9635	0.01	0.065	0.0001	0.0032	29.6	9.41E-05	107.9	31.61	100.31	55.05	19.25	3
V31E	833.89	13.62	45	51.2	0.9556	0.01	0.065	0.0001	0.0029	27.6	9.41E-05	109.9	29.77	86.94	48.41	20.53	3
V31F	155.60	16.53	45	53.5	0.9628	0.01	0.065	0.0001	0.0025	25.0	9.41E-05	112.5	28.04	71.37	40.78	21.82	3
V31G	254.72	15.88	45	41.4	0.9788	0.01	0.065	0.0001	0.0026	26.1	9.41E-05	111.4	29.44	77.33	43.80	21.60	4
V31H	128.49	16.32	45	67.0	0.9379	0.01	0.065	0.0001	0.0026	24.6	9.41E-05	112.9	26.93	69.27	39.62	21.75	2

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
V31J	357.95	16.18	45	53.9	0.9542	0.01	0.065	0.0001	0.0026	25.1	9.41E-05	112.4	27.88	72.20	41.14	21.71	3
V31K	226.66	13.07	45	43.2	0.9799	0.01	0.065	0.0001	0.0030	28.9	9.41E-05	108.6	31.62	94.69	52.35	20.19	3
V32A	194.70	14.51	45	64.5	0.9455	0.01	0.065	0.0001	0.0028	26.4	9.41E-05	111.1	28.48	79.83	44.86	21.02	2
V32B	556.96	12.50	45	44.4	0.9665	0.01	0.065	0.0001	0.0031	29.0	9.41E-05	108.5	31.28	96.14	53.00	19.80	3
V32C	629.93	14.76	45	35.3	0.98	0.01	0.065	0.0001	0.0028	27.2	9.41E-05	110.4	30.32	84.00	47.09	21.13	4
V32D	589.93	14.83	45	36.2	0.9802	0.01	0.065	0.0001	0.0028	27.1	9.41E-05	110.4	30.28	83.62	46.90	21.17	4
V32E	783.30	16.10	45	42.3	0.9702	0.01	0.065	0.0001	0.0026	25.6	9.41E-05	111.9	28.78	74.81	42.51	21.68	4
V32F	201.43	13.81	45	37.9	0.9685	0.01	0.065	0.0001	0.0029	27.8	9.41E-05	109.7	30.35	87.89	48.95	20.64	4
V32G	544.35	12.58	45	54.5	0.9646	0.01	0.065	0.0001	0.0031	28.8	9.4E-05	108.8	31.02	94.99	52.43	19.86	3
V32H	517.43	18.20	45	32.3	0.977	0.01	0.065	0.0001	0.0023	23.8	9.41E-05	113.7	27.67	64.90	37.68	22.20	5
V33A	576.87	19.42	45	37.3	0.9645	0.01	0.065	0.0001	0.0022	22.0	9.17E-05	117.5	25.97	57.30	33.85	22.31	4
V33B	406.65	27.43	47	36.2	0.9506	0.008	0.03	0.0001	0.0024	11.7	6.76E-05	148.4	15.00	36.62	23.08	34.40	6
V33C	398.06	34.37	47	45.2	0.9125	0.008	0.03	0.0001	0.0021	4.8	6.59E-05	156.7	8.84	18.59	14.00	37.27	5
V33D	455.20	35.62	47	46.2	0.8987	0.008	0.03	0.0001	0.0020	3.6	5.35E-05	168.7	7.23	14.79	11.45	37.38	5
V40A	372.23	33.84	47	58.9	0.8745	0.008	0.03	0.0001	0.0021	26.4	5.31E-05	154.4	26.46	56.31	31.74	36.90	4
V40B	292.32	31.85	47	44.1	0.8734	0.008	0.03	0.0001	0.0022	37.5	5.55E-05	144.7	35.88	79.73	43.37	36.27	5
V40C	454.87	29.19	47	47.7	0.9252	0.008	0.03	0.0001	0.0024	7.9	4.87E-05	168.2	10.53	24.77	16.18	35.04	5
V40D	333.29	32.04	47	42.4	0.9038	0.008	0.03	0.0001	0.0022	28.0	5.28E-05	152.6	28.64	63.37	35.33	36.30	6
V40E	300.92	32.49	47	34.7	0.9079	0.008	0.03	0.0001	0.0022	40.6	5.61E-05	141.9	40.19	88.06	47.65	36.51	7
V50A	408.93	33.73	47	36.4	0.9228	0.008	0.03	0.0001	0.0021	40.4	5.61E-05	142.1	40.75	86.92	47.14	36.92	7
V50B	383.79	34.05	47	47.4	0.9037	0.008	0.03	0.0001	0.0021	39.2	5.61E-05	143.3	38.86	82.30	44.79	37.01	5
V50C	409.09	31.48	47	73.7	0.9245	0.008	0.03	0.0001	0.0022	42.5	5.61E-05	140.0	42.56	95.35	51.31	36.14	3
V50D	143.99	26.00	47	78.9	0.9615	0.008	0.03	0.0001	0.0025	49.4	5.61E-05	133.1	50.34	126.57	66.88	33.42	3
V60A	106.82	11.04	45	58.8	0.9446	0.01	0.065	0.0001	0.0033	29.7	9.41E-05	107.8	31.01	101.68	55.63	18.62	2
V60B	551.66	11.16	45	55.4	0.9541	0.01	0.065	0.0001	0.0033	29.9	9.41E-05	107.6	31.47	102.65	56.16	18.73	3
V60C	360.65	13.85	45	42.0	0.9648	0.01	0.065	0.0001	0.0029	27.7	9.41E-05	109.8	30.13	87.08	48.53	20.67	3
V60D	307.89	14.42	45	52.5	0.9549	0.01	0.065	0.0001	0.0028	26.8	9.41E-05	110.7	29.15	82.01	45.98	20.97	3
V60E	747.20	20.26	45	35.6	0.9649	0.01	0.065	0.0001	0.0021	21.5	9.41E-05	116.1	25.71	54.32	32.43	22.36	4
V60F	406.02	26.51	45	47.1	0.9152	0.01	0.065	0.0001	0.0015	18.9	8.9E-05	124.6	23.98	36.33	23.24	21.26	3
V60G	461.40	34.55	45	33.7	0.9353	0.01	0.065	0.0001	0.0010	17.0	8.31E-05	133.3	26.69	25.55	17.95	17.97	4
V60H	354.94	35.36	45	38.0	0.9403	0.01	0.065	0.0001	0.0009	19.9	7.89E-05	135.5	29.77	27.17	18.61	17.53	3
V60J	185.94	31.50	47	51.6	0.888	0.008	0.03	0.0001	0.0022	24.8	7.54E-05	134.8	26.08	58.40	33.72	36.45	5
V60K	228.03	27.05	47	45.6	0.9152	0.008	0.03	0.0001	0.0025	43.9	5.87E-05	135.6	43.14	106.15	56.71	34.07	5
V70A	280.25	21.36	45	158.1	0.8768	0.01	0.065	0.0001	0.0020	18.4	9.38E-05	118.6	21.03	42.00	25.87	22.33	1
V70B	121.24	21.37	45	137.7	0.8962	0.01	0.065	0.0001	0.0020	18.9	9.41E-05	118.6	21.92	43.74	26.87	22.33	1
V70C	341.52	21.85	45	70.1	0.9305	0.01	0.065	0.0001	0.0019	19.3	9.41E-05	118.2	23.24	45.24	27.80	22.29	2
V70D	198.37	20.08	45	57.9	0.9477	0.01	0.065	0.0001	0.0021	21.2	9.41E-05	116.3	25.00	53.33	31.85	22.36	3
V70E	105.28	26.78	45	42.1	0.9439	0.01	0.065	0.0001	0.0015	14.7	9.41E-05	122.8	21.20	31.64	21.27	21.24	4
V70F	364.47	26.73	45	32.7	0.9459	0.01	0.065	0.0001	0.0015	14.9	9.41E-05	122.6	21.40	32.02	21.47	21.26	4
V70G	504.48	26.05	45	32.8	0.9326	0.01	0.065	0.0001	0.0016	15.3	9.41E-05	122.2	21.18	32.90	21.81	21.46	4
W11A	445.15	28.45	47	88.9	0.9389	0.008	0.03	0.0001	0.0024	46.0	5.61E-05	136.5	46.21	110.43	58.81	34.79	3
W11B	126.82	23.12	47	86.8	0.9596	0.008	0.03	0.0001	0.0027	52.3	5.61E-05	130.2	52.77	142.07	73.84	31.47	3
W11C	383.02	18.53	47	105.8	0.9758	0.008	0.03	0.0001	0.0029	57.5	5.61E-05	125.0	58.46	170.45	88.65	27.54	2
W12A	623.31	25.14	47	43.7	0.934	0.008	0.03	0.0001	0.0026	11.6	4.71E-05	166.0	13.64	34.92	21.11	32.76	5
W12B	656.33	32.75	47	54.7	0.9102	0.008	0.03	0.0001	0.0022	22.0	6.1E-05	155.2	23.94	52.16	30.39	36.68	4
W12C	570.07	39.82	46	41.0	0.9351	0.01	0.04	0.0001	0.0017	1.4	8.42E-05	166.9	9.09	15.36	14.25	35.32	6
W12D	568.94	25.46	21	44.0	0.9561	0.015	0.055	0.2	0.0025	11.9	0.000248	115.9	22.31	56.20	41.84	35.23	5
W12E	248.59	18.95	47	82.2	0.9577	0.008	0.03	0.0001	0.0029	38.8	0.000169	112.5	43.46	125.70	71.96	29.01	3
W12F	387.31	16.54	65	137.8	0.987	0.09	0.06	0.1	0.0226	36.5	9.23E-05	106.2	36.49	825.07	417.37	187.72	8
W12G	326.36	21.45	21	43.6	0.9673	0.015	0.055	0.2	0.0030	15.6	0.00031	96.9	24.68	74.43	51.74	35.67	6
W12H	484.57	17.00	21	92.2	0.9805	0.015	0.055	0.2	0.0036	25.1	0.000226	97.2	30.54	111.45	66.50	32.94	3
W12J	332.85	14.51	65	140.0	0.9874	0.09	0.06	0.1	0.0247	32.6	0.0001	99.9	32.61	806.28	408.09	180.15	8
W13A	275.84	21.95	47	102.8	0.9572	0.008	0.03	0.0001	0.0027	52.7	5.89E-05	129.0	53.13	144.95	76.11	30.59	2
W13B	222.76	16.86	47	139.2	0.9766	0.008	0.03	0.0001	0.0030	54.1	6.38E-05	119.7	55.34	166.54	87.00	25.90	2
W21A	340.14	14.34	45	57.0	0.9648	0.01	0.065	0.0001	0.0028	25.5	7.76E-05	126.1	27.91	78.85	44.14	20.81	3
W21B	580.39	18.96	46	45.9	0.9546	0.01	0.04	0.0001	0.0032	17.7	4.71E-05	159.7	19.16	61.14	34.16	30.68	5
W21C	369.64	17.58	46	28.7	0.9701	0.01	0.04	0.0001	0.0033	19.7	5.08E-05	154.7	21.41	70.90	39.26	29.55	7
W21D	468.70	19.92	46	28.4	0.9706	0.01	0.04	0.0001	0.0031	19.8	7.39E-05	134.9	22.36	69.48	39.58	31.68	7
W21E	415.98	20.39	46	30.9	0.9656	0.01	0.04	0.0001	0.0031	17.7	5.91E-05	149.5	19.92	61.07	34.80	31.87	7
W21F	242.75	16.12	46	30.6	0.9773	0.01	0.04	0.0001	0.0034	20.9	4.71E-05	156.6	22.53	77.54	42.37	28.12	6
W21G	562.85	18.18	46	40.2	0.9508	0.01	0.04	0.0001	0.0033	18.4	4.71E-05	159.1	19.68	64.13	35.62	30.04	5
W21H	432.82	22.40	46	41.1	0.9361	0.01	0.04	0.0001	0.0029	14.1	4.71E-05	163.4	15.69	45.47	26.33	33.00	5
W21J	530.05	26.02	46	40.0	0.9463	0.01	0.04	0.0001	0.0026	10.9	4.71E-05	166.6	13.12	34.24	20.83	34.57	6
W21K	797.46	31.19	46	32.9	0.9425	0.01	0.04	0.0001	0.0022	6.0	9.76E-05	159.2	12.25	27.34	20.99	36.32	7
W21L	532.82	27.15	21	32.7	0.9637	0.015	0.055	0.2	0.0023	10.0	0.00028	109.5	22.33	52.03	40.81	35.44	7
W22A	238.71	30.48	46	56.4	0.9249	0.01	0.04	0.0001	0.0023	6.5	4.71E-05	171.0	9.27	21.15	14.30	35.48	4
W22B	331.69	25.55	46	41.0	0.9514	0.01	0.04	0.0001	0.0026	11.4	4.71E-05	166.1	13.64	36.08	21.76	34.41	6
W22C	185.61	24.54	46	53.4	0.9224	0.01	0.04	0.0001	0.0027	11.9	4.71E-05	165.6	13.66	37.23	22.21	34.02	4
W22D	197.48	20.58	46	41.3	0.9331	0.01	0.04	0.0001	0.0031	15.8	4.71E-05	161.7	17.08	52.12	29.61	31.87	5
W22E	385.42	29.31	46	78.7	0.9208	0.01	0.04	0.0001	0.0024	7.5	6.27E-05	166.1	10.98	25.95	17.77	35.57	3
W22F	312.04	25.94	46	37.4	0.9416	0.01	0.04	0.0001	0.0026	10.9	8.97E-05	156.1	15.30	40.02	26.60	35.10	6
W22G	249.36	33.51	21	33.6	0.9413	0.015	0.055	0.2	0.0017	3.8	0.000299	111.3	21.79	37.52	34.43	33.86	7
W22H	306.12	21.25	46	35.3	0.9483	0.01	0.04	0.0001	0.0030	15.4	9.36E-05	150.6	19.07	57.10	35.23	32.81	6
W22J	604.95	31.62	21	27.8	0.9518	0.015	0.055	0.2	0.0019	5.6	0.000275	115.4	21.34	40.27	35.26	34.18	8
W22K	475.54	30.96	21	29.0	0.954	0.015	0.055	0.2	0.0019	6.3	0.000301	108.4	22.01	42.85	36.98	34.80	8
W22L	279.30	30.54	21	30.1	0.9667	0.015	0.055	0.2	0.0020	6.7	0.00031	105.8	22.43	44.55	38.11	35.06	8
W23A	413.72	22.25	21	41.5	0.9713	0.015	0.055	0.2	0.0029	14.8	0.000309	97.7	24.49	71.29	50.30	35.82	6
W23B	192.79	20.43	21	59.4	0.978	0.015	0.055	0.2	0.0032	18.9	0.000261	98.2	26.49	83.54	54.32	34.88	4
W23C	312.69	17.21	65	119.8	0.9888	0.09	0.06	0.1	0.0219	30.0	0.0001	102.5	30.11	660.41	335.29	189.60	10

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
W23D	247.88	14.57	65	106.2	0.991	0.09	0.06	0.1	0.0247	32.5	0.000104	99.7	32.62	804.72	407.49	180.42	11
W31A	369.72	24.01	46	45.3	0.9464	0.01	0.04	0.0001	0.0028	12.8	4.71E-05	164.7	14.74	40.80	24.07	33.79	5
W31B	304.28	26.18	46	41.6	0.9336	0.01	0.04	0.0001	0.0026	10.6	4.71E-05	166.9	12.69	32.96	20.15	34.62	5
W31C	171.56	26.43	46	53.1	0.9251	0.01	0.04	0.0001	0.0026	10.3	4.71E-05	167.2	12.31	31.73	19.51	34.70	4
W31D	294.57	19.99	46	42.4	0.935	0.01	0.04	0.0001	0.0031	16.4	4.71E-05	161.1	17.59	54.57	30.83	31.46	5
W31E	334.19	20.78	46	28.9	0.9434	0.01	0.04	0.0001	0.0030	15.7	9.16E-05	150.7	19.13	58.04	35.54	32.48	7
W31F	583.35	22.65	21	24.0	0.9585	0.015	0.055	0.2	0.0029	14.3	0.0002	125.2	22.05	63.06	43.52	34.65	9
W31G	519.77	17.89	21	21.7	0.9503	0.015	0.055	0.2	0.0035	18.6	0.00031	93.9	25.57	89.88	58.75	34.22	10
W31H	322.59	24.04	21	21.5	0.9627	0.015	0.055	0.2	0.0027	13.0	0.00031	99.5	23.52	63.20	46.44	36.03	11
W31J	552.60	23.59	65	23.1	0.9797	0.09	0.06	0.1	0.0162	21.9	0.000136	107.1	22.32	361.89	188.10	192.86	50
W31K	855.31	18.37	21	21.9	0.9575	0.015	0.055	0.2	0.0034	18.3	0.00031	94.2	25.63	88.30	58.11	34.49	10
W31L	321.38	23.17	65	25.0	0.9739	0.09	0.06	0.1	0.0166	20.0	0.000181	104.8	20.59	340.76	179.64	193.86	47
W32A	417.40	18.77	65	44.9	0.9929	0.09	0.06	0.1	0.0204	28.5	0.0001	104.0	28.82	588.43	299.40	192.57	26
W32B	934.44	10.49	65	95.5	0.9946	0.09	0.06	0.1	0.0293	36.8	0.0001	95.9	36.96	1082.07	545.82	154.11	10
W32C	728.23	17.51	21	29.6	0.9748	0.015	0.055	0.2	0.0036	22.6	0.000244	96.2	28.39	101.41	62.13	33.41	7
W32D	267.22	24.30	21	32.4	0.9471	0.015	0.055	0.2	0.0027	12.5	0.00031	100.0	22.90	60.82	45.07	36.03	7
W32E	455.92	18.64	21	37.3	0.9479	0.015	0.055	0.2	0.0034	17.9	0.00031	94.6	25.08	85.42	56.60	34.63	6
W32F	187.34	14.94	21	51.0	0.9776	0.015	0.055	0.2	0.0040	27.6	0.000192	96.2	31.50	125.07	71.55	31.10	4
W32G	647.50	16.95	21	56.6	0.9798	0.015	0.055	0.2	0.0037	23.4	0.000242	95.6	29.10	106.41	64.54	33.04	4
W32H	1276.01	22.39	65	89.2	0.9901	0.09	0.06	0.1	0.0172	24.9	0.0001	107.6	25.26	434.37	222.53	193.61	14
W41A	187.61	17.93	45	109.6	0.9581	0.01	0.065	0.0001	0.0024	23.5	9.41E-05	114.0	26.86	63.84	37.06	22.15	2
W41B	305.61	14.94	45	96.1	0.9549	0.01	0.065	0.0001	0.0027	26.3	9.41E-05	111.2	28.77	79.02	44.51	21.22	2
W41C	217.31	14.37	45	95.1	0.9671	0.01	0.065	0.0001	0.0028	27.1	9.37E-05	110.7	29.81	84.09	47.06	20.94	2
W41D	238.02	14.26	46	85.4	0.9593	0.01	0.04	0.0001	0.0036	24.4	6.72E-05	135.9	25.82	93.25	51.01	26.22	2
W41E	303.17	16.18	46	78.3	0.9409	0.01	0.04	0.0001	0.0034	20.1	4.74E-05	157.1	20.98	72.09	39.55	28.18	3
W41F	343.46	16.55	46	74.2	0.9405	0.01	0.04	0.0001	0.0034	19.8	4.82E-05	156.7	20.74	70.57	38.84	28.56	3
W41G	95.80	21.44	46	66.7	0.893	0.01	0.04	0.0001	0.0030	14.3	4.71E-05	163.2	15.09	44.95	25.90	32.43	3
W42A	397.37	16.36	45	117.7	0.93	0.01	0.065	0.0001	0.0026	22.9	8.02E-05	126.4	24.98	64.10	36.76	21.65	2
W42B	416.55	15.56	45	94.1	0.9554	0.01	0.065	0.0001	0.0027	23.7	7.38E-05	131.0	26.10	69.62	39.43	21.32	2
W42C	376.56	14.28	46	110.5	0.9385	0.01	0.04	0.0001	0.0036	18.2	6.8E-05	157.1	19.90	71.85	40.94	26.25	2
W42D	489.41	14.48	46	85.4	0.9655	0.01	0.04	0.0001	0.0036	21.7	5.79E-05	151.1	23.27	83.57	46.01	26.42	2
W42E	231.74	16.77	46	77.7	0.9443	0.01	0.04	0.0001	0.0034	19.6	4.71E-05	157.9	20.56	69.56	38.29	28.76	3
W42F	305.53	16.95	46	78.4	0.9521	0.01	0.04	0.0001	0.0034	19.6	4.71E-05	157.9	20.76	69.90	38.49	28.94	3
W42G	248.17	19.72	46	73.9	0.925	0.01	0.04	0.0001	0.0031	16.5	4.71E-05	161.0	17.51	54.70	30.85	31.27	3
W42H	272.90	23.27	46	65.9	0.922	0.01	0.04	0.0001	0.0028	13.1	4.71E-05	164.4	14.64	41.41	24.27	33.45	4
W42J	290.46	21.93	46	60.6	0.9182	0.01	0.04	0.0001	0.0029	14.3	4.71E-05	163.2	15.54	45.64	26.35	32.72	4
W42K	415.98	16.42	46	72.5	0.9656	0.01	0.04	0.0001	0.0034	19.6	0.000047	157.9	21.02	71.78	39.48	28.42	3
W42L	250.66	19.89	46	64.7	0.9351	0.01	0.04	0.0001	0.0031	16.5	4.71E-05	161.0	17.73	55.14	31.11	31.39	3
W42M	391.57	21.13	46	59.0	0.9274	0.01	0.04	0.0001	0.0030	19.6	0.000047	157.9	20.47	61.49	34.19	32.24	4
W43A	248.21	15.58		75.4	0.9555					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W43B	331.71	20.71		76.7	0.9332					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W43C	395.08	20.00	46	66.4	0.9446	0.01	0.04	0.0001	0.0031	19.6	0.000047	157.9	20.78	64.41	35.71	31.47	3
W43D	261.66	26.41		17.9	0.9673					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W43E	264.55	29.19		17.7	0.9737					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W43F	631.45	29.63	65	22.7	0.9538	0.09	0.06	0.1	0.0119	10.5	0.000246	107.4	12.09	144.35	84.76	180.53	48
W44A	254.71	18.78	46	29.3	0.9318	0.01	0.04	0.0001	0.0032	17.4	0.000104	146.0	20.65	66.19	40.17	31.08	7
W44B	486.09	17.60	46	24.6	0.9576	0.01	0.04	0.0001	0.0033	17.4	0.000104	146.0	21.07	69.74	42.14	30.03	8
W44C	314.30	16.80	21	20.0	0.9586	0.015	0.055	0.2	0.0037	18.6	0.00031	93.9	25.45	93.64	60.77	33.51	11
W44D	236.43	18.68	21	18.5	0.9511	0.015	0.055	0.2	0.0034	18.6	0.00031	93.9	25.87	87.96	57.82	34.65	12
W44E	711.45	24.17	21	19.2	0.9603	0.015	0.055	0.2	0.0027	18.6	0.00031	93.9	28.36	75.77	51.85	36.03	12
W45A	1289.09	29.19	65	18.2	0.9746	0.09	0.06	0.1	0.0122	14.4	0.000176	110.6	15.58	190.31	104.63	180.84	60
W45B	508.13	22.80	65	25.8	0.991	0.09	0.06	0.1	0.0169	24.5	0.0001	108.0	24.90	419.69	215.22	193.29	45
W51A	624.64	12.96	28	65.8	0.9492	0.015	0.08	0.1	0.0036	14.4	9.87E-05	158.1	17.71	64.56	39.69	24.25	3
W51B	496.45	12.14	28	63.0	0.9707	0.015	0.08	0.1	0.0038	16.0	9.53E-05	157.1	19.33	74.00	44.26	23.81	3
W51C	677.71	12.29	46	70.4	0.9661	0.01	0.04	0.0001	0.0038	20.6	6.81E-05	155.1	22.64	85.90	48.06	23.75	2
W51D	527.43	14.40	46	68.5	0.9671	0.01	0.04	0.0001	0.0036	19.6	6.27E-05	156.5	21.56	77.57	43.53	26.36	3
W51E	274.28	12.60	46	78.3	0.9404	0.01	0.04	0.0001	0.0038	19.6	0.000063	156.5	20.87	78.58	43.93	24.12	2
W51F	589.36	12.05	46	83.3	0.9461	0.01	0.04	0.0001	0.0038	19.6	0.000063	156.5	20.96	80.02	44.67	23.38	2
W51G	420.10	14.61		85.1	0.9014					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W51H	286.45	21.00		82.5	0.9022					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W52A	289.44	10.33	28	61.4	0.9624	0.015	0.08	0.1	0.0043	16.5	0.000101	156.0	19.49	82.97	49.10	22.50	3
W52B	336.19	10.83	46	61.3	0.9811	0.01	0.04	0.0001	0.0039	23.3	6.29E-05	152.7	25.28	99.43	54.42	21.64	3
W52C	177.84	11.30	46	60.2	0.9642	0.01	0.04	0.0001	0.0039	25.3	4.71E-05	152.2	26.13	101.62	54.26	22.24	3
W52D	119.29	11.43	46	78.5	0.9368	0.01	0.04	0.0001	0.0039	25.3	0.000047	152.2	25.39	98.42	52.56	22.43	2
W53A	547.48	9.71	46	62.9	0.9699	0.01	0.04	0.0001	0.0040	21.6	7.72E-05	153.1	23.81	96.21	53.84	20.00	2
W53B	218.54	9.90	46	70.8	0.9772	0.01	0.04	0.0001	0.0040	22.5	7.21E-05	152.7	24.63	99.07	54.92	20.26	2
W53C	315.62	10.89	46	79.1	0.9577	0.01	0.04	0.0001	0.0039	24.7	5.13E-05	152.4	25.61	100.57	54.03	21.67	2
W53D	314.71	10.73	46	68.1	0.957	0.01	0.04	0.0001	0.0039	25.6	4.71E-05	151.9	26.20	103.33	55.09	21.40	2
W53E	421.87	11.96	46	87.6	0.9435	0.01	0.04	0.0001	0.0038	24.7	0.000051	152.4	25.26	96.65	51.99	23.18	2
W53F	447.34	10.54	46	87.6	0.9334	0.01	0.04	0.0001	0.0040	24.7	0.000051	152.4	24.92	98.73	52.99	21.14	2
W53G	382.31	13.62		95.4	0.9006					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W54A	251.08	9.87	28	62.7	0.9773	0.015	0.08	0.1	0.0044	17.2	0.000101	155.3	20.36	88.96	52.18	22.06	3
W54B	281.94	10.45	28	70.0	0.9802	0.015	0.08	0.1	0.0042	19.2	8.78E-05	154.6	21.96	92.79	53.04	22.54	2
W54C	107.45	10.67	46	71.8	0.976	0.01	0.04	0.0001	0.0039	25.5	5.04E-05	151.6	26.82	105.90	56.68	21.34	2
W54D	138.75	10.97	46	87.9	0.9681	0.01	0.04	0.0001	0.0039	25.7	4.71E-05	151.8	26.69	104.64	55.78	21.75	2
W54E	194.12	12.43	46	101.0	0.9371	0.01	0.04	0.0001	0.0038	24.7	0.000051	152.4	25.11	94.97	51.12	23.82	2
W54F	268.30	14.48		107.4	0.9198					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W54G	265.33	20.21		100.8	0.935					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W55A	688.70	10.64	28	57.7	0.9849	0.015	0.08	0.1	0.0042	16.7	0.000101	155.8	20.16	84.25	49.87	22.78	3

QUAT	area Km2	GWL mbgl	Geo region	Recharge mm/a	Slope Factor	A	B	C	S	weathered zone m	Sf	Fractured zone m	Aquifer thickness m	Total Aq storage mm	SWL mm	PMAX	Moving avergae months
W55B	217.83	10.59	46	67.3	0.9734	0.01	0.04	0.0001	0.0040	21.5	7.35E-05	153.6	23.69	93.73	52.36	21.34	2
W55C	532.20	10.80	46	91.4	0.9534	0.01	0.04	0.0001	0.0039	25.4	4.69E-05	151.2	25.91	102.00	54.38	21.51	2
W55D	270.86	10.70	46	90.0	0.964	0.01	0.04	0.0001	0.0039	25.4	4.69E-05	151.2	26.19	103.37	55.10	21.36	2
W55E	161.23	11.24	46	95.7	0.9441	0.01	0.04	0.0001	0.0039	25.4	4.69E-05	151.2	25.68	99.99	53.34	22.15	2
W56A	359.72	11.36	46	182.6	0.9454	0.01	0.04	0.0001	0.0039	25.4	4.69E-05	151.2	25.72	99.87	53.28	22.32	1
W56B	224.66	13.35	46	200.4	0.9336	0.01	0.04	0.0001	0.0037	25.4	4.69E-05	151.2	25.48	94.17	50.40	24.98	1
W56C	252.69	16.97		243.1	0.9097					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W56D	165.69	16.34		207.9	0.9425					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W56E	185.68	18.63		229.6	0.9315					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W56F	199.26	23.31		94.7	0.9517					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57A	593.11	29.58		84.9	0.9415					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57B	433.96	27.49		28.2	0.9692					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57C	574.49	27.57		26.5	0.9812					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57D	366.35	26.66		91.5	0.9342					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57E	403.01	27.80		19.9	0.9758					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57F	223.41	19.09		75.3	0.9382					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57G	623.17	26.67		16.1	0.9767					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57H	804.68	28.83		31.4	0.953					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W57J	519.42	30.15	21	24.8	0.9522	0.015	0.055	0.2	0.0020	18.6	0.00031	93.9	31.44	63.63	45.67	35.18	9
W57K	137.42	24.05	65	17.6	0.9893	0.09	0.06	0.1	0.0158	22.2	0.000121	108.3	22.80	361.39	187.16	192.05	23
W60A	172.45	15.08		238.0	0.9188					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60B	142.58	15.89		249.8	0.9157					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60C	233.04	18.39		246.3	0.9327					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60D	186.89	23.21		102.7	0.9595					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60E	134.05	25.50		39.1	0.9774					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60F	418.09	26.19	20	42.0	0.9822	0.01	0.06	0.2	0.0015	34.8	0.000246	95.7	50.08	72.81	47.96	22.26	4
W60G	221.88	22.45		100.8	0.9511					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60H	365.44	26.54		29.7	0.9796					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60J	447.42	27.83		32.7	0.987					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
W60K	1165.17	25.36	20	42.1	0.9493	0.01	0.06	0.2	0.0015	34.8	0.000246	3.6	33.59	50.95	25.89	22.35	6
W70A	2577.95	10.07	65	79.7	0.9931	0.09	0.06	0.1	0.0298	37.1	0.0001	95.4	37.20	1107.68	558.59	150.47	12
X11A	671.69	9.99	28	45.8	0.9813	0.015	0.08	0.1	0.0043	21.6	0.00026	143.4	29.65	128.66	82.65	22.97	3
X11B	596.64	10.57	28	50.8	0.9822	0.015	0.08	0.1	0.0042	19.0	0.000188	149.5	25.30	106.19	66.94	23.17	3
X11C	318.80	8.55	28	55.1	0.9837	0.015	0.08	0.1	0.0047	23.2	0.000268	141.4	30.79	144.79	91.05	21.25	3
X11D	590.37	11.09	12	54.5	0.9692	0.006	0.05	0.001	0.0022	35.8	0.000834	103.1	72.85	159.37	121.38	16.75	2
X11E	241.40	12.23	12	59.3	0.9587	0.006	0.05	0.001	0.0021	33.0	0.000788	107.3	70.03	147.71	114.38	17.71	2
X11F	182.52	13.16	12	71.5	0.921	0.006	0.05	0.001	0.0020	41.0	0.001165	81.5	80.51	164.70	126.10	21.13	2
X11G	263.74	14.06	12	111.4	0.9136	0.006	0.05	0.001	0.0020	39.7	0.001165	82.8	80.67	160.19	124.16	22.15	2
X11H	265.14	15.39	12	128.7	0.9211	0.006	0.05	0.001	0.0019	32.0	0.000759	110.5	70.17	133.20	105.20	20.45	1
X11J	186.21	16.46	12	146.1	0.9162	0.006	0.05	0.001	0.0018	30.4	0.000737	113.2	69.62	127.37	101.90	21.13	1
X11K	210.70	14.20	46	118.3	0.9513	0.01	0.04	0.0001	0.0036	22.2	4.71E-05	155.3	23.04	83.34	45.15	26.02	2
X12A	244.33	12.40	46	76.7	0.9627	0.01	0.04	0.0001	0.0038	22.7	6.54E-05	153.5	24.41	92.39	51.03	23.88	2
X12B	154.77	12.87	12	81.7	0.9515	0.006	0.05	0.001	0.0021	40.3	0.001035	88.6	80.62	166.51	126.88	19.96	2
X12C	186.14	14.01	46	93.1	0.9299	0.01	0.04	0.0001	0.0036	25.0	0.000238	143.1	31.98	116.22	73.97	27.13	2
X12D	222.96	13.20	46	77.5	0.9541	0.01	0.04	0.0001	0.0037	23.2	4.71E-05	154.3	24.01	89.06	48.00	24.79	2
X12E	332.66	11.73	46	77.6	0.9432	0.01	0.04	0.0001	0.0038	23.7	5.07E-05	153.5	24.24	93.29	50.31	22.87	2
X12F	312.72	11.34	46	86.0	0.9366	0.01	0.04	0.0001	0.0039	24.5	4.71E-05	153.0	24.69	95.93	51.34	22.30	2
X12G	238.74	12.03	46	90.9	0.9205	0.01	0.04	0.0001	0.0038	23.5	4.71E-05	154.0	23.42	89.47	48.07	23.26	2
X12H	285.69	11.69	46	102.2	0.9081	0.01	0.04	0.0001	0.0039	23.5	4.71E-05	154.0	23.04	88.74	47.66	22.79	2
X12J	295.68	13.54	46	145.8	0.8669	0.01	0.04	0.0001	0.0037	20.8	4.71E-05	156.7	19.79	72.80	39.60	25.22	2
X12K	286.20	13.10	46	108.9	0.8918	0.01	0.04	0.0001	0.0037	20.8	4.71E-05	156.7	20.34	75.65	41.11	24.67	2
X13A	244.80	15.39	46	151.4	0.8863	0.01	0.04	0.0001	0.0035	20.8	4.71E-05	156.7	20.32	71.28	38.91	27.36	2
X13B	236.73	16.53		129.5	0.9069					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X13C	195.22	16.67		150.9	0.9066					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X13D	180.66	17.67		113.6	0.9047					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X13E	211.54	20.59		94.3	0.9347					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X13F	216.87	18.69		91.9	0.935					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X13G	334.72	20.80		59.1	0.9569					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X13H	305.49	23.18	46	46.6	0.976	0.01	0.04	0.0001	0.0028	24.9	0.000149	120.8	30.56	86.63	52.12	34.59	5
X13J	827.77	21.27	46	41.7	0.976	0.01	0.04	0.0001	0.0030	24.9	0.000149	120.8	30.23	90.47	54.04	33.41	6
X13K	620.77	21.11	20	22.2	0.9824	0.01	0.06	0.2	0.0019	34.8	0.000246	95.7	46.52	87.23	55.18	22.38	6
X13L	286.21	17.12	20	24.7	0.979	0.01	0.06	0.2	0.0023	31.3	0.000168	117.7	39.15	88.76	54.04	20.84	6
X14A	140.81	16.98	46	189.6	0.8515	0.01	0.04	0.0001	0.0034	16.9	4.54E-05	154.3	16.17	54.40	30.18	28.95	1
X14B	185.24	18.05	46	187.6	0.8602	0.01	0.04	0.0001	0.0033	16.9	4.54E-05	154.3	16.39	53.58	29.80	29.92	1
X14C	165.77	16.88		161.3	0.9151					0.0	0	0.0	#DIV/0!	0.00	0.00	0.00	0
X14D	128.59	17.23	46	166.1	0.9135	0.01	0.04	0.0001	0.0033	16.9	0.000097	154.3	19.54	65.29	39.48	29.63	2
X14E	177.31	18.39	46	77.4	0.9418	0.01	0.04	0.0001	0.0032	17.7	4.5E-05	152.2	18.63	60.34	33.40	30.20	3
X14F	117.47	17.18	46	188.8	0.9003	0.01	0.04	0.0001	0.0033	18.3	4.71E-05	159.2	18.46	61.77	34.26	29.15	1
X14G	204.17	18.09	46	62.2	0.9541	0.01	0.04	0.0001	0.0033	17.7	4.5E-05	152.2	18.85	61.57	34.05	29.95	3
X14H	359.79	18.53	46	41.3	0.9734	0.01	0.04	0.0001	0.0032	18.5	4.71E-05	159.0	20.22	65.28	36.28	30.33	5
X21A	264.94	10.85	12	66.0	0.9411	0.006	0.05	0.001	0.0022	43.9	0.001165	78.6	80.44	177.32	131.73	18.28	2
X21B	378.32	13.70	12	58.2	0.9323	0.006	0.05	0.001	0.0020	40.9	0.001165	81.6	82.25	165.28	126.97	21.75	3
X21C	311.03	15.98	12	66.1	0.9322	0.006	0.05	0.001	0.0019	38.6	0.001165	83.9	84.98	158.10	124.61	24.17	3
X21D	219.13	18.45	12	61.0	0.9115	0.006	0.05	0.001	0.0017	35.7	0.001165	86.8	86.60	147.71	119.95	26.48	3
X21E	345.11	19.66	12	128.3	0.8939	0.006	0.05	0.001	0.0016	33.5	0.001111	90.6	85.09	138.90	114.44	26.97	2
X21F	396.73	11.42	12	56.8	0.9619	0.006	0.05	0.001	0.0022	44.1	0.001157	78.8	82.91	179.49	133.62	18.96	3
X21G	347.34	15.06	12	64.6	0.9293	0.006	0.05	0.001	0.0019	39.5	0.001165	83.0	83.54	160.38	125.11	23.23	3
X21H	228.85	19.10	12	152.3	0.8984	0.006	0.05	0.001	0.0017	29.0	0.000828	110.0	75.24	125.36	103.62	23.82	1
X21J	354.61	18.36	12	116.1	0.8841	0.006	0.05	0.001	0.0017	34.5	0.001165	88.0	83.48	142.85	116.77	26.40	2

QUAT	area	GWL	Geo region	Recharge	Slope Factor	A	B	C	S	weathered zone	Sf	Fractured zone	Aquifer thickness	Total Aq storage	SWL	PMAX	Moving avergae
	Km2	mbgl		mm/a						m		m	m	mm	mm		months
X21K	245.14	20.54	12	149.9	0.8986	0.006	0.05	0.001	0.0016	31.1	0.000977	99.0	82.97	131.16	109.04	26.28	2
X22A	251.37	19.17	12	159.7	0.8914	0.006	0.05	0.001	0.0017	34.2	0.001165	88.3	85.69	142.40	117.04	27.10	2
X22B	226.65	19.78	12	153.0	0.9113	0.006	0.05	0.001	0.0016	32.1	0.000653	106.0	68.04	110.61	86.83	22.54	1
X22C	366.20	20.23	19	77.8	0.9341	0.01	0.07	0.2	0.0017	27.9	0.000152	128.7	37.03	61.39	39.81	18.30	2
X22D	274.45	18.41	12	157.5	0.9231	0.006	0.05	0.001	0.0017	34.9	0.000943	94.3	80.30	137.14	109.63	24.41	1
X22E	153.01	18.05	19	142.2	0.9357	0.01	0.07	0.2	0.0019	32.2	0.000178	120.2	40.74	76.59	48.31	18.57	1
X22F	212.41	17.91	19	73.8	0.9517	0.01	0.07	0.2	0.0019	32.9	0.000172	119.6	41.62	78.84	49.20	18.50	2
X22G	107.44	17.95	19	137.2	0.9463	0.01	0.07	0.2	0.0019	32.7	0.000172	119.8	41.28	78.03	48.75	18.51	1
X22H	200.17	18.36	19	68.7	0.9626	0.01	0.07	0.2	0.0018	32.9	0.000172	119.6	42.37	78.24	49.01	18.53	2
X22J	239.88	20.81	19	63.8	0.9417	0.01	0.07	0.2	0.0016	29.9	0.000172	122.6	40.50	64.89	42.37	18.46	2
X22K	334.90	22.71	19	72.2	0.9176	0.01	0.07	0.2	0.0014	27.1	0.000169	126.0	38.50	55.09	37.31	18.17	2
X23A	126.81	20.86	19	163.5	0.9322	0.01	0.07	0.2	0.0016	15.7	5.59E-05	161.4	19.90	31.81	20.11	17.25	1
X23B	229.13	19.92	46	68.7	0.9311	0.01	0.04	0.0001	0.0031	18.7	6.82E-05	154.6	20.54	63.83	36.83	31.62	3
X23C	81.29	17.50	19	161.0	0.9241	0.01	0.07	0.2	0.0019	18.3	4.71E-05	159.2	20.51	39.77	23.35	17.38	1
X23D	181.87	17.85	19	99.8	0.9593	0.01	0.07	0.2	0.0019	18.8	4.71E-05	158.7	21.85	41.52	24.34	17.39	2
X23E	180.39	14.78	46	102.7	0.9177	0.01	0.04	0.0001	0.0036	20.9	4.71E-05	156.6	21.08	75.14	40.95	26.68	2
X23F	309.58	17.14	46	83.8	0.9213	0.01	0.04	0.0001	0.0033	18.7	4.71E-05	158.8	19.32	64.70	35.79	29.12	3
X23G	225.09	22.73	46	85.8	0.8906	0.01	0.04	0.0001	0.0029	14.1	5.54E-05	161.7	15.36	44.12	26.05	33.27	3
X23H	306.06	18.69	46	83.2	0.901	0.01	0.04	0.0001	0.0032	22.5	9.74E-05	144.9	24.20	77.78	45.25	30.94	3
X24A	248.51	15.68	19	42.6	0.9688	0.01	0.07	0.2	0.0021	35.7	0.000172	116.8	43.63	93.61	56.53	18.17	3
X24B	334.97	16.91	19	44.8	0.9556	0.01	0.07	0.2	0.0020	34.0	0.000172	118.5	42.18	84.55	52.00	18.40	3
X24C	285.71	18.95	19	51.6	0.9479	0.01	0.07	0.2	0.0018	31.0	0.000165	122.9	40.14	71.67	45.44	18.48	3
X24D	301.85	16.30	46	63.9	0.9326	0.01	0.04	0.0001	0.0034	22.7	7.33E-05	149.5	24.16	82.74	46.48	28.51	3
X24E	526.00	14.57	19	34.4	0.9648	0.01	0.07	0.2	0.0023	33.7	0.000146	124.0	40.14	91.50	54.50	17.67	4
X24F	262.07	16.41	19	33.8	0.9747	0.01	0.07	0.2	0.0021	27.9	0.000109	137.1	34.30	70.68	42.65	17.81	4
X24G	619.95	14.18	19	24.9	0.9807	0.01	0.07	0.2	0.0023	37.6	0.000172	114.9	45.18	105.15	62.26	17.73	5
X24H	769.61	13.41	19	20.5	0.9801	0.01	0.07	0.2	0.0024	40.3	0.000208	101.5	48.06	116.60	68.63	17.66	6
X31A	230.07	18.00	12	285.7	0.8985	0.006	0.05	0.001	0.0017	35.3	0.001157	87.4	84.18	145.89	118.38	26.01	1
X31B	195.18	19.02	19	283.1	0.9207	0.01	0.07	0.2	0.0018	31.7	0.000359	115.2	50.58	89.93	64.02	20.33	1
X31C	153.98	18.84	19	298.3	0.9236	0.01	0.07	0.2	0.0018	32.8	0.000573	107.6	62.00	111.36	84.15	22.32	1
X31D	191.99	17.26	19	108.4	0.9436	0.01	0.07	0.2	0.0020	33.2	0.000172	119.3	41.18	80.94	50.14	18.44	2
X31E	213.84	20.57	19	261.1	0.9379	0.01	0.07	0.2	0.0016	30.0	0.000196	121.8	41.90	68.08	45.21	18.72	1
X31F	93.99	20.06	19	275.9	0.9438	0.01	0.07	0.2	0.0017	31.1	0.000258	118.8	46.65	78.12	53.53	19.38	1
X31G	168.54	18.27	19	105.0	0.9583	0.01	0.07	0.2	0.0019	32.7	0.000172	119.8	41.99	77.94	48.83	18.53	2
X31H	60.42	18.11	19	167.4	0.9405	0.01	0.07	0.2	0.0019	32.5	0.000172	120.0	40.92	76.66	48.02	18.52	1
X31J	154.30	16.25	19	93.9	0.9471	0.01	0.07	0.2	0.0021	34.3	0.000172	118.2	41.76	86.85	53.04	18.29	2
X31K	487.55	16.11	19	33.4	0.9765	0.01	0.07	0.2	0.0021	35.5	0.000172	117.0	44.07	92.35	55.98	18.26	4
X31L	303.85	18.61	19	33.0	0.973	0.01	0.07	0.2	0.0018	33.0	0.000172	119.5	43.08	78.44	49.21	18.54	4
X31M	709.11	16.51	19	19.4	0.9847	0.01	0.07	0.2	0.0020	35.5	0.000172	117.0	44.58	91.39	55.59	18.34	6
X32A	112.20	19.24	19	116.8	0.9336	0.01	0.07	0.2	0.0018	31.0	0.000198	120.7	41.64	73.09	47.69	18.79	1
X32B	55.31	19.24	19	106.5	0.9573	0.01	0.07	0.2	0.0018	31.7	0.000172	120.8	41.67	73.16	46.51	18.54	2
X32C	233.34	22.39	19	31.5	0.9812	0.01	0.07	0.2	0.0015	29.5	0.000172	123.0	43.18	63.01	41.87	18.26	4
X32D	99.99	19.42	19	131.6	0.9214	0.01	0.07	0.2	0.0017	30.4	0.000172	122.1	39.15	68.04	43.68	18.54	1
X32E	78.26	20.10	19	90.4	0.9612	0.01	0.07	0.2	0.0017	31.1	0.000172	121.4	41.94	70.04	45.04	18.51	1
X32F	157.31	21.27	19	31.8	0.9797	0.01	0.07	0.2	0.0016	30.6	0.000172	121.9	43.15	67.28	43.90	18.41	4
X32G	335.55	23.98	19	23.9	0.983	0.01	0.07	0.2	0.0013	28.0	0.000172	124.5	43.42	57.56	39.29	17.96	5
X32H	488.43	22.85	19	20.1	0.9857	0.01	0.07	0.2	0.0014	29.2	0.000172	123.3	43.51	61.77	41.32	18.18	6
X32J	355.23	17.81	19	17.9	0.9806	0.01	0.07	0.2	0.0019	34.0	0.000172	118.5	43.84	83.54	51.75	18.50	7
X33A	600.21	13.80	19	18.6	0.9828	0.01	0.07	0.2	0.0024	38.1	0.000172	114.4	45.54	108.22	63.78	17.58	6
X33B	310.46	11.48	20	14.4	0.9856	0.01	0.06	0.2	0.0029	44.0	0.000231	91.4	50.47	147.05	83.95	18.05	8
X33C	182.53	12.49	20	9.0	0.98	0.01	0.06	0.2	0.0028	44.3	0.000259	83.2	50.95	142.14	81.62	19.04	13
X33D	350.35	9.03	20	13.8	0.972	0.01	0.06	0.2	0.0032	47.2	0.000255	81.5	52.08	168.06	94.11	15.71	7
X40A	923.51	12.42	20	13.6	0.9875	0.01	0.06	0.2	0.0028	44.3	0.000251	85.5	51.29	143.55	82.37	18.94	9
X40B	743.23	12.29	20	12.6	0.988	0.01	0.06	0.2	0.0028	44.1	0.000247	86.8	51.13	143.93	82.54	18.81	9
X40C	941.14	21.13	19	17.6	0.9874	0.01	0.07	0.2	0.0016	31.8	0.000186	116.7	44.99	70.73	46.06	18.57	7
X40D	588.75	15.29	20	10.2	0.9779	0.01	0.06	0.2	0.0025	41.3	0.000256	87.1	49.19	121.24	71.50	20.80	13

9. APPENDIX B BASEFLOW DATA FOR CALIBRATION AND GRA2 GROUNDWATER USE

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
A10A	0	0	0	0	0	1.3144
A10B	0	0	0	0	0	0.3790
A10C	0	0	0	0	0	0.0010
A21A	19.8	20.09	6.985416	9.5436	9.68338	2.8636
A21B	10.1	11.45	4.37202	5.3227	6.03415	1.5124
A21C	28	30.09	15.42324	21.308	22.89849	1.4281
A21D	44.3	39.72	12.13363	16.4796	14.77584	0.5581
A21E	29.7	32.49	6.13791	8.613	9.4221	0.1183
A21F	10.2	12.1	7.286994	10.2102	12.1121	4.3275
A21G	70.8	62.7	9.08304	11.328	10.032	0.0161
A21H	8	13.21	2.20284	4.112	6.78994	1.5851
A21J	3.2	6.14	1.7958	3.6832	7.06714	4.6352
A21K	33	33.06	8.64528	28.545	28.5969	0.9360
A21L	2.9	4.55	0.209874	0.6177	0.96915	1.2828
A22A	5.4	7.37	1.228716	3.8178	5.21059	4.7547
A22B	5.4	7.18	0.50958	1.5336	2.03912	0.1370
A22C	6.1	6.17	0.989604	3.1415	3.17755	0.6118
A22D	2.9	5	0.540033	1.5718	2.71	0.9535
A22E	3	5.5	0.840792	2.439	4.4715	0.0372
A22F	3	5.46	1.771278	5.07	9.2274	1.7540
A22G	6.6	8.49	1.079232	3.2934	4.23651	0.0440
A22H	3.3	7.63	0.749658	1.9107	4.41777	1.1487
A22J	3	5.56	0.600534	1.776	3.29152	0.3806
A23A	24.4	25.06	10.34857	16.6408	17.09092	31.6388
A23B	7.7	9.37	3.301689	6.2678	7.62718	3.5696
A23C	2.9	3.77	0.689472	1.4239	1.85107	1.5829
A23D	88.3	93.5	10.62075	12.8035	13.5575	0.0191
A23E	8.8	11.71	1.74231	4.312	5.7379	7.7538
A23F	3	4.21	0.84072	1.695	2.37865	1.6520
A23G	12	11.75	2.21949	11.424	11.186	6.6126
A23H	3	4.55	1.561962	3.174	4.8139	1.9196
A23J	2.9	4.11	1.409859	2.6999	3.82641	2.6752
A23K	3	4.87	1.471092	3.393	5.50797	5.5971
A23L	3	4.75	0.450288	0.987	1.56275	0.0272
A24A	3	4.91	0.509082	1.479	2.42063	2.4799
A24B	3.1	5.61	0.781218	2.1979	3.97749	15.0614
A24C	0	0	0	0	0	24.8333
A24D	0	0.13	0	0	0.17264	1.6120
A24E	0	0	0	0	0	0.6690
A24F	0	0	0	0	0	4.3545
A24G	9	12.22	3.20742	6.624	8.99392	0.1135
A24H	5.1	10.23	1.436085	6.8289	13.69797	3.4878
A24J	0	0.04	0	0	0.10072	10.0475
A31A	11.4	11.79	5.54268	7.2162	7.46307	2.6024
A31B	11.5	11.95	5.34786	6.8655	7.13415	0.1113
A31C	2.7	2.84	0.479574	1.3122	1.38024	0.1642
A31D	2.8	3.14	0.719796	1.974	2.2137	0.2165
A31E	4.2	5.69	0.8103	2.5284	3.42538	0.1827
A31F	3.5	5.2	0.689424	2.4605	3.6556	0.4183
A31G	3.5	5.11	1.47096	4.9945	7.29197	1.1210
A31H	0	0	0	0	0	0.3572
A31J	0	0	0	0	0	0.1910
A32A	0	0	0	0	0	0.2049
A32B	0	0	0	0	0	0.0830
A32C	0	0	0	0	0	0.2357
A32D	0	0	0	0	0	0.7575
A32E	0	0	0	0	0	2.1458
A41A	5	10.13	0.566667	3.46	7.00996	0.7055
A41B	4.7	8.31	0.2988	1.6826	2.97498	0.0112
A41C	0	0	0	0	0	0.1054
A41D	0	0	0	0	0	1.6671
A41E	0	0.09	0	0	0.1746	0.1316
A42A	31.4	27.26	9.600012	17.9922	15.61998	4.5566
A42B	32.3	29.49	9.27129	16.8606	15.39378	4.4651
A42C	32.1	29.03	12.21051	22.4058	20.26294	5.5128
A42D	30.7	38.44	5.916072	15.2579	19.10468	2.9309
A42E	26.6	29.68	10.01503	26.7862	29.88776	8.0997
A42F	4.6	10.28	0.629109	4.7012	10.50616	2.6572
A42G	4.4	9.39	0.659505	5.3108	11.33373	0.0648
A42H	4.1	7.5	0.54093	4.3337	7.9275	0.0571
A42J	0	0.05	0	0	0.0906	0.1886
A50A	30.1	37.55	3.477285	8.9698	11.1899	2.7320
A50B	26.4	29.09	3.86775	10.7184	11.81054	0.7911
A50C	26.1	28.37	3.420468	9.4482	10.26994	1.2215

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
A50D	4.5	10.54	0.357	2.8665	6.71398	0.0273
A50E	4.1	7.72	0.329088	2.5789	4.85588	0.0478
A50F	4	6.43	0.18123	1.488	2.39196	0.0609
A50G	0	0	0	0	0	0.3606
A50H	0	0	0	0	0	0.3333
A50J	0	0	0	0	0	1.1931
A61A	17	18.31	1.799847	6.477	6.97611	2.2914
A61B	15	16.14	1.200108	5.43	5.84268	0.0619
A61C	13	14.15	1.109298	7.631	8.30605	2.1094
A61D	12	14.34	1.110996	5.472	6.53904	2.6949
A61E	12	13.35	1.110174	6.564	7.30245	8.4988
A61F	7.8	8.25	2.64177	6.1542	6.50925	11.7597
A61G	7.6	7.73	2.969343	7.0452	7.16571	2.0244
A61H	18.4	20.5	6.118266	10.764	11.9925	6.2619
A61J	18.3	19.5	7.73955	14.9694	15.951	7.9596
A62A	17.7	19.26	3.72186	7.5756	8.24328	2.8758
A62B	3.2	6.63	0.479952	2.272	4.7073	0.4880
A62C	2.9	4.73	0.269952	1.1165	1.82105	0.1200
A62D	2.9	5.1	0.39078	1.7487	3.0753	0.2514
A62E	0	0	0	0	0	0.7920
A62F	0	0.03	0	0	0.0186	0.4360
A62G	0	0	0	0	0	0.2550
A62H	0	0.01	0	0	0.00871	0.4820
A62J	0	0.05	0	0	0.0465	0.1440
A63A	0	0.04	0	0	0.07712	0.8357
A63B	0	0	0	0	0	1.3077
A63C	0	0	0	0	0	0.1067
A63D	0	0	0	0	0	0.9995
A63E	0	0	0	0	0	20.6892
A71A	0	0.11	0	0	0.12584	27.3431
A71B	0	0.01	0	0	0.00882	2.8553
A71C	0	0.01	0	0	0.01331	5.9253
A71D	0	0	0	0	0	0.4545
A71E	0	0	0	0	0	9.5082
A71F	0	0	0	0	0	8.4632
A71G	0	0	0	0	0	9.7338
A71H	0	0.19	0	0	0.19228	4.7351
A71J	0	0	0	0	0	1.9658
A71K	0	0	0	0	0	1.4801
A71L	0	0	0	0	0	0.1320
A72A	0	0.18	0	0	0.34344	8.0378
A72B	0	0	0	0	0	0.8416
A80A	31	54.37	2.616768	8.897	15.60419	1.5635
A80B	13.2	18.58	1.230768	3.3132	4.66358	0.8531
A80C	9.2	10.83	0.958797	2.7048	3.18402	0.1250
A80D	11.2	15.47	0.570105	1.4336	1.98016	0.0788
A80E	11.2	15.64	1.14048	2.7664	3.86308	0.3839
A80F	0	0	0	0	0	0.0933
A80G	0	0	0	0	0	0.1356
A80H	0	33.83	2.912481	0	8.99878	0.0590
A80J	0	0	0	0	0	0.1500
A91A	38.3	38.29	4.617216	8.8856	8.88328	0.6362
A91B	29.8	25.11	3.9303	8.195	6.90525	0.1400
A91C	82.3	82.66	10.88579	20.575	20.665	0.3667
A91D	136.4	178.73	11.64659	18.0048	23.59236	1.2373
A91E	107.8	128.82	14.49016	24.0394	28.72686	0.4230
A91F	5.3	11.27	1.0827	3.074	6.5366	0.8580
A91G	160.6	176.18	33.06992	65.2036	71.52908	0.8730
A91H	7.2	17.48	0.722904	3.24	7.866	0.4180
A91J	0	0	0	0	0	0.0030
A91K	0	0	0	0	0	0.0000
A92A	170.5	183.6	27.07726	56.0945	60.4044	0.2640
A92B	7.1	16.63	0.87216	4.0115	9.39595	0.2410
A92C	0	0	0	0	0	0.1370
A92D	0	0	0	0	0	0.1290
B11A	9.8	14.49	3.42147	9.261	13.69305	0.0515
B11B	9.6	13.63	1.55925	4.176	5.92905	0.2034
B11C	9.4	12.68	1.348512	3.619	4.8818	0.0522
B11D	9.4	11.65	1.860276	5.1794	6.41915	0.0138
B11E	9.5	12.3	1.58928	4.4365	5.7441	0.0004
B11F	9.7	12.99	1.501764	4.1516	5.55972	0.0191
B11G	9.7	13.07	1.171272	3.5696	4.80976	0.0606
B11H	9.7	13.19	0.781392	2.3862	3.24474	0.4772
B11J	21.1	26.04	3.268323	5.6759	7.00476	0.0491
B11K	21.2	24.82	4.38228	8.0136	9.38196	0.0000
B11L	21.5	25.5	2.84868	5.203	6.171	0.0001
B12A	8.1	11.44	1.680603	3.2805	4.6332	0.0246
B12B	8.4	11.97	2.697006	5.5356	7.88823	0.1247

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
B12C	8.5	12.42	2.188494	4.4965	6.57018	0.1997
B12D	9.8	13.73	1.200714	3.5476	4.97026	1.5323
B12E	21.6	27.51	5.580927	9.4176	11.99436	0.0777
B20A	15.2	17.73	4.050162	8.7248	10.17702	1.5211
B20B	15.3	17.23	2.219112	4.9266	5.54806	0.1506
B20C	15.5	17.65	2.551536	5.642	6.4246	0.1353
B20D	15.6	16.92	3.268284	7.488	8.1216	0.5012
B20E	15.1	16.54	4.3785	9.362	10.2548	0.5097
B20F	15.3	16.36	3.480567	7.7112	8.24544	0.2119
B20G	20.7	23.54	5.639751	10.8054	12.28788	0.1650
B20H	20.8	22.48	5.882229	11.7104	12.65624	0.0325
B20J	21.6	23.46	4.321791	8.7912	9.54822	0.0335
B31A	8.8	13.42	1.34937	3.4056	5.19354	0.1357
B31B	7.7	10.5	1.261386	2.9645	4.0425	0.0224
B31C	6.7	9.06	1.19892	2.4991	3.37938	0.0227
B31D	6.6	8.73	1.738956	3.6828	4.87134	0.0053
B31E	0	0	0	0	0	28.3520
B31F	0	0	0	0	0	0.0002
B31G	6.6	8.33	1.411956	2.8578	3.60689	0.0000
B31H	5.8	6.91	1.801248	3.5496	4.22892	0.0000
B31J	0	0	0	0	0	0.9976
B32A	21.4	26.05	9.056367	17.1414	20.86605	0.0596
B32B	20.9	24.16	5.940072	12.8326	14.83424	0.0000
B32C	19.3	18.7	2.400156	5.8479	5.6661	0.0366
B32D	3.8	6.65	0.29862	1.9798	3.46465	1.4582
B32E	4	9.67	0.11919	0.812	1.96301	0.0652
B32F	4	8.47	0.419904	2.668	5.64949	0.3047
B32G	7	11.12	3.898122	6.776	10.76416	0.0000
B32H	6.7	9.3	2.640924	4.6498	6.4542	0.8819
B32J	0	0.59	0	0	0.19057	1.9943
B41A	17.1	25.9	5.99886	13.0815	19.8135	0.0121
B41B	16.2	25.01	6.08946	12.6036	19.45778	0.0102
B41C	16	24.03	2.31105	4.832	7.25706	0.1434
B41D	13.7	18.12	2.818557	5.5211	7.30236	0.6742
B41E	0	0.72	0	0	0.17064	0.6964
B41F	23.7	31.34	3.865485	9.006	11.9092	0.1096
B41G	21.5	28.84	4.3152	9.503	12.74728	1.6566
B41H	0	1.02	0	0	0.4182	0.8072
B41J	0	1.14	0	0	0.78774	33.0747
B41K	0	1.47	0	0	0.93345	1.0155
B42A	51	62.31	11.19088	16.269	19.87689	0.0463
B42B	65	79	8.517432	13.91	16.906	0.0032
B42C	8	16.44	0.449082	1.312	2.69616	0.0080
B42D	82.2	103.11	6.836466	12.741	15.98205	0.0034
B42E	5.8	9.75	0.509832	1.2876	2.1645	0.5162
B42F	48.4	56.88	8.758344	13.5036	15.86952	0.3972
B42G	6.8	11.53	0.780804	2.2236	3.77031	0.9340
B42H	0	0.98	0	0	0.40474	1.1935
B51A	0	0.84	0	0	0.26124	0.4740
B51B	0	0.71	0	0	0.41961	0.7250
B51C	0	0.46	0	0	0.29348	0.2660
B51E	0	0	0	0	0	43.4068
B51F	0	0.66	0	0	0.2607	0.0037
B51G	0	0.48	0	0	0.28368	6.2282
B51H	0	0.7	0	0	0.5019	1.2090
B52A	0	0.18	0	0	0.10188	0.4710
B52B	0	0.69	0	0	0.43677	0.9770
B52C	0	0	0	0	0	0.1250
B52D	0	0.13	0	0	0.04433	0.4300
B52E	0	0.48	0	0	0.21648	0.4830
B52F	0	0	0	0	0	0.1290
B52G	0	0.05	0	0	0.01455	0.2740
B52H	0	1.93	0	0	1.08659	0.4180
B52J	0	0.47	0	0	0.18565	0.2270
B60A	214.7	263.55	39.87287	45.087	55.3455	0.0090
B60B	185.7	220.89	46.00842	56.0814	66.70878	0.0030
B60C	231.2	304.6	17.21578	21.7328	28.6324	0.0000
B60D	86.3	114.49	14.34591	21.0572	27.93556	0.8200
B60E	75	105.07	4.53096	6.225	8.72081	0.0000
B60F	12.3	17.84	1.952304	4.92	7.136	0.4029
B60G	9.5	12.22	1.79955	4.256	5.47456	1.9546
B60H	12.4	18.54	1.890096	4.774	7.1379	0.8133
B60J	75.7	71.11	4.770504	51.1732	48.07036	0.0208
B71A	0	2.24	0	0	0.66752	0.0670
B71B	0	0.57	0	0	0.15618	0.1012
B71C	62.6	87.34	11.91125	16.4638	22.97042	0.0312
B71D	30.9	39.73	5.191959	7.0143	9.01871	0.0740
B71E	0	1.53	0	0	1.19646	1.0420

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
B71F	43.2	54.98	15.18779	23.3712	29.74418	0.1260
B71G	47.3	67.51	6.993162	11.5885	16.53995	0.1620
B71H	0	0	0	0	0	0.1212
B71J	0	0	0	0	0	0.0119
B72A	53.7	51.8	5.795532	28.6758	27.6612	0.5078
B72B	0	0	0	0	0	0.0051
B72C	0	0	0	0	0	0.0120
B72D	0	0	0	0	0	0.0530
B72E	56.4	58.17	3.357585	18.048	18.6144	0.3730
B72F	49.5	76.04	2.580456	4.0095	6.15924	0.0095
B72G	0	0	0	0	0	0.0142
B72H	0	0	0	0	0	0.0000
B72J	0	0	0	0	0	0.0139
B72K	0	0	0	0	0	0.3051
B73A	73.7	97.35	6.962058	12.1605	16.06275	0.2212
B73B	0	0	0	0	0	0.0261
B73C	0	0	0	0	0	0.0037
B73D	0	0	0	0	0	0.0059
B73E	0	0	0	0	0	0.3410
B73F	0	0	0	0	0	0.0000
B73G	0	0	0	0	0	0.0000
B73H	0	0	0	0	0	0.0000
B73J	0	0	0	0	0	0.0000
B81A	199.4	231.17	25.02993	33.6986	39.06773	0.0097
B81B	148.9	189.28	57.48312	71.6209	91.04368	0.0497
B81C	18.5	31.99	2.039796	3.848	6.65392	0.0267
B81D	81.7	83.16	12.96178	39.1343	39.83364	2.0584
B81E	0	0	0	0	0	1.8903
B81F	0	0	0	0	0	0.5550
B81G	0	0	0	0	0	0.6990
B81H	0	0	0	0	0	0.3020
B81J	0	0	0	0	0	0.1150
B82A	7.2	15.75	0.960351	3.3624	7.35525	0.4261
B82B	7	14.17	0.779328	2.842	5.75302	4.5629
B82C	7.1	15.14	0.631029	2.13	4.542	0.0500
B82D	5	8.74	0.958815	3.16	5.52368	0.8166
B82E	5.9	10.57	0.71982	2.4957	4.47111	0.3756
B82F	6.1	11.68	1.31664	4.636	8.8768	1.0685
B82G	0	0	0	0	0	1.2488
B82H	0	0	0	0	0	0.3490
B82J	0	0	0	0	0	0.0200
B83A	0	0	0	0	0	0.0006
B83B	0	0	0	0	0	0.0000
B83C	0	0	0	0	0	0.0000
B83D	0	0	0	0	0	0.0000
B83E	0	0	0	0	0	0.0000
B90A	0	0	0	0	0	0.0430
B90B	0	0	0	0	0	0.3060
B90C	0	0	0	0	0	0.1630
B90D	0	0	0	0	0	0.0000
B90E	0	0	0	0	0	0.0000
B90F	0	0	0	0	0	0.5160
B90G	0	0	0	0	0	0.0170
B90H	0	0	0	0	0	0.0000
C11A	10.4	22.07	1.0926	7.4984	15.91247	0.0000
C11B	8.8	19.4	0.802995	4.7168	10.3984	0.0874
C11C	11.5	26.47	0.719355	5.175	11.9115	0.1350
C11D	8.8	19	0.561411	3.2824	7.087	0.1734
C11E	8.5	18.57	1.689192	9.8345	21.48549	1.2575
C11F	8.8	17.87	1.339539	8.1928	16.63697	0.3857
C11G	7.2	13.64	0.588582	3.1176	5.90612	0.2219
C11H	6	20.03	0.69072	6.624	22.11312	1.3823
C11J	7.1	15.69	1.336116	7.1142	15.72138	0.4774
C11K	4.9	16.53	0.18984	1.666	5.6202	0.3058
C11L	7.8	17.2	1.34082	7.3944	16.3056	0.4884
C11M	6.4	12.88	1.236429	5.0944	10.25248	0.4291
C12A	4.9	12.76	0.975801	2.3765	6.1886	0.0002
C12B	5.4	12.94	0.914898	2.5866	6.19826	0.1264
C12C	4.5	11.68	1.335015	2.997	7.77888	0.1651
C12D	6	16.63	0.852306	5.394	14.95037	3.7770
C12E	5.1	15	0.487032	2.5398	7.47	0.2556
C12F	4.9	13.8	0.75012	4.0915	11.523	0.3649
C12G	5.1	14.76	0.526824	2.9121	8.42796	0.2003
C12H	4.9	10.18	0.359916	1.7395	3.6139	0.0807
C12J	4.9	9.9	0.326592	1.6856	3.4056	0.1675
C12K	6.2	12.53	0.488409	2.9698	6.00187	0.0928
C12L	6	11.45	0.879624	5.322	10.15615	3.7728
C13A	13.2	27.02	1.834623	7.854	16.0769	0.2099

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
C13B	7.9	16.54	1.649286	4.8664	10.18864	0.2740
C13C	10.1	20.68	2.414694	8.4537	17.30916	0.0417
C13D	8.6	18	2.51472	7.7056	16.128	0.1100
C13E	8.7	18.18	1.682358	5.2461	10.96254	0.0097
C13F	8.3	15.97	1.627626	5.0713	9.75767	0.0329
C13G	7.4	14.95	1.242264	3.219	6.50325	0.0062
C13H	5.2	10.8	1.503741	3.0628	6.3612	0.0208
C21A	6.2	17.26	0.369198	4.3834	12.20282	0.0585
C21B	9.6	14.02	1.035168	4.1376	6.04262	0.2260
C21C	8.8	12.58	1.016784	3.8544	5.51004	0.1311
C21D	9.6	13.51	1.05525	4.2816	6.02546	0.8413
C21E	9.3	13.2	1.466595	5.8497	8.3028	0.2200
C21F	9.9	14.06	1.0179	4.2273	6.00362	0.5890
C21G	8.5	11.62	1.056132	3.9355	5.38006	0.0302
C22A	9.4	13.01	3.331776	5.1512	7.12948	1.4034
C22B	9.3	13.13	2.425932	3.6456	5.14696	1.4629
C22C	9.1	12.87	2.843016	4.2315	5.98455	0.0299
C22D	9.6	13.23	2.138598	3.312	4.56435	2.3405
C22E	8.5	11.92	3.128823	4.522	6.34144	0.9108
C22F	8	10.85	2.073978	3.52	4.774	0.0544
C22G	6.7	9.42	3.816393	5.5677	7.82802	0.4663
C22H	7.5	9.89	2.140656	3.405	4.49006	0.0662
C22J	7.3	9.66	3.07719	4.8837	6.46254	0.2402
C22K	7.7	10.53	2.07252	3.3418	4.57002	0.3400
C23A	5.2	9.5	0.189486	1.3416	2.451	0.1197
C23B	5.4	9.92	0.493248	3.7854	6.95392	0.4006
C23C	5	10.08	0.70227	5.345	10.77552	0.5970
C23D	19.3	21.54	5.289456	9.843	10.9854	4.9254
C23E	17.7	19.48	8.105379	15.045	16.558	34.2309
C23F	16.5	17.95	20.42044	21.846	23.7658	0.2736
C23G	16.1	17.64	5.355384	9.8693	10.81332	2.3242
C23H	16.5	17.59	4.04496	7.4415	7.93309	0.2713
C23J	5.4	11.1	0.461652	4.806	9.879	0.6314
C23K	5	10.16	0.248376	1.98	4.02336	0.2599
C23L	5.2	10.4	0.745788	6.2972	12.5944	0.7290
C24A	4.1	10.45	0.433008	3.4399	8.76755	0.3389
C24B	3.4	9.04	0.27051	1.802	4.7912	5.1207
C24C	15.7	16.56	5.842137	21.195	22.356	14.8672
C24D	3.1	7.93	0.962268	1.1284	2.88652	0.1501
C24E	2.5	6.65	0.268035	2.3125	6.15125	7.5156
C24F	2.9	7.32	0.586944	5.858	14.7864	1.3006
C24G	2.9	7.5	0.292695	2.8565	7.3875	0.3336
C24H	0	0	0	0	0	1.3988
C24J	0	0	0	0	0	0.8432
C25A	0	0	0	0	0	0.5057
C25B	0	0	0	0	0	0.5744
C25C	0	0	0	0	0	0.7644
C25D	0	0	0	0	0	0.5884
C25E	0	0	0	0	0	1.8611
C25F	0	0	0	0	0	0.6328
C31A	0	0.46	0	0	0.64492	4.8014
C31B	0	0.33	0	0	0.57519	1.6303
C31C	0	0.39	0	0	0.63765	1.8655
C31D	0	0.19	0	0	0.28386	0.6323
C31E	0	0.19	0	0	0.5624	5.3698
C31F	0	0.01	0	0	0.01789	4.5472
C32A	0	0.36	0	0	0.5058	0.7462
C32B	0	0.39	0	0	1.17078	4.2041
C32C	0	0.47	0	0	0.77926	0.6170
C32D	0	0.44	0	0	1.8216	4.3011
C33A	0	0.39	0	0	1.11501	1.0209
C33B	0	0.33	0	0	0.93555	0.6825
C33C	0	0.26	0	0	1.07874	0.6428
C41A	0	8.09	0.025464	0	8.72102	1.0926
C41B	0	8.06	0.023652	0	8.1003	0.4037
C41C	0	7.9	0.025242	0	8.6505	0.3016
C41D	0	5.61	0	0	6.47955	0.2837
C41E	0	3.53	0	0	1.38023	0.1303
C41F	0	2.92	0	0	1.6206	0.2404
C41G	0	2.68	0	0	0.72896	0.0695
C41H	0	3.17	0	0	2.81179	0.1742
C41J	0	2.89	0	0	1.60684	0.0602
C42A	5.7	13.35	1.15335	3.9615	9.27825	0.3245
C42B	4.5	10.03	1.028883	3.2715	7.29181	0.3370
C42C	5.5	12.79	1.247712	4.3615	10.14247	0.3368
C42D	3.9	8.42	0.837408	2.5857	5.58246	0.3088
C42E	4.2	8.92	0.981081	3.15	6.69	0.3456
C42F	4.3	10.37	0.935055	3.1562	7.61158	0.2301

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
C42G	3.8	9.28	0.656016	2.109	5.1504	0.2196
C42H	3.6	8.51	0.492246	1.602	3.78695	1.0720
C42J	3.4	8.08	1.125927	3.4476	8.19312	0.4196
C42K	3.3	7.72	0.727155	2.2044	5.15696	0.8804
C42L	3	6.85	0.329241	1.533	3.50035	0.0676
C43A	0	0	0	0	0	0.3247
C43B	0	0	0	0	0	0.2086
C43C	0	0	0	0	0	0.2988
C43D	0	0	0	0	0	0.3774
C51A	0	3.08	0	0	2.079	0.6852
C51B	0	3.41	0	0	5.76631	0.8667
C51C	0	1.94	0	0	1.21056	1.5489
C51D	0	2.27	0	0	2.09294	0.2361
C51E	0	2.17	0	0	1.74902	0.1357
C51F	0	1.1	0	0	0.9647	1.5968
C51G	0	2.06	0	0	3.7801	1.1807
C51H	0	1.87	0	0	3.33234	2.7192
C51J	0	1.43	0	0	1.50436	3.3225
C51K	0	0	0	0	0	28.9962
C51L	0	0	0	0	0	0.3657
C51M	0	0	0	0	0	0.2389
C52A	0	2.55	0	0	2.38935	0.5004
C52B	0	5.3	0.025524	0	5.0297	0.0676
C52C	0	3.49	0	0	2.094	0.0971
C52D	0	2.87	0	0	1.35177	0.1899
C52E	0	2.48	0	0	2.22456	0.3746
C52F	0	1.72	0	0	1.18336	0.0593
C52G	0	2.99	0	0	5.34911	0.7222
C52H	0	0	0	0	0	0.7613
C52J	0	0	0	0	0	0.0467
C52K	0	0	0	0	0	11.1276
C52L	0	0	0	0	0	4.3575
C60A	5.6	12.1	1.164978	4.816	10.406	0.1603
C60B	5	10.7	1.30065	5.11	10.9354	0.4674
C60C	3.7	7.99	1.194408	3.8776	8.37352	0.3906
C60D	3	7.26	0.581715	1.935	4.6827	0.1601
C60E	3.3	7.53	0.748332	2.1912	4.99992	0.5987
C60F	3.2	7.58	0.60993	2.1088	4.99522	0.2090
C60G	2.7	6.55	0.666198	2.1114	5.1221	2.0744
C60H	0	0	0	0	0	0.3434
C60J	0	0	0	0	0	0.7526
C70A	5.6	11.49	0.632358	3.4328	7.04337	0.4658
C70B	5.2	10.26	0.632709	3.432	6.7716	0.3915
C70C	5.2	10.11	0.842523	4.6124	8.96757	0.4498
C70D	4.1	8.41	0.428895	2.7675	5.67675	0.6412
C70E	3.9	9.36	0.410058	2.7027	6.48648	0.2479
C70F	3.9	9.25	0.326019	2.1996	5.217	0.2337
C70G	3.9	8.46	0.5643	3.5139	7.62246	0.3108
C70H	3.6	8.59	0.13761	0.9036	2.15609	0.0815
C70J	3.9	8.97	0.291924	2.0319	4.67337	0.2377
C70K	3.5	8.33	0.655317	3.1185	7.42203	0.6714
C81A	18.5	45.35	1.666632	7.067	17.3237	0.0506
C81B	13.5	28.48	2.153688	7.776	16.40448	0.0815
C81C	12.4	25.73	0.896445	3.1	6.4325	0.0320
C81D	12.5	26.61	0.86976	2.4375	5.18895	0.0265
C81E	9.4	16.61	2.01426	6.0442	10.68023	0.0977
C81F	20.5	44.05	4.78632	14.1245	30.35045	0.3490
C81G	13	21.72	2.171688	5.655	9.4482	0.0925
C81H	8.6	15.3	1.08783	3.0788	5.4774	0.0352
C81J	7.7	12.29	1.057575	3.0184	4.81768	0.0558
C81K	8.1	12.99	1.031067	2.9079	4.66341	0.0521
C81L	12.8	25.63	2.881428	10.176	20.37585	0.1111
C81M	9.6	16.8	3.452916	10.4928	18.3624	0.1600
C82A	9.9	18.56	1.795185	5.7618	10.80192	0.0788
C82B	9.4	17.03	1.467576	4.6342	8.39579	0.0706
C82C	8.9	15.39	1.030329	3.1417	5.43267	0.0693
C82D	8.1	13.36	1.632972	4.6332	7.64192	0.1602
C82E	9.7	17.01	1.852095	6.0431	10.59723	0.0399
C82F	8.6	14.41	1.386078	4.1624	6.97444	0.0081
C82G	9.3	15.68	1.711035	5.4033	9.11008	0.0919
C82H	7.8	11.73	2.121063	6.1074	9.18459	0.1936
C83A	10.9	17.45	3.646134	8.1314	13.0177	0.0738
C83B	9.2	14.83	1.145232	2.3092	3.72233	0.0255
C83C	9	13.23	3.480576	7.452	10.95444	0.0964
C83D	8.1	13.14	1.964025	3.7665	6.1101	0.0491
C83E	8.5	12.42	1.73817	3.621	5.29092	0.1058
C83F	8.6	12.27	2.254503	7.525	10.73625	11.2326
C83G	9.1	13.42	1.880187	6.3245	9.3269	0.2086

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
C83H	8.9	13.37	1.469424	4.8683	7.31339	0.2407
C83J	8.7	12.28	0.572814	1.9314	2.72616	0.1094
C83K	5.6	13.76	1.105794	3.0688	7.54048	0.2441
C83L	5.8	13.59	1.669668	4.7908	11.22534	0.0547
C83M	5.8	12.83	2.15358	6.38	14.113	0.3943
C91A	0	0	0	0	0	3.5138
C91B	0	0	0	0	0	18.9061
C91C	0	0	0	0	0	7.2676
C91D	0	0	0	0	0	0.8893
C91E	0	0	0	0	0	0.7738
C92A	0	0.26	0	0	1.01998	0.8261
C92B	0	0	0	0	0	0.3232
C92C	0	0	0	0	0	0.2375
D11A	60.9	167.41	9.191133	16.9302	46.53998	0.0000
D11B	42.5	124.27	6.776379	10.03	29.32772	0.0000
D11C	45.8	132.84	8.6652	13.3736	38.78928	0.0000
D11D	33.2	96.46	8.098302	10.5908	30.77074	0.0000
D11E	28.1	74.96	7.825545	9.0482	24.13712	0.0000
D11F	35.9	98.04	11.46817	14.8267	40.49052	0.0000
D11G	30.7	86.74	9.609243	9.824	27.7568	0.0000
D11H	28.7	81.41	9.184266	10.3033	29.22619	0.0000
D11J	24	62.65	9.80304	10.56	27.566	0.0000
D11K	23.1	59.69	8.333082	8.8011	22.74189	0.0000
D12A	16.5	36.42	4.7058	6.0885	13.43898	0.0426
D12B	21.1	51.21	5.760828	8.1235	19.71585	0.1600
D12C	0	4.95	0	0	1.69785	0.0404
D12D	0	3.82	0	0	1.3561	0.1657
D12E	0	3.9	0	0	2.7768	0.2320
D12F	0	2.61	0	0	2.09583	0.2843
D13A	29.2	65.04	10.89158	13.87	30.894	0.0096
D13B	26.9	60.75	11.51951	14.3377	32.37975	0.0144
D13C	20.5	48.76	9.657522	10.5985	25.20892	0.0145
D13D	18.7	43.05	10.80311	11.8745	27.33675	0.0220
D13E	24.2	56.08	21.01768	24.9502	57.81848	0.0350
D13F	18.2	42.48	13.61189	17.654	41.2056	0.0614
D13G	0	6.22	0	0	6.9975	0.1599
D13H	0	2.97	0	0	3.39768	0.1693
D13J	0	3.29	0	0	3.83943	1.4798
D13K	22.5	51.53	6.961815	8.9325	20.45741	0.0808
D13L	0	4.34	0	0	2.95988	0.2756
D13M	0	2.55	0	0	1.7289	0.2708
D14A	0	1.95	0	0	1.4898	0.2721
D14B	0	1.21	0	0	0.39204	0.0278
D14C	0	1.89	0	0	1.36458	0.3466
D14D	0	0.85	0	0	0.578	0.1764
D14E	0	0.71	0	0	0.47073	2.7901
D14F	0	1.71	0	0	0.92511	2.1080
D14G	0	2.57	0	0	1.55485	2.3811
D14H	0	0.91	0	0	0.63427	1.5935
D14J	0	0.75	0	0	0.38625	0.9125
D14K	0	0.73	0	0	0.46282	2.6634
D15A	37.7	99.61	12.91	16.4749	43.52957	0.0000
D15B	36.6	96.87	11.44923	14.3838	38.06991	0.0000
D15C	28.6	73.95	6.80817	7.8936	20.4102	0.0000
D15D	34.1	89.3	12.29006	14.9017	39.0241	0.0000
D15E	25.4	64.19	11.15737	15.7226	39.73361	0.0000
D15F	4.7	22.66	0.540345	1.6544	7.97632	0.0000
D15G	3.7	15.57	0.663255	1.7945	7.55145	0.0465
D15H	3	11.07	0.419931	1.083	3.99627	0.1261
D16A	60.5	165.17	6.77556	9.6195	26.26203	0.0000
D16B	49	137.12	9.454896	12.201	34.14288	0.0000
D16C	21.3	54.38	10.07481	9.3294	23.81844	0.0000
D16D	39.4	107.69	10.1161	13.3566	36.50691	0.0001
D16E	27	72.45	10.62369	11.718	31.4433	0.0000
D16F	39.6	108.57	8.279352	10.9692	30.07389	0.0000
D16G	35.2	96.2	8.168241	10.208	27.898	0.0000
D16H	23.3	60.69	7.738512	8.0385	20.93805	0.0000
D16J	30.7	78.74	9.439968	11.4818	29.44876	0.0000
D16K	30	80.04	8.2875	9.87	26.33316	0.0000
D16L	21.3	53.47	11.21165	11.3529	28.49951	0.0000
D16M	17.4	41.54	13.83068	13.1022	31.27962	0.0000
D17A	39.8	112.7	25.07129	25.3924	71.9026	0.0000
D17B	39.8	112.42	17.32645	17.5916	49.68964	0.0000
D17C	30.4	82.43	16.977	15.96	43.27575	0.0000
D17D	32	83.09	24.13321	23.936	62.15132	0.0000
D17E	33.6	87.26	20.16375	20.328	52.7923	0.0000
D17F	20.9	50.18	14.33596	12.1638	29.20476	0.0000
D17G	20.5	48.18	17.25938	17.4045	40.90482	0.0000

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
D17H	19.6	45.62	16.76415	16.6992	38.86824	0.0000
D17J	30	78.62	10.64204	13.11	34.35694	0.0000
D17K	20.6	49.41	7.883784	7.8898	18.92403	0.0000
D17L	19	44.1	11.36869	11.21	26.019	0.0000
D17M	20.8	46.74	10.50194	10.9824	24.67872	0.0000
D18A	26.6	65.48	16.07546	15.9334	39.22252	0.0000
D18B	21.9	51.36	7.355502	7.1613	16.79472	0.0000
D18C	19.6	44.84	9.185112	9.1336	20.89544	0.0000
D18D	24.7	59.87	19.50149	18.9202	45.86042	0.0000
D18E	25	60.47	9.593328	9.4	22.73672	0.0000
D18F	18.9	43.06	8.604888	8.4294	19.20476	0.0000
D18G	25.4	63.28	9.150516	12.4968	31.13376	0.0001
D18H	20.8	49.36	6.035112	7.9872	18.95424	0.0000
D18J	20.6	49.16	13.41223	17.6954	42.22844	0.0000
D18K	24	57.75	15.79617	22.44	53.99625	0.5554
D18L	18.2	41.02	8.7912	11.102	25.0222	0.1050
D21A	38.6	82.32	7.418232	11.9274	25.43688	0.0047
D21B	43.6	90.98	9.75996	17.1784	35.84612	0.0000
D21C	28.9	64.34	4.58874	6.1268	13.64008	0.0014
D21D	25.2	55.02	4.979718	6.3504	13.86504	0.0026
D21E	21.5	46.58	4.984188	5.762	12.48344	0.0289
D21F	4.4	20.16	0.659736	2.112	9.6768	0.0454
D21G	4.7	22.7	0.387807	1.3066	6.3106	0.0196
D21H	21.3	46.85	6.509412	8.1153	17.84985	0.0110
D21J	40.1	83.29	8.2308	14.3959	29.90111	0.0000
D21K	36.9	76.97	7.1991	12.0294	25.09222	0.0000
D21L	26.9	57.54	5.848407	8.1776	17.49216	0.0000
D22A	3.9	16.68	0.776811	2.4804	10.60848	0.1228
D22B	4.4	20.44	0.658275	2.0108	9.34108	0.0550
D22C	21.3	44.82	7.536	10.3518	21.78252	0.0081
D22D	4	17.21	0.77832	2.512	10.80788	0.0441
D22E	23.7	45	7.646874	11.8026	22.41	0.0000
D22F	19.7	37.5	8.825388	12.4701	23.7375	0.0000
D22G	3.9	16.09	1.102824	3.7791	15.59121	1.0284
D22H	4.5	19.58	0.806358	2.4345	10.59278	0.0328
D22J	20.6	42.79	9.900042	13.4312	27.89908	0.0000
D22K	19.3	39.92	4.739652	6.2532	12.93408	0.0000
D22L	4.1	17.12	0.53703	1.5416	6.43712	0.0486
D23A	3.9	18.33	0.785307	2.3712	11.14464	0.0541
D23B	4.1	19.8	0.775062	2.4477	11.8206	0.0000
D23C	3.3	13.96	0.965118	2.8413	12.01956	0.5425
D23D	3	11.54	0.567252	1.695	6.5201	0.2341
D23E	3.1	12.08	0.74766	2.1762	8.48016	0.1271
D23F	3.3	16.04	0.36054	1.1616	5.64608	0.0271
D23G	3.1	14.82	0.506709	1.5872	7.58784	0.3855
D23H	0	2.3	0	0	1.7848	0.7684
D23J	0	2.67	0	0	1.42578	0.1879
D24A	3.1	14.5	0.298716	0.961	4.495	0.1194
D24B	0	4.13	0	0	1.9411	0.2131
D24C	0	2.37	0	0	0.94326	0.1459
D24D	0	1.69	0	0	1.01062	0.3119
D24E	0	1.52	0	0	0.74328	0.1289
D24F	0	2.29	0	0	1.29843	0.1921
D24G	0	2.52	0	0	1.57752	0.2077
D24H	0	1.55	0	0	1.1408	0.3165
D24J	0	1.1	0	0	1.1352	0.3750
D24K	0	0.93	0	0	0.81561	0.6493
D24L	0	0.6	0	0	0.3066	0.5482
D31A	0	0.2	0	0	0.232	1.8298
D31B	0	0	0	0	0	1.4877
D31C	0	0	0	0	0	0.1034
D31D	0	0.01	0	0	0.01108	3.8078
D31E	0	0	0	0	0	18.6451
D32A	0	0	0	0	0	0.0452
D32B	0	0	0	0	0	0.0071
D32C	0	0	0	0	0	0.4078
D32D	0	0	0	0	0	0.0516
D32E	0	0	0	0	0	0.0982
D32F	0	0	0	0	0	0.6131
D32G	0	0	0	0	0	1.1025
D32H	0	0	0	0	0	1.1492
D32J	0	0	0	0	0	2.9978
D32K	0	0	0	0	0	2.0828
D33A	0	0	0	0	0	2.4587
D33B	0	0	0	0	0	0.1369
D33C	0	0	0	0	0	0.1581
D33D	0	0	0	0	0	0.8938
D33E	0	0	0	0	0	0.3954

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
D33F	0	0	0	0	0	0.1378
D33G	0	0	0	0	0	0.1761
D33H	0	0	0	0	0	0.1808
D33J	0	0	0	0	0	0.1460
D33K	0	0	0	0	0	0.0971
D34A	0	0.02	0	0	0.01588	1.3323
D34B	0	0	0	0	0	0.6704
D34C	0	0	0	0	0	1.7193
D34D	0	0	0	0	0	1.3842
D34E	0	0	0	0	0	1.3671
D34F	0	0	0	0	0	2.0824
D34G	0	0.01	0	0	0.0095	1.2540
D35A	0	0	0	0	0	0.2045
D35B	0	0	0	0	0	0.3429
D35C	0	0.32	0	0	0.30176	1.3101
D35D	0	0.03	0	0	0.01758	0.1045
D35E	0	0	0	0	0	0.1009
D35F	0	0.21	0	0	0.11697	0.4996
D35G	0	0.02	0	0	0.01104	0.1232
D35H	0	0	0	0	0	0.5765
D35J	0	0.08	0	0	0.08016	0.2529
D35K	0	0	0	0	0	0.3771
D41A	0	0.06	0	0	0.25932	12.8616
D41B	0	0	0	0	0	2.1007
D41C	0	0	0	0	0	0.7061
D41D	0	0	0	0	0	0.8161
D41E	0	0	0	0	0	1.3457
D41F	0	0	0	0	0	0.6147
D41G	0	0	0	0	0	1.2204
D41H	0	0	0	0	0	0.7865
D41J	0	0	0	0	0	3.4886
D41K	0	0	0	0	0	1.0620
D41L	0	0	0	0	0	3.9896
D41M	0	0	0	0	0	0.2437
D42A	0	0	0	0	0	0.0227
D42B	0	0	0	0	0	0.1148
D42C	0	0	0	0	0	2.5528
D42D	0	0	0	0	0	0.7999
D42E	0	0	0	0	0	0.1966
D51A	0	0.2	0	0	0.1594	0.1150
D51B	0	0	0	0	0	0.0305
D51C	0	0	0	0	0	0.9977
D52A	0	0	0	0	0	0.0132
D52B	0	0	0	0	0	0.0230
D52C	0	0	0	0	0	0.0166
D52D	0	0	0	0	0	0.0039
D52E	0	0	0	0	0	0.0019
D52F	0	0	0	0	0	0.0000
D53A	0	0	0	0	0	0.0697
D53B	0	0	0	0	0	0.0645
D53C	0	0	0	0	0	0.3166
D53D	0	0	0	0	0	0.0693
D53E	0	0	0	0	0	0.0311
D53F	0	0	0	0	0	0.4238
D53G	0	0	0	0	0	0.1785
D53H	0	0	0	0	0	0.0598
D53J	0	0	0	0	0	0.0168
D54A	0	0	0	0	0	0.0992
D54B	0	0	0	0	0	0.5657
D54C	0	0	0	0	0	0.0877
D54D	0	0	0	0	0	0.2770
D54E	0	0	0	0	0	0.1040
D54F	0	0	0	0	0	0.2020
D54G	0	0	0	0	0	0.1112
D55A	0	0	0	0	0	0.0291
D55B	0	0	0	0	0	0.0690
D55C	0	0	0	0	0	0.0265
D55D	0	0	0	0	0	0.1599
D55E	0	0	0	0	0	0.2496
D55F	0	0	0	0	0	0.1578
D55G	0	0	0	0	0	0.0787
D55H	0	0	0	0	0	0.0473
D55J	0	0	0	0	0	0.0046
D55K	0	0	0	0	0	0.0313
D55L	0	0	0	0	0	0.5218
D55M	0	0	0	0	0	0.0494
D56A	0	0	0	0	0	0.0178
D56B	0	0	0	0	0	0.0181

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
D56C	0	0	0	0	0	0.0324
D56D	0	0	0	0	0	0.0198
D56E	0	0	0	0	0	0.0364
D56F	0	0	0	0	0	0.0568
D56G	0	0	0	0	0	0.0356
D56H	0	0	0	0	0	2.6349
D56J	0	0	0	0	0	1.5334
D57A	0	0	0	0	0	0.0087
D57B	0	0	0	0	0	0.0987
D57C	0	0	0	0	0	0.0188
D57D	0	0	0	0	0	0.2293
D57E	0	0	0	0	0	0.0736
D58A	0	0	0	0	0	0.0028
D58B	0	0	0	0	0	0.0008
D58C	0	0	0	0	0	0.0005
D61A	0	0	0	0	0	0.2431
D61B	0	0	0	0	0	0.0691
D61C	0	0	0	0	0	0.0776
D61D	0	0	0	0	0	0.0451
D61E	0	0	0	0	0	0.4210
D61F	0	0	0	0	0	0.0635
D61G	0	0	0	0	0	0.0541
D61H	0	0	0	0	0	0.0790
D61J	0	0	0	0	0	0.1023
D61K	0	0	0	0	0	0.1087
D61L	0	0	0	0	0	0.0655
D61M	0	0	0	0	0	0.0638
D62A	0	0	0	0	0	0.4365
D62B	0	0	0	0	0	0.2243
D62C	0	0	0	0	0	2.5007
D62D	0	0	0	0	0	0.1393
D62E	0	0	0	0	0	0.1730
D62F	0	0	0	0	0	0.2014
D62G	0	0	0	0	0	0.3240
D62H	0	0	0	0	0	0.1080
D62J	0	0	0	0	0	0.1419
D71A	0	0	0	0	0	0.1334
D71B	0	0	0	0	0	0.5250
D71C	0	0	0	0	0	0.1268
D71D	0	0	0	0	0	0.1741
D72A	0	0	0	0	0	0.0397
D72B	0	0	0	0	0	0.0375
D72C	0	0	0	0	0	0.6722
D73A	0	0.6	0	0	1.9428	42.7647
D73B	0	0.03	0	0	0.11163	0.2362
D73C	0	0	0	0	0	0.5676
D73D	0	0	0	0	0	0.0522
D73E	0	0	0	0	0	0.1290
D73F	0	0	0	0	0	0.0768
D81A	0	0	0	0	0	0.0817
D81B	0	0	0	0	0	0.0320
D81C	0	0	0	0	0	0.1006
D81D	0	0	0	0	0	0.0684
D81E	0	0	0	0	0	0.0882
D81F	0	0	0	0	0	0.0685
D81G	0	0	0	0	0	0.3901
D82A	0	0	0	0	0	0.0587
D82B	0	0	0	0	0	0.1471
D82C	0	0	0	0	0	0.1247
D82D	0	0	0	0	0	0.0924
D82E	0	0	0	0	0	0.0293
D82F	0	0	0	0	0	0.0324
D82G	0	0	0	0	0	0.0184
D82H	0	0	0	0	0	0.0255
D82J	0	0	0	0	0	0.0431
D82K	0	0	0	0	0	0.0676
D82L	0	0	0	0	0	0.0234
E10A	56.6	133.9	2.0034	7.5844	17.9426	3.4516
E10B	42.7	100.13	0.73566	8.6254	20.22626	3.7288
E10C	31.5	74.22	0.60378	6.048	14.25024	0.3425
E10D	25.5	58.91	0.92379	5.9925	13.84385	3.5756
E10E	17.9	39.48	0.82104	6.5514	14.44968	0.2700
E10F	17	37.24	0.82368	6.562	14.37464	4.8958
E10G	17	38.14	1.0824	8.636	19.37512	0.1039
E10H	23.7	55.76	0.49392	3.8394	9.03312	1.0365
E10J	8.5	19.25	0.77088	3.978	9.009	1.9459
E10K	0	0	0	0	0	0.0954
E21A	24.4	56.91	0.962688	4.636	10.8129	5.3593

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
E21B	16.4	36.71	0.751626	3.6572	8.18633	1.3477
E21C	14.8	32.56	0.658152	3.4484	7.58648	1.2561
E21D	24.9	58.53	1.22499	6.0258	14.16426	7.3865
E21E	9.2	20.41	0.511299	2.6956	5.98013	2.6901
E21F	6.2	13.42	0.422025	2.3498	5.08618	0.5436
E21G	15.2	35.93	0.806784	4.0432	9.55738	12.0883
E21H	12.6	29.51	1.01727	5.0904	11.92204	2.5612
E21J	8.2	18.22	0.47889	2.5994	5.77574	0.0062
E21K	8.8	19.24	0.483075	2.904	6.3492	0.4003
E21L	0	0	0	0	0	0.0036
E22A	0	0.31	0	0	0.2325	0.0299
E22B	0	0.24	0	0	0.15312	0.0220
E22C	0	1.73	0	0	0.8477	0.2093
E22D	0	0	0	0	0	0.0173
E22E	0	0	0	0	0	0.1200
E22F	0	0	0	0	0	0.0121
E22G	0	0	0	0	0	0.0036
E23A	0	0.32	0	0	0.24384	0.0586
E23B	0	0.14	0	0	0.0987	0.0000
E23C	0	0	0	0	0	0.0003
E23D	0	0	0	0	0	0.0515
E23E	0	0.35	0	0	0.1974	0.3385
E23F	0	0	0	0	0	1.0708
E23G	0	0	0	0	0	0.0271
E23H	0	0	0	0	0	0.0227
E23J	0	0	0	0	0	0.0311
E23K	0	0	0	0	0	0.0025
E24A	10.7	8.17	0	2.7285	2.08335	0.0459
E24B	0	2.06	0	0	0.96408	0.0611
E24C	0	1.31	0	0	1.02704	0.2430
E24D	0	0.4	0	0	0.3988	0.0000
E24E	0	0.61	0	0	0.40931	0.0390
E24F	0	0.39	0	0	0.22698	0.0040
E24G	0	0.21	0	0	0.13293	0.0000
E24H	0	0.3	0	0	0.1449	0.0082
E24J	0	1.95	0	0	2.1021	1.4556
E24K	0	1.27	0	0	0.82804	0.0000
E24L	7.1	13.12	0.476544	3.6636	6.76992	2.4295
E24M	0	0	0	0	0	0.0040
E31A	0	0	0	0	0	0.0000
E31B	0	0	0	0	0	0.0000
E31C	0	0	0	0	0	0.0000
E31D	0	0	0	0	0	0.0000
E31E	0	0	0	0	0	0.0000
E31F	0	0	0	0	0	0.0627
E31G	0	0	0	0	0	0.0027
E31H	0	0	0	0	0	0.0012
E32A	0	0	0	0	0	2.1590
E32B	0	0	0	0	0	3.3770
E32C	0	0	0	0	0	0.0000
E32D	0	0	0	0	0	0.0000
E32E	0	0	0	0	0	3.6360
E33A	0	0	0	0	0	0.0332
E33B	0	0	0	0	0	0.0209
E33C	0	0	0	0	0	0.0273
E33D	0	0	0	0	0	0.0487
E33E	0	0	0	0	0	0.1689
E33F	0	0	0	0	0	0.0734
E33G	0	0	0	0	0	1.3023
E33H	0	0	0	0	0	0.0438
E40A	0	0.09	0	0	0.08469	1.7217
E40B	0	0.04	0	0	0.02828	0.9328
E40C	0	0.28	0	0	0.1484	0.0940
E40D	0	0.28	0	0	0.15232	0.0015
F10A	0	0	0	0	0	0.0283
F10B	0	0	0	0	0	0.0485
F10C	0	0	0	0	0	0.0518
F20A	0	0	0	0	0	0.1282
F20B	0	0	0	0	0	0.0229
F20C	0	0	0	0	0	0.0430
F20D	0	0	0	0	0	0.0607
F20E	0	0	0	0	0	0.0191
F30A	0	0	0	0	0	0.1430
F30B	0	0	0	0	0	0.0651
F30C	0	0	0	0	0	0.0965
F30D	0	0	0	0	0	0.0576
F30E	0	0	0	0	0	0.0758
F30F	0	0	0	0	0	0.0654

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
F30G	0	0	0	0	0	1.0063
F40A	0	0	0	0	0	0.1003
F40B	0	0	0	0	0	0.0180
F40C	0	0	0	0	0	0.0651
F40D	0	0	0	0	0	0.0330
F40E	0	0	0	0	0	0.0474
F40F	0	0	0	0	0	0.0867
F40G	0	0	0	0	0	0.0155
F40H	0	0	0	0	0	0.0226
F50A	0	0	0	0	0	0.0294
F50B	0	0	0	0	0	0.0269
F50C	0	0	0	0	0	0.0121
F50D	0	0	0	0	0	0.0130
F50E	0	0	0	0	0	0.0312
F50F	0	0	0	0	0	0.1860
F50G	0	0	0	0	0	0.0342
F60A	0	0	0	0	0	0.0089
F60B	0	0	0	0	0	0.0445
F60C	0	0	0	0	0	0.0234
F60D	0	0	0	0	0	0.0164
F60E	0	0	0	0	0	0.0274
G10A	142.4	373.11	10.68843	24.4928	64.17492	0.0300
G10B	101.5	259.26	5.138568	12.789	32.66676	0.0196
G10C	58.6	141.62	5.003979	19.2208	46.45136	0.5832
G10D	22.7	53.88	4.016616	15.6176	37.06944	1.7538
G10E	23.9	55.43	2.276064	9.4166	21.83942	11.1348
G10F	15.2	36.18	2.222718	8.1928	19.50102	0.1621
G10G	84.9	207.4	3.057042	15.7914	38.5764	0.0346
G10H	0	9.36	0.5088	0	6.318	1.4927
G10J	0	12.11	0.806652	0	10.51148	6.6445
G10K	0	2.14	0	0	2.51664	2.6975
G10L	0	2.83	0	0	4.96665	0.4196
G10M	0	0.56	0	0	1.1228	1.9990
G21A	0	2.28	0	0	1.19244	0.1953
G21B	0	2.09	0	0	0.63536	14.8062
G21C	8.6	18.85	0.391386	2.0984	4.5994	0.0671
G21D	7	14.84	0.660726	3.388	7.18256	2.5107
G21E	8.9	20.89	1.021686	4.7259	11.09259	1.3437
G21F	7.3	16.84	0.389367	1.7666	4.07528	1.3447
G22A	15.9	41	0.84372	3.7842	9.758	0.0125
G22B	33.4	87.9	0.72261	3.6406	9.5811	1.2397
G22C	12	28.73	0.747609	3.048	7.29742	0.0835
G22D	19.3	50.13	0.993627	4.7478	12.33198	9.9010
G22E	10.6	24.2	0.658896	2.8726	6.5582	0.4020
G22F	127.7	339.92	4.768563	8.4282	22.43472	0.3430
G22G	20.5	47.49	0.477531	2.173	5.03394	0.0980
G22H	15	35.04	0.837984	3.405	7.95408	0.1884
G22J	66.7	173.16	4.648359	8.5376	22.16448	0.5930
G22K	43.2	113.64	1.8576	3.456	9.0912	0.0000
G30A	0	0.07	0	0	0.05327	2.7694
G30B	4.3	8.68	0.481185	2.8294	5.71144	1.4969
G30C	4.8	9.32	0.27072	1.6848	3.27132	2.4420
G30D	0	1.72	0	0	0.91848	2.5644
G30E	0	0	0	0	0	1.0199
G30F	0	0.25	0	0	0.195	1.9582
G30G	0	0	0	0	0	2.1867
G30H	0	0	0	0	0	0.0353
G40A	79.7	213.83	3.183615	5.7384	15.39576	0.0001
G40B	59.7	157.19	3.86712	7.2834	19.17718	0.0020
G40C	108.1	291.05	8.81988	15.6745	42.20225	0.0227
G40D	64.8	171.63	11.1501	21.1896	56.12301	0.0062
G40E	13.6	41.05	0.870948	3.7808	11.4119	0.2912
G40F	5.4	16.43	0.539085	2.2788	6.93346	0.0082
G40G	13.7	41.5	0.658674	3.014	9.13	0.0124
G40H	12.5	35.45	0.298605	1.2	3.4032	0.0018
G40J	8.9	25.96	0.32805	1.5041	4.38724	0.0083
G40K	4.9	14.23	0.480819	2.1021	6.10467	0.0173
G40L	7.2	18.64	0.7482	2.772	7.1764	2.5973
G40M	7.3	19.01	0.777975	2.8689	7.47093	0.0070
G50A	6.2	0	0.420552	1.5066	0	0.0038
G50B	5.7	15.01	0.540204	1.9323	5.08839	0.0234
G50C	4.7	11.71	0.542061	1.9787	4.92991	0.0068
G50D	3.4	9.13	0.538008	1.9448	5.22236	0.3198
G50E	3.7	10.05	0.3306	1.1581	3.14565	0.7218
G50F	3.8	9.16	0.300132	1.102	2.6564	0.5173
G50G	2.2	5.6	0.240306	0.836	2.128	0.0117
G50H	2.2	5.71	0.538785	1.958	5.0819	0.0180
G50J	2.1	5.45	0.329472	1.0857	2.81765	0.0082

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
G50K	3.6	8.69	0.2394	0.5868	1.41647	0.0017
H10A	20.7	50.43	0.837516	4.8438	11.80062	3.2995
H10B	36.7	87.98	1.077384	5.9454	14.25276	4.5534
H10C	33.6	81.97	1.555425	8.736	21.3122	13.3353
H10D	65.3	162.69	1.134	6.3341	15.78093	0.0034
H10E	149.7	374.8	4.55364	12.7245	31.858	0.0017
H10F	43.8	109.06	1.922742	10.8624	27.04688	8.9360
H10G	44.2	110.68	2.146725	11.934	29.8836	8.4146
H10H	53	133.11	1.77705	9.911	24.89157	1.4186
H10J	119.9	302.19	9.320688	25.6586	64.66866	0.4807
H10K	82.4	202.15	6.203286	15.9856	39.2171	0.3938
H10L	0	9.17	0	0	0.88032	2.5953
H20A	0	0	0	0	0	0.4200
H20B	3.8	9.54	0.120582	0.4712	1.18296	2.1175
H20C	4.8	12.68	0.29172	0.3888	1.02708	1.8244
H20D	35.5	86.52	0.992616	3.5855	8.73852	0.1357
H20E	54.8	136	1.46949	5.206	12.92	0.1768
H20F	8.3	28.74	0.241116	0.9711	3.36258	2.1997
H20G	5.6	15.61	0.1197	0.476	1.32685	0.4916
H20H	0	0.27	0	0	0.02403	0.7075
H30A	0	6.51	0	0	1.84884	1.0585
H30B	0	2.56	0	0	0.8064	1.4042
H30C	0	9.62	0.027912	0	3.14574	0.7427
H30D	0	1.86	0	0	0.23622	1.1719
H30E	0	10.29	0.090882	0	1.58466	0.3067
H40A	0	2.49	0	0	0.45816	0.0038
H40B	3.6	6.28	0.419601	0.8676	1.51348	0.7990
H40C	0	4.65	0	0	1.2648	4.2137
H40D	0	18.09	0	0	3.29238	1.5695
H40E	0	17.3	0	0	4.9305	1.6816
H40F	0	1.49	0	0	0.5066	1.7010
H40G	0	12.81	0.20964	0	3.36903	0.2355
H40H	0	9.8	0	0	2.0384	0.0424
H40J	0	9.13	0.088956	0	1.86252	0.0193
H40K	0	8.01	0.119616	0	2.17071	0.0154
H40L	0	5.53	0.029232	0	0.87927	0.0088
H50A	0	3.55	0.029064	0	0.94075	0.1539
H50B	0	6.58	0.119952	0	2.83598	0.1392
H60A	161.8	416.16	3.475692	11.8114	30.37968	0.0012
H60B	72.1	188.06	4.231521	15.141	39.4926	0.0036
H60C	51.5	128.9	3.066714	11.1755	27.9713	0.5261
H60D	22.7	58.77	1.3761	5.1529	13.34079	0.0065
H60E	21.9	55.33	0.93114	3.723	9.4061	0.0297
H60F	17.5	44.08	0.656778	2.8875	7.2732	0.3497
H60G	10.5	27.14	0.511146	1.4805	3.82674	0.0028
H60H	9.8	25.65	0.870975	2.4794	6.48945	0.0069
H60J	9.5	24.85	0.9909	2.7835	7.28105	0.0301
H60K	5.3	13.95	0.449307	1.3886	3.6549	0.1177
H60L	4.9	13.06	0.361188	1.127	3.0038	0.2682
H70A	7.2	18.96	0.508416	1.6128	4.24704	0.1686
H70B	41.3	147.65	8.82504	6.3189	22.59045	0.3953
H70C	0	2.92	0	0	0.83804	0.7855
H70D	35.2	123.6	7.984332	5.984	21.012	0.0202
H70E	46.7	166.66	10.58593	7.3319	26.16562	0.0729
H70F	29.3	101.4	4.531155	3.5453	12.2694	0.5566
H70G	2.2	5.42	0.539028	1.4344	3.53384	0.2431
H70H	2.7	6.6	0.420147	1.08	2.64	0.0876
H70J	2.5	6.27	0.539193	1.3775	3.45477	0.0255
H70K	4	10.08	0.36	0.828	2.08656	0.0586
H80A	31.6	107.51	5.909514	4.7084	16.01899	0.0055
H80B	52.8	184.35	9.81519	6.4944	22.67505	0.0045
H80C	4.4	11.34	0.779418	1.254	3.2319	0.0326
H80D	3	8.05	0.33048	0.693	1.85955	0.0078
H80E	3.8	9.26	0.571242	1.4174	3.45398	0.0137
H80F	5.8	16.66	0.59913	1.1832	3.39864	0.0052
H90A	36.2	118.41	9.05988	6.4798	21.19539	0.0048
H90B	38	125.8	6.36081	4.484	14.8444	0.0033
H90C	4.1	10.05	0.569811	0.8938	2.1909	0.0068
H90D	3.2	8.6	0.929241	1.9264	5.1772	0.0180
H90E	4.7	12.79	1.109376	2.3312	6.34384	2.3222
J11A	0	1.17	0	0	0.51246	0.0056
J11B	0	0.58	0	0	0.42804	0.0312
J11C	0	0	0	0	0	0.0086
J11D	0	0.47	0	0	0.37647	9.3119
J11E	0	0	0	0	0	0.6192
J11F	0	0	0	0	0	1.1657
J11G	0	0	0	0	0	0.0154
J11H	0	0.36	0	0	0.23436	7.0995

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
J11J	0	0.96	0.029562	0	0.432	1.4456
J11K	0	0.16	0	0	0.08256	0.3972
J12A	0	4.08	0	0	0.73848	0.4756
J12B	0	0.38	0	0	0.09538	0.0022
J12C	0	0.79	0	0	0.28914	0.1038
J12D	0	1.28	0	0	1.06368	0.8133
J12E	0	0.94	0.03024	0	0.33464	0.0086
J12F	0	0.49	0	0	0.3479	0.3272
J12G	0	0.86	0.029502	0	0.65446	0.0120
J12H	0	0.59	0	0	0.32391	0.2219
J12J	0	0.44	0	0	0.24156	0.3976
J12K	0	0.05	0	0	0.02585	0.1191
J12L	0	1.44	0.089082	0	1.09152	0.2849
J12M	0	0.79	0.03045	0	0.38157	0.1288
J13A	0	1.05	0.030576	0	0.5439	1.1023
J13B	0	1.02	0.029667	0	0.41004	0.2782
J13C	0	2.05	0.05964	0	0.89175	0.0339
J21A	0	1.99	0.031101	0	1.69946	5.8904
J21B	0	0.51	0	0	0.2703	0.3336
J21C	0	0	0	0	0	0.2787
J21D	0	0	0	0	0	0.8602
J21E	0	0	0	0	0	0.3906
J22A	0	1.29	0	0	0.56244	0.0087
J22B	0	0.47	0	0	0.15134	0.0071
J22C	0	0.39	0	0	0.14196	0.0180
J22D	0	0.14	0	0	0.0952	0.3088
J22E	0	0.19	0	0	0.15846	0.4063
J22F	0	3.81	0	0	1.12776	0.8405
J22G	0	1.39	0	0	0.78813	0.0164
J22H	0	1.94	0.029379	0	1.56558	0.0458
J22J	0	0.05	0	0	0.0189	0.1836
J22K	0	0	0	0	0	5.7399
J23A	0	0	0	0	0	10.9646
J23B	0	0.03	0	0	0.02346	1.8208
J23C	0	0	0	0	0	0.0126
J23D	0	0	0	0	0	0.0154
J23E	4.1	9.2	0.300288	0.9225	2.07	2.4339
J23F	0	0.62	0	0	0.29636	3.1548
J23G	0	0	0	0	0	0.0059
J23H	0	0.42	0	0	0.11088	0.5578
J23J	3.4	8.14	0.269688	0.7786	1.86406	0.1614
J24A	0	0.98	0	0	0.90748	0.0258
J24B	0	0.08	0	0	0.06144	0.0515
J24C	0	0.06	0	0	0.05166	0.0159
J24D	0	0	0	0	0	0.0230
J24E	0	0	0	0	0	0.0178
J24F	0	0.02	0	0	0.00564	1.2224
J25A	2.9	7.04	0.359766	1.0266	2.49216	0.0049
J25B	4	10.35	0.63054	1.588	4.10895	0.1076
J25C	0	0.33	0	0	0.05973	0.1152
J25D	5.3	13.35	0.419604	1.113	2.8035	0.1817
J25E	0	0.15	0	0	0.04305	0.0056
J31A	2.5	6.92	0.38964	1.1175	3.09324	0.3233
J31B	1.6	3.5	0.119889	0.32	0.7	0.0040
J31C	1.7	3.61	0.089964	0.2856	0.60648	0.0189
J31D	1.1	2.06	0.12	0.3344	0.62624	0.0981
J32A	0	0	0	0	0	0.0102
J32B	0	0	0	0	0	0.0131
J32C	0	0	0	0	0	0.0160
J32D	0	0	0	0	0	0.0000
J32E	0	0	0	0	0	0.0059
J33A	1.9	4.01	0.300468	0.8531	1.80049	0.0094
J33B	2.4	5.51	0.511128	1.4184	3.25641	1.1321
J33C	0	0.41	0	0	0.17548	1.0493
J33D	5.9	14.25	0.508818	1.5281	3.69075	0.3913
J33E	8.6	23.04	1.018026	2.8294	7.58016	0.5591
J33F	4.5	10.9	0.781884	1.647	3.9894	0.0094
J34A	2.9	7.25	0.239811	0.7308	1.827	0.0171
J34B	4.8	12.3	0.539598	1.6416	4.2066	0.0100
J34C	7.5	21.66	0.899721	2.3925	6.90954	0.0031
J34D	2.8	7.74	0.45105	0.9912	2.73996	0.0048
J34E	2.3	5.98	0.30057	0.5934	1.54284	0.0025
J34F	2.2	5.42	0.299814	0.704	1.7344	1.2635
J35A	7.4	17.78	1.622922	3.1672	7.60984	2.5283
J35B	2.1	5.29	0.628992	1.3671	3.44379	1.9930
J35C	1.7	3.98	0.21033	0.4505	1.0547	0.0043
J35D	6.9	17.04	1.798119	3.4983	8.63928	0.0121
J35E	2.4	5.83	0.210576	0.516	1.25345	0.0036

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
J35F	4.5	11.62	0.929331	2.25	5.81	1.2034
J40A	8.5	22.44	1.408554	3.859	10.18776	0.0752
J40B	8.8	24.99	0.837864	1.9536	5.54778	0.0218
J40C	11.3	34.05	2.637225	4.9268	14.8458	0.0975
J40D	4.4	13.92	1.377	2.882	9.1176	0.6979
J40E	4.3	13.39	1.110186	2.3822	7.41806	0.0465
K10A	4.4	12.95	0.41952	0.7832	2.3051	0.2427
K10B	4.4	12.32	0.38988	0.7524	2.10672	0.0235
K10C	10.5	27.46	1.141161	1.6695	4.36614	0.0216
K10D	4.4	12.87	0.38985	0.7216	2.11068	0.0245
K10E	49	114.07	5.639205	6.517	15.17131	0.0237
K10F	10.8	17.03	0.359415	1.1448	1.80518	0.0184
K20A	53.7	125.35	9.89976	9.0216	21.0588	0.1184
K30A	57.2	142.28	13.19506	11.2112	27.88688	0.0040
K30B	61.1	159.24	10.79396	8.4929	22.13436	0.0030
K30C	63.4	150.68	13.43285	12.046	28.6292	0.2870
K30D	53.9	110.61	8.996889	9.5942	19.68858	0.0020
K40A	51.7	116.32	5.3397	4.4979	10.11984	0.0010
K40B	68.5	128.42	7.258416	7.672	14.38304	0.0000
K40C	79.5	191.11	11.25293	7.95	19.111	0.0030
K40D	57.6	140.85	10.82843	7.488	18.3105	0.0010
K40E	70.7	95.52	12.17649	18.9476	25.59936	0.0020
K50A	68.9	120.38	12.38706	16.1915	28.2893	0.0000
K50B	73	125.64	12.89779	14.819	25.50492	0.1410
K60A	15.5	42.03	2.490075	2.4955	6.76683	0.0017
K60B	29.9	66.24	4.34826	4.2757	9.47232	0.0025
K60C	29.6	69.94	5.097306	4.7656	11.26034	0.0019
K60D	32	84.86	11.73492	9.344	24.77912	0.0023
K60E	30.6	59.46	2.820972	3.06	5.946	0.0360
K60F	31.8	56.55	6.001884	7.6956	13.6851	0.0032
K60G	33.5	66.44	5.431293	5.5945	11.09548	1.7744
K70A	35.5	82.3	5.762646	6.035	13.991	0.2217
K70B	97.7	210.73	11.18344	10.3562	22.33738	0.0002
K80A	103.5	282.56	22.24148	15.111	41.25376	0.0010
K80B	103.7	264.61	29.91761	21.5696	55.03888	0.0013
K80C	101.4	239	22.99064	19.1646	45.171	0.0010
K80D	86.3	211.02	17.55554	15.1888	37.13952	0.0009
K80E	29.1	87.18	7.433625	7.7406	23.18988	0.0012
K80F	23.4	66.71	4.95282	5.1714	14.74291	0.1255
K90A	19.7	57.87	3.750786	4.2158	12.38418	0.0004
K90B	23.6	69.97	3.239757	3.54	10.4955	0.0678
K90C	8.5	21.41	1.471797	2.2695	5.71647	0.0002
K90D	12.3	32.94	1.801536	2.6445	7.0821	0.0011
K90E	11.6	30.08	1.619094	2.0416	5.29408	0.6567
K90F	12.6	32.62	2.552202	3.15	8.155	1.3129
K90G	10.7	26.01	2.277906	3.0602	7.43886	0.7766
L11A	0	0.33	0	0	0.3069	1.9574
L11B	0	0.49	0	0	0.42875	1.6812
L11C	0	0.41	0	0	0.23288	0.5623
L11D	0	0.48	0	0	0.61728	0.0615
L11E	0	0.14	0	0	0.06384	3.2027
L11F	0	0.23	0	0	0.17135	1.2273
L11G	0	0.04	0	0	0.08096	1.3476
L12A	0	0	0	0	0	0.0496
L12B	0	0	0	0	0	2.8642
L12C	0	0	0	0	0	5.3456
L12D	0	0	0	0	0	0.0623
L21A	0	0.44	0	0	0.26796	0.0397
L21B	0	0.59	0	0	0.44604	0.0470
L21C	0	1.51	0.029835	0	1.55983	0.6100
L21D	0	3.29	0.087618	0	2.84585	0.7383
L21E	0	1.14	0.03051	0	0.81168	0.1441
L21F	0	0.5	0	0	0.288	0.0464
L22A	0	0.52	0	0	0.55744	0.0720
L22B	0	0	0	0	0	2.6234
L22C	0	0.09	0	0	0.0684	2.4955
L22D	0	0.34	0	0	0.1802	0.0407
L23A	0	0	0	0	0	1.6366
L23B	0	0.29	0	0	0.23722	2.7241
L23C	0	0	0	0	0	2.6009
L23D	0	0	0	0	0	0.0492
L30A	0	0	0	0	0	0.2269
L30B	0	0	0	0	0	0.0431
L30C	0	0	0	0	0	0.0177
L30D	0	0	0	0	0	0.0381
L40A	0	0.01	0	0	0.00763	0.9029
L40B	0	0.09	0	0	0.05346	0.1172
L50A	0	0.22	0	0	0.10252	0.0331

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
L50B	0	0.04	0	0	0.02228	0.0415
L60A	0	0.08	0	0	0.05416	0.2365
L60B	0	0	0	0	0	0.1587
L70A	0	0	0	0	0	0.0435
L70B	0	0	0	0	0	0.2947
L70C	0	0	0	0	0	0.2810
L70D	0	0	0	0	0	0.0397
L70E	0	0.26	0	0	0.18252	0.0626
L70F	0	0.18	0	0	0.05508	0.0298
L70G	6	13.07	1.74	2.82	6.1429	0.0094
L81A	6.6	17.16	0.631533	2.1912	5.69712	0.0189
L81B	4.5	10.46	0.300237	1.1745	2.73006	1.2321
L81C	4.7	11.16	0.449199	1.5604	3.70512	0.0249
L81D	3.8	8.79	0.36135	1.1704	2.70732	0.0200
L82A	8.4	19.96	0.931008	2.2596	5.36924	0.0040
L82B	11.7	27.71	1.915914	4.7385	11.22255	0.0398
L82C	11.9	28.39	1.832268	4.3078	10.27718	0.0207
L82D	7.9	20	2.432505	4.6689	11.82	0.1770
L82E	8.1	19.21	1.46916	2.9565	7.01165	0.0096
L82F	6.2	13.56	0.57084	1.0478	2.29164	0.0073
L82G	5.4	10.75	0.719712	1.431	2.84875	0.0095
L82H	5	9.11	0.511014	1.15	2.0953	0.0010
L82J	5.8	12.31	0.510384	0.9512	2.01884	0.0000
L90A	6.9	16.38	2.397579	3.5604	8.45208	0.0021
L90B	13.3	37.61	2.973348	4.8678	13.76526	0.0001
L90C	13.9	39.5	2.698122	4.4341	12.6005	0.0005
M10A	4.8	20.16	0.748332	1.272	5.3424	0.0111
M10B	5.6	22.59	1.13832	2.2008	8.87787	0.0012
M10C	6.2	23.93	1.5006	2.666	10.2899	1.1170
M10D	0	0.12	0	0	0.03684	0.4759
M20A	0	8.06	0.09162	0	2.91772	0.0793
M20B	13.8	45.81	1.856088	4.2504	14.10948	0.0069
M30A	0	0	0	0	0	0.0225
M30B	0	0	0	0	0	0.3266
N11A	0	2.31	0.061248	0	1.61931	0.7409
N11B	0	1.76	0.059775	0	1.364	1.0101
N12A	0	2.4	0.060102	0	1.7736	0.2100
N12B	0	2.11	0.060126	0	1.69011	0.0198
N12C	0	2.08	0.05895	0	1.36656	1.1250
N13A	0	2.77	0.09009	0	1.53735	1.2891
N13B	0	2.58	0.089667	0	1.24614	1.6736
N13C	0	1.19	0.030186	0	0.58548	0.1671
N14A	0	1.16	0.030429	0	0.58696	1.8432
N14B	0	1.07	0.0294	0	0.41623	9.5858
N14C	0	5.3	0.122913	0	3.4821	23.4081
N14D	0	1.57	0.029988	0	0.57619	3.0418
N21A	0	1.29	0.029718	0	0.59082	0.4626
N21B	0	5.84	0.118476	0	2.26592	0.2040
N21C	0	2.61	0.090675	0	1.96272	0.7958
N21D	0	1.69	0.029592	0	0.9464	0.0000
N22A	0	1.77	0.02925	0	1.07439	2.3108
N22B	0	0.59	0	0	0.37937	0.3167
N22C	0	0.96	0	0	0.38304	0.0249
N22D	0	1.93	0	0	0.66392	0.0216
N22E	0	0.67	0	0	0.22981	2.0369
N23A	0	2.73	0.060858	0	1.46601	0.0534
N23B	0	1.08	0	0	0.2646	1.5771
N24A	0	1.13	0.029478	0	0.75371	1.3392
N24B	0	1.14	0.029835	0	0.76038	6.4105
N24C	0	1.27	0.029016	0	1.01346	5.4458
N24D	0	0.35	0	0	0.1344	1.7654
N30A	0	5.61	0.179742	0	4.7685	5.3047
N30B	0	2.7	0.091419	0	1.9899	2.5391
N30C	0	2.22	0.030294	0	0.77034	0.3482
N40A	1.1	2.95	0.269382	0.7348	1.9706	0.4385
N40B	0	0	0	0	0	0.9394
N40C	2	7.54	0.690498	1.16	4.3732	2.4168
N40D	0	0.56	0	0	0.37464	1.3781
N40E	0	0	0	0	0	1.7538
N40F	0	0.81	0	0	0.61722	0.8505
P10A	3	11.31	0.239481	0.378	1.42506	0.0204
P10B	2.1	8.07	0.7203	1.0668	4.09956	0.0828
P10C	1.2	2.99	0.14994	0.3372	0.84019	0.0280
P10D	1.3	4.48	0.479484	0.7332	2.52672	0.0741
P10E	0	0.75	0	0	0.3495	0.1157
P10F	0	2.21	0	0	1.03649	0.1211
P10G	0	1.79	0	0	0.61397	0.2231
P20A	0	12.13	0.09081	0	5.48276	0.9258

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
P20B	0	5.14	0.027774	0	1.70648	0.1311
P30A	3.1	12.72	0.360705	0.5456	2.23872	0.0291
P30B	0	2.3	0	0	0.9269	0.0810
P30C	0	0	0	0	0	0.0247
P40A	3.2	14.23	0.749616	0.9984	4.43976	0.0629
P40B	0	2.03	0	0	0.53592	0.0949
P40C	0	4.2	0.029778	0	1.4364	0.7540
P40D	0	6.24	0.028056	0	1.53504	0.3684
Q11A	0	2.52	0.029172	0	0.96264	0.0585
Q11B	0	1.51	0	0	0.56776	0.2231
Q11C	0	1.39	0	0	0.50318	0.0148
Q11D	0	1.05	0	0	0.50505	0.8596
Q12A	0	2.52	0.03066	0	1.58004	0.2219
Q12B	0	3.17	0.029808	0	2.01929	0.9696
Q12C	0	1.58	0.02952	0	0.67624	4.4904
Q13A	0	1.71	0.028836	0	1.76301	3.7382
Q13B	0	0.44	0	0	0.1056	12.0942
Q13C	0	0.92	0	0	0.4186	36.7915
Q14A	0	1.49	0	0	0.72563	11.4417
Q14B	0	1.77	0.02889	0	1.28502	11.6266
Q14C	0	1.37	0.029238	0	1.14532	4.5668
Q14D	0	0.61	0	0	0.24949	0.5064
Q14E	0	0.73	0	0	0.25039	0.4741
Q21A	0	1.84	0.030264	0	1.10584	0.2989
Q21B	0	0.74	0	0	0.28194	13.6068
Q22A	0	1.67	0	0	0.86506	2.6566
Q22B	0	0.79	0	0	0.1738	2.8727
Q30A	2.3	6.39	0.7203	0.9085	2.52405	0.0831
Q30B	0	1.48	0	0	0.71336	3.9180
Q30C	0	1.29	0	0	0.54309	13.7753
Q30D	0	1.23	0	0	0.38253	6.6970
Q30E	0	1.5	0	0	0.489	38.1761
Q41A	0	6.96	0.119496	0	1.6008	0.0245
Q41B	0	4.08	0.120528	0	1.77072	0.5750
Q41C	0	3.26	0.0897	0	1.08558	0.4086
Q41D	0	1.62	0.03024	0	0.4779	0.8135
Q42A	0	4.09	0.060354	0	1.82414	0.2946
Q42B	0	2.92	0.06045	0	1.09792	0.2872
Q43A	0	2.59	0.060543	0	1.82854	1.5074
Q43B	0	1.53	0.060564	0	1.22859	2.5155
Q44A	0	1.75	0.029484	0	0.7455	5.8963
Q44B	0	1.23	0.029484	0	0.55227	6.0310
Q44C	0	1.18	0	0	0.29972	17.5480
Q50A	0	2.44	0.089271	0	1.5616	47.2550
Q50B	0	3.26	0.090522	0	1.31378	0.0453
Q50C	0	2.71	0.029946	0	0.53658	0.0255
Q60A	0	5.88	0.149544	0	1.85808	0.0467
Q60B	0	6.22	0.209379	0	2.3014	0.0592
Q60C	0	3.32	0.029643	0	0.43824	0.0231
Q70A	0	3.2	0.03069	0	0.8032	0.0415
Q70B	0	2.23	0.059325	0	1.02134	0.0621
Q70C	0	1.85	0.03024	0	0.4625	0.0325
Q80A	2.5	7.33	0.719226	0.8925	2.61681	0.0395
Q80B	2.4	6.61	0.869649	1.08	2.9745	1.3099
Q80C	2.5	7.08	0.57081	0.7025	1.98948	0.0248
Q80D	3	10.8	1.051824	1.254	4.5144	0.3570
Q80E	0	2.62	0.030618	0	0.9563	0.0362
Q80F	0	2.29	0.089793	0	1.60529	0.0693
Q80G	0	2.04	0.029988	0	0.54264	0.0269
Q91A	0	3.32	0.119394	0	1.58696	0.0733
Q91B	0	5.31	0.21042	0	2.73465	0.0795
Q91C	0	0.32	0	0	0.1552	0.0800
Q92A	13.9	28.57	2.881398	4.5036	9.25668	0.0029
Q92B	5.3	12.6	0.929961	1.7172	4.0824	0.0000
Q92C	5	11.07	1.588032	3.005	6.65307	0.0220
Q92D	5.3	13.54	0.81054	1.3197	3.37146	0.0004
Q92E	0	0	0	0	0	0.0261
Q92F	0	0	0	0	0	0.1099
Q92G	0	0.23	0	0	0.20332	0.1122
Q93A	0	0	0	0	0	0.0440
Q93B	0	0.1	0	0	0.0392	0.0649
Q93C	0	0.13	0	0	0.05369	0.0241
Q93D	0	2.68	0	0	1.31588	0.1911
Q94A	24.1	39.84	3.839553	6.2419	10.31856	0.0030
Q94B	16.2	30.31	1.589697	2.3814	4.45557	0.0090
Q94C	20	37.86	1.679106	2.7	5.1111	0.0050
Q94D	5.5	13.09	0.75096	1.166	2.77508	0.0041
Q94E	5.8	14.89	0.871392	1.3224	3.39492	0.0018

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
Q94F	0	0.33	0	0	0.24222	0.1029
R10A	26.7	44.46	2.129484	3.6846	6.13548	0.1010
R10B	28.4	48.14	3.537072	6.3048	10.68708	0.0350
R10C	22.9	38.42	1.859508	2.8625	4.8025	0.0330
R10D	17	30.02	2.041083	3.026	5.34356	0.0380
R10E	5.5	10.6	0.480246	1.089	2.0988	0.0750
R10F	38.3	73.42	1.49952	2.7193	5.21282	0.0080
R10G	11.8	20.52	1.529145	1.9942	3.46788	0.0540
R10H	4.7	8.69	0.480186	1.1421	2.11167	0.1220
R10J	2.7	6.08	0.239976	0.4833	1.08832	0.0200
R10K	4.7	9.62	1.288437	2.8341	5.80086	0.2850
R10L	4.7	12.42	0.690795	1.8565	4.9059	0.0840
R10M	8	20.1	0.541443	1.408	3.5376	0.0570
R20A	33.4	71.52	3.053034	4.6426	9.94128	0.0300
R20B	13.2	29.12	1.932	2.046	4.5136	0.1050
R20C	19.2	40.42	1.99728	2.3232	4.89082	0.0390
R20D	6.3	13.46	0.648117	1.6254	3.47268	0.0630
R20E	9.2	20.76	1.152	2.2908	5.16924	0.1201
R20F	9.5	26.09	0.9108	2.4795	6.80949	0.1290
R20G	13.8	43.71	0.688602	1.4214	4.50213	0.0004
R30A	15.6	43.06	3.394566	6.6456	18.34356	0.1021
R30B	12.7	32.46	3.143844	6.6929	17.10642	0.0926
R30C	9.6	20.93	2.129292	4.8672	10.61151	0.0056
R30D	12.6	31.37	0.89964	1.9026	4.73687	0.0470
R30E	9.4	23.32	1.42308	4.4368	11.00704	0.1062
R30F	12.7	37.77	1.226556	2.6543	7.89393	0.0230
R40A	12.2	37.41	2.010924	4.0626	12.45753	0.1057
R40B	7.9	19.79	1.169154	2.5754	6.45154	0.0410
R40C	9.3	25.63	0.841464	1.8135	4.99785	0.0668
R50A	6.4	16.73	0.897462	2.5216	6.59162	0.1970
R50B	6.4	16.95	0.957411	2.6432	7.00035	0.3110
S10A	4.2	8.11	0.510348	1.0836	2.09238	0.2519
S10B	5.2	10.61	0.900135	2.0748	4.23339	0.2557
S10C	4.4	8.97	0.51057	1.0384	2.11692	0.1210
S10D	5.3	10.64	0.748374	1.6801	3.37288	0.1190
S10E	5.3	10.57	0.570318	1.272	2.5368	0.0930
S10F	5.3	10.76	0.66006	1.5953	3.23876	0.0155
S10G	5.6	12.32	0.959634	2.1112	4.64464	0.0940
S10H	5.1	13.38	1.500786	2.4123	6.32874	0.2600
S10J	5.1	13.34	1.052064	1.6524	4.32216	0.1970
S20A	10.7	17.85	2.21958	3.1886	5.3193	0.0667
S20B	10.6	17.65	3.302304	4.7382	7.88955	0.0255
S20C	10.8	18.33	4.171713	5.9616	10.11816	0.2850
S20D	12.3	22.84	2.611002	3.813	7.0804	0.2150
S31A	4.1	7.48	0.779055	1.6769	3.05932	0.9350
S31B	4.1	7.18	0.780876	1.64	2.872	0.9470
S31C	3.4	6.26	1.04838	2.0604	3.79356	2.1731
S31D	4.4	9.08	0.65988	1.4564	3.00548	1.1075
S31E	3.4	5.98	0.72012	1.496	2.6312	5.0116
S31F	4.5	9.26	0.451047	1.017	2.09276	1.5277
S31G	3.5	6.65	0.419931	0.84	1.596	5.5887
S32A	3.8	8.55	0.631125	1.2312	2.7702	0.2435
S32B	2.3	4.06	0.449565	1.2857	2.26954	1.1223
S32C	3.5	5.41	0.45033	1.841	2.84566	1.0523
S32D	33.1	47.3	6.963735	10.1617	14.5211	0.0550
S32E	28.2	37.04	5.431842	8.319	10.9268	0.0177
S32F	3.9	9.3	0.691587	1.2753	3.0411	0.1360
S32G	3.6	7.41	0.450465	0.8568	1.76358	0.3853
S32H	2.9	5.1	0.299646	1.0005	1.7595	3.2049
S32J	3.9	11.3	0.329517	0.9321	2.7007	0.7065
S32K	3.7	9.57	0.541296	1.4763	3.81843	0.7157
S32L	3.7	10.13	0.38916	1.0619	2.90731	0.1094
S32M	5.2	13.69	0.598428	2.1164	5.57183	0.1944
S40A	3.9	10.47	0.809232	1.7394	4.66962	0.3056
S40B	3.9	11.07	0.81054	1.7082	4.84866	0.3871
S40C	5.2	13.49	0.628035	1.7004	4.41123	0.2125
S40D	8.4	18.57	0.26904	1.0164	2.24697	0.0396
S40E	7.8	19.17	1.984401	3.9156	9.62334	0.3009
S40F	7.9	20.83	1.377675	2.6465	6.97805	0.3071
S50A	15.3	33.58	2.042784	3.4272	7.52192	0.0038
S50B	20.5	43.12	3.444495	6.847	14.40208	0.0051
S50C	12	24.75	3.119802	4.596	9.47925	0.0542
S50D	14.1	29.1	3.357009	5.5836	11.5236	0.1370
S50E	18	41.34	2.04282	8.064	18.52032	0.1870
S50F	12.6	24.42	0.390525	1.0962	2.12454	0.0110
S50G	12.2	23.91	2.25234	6.1122	11.97891	0.1040
S50H	10.2	18.56	1.562175	3.825	6.96	0.1490
S50J	11.4	22.91	2.997234	7.809	15.69335	0.3060

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
S60A	57.3	82.27	10.56756	18.7944	26.98456	0.0992
S60B	37.3	51.16	7.948281	9.8472	13.50624	0.2175
S60C	22.7	34.35	2.731509	4.9032	7.4196	0.1878
S60D	18.9	28.68	3.18024	5.0085	7.6002	0.0144
S60E	9.7	25.26	1.109313	2.0855	5.4309	0.0384
S70A	12.4	31.26	2.697651	4.2036	10.59714	0.1903
S70B	17	27.83	2.7621	4.539	7.43061	0.0115
S70C	11.3	28.85	1.531692	2.2374	5.7123	0.0570
S70D	12.3	32.47	4.265217	6.3222	16.68958	0.3380
S70E	17.1	27.81	5.014584	8.2251	13.37661	0.2190
S70F	23.3	37.55	4.736025	8.3647	13.48045	0.0384
T11A	15.6	35.95	3.034296	5.148	11.8635	0.0072
T11B	15.7	38.17	3.936504	6.5155	15.84055	0.0100
T11C	24	57.46	4.44216	9.264	22.17956	0.2150
T11D	23.8	56.44	3.741984	8.1634	19.35892	0.0768
T11E	33.8	72.37	2.61324	7.8754	16.86221	0.0564
T11F	28.7	67.86	3.17502	7.8925	18.6615	0.1360
T11G	15.7	42.93	2.87496	4.5687	12.49263	0.1500
T11H	14.4	39.31	1.98372	3.1104	8.49096	0.1180
T12A	23.7	50.03	2.579643	6.6123	13.95837	0.0570
T12B	15.5	37.08	1.981161	3.565	8.5284	0.1310
T12C	15.6	35.54	2.366199	4.4304	10.09336	0.2080
T12D	14.5	34.86	2.698272	4.64	11.1552	0.1800
T12E	14.5	37.79	3.690471	5.974	15.56948	0.2530
T12F	15.7	40.52	3.14685	5.4322	14.01992	0.1900
T12G	12.3	34.08	2.400174	3.3948	9.40608	0.2240
T13A	15.7	49.74	3.15252	4.5216	14.32512	0.1580
T13B	14.1	43.06	2.945064	4.0185	12.2721	0.1610
T13C	14.5	46.31	3.421872	4.611	14.72658	0.1040
T13D	32	53.22	6.35841	11.456	19.05276	0.1840
T13E	36.7	67.13	3.59652	6.1656	11.27784	0.0860
T20A	46.1	113.38	16.35645	22.1741	54.53578	0.0960
T20B	40.5	95.5	12.49979	16.4025	38.6775	0.1710
T20C	31.5	63.42	7.919802	10.08	20.2944	0.2170
T20D	19.9	35.47	5.578668	7.7212	13.76236	0.2500
T20E	25.7	44.29	5.821983	8.995	15.5015	0.3590
T20F	19.9	35.5	6.29952	8.8157	15.7265	0.3280
T20G	38.3	65.39	4.646319	8.1579	13.92807	0.1300
T31A	25.4	55.71	2.018076	5.6388	12.36762	0.0030
T31B	20.8	43.65	2.420493	5.9072	12.3966	0.0130
T31C	20.8	43.32	2.450684	6.0528	12.60612	0.2320
T31D	15.5	30.7	2.643335	5.4715	10.8371	0.0180
T31E	16.6	33	3.884228	8.4494	16.797	0.0930
T31F	14.3	27.86	4.714369	8.6515	16.8553	0.3328
T31G	19.2	41.25	1.9444	4.0128	8.62125	0.0020
T31H	19.4	42.46	5.443307	11.9698	26.19782	0.4150
T31J	21	36.77	5.057282	10.647	18.64239	0.2090
T32A	20.9	35.34	4.258774	7.2732	12.29832	0.0090
T32B	21.2	39.95	4.040312	6.5084	12.26465	0.0190
T32C	19.5	38.32	4.958443	7.2735	14.29336	0.0140
T32D	19.7	36.25	3.664252	6.9147	12.72375	0.0170
T32E	24.5	47.67	5.324136	9.3835	18.25761	0.2310
T32F	34.2	61.31	4.571537	10.1574	18.20907	0.2150
T32G	25.9	50.56	6.407063	11.3442	22.14528	0.3000
T32H	29.4	55.59	6.7298	13.3182	25.18227	0.2630
T33A	16.7	35.02	6.805385	11.2224	23.53344	0.2660
T33B	19.2	38.5	6.431276	11.5584	23.177	0.1540
T33C	16.9	34.21	3.607828	6.2023	12.55507	0.1210
T33D	15.5	32.23	4.464635	7.1455	14.85803	0.2550
T33E	15.7	33.42	2.000614	4.1919	8.92314	0.1400
T33F	19.1	44.2	3.676617	8.3467	19.3154	0.2310
T33G	19.2	48.11	4.507664	9.6576	24.19933	0.3770
T33H	19.5	36.26	5.757743	10.0815	18.74642	0.4360
T33J	16.8	32.64	5.008293	7.6776	14.91648	0.2520
T33K	25.7	51.08	2.211859	4.3433	8.63252	0.1160
T34A	44.3	82.22	5.430144	10.7206	19.89724	0.1050
T34B	43.9	73.84	5.186796	10.7994	18.16464	0.0890
T34C	39.5	64.58	5.646204	11.139	18.21156	0.0790
T34D	43.4	75.35	7.32792	14.8428	25.7697	0.1860
T34E	44.1	81.23	5.99982	11.8188	21.76964	0.0000
T34F	43.8	79.69	5.366844	10.4244	18.96622	0.0230
T34G	44.7	83.87	8.826246	16.0026	30.02546	0.0500
T34H	44	82.03	14.83755	26.004	48.47973	0.3030
T34J	19.3	35.74	2.880923	5.7321	10.61478	0.1940
T34K	17.2	31.05	3.143568	5.7276	10.33965	0.1310
T35A	44.7	92.59	11.65651	21.2325	43.98025	0.0950
T35B	44.8	93.6	9.717971	17.7408	37.0656	0.0000
T35C	50.4	113.28	8.282451	15.4224	34.66368	0.0000

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
T35D	39.3	77.58	7.920047	13.6764	26.99784	0.0590
T35E	45	98	12.42864	22.14	48.216	0.2280
T35F	41.3	82.16	9.026461	14.8267	29.49544	0.0001
T35G	35.7	64.18	12.83523	20.5275	36.9035	0.0520
T35H	40.6	83.18	13.2712	21.112	43.2536	0.2710
T35J	45.3	103.9	5.237809	8.5164	19.5332	0.1030
T35K	36.8	78.04	15.98668	23	48.775	0.3800
T35L	19.1	35.14	4.04371	6.494	11.9476	0.1810
T35M	25.8	53.22	4.311284	7.869	16.2321	0.1090
T36A	35.3	61.93	10.55997	16.3086	28.61166	0.1860
T36B	45.3	86.41	7.563672	12.0045	22.89865	0.1170
T40A	54.7	112.75	7.265916	11.3776	23.452	0.0840
T40B	53.8	109.03	10.58064	14.9564	30.31034	0.1260
T40C	41.5	77.65	6.35508	9.8355	18.40305	0.1440
T40D	30.9	51.87	7.526142	11.4948	19.29564	0.1710
T40E	31.3	57.31	10.32623	15.2118	27.85266	0.3660
T40F	58.9	106.89	10.97812	19.7315	35.80815	0.3837
T40G	55.9	103.45	9.60921	16.77	31.035	0.2660
T51A	54.2	162.6	10.9073	17.7776	53.3328	0.0314
T51B	50.7	143.78	6.461352	10.647	30.1938	0.0241
T51C	51.4	89.86	13.45092	23.7468	41.51532	0.1297
T51D	53.1	157.26	4.613466	7.5402	22.33092	0.0269
T51E	51.7	91.06	7.37352	13.2352	23.31136	0.0807
T51F	49.1	129.28	8.794686	15.0737	39.68896	0.0315
T51G	46.7	117.19	6.907464	11.9552	30.00064	0.0393
T51H	51.1	89.01	14.99315	26.572	46.2852	0.3161
T51J	48.3	81.71	7.343235	12.7995	21.65315	0.0539
T52A	48	87.53	10.82546	18.336	33.43646	0.0680
T52B	45.8	82.33	6.744525	11.7248	21.07648	0.0960
T52C	41.8	73.27	6.482595	10.9098	19.12347	0.1870
T52D	29.3	46.44	9.81288	15.5583	24.65964	0.2790
T52E	47	86.91	6.544962	10.951	20.25003	0.0900
T52F	47.2	88.08	11.69287	19.7296	36.81744	0.1000
T52G	47	87.17	6.333066	10.387	19.26457	0.0960
T52H	28	44.62	6.267861	9.632	15.34928	0.2970
T52J	32.2	56.44	7.897188	11.8496	20.76992	0.2050
T52K	29.7	52.45	8.819904	12.6522	22.3437	0.1129
T52L	38.4	68.78	4.226622	6.8736	12.31162	0.0141
T52M	38.7	69.92	7.5057	12.1131	21.88496	0.2161
T60A	36.7	64.01	13.08405	20.0749	35.01347	0.1820
T60B	38.5	68.59	13.23185	20.328	36.21552	0.3180
T60C	43.8	80.13	9.746568	15.8994	29.08719	0.1620
T60D	59	105.57	12.96118	24.485	43.81155	0.1150
T60E	37.2	69.65	4.949025	7.3656	13.7907	0.0930
T60F	42.3	81.11	12.59934	19.6272	37.63504	0.2970
T60G	64.7	119.43	12.37366	23.292	42.9948	0.1550
T60H	89.4	161.14	18.43361	28.7868	51.88708	0.0600
T60J	62.8	118.11	13.25005	18.4632	34.72434	0.2300
T60K	59.1	111.37	10.65456	14.3022	26.95154	0.1690
T70A	29.3	49.95	5.906952	9.2002	15.6843	0.1850
T70B	39.9	74.9	7.14024	11.0523	20.7473	0.1540
T70C	35.4	61.57	4.406337	7.0092	12.19086	0.0950
T70D	42.1	80.64	8.76216	14.0193	26.85312	0.2600
T70E	26.5	44.81	3.95952	6.042	10.21668	0.0900
T70F	35.3	61.11	5.88132	9.3545	16.19415	0.1900
T70G	36.7	63.61	6.065088	9.8723	17.11109	0.2580
T80A	42.1	79.37	4.560054	8.9673	16.90581	0.1870
T80B	35.2	65.1	4.65432	8.2368	15.2334	0.1720
T80C	22.2	43.26	4.560624	6.993	13.6269	0.1990
T80D	38.6	72.05	5.84841	10.808	20.174	0.2450
T90A	14.7	25.84	3.77967	4.8363	8.50136	0.2770
T90B	38.6	71.15	9.726042	15.5172	28.6023	0.3170
T90C	32.3	54.51	6.924903	11.8541	20.00517	0.1280
T90D	23.4	38.11	5.733864	8.7516	14.25314	0.2320
T90E	32.4	54.85	7.772652	13.3488	22.5982	0.1580
T90F	40	68.07	6.303258	11.28	19.19574	0.1030
T90G	29.4	46.09	7.86552	13.524	21.2014	0.1970
U10A	82.4	185.11	18.01114	34.4432	77.37598	0.0290
U10B	70.6	157.98	15.04077	27.6752	61.92816	0.0818
U10C	61.1	137.51	9.381303	16.3137	36.71517	0.0298
U10D	55.9	116.94	10.77408	18.8383	39.40878	0.1010
U10E	57.9	124.42	11.13903	18.9333	40.68534	0.1250
U10F	52	92.2	8.97075	19.708	34.9438	0.1700
U10G	53	101.24	8.994027	18.709	35.73772	0.0321
U10H	49.9	91	9.851202	22.8542	41.678	0.1490
U10J	36.9	55.27	8.263632	18.6345	27.91135	0.3170
U10K	28.5	41.95	4.875264	10.374	15.2698	0.0320
U10L	30.3	36.48	5.101812	9.3021	11.19936	0.1300

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
U10M	41.2	52.77	6.41277	11.536	14.7756	0.2611
U20A	92.9	128.8	14.22028	27.2197	37.7384	0.0177
U20B	70.1	92.85	12.6228	24.7453	32.77605	0.0801
U20C	66.2	86.32	9.544194	18.4698	24.08328	0.0768
U20D	62.4	100.1	10.57613	21.0912	33.8338	0.0255
U20E	44.9	73.42	6.858684	17.511	28.6338	0.0661
U20F	45.2	75.8	8.850576	19.662	32.973	0.2562
U20G	39.4	59.64	8.620095	19.4636	29.46216	0.3704
U20H	67	96.65	8.013996	14.74	21.263	0.4471
U20J	38.6	48.9	14.02501	26.1708	33.1542	0.3516
U20K	43.7	70.91	5.3193	11.8427	19.21661	0.7560
U20L	35.6	45.4	6.052266	11.6768	14.8912	0.6426
U20M	48.2	65.18	8.893584	17.352	23.4648	1.2180
U30A	44.5	76.75	11.26146	16.732	28.858	0.1990
U30B	51.1	77.01	5.136705	11.2931	17.01921	0.8610
U30C	46	83.43	6.167205	11.132	20.19006	0.1030
U30D	45.4	80.37	4.561479	8.2174	14.54697	0.0010
U30E	46.9	87.33	6.78903	13.601	25.3257	0.0560
U40A	52.4	84.35	10.01255	16.6108	26.73895	0.0132
U40B	36.5	50.22	6.810426	14.162	19.48536	1.4482
U40C	36.9	56.5	5.061486	9.7416	14.916	0.1090
U40D	36.3	54.19	4.945392	9.6921	14.46873	0.2760
U40E	33.7	52.16	6.982146	10.7166	16.58688	0.1200
U40F	33.6	46.12	4.540122	9.744	13.3748	0.0810
U40G	39.5	57.04	5.703264	9.9935	14.43112	0.1160
U40H	42.5	66.12	9.27954	15.3425	23.86932	0.3610
U40J	45.8	74.44	7.445376	12.7782	20.76876	0.0720
U50A	47.5	86.08	8.554104	14.155	25.65184	3.6194
U60A	51	73.03	3.4431	5.355	7.66815	0.0120
U60B	36.2	45.74	6.827625	11.4392	14.45384	0.0634
U60C	31.7	39.9	8.513067	11.5705	14.5635	0.1317
U60D	44.4	57.91	5.20332	8.214	10.71335	0.1250
U60E	46.3	60.96	7.647816	12.964	17.0688	0.8045
U60F	50.3	71.68	5.90034	13.6816	19.49696	0.0004
U70A	55.1	84.22	2.99763	6.2814	9.60108	0.0150
U70B	39.9	49.66	5.745216	10.8528	13.50752	0.0541
U70C	41.2	52.8	8.329014	14.42	18.48	0.2061
U70D	48.8	66.75	5.926272	10.1504	13.884	0.1699
U70E	52.9	79.83	2.736954	4.6023	6.94521	0.2010
U70F	52.8	79.03	1.829334	3.1152	4.66277	0.1440
U80A	55	87.84	5.55363	8.69	13.87872	0.2219
U80B	34.4	45.02	7.437837	11.6616	15.26178	0.1960
U80C	50	72.43	6.208092	10.1	14.63086	0.1933
U80D	55.5	89.9	4.26039	6.66	10.788	0.2537
U80E	38.2	49.49	9.867744	15.853	20.53835	0.2754
U80F	48.6	67.3	3.991164	6.6582	9.2201	0.1821
U80G	48.8	67.99	7.769034	12.7368	17.74539	0.0686
U80H	53.7	82.68	8.36658	13.0491	20.09124	0.0841
U80J	38.6	51.1	8.909667	14.3206	18.9581	0.0680
U80K	49.4	70.24	5.5809	9.0896	12.92416	0.1085
U80L	51.1	76.32	3.507753	5.4677	8.16624	0.1892
V11A	113.8	230.73	9.655503	23.5566	47.76111	0.0538
V11B	120.5	254.02	12.72256	30.4865	64.26706	0.0125
V11C	87.4	157.51	9.057216	22.0248	39.69252	0.0381
V11D	37.5	69.25	2.147148	9.975	18.4205	0.1793
V11E	91.9	169.13	7.254954	17.7367	32.64209	0.0360
V11F	19.8	42.9	0.732576	3.1878	6.9069	0.1163
V11G	115.4	237.66	16.20599	36.1202	74.38758	0.0172
V11H	43.4	88.6	1.29198	5.7722	11.7838	0.0409
V11J	28.2	59.02	1.220832	4.0608	8.49888	0.0088
V11K	22.8	56.82	1.267677	5.6316	14.03454	0.0844
V11L	16.2	31.29	1.175226	5.0544	9.76248	0.1064
V11M	16.3	30.4	0.555954	2.5102	4.6816	0.0221
V12A	31.3	66.21	4.52016	9.6091	20.32647	0.0637
V12B	27.4	56.85	3.96312	8.0282	16.65705	0.1163
V12C	18.4	32.65	1.145856	2.852	5.06075	0.1776
V12D	41.6	83.13	3.78432	9.8176	19.61868	0.0253
V12E	18.1	33.34	2.448936	5.8825	10.8355	0.1191
V12F	16.1	27.13	2.322078	5.3613	9.03429	0.0936
V12G	16.3	26.94	3.406752	8.2478	13.63164	0.0856
V13A	60.1	176.56	5.27028	13.9432	40.96192	0.0049
V13B	42.9	86.12	2.743917	12.6126	25.31928	0.0257
V13C	28	58.69	1.88331	7.168	15.02464	0.0555
V13D	26	54.13	1.933632	7.384	15.37292	0.0993
V13E	15.6	28.19	0.92976	4.3836	7.92139	0.0067
V14A	16.1	28.84	0.80391	3.6064	6.46016	0.2062
V14B	15.7	24.33	1.081809	2.669	4.1361	0.0586
V14C	18.2	37.57	1.531731	3.549	7.32615	0.0174

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
V14D	15.7	26.52	4.095864	9.9224	16.76064	0.0487
V14E	16.7	29.36	1.847424	4.7929	8.42632	0.0209
V20A	57.4	125.99	10.65324	15.3258	33.63933	0.0066
V20B	54.4	114.9	5.710419	10.336	21.831	0.0030
V20C	53.4	110.94	5.543346	10.0392	20.85672	0.0050
V20D	46.3	69.37	4.597578	13.8437	20.74163	0.0077
V20E	16.6	35.09	4.703055	9.9434	21.01891	0.0344
V20F	35.5	74.2	2.706852	5.467	11.4268	0.0240
V20G	16.7	35.65	1.8144	4.2418	9.0551	0.0235
V20H	14.3	27.61	3.948288	8.6229	16.64883	0.1447
V20J	14.1	24.65	1.96251	4.4274	7.7401	0.0541
V31A	32.1	68.84	6.89931	19.9662	42.81848	0.0424
V31B	26.5	58.83	5.065065	13.3825	29.70915	0.1189
V31C	21.9	51.62	3.875361	8.6724	20.44152	0.1107
V31D	18.2	34.45	2.791152	8.4994	16.08815	0.0418
V31E	20.5	42.2	7.082037	17.097	35.1948	0.1167
V31F	23	52.24	1.374696	3.588	8.14944	0.1124
V31G	16.8	27.86	1.85724	4.284	7.1043	0.0762
V31H	25.1	63.15	1.24998	3.2379	8.14635	0.0136
V31J	21	45	3.008592	7.518	16.11	0.0410
V31K	18.3	31.47	1.69776	4.1541	7.14369	0.1467
V32A	24.5	56.36	1.690902	4.7775	10.9902	0.0089
V32B	18.4	32.86	3.93276	10.2488	18.30302	0.1418
V32C	16.1	24.84	4.1004	10.143	15.6492	0.2171
V32D	16.4	26.3	3.951906	9.676	15.517	0.2066
V32E	17.8	29.87	4.8564	13.9374	23.38821	0.0881
V32F	16.3	25.96	1.204416	3.2763	5.21796	0.0444
V32G	20.6	43.09	3.842712	11.2064	23.44096	0.0182
V32H	15.9	24.09	3.049728	8.2203	12.45453	0.1570
V33A	16.4	27.1	3.747249	9.4628	15.6367	0.2280
V33B	16.2	26.07	2.591325	6.5934	10.61049	0.1071
V33C	17.7	31.97	2.643708	7.0446	12.72406	0.0597
V33D	16.2	28.08	2.841552	7.371	12.7764	0.1714
V40A	22.8	49.22	4.563612	8.4816	18.30984	0.0890
V40B	17.6	32.75	3.205776	5.1392	9.563	0.1106
V40C	20.1	39.05	5.267457	9.1455	17.76775	0.2333
V40D	19.4	38.01	3.8637	6.4602	12.65733	0.1370
V40E	16	30.75	3.268062	4.816	9.25575	0.0929
V50A	26	35.36	8.434335	10.634	14.46224	0.1090
V50B	31.5	47.13	10.21062	12.096	18.09792	0.0480
V50C	45.4	73.43	14.56117	18.5686	30.03287	0.2870
V50D	46.9	79.66	5.556066	6.8943	11.71002	0.1170
V60A	26.7	61.24	1.540362	2.8569	6.55268	0.0973
V60B	23.8	47.79	7.026012	13.1376	26.38008	0.6664
V60C	16	23.09	2.520777	5.776	8.33549	0.0765
V60D	23.8	47.56	3.963912	7.3304	14.64848	0.0207
V60E	15.8	22.21	5.190984	11.8026	16.59087	0.1451
V60F	17.7	31.01	2.40225	7.1862	12.59006	0.1010
V60G	14.3	23.63	2.625804	6.5923	10.89343	0.2160
V60H	15.4	23.94	1.75911	5.467	8.4987	0.1701
V60J	19.6	39.28	1.130538	3.6456	7.30608	0.1150
V60K	14.5	26.92	1.458432	3.306	6.13776	0.0449
V70A	70.3	163.04	10.83744	19.7543	45.81424	0.0269
V70B	60.9	142.54	4.456548	7.3689	17.24734	0.0330
V70C	36	70.07	6.156474	12.312	23.96394	0.0522
V70D	28.4	58.75	3.446859	5.6232	11.6325	0.3115
V70E	17.7	36.85	0.817191	1.8585	3.86925	0.0030
V70F	14	24.49	2.277714	5.11	8.93885	0.0065
V70G	14	24.1	2.924493	7.07	12.1705	0.0115
W11A	47.7	88.76	13.79635	21.2265	39.4982	0.3736
W11B	47.3	87.25	3.867408	6.0071	11.08075	0.1023
W11C	49.6	97.12	12.95658	18.9472	37.09984	0.2630
W12A	36.8	40.25	11.5092	22.9264	25.07575	0.2864
W12B	42.9	50.38	13.5642	28.1424	33.04928	0.3020
W12C	29.7	40.98	9.8448	16.929	23.3586	0.1421
W12D	29.7	44.01	8.526	16.8993	25.04169	0.9777
W12E	52.1	75.07	7.3431	12.9729	18.69243	0.2814
W12F	95.1	130.7	20.3964	37.9449	52.1493	0.3278
W12G	28.4	42.39	5.4	9.2584	13.81914	0.1511
W12H	52	74.74	12.567	25.22	36.2489	0.5490
W12J	94.7	120.53	18.6624	31.4404	40.01596	0.1100
W13A	51.1	103	9.053856	14.1036	28.428	0.2190
W13B	58.2	139.4	9.588579	12.9204	30.9468	0.4929
W21A	27.2	52.74	3.366	9.248	17.9316	0.0014
W21B	22	40.42	5.12493	12.76	23.4436	0.0206
W21C	16	27.01	2.33988	5.92	9.9937	0.0100
W21D	15.9	26.56	3.003696	7.4571	12.45664	0.3486
W21E	16.1	27.85	2.818296	6.6976	11.5856	0.2440

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
W21F	15.6	23.46	1.441872	3.7908	5.70078	0.0108
W21G	16.1	26.2	3.62997	9.0643	14.7506	0.1033
W21H	17.9	31.47	2.969076	7.7507	13.62651	0.0964
W21J	18.5	36.8	3.805668	9.805	19.504	0.0271
W21K	16.7	33.98	5.817297	13.3099	27.08206	0.3175
W21L	16.1	33.03	3.99252	8.5813	17.60499	0.0990
W22A	30.1	54.79	2.91018	7.1939	13.09481	0.0054
W22B	22	40.67	3.572448	7.304	13.50244	0.1090
W22C	27.2	49.67	2.127708	5.0592	9.23862	0.0286
W22D	17.9	31	1.498776	3.5263	6.107	0.0279
W22E	43.3	78.46	5.73402	16.6705	30.2071	0.0918
W22F	18.5	33.7	2.487381	5.772	10.5144	0.1661
W22G	17.8	30.85	1.977948	4.4322	7.68165	0.1990
W22H	16.3	27.44	2.34111	4.9878	8.39664	0.2220
W22J	15.9	25.65	4.464816	9.6195	15.51825	0.2140
W22K	16.6	28.76	3.657132	7.9016	13.68976	0.3037
W22L	16.1	30.12	2.28123	4.4919	8.40348	0.0802
W23A	28.3	41.28	6.475296	11.7162	17.08992	0.2258
W23B	36.8	56.41	4.019412	7.1024	10.88713	0.1320
W23C	69.3	88.95	12.47625	21.6909	27.84135	0.0830
W23D	54	71.02	7.4136	13.392	17.61296	0.0699
W31A	21.7	38.88	3.752952	8.029	14.3856	0.0100
W31B	20.7	37.91	3.057603	6.2928	11.52464	0.0096
W31C	26.9	51.17	1.97751	4.6268	8.80124	0.0370
W31D	20.5	36.57	2.968371	6.0475	10.78815	0.0070
W31E	5	9.73	0.57072	1.67	3.24982	0.0079
W31F	4.8	8.78	0.93174	2.7984	5.11874	0.8913
W31G	4.5	7.16	0.751197	2.34	3.7232	0.9754
W31H	4.6	9.34	0.508827	1.4858	3.01682	1.1042
W31J	4.6	9.45	0.89919	2.5438	5.22585	0.2242
W31K	4.5	9.17	1.377621	3.8475	7.84035	0.3667
W31L	4.6	10.26	0.569196	1.4766	3.29346	0.0445
W32A	16.8	22.06	5.49024	7.0224	9.22108	0.1120
W32B	36	41.05	19.14296	33.66	38.38175	0.1240
W32C	4.8	11.77	1.680318	3.4944	8.56856	0.1667
W32D	6.2	17.41	0.77805	1.6554	4.64847	0.3201
W32E	6.2	17.13	1.31928	2.8272	7.81128	0.1591
W32F	6.3	19.15	0.568458	1.1781	3.58105	4.7254
W32G	7.6	24.19	2.18322	4.9248	15.67512	0.4993
W32H	43.1	51.81	32.97622	54.9956	66.10956	0.2132
W41A	56.9	112.55	6.685308	10.6972	21.1594	0.0087
W41B	55.3	97.62	10.13687	16.9218	29.87172	0.0053
W41C	54.7	95.61	7.015788	11.8699	20.74737	0.0007
W41D	52.8	87.15	7.50657	12.5664	20.7417	0.0017
W41E	48.6	80.15	9.232905	14.7258	24.28545	0.0731
W41F	47.7	74.33	10.14654	16.3611	25.49519	0.0058
W41G	43.5	66.96	2.730102	4.176	6.42816	0.0068
W42A	58.4	118.49	14.08126	23.1848	47.04053	0.0220
W42B	55.4	94.82	13.59107	23.1018	39.53994	0.0158
W42C	57	109.7	13.0487	21.489	41.3569	0.0004
W42D	53.2	86.05	15.11355	26.0148	42.07845	0.0544
W42E	48.3	77.28	6.99174	11.2056	17.92896	0.0577
W42F	48.3	77.23	9.173196	14.7798	23.63238	0.0000
W42G	47.1	73.89	7.467102	11.6808	18.32472	0.0714
W42H	43.4	66.8	7.707996	11.8482	18.2364	0.0067
W42J	41.6	63.44	8.252814	12.064	18.3976	0.0115
W42K	45.8	76.09	12.94043	19.0528	31.65344	0.0000
W42L	42.8	67.05	7.407954	10.7428	16.82955	0.0860
W42M	41.1	62.19	11.22297	16.1112	24.37848	0.1237
W43A	53	75.92	8.487	13.144	18.82816	0.0000
W43B	53.8	77.87	11.45653	17.8616	25.85284	0.0000
W43C	50	67.43	12.69743	19.75	26.63485	0.0000
W43D	3.9	10.03	0.330372	1.0218	2.62786	0.0000
W43E	2.9	7.73	0.300456	0.7685	2.04845	0.0000
W43F	4.6	11.03	0.840486	2.9072	6.97096	0.2500
W44A	4.1	11.82	0.329847	1.0455	3.0141	3.4615
W44B	4	10.61	0.629793	1.944	5.15646	0.9110
W44C	3.2	9.48	0.36075	1.0048	2.97672	0.0982
W44D	2.8	6.56	0.239604	0.6608	1.54816	0.3704
W44E	2.9	7.33	0.751608	2.0648	5.21896	0.0180
W45A	4.3	9.06	1.558755	5.5427	11.67834	2.5242
W45B	4.3	9.38	0.6321	2.1887	4.77442	0.0764
W51A	28.6	51.45	6.825024	17.8464	32.1048	0.1623
W51B	27.6	43.45	4.905225	13.6896	21.5512	0.7385
W51C	28	48.85	6.59988	18.984	33.1203	0.0762
W51D	28	48.71	5.236578	14.756	25.67017	0.1168
W51E	57.8	78.94	9.632064	15.8372	21.62956	0.0037
W51F	62.1	84.75	21.28666	36.5769	49.91775	0.1090

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
W51G	64	87.3	16.11737	26.88	36.666	0.0000
W51H	60.3	82.96	10.70789	17.2458	23.72656	0.0000
W52A	26.8	39.36	3.235752	7.7452	11.37504	0.0539
W52B	27.6	42.6	3.911559	9.2736	14.3136	0.0470
W52C	26.9	40.19	2.046408	4.7882	7.15382	0.0116
W52D	59.8	81.03	4.047171	7.1162	9.64257	0.0026
W53A	25.6	38.19	5.711862	14.0288	20.92812	0.0430
W53B	27.4	42	2.1321	6.0006	9.198	0.0000
W53C	28.3	49.73	3.43926	8.9428	15.71468	0.0115
W53D	27.7	43.31	2.97192	8.7255	13.64265	0.0049
W53E	65.2	89.71	15.14873	27.5144	37.85762	0.0168
W53F	65.1	89.38	16.3011	29.0997	39.95286	0.0000
W53G	66.2	96.76	14.60442	25.2884	36.96232	0.0000
W54A	21.9	33.3	1.979778	5.4969	8.3583	0.0000
W54B	27.9	41.22	2.36034	7.8678	11.62404	0.0010
W54C	27.7	43.91	0.623328	2.9639	4.69837	0.0000
W54D	64.5	88.78	4.917963	8.9655	12.34042	0.0168
W54E	67.4	100.56	7.740141	13.0756	19.50864	0.0104
W54F	68.9	108.73	11.3338	18.4652	29.13964	0.0000
W54G	66.3	98.71	10.70292	17.5695	26.15815	0.0000
W55A	20.7	31.64	3.42888	14.2623	21.79996	0.0000
W55B	28.1	41.8	1.179234	6.1258	9.1124	0.0750
W55C	65.2	90.47	19.54715	34.6864	48.13004	0.0226
W55D	64.9	89.85	9.936468	17.5879	24.34935	0.0018
W55E	66.2	95.53	6.657066	10.6582	15.38033	0.0000
W56A	165	185.34	42.86743	59.4	66.7224	0.0027
W56B	172.3	198.05	29.21069	38.7675	44.56125	0.0000
W56C	203.9	242.82	37.56	51.5867	61.43346	0.0000
W56D	179.9	211.82	22.25524	29.8634	35.16212	0.0000
W56E	197.6	233.55	26.57855	36.7536	43.4403	0.0000
W56F	73.5	96.31	9.98811	14.6265	19.16569	0.0000
W57A	56	84.92	21.34787	33.208	50.35756	0.0000
W57B	4.7	20	0.77976	2.0398	8.68	0.0000
W57C	4.5	17.78	0.95988	2.5875	10.2235	0.0000
W57D	60.3	91.69	13.70201	22.0698	33.55854	0.0000
W57E	4.2	13.99	0.62757	1.6926	5.63797	0.0000
W57F	51.1	74.03	7.47474	11.3953	16.50869	0.0000
W57G	3.9	10.68	0.838728	2.4297	6.65364	0.0000
W57H	4.3	13.85	0.627264	1.8318	5.9001	0.0000
W57J	3.1	9.47	0.66024	1.6182	4.94334	0.0130
W57K	3.1	9.42	0.358776	0.9331	2.83542	0.0180
W57L	0	9.42	1.73679	0	1.29996	
W60A	202.3	243.98	25.42036	34.7956	41.96456	0.0000
W60B	210.2	257.27	21.7156	30.0586	36.78961	0.0000
W60C	203.2	245.79	34.54809	47.3456	57.26907	0.0000
W60D	75.9	107.59	9.744237	14.1933	20.11933	0.0000
W60E	5.6	21.91	0.299574	0.7504	2.93594	0.0000
W60F	5.6	21.41	0.931944	2.3408	8.94938	0.0000
W60G	73.9	101.39	11.84566	16.4058	22.50858	0.0000
W60H	5.6	21.14	0.781218	2.044	7.7161	0.0000
W60J	5.7	23.12	1.023759	2.5479	10.33464	0.0000
W60K	5.8	22.53	1.442304	3.857	14.98245	0.0000
W60L	0	22.53	9.20824	0	11.10729	
W60M	0	22.53	4.29536	0	5.1819	
W70A	22.3	25.67	35.95192	57.7347	66.45963	0.5480
X11A	13.6	14.47	3.268998	9.1392	9.72384	0.2263
X11B	14.3	17.24	3.092517	8.5371	10.29228	0.1520
X11C	14.3	17.59	1.67931	4.5617	5.61121	0.0279
X11D	50.6	52.81	18.71847	29.854	31.1579	0.0198
X11E	51.7	57.22	7.948152	12.5114	13.84724	0.0139
X11F	59	64.86	6.511908	10.797	11.86938	0.0064
X11G	95.4	111.91	17.34283	25.1856	29.54424	0.0095
X11H	110.3	129.27	19.71461	29.2295	34.25655	0.0095
X11J	122.7	149.87	17.45568	22.8222	27.87582	0.0032
X11K	100.2	118.17	14.81642	21.1422	24.93387	0.0055
X12A	65.8	77.19	10.7408	16.0552	18.83436	0.0010
X12B	70.1	82.99	7.04925	10.8655	12.86345	0.0048
X12C	76.2	90.31	9.090378	14.1732	16.79766	0.0067
X12D	40.4	45.12	5.579799	9.0092	10.06176	0.0073
X12E	43.6	49.09	8.520714	14.5188	16.34697	0.0043
X12F	41.8	46.26	7.91808	13.0834	14.47938	0.0080
X12G	45.1	50.92	6.41682	10.7789	12.16988	0.0020
X12H	47	58.35	7.77462	13.442	16.6881	0.0000
X12J	105.4	131.77	24.07093	31.1984	39.00392	0.0006
X12K	45.6	56.7	7.709202	13.0416	16.2162	0.0000
X13A	109.2	140.89	20.4308	26.754	34.51805	0.0000
X13B	105.3	131.55	17.04828	24.9561	31.17735	0.0000
X13C	115.3	156.8	15.62759	22.4835	30.576	0.0000

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
X13D	87.7	123.81	9.6321	15.8737	22.40961	0.0000
X13E	71.3	92.96	9.121536	15.1156	19.70752	0.0000
X13F	70.5	90.9	9.20778	15.2985	19.7253	0.0000
X13G	8.2	25.58	1.291482	2.747	8.5693	0.0000
X13H	6.7	17.76	1.017825	2.0502	5.43456	0.0000
X13J	0	0	0	0	0	1.2810
X13K	0	0	0	0	0	0.3230
X13L	0	0	0	0	0	0.0587
X14A	150.5	192.6	16.20715	21.2205	27.1566	0.0003
X14B	148.7	189.14	19.76912	27.5095	34.9909	0.0020
X14C	132.9	159.07	14.21635	22.0614	26.40562	0.0000
X14D	137.7	168.38	11.64096	17.7633	21.72102	0.0000
X14E	42.1	61.46	4.95264	7.4517	10.87842	0.0000
X14F	152.1	195	14.07569	17.7957	22.815	0.0007
X14G	34.4	49.61	4.79856	7.0176	10.12044	0.5033
X14H	6.8	19.09	1.16964	2.448	6.8724	0.2073
X21A	59.6	73.26	9.662328	15.794	19.4139	0.0042
X21B	53	63.43	13.19669	20.034	23.97654	0.8541
X21C	59.1	72.18	11.70061	18.3801	22.44798	0.7745
X21D	55.6	67.57	8.071572	12.1764	14.79783	0.0018
X21E	102.8	125.05	24.27559	35.466	43.14225	0.0002
X21F	50.7	58.76	13.28659	20.1279	23.32772	0.0736
X21G	54.9	64.53	12.17815	19.0503	22.39191	0.1215
X21H	127.1	153.1	18.17745	29.1059	35.0599	0.0000
X21J	105.5	115	21.63763	37.4525	40.825	0.0029
X21K	125.9	150.17	19.58318	30.8455	36.79165	0.0110
X22A	132.9	164.24	23.77948	33.4908	41.38848	0.0000
X22B	129.9	158.1	19.82793	29.4873	35.8887	0.0100
X22C	45.9	56.55	11.66972	16.7994	20.6973	0.0050
X22D	119	155.01	29.10046	32.606	42.47274	0.0870
X22E	113.6	145.5	14.55665	17.3808	22.2615	0.0000
X22F	46.1	57.26	6.72252	9.7732	12.13912	0.0170
X22G	109.5	139.45	10.26008	11.7165	14.92115	0.0000
X22H	45	54.15	6.209598	9	10.83	0.0540
X22J	38.3	41.64	5.877648	9.192	9.9936	0.0060
X22K	41.6	47.79	8.90505	13.936	16.00965	0.0000
X23A	142	160.55	14.31348	18.034	20.38985	0.0001
X23B	40.6	43.67	6.180834	9.2974	10.00043	0.0002
X23C	143.3	165.9	7.945674	11.6073	13.4379	0.0001
X23D	83.8	95.46	9.721521	15.2516	17.37372	0.0002
X23E	72.1	94.23	9.992766	12.978	16.9614	0.0002
X23F	38.5	40.81	7.916076	11.935	12.6511	1.1904
X23G	42.3	49.53	6.210396	9.5175	11.14425	0.0003
X23H	42.3	49.31	8.575776	12.9438	15.08886	0.2703
X24A	5.8	14.09	0.778734	1.4442	3.50841	0.5390
X24B	5.7	13.42	1.05216	1.9095	4.4957	0.5470
X24C	5.8	14.48	0.931392	1.6588	4.14128	0.0000
X24D	7.3	25.72	1.11222	2.2046	7.76744	0.0024
X24E	0	0	0	0	0	0.0001
X24F	0	0	0	0	0	0.0003
X24G	0	0	0	0	0	0.0000
X24H	0	0	0	0	0	0.0252
X31A	234.5	284.63	51.48838	53.935	65.4649	0.2920
X31B	234.5	284.62	44.09285	45.7275	55.5009	0.0000
X31C	244.6	301.58	36.00828	37.6684	46.44332	0.0030
X31D	77.5	106.31	10.38258	14.88	20.41152	0.0050
X31E	184	249.28	31.12488	39.376	53.34592	0.2810
X31F	196.1	269.88	15.08536	18.4334	25.36872	0.2797
X31G	82.6	109.46	9.085128	13.9594	18.49874	0.5790
X31H	119	165.08	7.047282	7.14	9.9048	0.0000
X31J	73.1	95.84	7.17381	11.2574	14.75936	0.5310
X31K	0	0	0	0	0	0.2760
X31L	0	0	0	0	0	0.3940
X31M	0	0	0	0	0	0.2126
X32A	75.7	115.65	5.066901	8.4784	12.9528	0.4340
X32B	71	99.43	2.070924	3.905	5.46865	0.1570
X32C	6.8	19.22	0.719208	1.5844	4.47826	0.5970
X32D	80.9	126.13	5.102412	8.09	12.613	0.2430
X32E	64.5	90.81	2.968296	5.031	7.08318	0.3430
X32F	6.5	16.7	0.48015	1.0205	2.6219	0.3750
X32G	0	0	0	0	0	0.4849
X32H	0	0	0	0	0	0.1897
X32J	0	0	0	0	0	0.0079
X33A	0	0	0	0	0	0.0000
X33B	0	0	0	0	0	0.0000
X33C	0	0	0	0	0	0.0000
X33D	0	0	0	0	0	0.0000
X40A	0	0	0	0	0	0.0000

QUAT	BASE FLOW PITMAN	BASE FLOW HUGHES	BASE FLOW SCHULTZ	BASE FLOW PITMAN	BASE FLOW HUGHES	GW Use
	1213	1546	6421.396	10988.5	19611.48137	1771.716
	(mm/annum)	(mm/annum)	Mm3/a	Mm3/a	Mm3/a	Mm3/a
X40B	0	0	0	0	0	0.0000
X40C	0	0	0	0	0	0.1034
X40D	0	0	0	0	0	0.0000
Y10A	0	0	2.11302	0	0	
Y10B	0	0	1.1196	0	0	
Y10C	0	0	10.33734	0	0	
Y10D	0	0	16.98021	0	0	
Y10E	0	0	5.73579	0	0	
Y10F	0	0	4.34385	0	0	
Y10G	0	0	15.56008	0	0	
Y10H	0	0	1.1124	0	0	
Y10J	0	0	10.34264	0	0	
Y20A	0	0	40.97198	0	0	
Y20B	0	0	1.2264	0	0	
Y20C	0	0	51.02835	0	0	
Y20D	0	0	1.27756	0	0	
Y20E	0	0	0.67035	0	0	
Y20F	0	0	1.14232	0	0	
Y20G	0	0	12.90088	0	0	
Y20H	0	0	0.69475	0	0	
Y30A	0	0	0.07385	0	0	
Y30B	0	0	2.6829	0	0	
Y30C	0	0	0.59904	0	0	
Y30D	0	0	0.203	0	0	
Y30E	0	0	0.27545	0	0	
Y40A	0	0	0.79902	0	0	
Y40B	0	0	0.74664	0	0	
Y40C	0	0	0.64881	0	0	
Y40D	0	0	2.01933	0	0	
Y40E	0	0	15.88491	0	0	
Y40F	0	0	0.46656	0	0	
Y50A	0	10	31.248	0	36.01	
Y60A	0	25	19.3936	0	55.825	
Y70A	0	26	39.2509	0	105.248	
Z10A	0	0	0	0	0	
Z10B	0	0	0.5252	0	0	
Z10C	0	0	0.35178	0	0	
Z10D	0	0	0.03232	0	0	
Z10E	0	0	0	0	0	
Z10F	0	0	0	0	0	
Z10G	0	0	0	0	0	
Z10H	0	0	0.32076	0	0	
Z10J	0	0	0.02376	0	0	
Z20A	0	0	0	0	0	
Z20B	0	0	0.195	0	0	
Z20C	0	0	0	0	0	
Z20D	0	0	0	0	0	
Z20E	0	0	0	0	0	
Z20F	0	0	0	0	0	

10. APPENDIX C CALIBRATIONS OF VERIFICATION STUDY

Tertiary Catchment J11

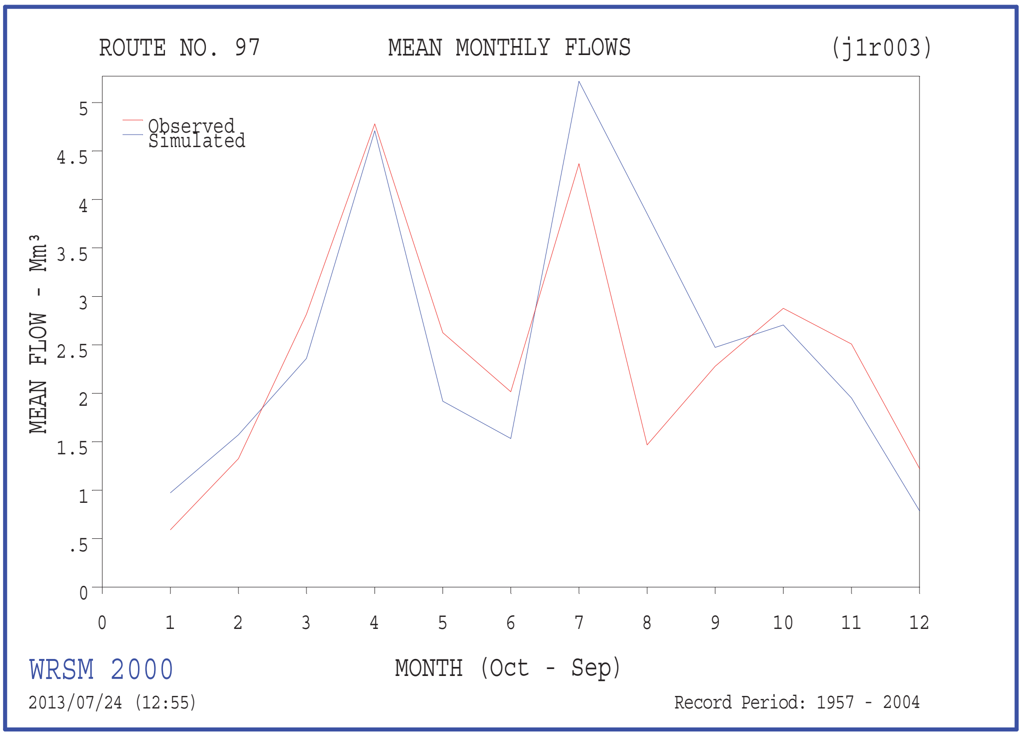


Figure C-1: J1R003 Mean monthly flows

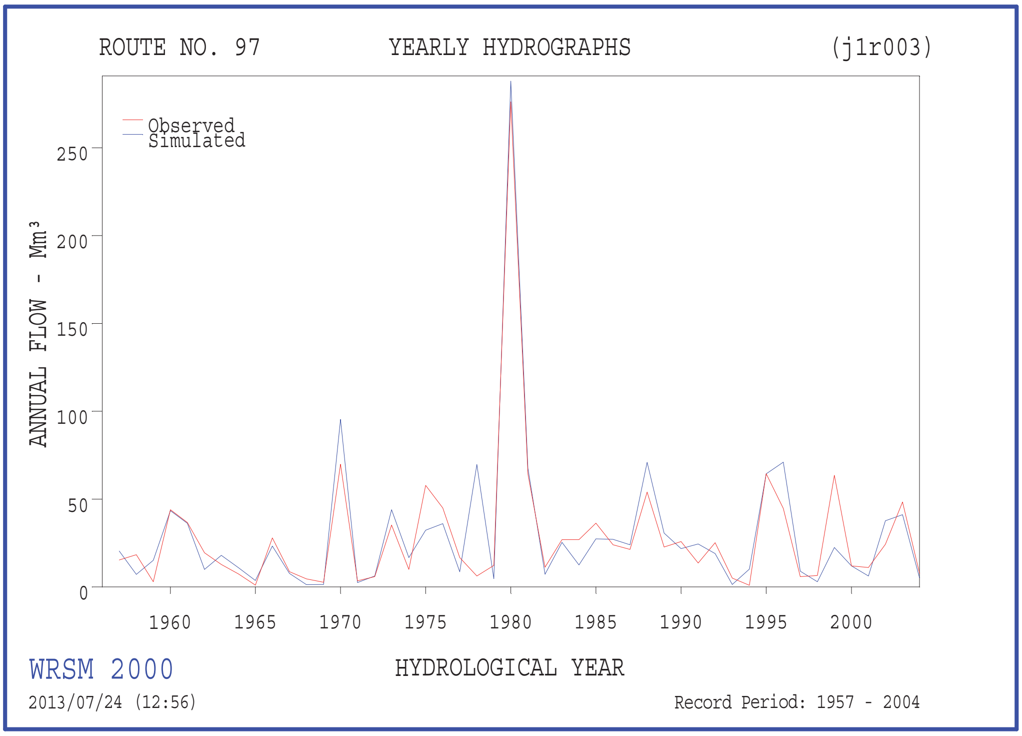


Figure C-2: J1R003 Yearly hydrographs

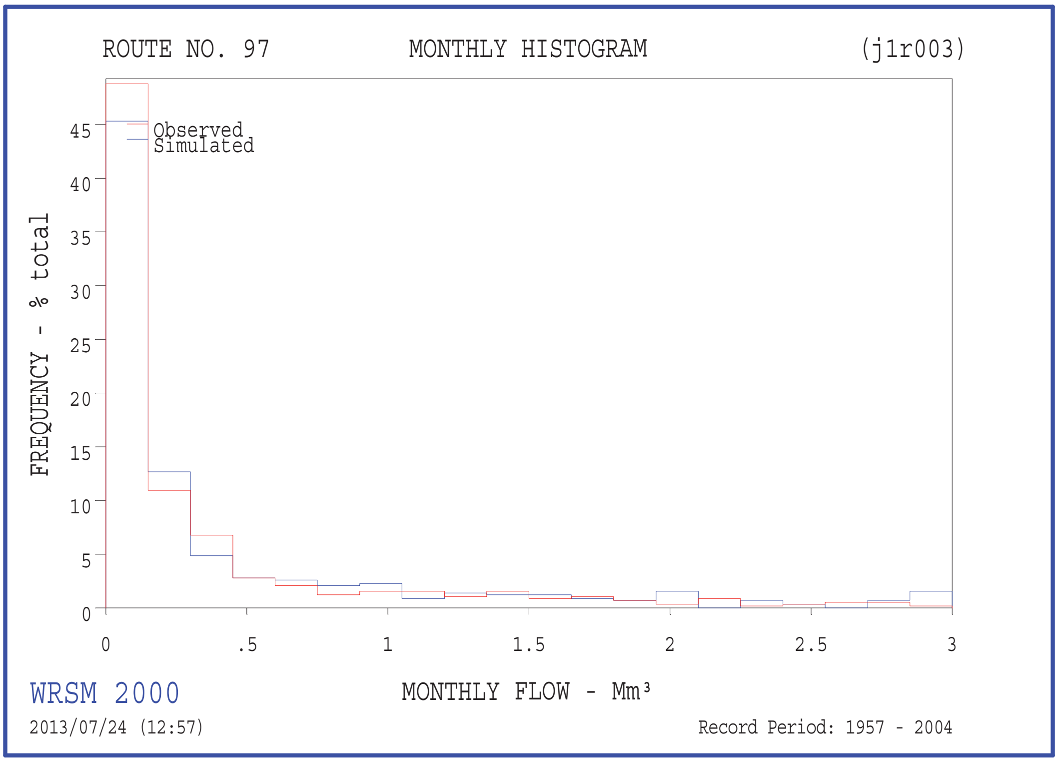


Figure C-3: J1R003 Monthly histogram

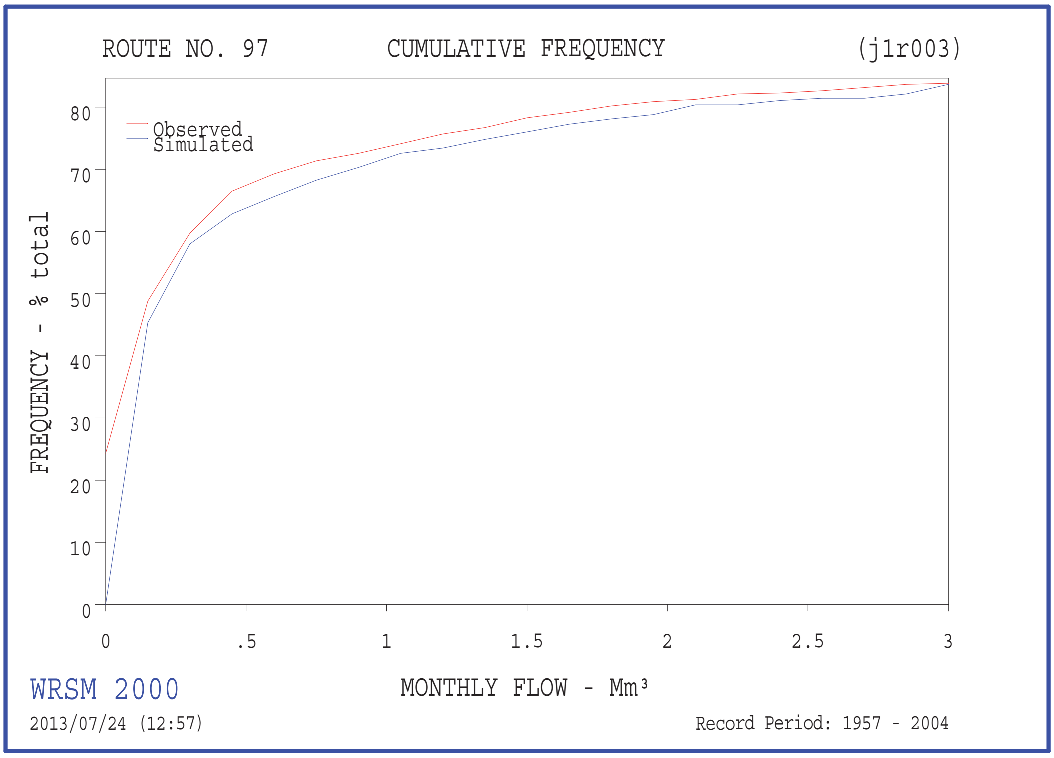


Figure C-4: J1R003 Cumulative frequency

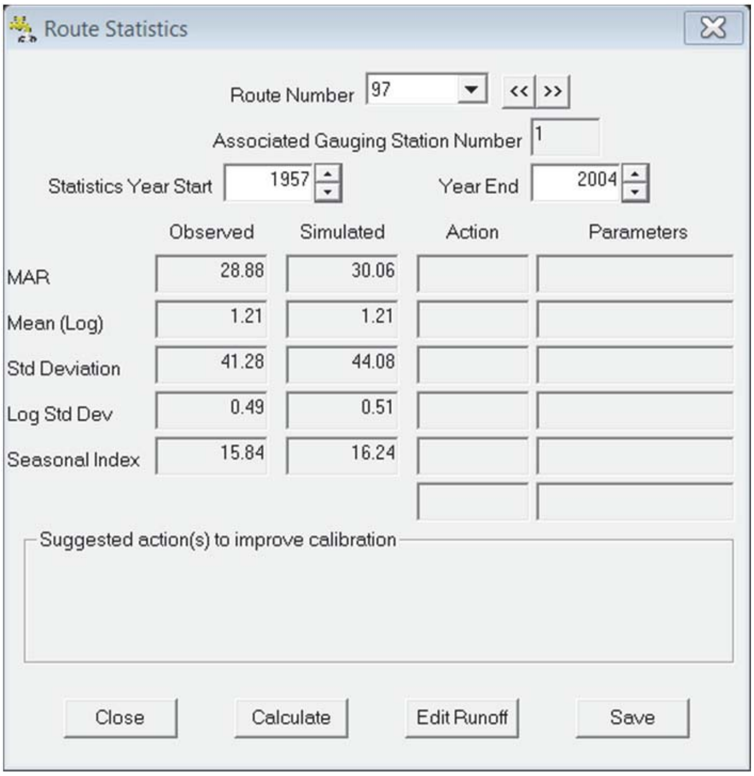


Figure C-4: J1R003 Statistics

Quaternary Catchment J23E

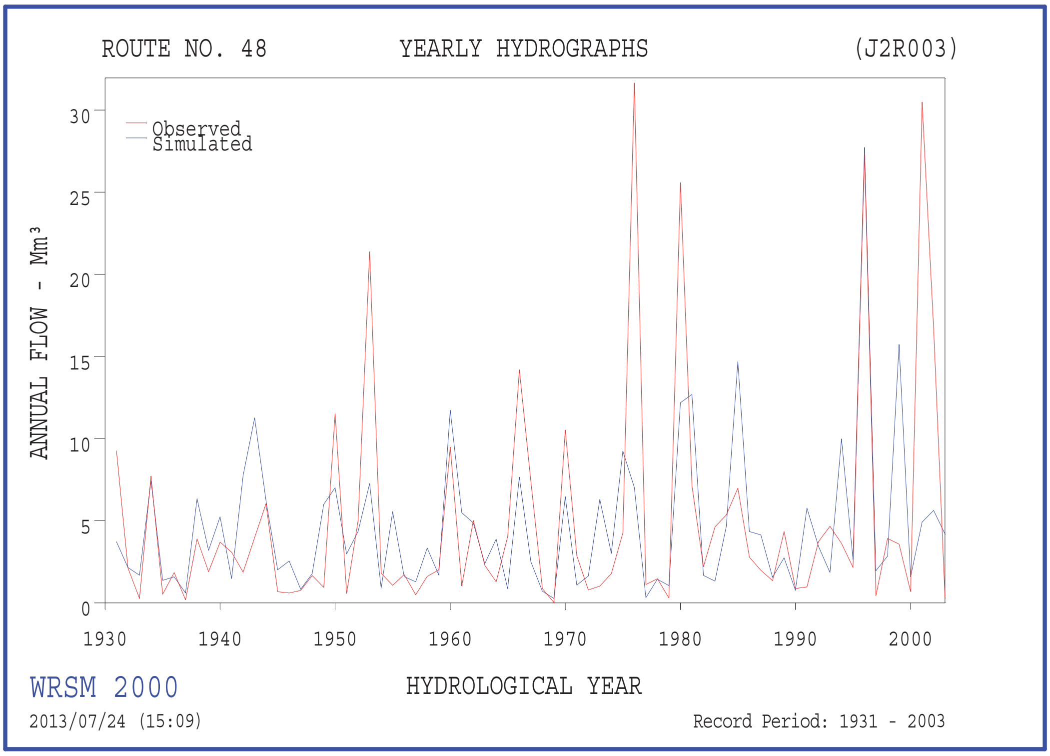


Figure C-5: J1R003 Yearly hydrograph

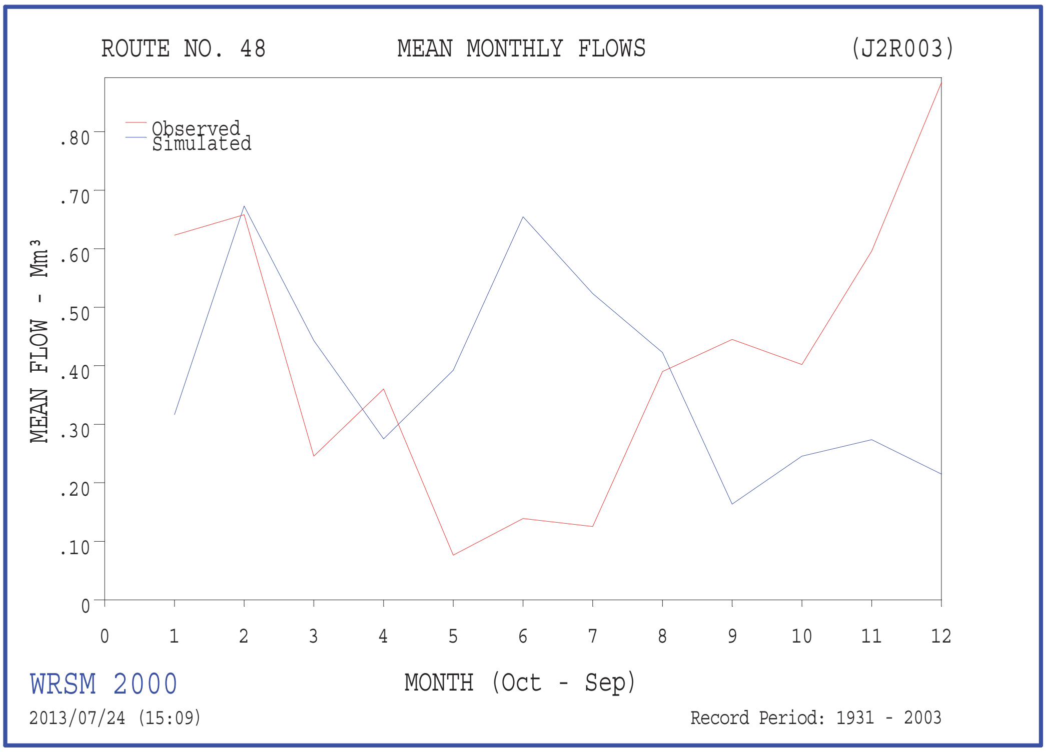


Figure C-6: J2R003 Mean monthly flows

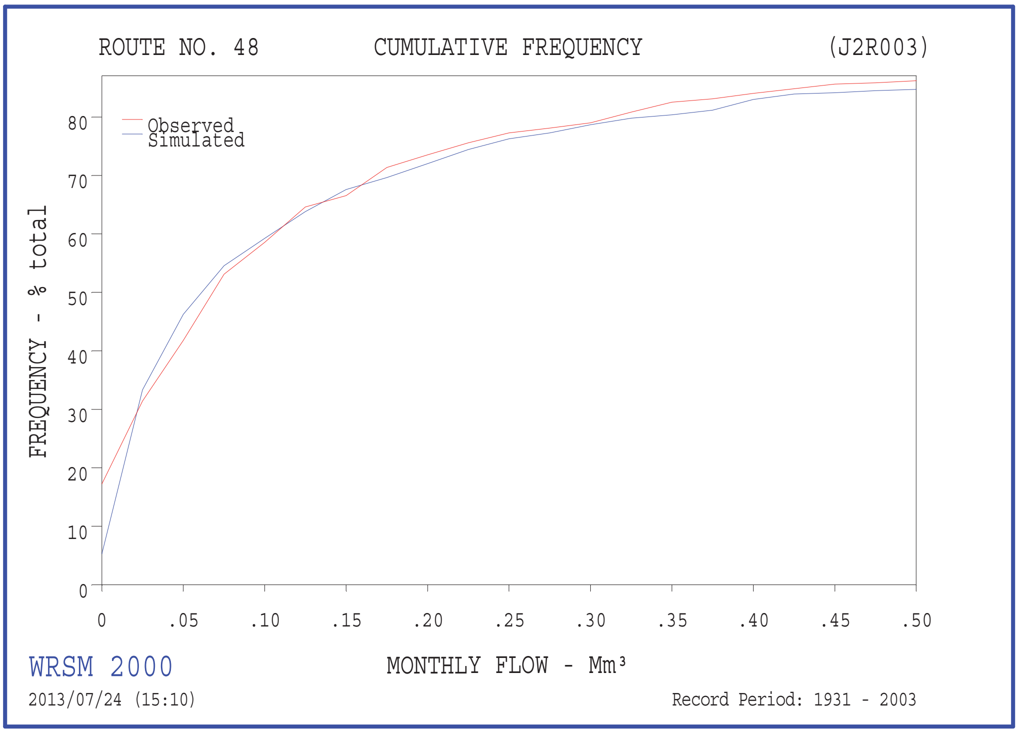


Figure C-7: J2R003 Cumulative frequency

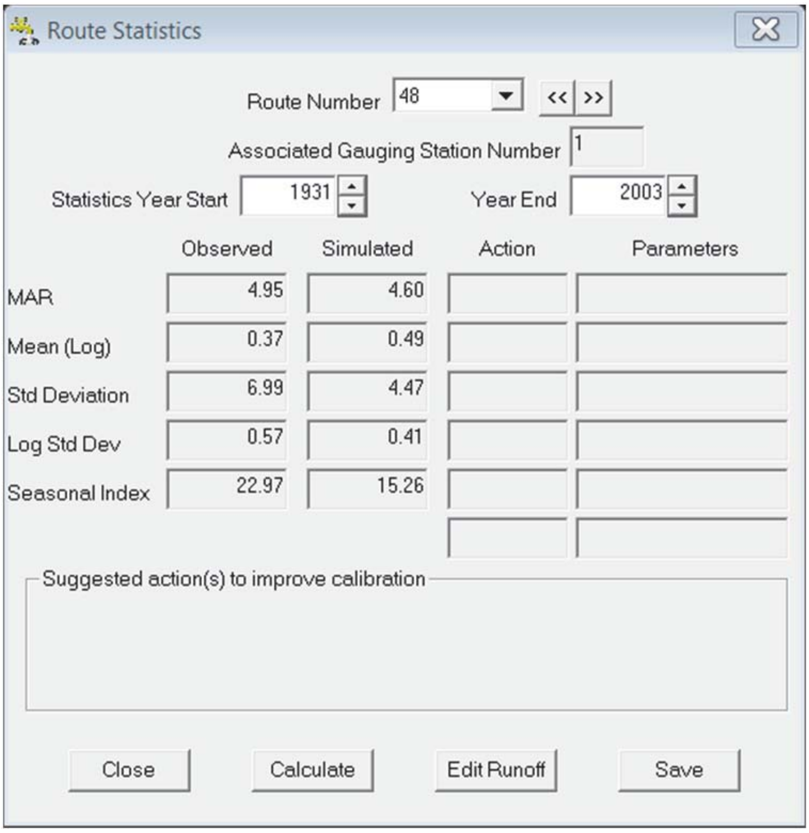


Figure C-8: J2R003 Statistics

Quaternary Catchment E10H

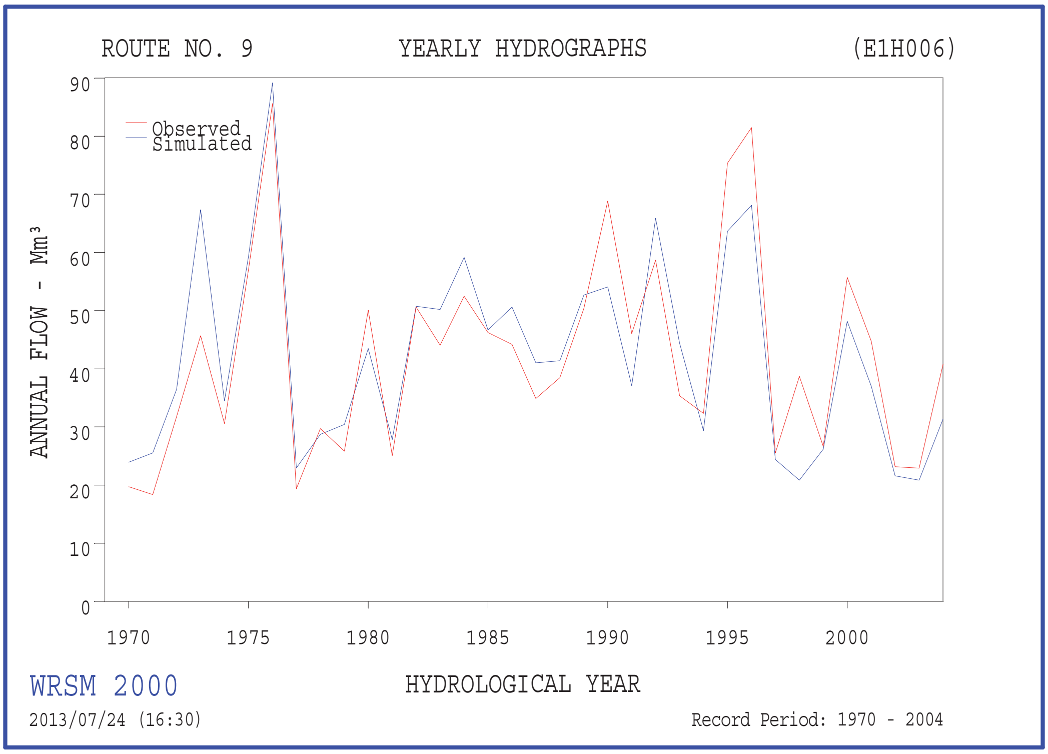


Figure C-9: E1H006 Yearly hydrograph

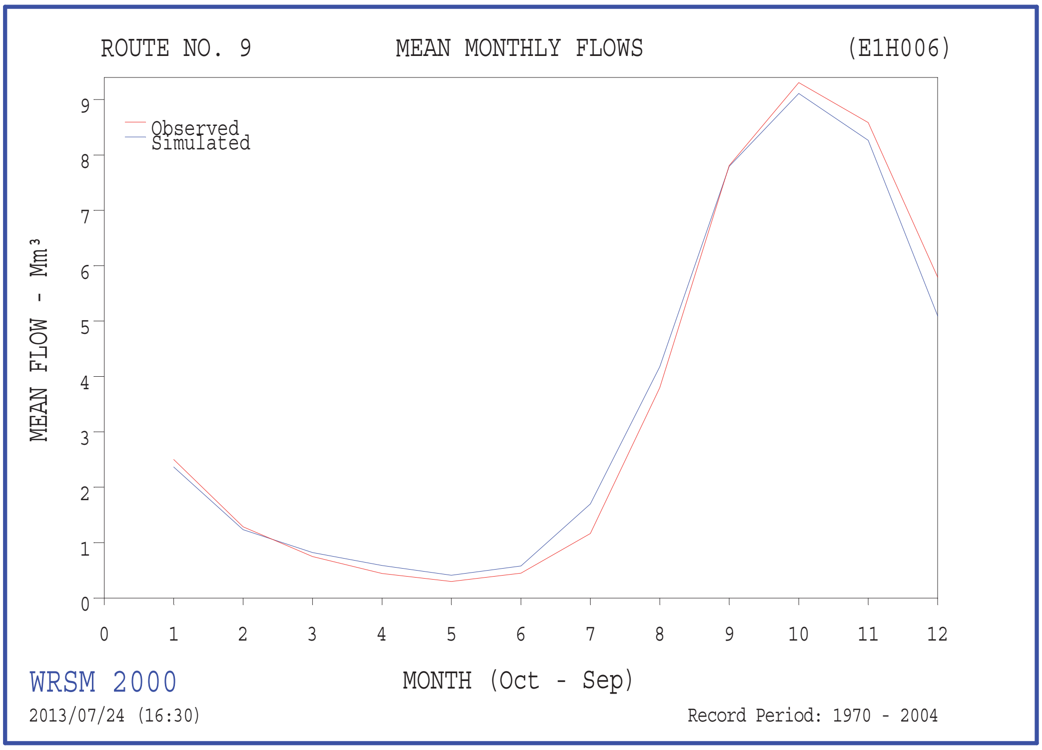


Figure C-10: E1H006 Mean monthly flows

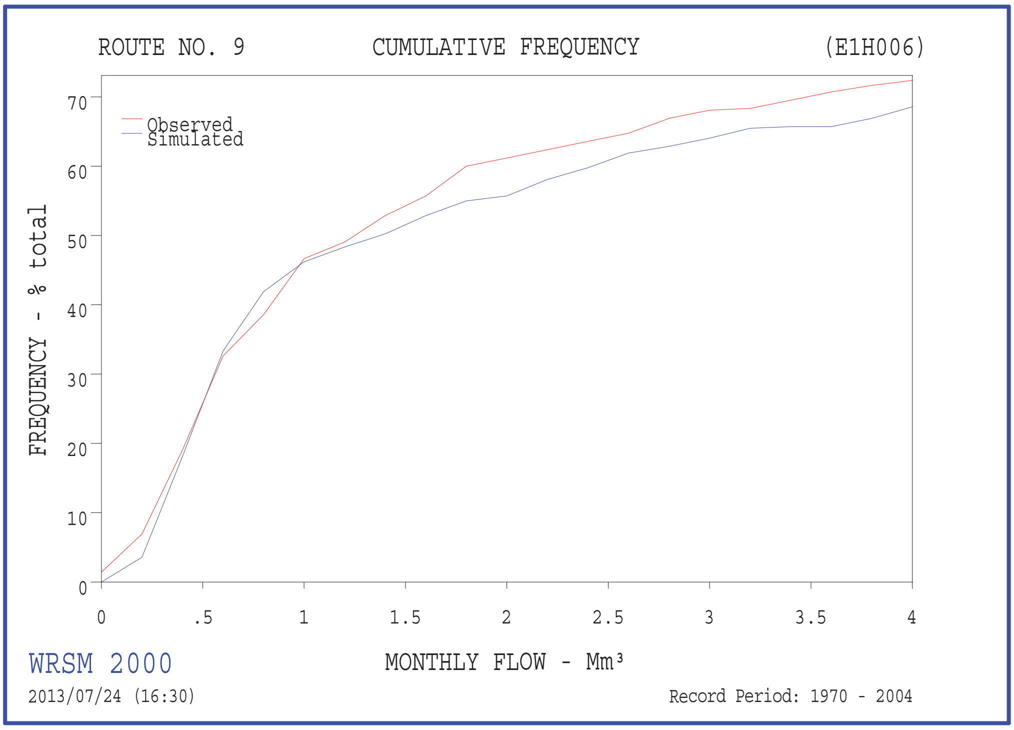


Figure C-11: E1H006 Cumulative frequency

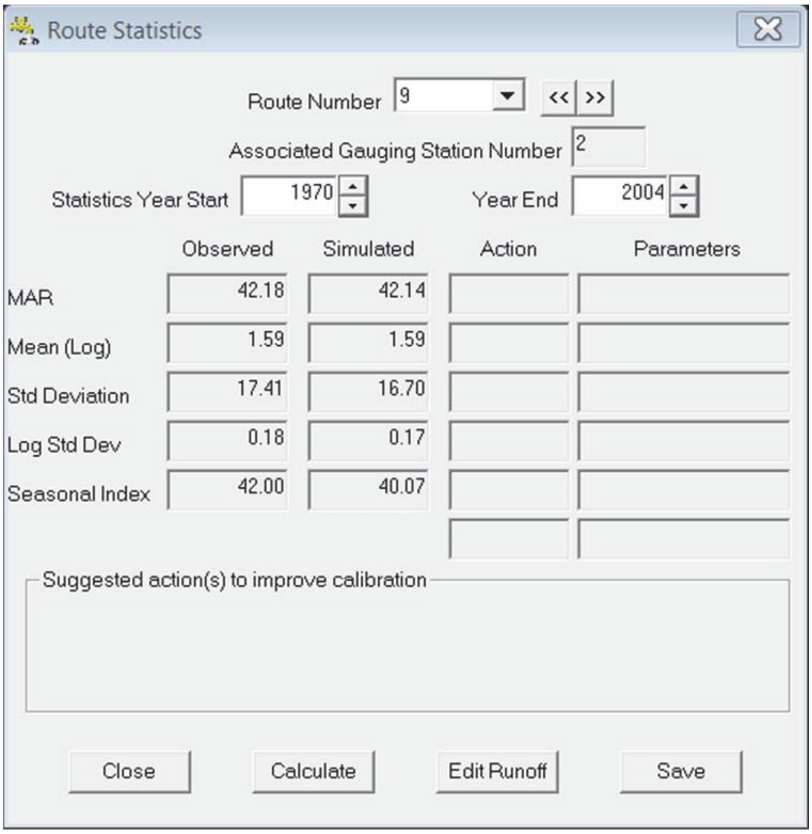


Figure C-12: E1H006 Statistics

Tertiary Catchments E40 and E24

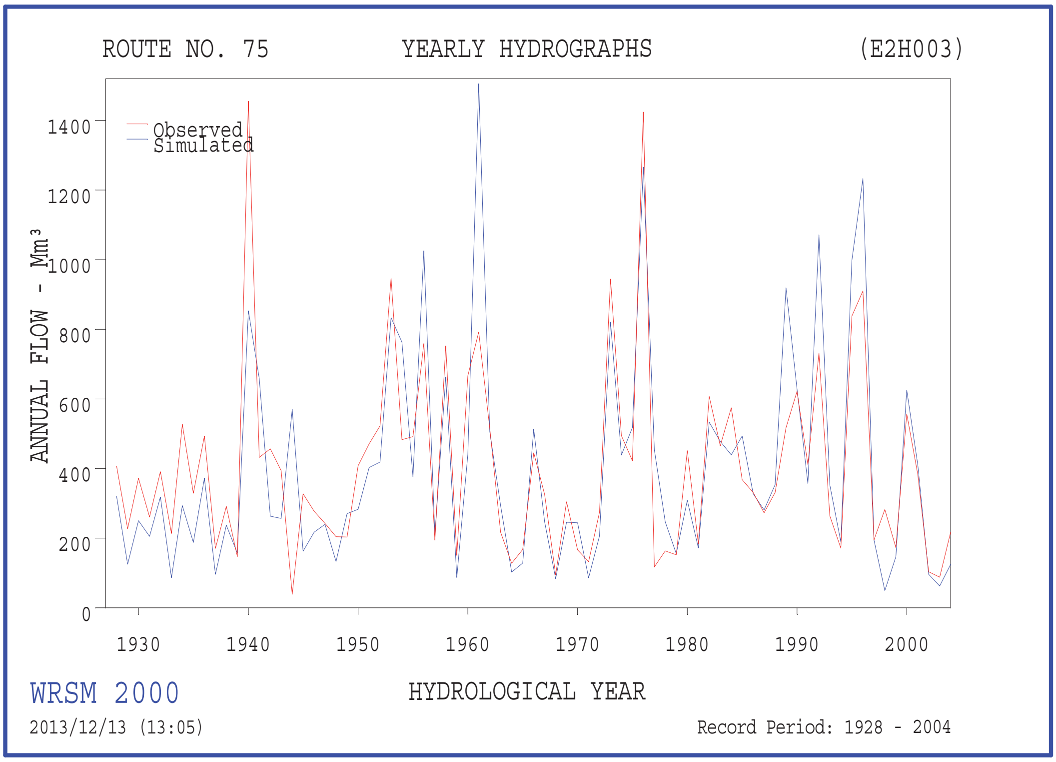


Figure C-13: E2H003 Yearly hydrograph

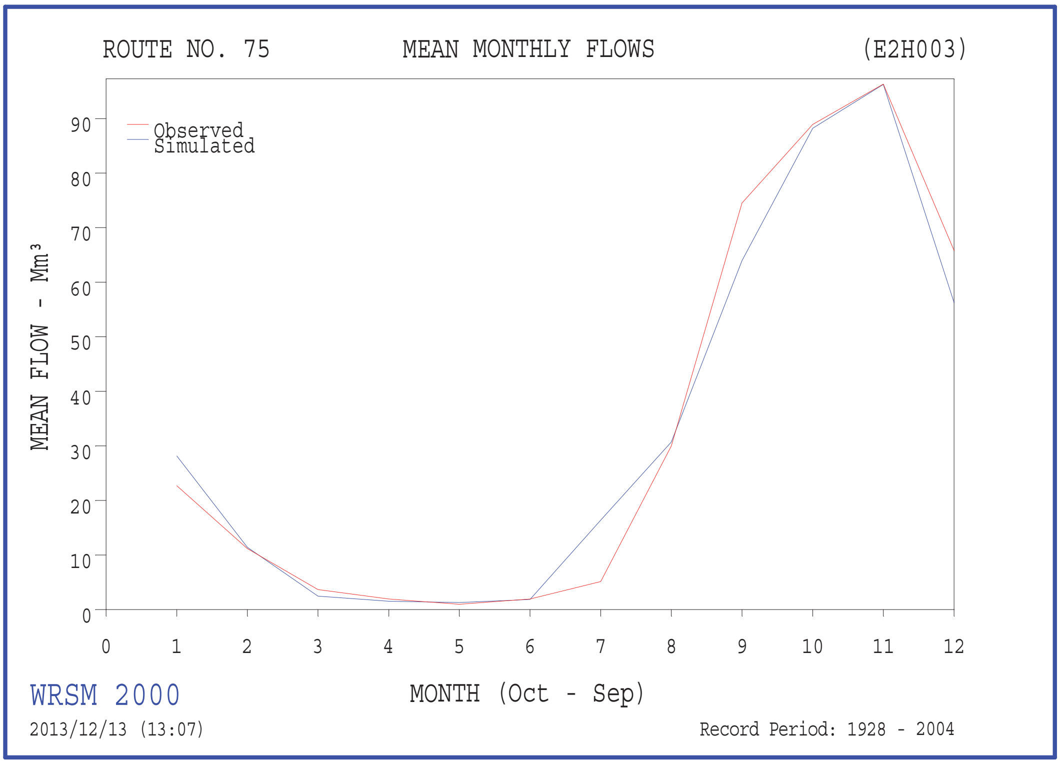


Figure C-14: E1H006 Mean monthly flows

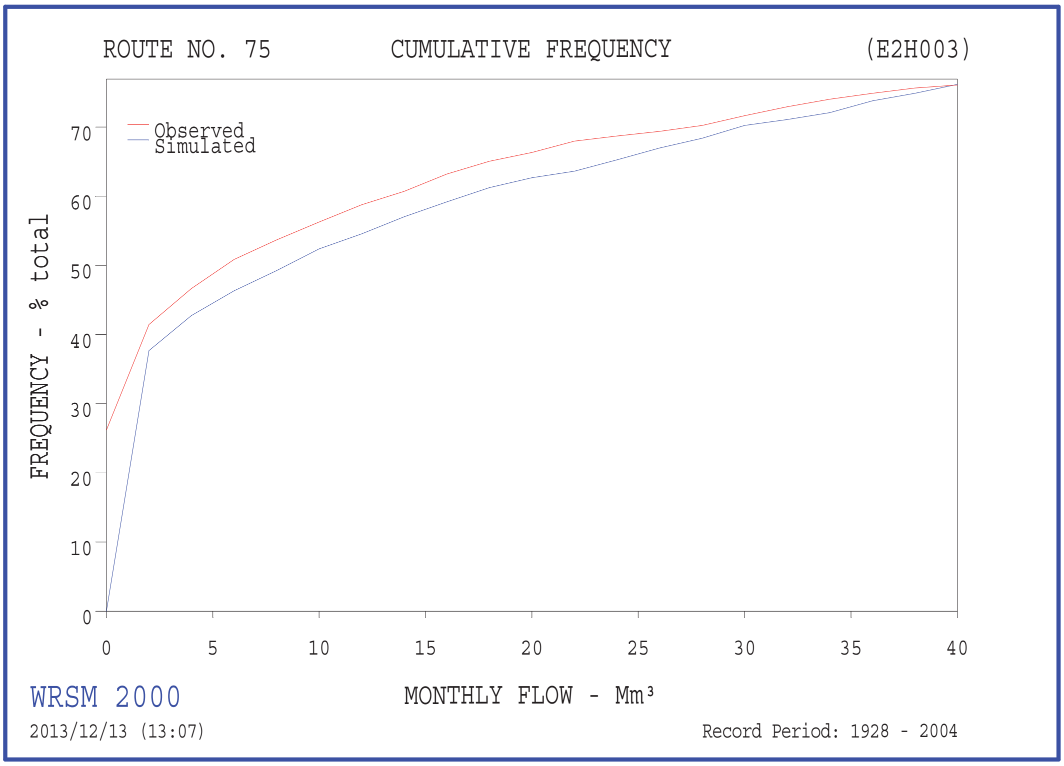


Figure C-15: E2H003 Cumulative frequency

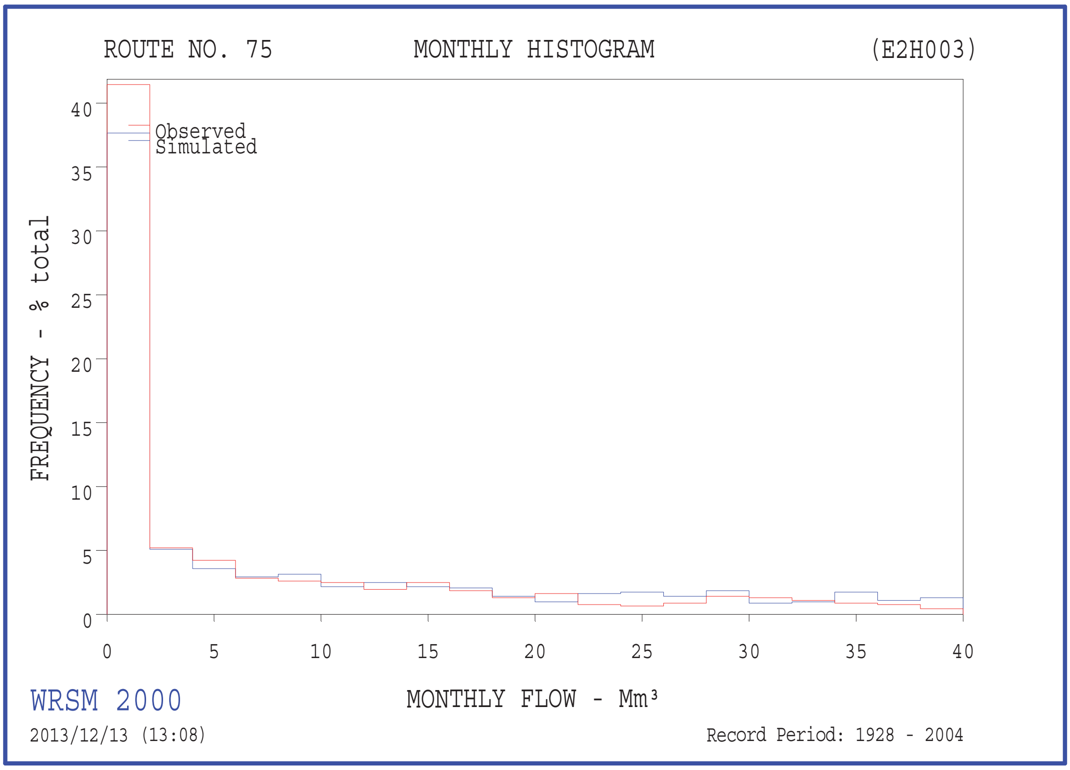


Figure C-16: E2H003 Monthly histogram

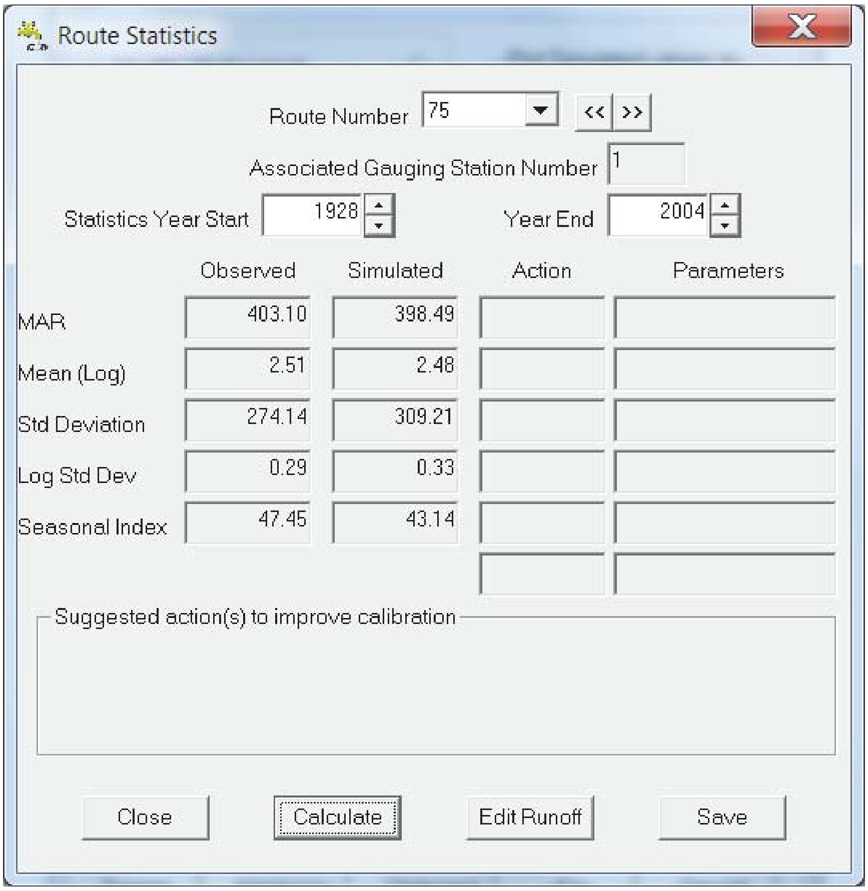


Figure C-17: E2H003 Statistics

Quaternary Catchment G30B

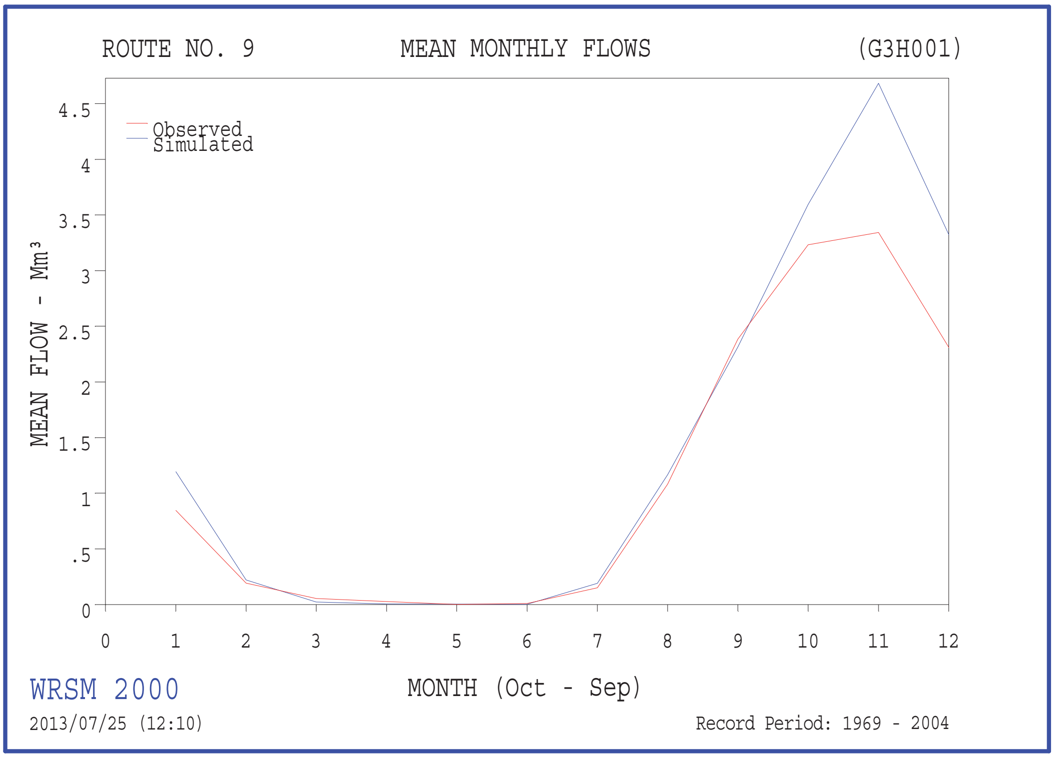


Figure C-18: G3H001 Mean monthly flows

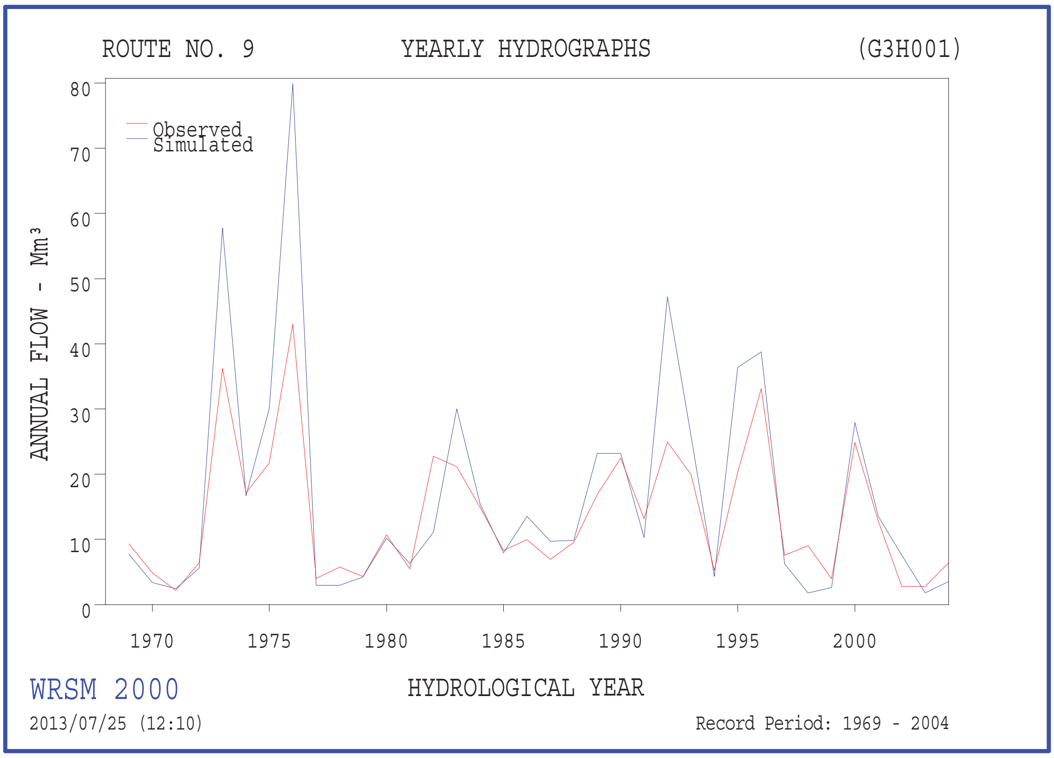


Figure C-19: G3H001 Yearly hydrographs

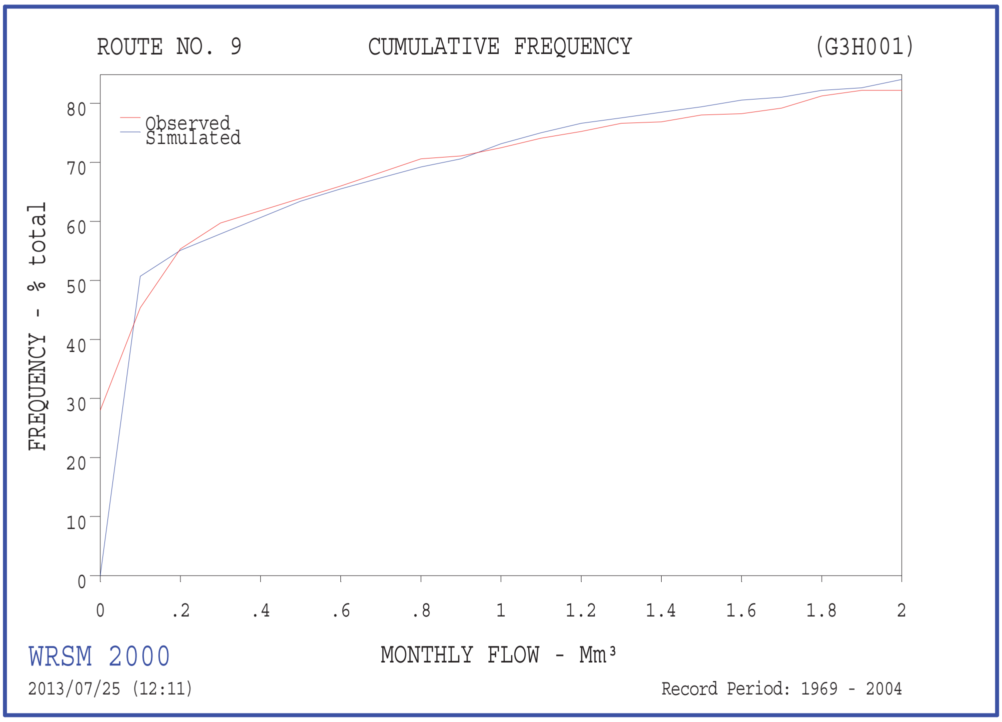


Figure C-20: G3H001 Cumulative frequency

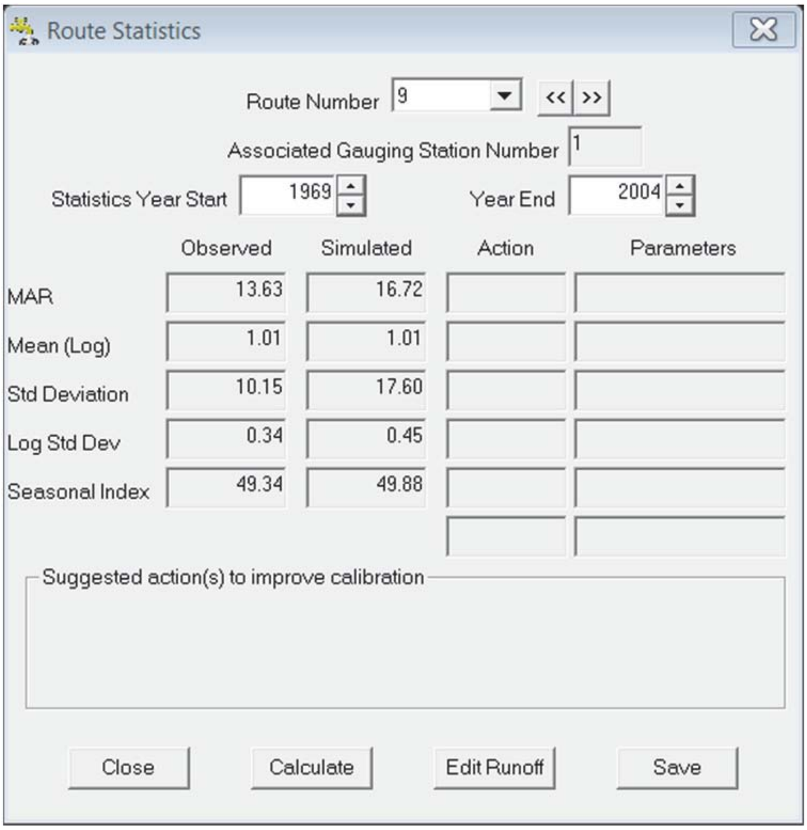


Figure C-21: G3H001 Statistics

Quaternary Catchment G10A

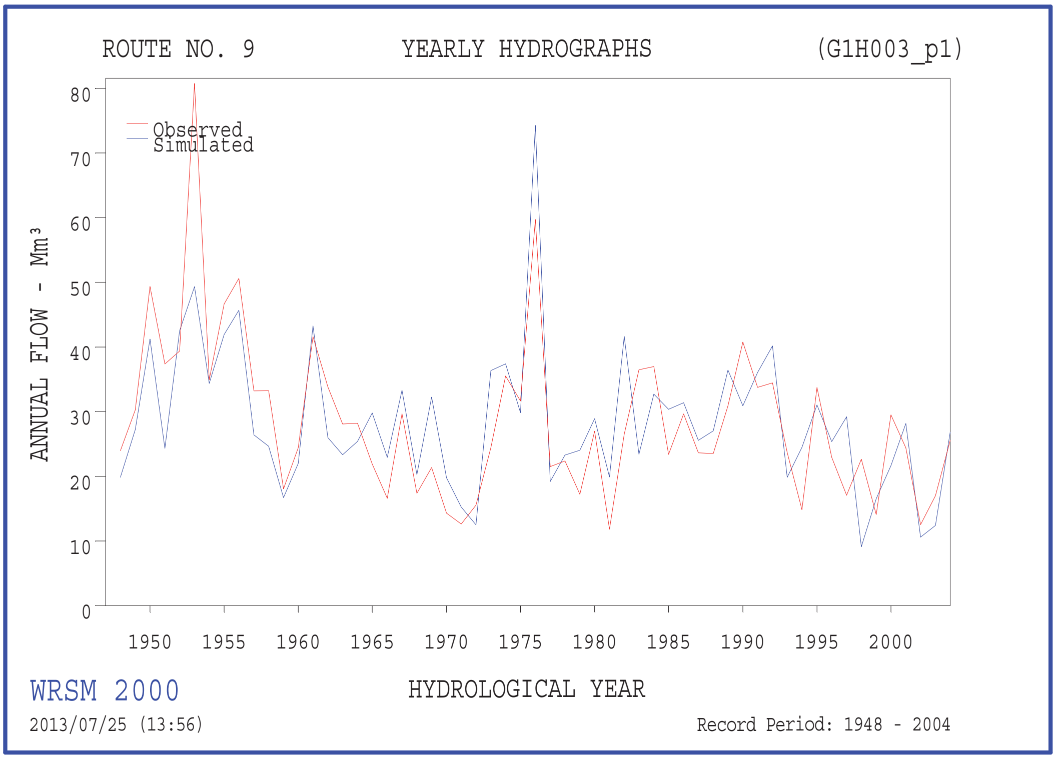


Figure C-22: G1H003 Yearly hydrograph

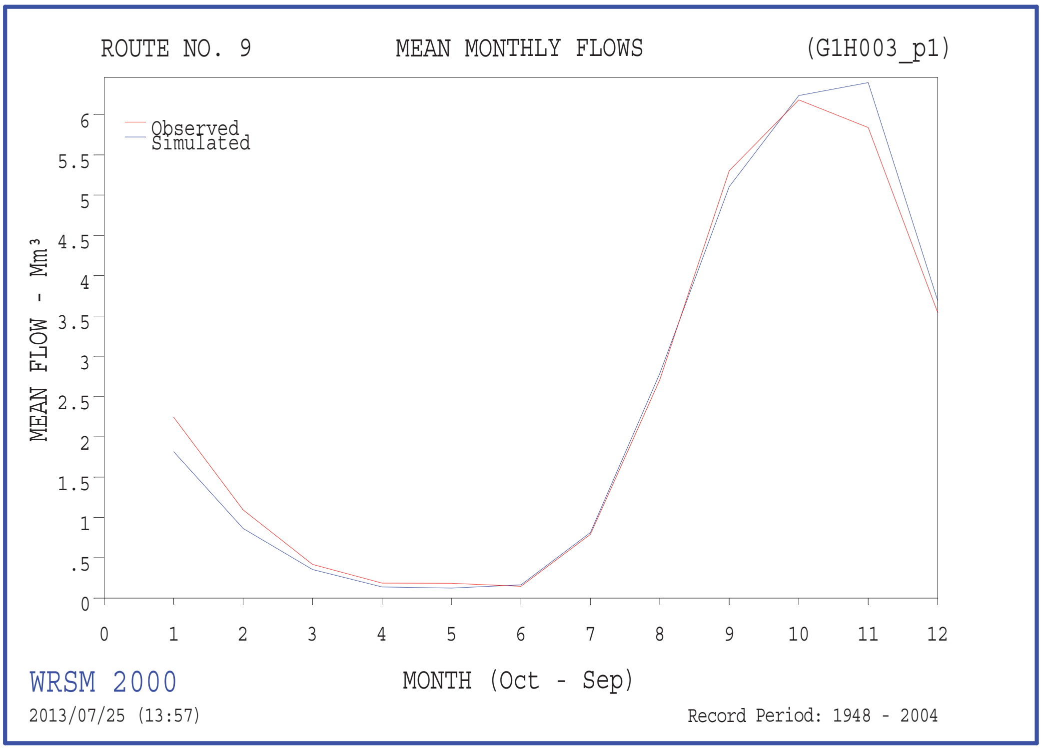


Figure C-23: G1H003 Mean monthly flows

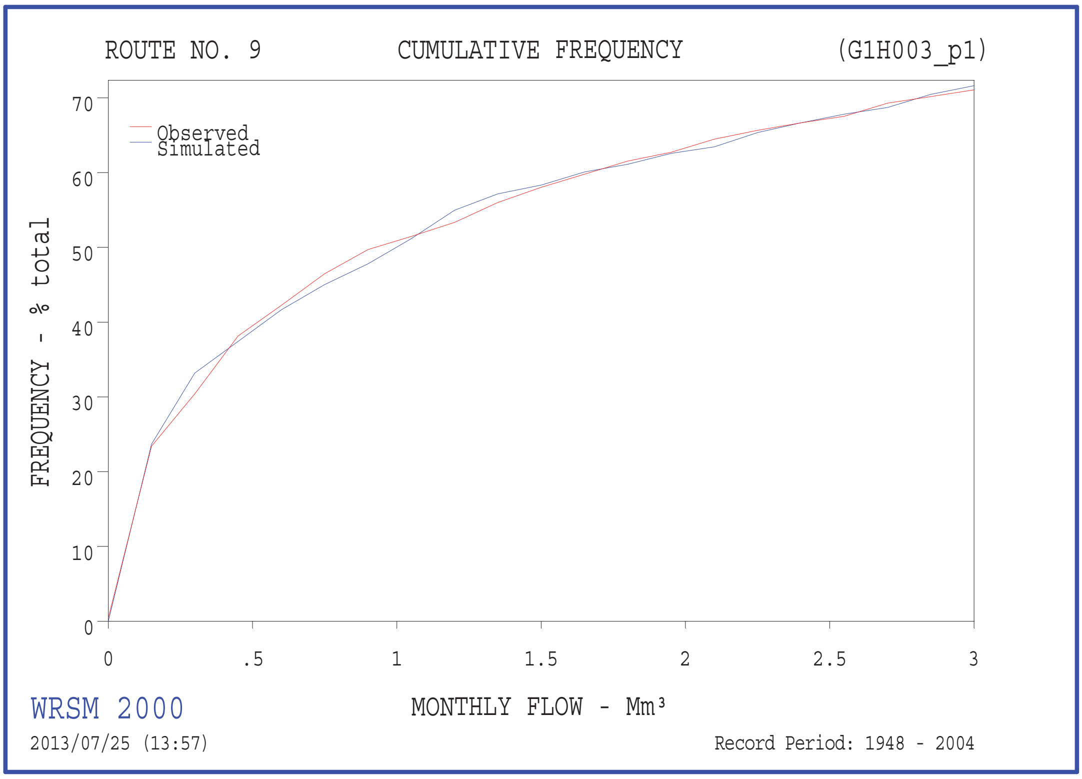


Figure C-24: G1H003 Cumulative frequency

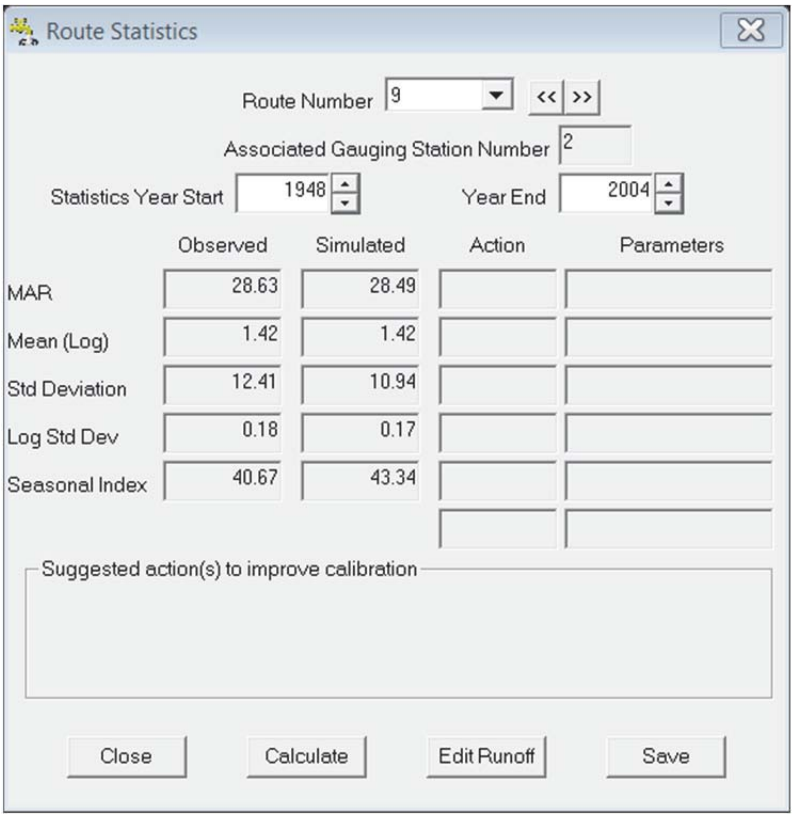


Figure C-25: G1H003 Statistics

Quaternary Catchment G10C

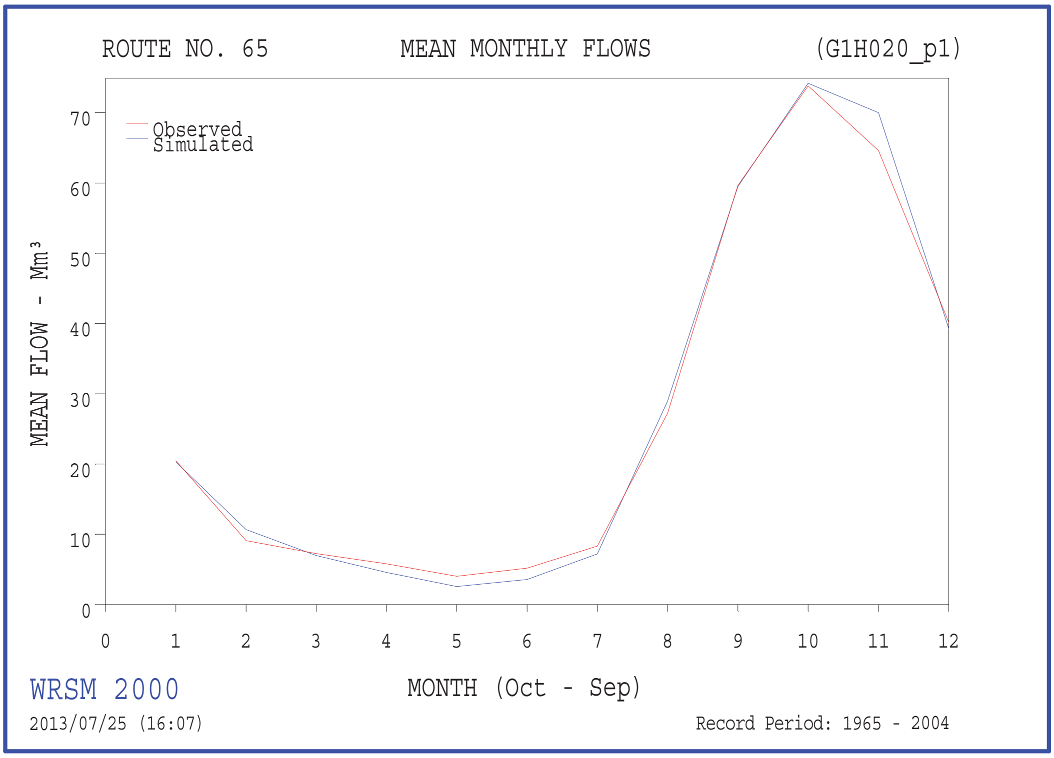


Figure C-26: G1H020 Mean monthly flows

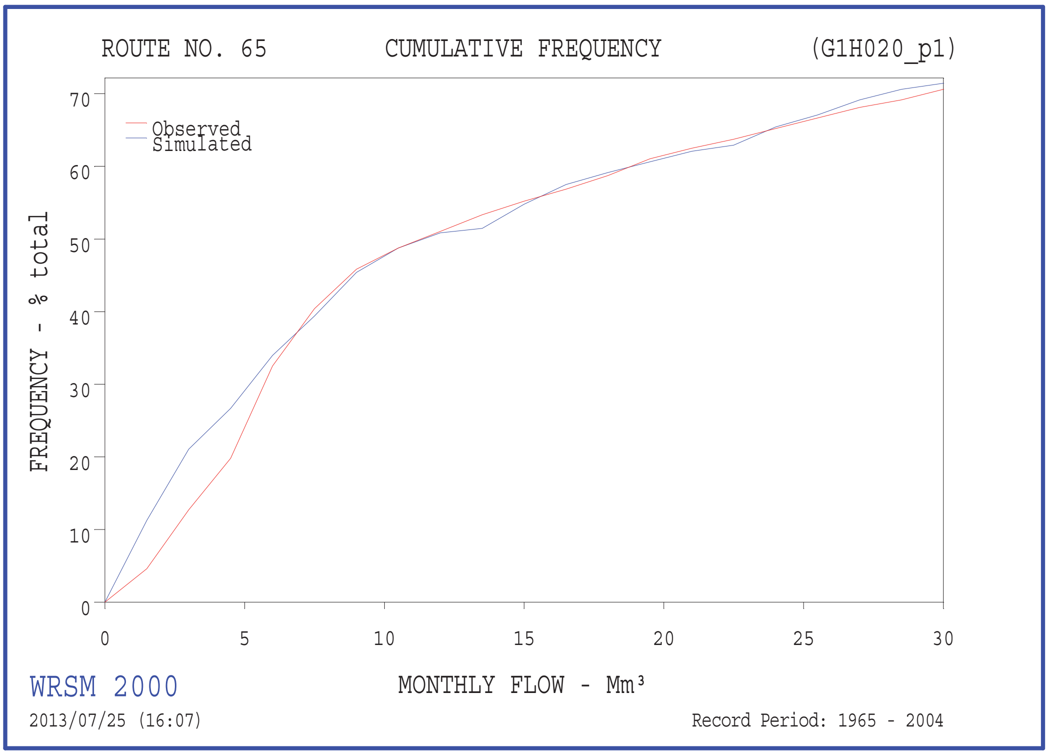


Figure C-27: G1H020 Cumulative frequency

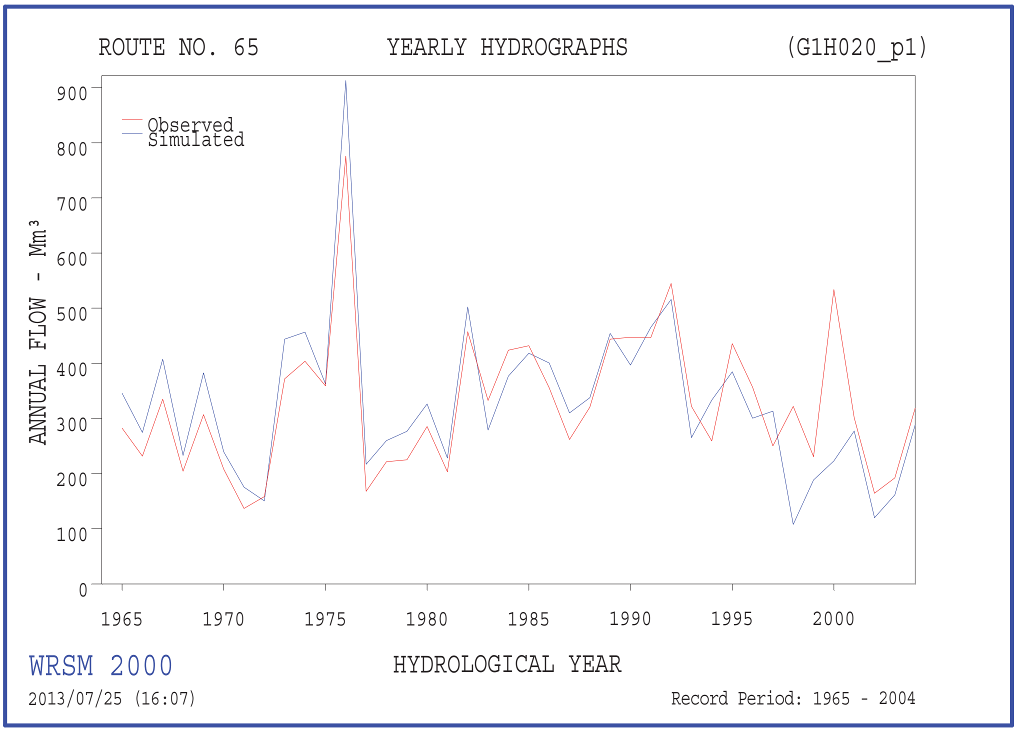


Figure C-28: G1H020 Yearly hydrograph

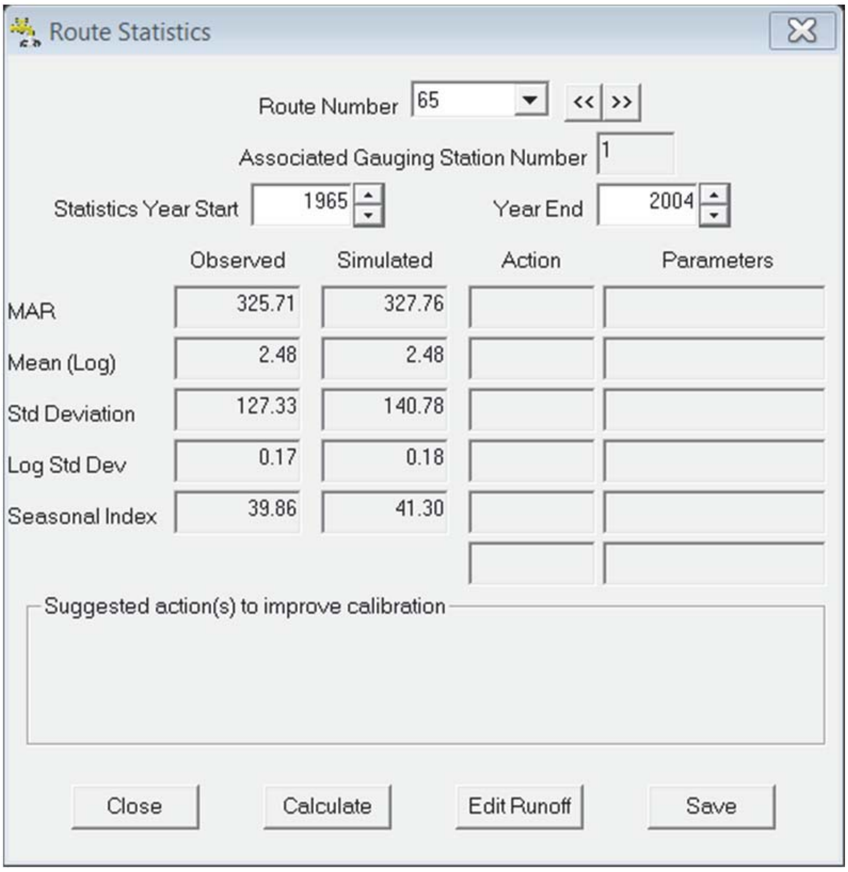


Figure C-29: G1H020 Statistics

Tertiary Catchment D51

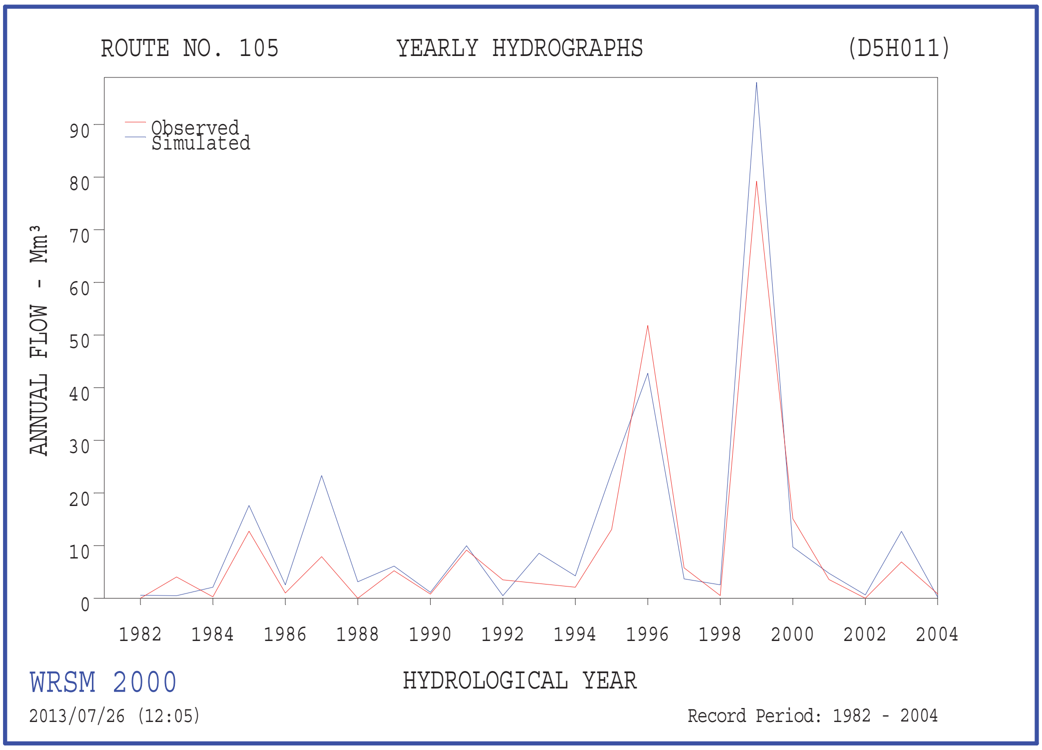


Figure C-30: D5H011 Yearly hydrograph

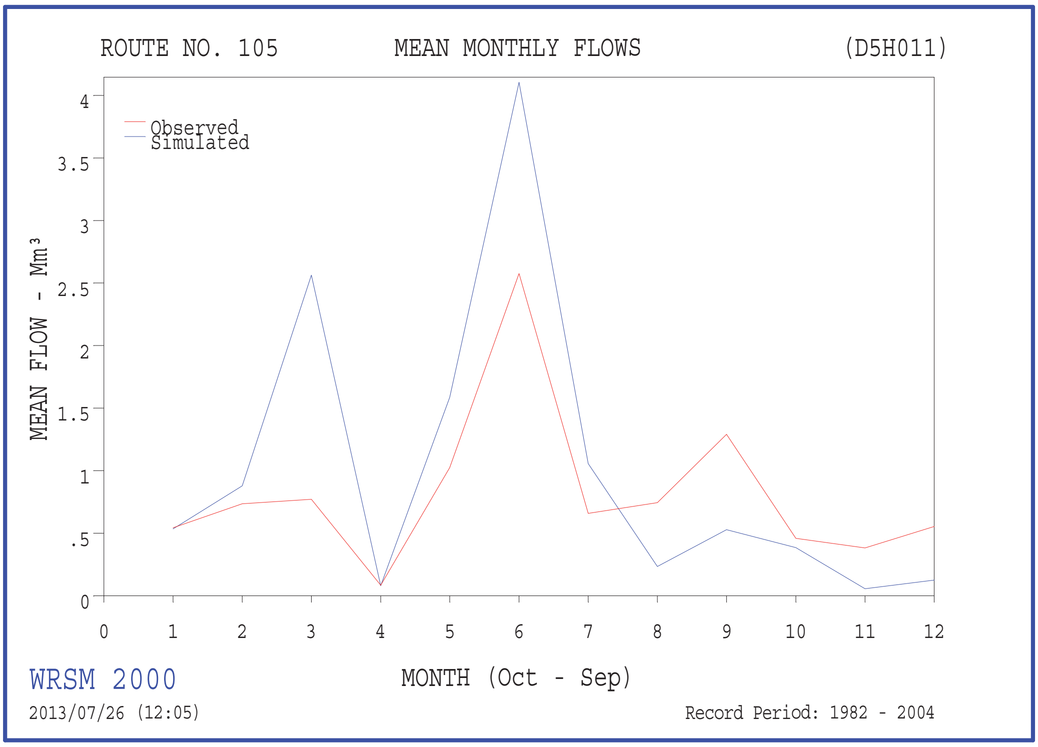


Figure C-31: D5H011 Mean monthly flows

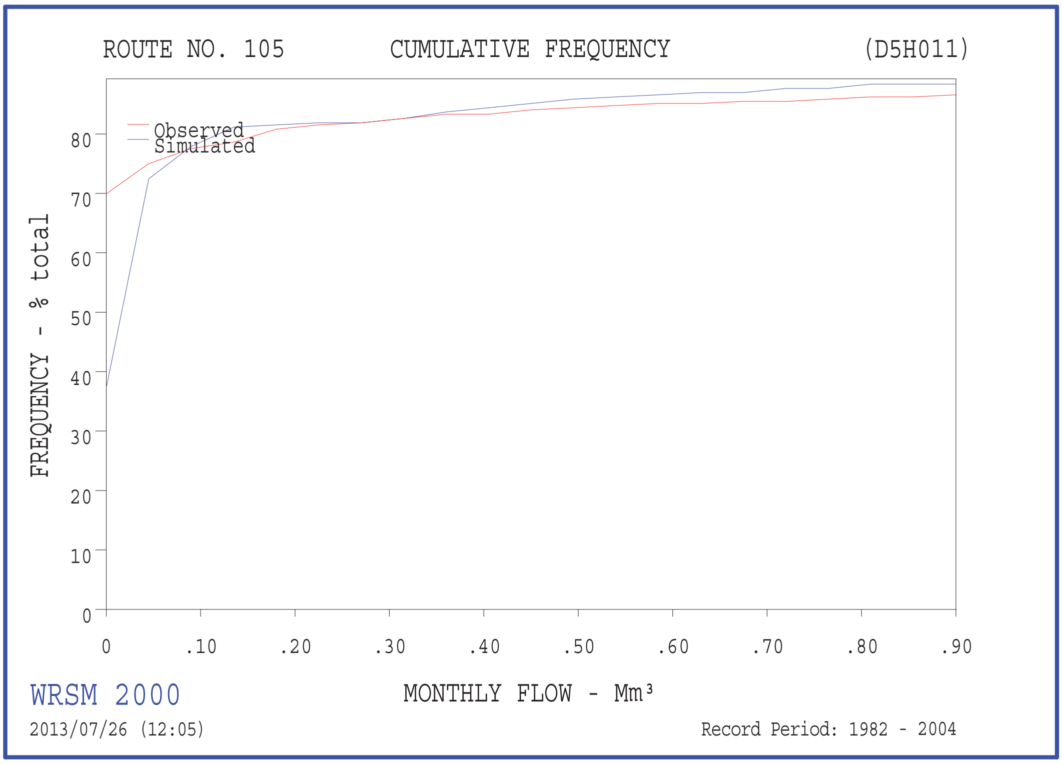


Figure C-32: D5H011 Cumulative frequency

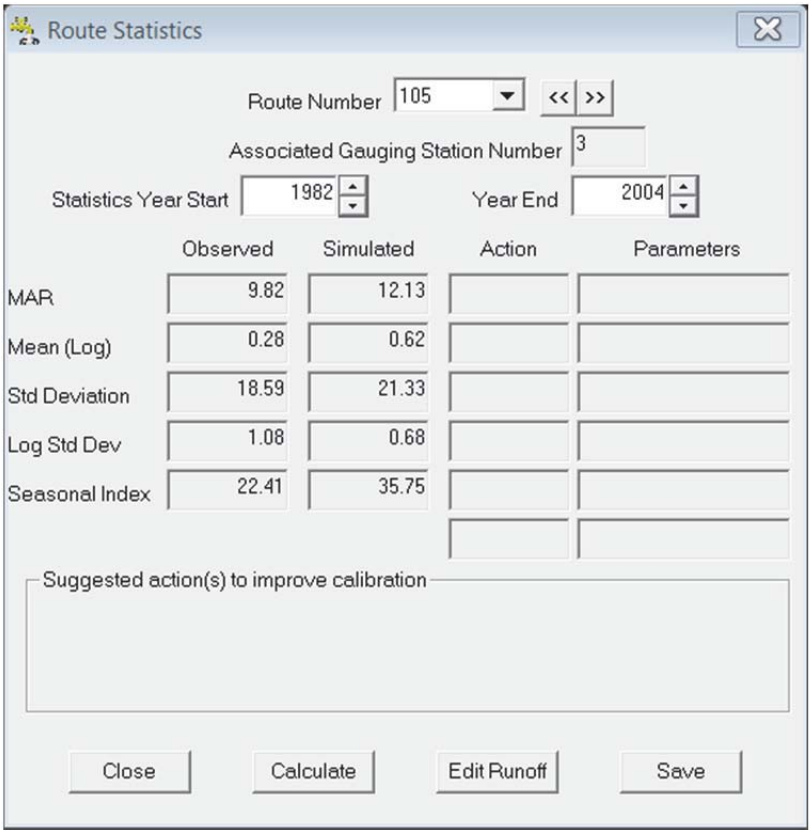


Figure C-33: D5H011 Statistics

Tertiary Catchment E22

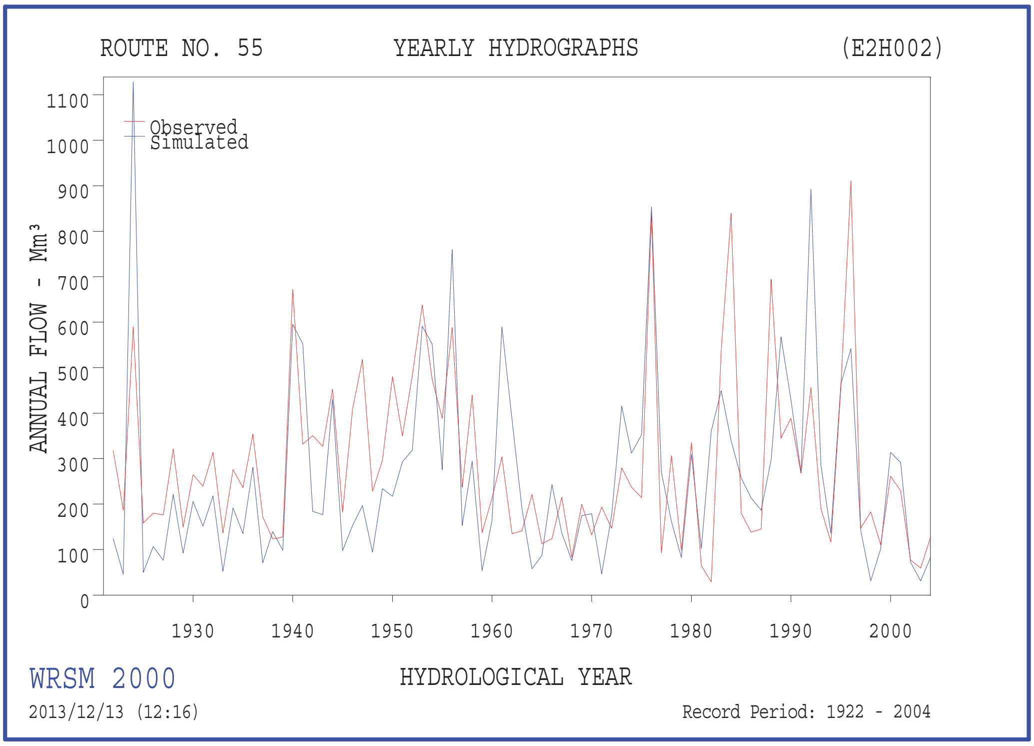


Figure C-34: E2H002 Yearly hydrograph

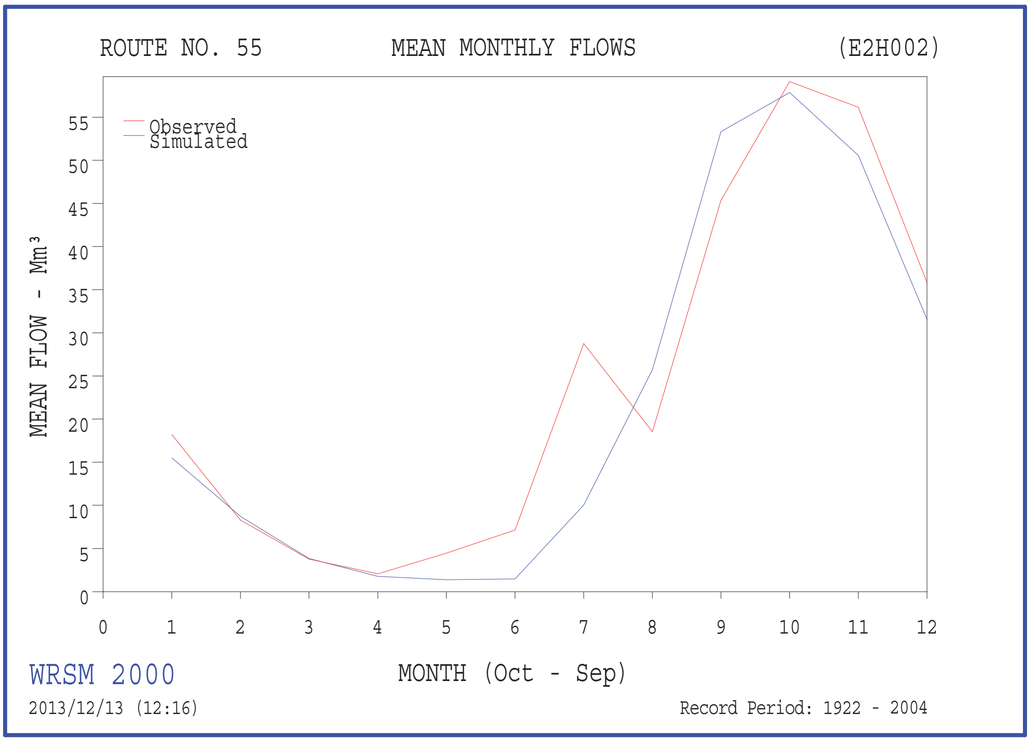


Figure C-35: E2H002 Mean monthly flows

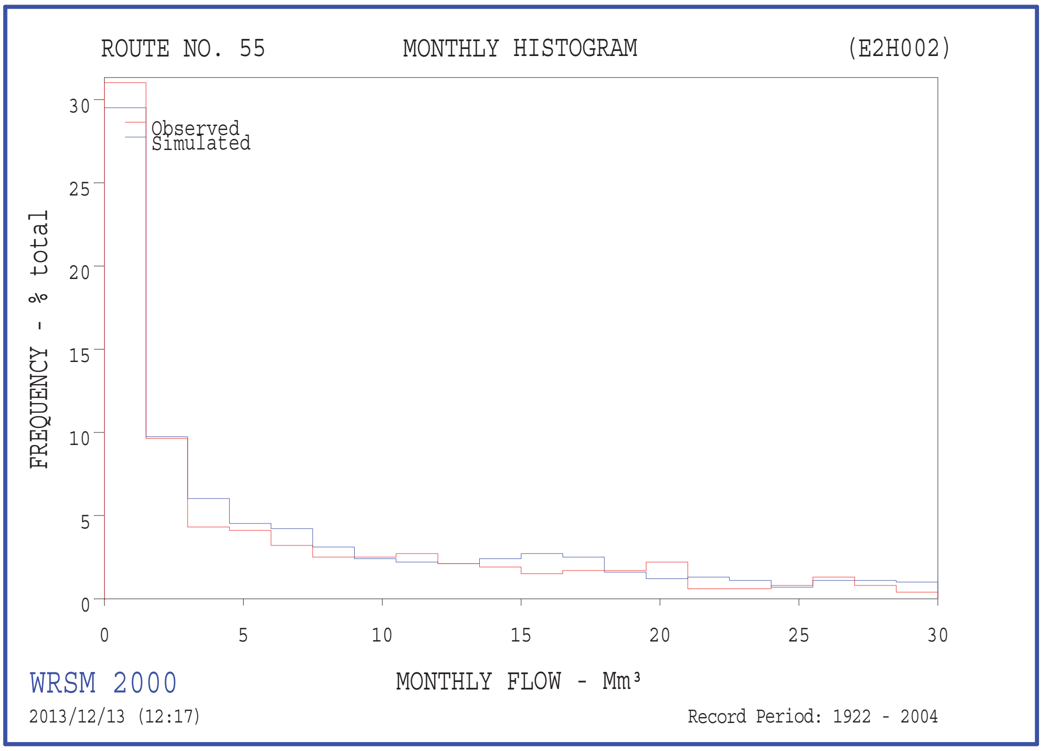


Figure C-36: E2H002 Monthly histogram

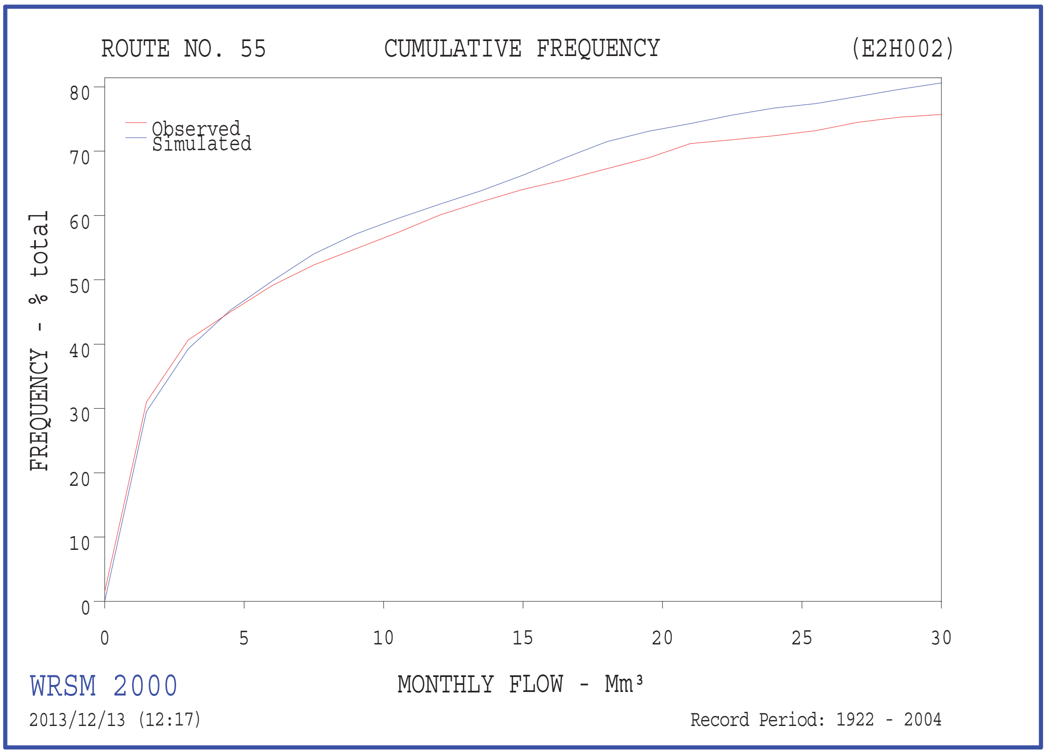


Figure C-37: E2H002 Cumulative frequency

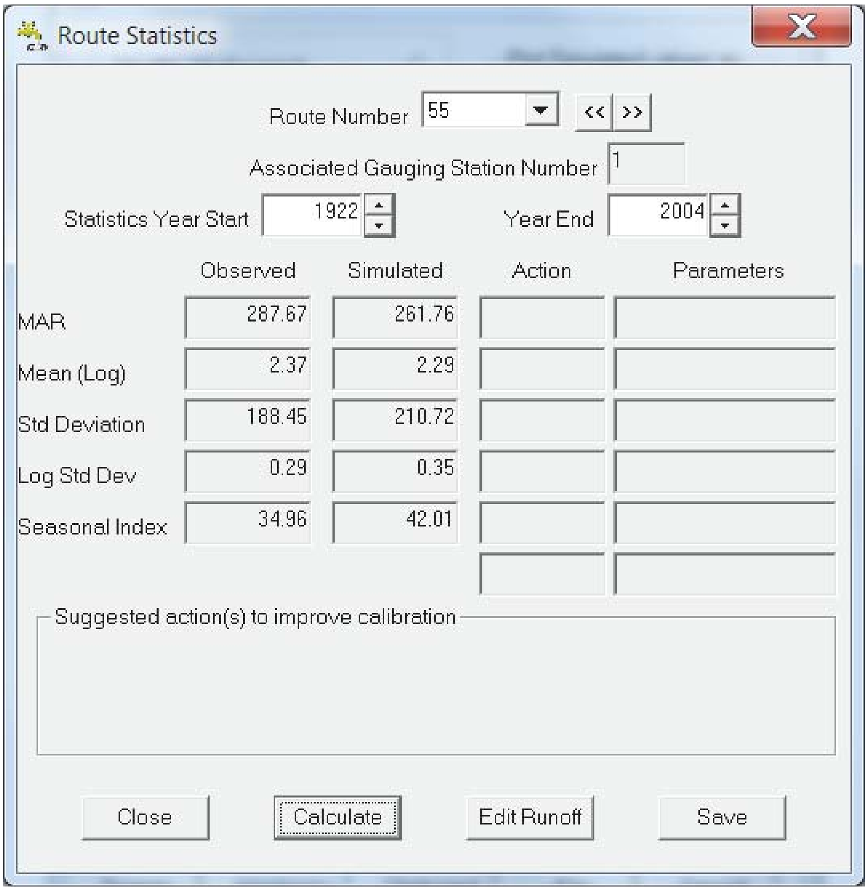


Figure C-38: E2H002 Statistics

Quaternary Catchment G40C

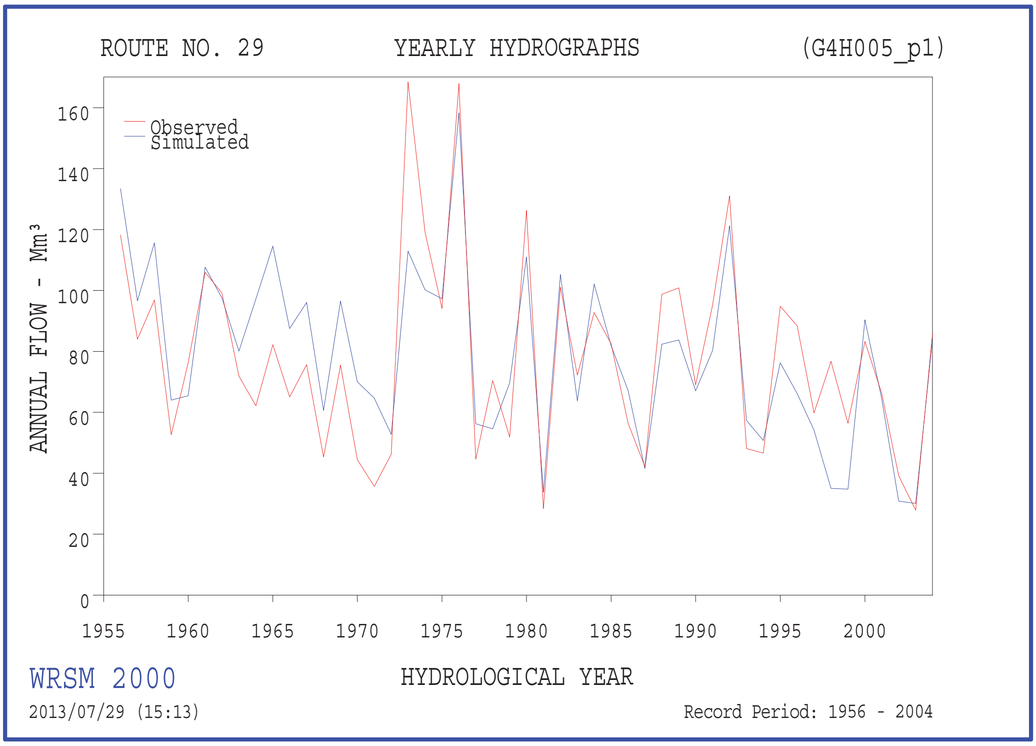


Figure C-39: G4H005 Yearly hydrograph

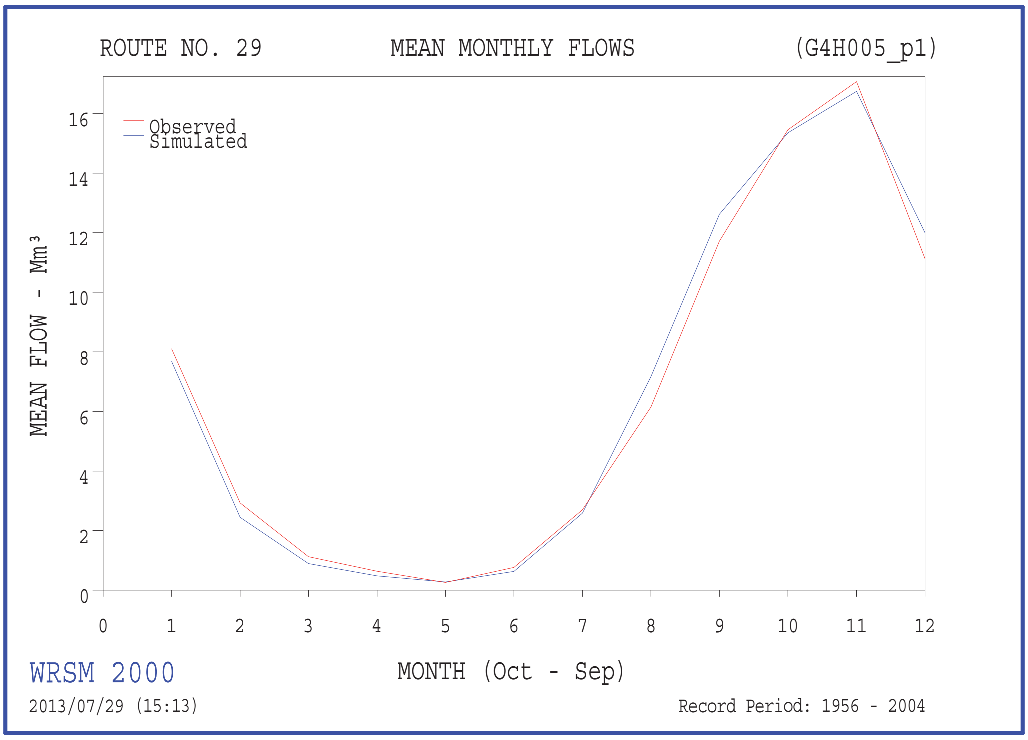


Figure C-40: G4H005 Mean monthly flows

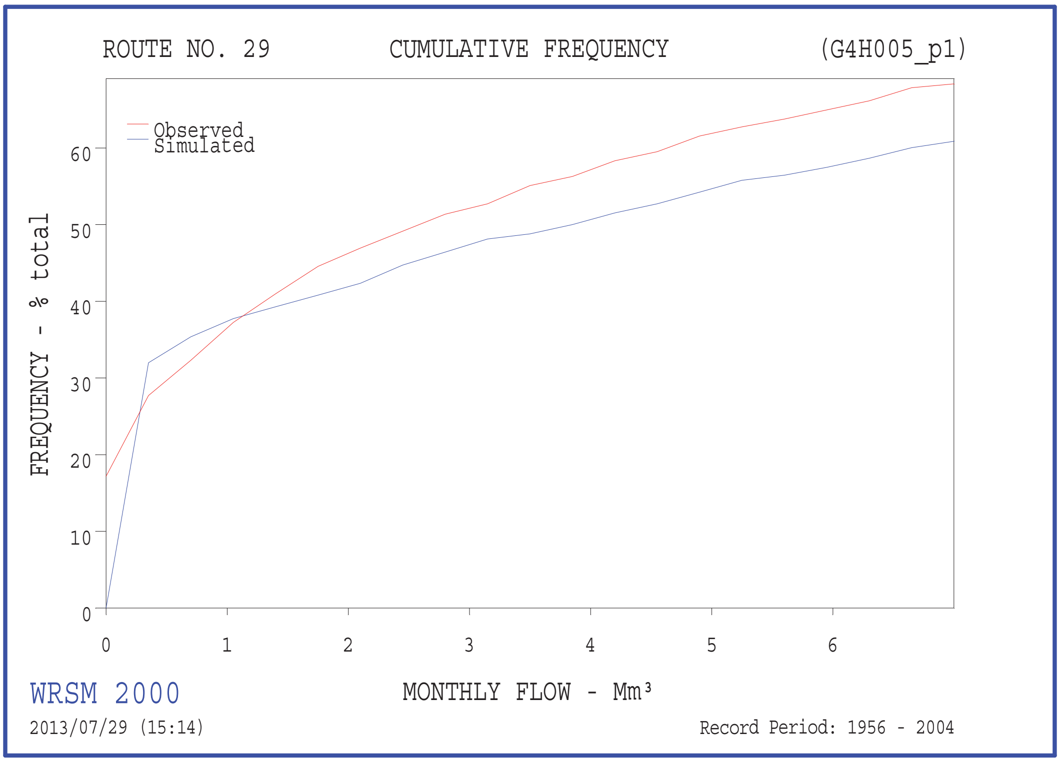


Figure C-41: G4H005 Cumulative frequency

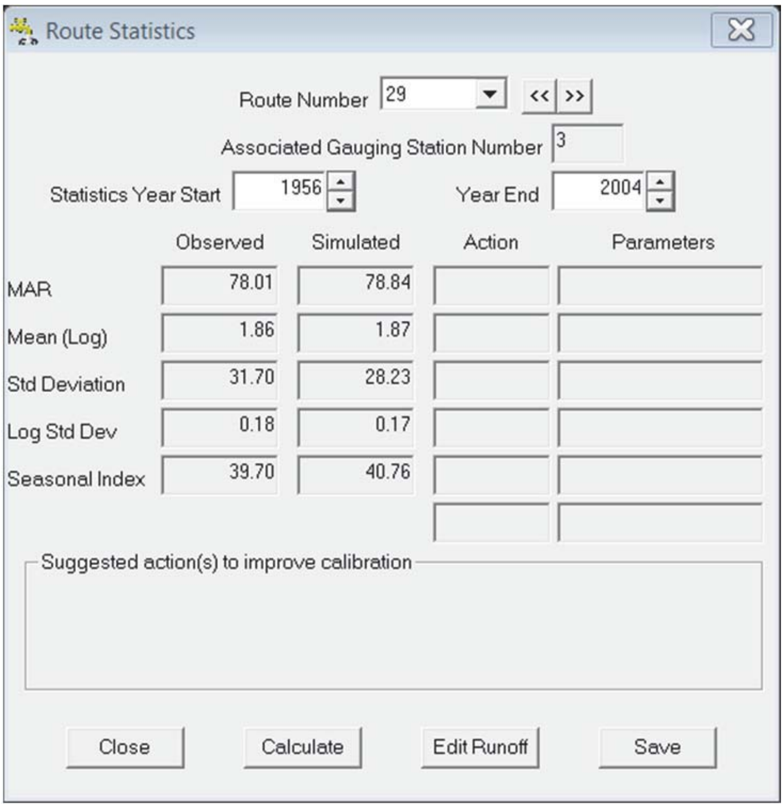


Figure C-42: G4H005 Statistics

Quaternary Catchment G40D

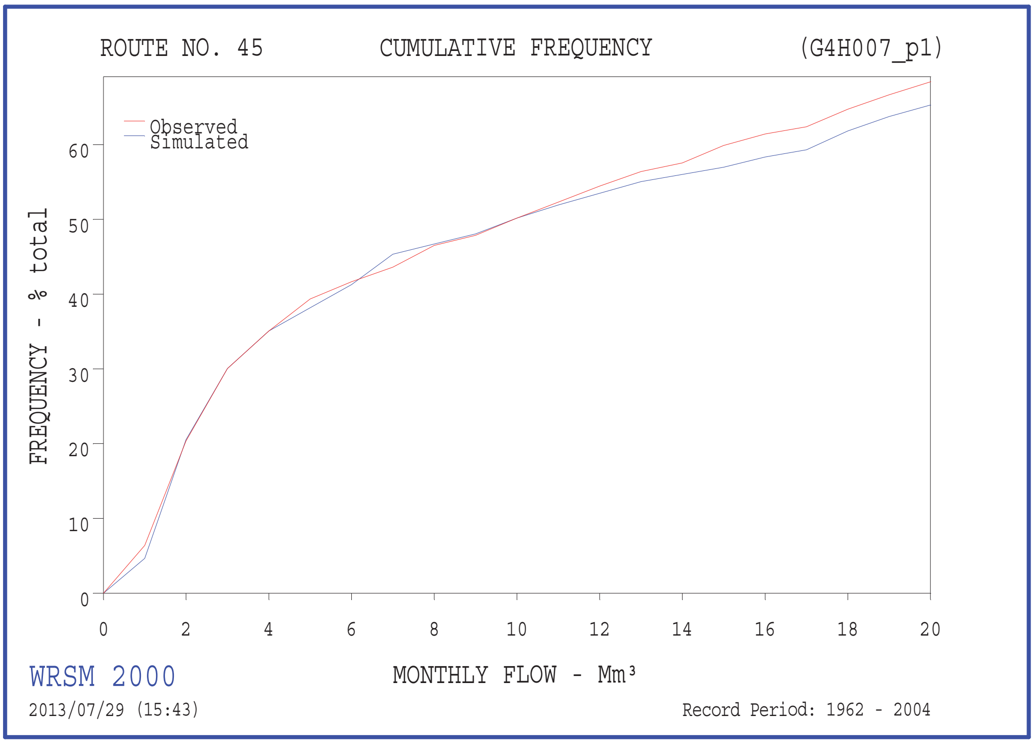


Figure C-43: G4H007 Cumulative frequency

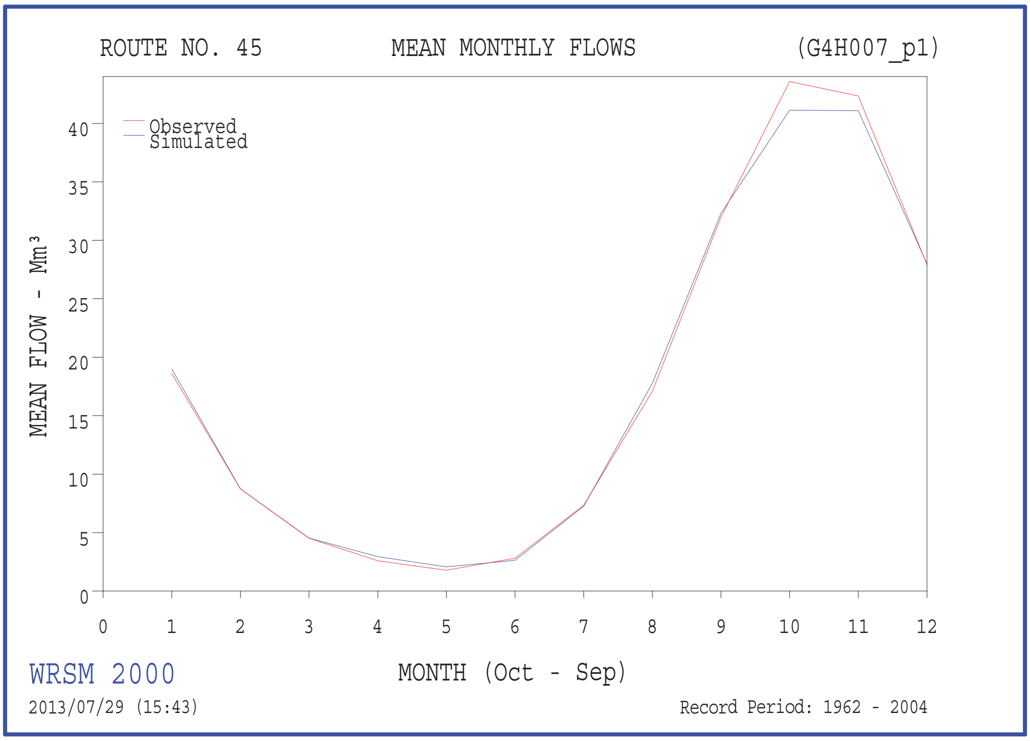


Figure C-44: G4H007 Mean monthly flows

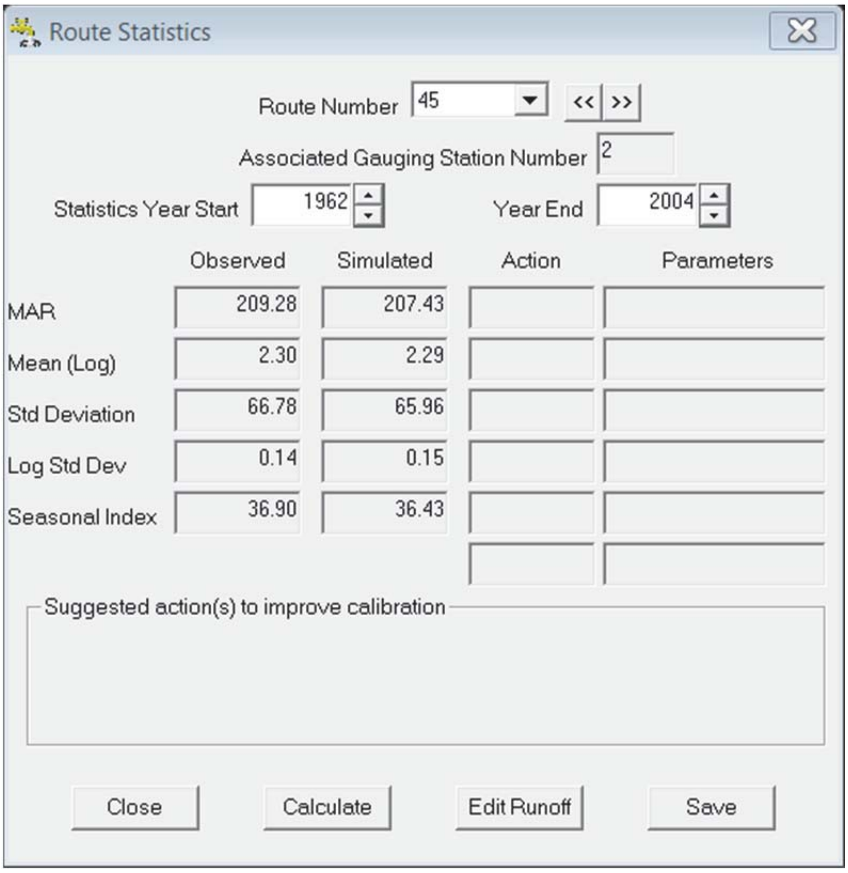


Figure C-45: G4H007 Statistics

Quaternary Catchment G50G

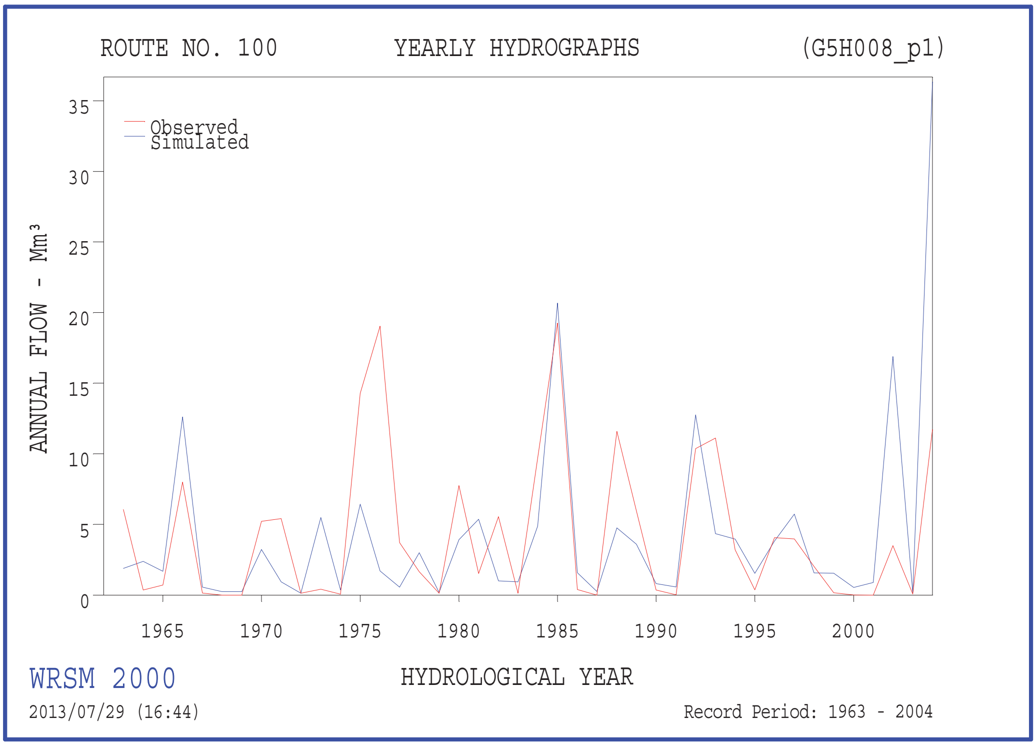


Figure C-46: G5H008 Yearly hydrographs

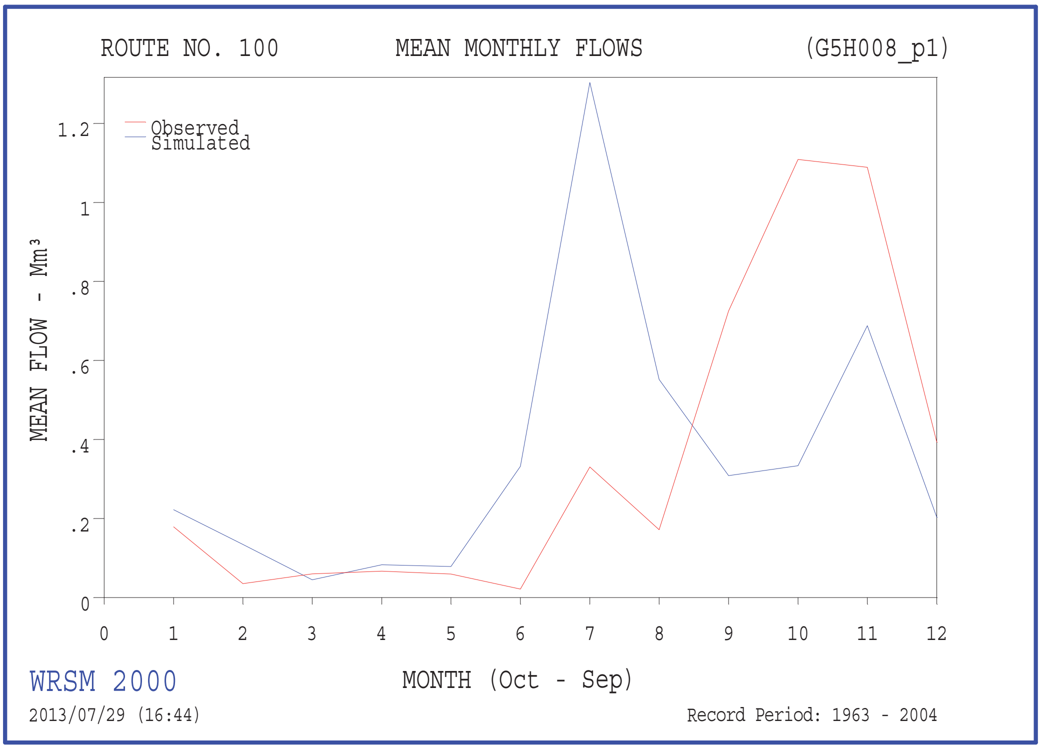


Figure C-47: G5H008 Mean monthly flows

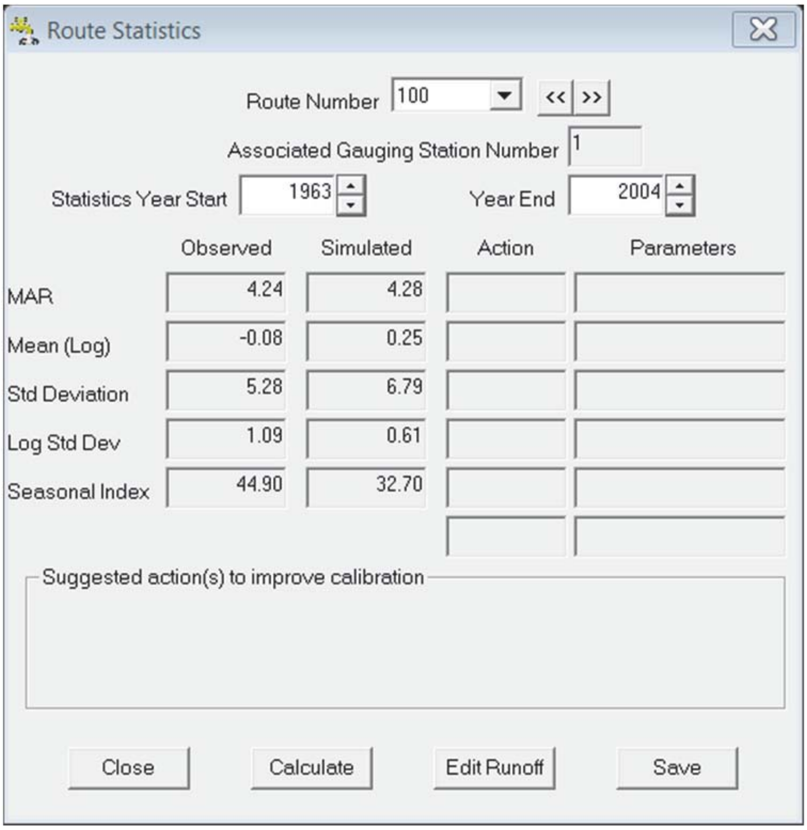


Figure C-48: G5H008 Statistics

Quaternary Catchment H10Ca

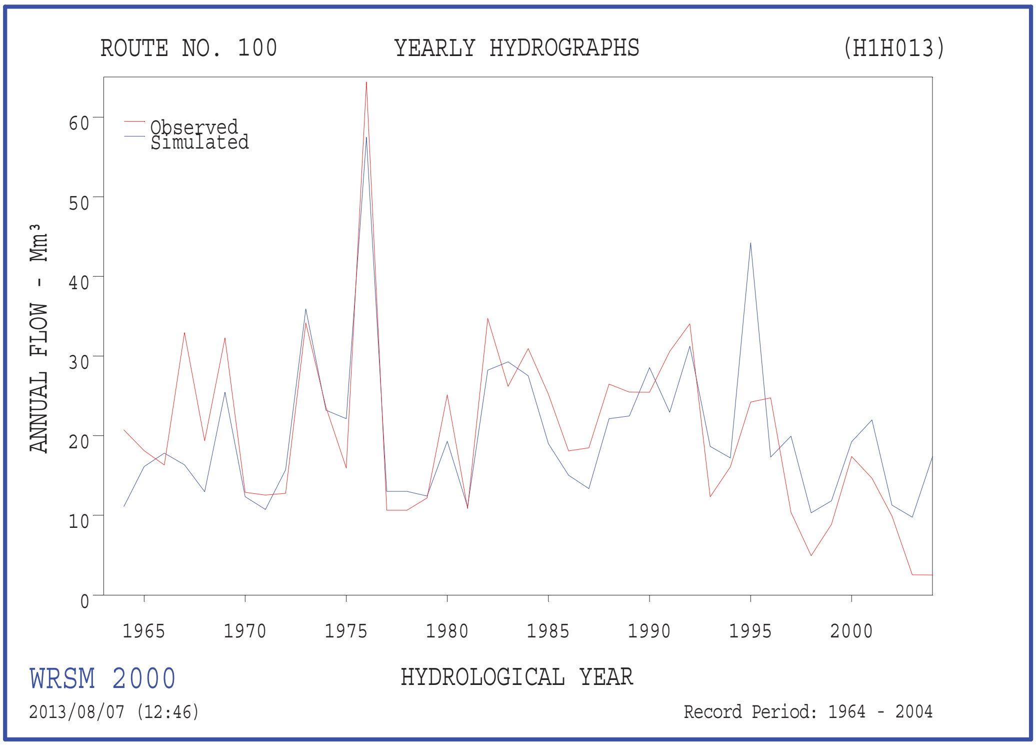


Figure C-49: H1H013 Yearly hydrograph

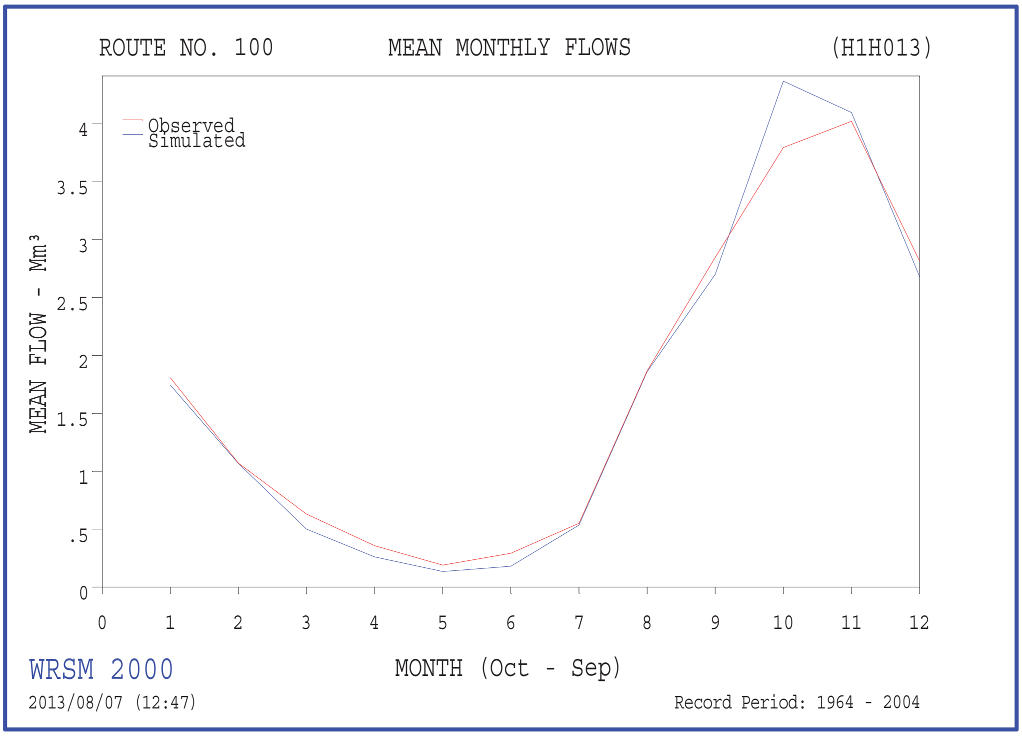


Figure C-50: H1H013 Mean monthly flows

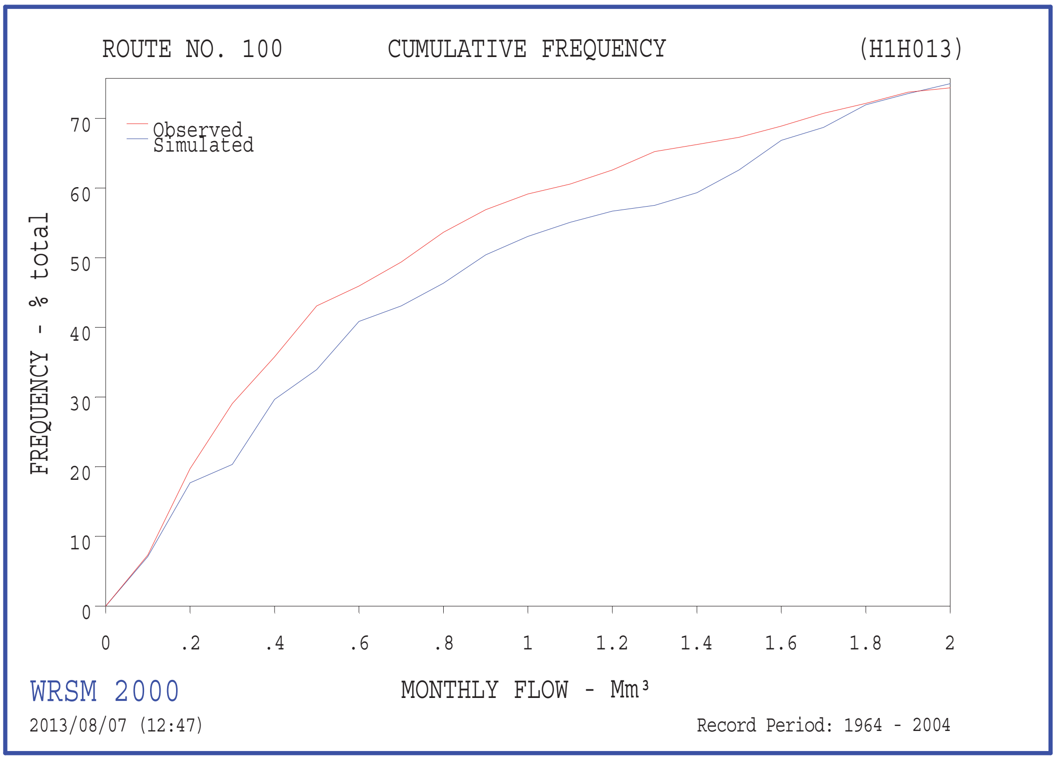


Figure C-50: H1H013 Cumulative frequency

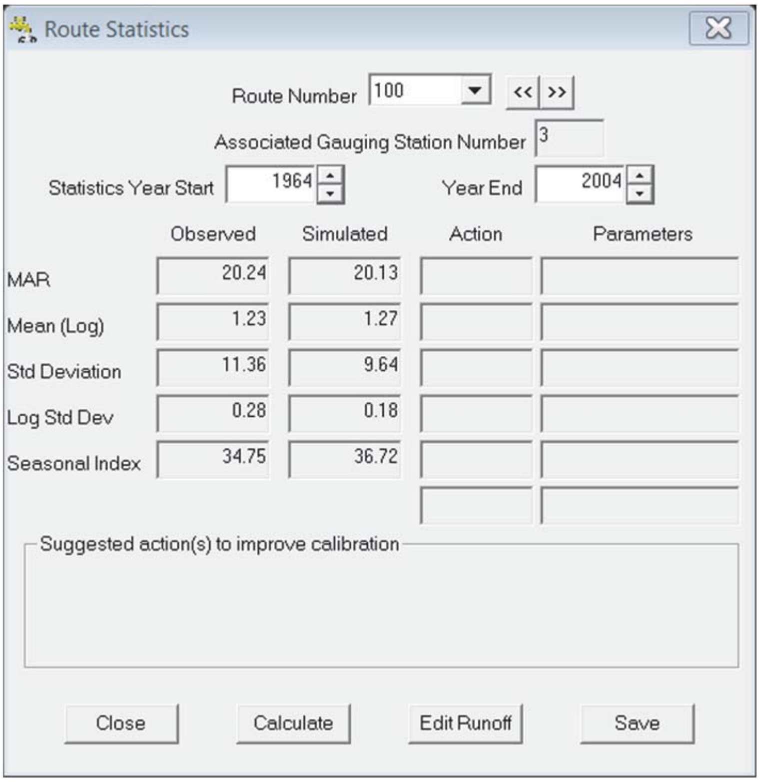


Figure C-51: H1H013 Statistics

Quaternary Catchment H10C

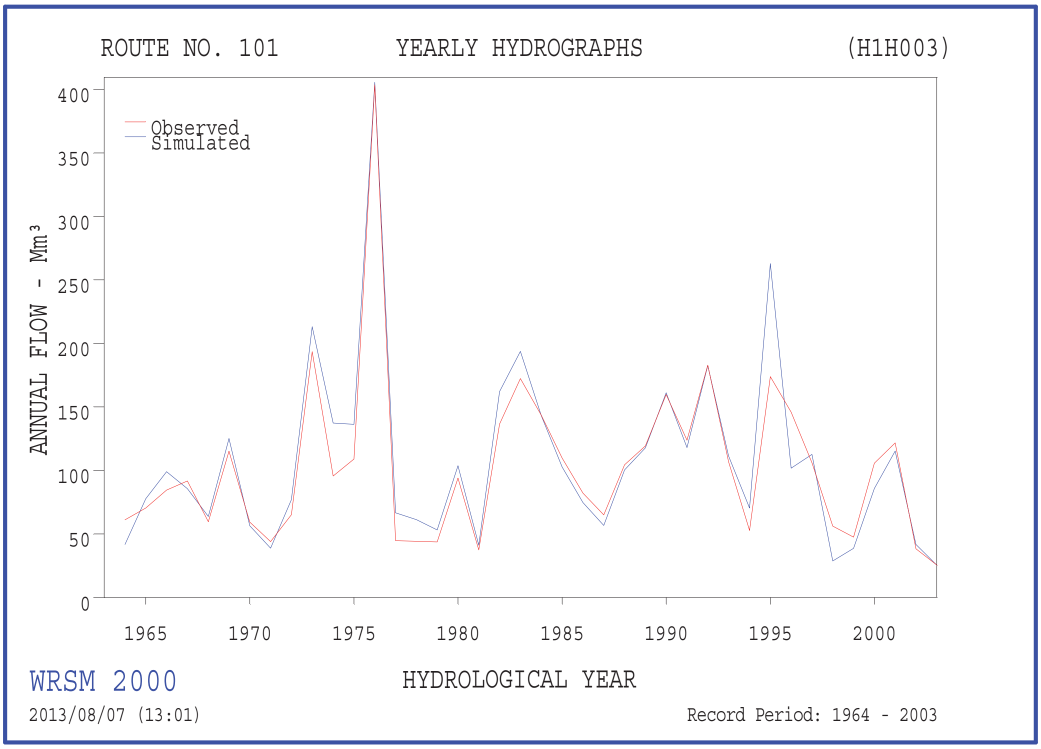


Figure C-53: H1H013 Yearly hydrographs

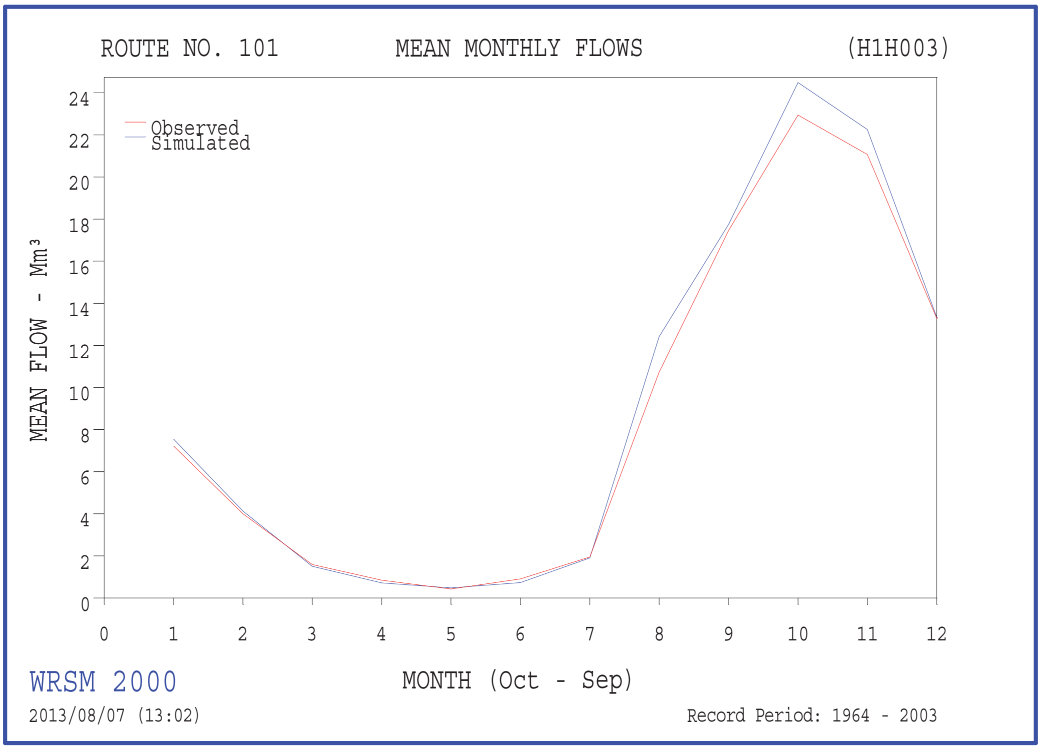


Figure C-54: H1H013 Mean monthly flows

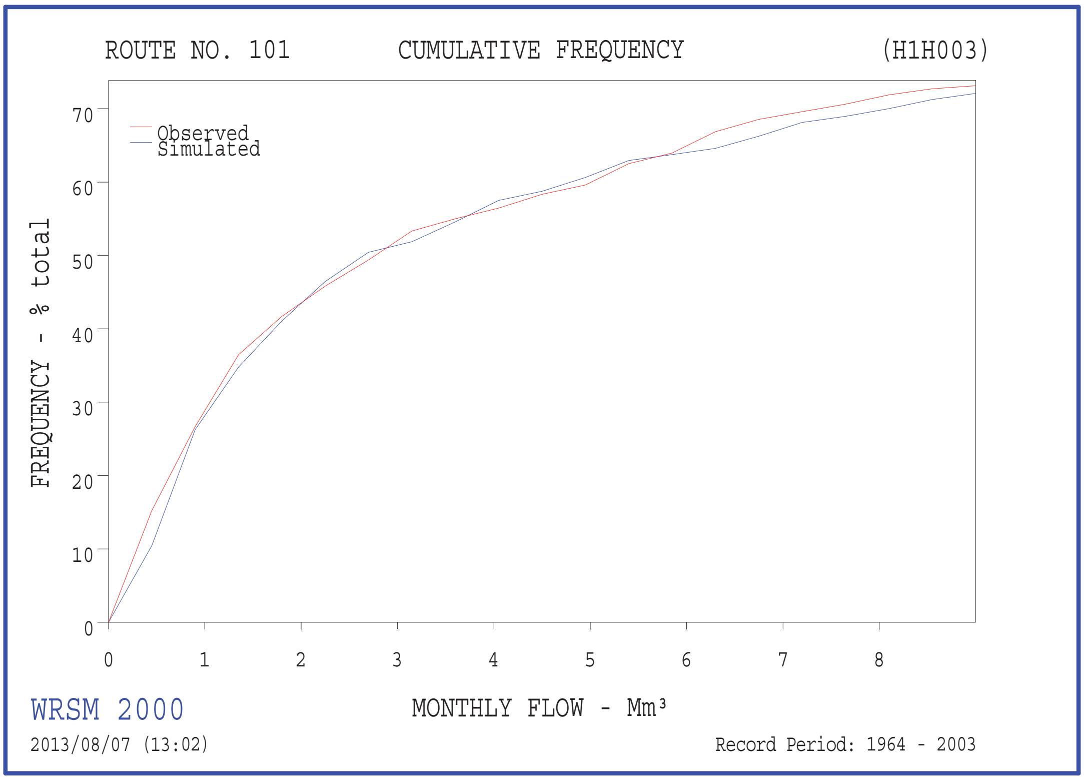


Figure C-55: H1H013 Cumulative frqeuency

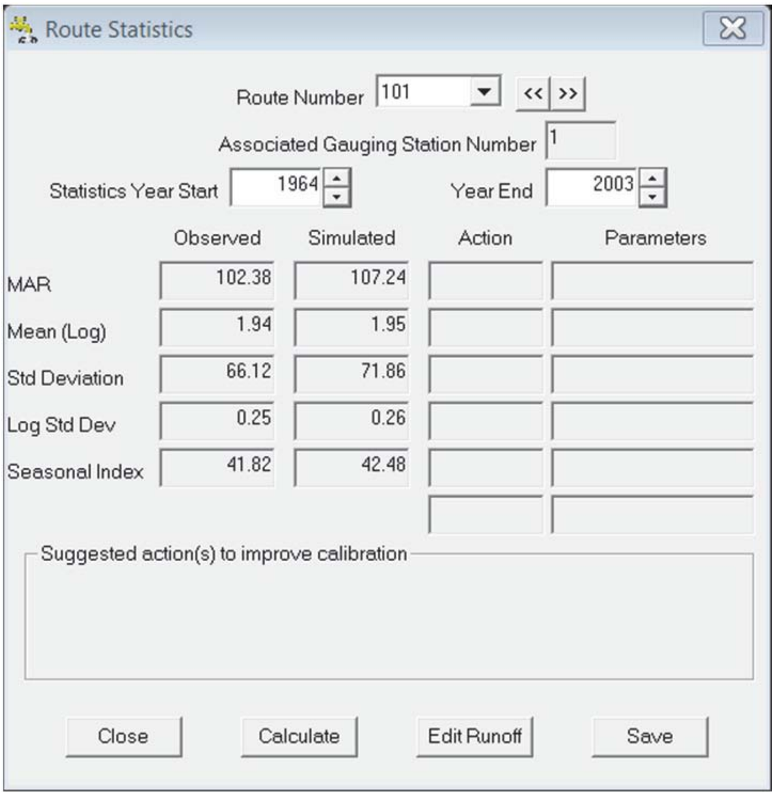


Figure C-56: H1H013 Statistics

Quaternary Catchment H10D

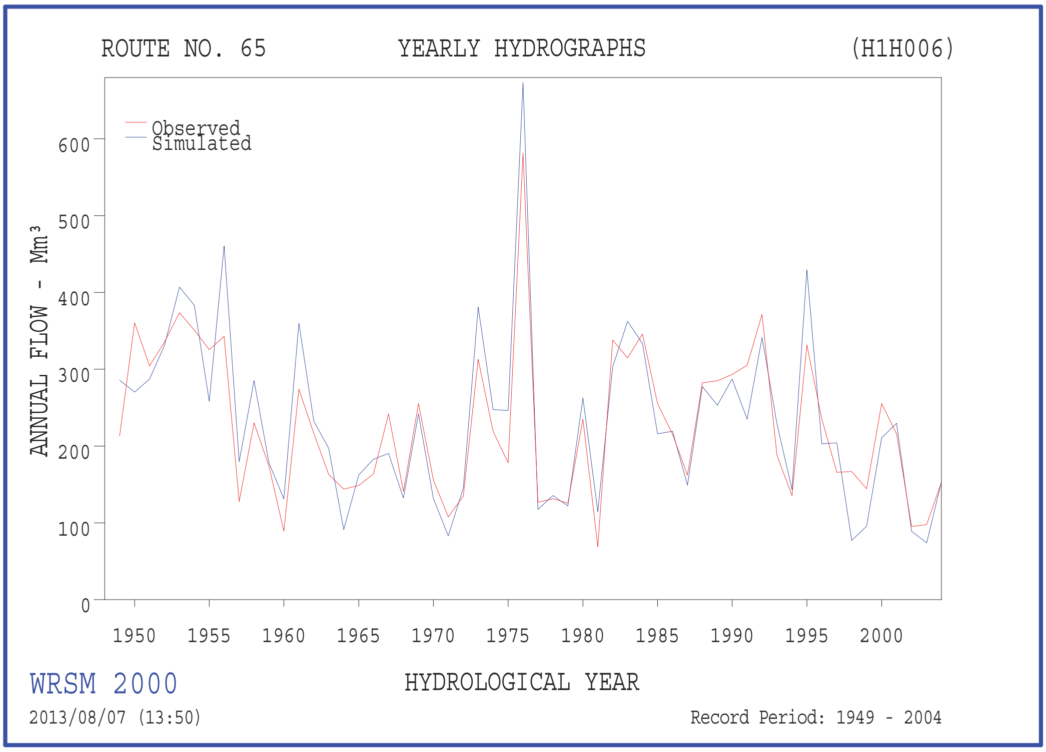


Figure C-57: H1H006 Yearly hydrographs

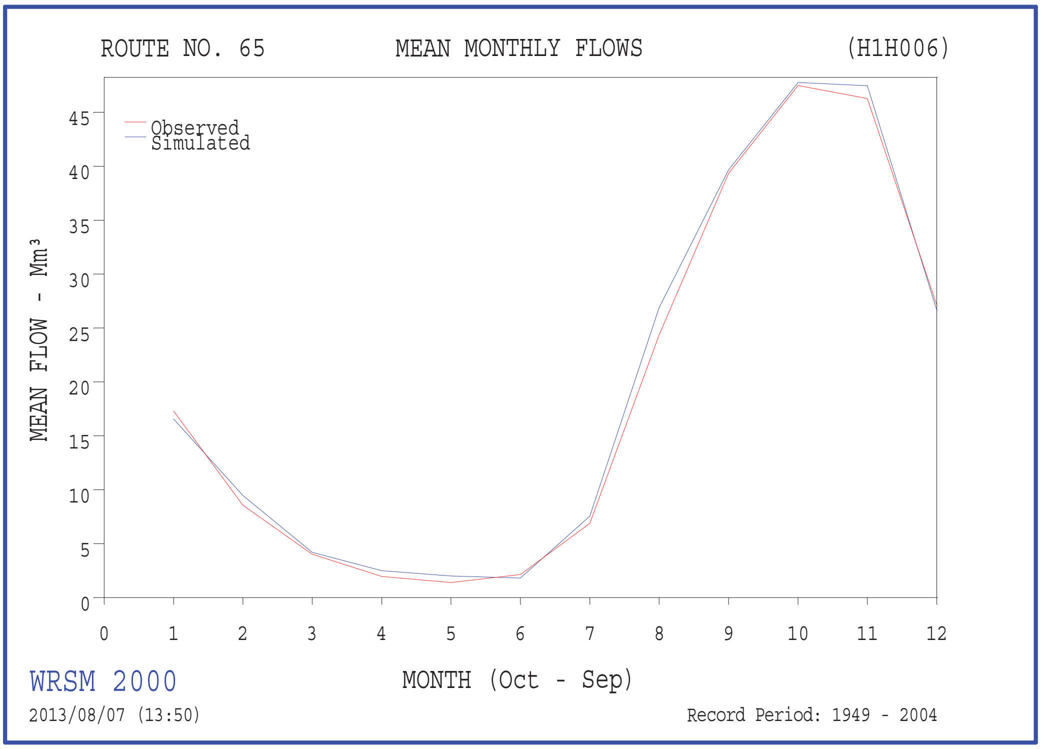


Figure C-58: H1H006 Mean monthly flows

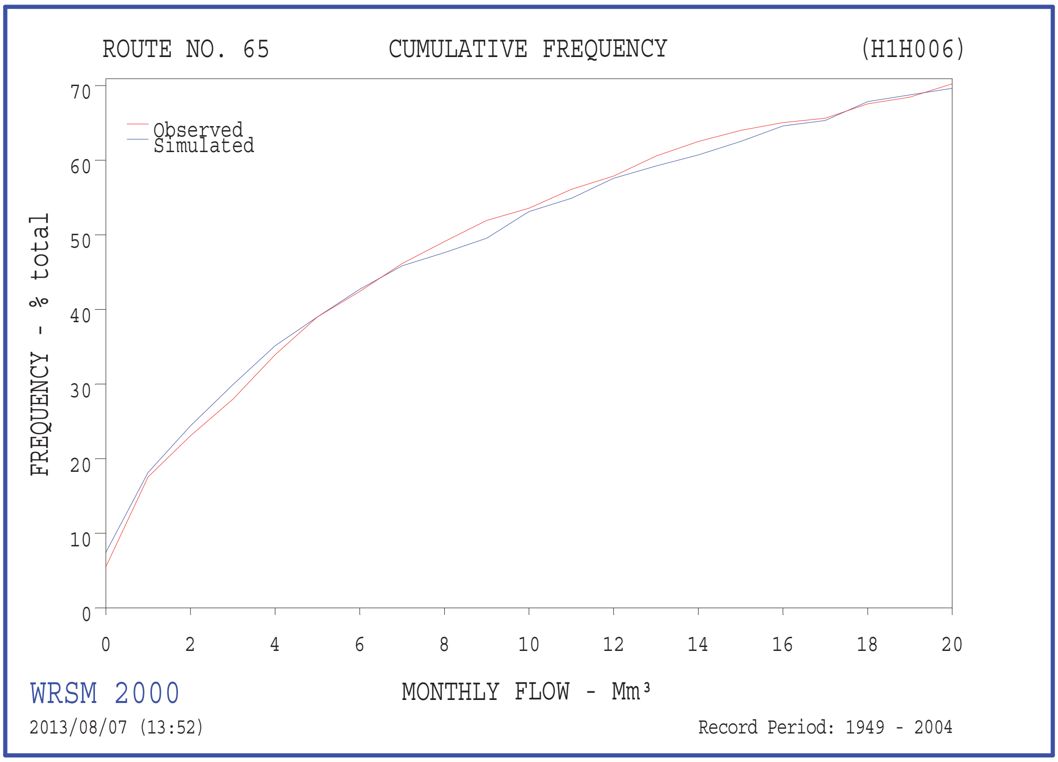


Figure C-59: H1H006 Cumulative frequency

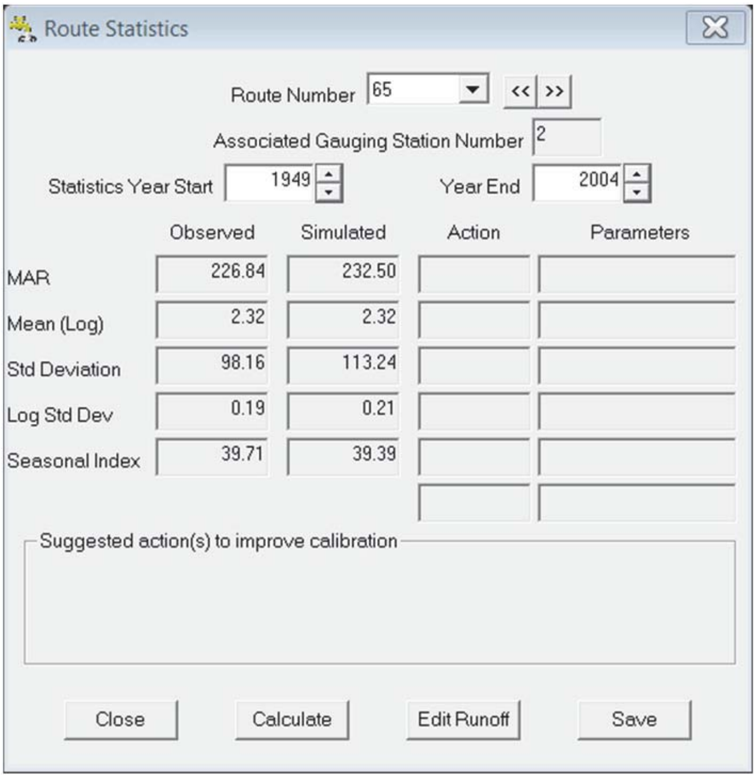


Figure C-60: H1H006 Statistics

Quaternary Catchment H60A

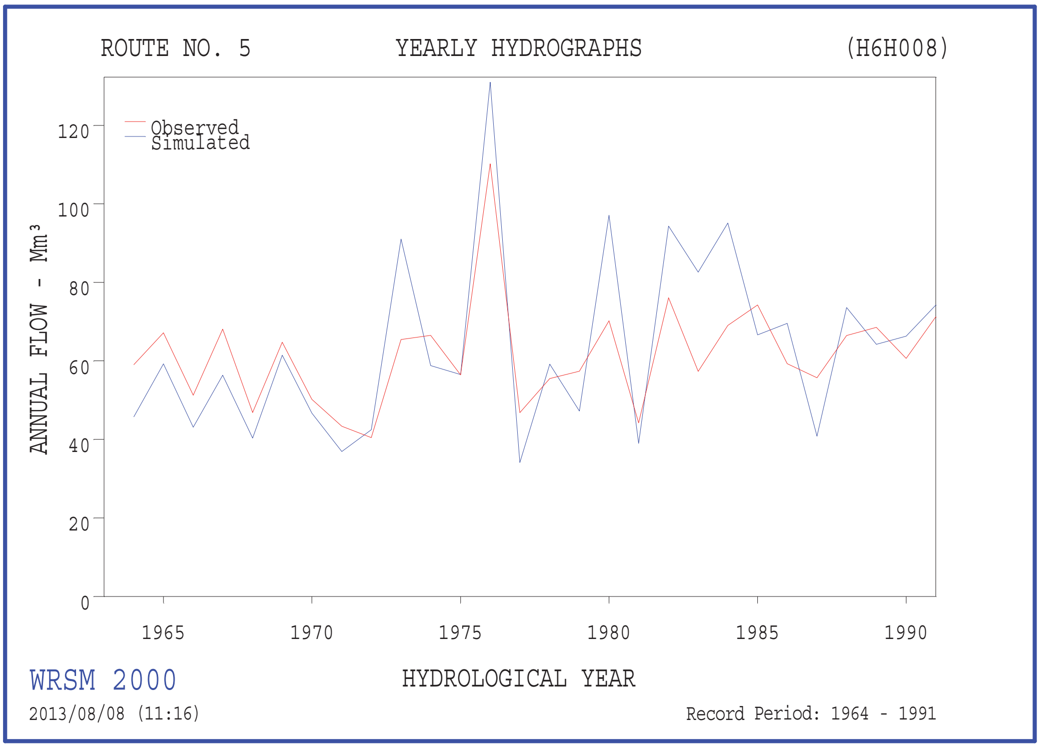


Figure C-61: H6H008 Yearly hydrographs

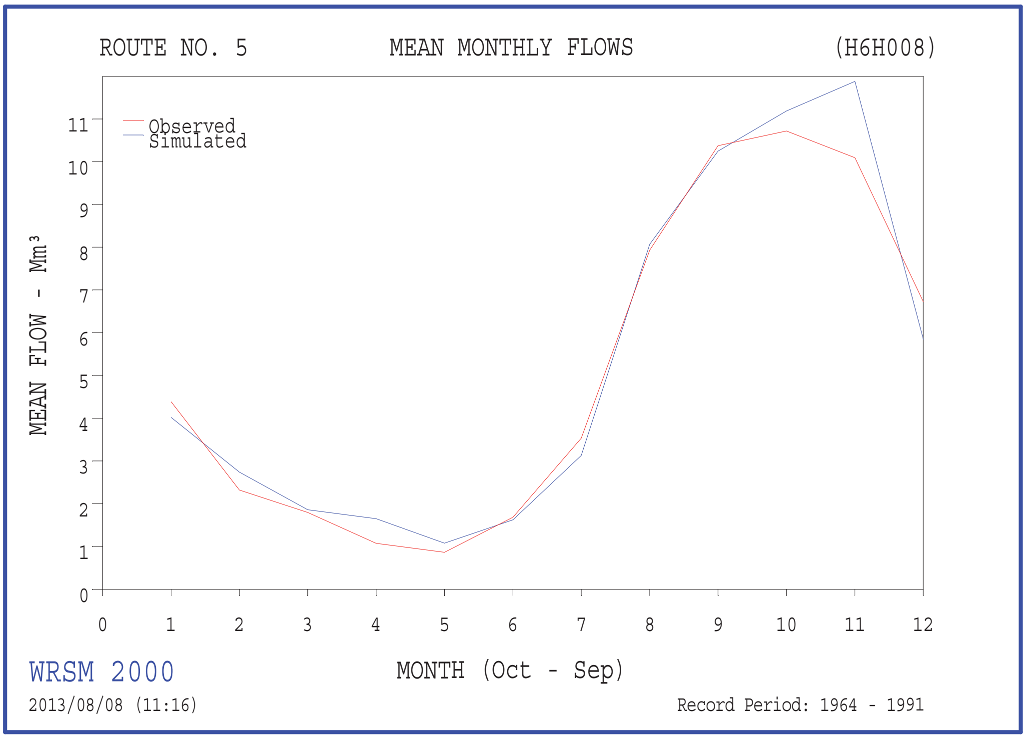


Figure C-62: H6H008 Mean monthly flows

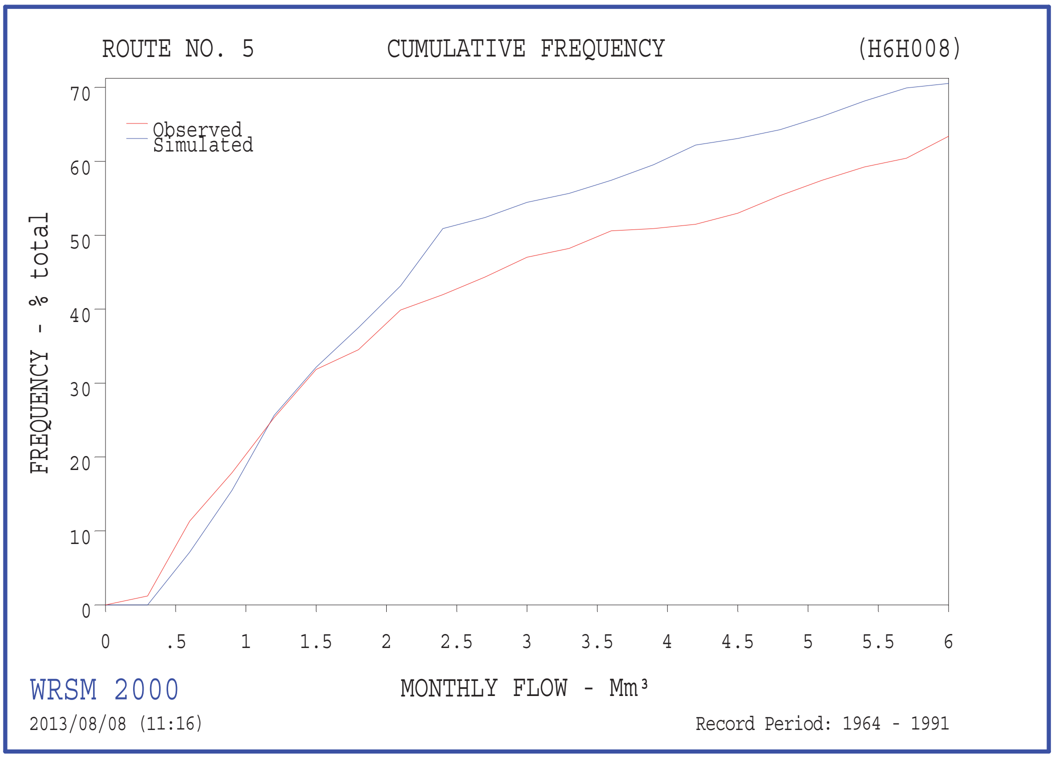


Figure C-63: H6H008 Cumulative frequency

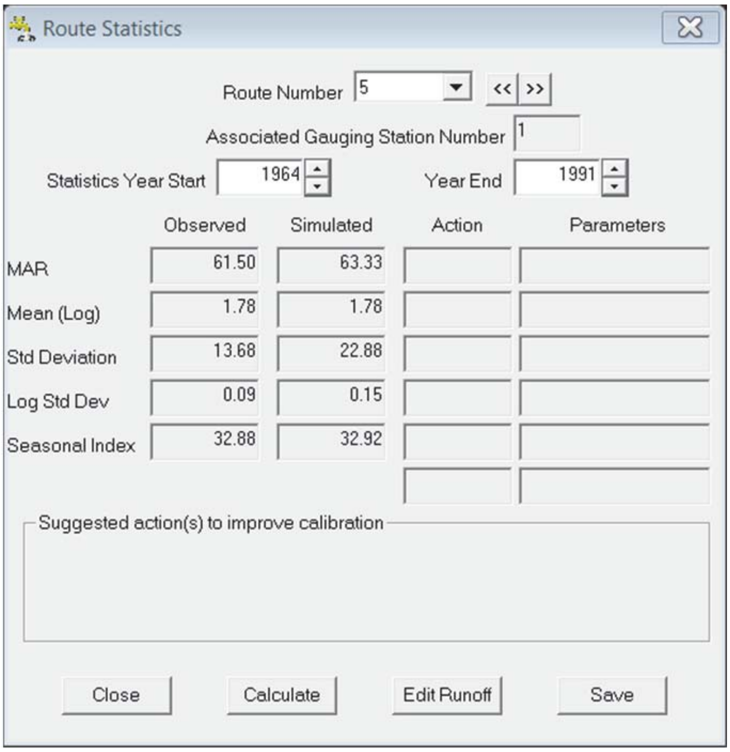


Figure C-64: H6H008 Statistics

Quaternary Catchment H60B

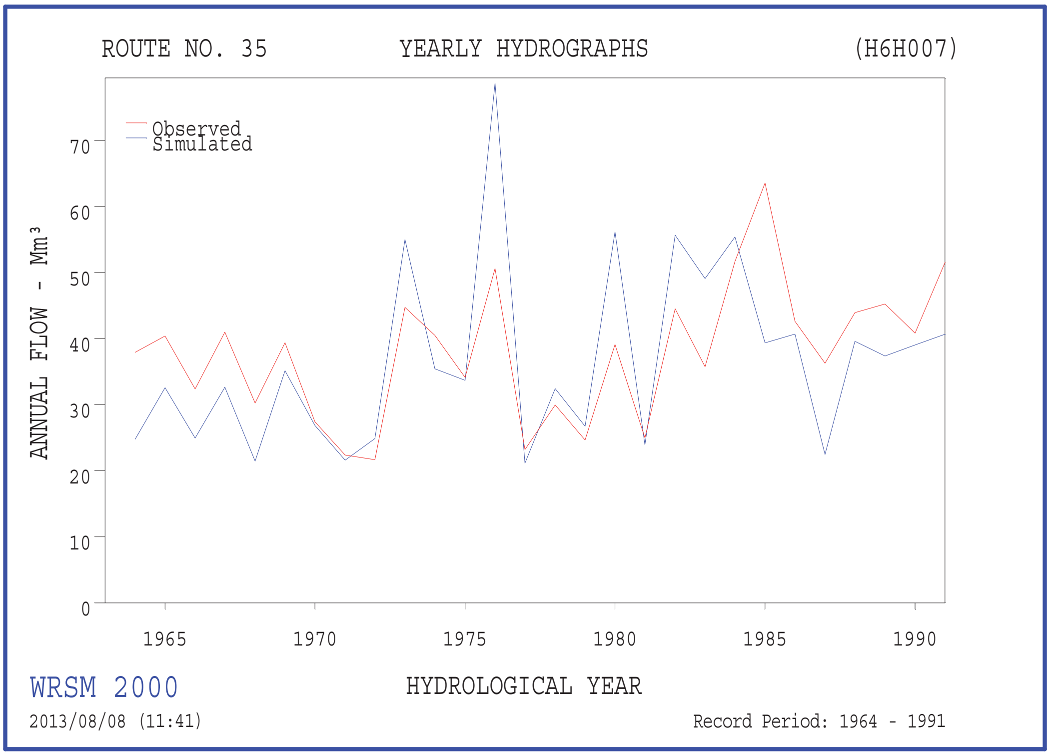


Figure C-65: H6H007 Yearly hydrograph

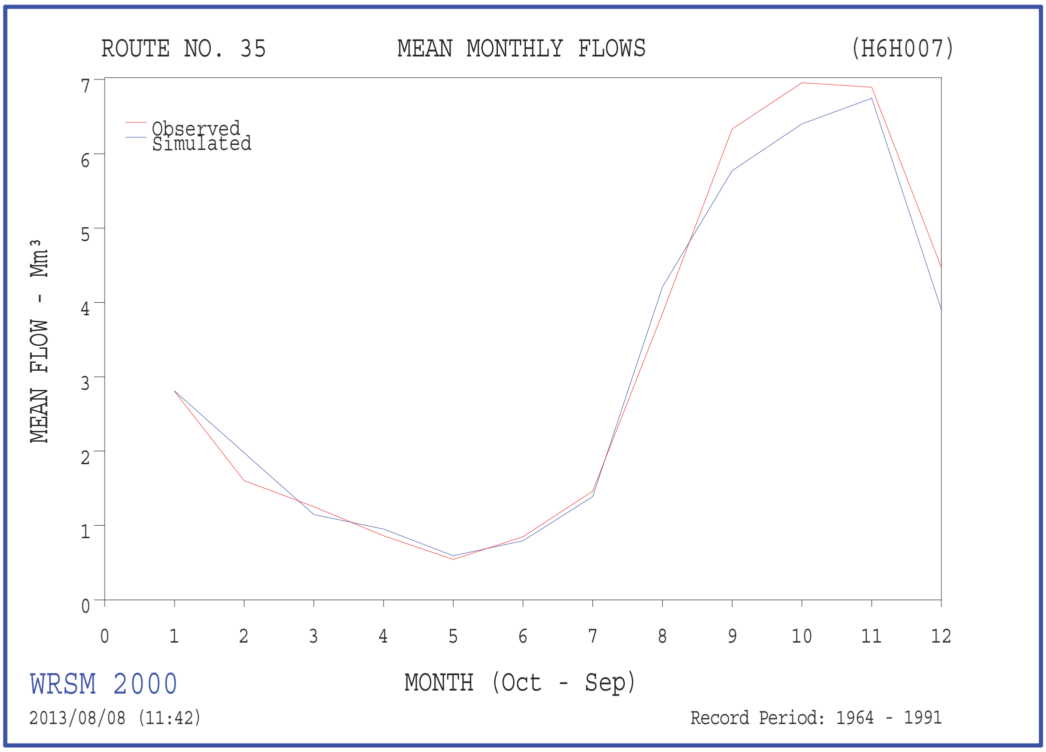


Figure C-66: H6H007 Mean monthly flows

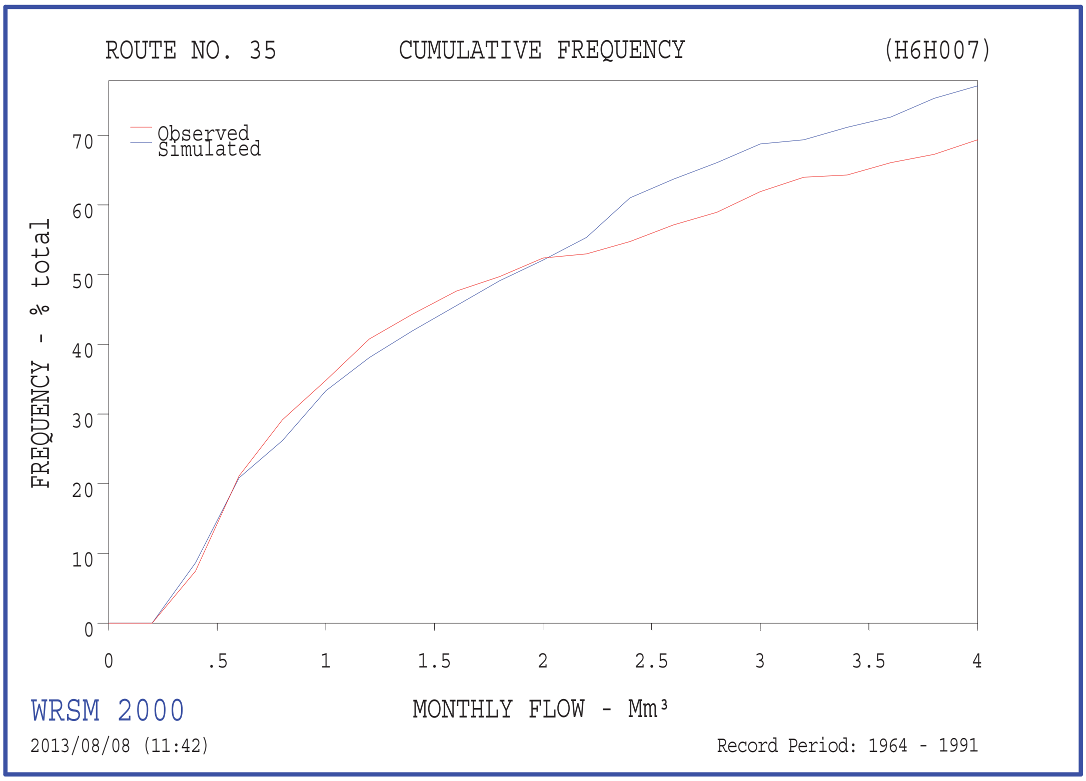


Figure C-67: H6H007 Cumulative frequency

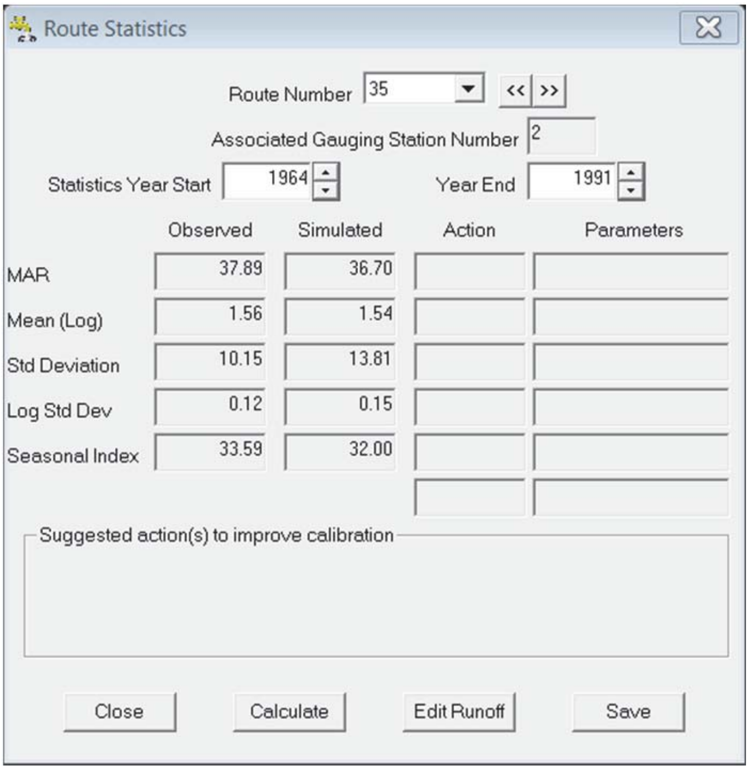


Figure C-68: H6H007 Statistics

Quaternary Catchment H60C

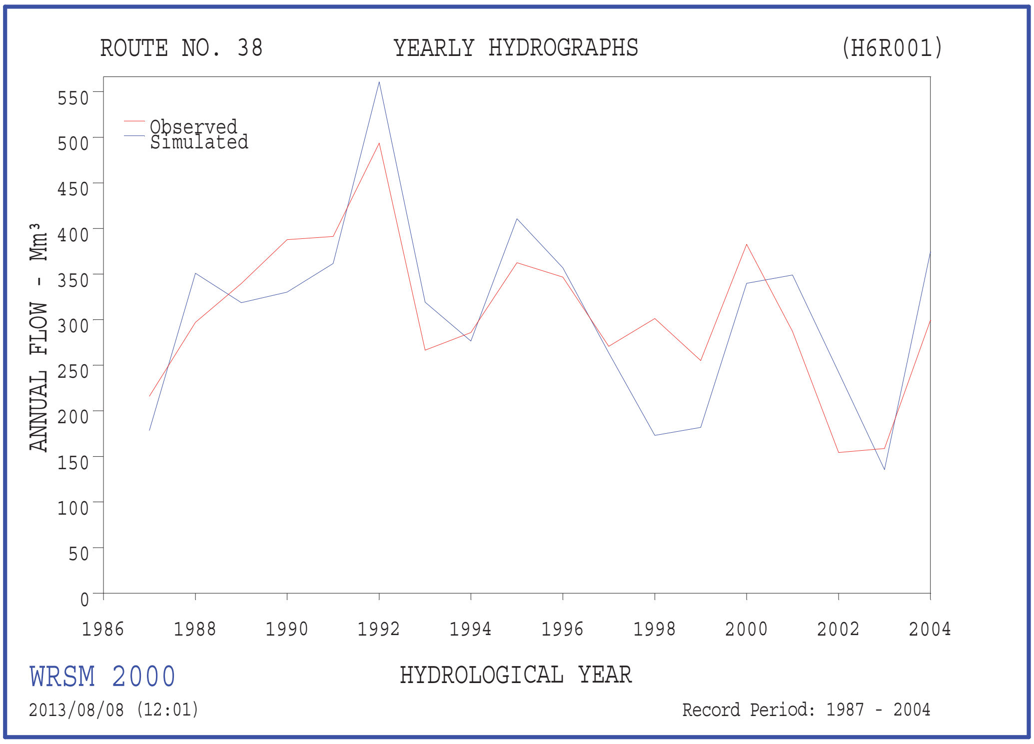


Figure C-69: H6R001 Yearly hydrographs

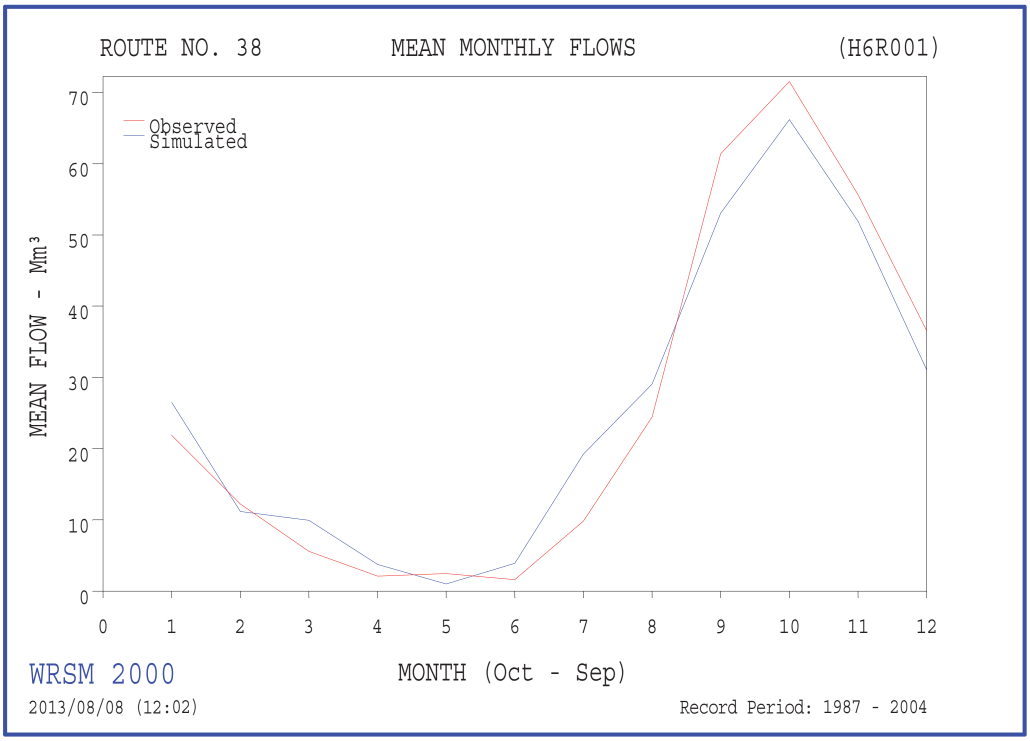


Figure C-70: H6R001 Mean monthly flows

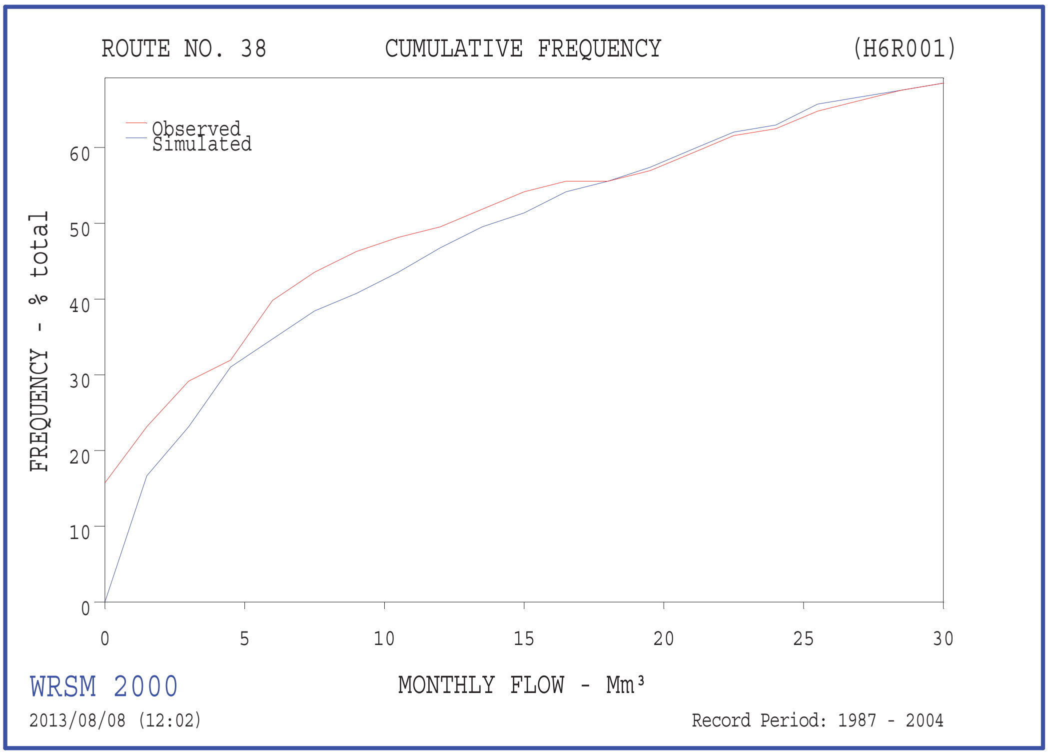


Figure C-71: H6R001 Cumulative frequency

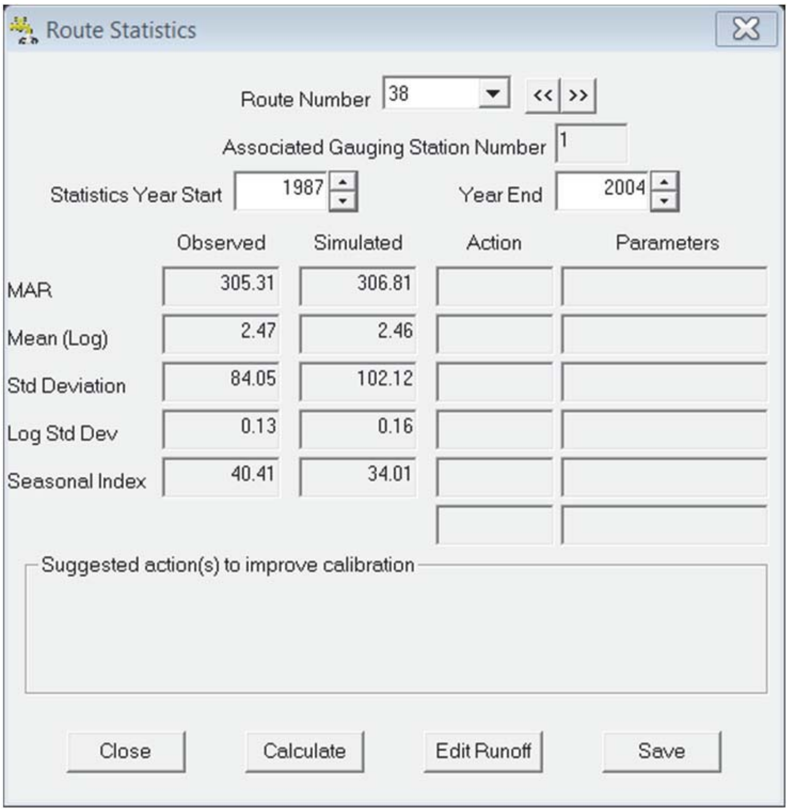


Figure C-71: H6R001 Statistics

Quaternary Catchment H60K

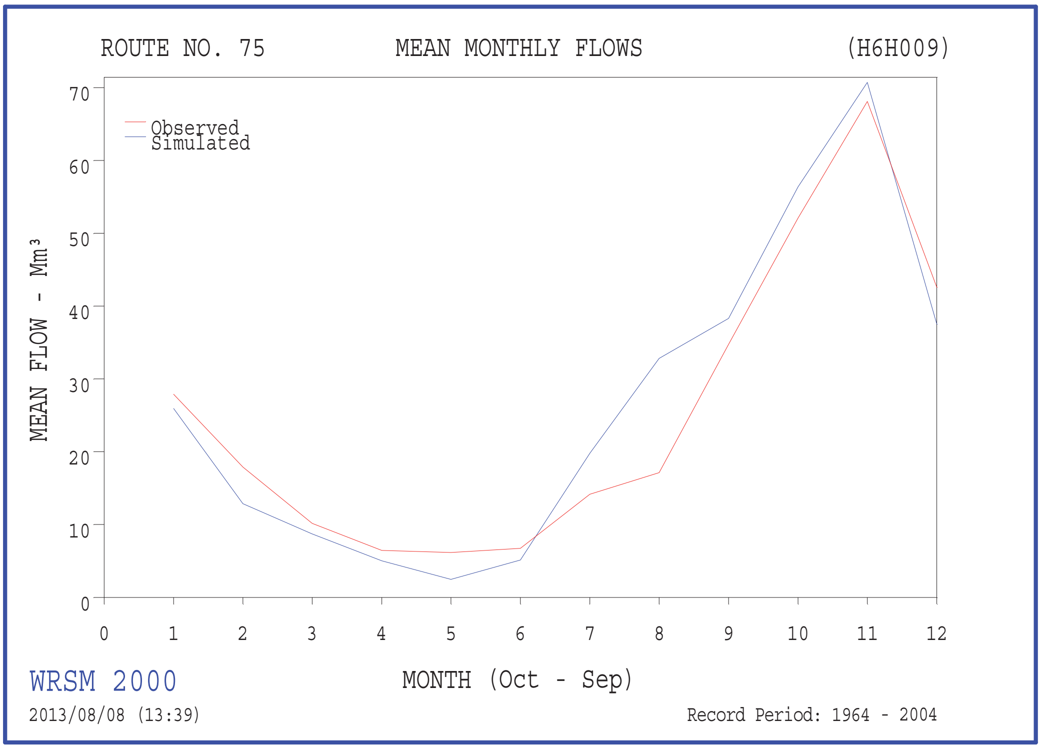


Figure C-72: H6H009 Mean monthly flows

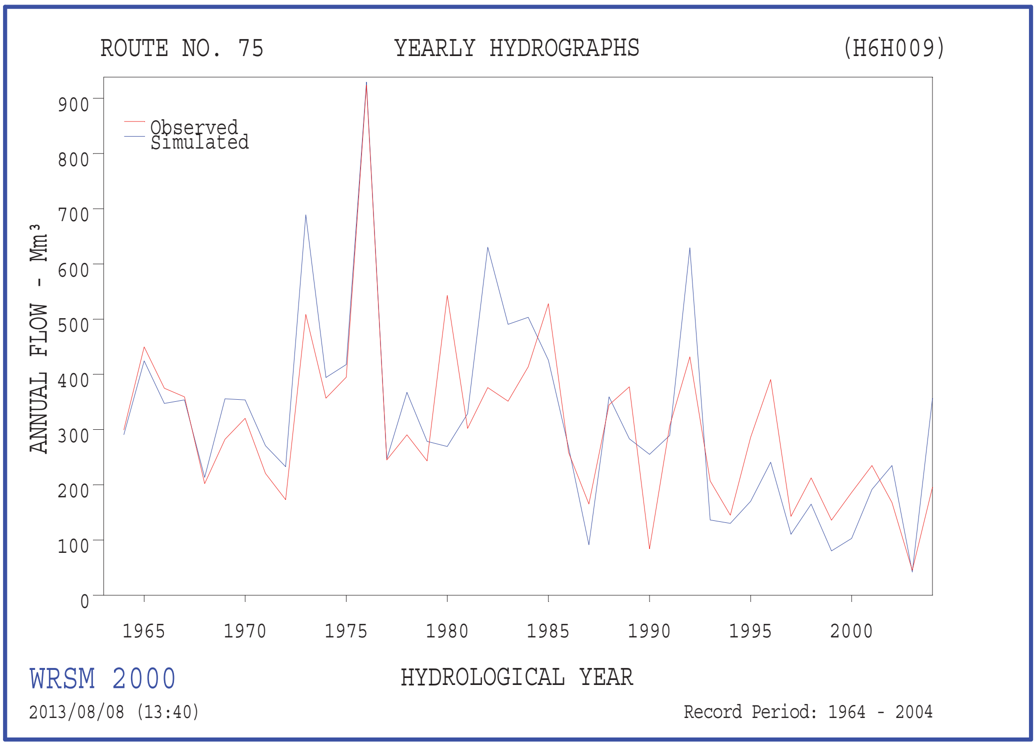


Figure C-73: H6H009 Yearly hydrograph

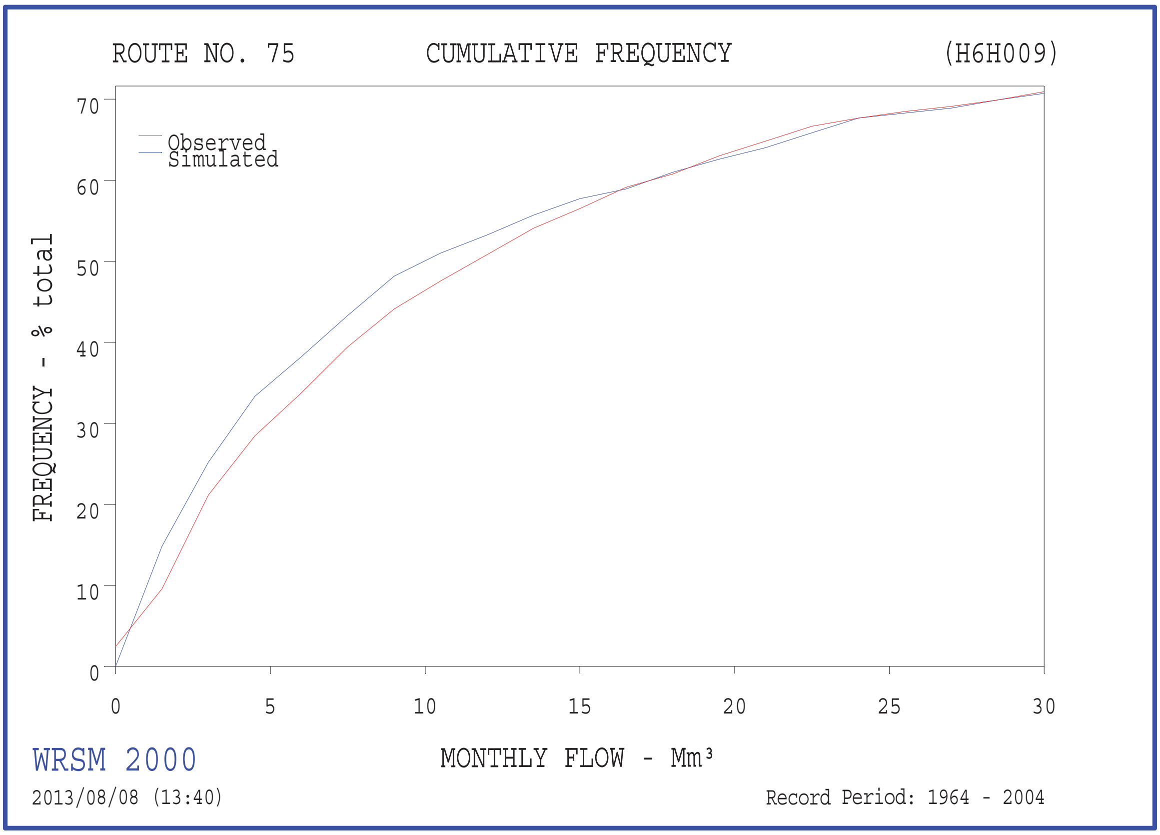


Figure C-74: H6H009 Cumulative frequency

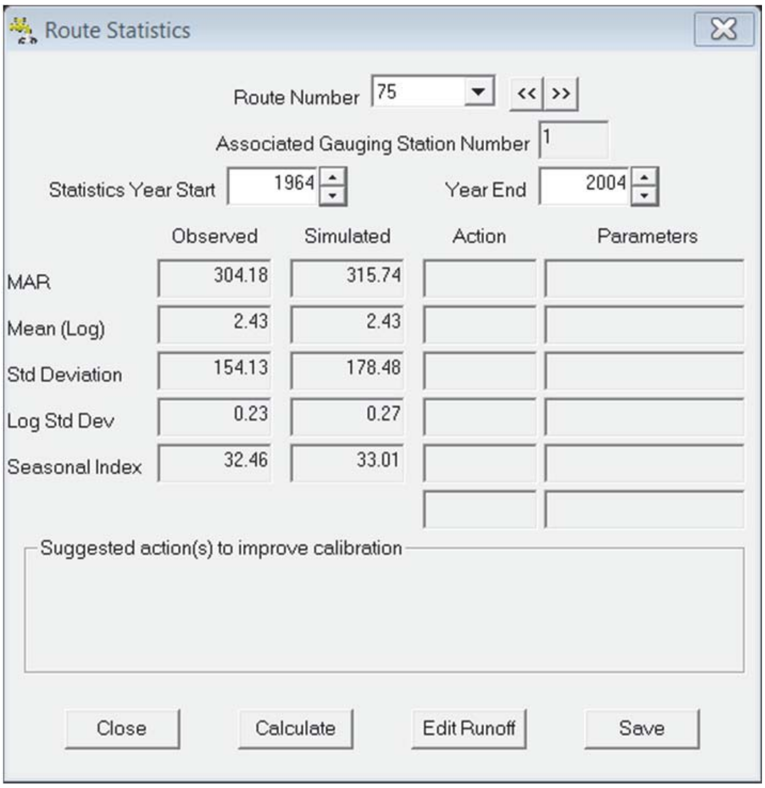


Figure C-75: H6H009 Statistics

Quaternary Catchment H40B (until 1994)

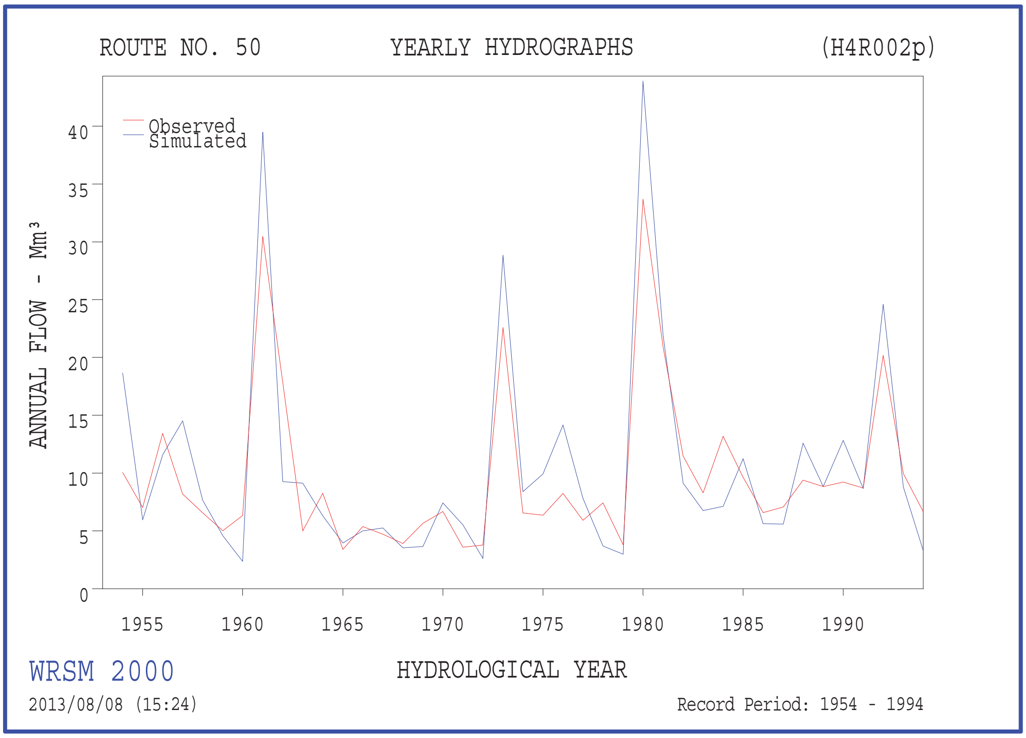


Figure C-76: H4R002 Yearly hydrographs

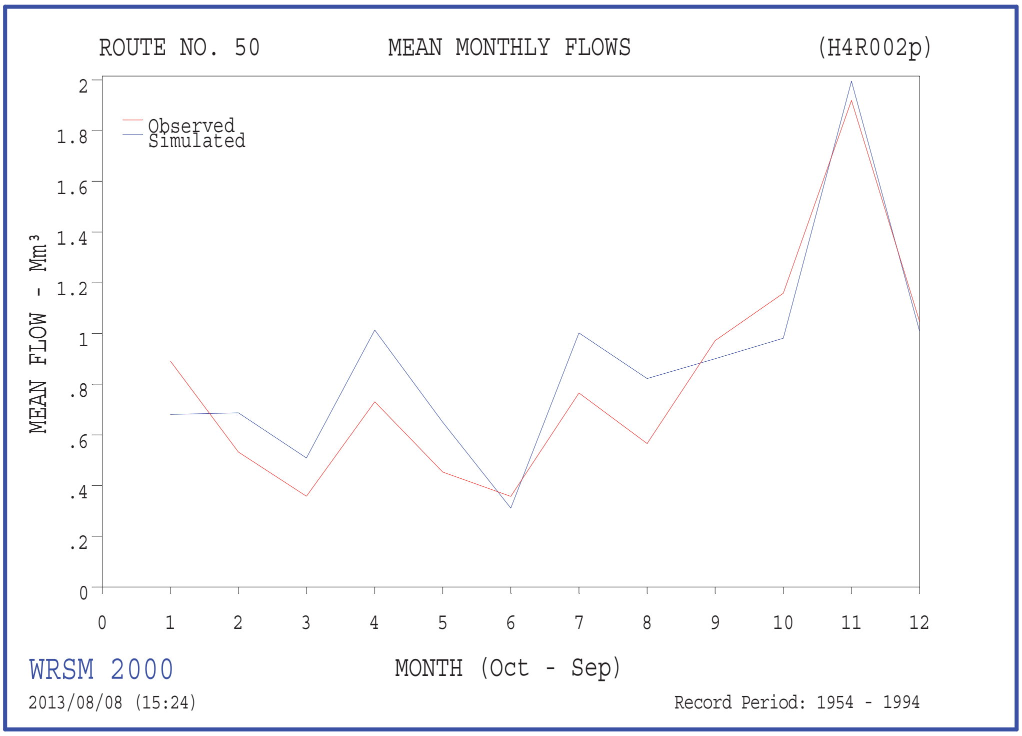


Figure C-77: H4R002 Mean monthly flows

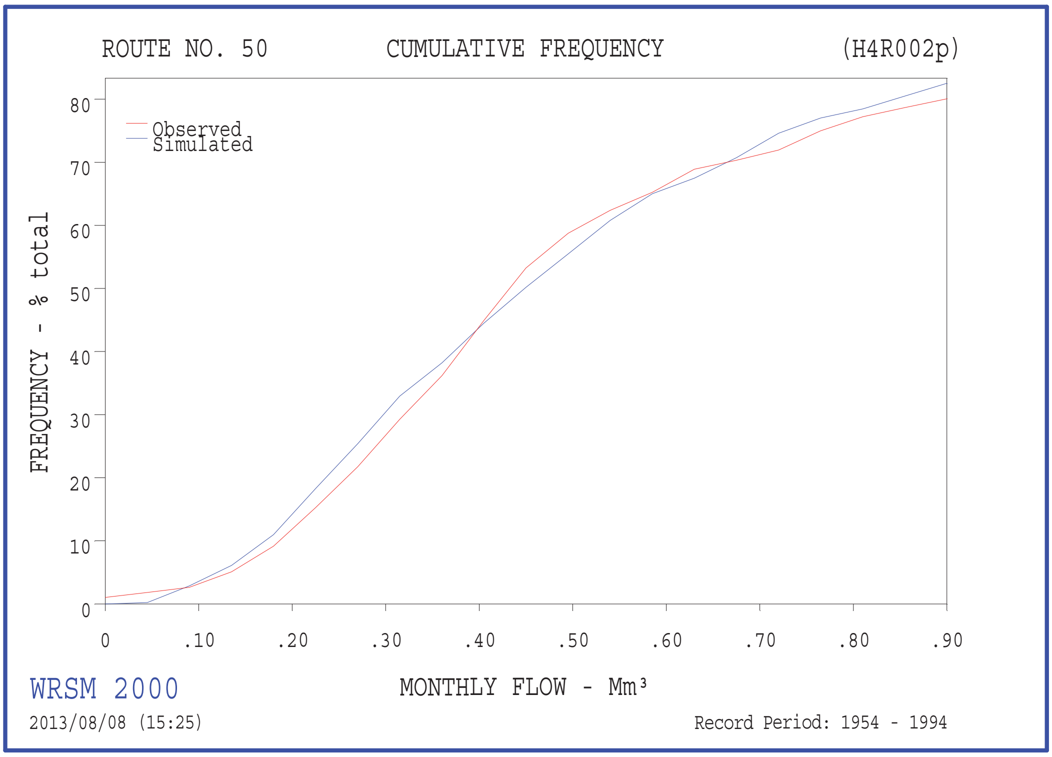


Figure C-78: H4R002 Cumulative frequency

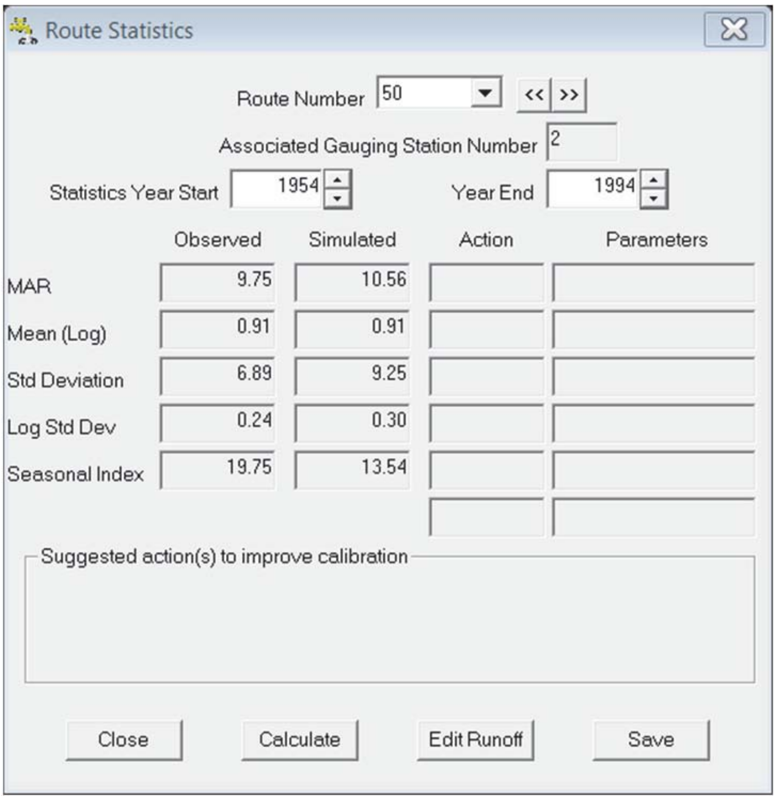


Figure C-79: H4R002 Statistics

Quaternary Catchment K10D

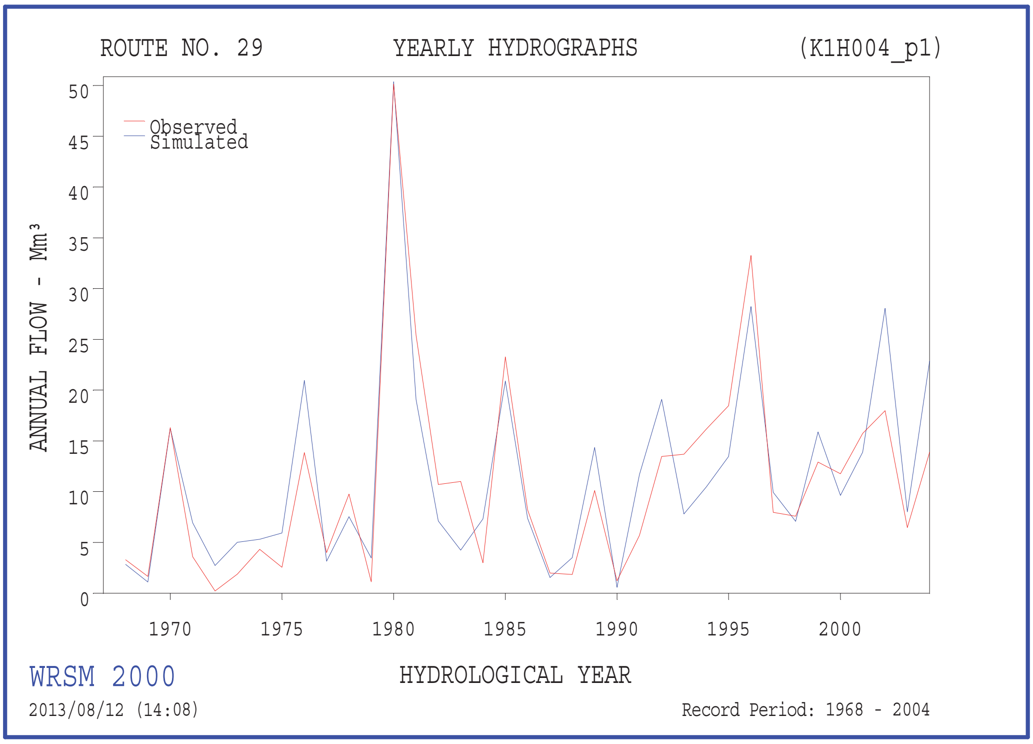


Figure C-80: K1H004 Yearly hydrographs

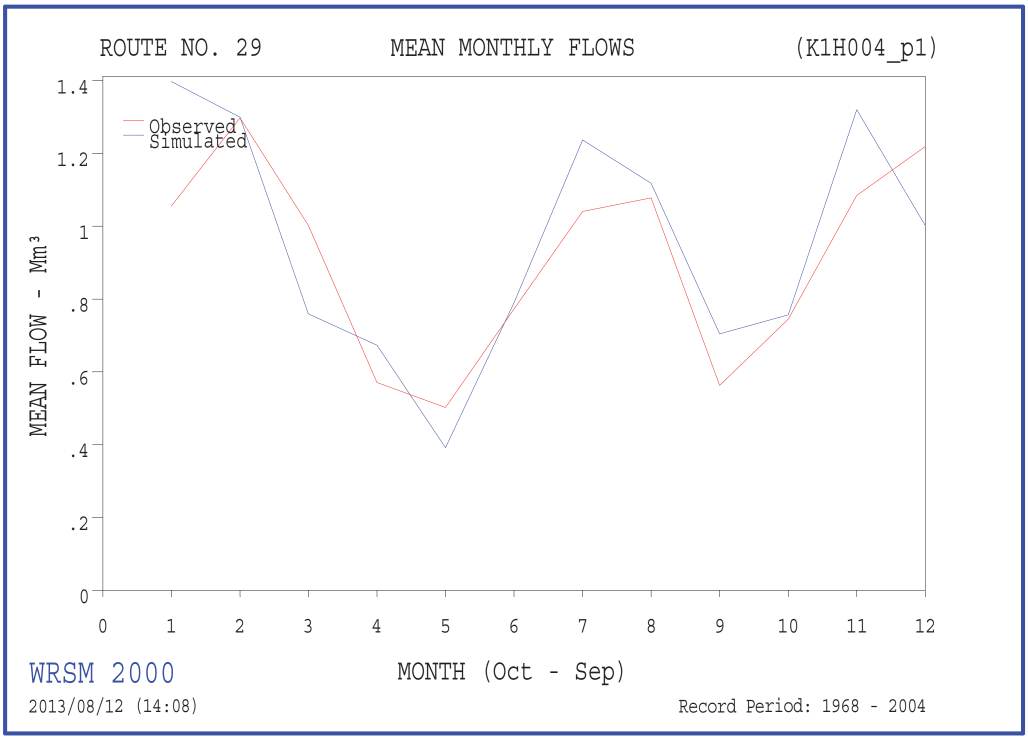


Figure C-81: K1H004 Mean monthly flows

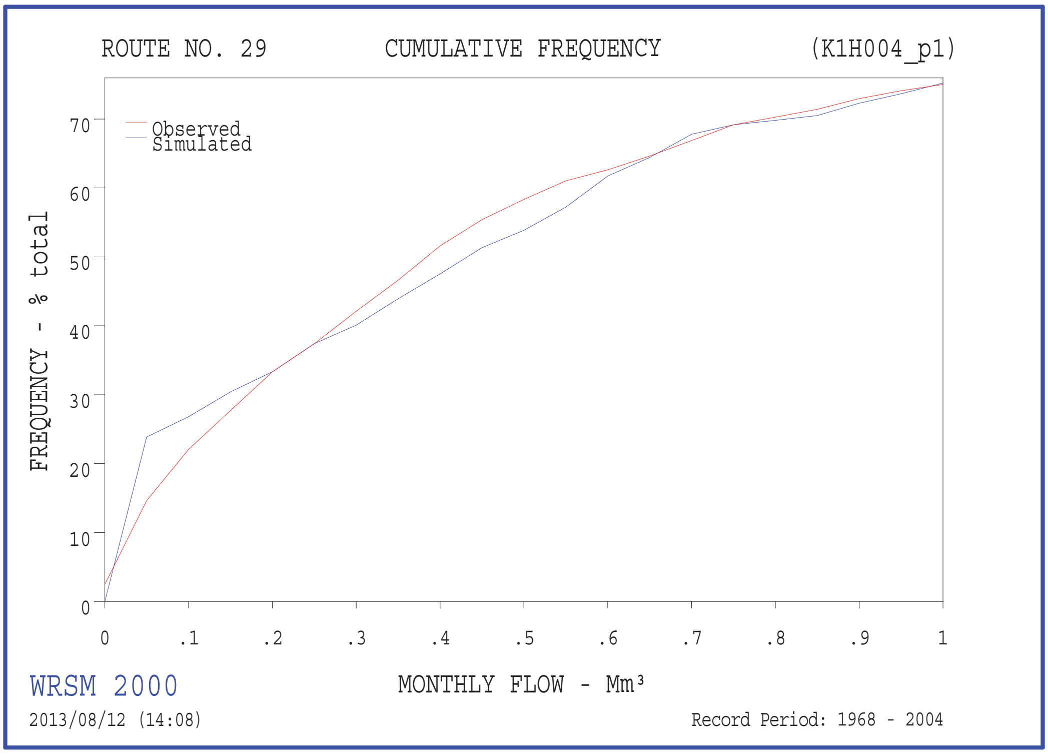


Figure C-82: K1H004 Cumulative frequency

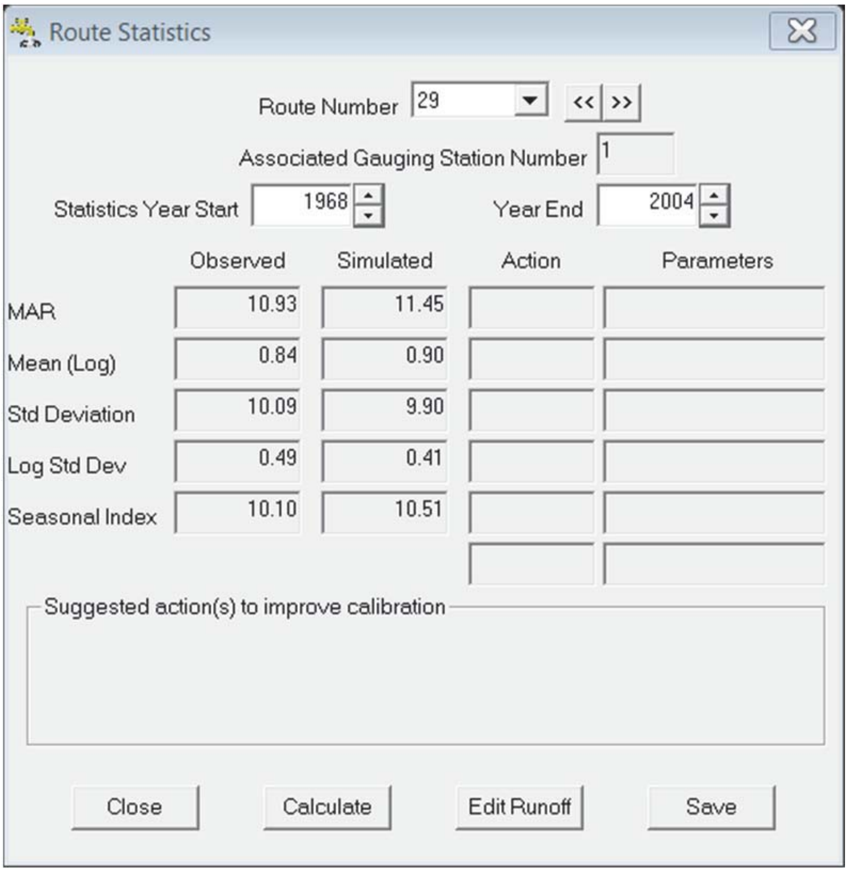


Figure C-83: K1H004 Statistics

Quaternary Catchment K10F

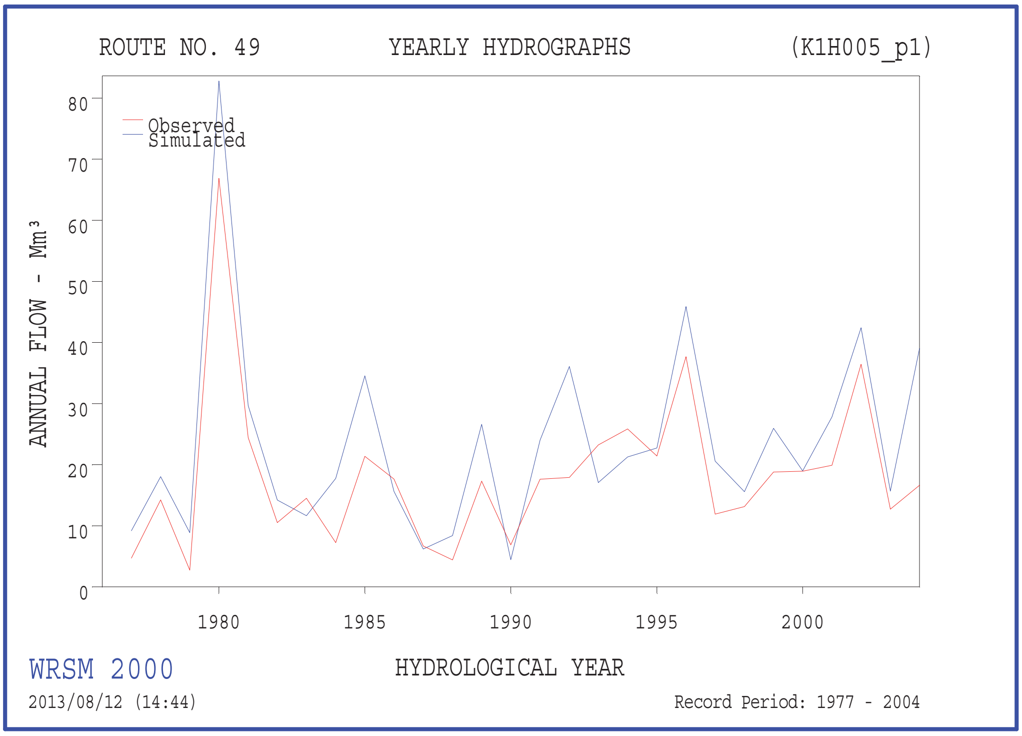


Figure C-84: K1H005 Yearly hydrographs

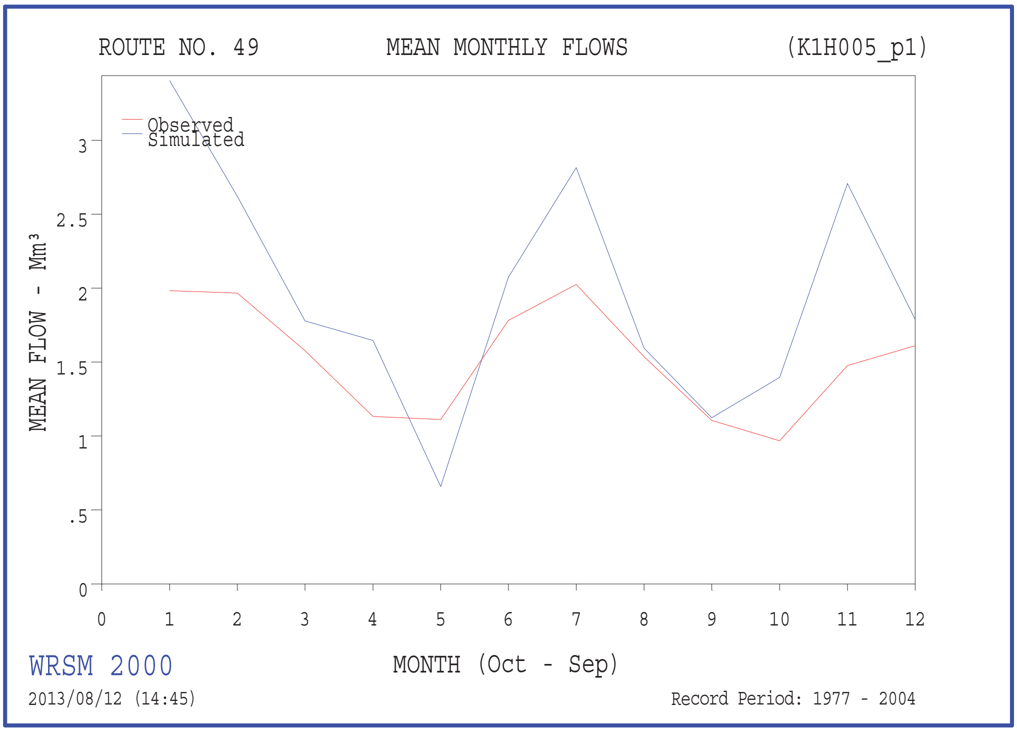


Figure C-85: K1H005 Mean monthly flows

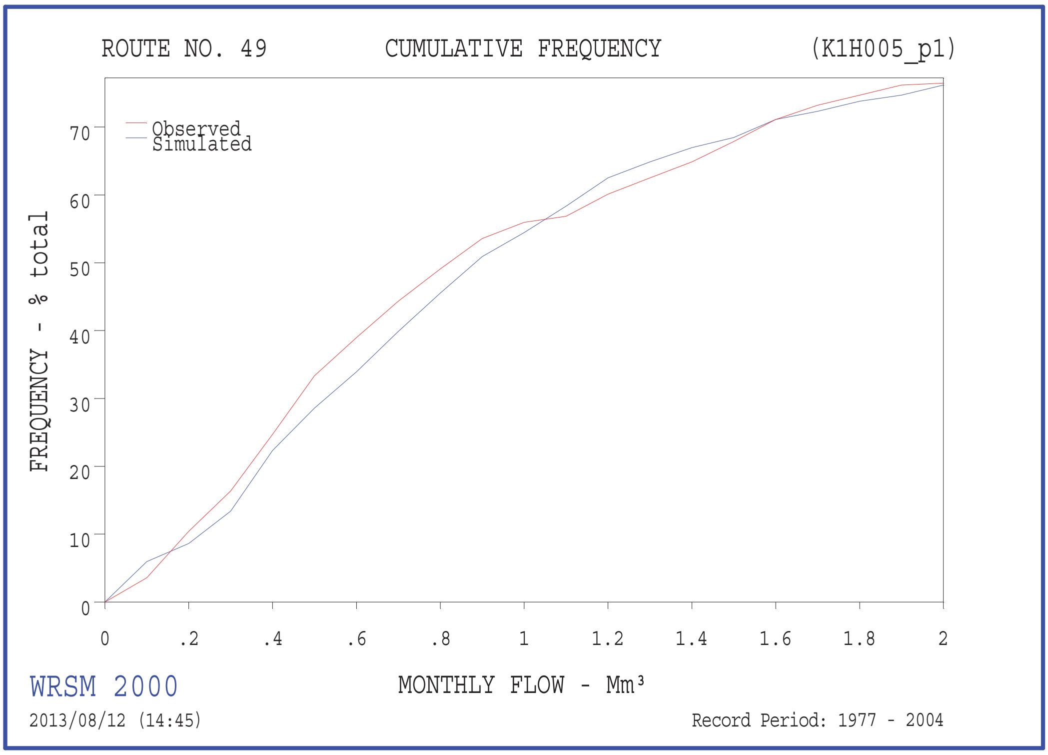


Figure C-86: K1H005 Cumulative frequency

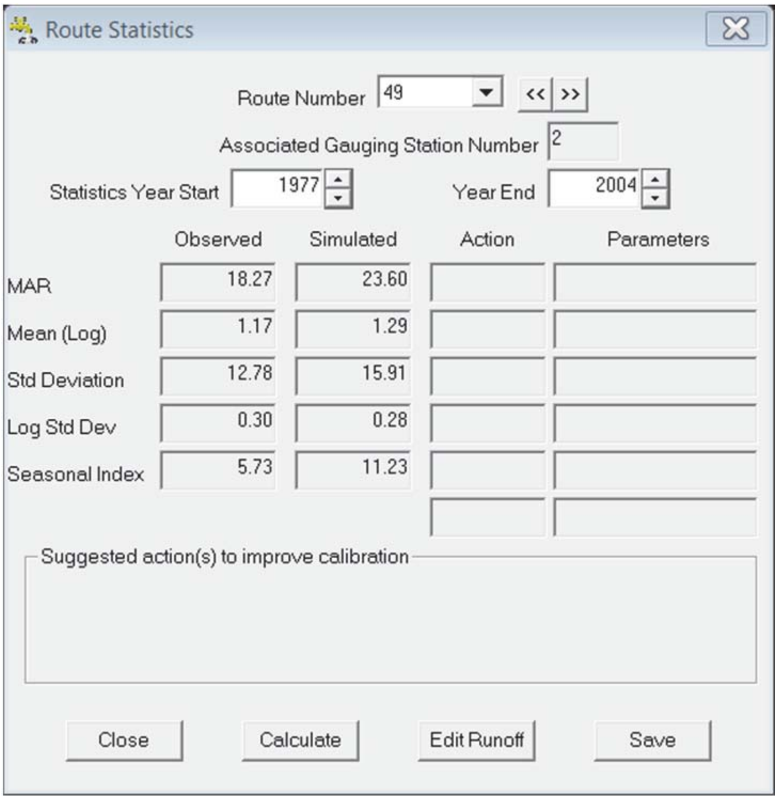


Figure C-87: K1H005 Statistics

Quaternary Catchment K40B

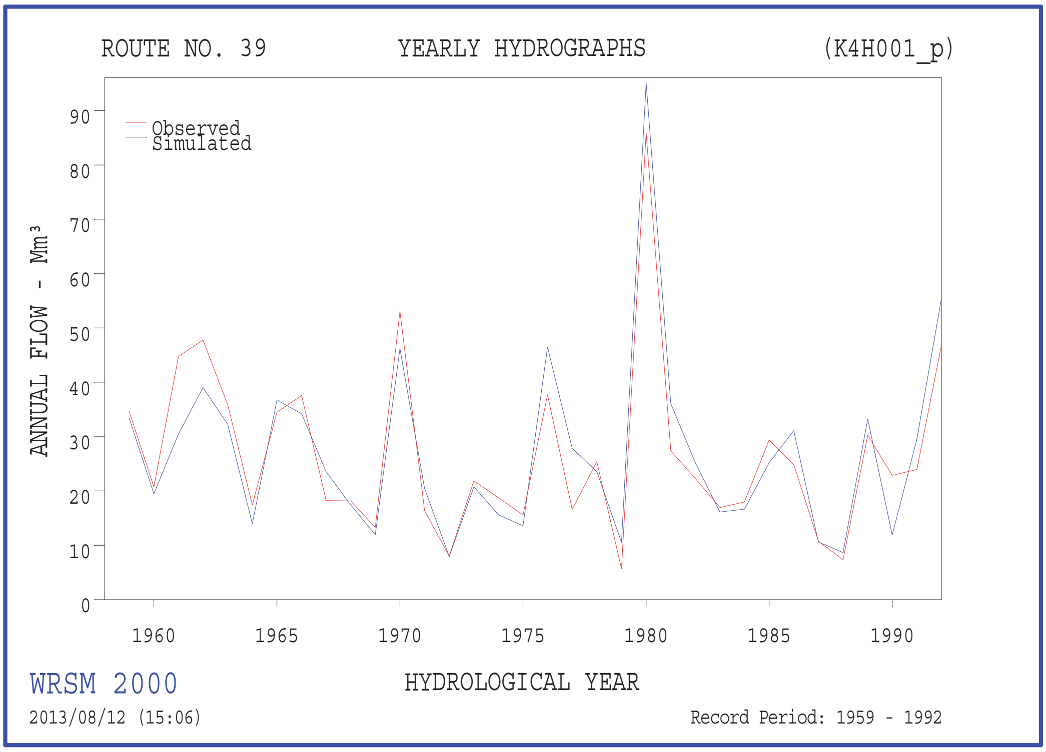


Figure C-88: K4H001 Yearly hydrographs

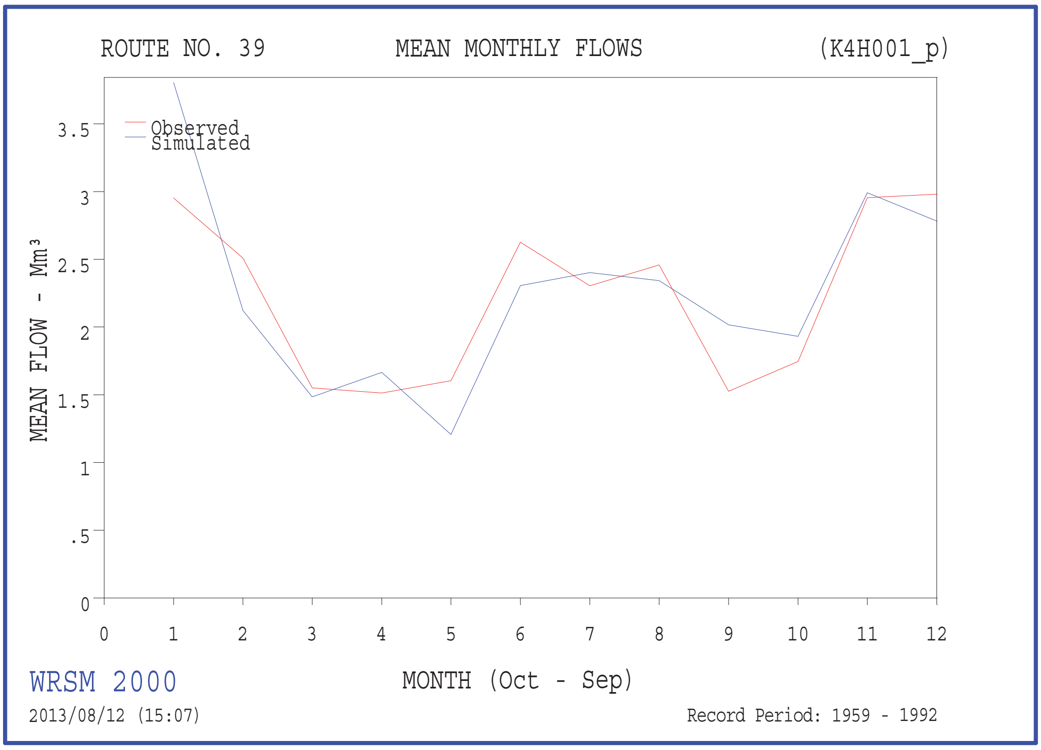


Figure C-89: K4H001 Mean monthly flows

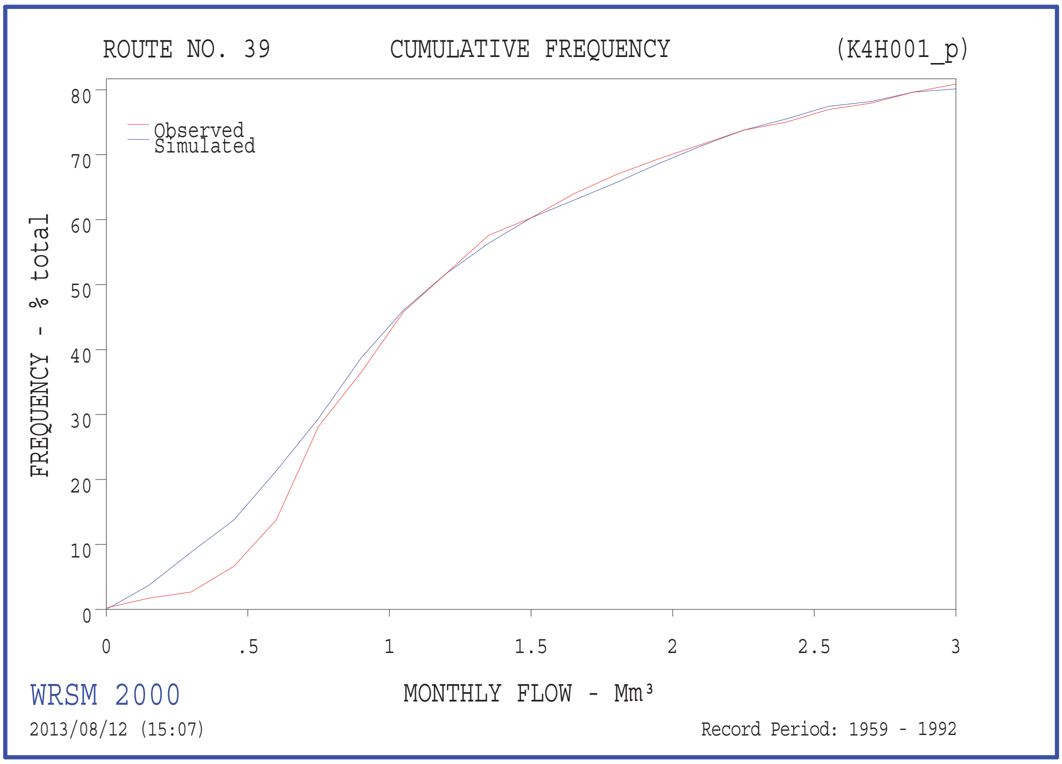
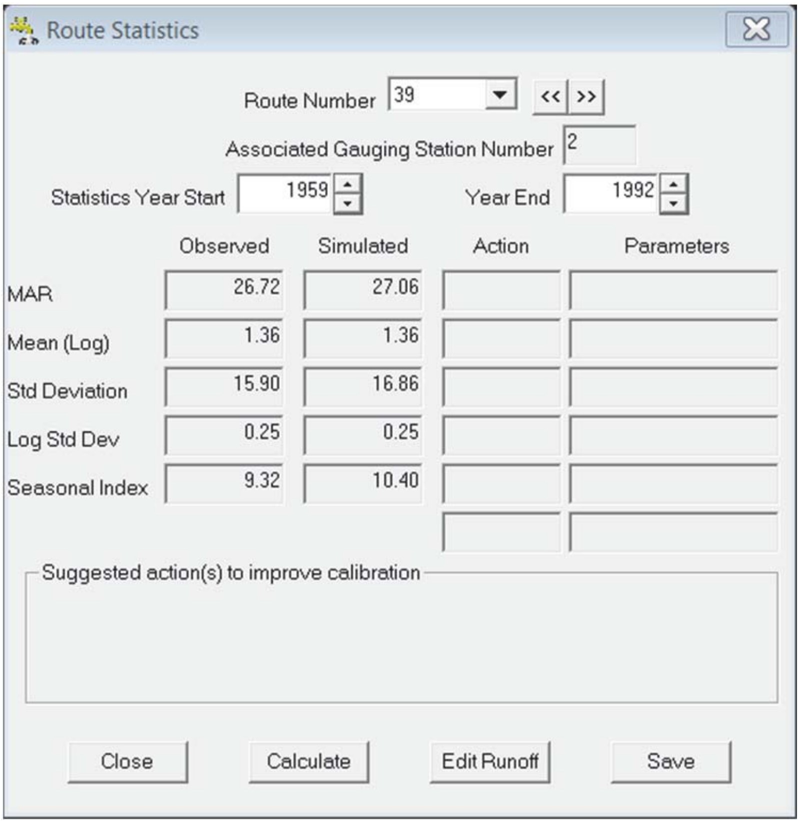


Figure C-90: K4H001 Cumulative frequency


Route Statistics

Route Number 39 << >>

Associated Gauging Station Number 2

Statistics Year Start 1959 Year End 1992

	Observed	Simulated	Action	Parameters
MAR	26.72	27.06		
Mean (Log)	1.36	1.36		
Std Deviation	15.90	16.86		
Log Std Dev	0.25	0.25		
Seasonal Index	9.32	10.40		

Suggested action(s) to improve calibration

Close Calculate Edit Runoff Save

Figure C-91: K4H001 Statistics

Quaternary Catchment A91B (1965-1998)

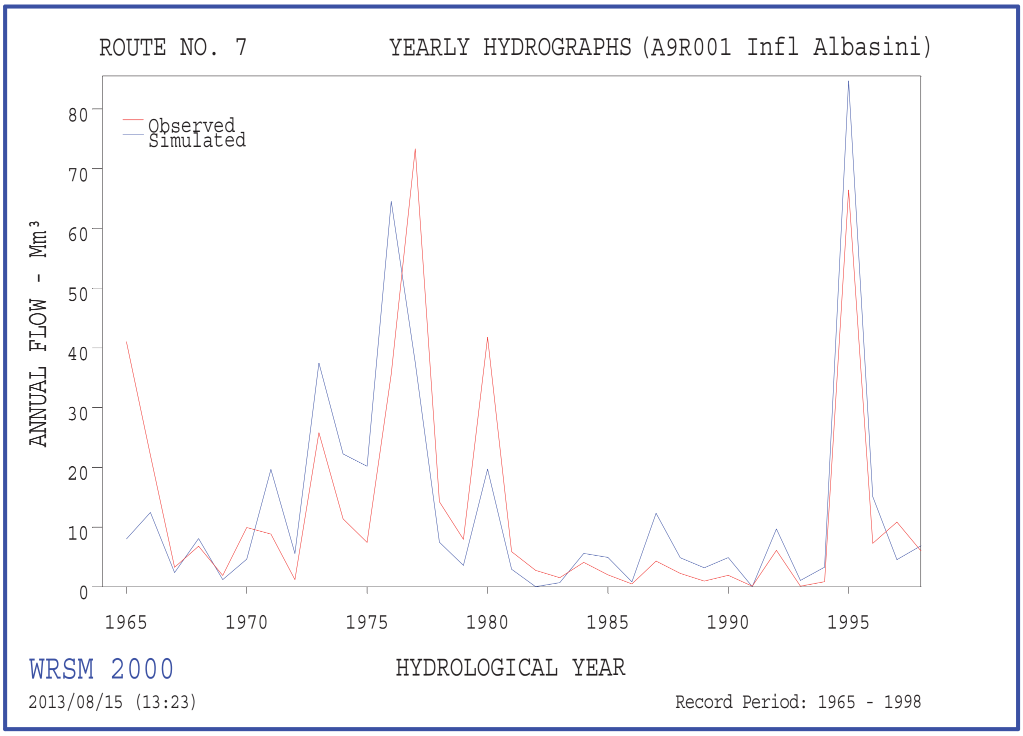


Figure C-92: A9R001 Yearly hydrographs

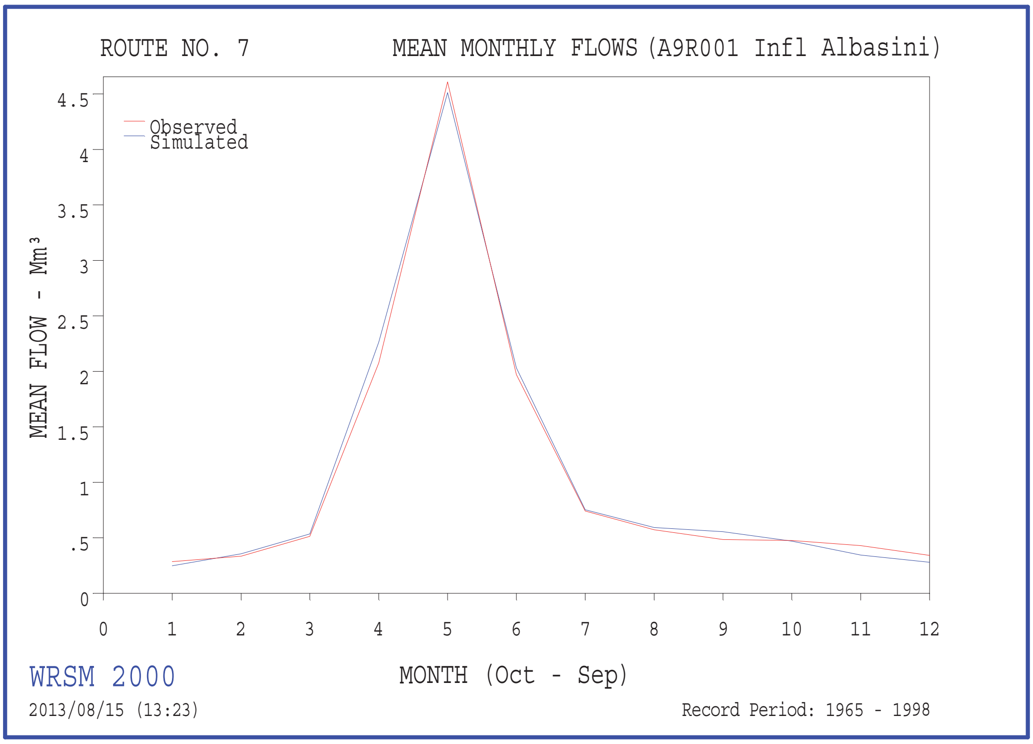


Figure C-93: A9R001 Mean monthly flows

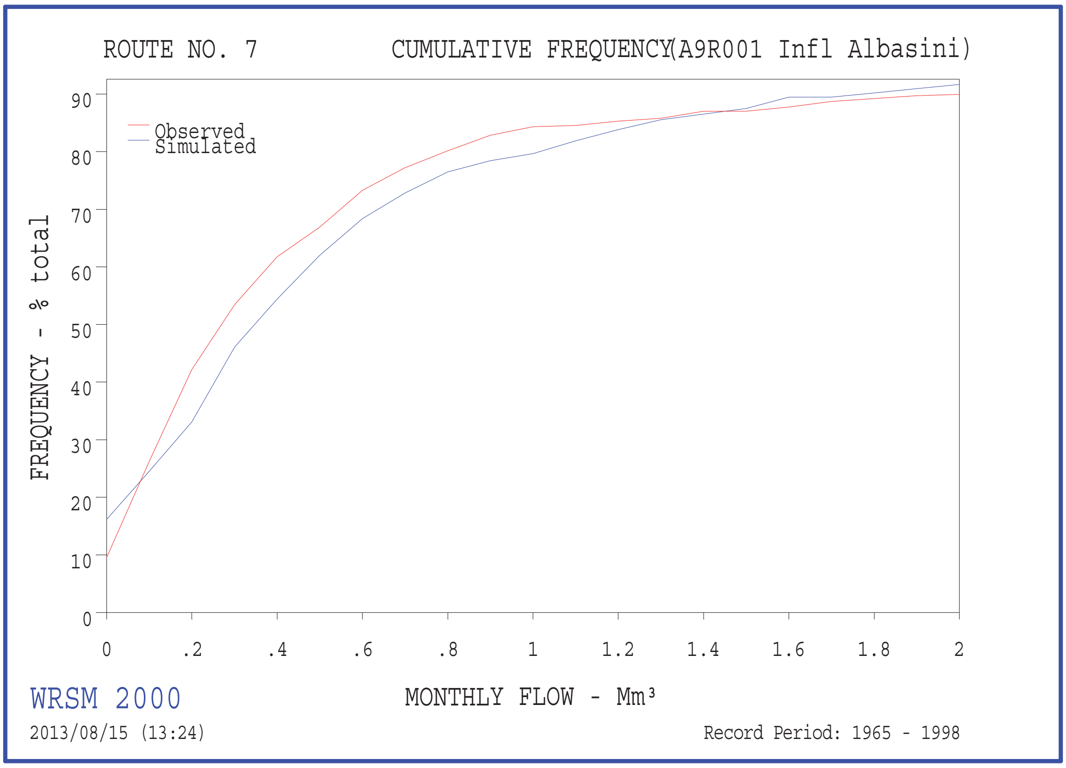


Figure C-94: A9R001 Cumulative frequency

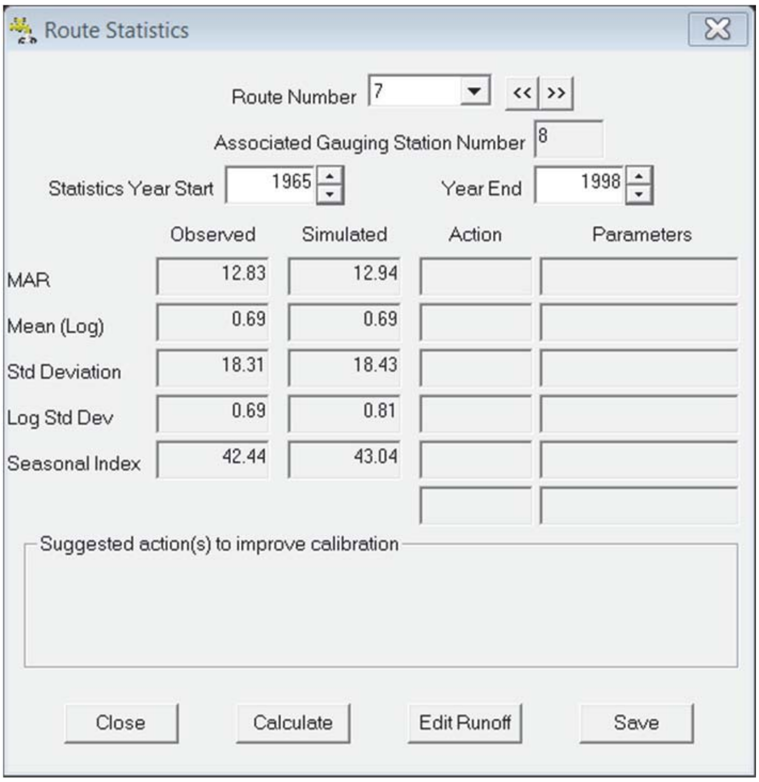


Figure C-95: A9R001 Statistics

Quaternary Catchment A91D1

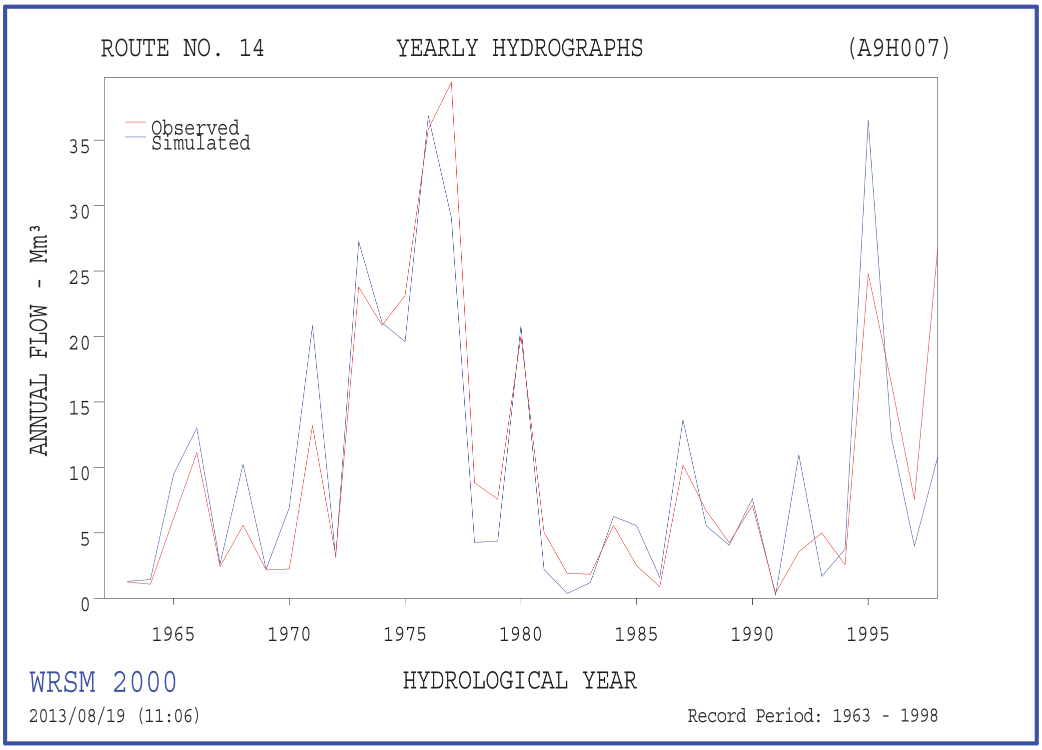


Figure C-96: A9H007 Yearly hydrograph

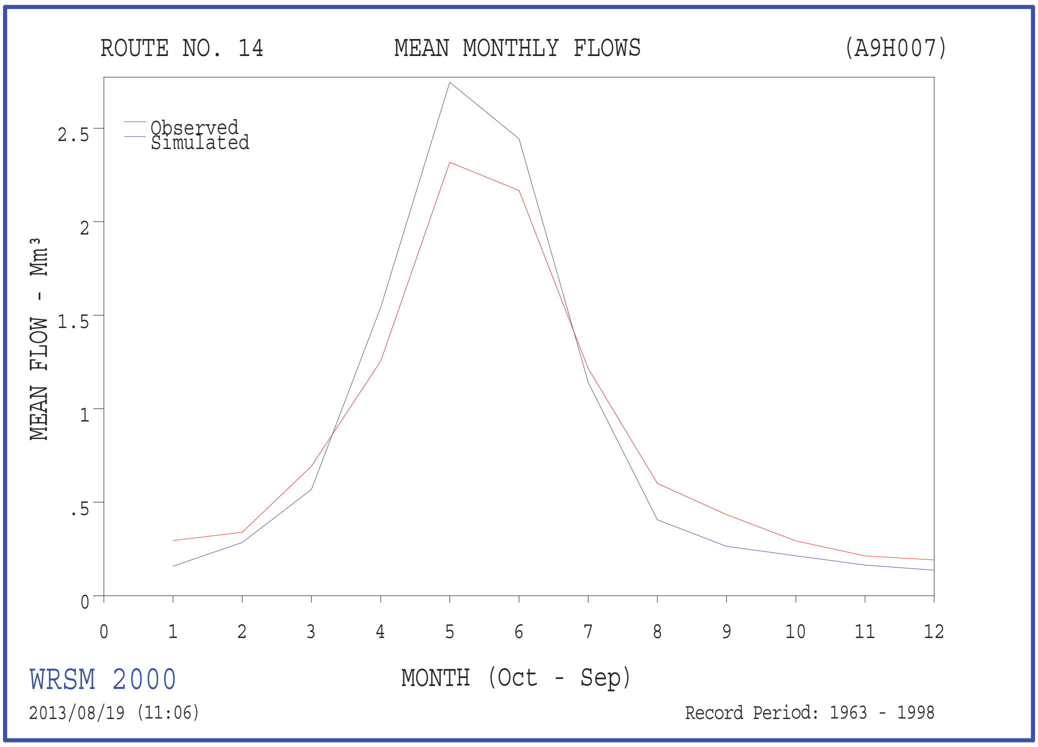


Figure C-97: A9H007 Mean monthly flows

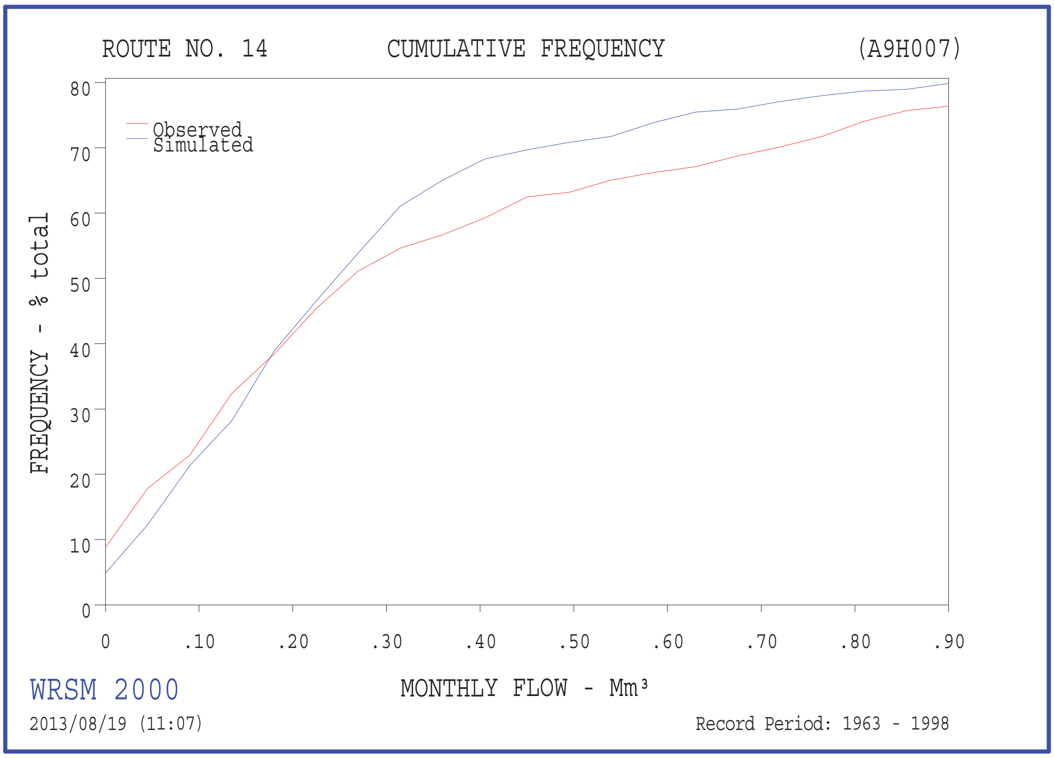


Figure C-98: A9H007 Cumulative frequency

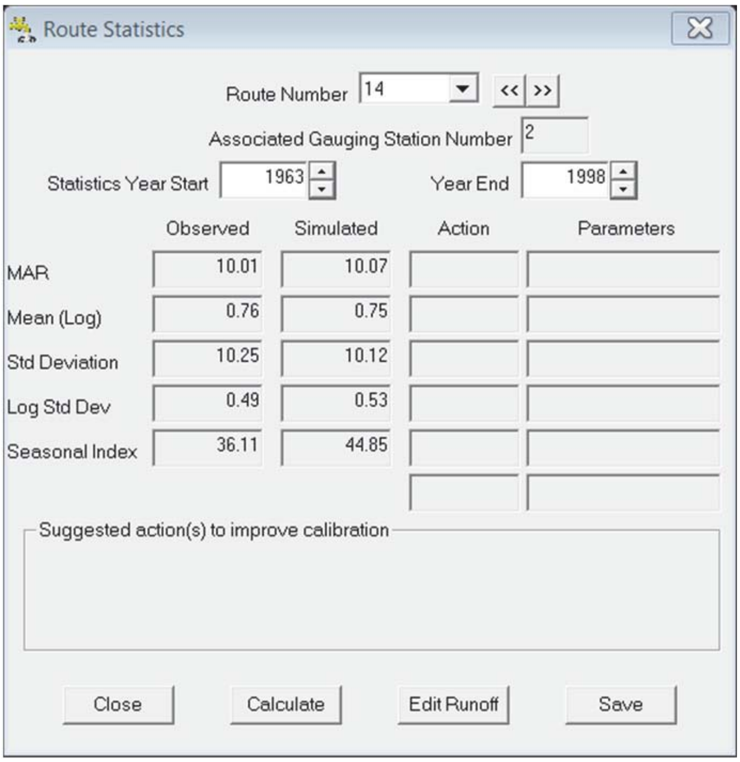


Figure C-99: A9H007 Statistics

Quaternary Catchment A91D3

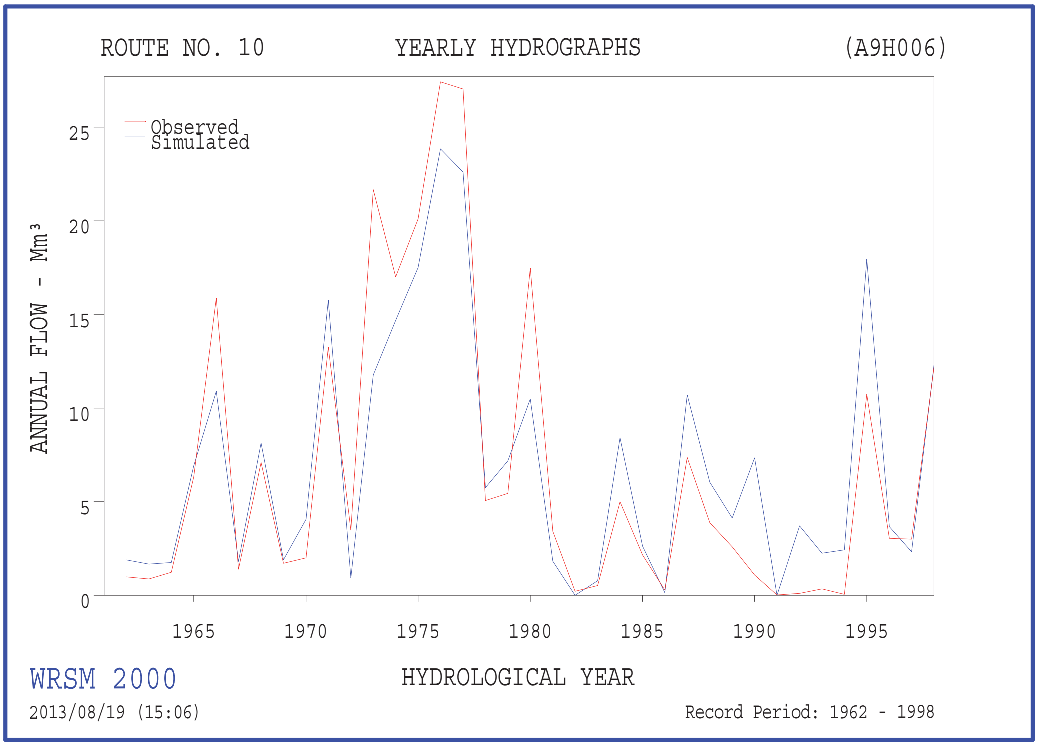


Figure C-100: A9H006 Yearly hydrograph

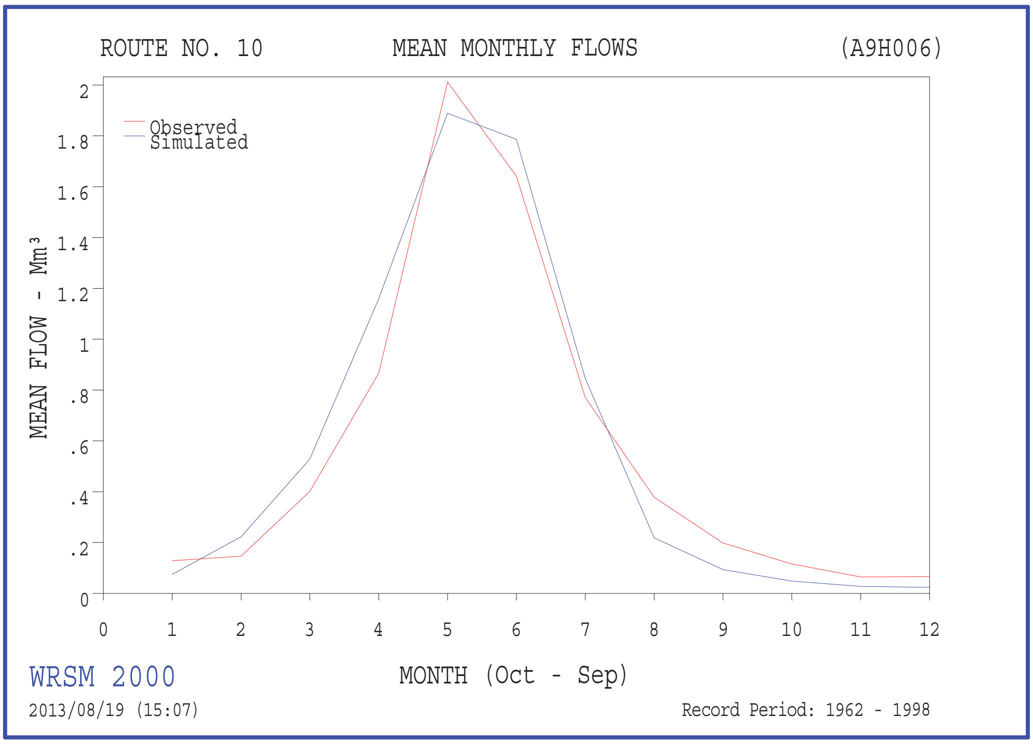


Figure C-101: A9H006 Mean monthly flows

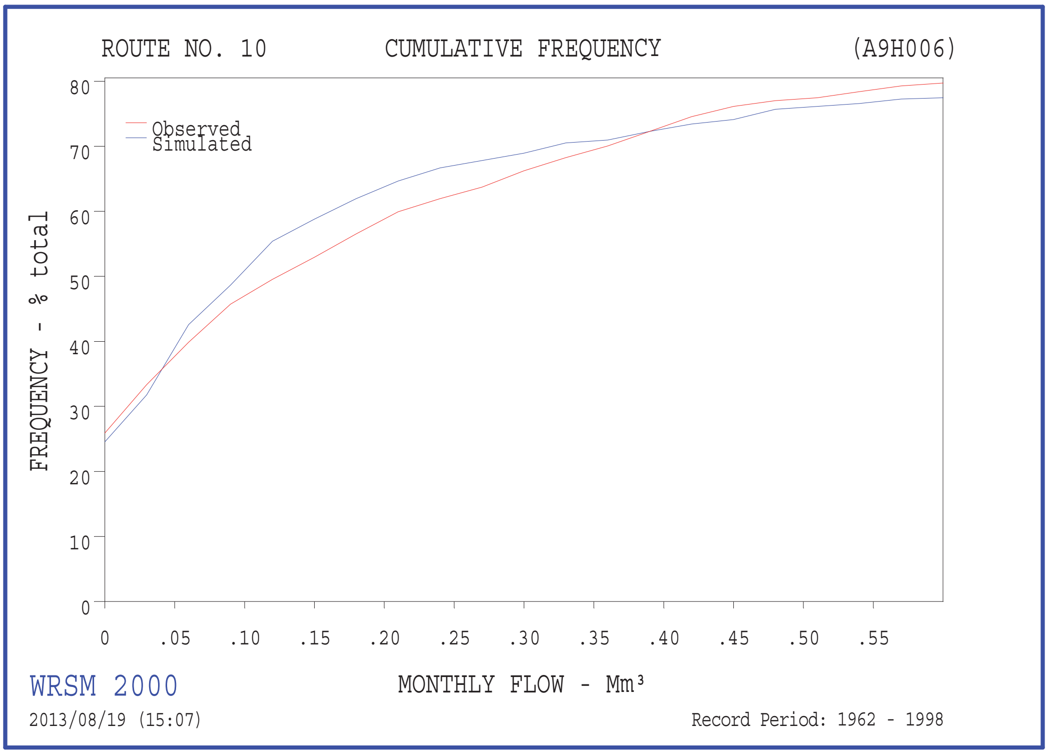


Figure C-102: A9H006 Cumulative frequency

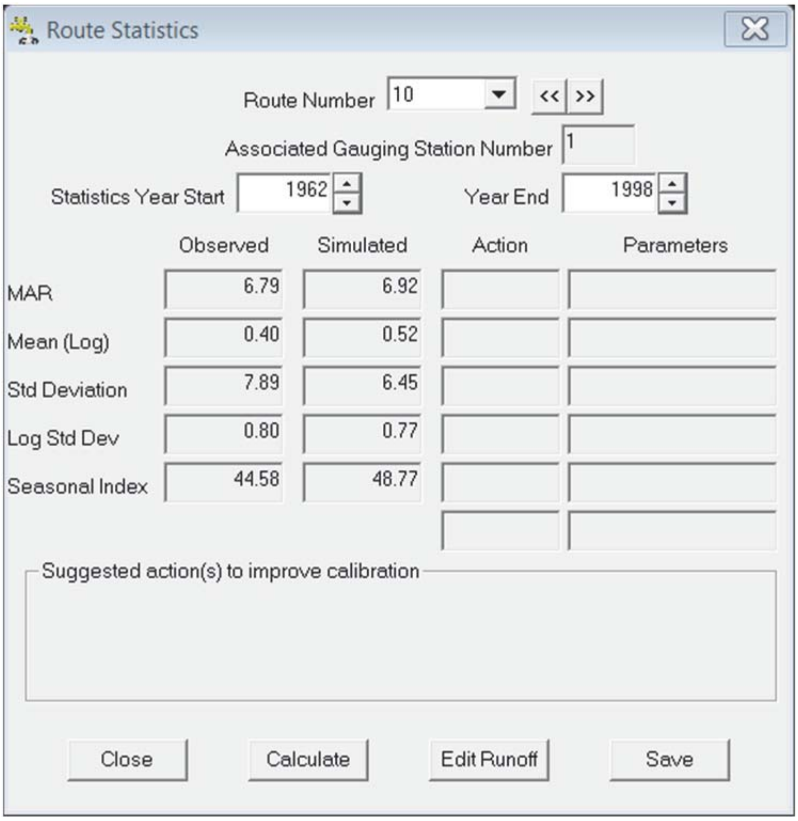


Figure C-103: A9H006 Statistics

Quaternary Catchment A91F

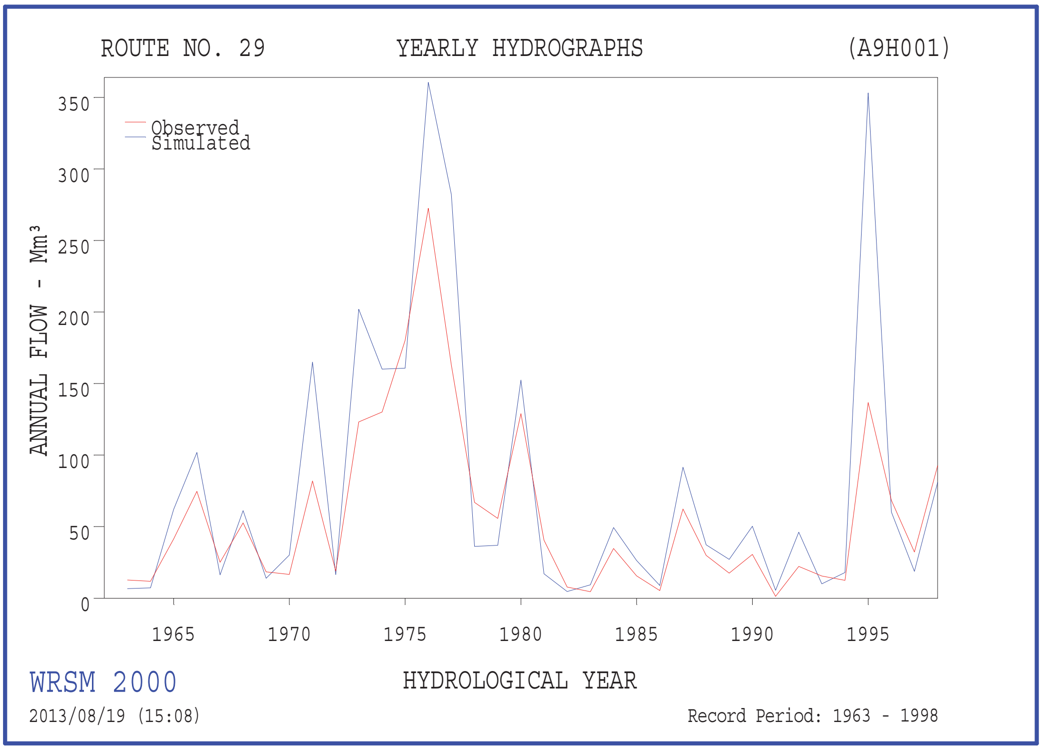


Figure C-104: A9H001 Yearly hydrograph

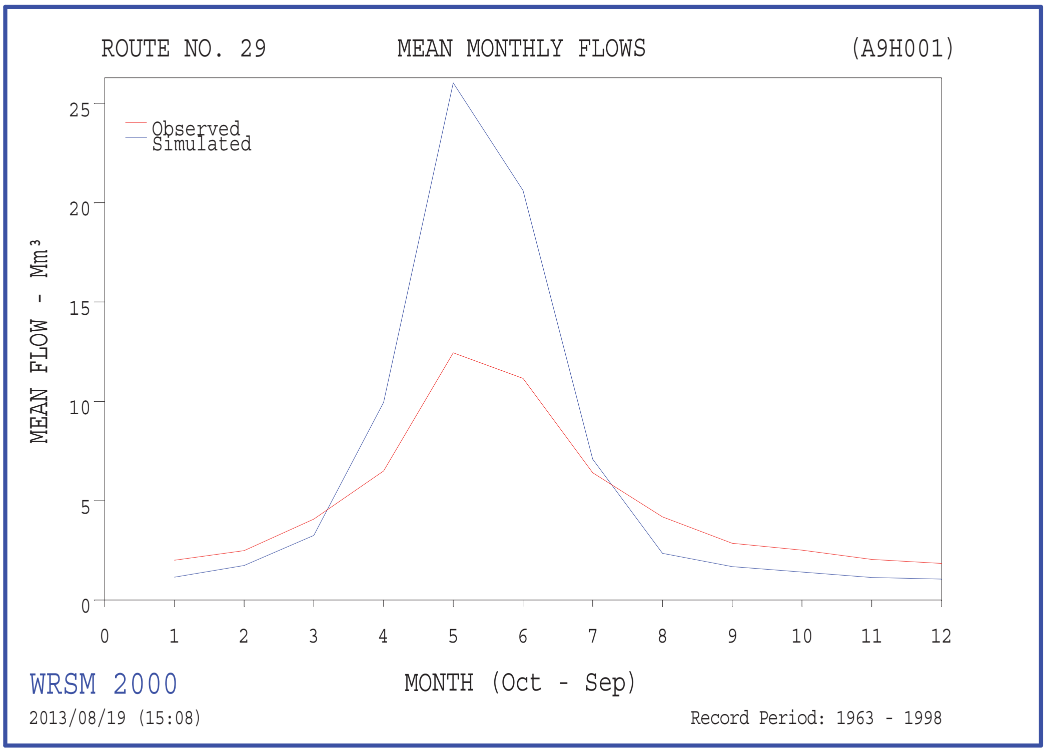


Figure C-105: A9H001 Mean monthly flows

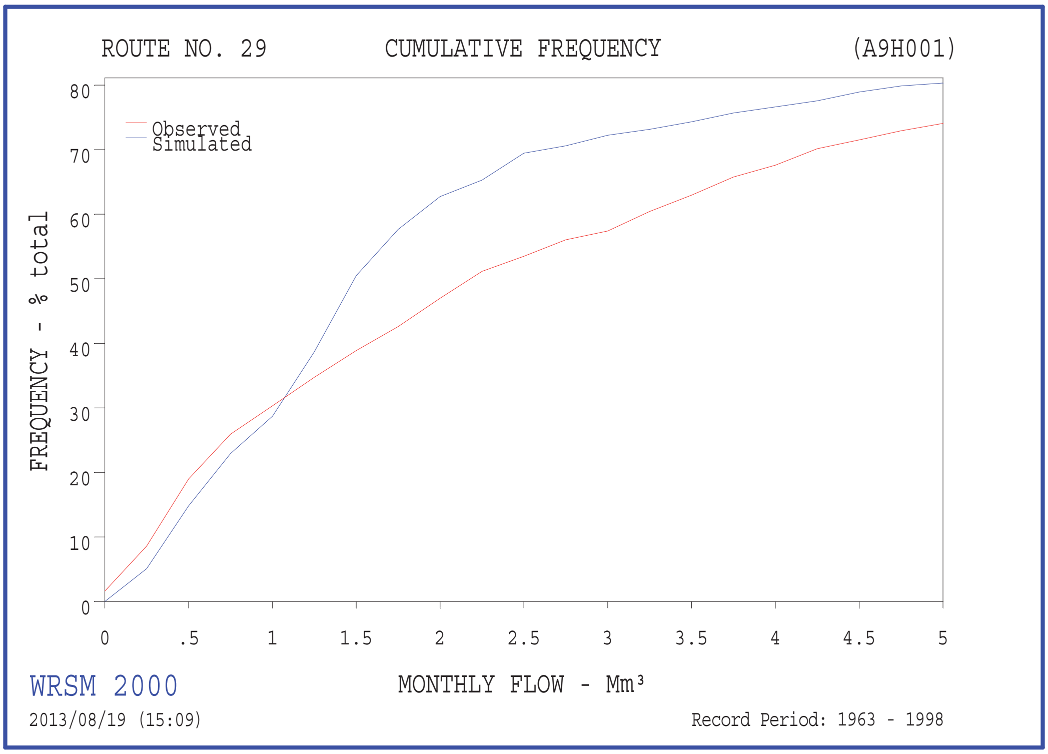


Figure C-106: A9H001 Cumulative frequency

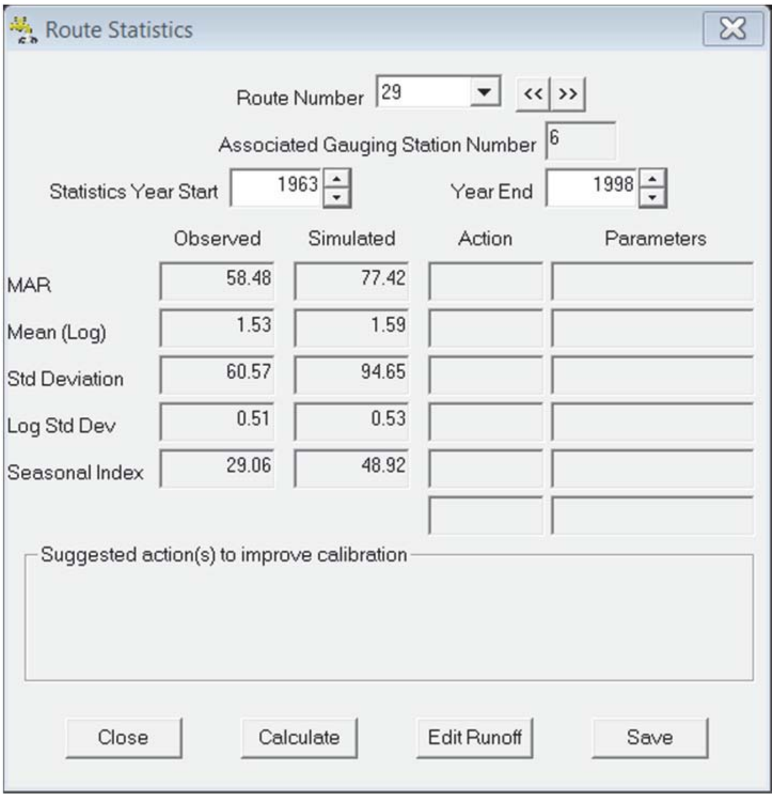


Figure C-107: A9H001 Statistics

Quaternary Catchment A91G1+G2

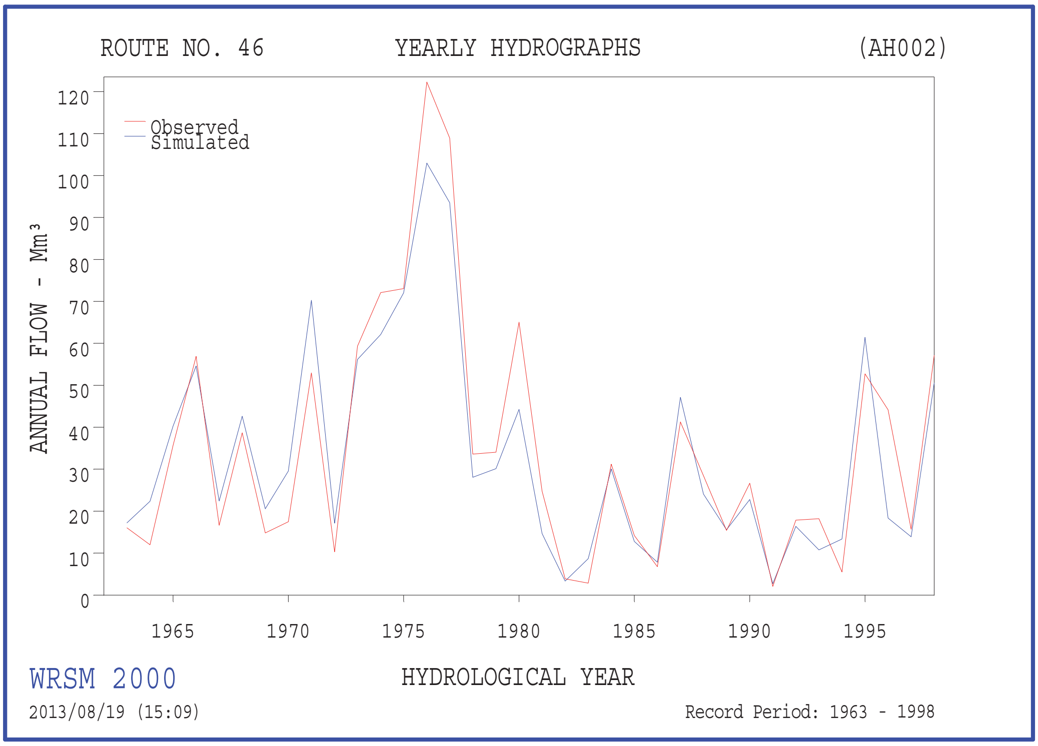


Figure C-108: A9H002 Yearly hydrographs

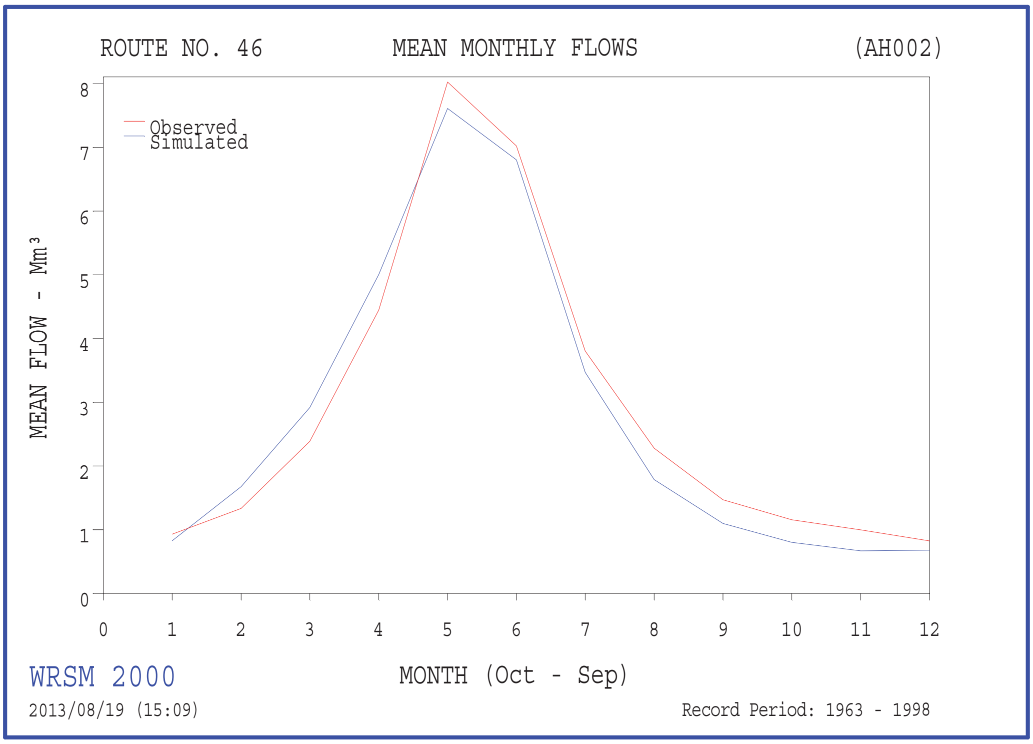


Figure C-109: A9H002 Mean monthly flows

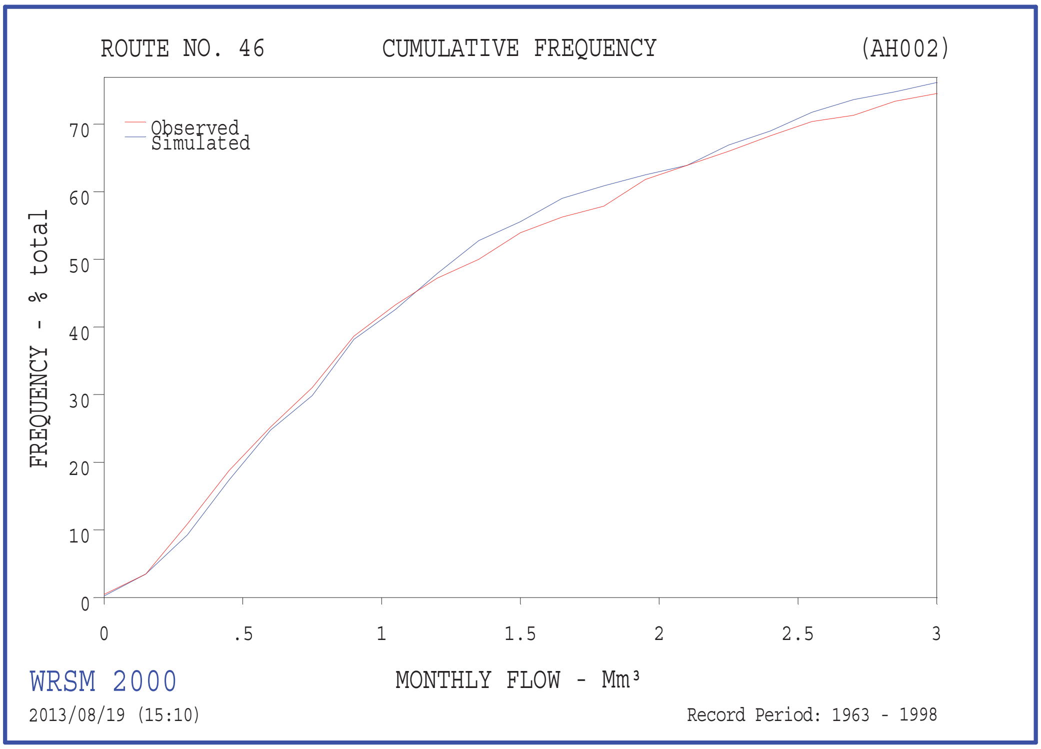


Figure C-110: A9H002 Cumulative frequency

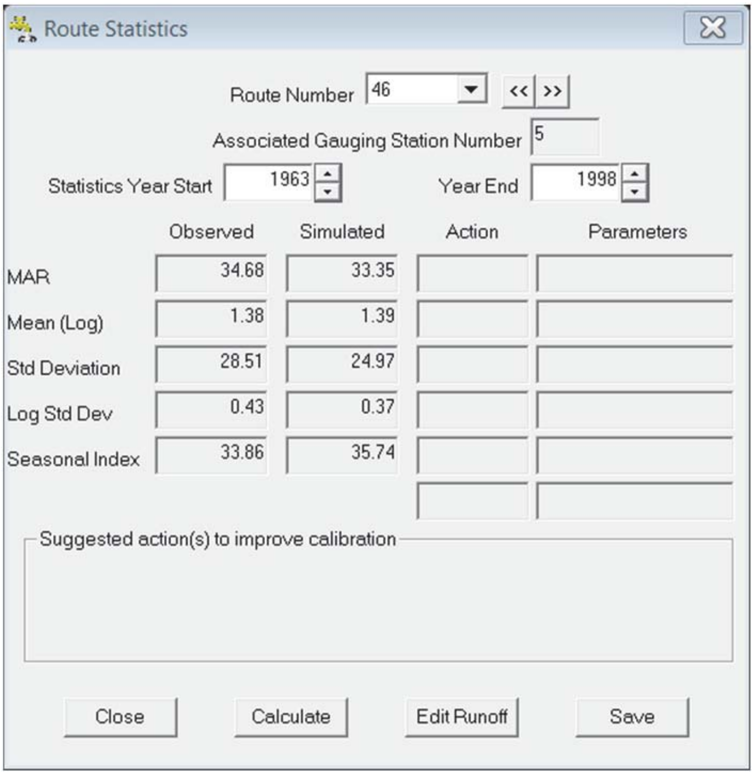


Figure C-111: A9H002 Statistics

Quaternary Catchment A91G3

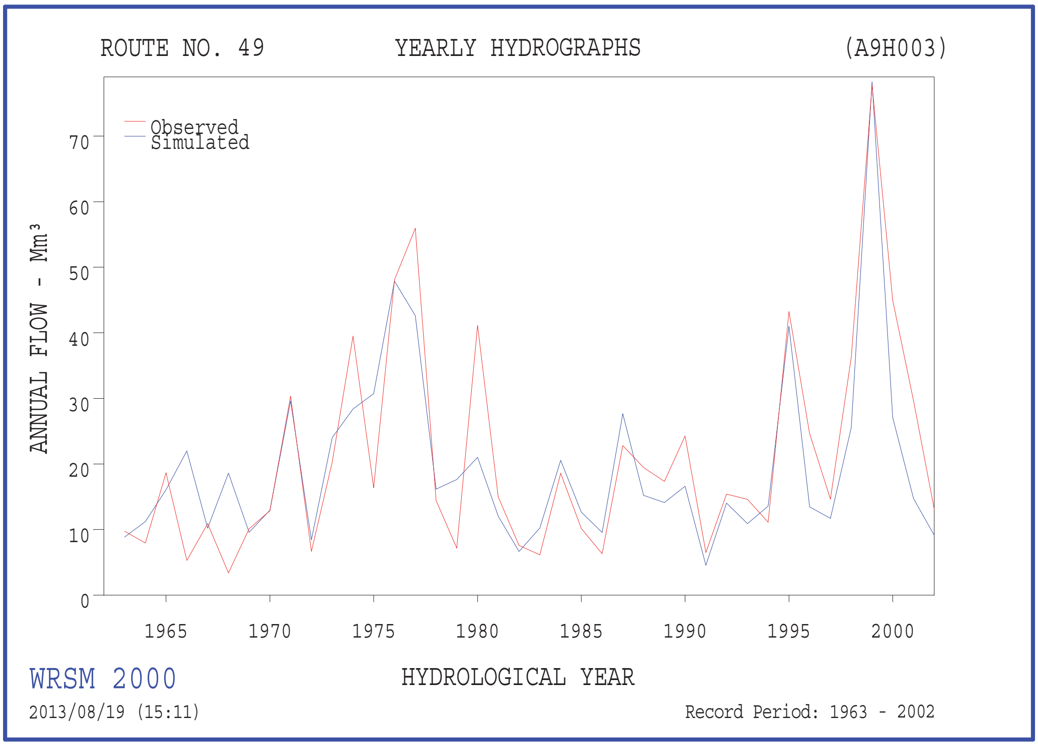


Figure C-112: A9R003 Yearly hydrographs

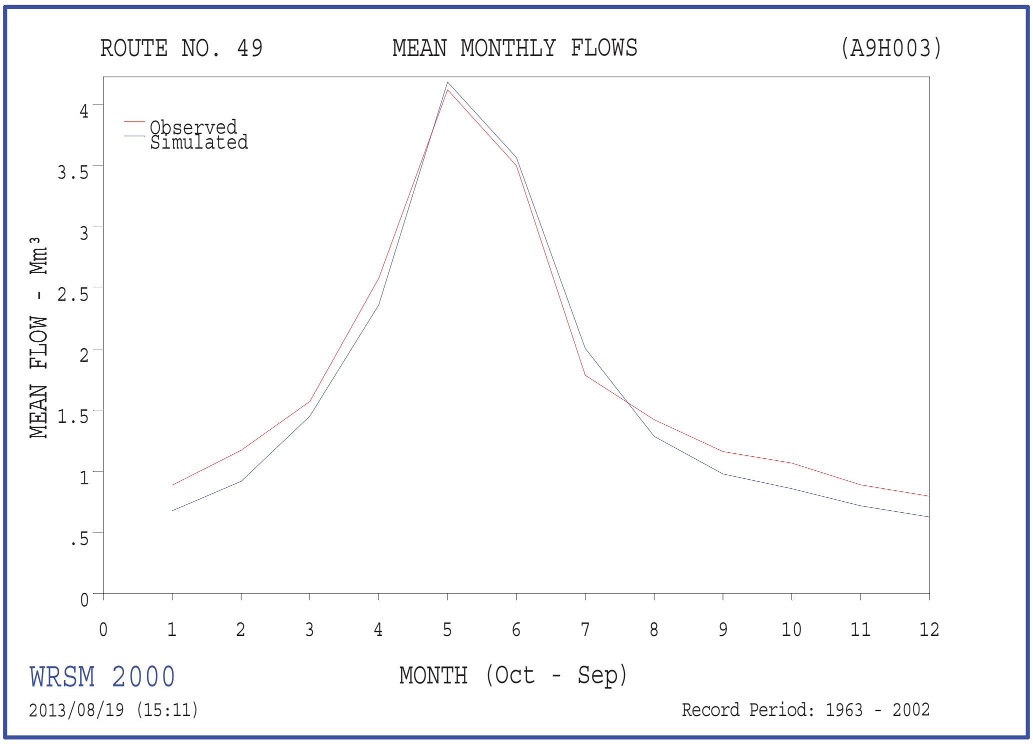


Figure C-113: A9R003 Mean monthly flows

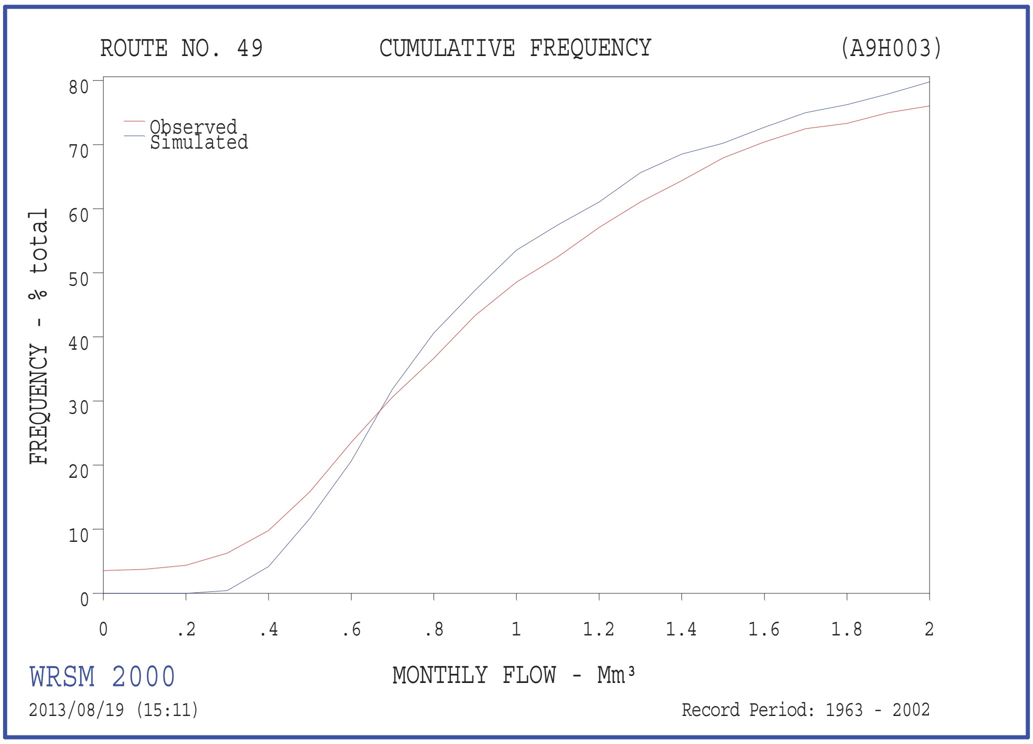


Figure C-114: A9R003 Cumulative frequency

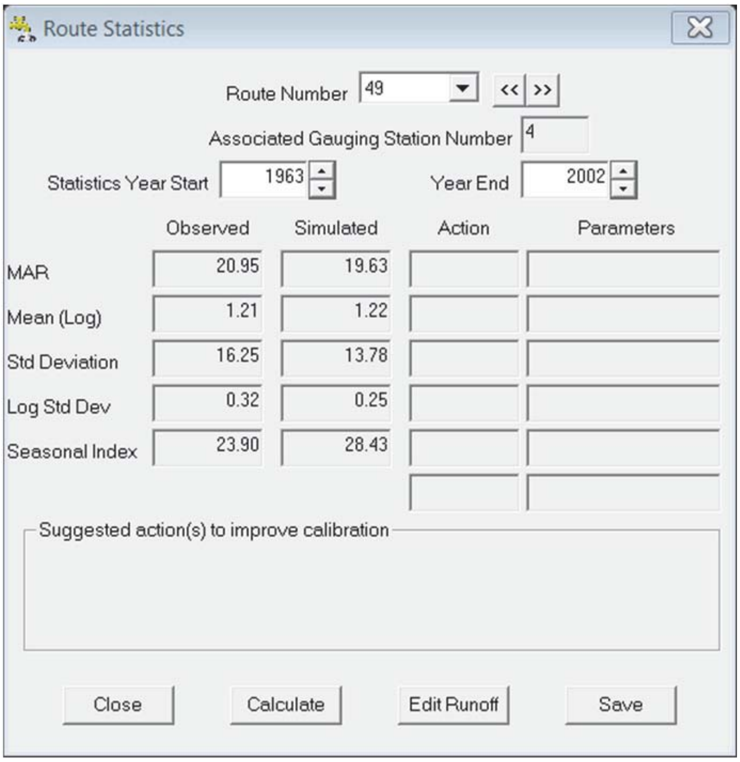


Figure C-115: A9R003 Statistics

Quaternary Catchment A91H

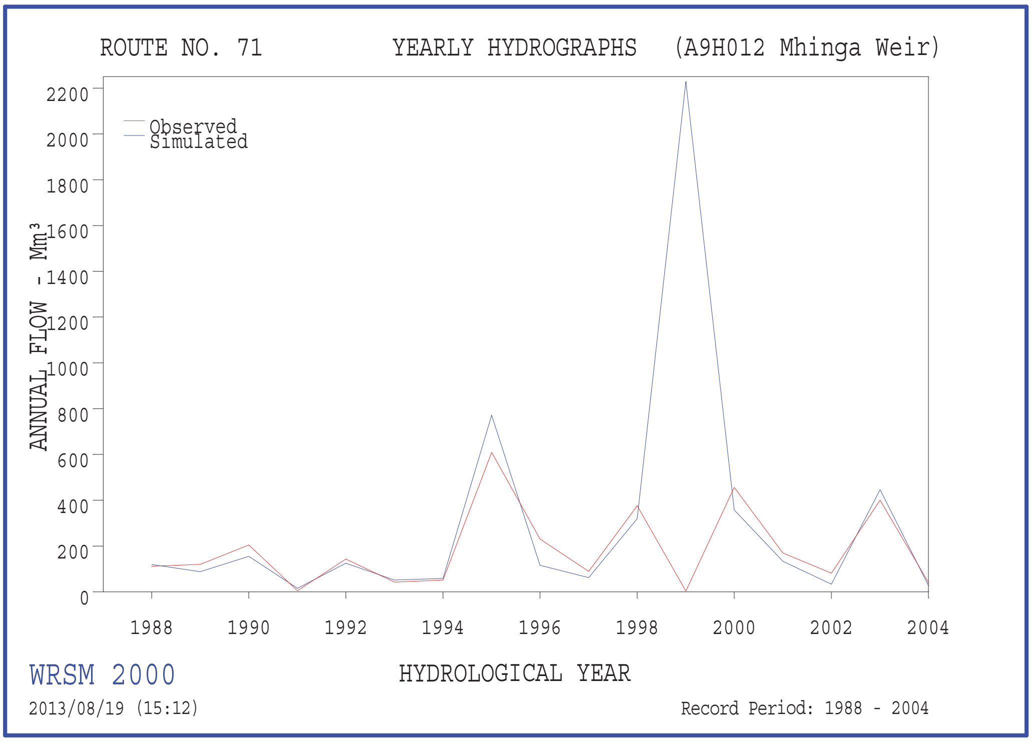


Figure C-116: A9H012 Yearly hydrographs

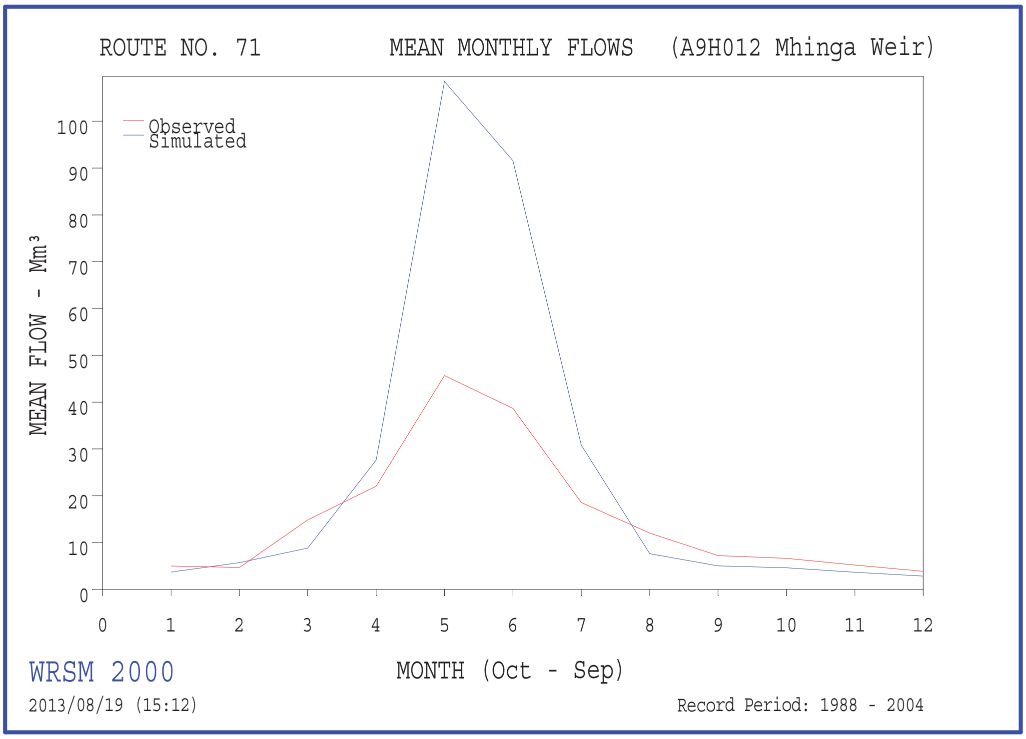


Figure C-117: A9H012 Mean monthly flows

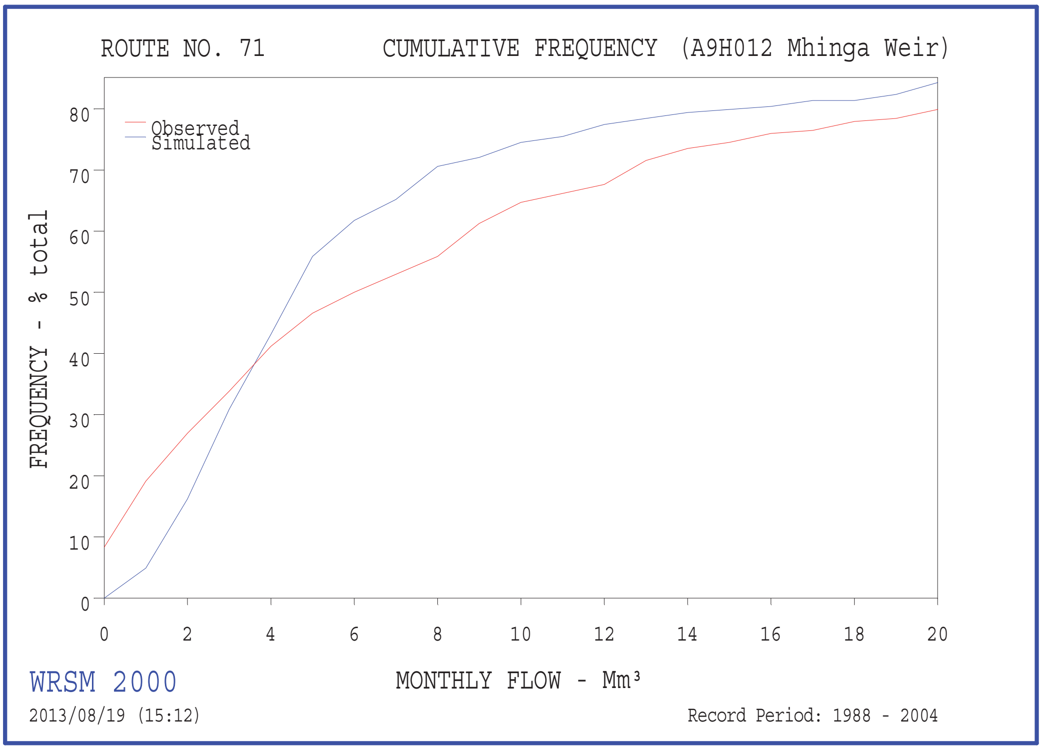


Figure C-118: A9H012 Cumulative frequency

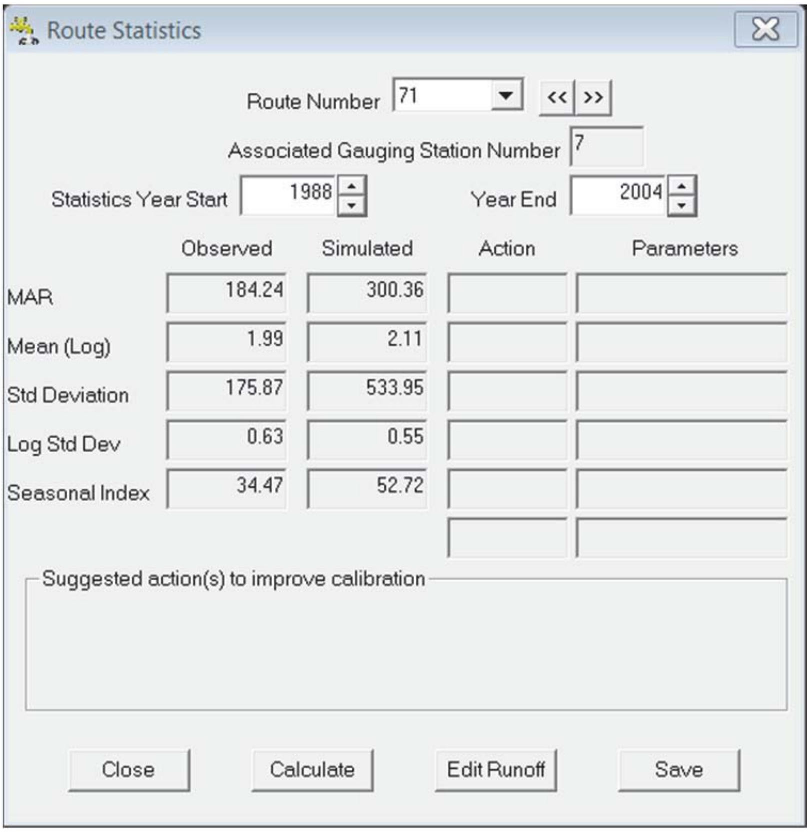


Figure C-119: A9H012 Statistics

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