



RH2 TECHNICAL

Memorandum

Client: Chelan County Department of Natural Resources

Project: Lake Chelan WRIA 47 Water Rights Processing

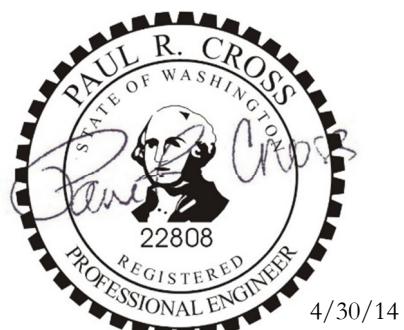
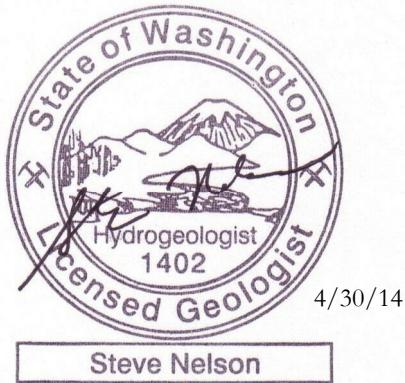
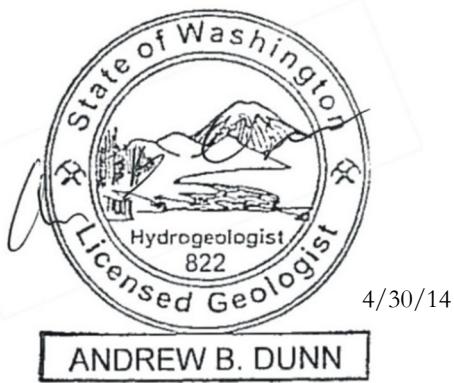
Project File: CNR 714.046.01.101 **Project Manager:** Paul Cross, P.E.

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Subject: Lake Chelan Watershed Reserve Accounting Analysis

Date: April 30, 2014



Introduction

This memorandum summarizes a recent estimate of the annual quantity of water rights remaining in the Lake Chelan Water Right Reserve, and an estimate of the annual quantity of water rights proposed in all of the active water right applications in the Lake Chelan Watershed above Chelan Dam.

The Washington State Department of Ecology (Ecology), the Chelan County Department of Natural Resources (CCNR), and the Lake Chelan Water Resources Inventory Area (WRIA) 47 Planning Unit (PU) desire to collectively process more than 100 applications for new water rights within WRIA 47 following a coordinated cost-reimbursement program authorized under Revised Code of Washington (RCW) 90.03.265 (3) which states:

To initiate this process, the department must notify in writing all persons who have pending applications on file for a new appropriation, change, transfer, or amendment of a water right from that water source. A water source may include surface water only, groundwater only, or

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surface and groundwater together if the department determines that they are hydraulically connected. The notice must be posted on the department's web site and published in a newspaper of general circulation in the area where affected properties are located. The notice must also be made individually by way of mail to:

- (a) Inform those applicants that cost-reimbursement processing of applications within the described water source is being initiated;
- (b) Provide to individual applicants the criteria under which the applications will be examined and determined;
- (c) Provide to individual applicants the estimated cost for having an application processed on a cost-reimbursement basis;
- (d) Provide an estimate of how long the cost-reimbursement process will take before an application is approved or denied; and
- (e) Provide at least sixty days for the applicants to respond in writing regarding the applicant's decision to participate in the cost-reimbursement process.

The intention of the PU to review the status of existing water rights and process applications for new water rights are two of the recommended actions for water quantity in the *WRIA 47 Chelan Watershed Plan* (RH2, 2013).

Water Right Reservation in Lake Chelan

A 1925 water right (Surface Water Certificate 319) issued to the Chelan Electric Company, now the Chelan County Public Utility District No. 1 (District), established a water right reservation of 45,000 acre-feet per year (afy) for multiple beneficial uses. A 1992 Agreement between Ecology and the District increased the water right reservation to 65,000 afy. The 1925 right and 1992 Agreement state that the reservation applies only to water above the Lake Chelan Dam and may only be used in the Lake Chelan Watershed. RH2 Engineering, Inc. (RH2) has estimated the volume of water that has been allocated by Ecology in the Lake Chelan Watershed above Chelan Dam and the amount of water remaining in the reservation and available for new water rights processing.

Evaluation of Water Right Tracking System Water Rights Database

A Water Right Tracking System (WRTS) spreadsheet containing all water right documents for WRIA 47 was obtained from Ecology on March 17, 2014. The original list from Ecology included a total of 2,386 records. To estimate the quantities of active rights, this list was culled to exclude the following types of documents:

1. All inactive water right documents;
2. All new water right applications;
3. All water right change applications;
4. All water rights with the point of diversion/withdrawal outside of the topographic boundary of Lake Chelan above the District's dam within WRIA 47 defined in Chapter 173-500 Washington Administrative Code (WAC). For points of diversion/withdrawal for water

rights located near the watershed boundary, each water right point of diversion/withdrawal location was viewed in the Water Resources Explorer and compared to the topographic divide/WRIA 47 boundary to determine whether the point of diversion/withdrawal was inside or outside of the Lake Chelan watershed;

5. All reservoir permits; and
6. All claims.

Additionally, RH2 reviewed water rights that have been through the change process in order to avoid double-counting the annual volume, which is possible based on WRTS tracking of water rights records. For instances where a water right was split through the change process, all of the daughter rights were retained for accounting and the original certificate or permit was removed from accounting. When multiple changes were made to one water right, but no daughter rights were produced, the most recent change decision was retained and the older change decisions were not included in the accounting. This accounts for any reduction in annual quantity brought about by the water right going through the change process. All available documentation for water rights identified in the WRTS summary as "Chng/ROE" was reviewed and appropriate records were either culled or retained for accounting. Also, priority dates for water rights at the "Chng/ROE" stage were restored to the actual priority date of the original water right, as opposed to the date recorded in WRTS, which indicates the date of change application filing.

Water rights identified for power use were assumed to be non-consumptive and no annual volume was assigned or debited from the reserve for these rights.

This evaluation resulted in a total of 768 water right records (excluding claims) that consist of water rights that are at the following stages: Permit; Certificate; Adjudicated Certificate; Certificate of Change; Change Report of Examination (ROE); and one ROE.

Claims

Water right claims were not included in the accounting, as they may or may not represent a valid water right and/or the quantity may be incorrect or absent. In many cases, the instantaneous rate and annual volume identified on a claim are unrealistic for the actual amount of water needed for the claimed use. Short-form claim forms did not require information on the instantaneous rate and annual volume and these quantities are usually not provided on the form.

Previous reserve accounting may have taken into account a tentative determination of the validity and extent of claims (Bob Barwin with Ecology, personal communication, April 7, 2014), but this was not done as part of this analysis. However, many claims are likely valid and represent actual water use and senior rights which should be accounted for in the final annual quantity analysis. Ecology and the District should establish, based on the intent of the 1992 Agreement, how to rationalize and account for claims to determine the most accurate and legally defensible estimate of senior water rights before releasing new rights from the reserve.

If claims are to be considered, Ecology and the District should agree on details such as the exclusion of claims based on identified priority date (i.e., after the water code was in place), alteration of annual volumes based on identified beneficial uses, and how to account for annual volumes for claims with no information on the number of connections or irrigated acres.

Based on a preliminary assessment, it is estimated that the annual volume that would be found to be valid through an adjudication of claims would be less than 4,000 afy.

Estimating the Current Annual Volume Allocated Under Active Water Right Documents

Several conditions led to various methods to quantify the annual volume of the water right. Those rights where WRTS listed an annual volume were included without additional investigation.

In a few instances when the annual volume appeared to be erroneously high based on acreage or type of use, the water right documents were reviewed. If the water right record was considered to be more accurate than the WRTS values, the water right record values were quantified in lieu of the WRTS values. Modifications to the WRTS database are shown in underlined text and noted in the WRTS spreadsheet.

Many of the water right records indicate only the instantaneous rate, and did not include an annual volume either in the database, or on the water right documents themselves. This practice was fairly common with older surface water rights in Washington State issued prior to 1960. If an annual volume was not identified, then assumed values for different water uses were used to estimate the annual volume of the water right (**Table 1**).

Table 1. Estimated Water Uses for Unquantified Water Rights

Water Use	Annual Volume Assigned (afy)
Domestic, per connection	1
Irrigation, per acre	3.5
Stock Watering	1

The single domestic estimate of 1 afy is lower than the 2 afy estimate in the initial watershed assessment (Montgomery Water Group, 1995). However, RH2 has reviewed Ecology's historical allocation of water to single domestic purposes, which ranged between 1 and 2 afy before 1990, and since 1990, has been allocated a volume of approximately 0.5 afy for this same purpose of use. The reduction in certificated water use is likely based on more efficient use of water now than in the early 1900s and the availability of more metering data to review and justify issuing the post-1990 water rights with the 0.5 afy annual volume. Since beneficial use is the actual measure of a domestic water right, RH2 concluded that 1 afy per connection for unquantified water rights is a reasonable but conservative estimate for single domestic use.

The irrigation water duty of 4 feet per acre was used in the initial watershed assessment (Montgomery Water Group, 1995). This annual volume is very high for the crops grown and the irrigation methods used in the watershed. Ecology has issued a duty of approximately 3.5 feet per acre for more recent water rights. The water duty of 3.5 feet per acre is considered to be a sufficiently conservative estimate for each unquantified irrigation water right lacking a defined annual volume to irrigate the highest duty crop with reasonable, but not necessarily the most efficient, irrigation methods.

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Water rights identifying stock watering as a purpose of use were assigned a volume of 1 afy for this use, with the understanding that stock watering use can range from a single animal up to large herds. RH2 assumed that stock watering in WRIA 47 is typically associated with a few animals; therefore, 1 afy appeared reasonable.

Large Quantity Water Right Holders

A more careful review of the water right record was performed for a few select entities that hold multiple water rights and, as a group, hold the majority of authorized annual quantities in the basin. Those entities include the Lake Chelan Reclamation District; City of Chelan; RLF Cascade Land Holdings, LLC; L H Piro-Beebe, LLC et al; Beebe Orchards Water Association; and Bear Mountain Ranch and Water District. The total estimated annual volume for water rights held or utilized by these entities has been estimated to equal 37,502 afy, or approximately 58 percent of the total reserve.

Lake Chelan Reclamation District

The Lake Chelan Reclamation District (LCRD) holds multiple water rights for both irrigation (Adjudicated Certificates S4-*46003J, S4-21301J, S4-21303J, S4-21305J, S4-21306J, S4-21308J, S4-21309J, S4-21310J, S4-21311J, S4-21312J, S4-21314J, S4-21316J, S4-21317J, and S4-21318J; Certificates SWC 212, SWC 213, SWC 3408, and S4-01345) and municipal supply (Certificate S4-27077C; Permits S4-30333 and S4-30334). Based on language in the report of examination for S4-01345, the total irrigation rights held by LCRD equaled 21,450 afy on December 16, 1969. However, in the certificate for the same right, which was issued on May 12, 1995, the total irrigation rights were provisioned as not to exceed 22,388 afy for the irrigation of 6,600 acres. RH2 assumed that the higher number was correct since it is a provision on a more recently issued certificate. The municipal rights held by LCRD equal 2,672 afy as provisioned in the reports of examination for S4-30333 and S4-30334 issued on March 1, 1995. Therefore, the total annual water rights held by LCRD within the watershed are estimated to equal 25,060 afy.

City of Chelan

The City of Chelan (City) holds or utilizes all or a portion of municipal water rights SWC 178, SWC 458(A), SWC 709(A), SWC 710, SWC 3244, SWC 4018, SWC 8093, SWC 10891, S4-25651P, S4-28906C(A), S4-30166P, S4-30167P, and S4-30361P. In the report of examination for S4-30167, issued in March, 1993, Ecology identified the annual volume under SWC 4018, SWC 10891, S4-30166P, and S4-30167P as not to exceed 4,283 afy. In addition to the rights originally obtained by the City and limited to 4,283 afy, the City has acquired interest in portions of four other water rights (SWC 458(A), SWC 709(A), S4-25651P, and S4-28906C(A)) and five full water rights (SWC 178, SWC 710, SWC 3244, SWC 8093, and S4-30361P), all totaling 1,093.14 afy. Therefore, the total of water rights held or utilized by the City of Chelan within the watershed is estimated to equal 5,376.14 afy.

Bear Mountain Ranch and Water District

The Bear Mountain Ranch and Bear Mountain Water District hold or utilize numerous water rights. These water rights include SWC 4590, SWC 5182, SWC 9550, SWC 9551, S3-00148C, S3-22540C, S4-27562C, S4-28906C(B), S4-30277P, S4-30501P, S4-30502C(A), S4-30541P, S4-30542(A) & (B),

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S4-30544P, S4-30693P, and S4-30959P. This water is used for municipal, irrigation, and related uses such as frost protection and golf course pond filling. The total water rights held or utilized by these two entities within the watershed, excluding water right claim 120592, are estimated to equal 2,968.04 afy.

RLF Cascade Land Holdings, LLC, L H Piro-Beebe, LLC et al, and Beebe Orchards Water Association

RLF Cascade Land Holdings, LLC, L H Piro-Beebe, LLC et al, and Beebe Orchards Water Association jointly share three water rights (SWC 540, SWC 564, and SWC 1052) that have been split among them. A water right change in the name of the Lower Squilchuck Irrigation District also references SWC 540, but it is not certain if this transfer is contained within or in addition to the annual volume described below. The original point of diversion for SWC 1052 with priority date of 1918 was Indian Springs, which is below the current location of Chelan Dam. The original point of diversion for SWC 540, with a priority date of November 1925, and SWC 564, with a priority date of 1931, is the penstock of the Lake Chelan Dam immediately above the point at which water enters the dam turbines. The point of diversion for the majority of this water was transferred to be taken directly off of the penstock for the hydropower plant which is located at the Chelan Dam. Per Superseding Certificates issued in March 2005, the cumulative total that all entities can take from the penstock under these water rights is estimated to equal 4,098.1 afy. A personal communication with Bob Barwin from Ecology (April 7, 2014) confirmed that all water rights diverting from the District's penstock should be debited against the reserve.

Previous Reserve Accounting

Previous investigators have estimated the annual volume of water that has been allocated and also the volume of water that remains under the reserve. The reserve accounting identified in various documents has been summarized in **Table 2**. An attempt has also been made to trace water allocation through time to see how the accounting from this study compares with these historic points. This comparison can be seen in **Table 2**.

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Table 2. Reserve Accounting Documented through Time (Does not include claims)

Historical Date Pertaining to Allocation Estimate	Prior Estimate of Allocated Quantity for Historical Date (afy)	Source of Estimate	New Estimate of Allocated Quantity for Historical Date (afy)
July 22, 1925	12,000	1992 Agreement Concerning Water Right Certificate No. 319 between Ecology and the District	14,288 ¹
December 16, 1969	30,163	ROE for S4-01345 for LCRD. The number presented is after this right was issued.	35,547
September 1982	34,198	Aspect Consulting LLC, July 25, 2013, Lake Chelan Water Rights Permitting Options. Barwin estimate.	42,710
April 29, 1992	34,000	1992 Agreement Concerning Water Right Certificate No. 319 between Ecology and the District	45,113
March 1, 1995	47,000	ROEs for S4-30333 and S4-30334 for LCRD. The number presented is after these rights were issued.	52,243
1995	35,900	Initial Watershed Assessment WRIA 47, June 8, 1995 (Permits and Certificates only)	
February 7, 2002	46,702.5	ROEs for S4-30277 and changes to old Beebe Ranch water rights. The number presented is after these rights were issued.	53,689
March 17, 2014	46,736.5	Extrapolating from accounting in ROEs issued in February 7, 2002	53,723
		Remaining Balance from 65,000 afy	11,277 afy

¹ Issuance of S4-01052 predates the District's water right and it was included in this study's tally as being senior to July 22, 1925, even though a change application approved in 2002 recognized that it was diverting water from the hydropower penstock. Earlier investigators would not have accounted for this right. If the estimated 2,732 afy for S4-01052 is subtracted from this value, the volume would be 11,556 afy, which is similar to the original estimate of 12,000 afy.

One difficulty with replicating the previous accounting is that the priority date might be many years different from when a water right is processed and when the accounting is performed. For instance, water right permit S4-30277 has a priority date of May 22, 1990, but the report of examination was issued on February 7, 2002. WRTS database output search only provides the priority date, which as shown here can be decades different from when an ROE or permit might have been issued. To try to fix this issue, a second WRTS query was performed and the original permit issuance date was extracted and used for purposes of determining how this current investigation compares with the other accounting tabulations made over time. Keep in mind that the issuance and then cancellation of permits would also create differences between these two accounting methods. However, for this study, that level of detail was not investigated, since ultimately it does not impact the current value.

The summary in **Table 2** indicates that approximately 11,277 afy remain in the reserve, if all of the assumptions used to perform the accounting are either correct or determined to be reasonable. A second accounting was performed beginning with Bob Barwin's September 1982, 34,198 afy as the starting point and only looking at more recently issued water rights. Using this approach, approximately 16,334 afy remain in the reserve. Using either method results in a lower remaining reserve compared to previous investigator's estimates. One potential source of the variability could be the use of the water right priority date in relation to September 1982 to determine how much water had been allocated after the Barwin accounting. The date that the ROE is issued (close to the permit issuance date) is actually when the water right should be debited from the reserve; RH2 concludes that the method used for this study resulting in an remaining reserve estimate of 11,277 afy is more accurate.

There are 186 water rights that are at permit, superseding permit, or change/ROE stage. If many of these water rights are ready to go to certificate, then a proof examination could be performed by a certified water right examiner and a certificate could be issued. Certification of these rights might increase the quantity of reservation water if certificates are issued for less than the permitted quantities based on proof examination results.

A summary of the reserve accounting methodology is attached as Summary of Reserve Accounting Spreadsheet.

Summary of Issues Requiring Resolution

The following summarizes technical and legal issues that Ecology, the District, and CCNR should resolve to establish a formal determination of the volume in the reservation available for new applications for beneficial use.

Claims as Part of the Reservation

Pre-1925 claims may or may not be considered part of the pre-1925 estimate of 12,000 afy because those claims were not filed until the 1970s. Bob Barwin from Ecology (personal communication, April 7, 2014) indicated that he attempted to quantify all water use recognized under a water right during his 1984 accounting. RH2's assessments on claims would likely look at claims as follows.

- Post-1917 surface claims could be considered invalid as there was a water right process after 1917.

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Table 3. Estimated Water Uses for Unquantified New Applications

Purpose	afy	Purpose	afy	Purpose	afy
Irrigation (per acre)	3.5	Frost Protection (FP) (per acre)	1	Commercial/Industrial (CI)	1
Domestic Multiple, General, Single (DM, DG, DS)	0.5	Heat Protection (HP) (per acre)	0.25	Fire Protection (FR)	0
Stock	1	Recreation (RE)	5	Power, Fish Propagation, Storage (PO, FS, SR)	0

Table 4 (attached) summarizes the new application details and an accumulated tally of annual volume water based on processing of new applications by priority. The total of the annual quantity requested is estimated at 10,129 afy. This estimate is close to the estimated annual volume remaining in the reserve (11,277 to 16,334 afy) without considering claims and exempt wells. Clearly, the number of applications that may be processed will depend on a conclusive determination of the quantity of water already used from the reservation, with or without claims and existing exempt wells, and the amount available for new applications, with or without new exempt wells.

References:

Aspect Consulting, July 25, 2013, Lake Chelan Water Right Permitting Options. Prepared for the Chelan County Department of Natural Resources.

City of Chelan, January 2010, Water System Plan.

Montgomery Water Group and Others, June 8, 1995, Draft Initial Watershed Assessment Water Resources Inventory Area 47 Chelan Watershed, Open File Technical Report 95-13.

RH2 Engineering, Inc. January 2012. Lake Chelan Watershed Plan (WRIA 47). Prepared for WRIA 47 - Lake Chelan Watershed Planning Unit.

Enclosures:

Table 4 – Summary of New and Active Applications for Water Rights Above Chelan Dam

Reserve Accounting Spreadsheet

Summary of Reserve Accounting Spreadsheet

- Or, should potential riparian rights be recognized up through 1932?
- Post-1945 groundwater claims could be considered invalid as there was a water right process after 1945.

A methodology for partial validation of claims where quantities are overestimated or uncertain should be established. RH2 has requested from Ecology a copy of Bob Barwin's 1984 assessment of existing rights for review and to use his estimate of pre-1925 water rights as the foundation for the remainder of the accounting, but Ecology has been unable to produce it.

Current and Future Exempt Wells as Part of the Reservation

Ecology records indicate that more than 800 water wells with diameters 6 inches or less are recorded for the entire WRIA 47 (both above and below the dam). Many of these wells are used for water supply and are exempt from the water rights permitting process. Bob Barwin (personal communication, April 7, 2014) indicated that he had attempted to estimate the amount of water used from these sources in his 1984 assessment. RH2 and Bob Barwin discussed the distribution of municipal infrastructure and the hydrogeology of the Chelan basin and it was agreed that in locations where permit exempt wells provide the only source of water for residential development, those wells likely yield low annual volumes of groundwater. Groundwater withdrawn from existing exempt wells in WRIA 47 above the dam (which are presumed to divert water from Lake Chelan) may reasonably be quantified as part of the reserve. If each exempt well is assumed to be withdrawing 0.5 afy (likely the actual withdrawal is less) then it may be reasonable to allocate approximately 200 afy to existing permit-exempt wells.

The PU, the District, and Ecology may desire to set aside a portion of the remaining reservation for new exempt wells above the dam. It may be reasonable to set aside approximately 100 afy for future permit-exempt wells.

Future Reservation Accounting

Estimating the amount of water allocated and utilized under this reserve is not straightforward, due to the passage of time, the number of water right records, and the complexity of estimating actual beneficial use. If additional water right may be released to support new applications not met by the currently available reserve, it might be prudent to establish a new and separate accounting for newly issued rights after the current reserve is allocated. This will create a clean starting point for future reserve accounting, which should be actively maintained by Ecology, as is done with other reservations throughout the state.

Estimate of Quantities Requested in New Applications

RH2 reviewed the 152 active applications for new water rights where the proposed points of diversion/withdrawal are apparently above the Chelan Dam to estimate the potential quantity in demand from new applications. Where the annual volume is recorded in WRTS, this value is assumed to be correct. Where the annual volume is not included in WRTS, the following estimates of annual volume for various purposes were used to quantify the total volume requested (**Table 3**).

Table 4.
Summary of New and Active Applications for Water Rights Above Chelan Dam

Estimated Volume of Proposed Purpose of Use										
Doc Numbe	Priority	Applicant	Doc ID	Purpose	Qi cfs	Qi gpm	Qa afy	Acres	Source	Total
G4-28205	5/12/1983	Gebbers Farms Inc	2283981	IR			407	175	G	175
G4-28219	5/23/1983	Gebbers Farms Inc	2283982	IR			255	105	G	280
G4-28471	5/30/1984	Pitman Carl	2284156	IR			400	140	G	420
S4-29148	10/21/1986	Pittman Brothers Orchards	2085461	IR	0.067			10.5	S	431
G4-29401	8/19/1987	Sylte Frazier	2085420	DM IR			100	18	G	449
G4-30048	8/16/1989	Plese Michael	2085547	DM FR IR			60	88	G	537
S4-30475	8/10/1990	Miller Marshall	2085698	DM IR PO	3.26			350.5	S	887
S4-30476	8/10/1990	Miller Marshall	2085699	DM IR	1.06			350.5	S	1,238
S4-30540	1/9/1991	Bear Mountain Ranch Inc	2085926	DM FR IR RE	2.6			320.5	S	1,558
S4-30543	1/9/1991	Bear Mountain Ranch Inc	2085351	DM IR	8			525.5	S	2,084
S4-30555	1/23/1991	Freer Percy	2085676	DM IR	0.06			2.25	S	2,086
G4-30559	1/30/1991	Cooper Jimmie	2085677	IR			50	52.5	G	2,138
G4-30560	1/30/1991	Cooper Jimmie	2085678	IR			50	35	G	2,173
G4-30687	4/9/1991	Paulston John	2085888	CI FP HP IR ST			250	54.25	G	2,228
S4-30771	5/29/1991	Newman Gene	2085843	DS IR PO	0.22			0.5	S	2,228
G4-31010	10/21/1991	Verellen Ned	2085986	DM FR IR			70	18	G	2,246
G4-31091	10/31/1991	Reggett George	2085944	DS IR			25	23.25	G	2,269
S4-31192	3/12/1992	Sherer Wesley	2086124	DM IR	1.5			70.5	S	2,340
S4-31504	10/8/1992	Bernhardt Ronald	2086437	DS IR	0.01			2.25	S	2,342
S4-31534	11/9/1992	Peterson Wesley	2086412	DM IR	0.75			116	S	2,458
G4-31727	5/6/1993	Triangle C Farms Inc	2086371	DS IR ST			30	19	G	2,477
G4-31902	1/10/1994	Martin James	2086479	DS IR RE ST			35	27.675	G	2,505
G4-31909	1/20/1994	Lesmeister Robert	2086485	DS IR			25	7.5	G	2,512
G4-31925	2/11/1994	Kludt-Waldron Orchards Inc	2086499	DM FP IR			100	56.75	G	2,569
S4-31954	3/21/1994	Kneisley Philip	2086522	DM	0.02			4	S	2,573
S4-34578	4/14/1994	Okinsella Keven	2086969	DS	0.011			0.5	S	2,573
S4-32149	8/24/1994	Miller Mark C	2086830	DM IR	1.34			210.5	S	2,784

Table 4.
Summary of New and Active Applications for Water Rights Above Chelan Dam

Estimated Volume of Proposed Purpose of Use										
Doc Numbe	Priority	Applicant	Doc ID	Purpose	Qi cfs	Qi gpm	Qa afy	Acres	Source	Total
G4-32247	11/21/1994	Stifter William	2086151	DM		140	4		G	2,788
S4-32249	11/28/1994	Emil Chris	2086153	DM FR	0.4		0.5		S	2,788
S4-32286	2/16/1995	Holmquist Gordon	2085292	DS	0.01		0.5		S	2,789
S4-32331	7/20/1995	Henri & Judith Lavonne Vansomerengrev	2085168	DS	0.02		0.5		S	2,789
S4-32365	9/20/1995	Kuntz John	2084960	DS	0.02		0.5	0	S	2,790
G4-32362	10/3/1995	Watsons Harverene Resort Inc	2084901	DM IR		125	70.5	20	G	2,860
S4-32371	10/16/1995	CARNAHAN HOPE	2084966	DS	0.1		0.5		S	2,861
S4-32373	10/18/1995	MCPHERSON RC GREG	2084968	DS	0.0156		0.5	0.5	S	2,861
S4-32375	10/23/1995	BOUSQUET THOMAS	2084970	DS	0.02		0.5	0.5	S	2,862
S4-32388	12/13/1995	Nolen Nick	2084985	DS	0.022		0.5		S	2,862
S4-32396	12/28/1995	Seal James	2084983	DM IR	0.16		35.5	10	S	2,898
S4-32397	12/28/1995	Seal James	2084984	DS IR	0.15		35.5	10	S	2,933
S4-32407	1/26/1996	Olson Bruce & Sylvia	2084748	DS	0.02		0.5		S	2,934
S4-32408	2/1/1996	Lackner Edward	2084558	DG IR	0.07		4		S	2,938
S4-32410	2/5/1996	Clark Jr Lewis	2084893	DM IR	0.2		35.5	10	S	2,973
S4-32412	2/12/1996	Ives Inez	2084891	DS	0.02		0.5		S	2,974
S4-32413	2/12/1996	M & A Enterprises Inc	2084890	DS	0.02		0.5		S	2,974
S4-32409	3/6/1996	Allen Thomas	2084889	DM IR	0.22		28.5	8	S	3,003
S4-32435	4/1/1996	Tobey Thomas	2075540	DS	0.01		0.5		S	3,003
S4-32436	4/1/1996	Worth William	2075541	DS	0.01		0.5		S	3,004
S4-32457	6/25/1996	Johnson Robert	2075290	DS	0.02		0.5		S	3,004
S4-32462	7/24/1996	Dietrich John	2075295	DS IR	0.02		2.25	0.5	S	3,007
S4-32463	7/24/1996	Dietrich John	2075296	DS IR	0.02		2.25	0.5	S	3,009
S4-32476	9/13/1996	Pauly James	2075309	DS	0.02		0.5		S	3,009
S4-32477	9/16/1996	Van Sickle Fred	2075310	DM	0.04		4		S	3,013
S4-32481	11/1/1996	Mack Mike	2075314	DS IR	0.02		4	1	S	3,017
S4-32482	11/5/1996	Waterville Cabin Association	2075315	DM	0.02		4		S	3,021

Table 4.
Summary of New and Active Applications for Water Rights Above Chelan Dam

Estimated Volume of Proposed Purpose of Use										
Doc Numbe	Priority	Applicant	Doc ID	Purpose	Qi cfs	Qi gpm	Qa afy	Acres	Source	Total
S4-32484	11/13/1996	Wells C Blick	2075317	DS	0.02		0.5		S	3,022
S4-32490	11/22/1996	Bagdon Robert	2075323	DS	0.02		0.5		S	3,022
S4-32495	12/17/1996	Smolinsky Holly	2075121	DS	0.01		0.5		S	3,023
S4-32496	12/20/1996	Dunn Arthur	2075128	IR	0.02		1.05	0.3	S	3,024
S4-32508	2/10/1997	King Kelly	2075150	DS IR	0.02		0.5		S	3,024
S4-32509	2/11/1997	Cove Owners Moorage Assn	2075151	DM	0.13		4		S	3,028
S4-32511	2/18/1997	Brownfield Michael	2075160	DS IR	0.02		0.5		S	3,029
S4-32535	4/24/1997	Miller Roy	2038484	DS	0.02		0.5		S	3,029
S4-32547	4/30/1997	Smolinsky Holly	2038443	DM	0.02		4		S	3,033
G4-32549	5/7/1997	Gavin Charles	2038446	DM IR		30	4	1	G	3,037
S4-32554	6/10/1997	Chelan River Irr Dist/Isenhart	2038450	MU	1.4		1016		S	4,053
S4-32560	7/10/1997	Brouner Barbara	2038473	DM IR	0.08		7.5	2	S	4,061
S4-32561	7/10/1997	Brouner Barbara	2038474	DM IR	0.08		7.5	2	S	4,068
S4-32562	7/10/1997	Brouner Barbara	2038475	DM IR	0.08		7.5	2	S	4,076
S4-32587	9/15/1997	Mullen Genette	2032985	DS IR	0.05		2.25	0.5	S	4,078
S4-32588	9/25/1997	Huber Norman	2032986	DS	0.02		0.5		S	4,079
S4-32601	10/28/1997	Riggan & Gebbers	2032913	FR IR SR	4.9		980	280	S	5,059
S4-32607	11/14/1997	Moss Milan	2032926	DM MU	0.05		1		S	5,060
S4-32636	11/26/1997	Little Butte Property Owners As	2032991	DM IR ST	0.267		19	5	S	5,079
S4-32621	1/12/1998	Greer Jim	2032931	DS	0.01		0.5		S	5,079
S4-32619	1/15/1998	Campbell Bruce D & Maria	2032930	DS		2	0.5		S	5,080
S4-32633	2/3/1998	Gebbers Farms Inc*	2032946	FP IR	1.894		427.5	95	S	5,507
S4-32638	2/11/1998	Shreiner Robert	2032970	DS IR	0.02		0.5		S	5,508
S4-32646	2/20/1998	Keiser Family Trust	2033038	DS IR	0.05		35.5	10	S	5,543
S4-32647	2/20/1998	Mellison Rob	2032782	DS IR	0.05		44.11	12.46	S	5,587
S4-32648	2/23/1998	Bailiff Dan	2033037	DS IR	0.04		3.125	0.75	S	5,590
S4-32651	2/27/1998	Baarstad Brian	2032787	DS IR	0.02		0.85	0.1	S	5,591

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Doc Numbe	Priority	Applicant	Doc ID	Purpose	Qi cfs	Qi gpm	Qa afy	Acres	Source	Total
S4-32658	3/16/1998	Champion Lois	2032801	DS	0.02		0.5		S	5,592
S4-32663	4/1/1998	Campbells Lodge Inc	2032850	IR	0.04		7	2	S	5,599
S4-32670	4/23/1998	Boykin John	2032857	DS	0.02		0.5		S	5,599
S4-32686	6/1/1998	Mattison (deceased) Melvin	2032880	DM IR	0.14		5.75	1.5	S	5,605
S4-32697	6/9/1998	Nash Claudia	2032892	DM	0.05		4		S	5,609
S4-32742	6/29/1998	Barnett Grace	2032687	DS	0.02		0.5		S	5,610
S4-32743	6/29/1998	Barnett Grace	2032688	DS	0.02		0.5		S	5,610
S4-32793	8/24/1998	Anderson Jesse	2032768	DS	0.02		0.5		S	5,611
S4-32794	8/26/1998	Tornow Brian	2032769	DS	5		0.5		S	5,611
G4-32796	9/4/1998	Bear Mountain Ranch Inc	2032770	DM		192.6	4		G	5,615
S4-32799	9/14/1998	Clark William	2032774	IR	0.334		70	20	S	5,685
S4-32800	9/15/1998	Sanfords Inc	2032775	DS	0.02		0.5		S	5,686
S4-32806	9/25/1998	Trustee Barnecut Cabin Property Trust	2032535	DS RE	0.02		5.5		S	5,691
S4-32807	9/25/1998	Trustee Barnecut Cabin Property Trust	2032536	DS RE	0.03		5.5		S	5,697
S4-32808	9/28/1998	Holden Betty	2032537	DS IR	0.02		3.125	0.75	S	5,700
S4-32815	10/19/1998	Little Butte Property Owners As	2032633	DM FR ST	0.01		1.5		S	5,701
S4-32817	10/28/1998	Owens Vicki	2032635	DS	0.01		0.5		S	5,702
G4-32828	12/21/1998	Courtney Clifford	2032645	DM FR IR ST		100	91.1	25.6	G	5,793
S4-32827	12/21/1998	Stehkin Valley Ranch	2032644	DS FS IR ST	0.0557		8.5	2	S	5,801
S4-32829	12/21/1998	Courtney Clifford	2032646	DS FR FS IR PO	0.153		7.85	2.1	S	5,809
S4-32831	1/4/1999	Anderson Kerry	2032392	CI DS IR	0.02		5.75	1.5	S	5,815
S4-32832	1/5/1999	Reid Norman & Betty	2032393	DS FR IR	0.0557		0.57	0.02	S	5,815
S4-32834	1/27/1999	Anderson Michael	2032425	DS	0.02		0.5		S	5,816
S4-32840	2/11/1999	Knott Howard J & Laurie J	2032437	DS IR	0.03		3.125	0.75	S	5,819
S4-32847	3/9/1999	Chelan City	2032463	IR	0.34		53	15	S	5,872
S4-32869	6/7/1999	Eslinger Mike	2032335	DS	0.02		0.5		S	5,873
S4-32872	6/28/1999	Pleyte John	2032337	DS	0.02		0.5		S	5,873

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Estimated Volume of Proposed Purpose of Use										
Doc Numbe	Priority	Applicant	Doc ID	Purpose	Qi cfs	Qi gpm	Qa afy	Acres	Source	Total
S4-32877	7/16/1999	Butler W Clark	2032342	DS IR	0.02		1.655	0.33	S	5,875
S4-32878	7/20/1999	Martin Ian	2032343	DS	0.03		0.5		S	5,875
S4-32879	8/2/1999	Johnson Terry	2032344	DS	0.011		0.5		S	5,876
S4-32887	9/8/1999	Pleyte John	2032366	DS	0.02		0.5		S	5,876
S4-32894	10/19/1999	Miller Jody	2032370	DS IR	0.02		0.955	0.13	S	5,877
S4-32903	1/24/2000	Wade Carl	2087895	DS	0.011		0.5		S	5,878
S4-32904	1/24/2000	Ward C Bradley	2087896	DS	0.011		0.5		S	5,878
S4-32906	2/1/2000	Goble Gary	2087645	CI DM	0.11		1.5		S	5,880
S4-32907	2/7/2000	Lettenmaier Dennis	2087646	DS	0.02		0.05		S	5,880
S4-32908	2/10/2000	Kelly Jim	2087647	DS	0.011		0.5		S	5,880
S4-32909	3/3/2000	Gunning William	2087648	DS	0.01		0.5		S	5,881
S4-32921	5/24/2000	Henry Paul	2087715	DS	0.01		0.5		S	5,881
S4-32937	12/22/2000	Lust Michael	2087533	DS	0.018		0.5		S	5,882
S4-34525	8/15/2001	Pisco Walter	2087386	DM IR	0.045		4.35	1.1	S	5,886
S4-34544	2/6/2002	Linton Robert	2087208	DS	0.006		0.5		S	5,887
S4-34545	2/6/2002	SMR LLC	2087209	DS	0.006		0.5		S	5,887
S4-34548	3/21/2002	Cargill Jim	2087037	DS	0.02		0.5		S	5,888
S4-34558	5/28/2002	Dainard Robert	2086861	IR	0.0222		0		S	5,888
S4-34576	9/16/2002	Burroughs David	2086956	DM	0.02		4		S	5,892
S4-34907	6/18/2003	Mangold Carl	4155139	DS	0.045		0.5		S	5,892
S4-34923	10/3/2003	Estrada Ralph & Toni	4164659	DS	0.02		1		S	5,893
S4-34929	12/4/2003	Cagliero Louie & Cheryl	4169205	IR	0.04		0.05	0.2	S	5,893
S4-34947	9/8/2004	Querin Oliver	4201983	DS	0.02		2		S	5,895
G4-34950	10/7/2004	Davison Bonnie	4214257	IR ST		6	116.435	178.55	G	6,012
S4-34949	10/7/2004	Davison Bonnie	4214246	IR	0.004		38.69	178.55	S	6,050
S4-35053	3/31/2005	Parkhill Richard	4243538	DS	0.22		1		S	6,051
R4-35039	7/8/2005	Chelan Butte Holdings LLC	4239763	IR	0		48	360	R	6,099

Table 4.
Summary of New and Active Applications for Water Rights Above Chelan Dam

Estimated Volume of Proposed Purpose of Use										
Doc Numbe	Priority	Applicant	Doc ID	Purpose	Qi cfs	Qi gpm	Qa afy	Acres	Source	Total
S4-35064	8/5/2005	Harm Sabine	4244221	DS IR	0.03		4.8	0.4	S	6,104
S4-35069	10/6/2005	Thompson Douglas	4248805	DS	0.02		2		S	6,106
S4-35072	10/20/2005	Chelan City	4249172	MU	22.29		3800		S	9,906
G4-35076	11/10/2005	Phelps Donald & Judy	4253756	IR		50	22.5	9	G	9,929
S4-35077	11/22/2005	Wright David	4253807	MU	1		120		S	10,049
S4-35090	4/20/2006	Chelan Cnty PUD 1 *	4270514	PO	5		2707		S	10,049
S4-35092	5/15/2006	Ness Steven & Sheila J	4273023	DS	0.02		0.5	0.5	S	10,049
G4-35098	8/7/2006	Virgil M & Frances M McClosky Trust	4287410	DM		40	20		G	10,069
S4-35103	8/22/2006	John Picken Trust	4289318	DS	0.04		0.5		S	10,070
S4-35104	8/22/2006	John Picken Trust	4289323	DS	0.04		0.5		S	10,070
S4-35102	8/23/2006	Lewis Jeffrey	4289296	DS	15		0.5		S	10,071
G4-35132	12/4/2006	Flynn Cynthia & Charles	4308936	DS		10	15	4	G	10,086
S4-35164	2/11/2008	Congdon Gordon	4485000	DG	3		0.03		S	10,086
S4-35171	4/3/2008	Morehead Hulteen Sandra	4496075	DS	0.005		0.5		S	10,086
S4-35388	7/26/2010	Smith Joan P and J Sam	4690137	DG	0.02		2	1	S	10,088
S4-35398	8/10/2010	Kohr / Merriman	4694001	DS			0.5		S	10,089
S4-33008	8/31/2010	John W Picken Credit Shelter Trust	4706030	DM	25		40		S	10,129
Total						0	0	0		10,129

* Excluded from Total - Non-Consumptive Use

WRTS download	Active rigths, no claims, large users accounted separately and included in total																						
Report Date: 3/17/2014																							
Total Permitted Rights by Date	Balance Remaining											Large users include:											
before 7/22/1925	14,288		50,712									Lake Chelan Recl District - Muni	2,672.00										
1/30/1970	35,547		29,453									Lake Chelan Recl District - Irr	22,388.00										
9/1/1982	42,710		22,290									City of Chelan	5,376.14										
4/29/1992	45,113		19,887									RLF Cascade; Beebe Orchards WA	4,098.10										
4/10/1995	52,243		12,757									Bear Mountain Water District and Ranch	2,968.04										
3/15/2002	53,689		11,311									Subtotal Large Users	37,502										
3/17/2014	53,723		11,277									All Other Rights	16,220.62										
	200		11,077									Total	53,722.90										
Estimated Exempt Well Rights												underlined = info changed from WRTS italicized = priority date used								Irr. Duty	Dom. Use	Stock Use	
	Estimated Claims		4,000		7,077															ft/acre	af/connect		
																			3.5	1	1		
File #	Cert #	Person	Stat	Doc	Priority Dt	Purpose	Qi	UOM	Qa	Ir Acres	TRS	QQ/Q	Src's	1stSrc	WRTS Documented	Permit Issue Date	Documented	Estimated	Total	Qa	IR use	Dom Use	Stock Use
S4-30329		Lottinville II Rane	A	Pmt	7/9/1990	IR,DS	0.022	CFS	4	1	27.0N 22.0E 10	1	LAKE CHELAN	7/10/1991						4	0		4
S4-30355CWRIS		SCHAUER D & G	A	Cert	7/24/1990	DS	0.011	CFS	0.5		28.0N 21.0E 09	SE/NW	1	LAKE CHELAN	7/10/1991					0.5	0		0.5
S4-30012CWRIS		Twenty Mile Association	A	Cert	6/26/1989	DS	0.011	CFS	0.5		29.0N 21.0E 28		1	LAKE CHELAN	7/11/1991					0.5	0		0.5
S4-30209CWRIS		MCBARRON J & T	A	Cert	3/15/1990	DS	0.02	CFS	0.5		29.0N 20.0E 24	NE/SE	1	LAKE CHELAN	7/11/1991					0.5	0		0.5
S4-30218CWRIS		BOWER E G	A	Cert	3/29/1990	DS	0.011	CFS	0.5		28.0N 21.0E 33	NW/NW	1	LAKE CHELAN	7/11/1991					0.5	0		0.5
S4-30230		Brennan Gay	A	Cert	4/6/1990	DS	0.016	CFS	0.5		27.0N 22.0E 16	SE/NW	1	LAKE CHELAN	7/11/1991					0.5	0		0.5
S4-30285CWRIS		MCDOWALL TRUST	A	Cert	6/6/1990	IR,DS	0.011	CFS	0.5		28.0N 21.0E 33	SE/SW	1	LAKE CHELAN	7/11/1991					0.5	0		0.5
S4-30374CWRIS		KINMAN TED	A	Cert	9/12/1990	DS	0.02	CFS	2		29.0N 20.0E 24	SE/SE	1	LAKE CHELAN	7/11/1991					2	0		2
S4-30392CWRIS		FRANK W H	A	Cert	10/22/1990	DS	0.011	CFS	0.5		28.0N 21.0E 16	SW/SW	1	LAKE CHELAN	7/11/1991					0.5	0		0.5
S4-29607CWRIS		Sunnybank Community Assn	A	Cert	2/17/1988	IR,DM	0.07	CFS	35.25	8	27.0N 21.0E 12	SW/NW	1	LAKE CHELAN	7/12/1991					35.25	0		35.25
S4-30436CWRIS		WILBUR J & V	A	Cert	9/10/1990	DS	0.011	CFS	0.5		28.0N 21.0E 04	NE/NW	1	LAKE CHELAN	7/12/1991					0.5	0		0.5
S4-30496		Sunnybank Community Assn	A	Pmt	12/10/1990	DM	0.11	CFS	0		27.0N 21.0E 12		1	LAKE CHELAN	7/12/1991					0	0		0
S4-30568		Sunnybank Community Assn	A	Pmt	2/4/1991	IR,DM	0.0975	CFS	5	2.5	27.0N 21.0E 12		1	LAKE CHELAN	7/12/1991					5	0		5
S4-30499		Realadyne Investments Inc	A	Pmt	12/14/1990	DM	0.055	CFS	10	2.5	27.0N 21.0E 12		1	LAKE CHELAN	7/18/1991					10	0		10
G4-29832GWRIS		CLAPP ROBERT & NANCY	A	Cert	10/21/1988	IR,DS	30	GPM	14.5	4.5	28.0N 22.0E 26	NW/NW	1	WELL	7/19/1991					14.5	0		14.5
S4-30001CWRIS		PERSHALL ESTATE	A	Cert	12/19/1989	IR,DM	0.12	CFS	11.33	1.3	27.0N 22.0E 08	SW/SW	1	LAKE CHELAN	7/19/1991					11.33	0		11.33
S4-30147		Mellison Rob	A	Pmt	1/19/1990	IR,DS	0.05	CFS	15	4	27.0N 22.0E 15		2	LAKE CHELAN	7/19/1991					15	0		15
S4-30156GWRIS		Sunshine Orchards	A	Cert	1/30/1990	IR	0.22	CFS	30	10	27.0N 22.0E 16	NW/NW	1	LAKE CHELAN	7/19/1991					30	0		30
S4-30302		Carpenter Richard A & Kristin	A	Pmt	6/12/1990	IR,DS	0.011	CFS	0.5	0.1	29.0N 21.0E 28		1	LAKE CHELAN	7/19/1991					0.5	0		0.5
S4-30324		Parker Robert	A	Pmt	7/12/1990	DS	0.011	CFS	0.5	0.25	28.0N 21.0E 28		1	LAKE CHELAN	7/19/1991					0.5	0		0.5
S4-30448CWRIS		SCHRADER CAROL A	A	Cert	10/10/1990	DS	0.011	CFS	0.25		28.0N 21.0E 32	NW/NW	1	LAKE CHELAN	7/19/1991					0.25	0		0.25
S4-30445		Wood Patricia	A	Pmt	10/15/1990	DM	0.22	CFS	10		27.0N 22.0E 16		1	LAKE CHELAN	7/19/1991					10	0		10
S4-30450CWRIS		MARTIN DONALD H	A	Cert	10/29/1990	DS	0.011	CFS	0.5		27.0N 22.0E 08	SW/SW	1	LAKE CHELAN	7/19/1991					0.5	0		0.5
S4-30471		Farrell Richard	A	Pmt	11/21/1990	DG	0.02	CFS	1	0.75	28.0N 21.0E 28		1	LAKE CHELAN	7/19/1991					1	0		1
S4-30473		Roberts Robert	A	Pmt	11/27/1990	IR,DM	0.033	CFS	2.7	0.4	28.0N 21.0E 28		3	LAKE CHELAN	7/19/1991					2.7	0		2.7
S4-30534		White Robert	A	Pmt	1/11/1991	IR,DS	0.011	CFS	0.5	0.13	28.0N 21.0E 28		1	LAKE CHELAN	7/19/1991					0.5	0		0.5
S4-30452CWRIS		ASKLUND CARL R	A	Cert	10/16/1990	IR,DS	0.011	CFS	0.5		28.0N 21.0E 04		1	LAKE CHELAN	7/23/1991					0.5	0		0.5
S4-30516CWRIS		ERVIN D & V	A	Cert	12/31/1990	IR,DS	0.03	CFS	6.5	2	27.0N 22.0E 08		1	LAKE CHELAN	7/23/1991					6.5	0		6.5
S4-30520CWRIS		ROSS SHIRLEY SCOTT	A	Cert	1/3/1991	IR,DS	0.011	CFS	1	0.2	28.0N 21.0E 16	SE/SW	1	LAKE CHELAN	7/23/1991					1	0		1
S4-30537CWRIS		BARTON ALFRED B	A	Cert	1/16/1991	DS	0.02	CFS	0.5		28.0N 21.0E 04	NE/NW	1	LAKE CHELAN	7/23/1991					0.5	0		0.5
S4-30561		Salmon Robert	A	Cert	1/18/1991	IR,DM	0.02	CFS	2.02	0.34	29.0N 21.0E 33	SE/SE	1	LAKE CHELAN	7/23/1991					2.02	0		2.02
S4-30617		Weston John	A	Pmt	3/1/1991	IR,DS	0.011	CFS	2.39	0.63	27.0N 22.0E 10		1	LAKE CHELAN	7/23/1991					2.39	0		2.39
S4-30037GWRIS		HANSON ELTON & A	A	Cert	7/31/1989	DS	0.011	CFS	0.5		27.0N 21.0E 12	SW/SE	1	LAKE CHELAN	8/9/1991					0.5	0		0.5
S4-30168CWRIS		FOSTER R & K	A	Cert	2/8/1990	DS																	

Summary of Reserve Accounting Spreadsheet

This attachment provides a brief description of the spreadsheet (WRIA 47 Reserve Accounting.xls) where the calculations for this memorandum were performed.

Sheet: Original

This is the entire WRTS database downloaded from Ecology, for all rights above the dam.

Sheet: Cull with All Shown

This sheet contains all of the water rights from the original WRTS dump. However, each record has been coded in the Cull Code column based on the reasons to cull identified in this memorandum. The culled records can all be found at the bottom of the list.

Sheet: Just Culled Records

This sheet just contains the water right documents that were not culled, as described above.

Sheet: Culled, Most Claims Removed

This sheet is a subset of the Just Culled Records sheet. In this sheet all documents identified as claims have been removed.

Sheet: Culled, All Claims Removed

This sheet is a subset of the Culled Most Claims Removed sheet. In this sheet all changes to claims have also been removed.

Sheet: Summary – ATTACHED WITH MEMORANDUM

This sheet is the sheet where most of the calculations are performed to arrive at the numbers presented in this memorandum. In this sheet all individual records for the large water right holders (LCRD, City of Chelan, RLF Cascade Land Holdings, LLC and L H Piro-Beebe, LLC et al, and Beebe Orchards Water Association, and Bear Mountain Ranch and Water District) have been deleted. Instead, individual totals for each of these entities are included based on the more rigorous review of the water right record.

Sheet: Just Large Water Right Holders

This sheet contains the individual water right records from WRTS for each of the large water right holders (LCRD, City of Chelan, RLF Cascade Land Holdings, LLC and L H Piro-Beebe, LLC et al, and Beebe Orchards Water Association, and Bear Mountain Ranch and Water District). There is also a comparison of the WRTS totals with the water right review totals. Additional work was also undertaken to split each large water right holders' rights up so that the appropriate rights could be included in all of the reservation accounting through time shown in **Table 2**.

Sheet: Permit Issuance Dates

This sheet is straight from Ecology on March 20, 2014. It identifies the dates when each permit for each water right record was issued. The "Eff Date" column was the date used and it was cross referenced through the vlookup function on the *Culled No Claims Large Lumped* sheet to perform the analysis shown in **Table 2**.