AGENDA

IDAHO WATER RESOURCE BOARD

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Governor

Roger W. Chase
Chairman
Pocatello
District 4

Jeff Raybould
Vice-Chairman
St. Anthony
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Vince Alberdi
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Peter Van Der Meulen
Hailey
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Charles "Chuck" Cuddy
Orofino
At Large

Albert Barker
Boise
District 2

John "Bert" Stevenson
Rupert
District 3

Dale Van Stone
Hope
District 1

Water Supply Bank & Mitigation Bank
Committee Meeting No. 1-16
November 1, 2016 upon completion of Work Session

Idaho Water Center
Conference Rooms B, C & D
322 East Front Street
BOISE

1. Welcome and Introductions
2. Water Supply Bank IT Project Update
3. Wood River Valley Ground Water Policy
4. Water Supply Bank Administration
5. Program Finances
6. Other Items for Discussion
7. Adjourn

Committee Members: Al Barker (Chair), Vince Alberdi, Roger Chase, Dale Van Stone

Americans with Disabilities

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email jennifer.strange@idwr.idaho.gov or by phone at (208) 287-4800.

Memorandum

To: Water Supply Bank Subcommittee of the Idaho Water Resource Board

From: Remington Buyer

Date: November 1, 2016

Re: Committee Agenda

The Water Supply Bank Subcommittee of the Idaho Water Resource Board will convene on November 1, 2016 to discuss the following agenda items:

1) An update on the outcomes of the Water Supply Bank IT Project,
2) A long-term ground water rental policy for the Wood River Valley
3) General administration of the Water Supply Bank
4) Water Supply Bank program finances, and
5) Other items for discussion

Included with this memo is a Project Report: Development of Computer Infrastructure for the Water Supply Bank, 2014-2016. The report summarizes information associated with the recently completed project to develop computer software for the Water Supply Bank. The committee will receive a PowerPoint presentation that summarizes key findings of the report. The committee will also receive a demonstration of the software.

In addition to the discussion of the software development project, the committee will also be briefed on the need to develop a long-term ground water management policy for the Wood River Valley. A resolution is proposed for the consideration of the Idaho Water Resource Board during the Board meeting on November 2, 2016. During the Committee meeting, Water Supply Bank Coordinator Remington Buyer will brief the Committee on the need for the long-term policy, and the role the Committee can play in developing the long-term policy in 2017. To bridge the gap between the current interim policy and the new long-term policy, the IWRB resolution authorizes an extension of the interim policy through 2017. A summary memo and draft of the resolution can be found under item 12 in the IWRB Board Books. The PowerPoint presentation for the Committee will also address this topic.

The need to balance competing Departmental and Water Supply Bank special-project objectives recently resulted in decreased staffing available to process Water Supply Bank rental requests during summer 2016. The Committee will be briefed on the current administrative calendar of the Bank, inclusive of current staff assignments. The PowerPoint presentation for the Committee will also address this topic.

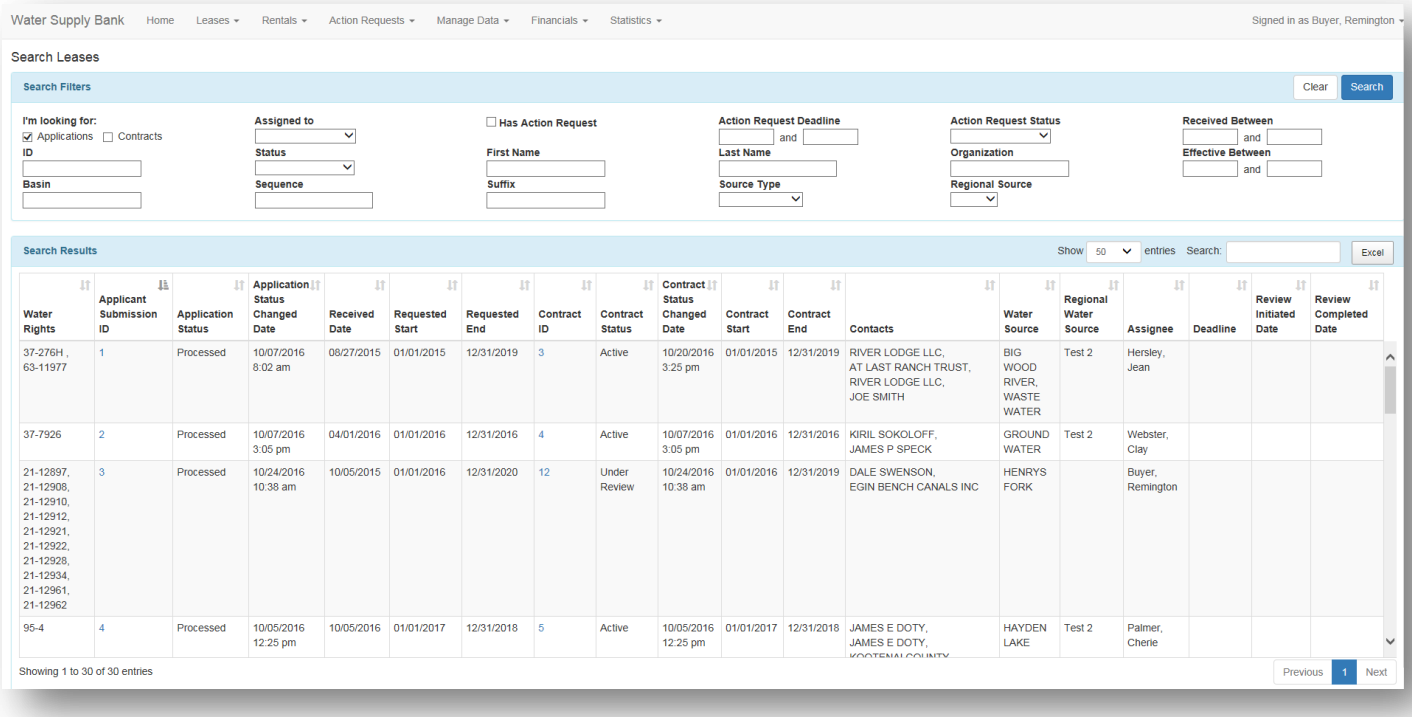
Finally, with the roll-out of the new software for the Water Supply Bank, and with the need to hold Committee meetings in 2017 to discuss a regional ground water policy for the Bank during 2017, the Committee is called upon to reconsider allowing for an adjustment to the current rental rate structure of the Bank as well as the benefit in holding listening sessions regarding the proposal of a fee-rule for Water Supply Bank rental applications. The PowerPoint presentation for the Committee will also address this topic.

IDAHO WATER RESOURCE BOARD

WATER SUPPLY BANK

Project Report:

Development of Computer Infrastructure for the Water Supply Bank, 2014-2016



Water Supply Bank Computer Infrastructure Development Report

Executive Summary

The Idaho Department of Water Resources (IDWR) has successfully concluded a software development contract with Resource Data Incorporated (RDI) to develop a database software solution for the Water Supply Bank. Of $500,000.00 in funding allocated for this project, $493,000.00 has been spent to develop the software solution.

The allocated funding has enabled the Bank to develop specialized computer software that will reduce median application processing times as well as improve tracking of application processing stages. The new software enables staff to enter all data in one location, eliminating duplicative data entry procedures. The new system can also automatically generate documents, reducing manual document editing processes. Additionally, once the software can be made available to the public via the WSB website, data entry by clients and representatives will significantly reduce the amount of data entry and review time currently required of Water Supply Bank staff. The software thus improves program transparency, data sharing capabilities and processing efficiencies, through faster communication with applicants and improved data integration with other IDWR water right processes.

However, the contracting out of software development work is a difficult task and requires full-time contract management by an IDWR/IWRB representative, as well as extensive coordination with IDWR/IWRB staff and representatives. Valuable lessons learned from this project include the need to engage in more extensive project documentation prior to selection of a contractor, and the need to have in place a method for ongoing project-reporting to IDWR/IWRB stakeholders throughout the life of the project, so that any issues associated with software engineering complexities, technological innovations, and time, human resource and financial constraints, can be quickly communicated to all necessary stakeholders.

Background & Context

Passed during the 2014 Idaho legislative session, House Bill H470 appropriated $500,000 to the Idaho Water Resource Board for development of information technology (IT) infrastructure for the Water Supply Bank. The Bank had experienced tremendous growth in the years preceding receipt of the funding, and with programmatic growth expected to continue, it was decided early that the objective for use of the funding would be to develop software for the Water Supply Bank to centralize all data management needs of the Bank while interfacing with IDWR's current workflow processes.

The software development process was initiated by issuance of a scope of work document, the IT Infrastructure Development Plan 2014-2016, which detailed how the Idaho Department of Water Resources (IDWR) would utilize the appropriated funding to develop an enterprise resource management (ERM), web-based database software solution for the Bank. A copy of the IT Infrastructure Development plan is included with this report as Attachment A.

As articulated in the initial scope of work, the IT infrastructure plan featured the following components:

1. Lease/rental application data entry
2. Application processing review menus (review statuses, memos, logs)
3. Integration with IDWR workflow data/systems
4. Automated document generation
5. Lease/rental transaction data entry/management
6. Lease/rental application/transaction data analytics (trend monitoring)
7. User/client communication functionality
8. Action/alert (call-up) system

WSB Scope of Work, Page 9

To ensure success of the project, Water Supply Bank Coordinator Remington Buyer worked with IDWR water right section staff to develop lease and rental application processing decision matrices so that all known decision points associated with the disposal of a lease or rental application could be identified. It was determined that each matrix decision point would be incorporated into the new software system, to ensure all essential application processing information could be captured in the new database system, and to ensure that IDWR staff could utilize the collected information to conduct electronic reviews of all applications. Decision matrices are included with this report as Attachments B1 and B2.

In addition to documenting water right administrative workflow processes, Coordinator Buyer also worked with IDWR Database Analyst Greg McNeil and IDWR GIS Programmer Michael Ciscell during the fall and winter of 2014, to evaluate the design (schema) of IDWR's Enterprise water right database. Through collaborative efforts, the three IDWR staff identified ways in which already existing database tables could be leveraged to provide efficiencies in the new software for the Water Supply Bank. Internal design work at IDWR culminated in the production of the Infrastructure Development Plan (Attachment C).This plan expanded upon the initial scope of work document, to articulate detailed roles for project team members and a multi-phased project development schedule with a detailed proposed project timeline. The plan was presented to the IWRB during winter 2014 as part of the spending authorization request which formally initiated the software development project.

To prepare for the evaluation and selection of a contractor, IDWR summarized all data from the scope of work and infrastructure development plans into a 150 page Development Documentation for the WSB Database Application. This document included all information previously detailed in the two aforementioned plans, as well as templates of documents to be generated by the software, anticipated database tables that were expected to be utilized by the software and example user interface screens.

In consideration of the vast amount of work put into developing the scoping documents and development plans, IDWR elected to proceed with a request for qualifications (RFQ) contractor selection process instead of request for proposals (RFP) selection process. This enabled IDWR to articulate the software development skill sets and credentials that were determined to be necessary to develop the project, as proposed. A contractor evaluation and selection committee was formed, comprised of IDWR Purchasing Agent Janet Garret, IDWR IT Section Manager Glen Gardiner, IDWR GIS Section Manager Linda Davis, IDWR Recharge Projects Coordinator Wesley Hipke, and WSB Coordinator Remington Buyer.

State of Idaho procurement procedures require that all IT service projects with non-state of Idaho entities be routed through the Idaho Department of Administration's Purchasing Division. The Department of Admin required IDWR to issue a project service order (PSO) form to fourteen approved software development vendors that held open statewide contracts with the state of Idaho through the Department of Administration. Twelve vendors responded to IDWR's PSO and three vendors were short-listed and invited to attend in-person interviews with the selection committee during summer 2015. The committee collectively determined that Resource Data Incorporated (RDI) should be the firm chosen to develop the software. RDI evaluated the aforementioned WSB development documentation (which was provided to them during the PSO process) and they estimated this project would require a budget of $242,000 for software development services, with $99,000 necessary for business analysis and project management services. The Department of Administration's PSO process was concluded during fall 2015 when IDWR received authorization from the Purchasing Division to initiate software development work with RDI under state of Idaho blanket umbrella contracts valued at $341,000.

Water Supply Bank Computer Infrastructure Development Report

Project Summary

Though IDWR was not required to enter into project-specific contracts with RDI, IDWR elected to do so to improve our ability to manage this project. Project-specific contracts went beyond the establishment of fixed rate billing by articulating that compensation for all software development work would only be authorized by IDWR through negotiated work orders. The work order process functioned as follows: IDWR and RDI discussed all known software development work so that detailed software development tasks could be enumerated. The number of hours required to complete software development tasks were estimated by RDI. IDWR evaluated all estimated development tasks and costs to ensure they were aligned with our critical path. IDWR then issued incremental work orders to RDI, in which IDWR specified an appropriate amount of time and compensation for software development work to be completed by RDI. Software development work orders were issued for a duration of four weeks. Work order compensation was a function of hours worked, with the smallest compensation for a software development work order being $8,000, while the largest work order included compensation of $40,000.

The issuance of work orders was a useful contract management strategy for IDWR as it allowed IDWR to incrementally authorized payment to RDI for software development work, while allowing for adjustment of the project scope as required, to address unforeseen occurrences and budget shortfalls. As the project proceeded, the issuance of each successive work order was an opportunity for IDWR and RDI to "check in" with each other, to ensure the critical path was being maintained, and to allow for course-correction with respect to deliverables that were determined to be unattainable as project complexities arose. In addition to monthly issuance of work orders, ad hoc daily conversations and weekly updates also facilitated active discussions about project management objectives throughout the project timeline.

However, the hourly-compensation terms and work estimation process made it difficult for IDWR to contract manage this project, as the project budget was never fixed to a known amount of work. Instead, the actual budget for production of deliverables was subject to constant revision whenever the complexity involved in the project shifted. Whenever the amount of time estimated as required to develop a particular feature increased, the budget remaining available for the project decreased inversely. RDI never committed to fixed bids for the development of any software components, and so IDWR had to both increase its project management involvement as well as actively revise the scope of work (reduce the number and complexity of software features) to ensure the project did not exceed budget.

The contract management challenges imposed by the work estimation/compensation methodology became apparent early in the project when, upon concluding initial business analysis work in December 2015, RDI revised its budget estimate for software development costs from $240,000.00 to one million dollars ($1,000,000.00). RDI informed IDWR that the software development budget for the project would need to be quadrupled to ensure that all software features requested by IDWR could be successfully undertaken as part of this project. Because a budget increase was not a viable option, IDWR elected to instead pursue a phased, incremental development approach to the engineering of the software platform, targeting development of core features in this project, but with plans in place to develop additional features at the end of the project, if additional funding remained available. IDWR also began to simplify the functionality of software features wherever possible, to ensure that any funding dedicated to this software development project was expensed prudently.

Though it is unfortunate that not all features of the Water Supply Bank software could be developed as part of this project, the decision to scale back development was not wholly without a silver lining. By reducing the complexity of the project and focusing on a lean development approach, funding remained available to be utilized whenever unforeseen complexities arose, or whenever user design changes were desired. As unforeseen complexities did arise, IDWR and RDI amended their contracts, to allow for both an increase in the total number of software development hours authorized to be undertaken by RDI, as well as an extension of the final project deadline, moving it back from July 2016 to September 2016.

The final possible project cost, inclusive of RDI billable hours and IDWR in-kind hours was $608,644.00. This is the sum of all RDI hours billed to this project at RDI billable rates, and it also includes 4,022 hours of IDWR staff hours, at a billing rate of $25/hour. IDWR's in-kind contributions to this project are estimated to be $100,550.00.

Minus IDWR's in-kind contributions to this project, compensation to RDI for this project might have been $508,094.00. However, RDI did work with IDWR to identify cost saving strategies, including adjusted billing rates and some matching hours, which enabled this project to be completed below the necessary budget target of $500,000.00. In the end, RDI received compensation of $493,000.00 for software development work (averaged billing rate was $96/hour). Project costs are summarized in Tables 1 and 2 below.

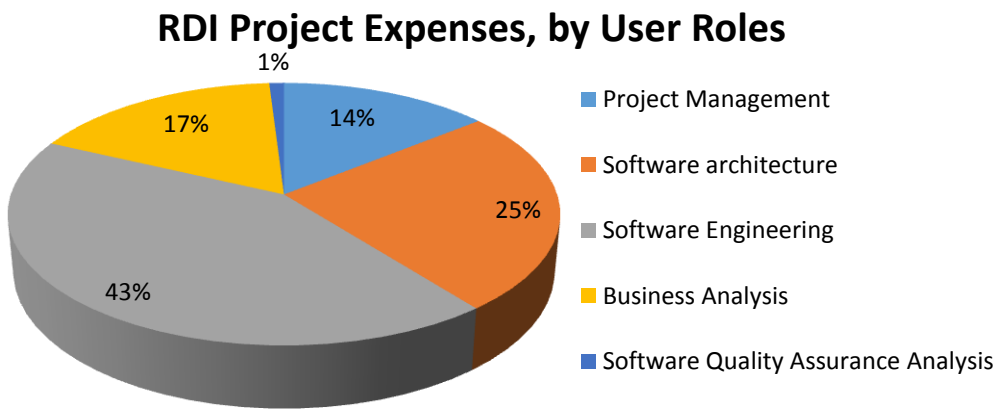
Table 1 - Total possible project costs, based on hours contributed and billing rates:

Role	Hours Contributed	RDI Hours	IDWR Hours	Hourly Rate	Project Cost
Project Coordinator	3120	0	3120	$25	$78,000.00
Project Manager	604	604	0	$118	$71,272.00
Database Administrator	119	0	119	$25	$2,975.00
Software architect	1236.25	1236.25	0	$105	$129,806.25
GIS Programmer	119	0	119	$25	$2,975.00
Software Architect/Engineer	285.75	285.75	0	$120	$34,290.00
Software Engineer	188.75	188.75	0	$95	$17,931.25
Software Engineer	536	536	0	$83	$44,488.00
Software Engineer	1552	1552	0	$80	$124,160.00
Technical Writer / Business Analyst	719.25	719.25	0	$118	$84,871.50
Network Administrator	55	0	55	$25	$1,375.00
Web Developer	109	0	109	$25	$2,725.00
Software Quality Assurance Analyst	15	15	0	$85	$1,275.00
Software Testers	400	0	400	$25	$10,000.00
Data Entry Operator	100	0	100	$25	$2,500.00
Totals	9159.00	5137.00	4022.00		$608,644.00

Table 2 – RDI Compensation and In-Kind Contributions offered by IDWR and RDI staff:

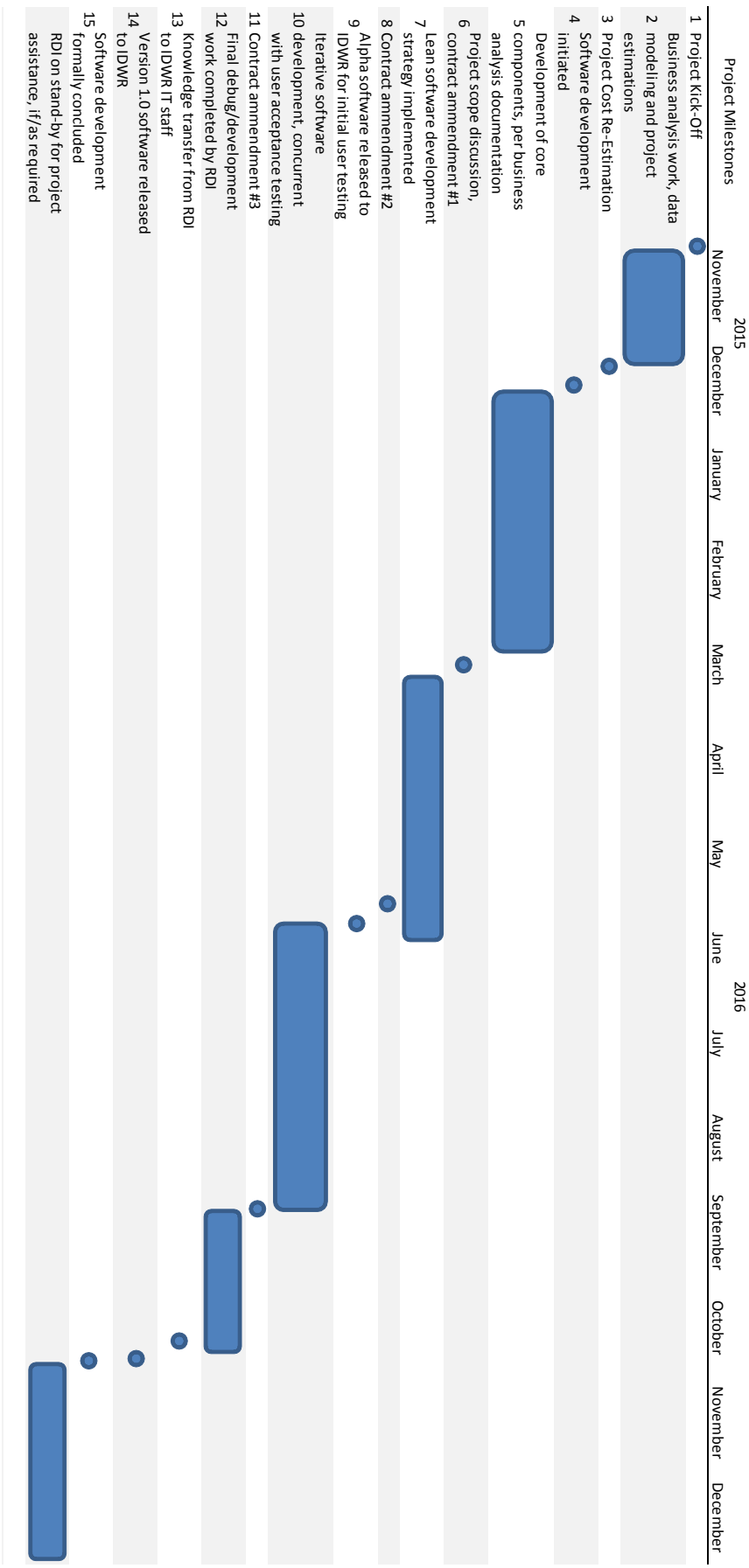
Role	Responsibility	RDI Compensation	In Kind Contributions
Project Coordinator	Project & Contract Management	$0	$78,000.00
Project Manager	Software Development Project Management	$70,674.25	$597.75
Database Administrator	Management of Database work	$0	$2,975.00
Software architect	Software Design and Engineering	$124,867.75	$4,938.50
GIS Programmer	Management of spatial data work	$0	$2,975.00
Software Architect/ Engineer	Assisting with software architecture/engineering	$30,435.00	$3,855.00
Software Engineer 1	Software engineering	$15,130.00	$2,801.25
Software Engineer 2	Software engineering	$43,238.25	$1,249.75
Software Engineer 3	Software engineering	$122,160.00	$2,000.00
Business Analyst	Documentation of project workflows and user scenario mapping	$84,819.50	$52.00
Network Administrator	Assisting with installation/integration of software onto IDWR's network	$0	$1,375.00
Web Developer	Assisting with installation of the web-browser user interface	$0	$2,725.00
Software Quality Assurance Analyst	Assisting with integration testing and initial software debugging	$1,245.00	$30.00
Software Testers	User Acceptance Testing/Debugging	$0	$10,000.00
Data Entry Operator	Assisting with data migration	$0	$2,500.00
Totals		$492,570	$116,074

Notable from Table 2 above, aside from the $100,550 of in kind hours contributed by IDWR staff, RDI committed $16,000 of billable hours through in-kind contributions to assist IDWR in achieving successful completion of this project on an agreed upon budget. The following is a breakdown of the project expenses, paid to RDI, by project role:



A project timeline of key development milestones is provided on the following page, followed by summary of which software functionality features were successfully accomplished through this effort.

Water Supply Bank Computer Infrastructure Development Report



Water Supply Bank Computer Infrastructure Development Report

	Feature	Explanation	Project Completion	Additional Information / Future Development Tasks
1	WSB enterprise database	A database, capable of providing all necessary data entry, access and retrieval tasks, necessary for comprhensive management of all relevant WSB data, now and in the future	Yes	Database is architected to be modular, allow for scaling and the addition of future tables, procedures
2	Web-browser user interface	A user access interface for the database, which is operating system agnostic, allowing for access to the database from any device that features a web browser and an internet connection	Yes	Enhanced user-interface to improve ease of use access for data entry
3	Digitized application submission process	Completely digitize the WSB lease/rental application submission process, inclusive of all possible attachments, and incorporate it into the WSB software so that future applications can be received online, via the IDWR website	Yes/No	The application form is fully digitized and incorporated into the software, however there does not presently exist the IT infrastructure on IDWR's servers to enable online application submissions. Work is required to enable online application submissions.
4	Design that incorporates elements of application submission, retrieval, storage and processing	The software needs to be able to retrieve and display lease/rental application data, and to allow for manipulation of the data to produce contracts and agreements, without overwriting user data	Yes	The software has been designed to accept applications submitted by WSB clients and to seamlessly pass through the application data to a transaction management interface, within which lease contracts and rental agreements can be produced and managed.
5	Automatic documentation production	The software needs to be able to automatically generate any necessary WSB document with minimal ad hoc editing by WSB staff	Yes/No	All relevant templates are loaded into the software and they can be called up by the end user, however presently, only a limited number of documents are auto-generated in their entirety by the software (contracts & agreements)
6	A comprehensive data management system for applications	The software must be able to generate unique IDs for all lease and/or rental applications, to allow staff to digitally assign applications amongst themselves for processing, and to track who has processed applications, and when.	Yes	The software tracks applications through all phases of processing, allowing staff to assign applications amongst themselves, and to track who has processed applications, and when, and what the final status of reviewed applications result in.
7	A comprehensive data management system for lease/rental transactions	The software must be able to generate unique IDs for all lease contracts and/or rental agreements, to allow staff to actively manage the lease and/or rental of a water right separate from the corresponding contract or agreement	Yes	Staff can now actively manage a single water right within a contract or agreement, for the life of a transaction, allowing for active, dynamic management of all WSB transactions
8	An action-request/follow-up feature	The software must be capable of generating "action requests" with deadlines, to allow staff to assign follow-up tasks to themselves, related to any application or lease/rental transaction	Yes	An action request tracking feature is built into the software
9	Dynamic water right availability tracking	The software must be capable of instantaneously tracking and updating the availability of water rights in the Bank, allowing for easy management of all rental request queries	Yes	As water rights are leased into the Bank, their "availability" is communicated for easy connection to a rental request. As rental requests are executed, the availability of the leased water right is automatically updated.
10	Multi-user functionality	The previous WSB database (an MS Access DB) only allowed data entry by a single user at a time. The new software must allow for updates by all users, concurrently, without limits	Yes	The new database system does not limit the number of users that can access it at any time
11	Full-mapping integration	The new software must be fully integrated with geospatial (mapping) technologies so that, as a user draws the place of use for a lease or rental, the proportionate amount of the water right being leased or rented can be automatically updated	Yes/No	The software is geospatially enabled, allowing IDWR staff to use ArcMap to automatically update the proportionate size of a lease or rental, based on the geometry of an application. A future task will be to build a mapping tool directly into the browser application, so that ArcMap is not required for users who intend to submit applications.
12	Dynamic water right pricing	The new software must be capable of accepting lease proposals and rental requests where applicants submit a rental rate based on cfs, AF or acres.	Yes	The new software allows an applicant to request a dollar rental rate based on diversion rates, acre foot volumes or acre values. Automatic calculations are computed to establish the relative AF value of a lease/rental if a user requests a cfs or AC rental rate.
13	Application processing fee tracking	The new software must be able to allow WSB staff to track within the database the fees association with any lease/rental application, and whether all necessary fees have been received.	Yes	The software allows for tracking of lease application fees, as well as rental application filing fees (future fee).
14	Rental fee tracking	The software allows the Bank to track all anticipated rental fees for multi-year rentals, to enable easy rental fee invoicing and tracking	Yes	Multi-year, dynamic rental fee tracking and invoicing is part of the design of the new software
15	Warrant payment tracking	The software allows the Bank to track all anticipated warrant payments to lessors, grouped by contactIDs, to enable easy requests, issuance and tracking of warrants	Yes	Warrant tracking, by contact ID is incorporated into the design of the new software system
16	Water Source Assignments	The new software allows the Bank to establish regional water sourced (ie, the ESPA) within which instant searching of all water rights leased to and/or rentable/rented from a water source can be determined	Yes	The current software allows the Bank to create and manage regional water sources
17	Status change tracking system	The new software must be capable of tracking the dates when applications and transactions are received and processed, including separate stages of processing.	Yes	The dates that applications are reviewed, processed, concluded, cancelled, withdrawn, etc, are all tracked, so that future analytical review of transaction information will be possible
18	Batch document generation	The new software should enable users to batch generate all relevant documents through a single interface, avoiding the need to go transaction by transaction to generate documents	No	Batch document generation was beyond the scope of this project
19	Full integration with IDWR workflow applications	The new software needs to be fully integrated with all relevant IDWR workflow applications, so that all IDWR staff can retrieve and review relevant WSB data	No	Integration with IDWR's internal workflow applications was beyond the scope of work undertaken by the software development contractor and must be undertaken by IDWR IT staff.
20	Full integration with the WSB website	The WSB database and all relevant and appropriate data stored within should be made available to the public for easy querying and review via the WSB's website	No	Integration of the software/database with the WSB's website and website search tools was beyond the scope of work for the contracted software developer and must be undertaken by IDWR IT staff.

Water Supply Bank Computer Infrastructure Development Report

Efficiencies and Possibilities of the New Software System

The allocation of funding to improve the computer infrastructure for the Water Supply Bank has enabled the Bank to develop specialized software that will reduce median application processing times as well as improve tracking of application processing stages. Presently Water Supply Bank administrative efficiencies are challenged by the amount of time required to review and enter application data into multiple data management systems, as well as the time required to prepare, edit and review documents. The time required to review applications limits the amount of time available for effective decision-making. Additionally, as much as one-third of the time required to process an application is spent working with an applicant or their representatives, to clarify the intent of a lease proposal or rental request.

The new software enables staff to enter all data in one location, eliminating duplicative data entry procedures. The new system can also automatically generate documents, reducing manual document editing processes. Additionally, once the software can be made available to the public via the WSB website, data entry by clients and representatives will significantly reduce the amount of data entry and review time currently required of Water Supply Bank staff. The software thus improves program transparency, data sharing capabilities and processing efficiencies, through faster communication with applicants and improved data integration with other IDWR water right processes.

In its current form, the WSB software improves program administration in the following ways:

1. All known application processing stages are defined and available to be selected by staff throughout the application review process. As such, the minimum, maximum and median time spent processing a lease or rental application is now being tracked.
2. All known lease contract and rental agreement statuses are selectable by staff, and as changes are made, the minimum, maximum and median duration of all lease contracts and rental agreements is being tracked.
3. Lease contracts and rental agreements are automatically generated from information entered during application data entry and review stages. Thus, applications are directly related to lease and rental transactions, yet both are managed separately, enabling comprehensive data management.
4. Ad hoc data entry into the software has been avoided wherever possible so that data entry can instead be based off already existing data (ie, a user selects contact information, water rights, points of diversion, etc, from already existing data within IDWR's database). This enables better tracking of WSB data, associated to all available water right data points, including water sources, administrative basins, water districts, beneficial uses, etc.
5. A single, centralized database system enables staff to quickly and efficiently, from one location, identify the status of applications, contracts and agreements, and all application attachments or subsequent correspondence associated with an application or transaction are easily managed.
6. The software is integrated with geospatial technologies, enabling easy mapping of any transaction.
7. The software runs within a web-browser, on an internet-ready server, meaning that it can one day be made available for public access by water user clients and their representatives.
8. The modular architecture of the database will enable easy adjustment of the software, as future versions incorporate new design enhancements and improved functionality.

Impediments, Solutions & Lessons Learned

Though software development has been a successful and invaluable opportunity to improve administrative efficiencies of the Water Supply Bank, limits on time, budget and human resources presented many challenges and constrained effective project management efforts. The issues encountered were often attributable to the three time, financial and personnel limitations and problems were often resolved by increasing the amount of time, funding or manpower available to undertake a task (or a combination of all three). The following is a summary of major issues encountered as part of this project and how such issues were addressed by IDWR:

	Issue	Explanation	Impact	Resolution
1	Initial software development work was not sufficiently lean or agile	Part of lean and agile software development process is to limit the amount of extensive, detail-driven work that is done at the beginning of the process, to ensure that basic features of a software solution can be accomplished prior to dedicating developer resources to fine-detail items	Software engineers relied heavily upon "use case" documents produced as part of the business analysis component of this project. The focus on use case documents resulted in a focused (non-lean/agile) programming approach	The decision was made early in the project to reduce the detail of the use case documents and to limit the complexity of programmed software features, particularly on the rental module
2	Initial, internal project documentation was too lean	Though much documentation was produced by IDWR water rights and IT staff prior to the selection of a contractor, documentation was not sufficiently detailed in key areas, specifically visioning documents, and database design schemas	Water Supply Bank agents and IDWR IT staff were required to rely upon the management of the project by the WSB Coordinator and the Coordinator had to actively engage the contractor on their behalf	The services of a business analyst were contracted as part of this project to further document necessary design elements, to benefit the project
3	The nature of this project resulted in heavy contract management	Because software development was not lean enough and because project documentation was too lean, a full time staff member from IDWR was required to actively manage contracting of this project	The Water Supply Bank Coordinator's full time focus was required to be directed to this project from November 2015 through to the present. Other WSB program administrative activities were de-prioritized resultantly	Lease and rental application processing was de-prioritized during summer 2016. Though this was unfortunate, the project was successfully accomplished, on budget. Work orders became invaluable contract management tools

4	Time, budget and resource constraints challenged the involvement of additional IDWR staff in the project	Because the contractor billed IDWR hourly for all work, there was a need to go light on design changes, to avoid scope creep and unnecessary software complexity. This resulted in a less than optimal involvement of additional IDWR staff in the project	IDWR water right agents were not afforded enough input in the design and redesign of certain features until late in the project. IDWR IT staff did not actively participate in code reviews until late in the project	Limited user interface design changes were accomplished during the user acceptance testing phase. A knowledge transfer helped engage IDWR IT programmers
5	IT programming constraints were not always known	IDWR's IT programmers are open to new programming technologies and standards that reflect industry best-practices, however it was not clear as to what new standards should be employed as part of this project	Discussions between the contractor and IDWR programmers resulted in agreed upon new technologies, however IDWR programmers will require time to learn how to support the new technologies	The WSB software will retain new technologies that are unique to the WSB software, though future support of the software will require IT staff to learn how to support the new technologies
6	Continuous integration with source code management was employed as part of the code deploy to IDWR	Continuous integration as a technological methodology includes being able to quickly and efficiently make code changes, compile updates to an application and manage different code branches through version control tools. RDI used a technology called "Jenkins" to continuously integrate code changes to the WSB software. IDWR does not currently use Jenkins software	IDWR was unable to apply code changes quickly when the contractor began iterating successive updates to their code. Instead, a database analyst and web programmer were required to manually apply updates at specific times, which complicated and slowed the software testing process.	IDWR is exploring the use of continuous integration software such as Jenkins for future support to the WSB software
7	Project funding was insufficient to achieve all objectives	The initial scope of work for the platform required for the Water Supply Bank was beyond the budget available	The WSB Coordinator had to actively choose to de-prioritize certain technologies and features, to keep the project under budget, without impairing future software upgrades	This project focussed on the core elements of the platform, necessary for improved operation of the Bank. Future enhancements are possible through successive software upgrades

8	Project funding was insufficient to account for all possible team roles	Limited funding was allocated to business analysis and software quality assurance analysis (SQAA) as part of this project	A reduction in business analysis enabled leaner development, but increased complexity with certain features required some major rewrites. Limited SQAA work resulted in bug-heavy code releases	The WSB Coordinator was responsible for working directly with the developers to resolve complex programming challenges. IDWR staff had to simultaneously debug and scenario-test the software
9	Off-site contracting reduced direct, active oversight	The development of software off-site meant that IDWR was often blind to code changes and updates until code was released to IDWR at key intervals	IDWR had to wait to see code changes, and debugging was particularly problematic as we had to remotely resolve almost all issues	An online test server was set up by the contractor to assist IDWR in initial testing/debugging
10	Contractor-Client relationship resulted in different priorities	The contractor and IDWR had different priorities. IDWR's priority was to ensure a quality product was delivered at or under budget, whereas the contractor was focused on undertaking (and billing IDWR) for the most important software development work	Multiple contract management engagements were required to prioritize and reprioritize all possible software development work, to ensure the contractor and IDWR achieved their mutual objectives	Heavy contract management was provided by both IDWR and the contractor, to ensure a quality product was built, on time, below the project maximum budget

The table above is a list of the key issues that were encountered and overcome as part of this project, though it is not an exhaustive list. To avoid or minimize the above difficulties as part of future IDWR/IWRB software development projects, the following recommendations should be considered:

Recommendations

- Invest more time and effort to internally document in even greater detail the user visions for the software, including the use case scenarios, mock-up images and technological specifications;
- Invest more time in database design, to avoid uncertainties and ad hoc design change proposals;
- Appoint an internal contract manager to fully manage the project on behalf of IDWR and/or the IWRB, prior to selection of a contractor and establish how the contract manager will be responsible for ongoing project reporting to IDWR/IWRB stakeholders throughout the process;
- Establish agreed upon compensation structures for key software development tasks (ie, remuneration for first-pass debugging, but not subsequent/repetitive debugging work);
- Consider the use of contractual compensation bonuses and/or penalties to better align development timelines with software development tasks.

Water Supply Bank Computer Infrastructure Development Report

Attachment A

IDAHO WATER RESOURCE BOARD

WATER SUPPLY BANK

SCOPE OF WORK:

WSB IT Infrastructure Development Plan 2014-2016

Water Supply Bank Application Development

Cover photo of Bank IT Proposal presented to the Idaho Water Resource Board March 20, 2014

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Idaho Department of Water Resources

Water Supply Bank Program

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Water Supply Bank Application Development

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Water Supply Bank Application Development

Background

The administration and data management of transactions in the Water Supply Bank transactions is currently accomplished with excel spreadsheets and a MS Access database on a local area network, with client information stored on a local server and spatial data referenced from a dedicated map server. With consistent increases in the number of yearly transactions processed through the Water Supply Bank, data management needs are no longer being met with current technology resources.

The 2014 Legislative Session passed Bill H470, appropriating $15 million in funding for the Idaho Water Resource Board which included $500,000 to develop information technology (IT) infrastructure for the Water Supply Bank. IT infrastructure is a comprehensive term and is interchangeable with software platform. Thus, this report summarizes how H470 funding will be utilized to develop a Water Supply Bank-specific software platform that includes the design and development of a Departmental-specific computer network software program that will import, manage and export Water Supply Bank data. The software platform also features a data sharing component, which will be a web-based data communication portal through which the public can see and query Water Supply Bank data and submit water rights for lease into and withdrawal from the Bank. To summarize, Water Sustainability Initiative funding for the Water Supply Bank will be utilized to develop a comprehensive software platform that will improve information transmission and data entry into the Bank, water right analysis and data management within the Bank, and communication/information sharing from the Bank.

Proposal

The Water Supply Bank requires a comprehensive software platform to modernize how water right data is transmitted to the Bank, how it is managed and queried within the Bank, and how it is communicated from the Bank to clients, IDWR staff and the public. The primary user is IDWR Bank staff, however the ability of non-Bank staff to access Bank data is an important consideration. At a minimum, the platform needs to accommodate data input, management, retrieval and exporting of Water Supply Bank data.

Software needs will be achieved through development of a comprehensive system that will feature a Departmental backend to manage all Water Supply Bank transaction data, with a public frontend to efficiently communicate available (rentable) water rights, and other Bank data. The following are the two components of the platform:

1) An internal, Departmental workflow software program that can receive electronic lease and rental applications and automatically copy corresponding data into network database tables. Bank staff can query the data in these tables to manipulate and manage water right/Bank transaction data. These network tables will store water right conditions and lease/rental contract-specific attribute data, eliminating the need for Bank staff to duplicate efforts by storing data in excel tables, Microsoft Access database and other programs. The software program will also include a notation section, enabling Bank staff to record memos and notes about Bank transactions directly into the Bank database records, eliminating the use of standalone Microsoft Word documents that are presently archived on the Department's

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computer network system. Water Supply Bank data stored in the network program will be pushed from the database into office suite programs (Microsoft Word) in order to auto-populate Bank contracts, cover letters, and other printable documents with transaction-specific data. Additionally, the network program will include a Bank reporting component which will enable Bank staff to query the database at any time and produce detailed statistics about the Bank. Finally, the Bank program will integrate with and communicate Bank data to separate Departmental workflow programs (infosearch, transfer app, water rights accounting, etc) to improve other Departmental processes that are impacted by Bank administration.

2) A web-based Water Supply Bank portal (eg: www.idwr.idaho.gov/WaterSupplyBank) that will receive data from the Water Supply bank network program, and through which Bank lease and rental data can be publicly queried, allowing potential renters to better understand what water rights (and corresponding conditions, volumes, flows, etc.) are available to rent from the Bank. This front end will significantly reduce the number of phone calls, emails and walk-in inquiries the Bank is currently receiving from individuals interested in renting water from the Bank. It will also improve the ability of potential renters to better understand what water is available to rent through the Bank at any given time. The front end will include a rental application component which will allow potential renters to select a rentable right and submit an electronic application to rent it through the Bank. In addition to rentals, the web-based front end will also interface with the Department's water rights search function to allow potential lessors to identify their water rights and submit them for lease into the Bank through a lease application system. Finally, a client secure-information system will facilitate transmission of contract and financial information to lessors and renters, along with secure messages from Bank staff.

Project Timeline

The development of the Water Supply Bank program will be a collaborative endeavor among many IDWR personnel and possibly external contractors. The project will be managed by the Water Supply Bank Coordinator. It is envisioned the Water Supply Bank program will be developed over a period of 18-24 months and will progress through four key stages:

1) Assessing program needs and evaluating available/necessary resources;
2) Application development and Water Supply Bank data auditing/updating;
3) Application debugging and beta-testing,
4) New system launch, archive old WSB system.

Diagram 1. Project Timeline

Water Supply Bank Application Development

Stage one will take approximately 6 months and will run from April through September 2014. During this time, the Water Supply Bank Coordinator will work with the Water Supply Bank Lead Agent, the Water Rights Section Manager and Supervisor, as well as IDWR GIS programmers, hydrologists and IT programmers, iterating a comprehensive workflow process that accurately identifies Bank workflow needs and establishes a work breakdown schedule that identifies all IT programming components.

IDWR Water Rights Section staff will communicate workflow needs for the Bank application which will be presented to Technical Services Bureau staff by the Water Supply Bank Coordinator. Technical Services Bureau staff will evaluate the workflow process as developed by Bank staff and assess the human and technical resources that will be necessary to design the program. Technical Services Bureau staff will communicate to the Water Supply Bank Coordinator all available resources and any additional human or technological resources that will need to be acquired to develop the application. If external contractors are necessary, Technical Services Bureau staff will communicate specific human resource skillset needs to the Water Supply Bank Coordinator so that contractor positions can be created, promoted and filled by the fall of 2014.

In addition to programming needs, the Water Supply Bank Coordinator will work with the Water Supply Bank Lead Agent to establish a method for conducting a full audit of all water rights currently leased into and rented from the Board's Water Supply Bank. The audit will include a method for quality controlling Water Supply Bank data while updating erroneous data and is necessary to prepare Bank data for migration into the new Water Supply Bank application prior to program launch. The Water Supply Bank audit methodology will identify all human and technical resource needs necessary to complete the audit in stage two.

Stage one deliverables: 1) A workflow application programming work breakdown schedule; **2**) A Water Supply Bank water right data auditing methodology (including quality control and data migration steps); **3)** Detailed work descriptions for the hiring of any external contractors.

Stage two will commence in fall 2014 and will last twelve months. It is during stage two that the bulk of application development will be done. During discussions with IT staff in stage one, the Water Supply Bank Coordinator will develop a detailed work breakdown schedule for stage two that identifies all IT programming components. These components will be identified as interim goals that will form a critical path for application development against which the Water Supply Bank Coordinator measure and track development performance.

The following are key components of stage two:

1) Bank Website: The current website will be updated and a Water Supply Bank web-based information dashboard, client information portal and the application submission system will be designed, programmed and made ready for integration with the website. The dashboard, client portal and application submission system will remain inactive until stage four.

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2) Bank Workflow Program: An internal, network workflow application will be created that will pull in electronic applications (transmitted through the public submission portal) and input the data into workflow application data tables stored on the network. The workflow program will include data retrieval, review, update and input functionality for Bank staff to directly manage Bank data. The workflow program will be a comprehensive data management system that will also include Bank data transmission to other IDWR workflow applications, a timing-mechanism that will automatically call-up transaction data on pre-programmed or user specified timeframes, as well as a document creation function that will automatically create, populate and produce Bank documents (contracts, cover letters, activity reports, etc).

3) Completed Bank Audit: a complete assessment, quantification and correction of Water Supply Bank data that will be ready for export and migration into the beta-version of the Water Supply Bank workflow program.

Stage two deliverables: 1) An updated, dynamic WSB website; 2) A Bank information dashboard; 3) A client information portal; 4) A Bank application submission system; 5) A beta-version of the workflow application; 6) A completed audit of all Water Supply Bank water right data, ready for data migration.

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Stage three will commence once all necessary intermediate deliverables from stage two have been met and a beta-version of the Water Supply Bank application is ready to stress tested by Bank staff. It is envisioned stage three will commence and run through the fall of 2015 and conclude by the year's end. Over the course of four months, water right lease and rental applications will be input electronically by a Bank staff member to fully test the functionality of the program and identify software bugs and glitches. All bugs and glitches will be reported to IT programmers to be fixed prior to stage four; stage three will only conclude after the Water Supply Bank Coordinator is satisfied that an effective and successful stress-testing of the beta-application has been completed and software glitches have been addressed.

Stage three deliverables: 1) A fully functional, dynamic WSB website with new components (dashboard, portal, submission system) ready for public launch; 2) A fully-functional version of the Water Supply Bank application with Bank data successfully migrated over into the new platform.

Stage four is the final stage during which the new Water Supply Bank website will be launched and promoted to clients, encouraging them to begin transitioning their Bank applications and interactions to the web-based platform. Following the successful launch of the website and the Water Supply Bank application, a timeframe will be publicly announced to phase out acceptance of paper applications.

Stage four deliverables: 1) A fully functional, dynamic Water Supply Bank web-based platform through which data can be transmitted to and from the Bank; 2) a fully functional Water Supply Bank workflow program that enables Bank staff to efficiently and fully administer Bank transactions by receiving electronic applications, conducting review, analysis and updating of Bank transaction data, and creating physical documents and electronic correspondence for submission to clients.

Budget

Five hundred thousand dollars ($500,000) has been made available for development of the Water Supply Bank platform. Project funding will go to human and technological resources and any other justifiably necessary development expenses. The Water Supply Bank Coordinator is responsible for managing all financial expenses associated with this project.

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Water Supply Bank Workflow Model

The workflow process for the Water Supply Bank outlines how data is transmitted to, through and from the Bank. Presently, lease and rental applications are transmitted to the Bank via mailed or in-person applications which are transcribed into Bank data management applications. By bringing water right and Water Supply Bank data into ArcGIS and excel models, staff analyze water rights to determine how they can best be leased into and rented from the Bank. As analyses of lease and rental applications are completed, Bank staff transfer data into macro scripts in Microsoft Word to generate Lease Contracts, Rental Agreements and a multitude of cover letters. As a whole, the current workflow process is time-consuming, human-resource intensive and can be vastly improved through a, updated, streamlined workflow process to improve data transmission and administrative functions.

Improved workflow processes can be achieved through better communication of Bank (and non-Bank) water right information to individuals who may be interested in transacting with the Water Supply Bank, as well as through an online, electronic application submission, tracking and management system. Such an electronic system includes an online web portal through which Bank information can be accessed and applications can be submitted and received by Bank staff, and it also includes an internal, network-application interface through which Bank applications can analyzed, processed and managed. The full process is outlined in **Diagram 2: Water Supply Bank Workflow Model.**

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Water Supply Bank Application Development

Diagram 2: WSB Workflow Model

WSB Homepage: Updated program description, access to Bank data (Dashboard, query system, tabular data, etc), links to controlled access part of server for clients to retrieve messages, as well as a stable lease/rental application submission system.

WSB Dashboard: An automated, realtime public information portal displaying WSB data.

Examples of data include: #/% of WRs leased in/rented out, Vol leased in / % available for rent by Basin, # of WRs by B/U, etc.

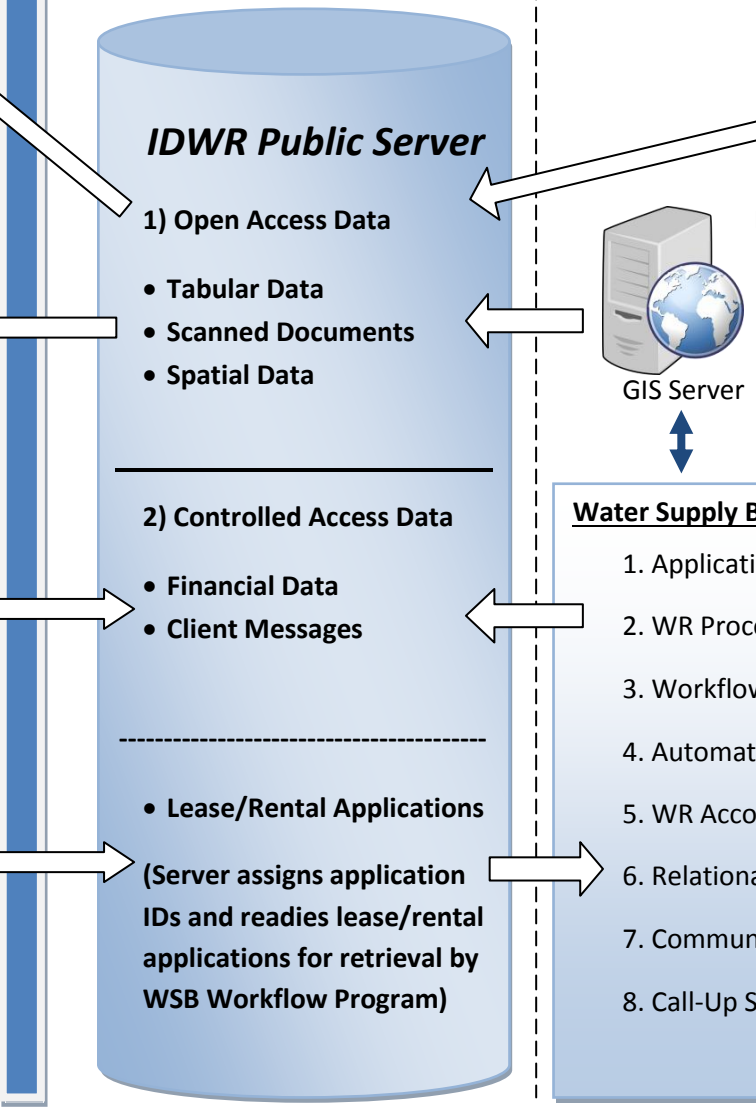
From Dashboard, link will be available to the specific WR query tool, as well FTP site to access tabular/GIS data from the Bank.

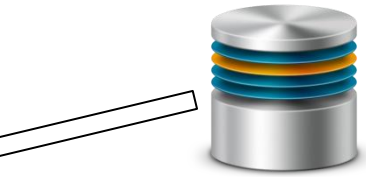
Client Relationship Management (CRM) System: Secure site (requires client ID + password) through which clients can check the status of a lease or rental application, receive secure messages from the Bank, see transaction history and see financial. The system will be the go-to for clients to check their application status.

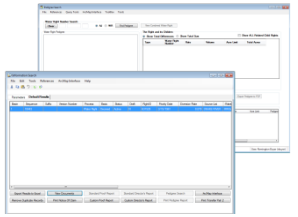
Application Submission System: Browser-based lease/rental application submittal system. System requires applicants use a client ID to submit applications through the Controlled Access Data portion of the server. This system will enable WSB staff to control the influx of rental applications by opening/closing application submission windows.

Server on IDWR's public network from which public data can be accessed and submitted.

IDWR intranet: WSB Application will interface with different Dept. workflow applications (infosearch, ArcGIS, ESPAM, Enforcement Database, etc.)







Water Supply Bank Workflow Program

1. Application Retrieval (from public server)
2. WR Processing (data entry/updates, memo logs)
3. Workflow Integration (network communication)
4. Automated Doc Generation (maps, contracts, etc.)
5. WR Accounting (r/w/e capacity for WR tables)
6. Relational Data Query System (trend monitoring)
7. Communication Platform (client messaging system)
8. Call-Up System (definable pop-up alert system)

Water Supply Bank Application Development

The Water Supply Bank Workflow Model is comprised of many different components that can be grouped as either an internal, IDWR workflow system, or an external public access system. The optimal method of understanding the full workflow process and how it can improve administration of Bank processes is to consider how an application to lease or rent water through the Bank can be identified, submitted and processed through the system as a whole.

External Public Access System: A Water Supply Bank Web Portal

The Water Supply Bank web platform is where all general Bank inquiries begin. The web platform is housed on the IDWR public server which stores open-access data for general inquiry by the public, as well as lightly-secured client specific data that is accessed through a secured, log-in system. The following are components of the web platform:

1. Water Supply Bank Website

The website is the first point of contact for the general public and the Water Supply Bank. The website houses general information about the Water Supply Bank and IDWR programs. From the website, individuals can learn about the history and function of the Water Supply Bank, they can access Bank data through the **Data Dashboard**, they can access semi-secure information through the **Client Relationship Management (CRM) Portal**, they can **submit an electronic lease or rental application to the Bank**, and they can use IDWR's water right search tool, mapping tool and other Departmental tools to access publicly available data.

2. Data Dashboard

The Data Dashboard is a sub-component of the Water Supply Bank website where Bank data is visualized through charts, graphs and relevant imagery. The Dashboard is a generalized information clearinghouse for the Water Supply Bank and it lists all manners of data including, but not limited to:

- The number of water rights leased into the Bank, filterable by water right conditions (volume, flow, acreage, priority dates, beneficial use, season of use, etc;
- The number of water rights rented out from the Bank, filterable by water right conditions (volume, flow, acreage, priority dates, beneficial use, season of use, etc;
- The availability of water rights per basin, water district, or geographic region,
- The value of financial transactions processed through the Bank in a given year;
- The average length of Lease Contracts and Rental Agreements, by basin, region;
- The percentage of leased rights available for irrigation, industrial use, etc.
- The number of private lease/rental agreements operational in the Water Supply Bank;
- The number of active lessors/renters transacting through the Bank;
- The volume, flow rate and acreage of leased rights available to rent by Basin;

The Water Supply Bank Coordinator will be responsible for developing an exhaustive list of data points that will require visualization through the Data Dashboard prior to the end of Phase one of the develop program (Summer 2014).

3. Client Relationship Management System

The Client Relationship Management (CRM) Portal is a simple, secure, internet-accessible system that displays client-specific information related to Water Supply Bank transactions. The purpose of the CRM portal is to provide Water Supply Bank clients with user-specific information to keep them informed about the status of the lease or rental application or contract/agreement. The CRM will also be a place through which financial information can be transmitted to clients, as well as secure messages and status updates for Bank transactions.

CRM information to be displayed will include, but is not limited to:

- The attributes, spatial location and specific terms of all water rights that the individual has leased into the Water Supply Bank;
- The attributes, spatial location and specific terms of all water rights that an individual is renting from the Water Supply Bank;
- A summary of all financial transactions (fees and warrants) processed through the Bank;
- A statement of any outstanding financial fees or projected payments owed by/to the individual;
- Secure messages from Bank staff to a client regarding their application or contracts/agreements.

4. Application Submission System

The final component of the web-platform is an online, lease/rental application submission system that will enable clients to electronically transmit applications to the Water Supply Bank. The system will be different for lease and rental applications, however it will function in three simple steps:

1. An individual uses their secure Client ID to access a Water Supply Bank application,
2. An application ID is created when an application is started and this ID (and corresponding data) is transferred to IDWR's public server, where it can be retrieved by the Water Supply Bank application.
3. An individual can track the status of their application through the CRM portal and can monitor the progress of their application as it is processed by Bank staff.

The lease and rental applications will be slightly different. Lease applications will begin after the client identifies a valid water right within IDWR's system and confirms their ownership of the right. The system will gather all information currently collected on lease application and guide the client through to completion (submission to the secure server). Rental applications will be slightly more complex and will require that an individual drop a point on an online map to indicate the spot where they would like to put rental water to beneficial use, after which the rental application can proceed.

There are different ways to automate the manner in which leased rights can be associated to a rental location and the Water Supply Bank Coordinator will work with IT programmers during Phase one to select the best method to accomplish this match up.

Water Supply Bank Worklow Software Program

1. Application Retrieval

The Water Supply Bank workflow program will retrieve electronic application submitted to the Bank through the secure application creation system. Beyond improving client access to the Bank, the online, browser-based application system will enable Water Supply Bank staff to update the lease and rental application interface when necessary and it will eliminate the opportunity of clients to submit incomplete applications. The online system will also prevent clients from submitting applications without application payments and it will enable Bank staff to set fixed times for receiving applications.

2. Water Right Processing

Each WSB lease and rental application will have a unique ID, allowing Bank administrative staff (IDWR staff, watermasters, etc) to electronically access all lease and rental applications and input review memos, notes and other relevant remarks. As lease/rental applications are approved, applications will be archived and data will be copied into a lease and rental tables and assigned unique rental and lease IDs as well as Contract and Agreement IDs. Separating lease and rental ID tables from contract and agreement tables will allow the Bank to track lease and rental trends unique to a water right, as well as to lessors and renters. Application windows: Financial, Document Creation, Communication, Statistics.

As water rights are processed into the Water Supply Bank, it will be beneficial for the Bank workflow program to communicate Bank information to other workflow processes (eg: infosearch) as well as to update the Enterprise server with new client IDs as they are created for Bank transactions.

3. Workflow Integration

Though the Water Supply Bank workflow program will be a standalone database management application, it will communicate Bank specific data to other workflow applications and processes, including, but not limited to:

- Water Rights InfoSearch: WSB info will be displayed on its own data row,
- Water Rights Ownership Changes: such changes will trigger alerts in the Bank application,
- Water Right split workflow process: splits will trigger alerts in the Bank application,
- Protest Notification: lease and rental applications can be pushed to the protest notice table,
- GIS: The Bank application will push relevant data into a new, updated ArcGIS analysis interface,
- Water Right Transfer Workflow: WSB app will provide Transfer workflow with visual alert,
- Water Compliance Bureau: Integration with Enforcement database (violation flagging/tracking),
- Water Rights Accounting Model: WMIS, USGS stream gauge and other data the Bank can reference to track/audit lease/rental activities.

4. Automated Document Generation

The application will automatically generate standard correspondence letters, Lease Contracts, Rental Agreements as well as statistics.

5. Water Supply Accounting

Through cross-referenced database tables and server connections to non-Bank data sources (eg water rights accounting sources), the workflow program will manage all water rights leased into the Bank and water rights rented out, as well as water use data from non-Bank sources such as the Water Management Information System and water rights accounting model. This comprehensive data management will enable highly accurate and efficient accounting of all water rights and water volumes being leased and rented through the Bank, allowing staff to monitor availability and use of Bank water. Key data from the water right accounting tables can be queried daily to be pushed to the Water Supply Bank Data Dashboard.

7. Relational Data Query System

The application will programmed to allow a multitude of user defined data queries, allowing Bank staff to review data tables and longitudinally track and monitor Bank transaction trends.

6. Communication Platform

The application will have a communication component that will allow Bank staff to generate and document email messages to clients, as well as secure communications sent via the CRM portal.

8. Call-Up System

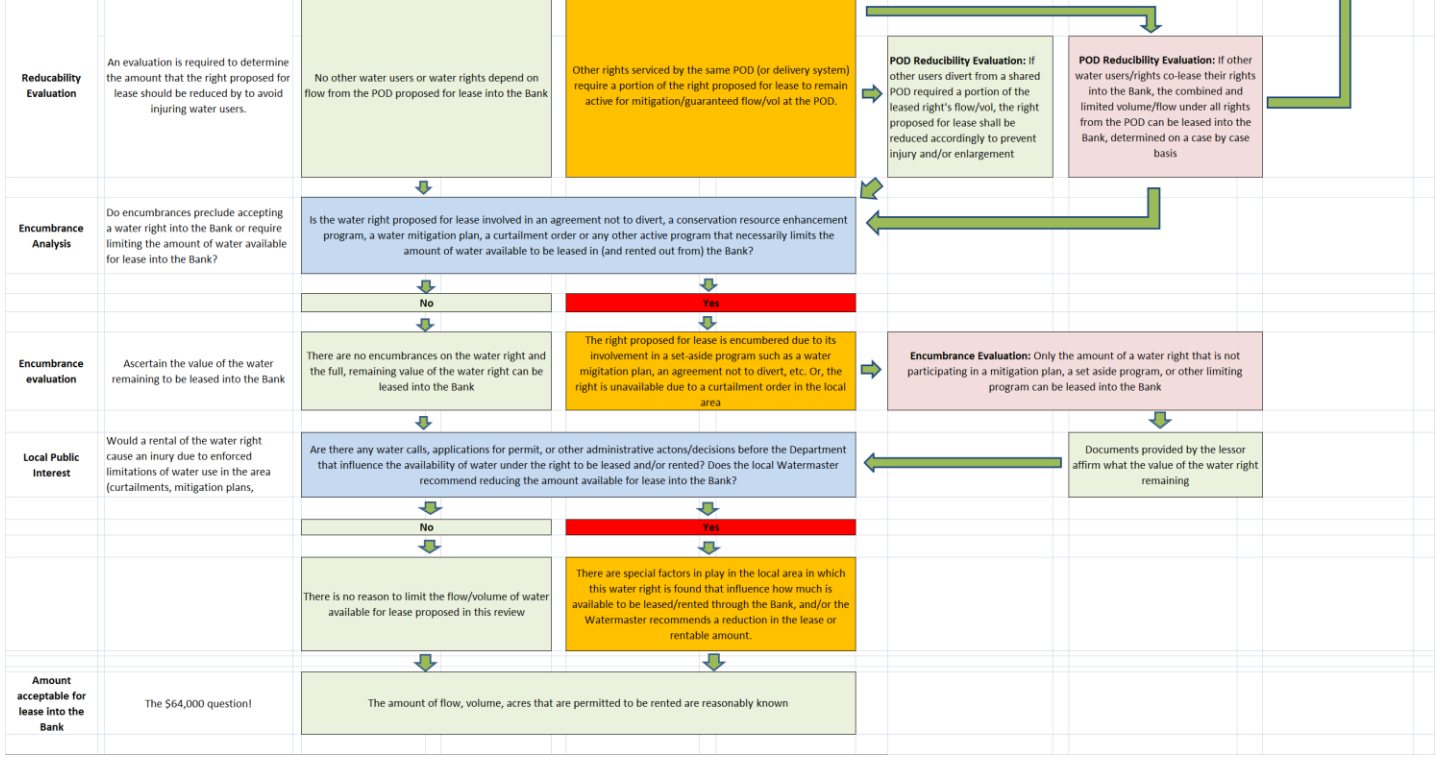
The system will feature an automatic call-up/alert function that will notify staff whenever a pre-established or user-defined length of time (or action event) occurs, such as providing 14 days for the signing of Rental Agreements.

Water Supply Bank Computer Infrastructure Development Report

Attachments B1 & B2

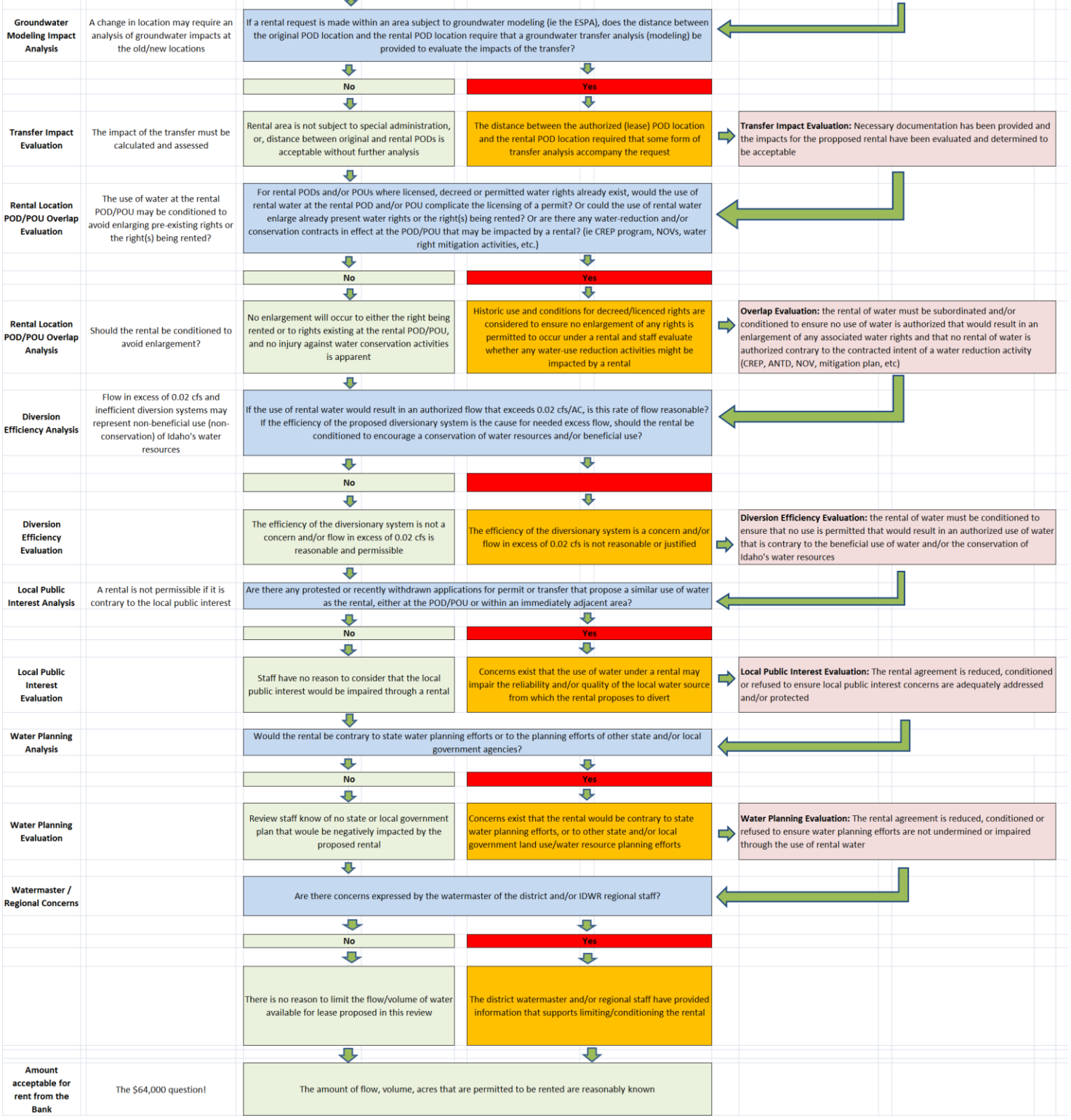
WSB Lease Proposal Analysis & Evaluation Workflow

Concern	Importance	Answer, Implication and Resulting Required Action
WR Ownership	Only the current owner(s) of the water right can lease it in	Is the applicant submitting the lease application registered in IDWR's system as the sole owner of the water right?
		Yes
Ownership Evaluation	Can the applicant represent water right owner(s)?	Lessor is the current owner of water right and has authority to submit lease
		No
		Lessor may not have full authority to submit a lease to the Bank. Authority to submit a lease must be confirmed.
		Authority Evaluation: The lessor must provide a change in ownership form, submit documentary proof of their authority to represent the water right owner(s) on the lease application, which includes the lessor designation form, if multiple owners co-own a right
Authority to Access Appurtenant Land	Applicant must demonstrate ability to legally access WR	Do you own the land to which the POD(s) and/or POU(s) of the water right proposed for lease is appurtenant?
		Yes
Access Authority Evaluation	Can the applicant confirm their legitimate access to the PODs/POUs?	Lessor has ability to regulate the diversion and application of water right and suspension is not a concern
		No
		Lessor may be unable to legally divert and/or apply water to beneficial use at the POU. Regulation of water right is a concern.
		Access Authority Evaluation: The lessor provides documentary proof that they are legally premitted to access water via the POD(s) at the POU(s). (Relevant for final two steps in the evaluation process)
WR Validity	Validity is required to ascertain if the right can be accepted into the Bank.	Has it been greater than 5 years since the right was decreed, or, is the water right not decreed, but instead licensed or permitted?
		No
Beneficial Use Analysis	If forfeiture is a concern, confirmed beneficial use of water from the POD of the water right proposed for lease must be considered	It has been less than five years since the decree date. Water right is valid. No historic use analysis required, move on to overlap analysis
		Yes
		Water right may not be valid (forfeiture or abandonement is a concern) A beneficial use analysis is required
		Beneficial Use Analysis: The maximum amount of a water right that is confirmed diverted from the authorized source and put to use within the authorized POU, absent water diverted under a rental, or from another source, can be accepted for lease into the Bank. *Agents must determine that confirmed use was not not the result of water from another source (ie a rental, canal shares, etc)
Overlap Analysis	If water rights with a common purpose overlap, their use of water may be "stacked" and the idling of one POU may limit the use of another right	Within the authorized place of use for the portion of a water right confirmed valid, does any part of the POU proposed to be idled through a lease overlap with the POU for another water right that is utilized for the same beneficial use?
		No
Enlargement Evaluation	To prevent enlargement, only the volume (corresponding to land verified to not overlap) can be leased to the Bank	Right features no overlap, enlargement is not a concern, full volume, flow or acres (as proposed) can be leased into the Bank.
		Yes
		Sub question: If water rights do overlap, are there limits on the use of water under the non-leased rights (eg. PPU and/or acre limits) that allow for the full beneficial use of water to be achieved under that right inspite of its POU being reduced?
		Yes
		Full beneficial use can be maintained under the non-leased right if the overlapped part of the POU is leased to the Bank
		No
		Full beneficial use of the non-leased right cannot be achieved if the overlapping portion is leased to the Bank
		Enlargement Evaluation: Either only the non-overlapping portion of the right is accepted into the Bank, or, the overlapping portion of the other right(s) are co-leased to the Bank
		Overlapping water rights are submitted to the Bank as sibling leases.
Supplementality Analysis	If a water right is supplemental, it cannot be rented as a primary right, else enlargement will occur	Does water right feature a condition that subordinates its use to another water right, or, does a right which overlaps the leased right include a condition requiring that the right being leased only be used after it or another right is fully utlized?
		Lease proposal is reduced to non-overlapping portion* *If the overlap is attributed to water delivered by a surface water entity, lease is conditioned to require lessor to retain (not lease) shares
		No
Supplementality Evaluation	Supplemental to primary right evaluation is done	Right is not supplemental and can be rented as a primary right.
		Yes
		Right is supplemental and can only be rented as supplemental unless a minimum 5 years of recent use records confirm the primary use of the right
		Supplemental Evaluation: Pump records, watermaster comments or other documentation establishes the average volume that has been primarily used by the supplemental right.
Comingling Analysis	If beneficial use is achieved through comingling of water sources, actual use/forfeiture cannot be confirmed solely through beneficial use at POU	To achieve licensed or decreed beneficial within the POU of the right proposed to be leased to the Bank, does comingling of water sources occur?
		Averaged vol/flow of supplemental right is established and leased to the Bank as primary.
		No
Comingling Evaluation	An evaluation may be done to evaluate the full amounts available from comingled sources	Water right has come from a single source and is not comingled, so the volume can be easily calculated.
		Yes
		Comingling prevents the Bank from determining what the full availability of water is from a single source.
		Comingling Evaluation: Pump records, watermaster affirmation or other documentation is provided that establishes the volume and flow utilized from the POD of the right sought for lease into the Bank.
POD Analysis	Can the water right be reduced at the POD without injuring other water users?	Do other water users divert from the same POD as the right proposed for lease? If so, would a decrease in flow from the POD (necessary under a lease) cause injury to other water users? (ie canal water users or an irrigation district?)
		Use records establish the water volume that is available for lease into the Bank.
		No
Reducability Evaluation	An evaluation is required to determine the amount that the right proposed for lease should be reduced by to avoid injuring water users.	No other water users or water rights depend on flow from the POD proposed for lease into the Bank
		Yes
		Other rights serviced by the same POD (or delivery system) require a portion of the right proposed for lease to remain active for mitigation/guaranteed flow/vol at the POD.
		POD Reducibility Evaluation: If other users divert from a shared POD required a portion of the leased right's flow/vol, the right proposed for lease shall be reduced accordingly to prevent injury and/or enlargement
		POD Reducibility Evaluation: If other water users/rights co-lease their rights into the Bank, the combined and limited volume/flow under all rights from the POD can be leased into the Bank, determined on a case by case basis
Encumbrance Analysis	Do encumbrances preclude accepting a water right into the Bank or require limiting the amount of water available for lease into the Bank?	Is the water right proposed for lease involved in an agreement not to divert, a conservation resource enhancement program, a water mitigation plan, a curtailment order or any other active program that necessarily limits the amount of water available to be leased in (and rented out from) the Bank?
		No
		Yes


Reducability Evaluation
An evaluation is required to determine the amount that the right proposed for lease should be reduced by to avoid injuring water users.
No other water users or water rights depend on flow from the POD proposed for lease into the Bank
Other rights serviced by the same POD (or delivery system) require a portion of the right proposed for lease to remain active for mitigation/guaranteed flow/vol at the POD.
POD Reducibility Evaluation: If other users divert from a shared POD required a portion of the leased right's flow/vol, the right proposed for lease shall be reduced accordingly to prevent injury and/or enlargement
POD Reducibility Evaluation: If other water users/rights co-lease their rights into the Bank, the combined and limited volume/flow under all rights from the POD can be leased into the Bank, determined on a case by case basis
Encumbrance Analysis
Do encumbrances preclude accepting a water right into the Bank or require limiting the amount of water available for lease into the Bank?
Is the water right proposed for lease involved in an agreement not to divert, a conservation resource enhancement program, a water mitigation plan, a curtailment order or any other active program that necessarily limits the amount of water available to be leased in (and rented out from) the Bank?
No
Yes
Encumbrance evaluation
Ascertain the value of the water remaining to be leased into the Bank
There are no encumbrances on the water right and the full, remaining value of the water right can be leased into the Bank
The right proposed for lease is encumbered due to its involvement in a set-aside program such as a water migitation plan, an agreement not to divert, etc. Or, the right is unavailable due to a curtailment order in the local area
Encumbrance Evaluation: Only the amount of a water right that is not participating in a mitigation plan, a set aside program, or other limiting program can be leased into the Bank
Documents provided by the lessor affirm what the value of the water right remaining
Local Public Interest
Would a rental of the water right cause an inury due to enforced limitations of water use in the area (curtailments, mitigation plans,
Are there any water calls, applications for permit, or other administrative actons/decisions before the Department that influence the availability of water under the right to be leased and/or rented? Does the local Watermaster recommend reducing the amount available for lease into the Bank?
No
Yes
There is no reason to limit the flow/volume of water available for lease proposed in this review
There are special factors in play in the local area in which this water right is found that influence how much is available to be leased/rented through the Bank, and/or the Watermaster recommends a reduction in the lease or rentable amount.
Amount acceptable for lease into the Bank
The $64,000 question!
The amount of flow, volume, acres that are permitted to be rented are reasonably known

WSB Rental Request Analysis & Evaluation Workflow

Concern	Importance	Answer, Implication and Resulting Required Action		
Confirmed beneficial purpose of use	A rental must be for a beneficial use	Is the rental request for a purpose of use that is recognized as beneficial?		
		Yes	**No**	
Purpose of use determination	Is the rental request for a recognized beneficial purpose?	Water is being requested for a recognized, beneficial purpose	Greater explanation of the rental request is necessary	**Purpose of Use Evaluation:** The renter must provide evidence to support that their intended purpose of use is a beneficial use.
Duplicative Processes Analysis	IDWR will evaluate whether a rental request duplicates a proposed transfer or application for permit	Is the rental request similar to, or the same as, a pending or protested application for permit or water right transfer?		
		No	**Yes**	
Duplicative Process Evaluation		There are no other IDWR applications for permit or transfer that address the same purpose as the rental	An application for permit or a water right transfer is proposing the same purpose of use as the rental	**Duplicative Process Evaluation:** The rental request might not be considered if a similar IDWR application process is already underway, or pending, and staff resources would be made redundant or overburdened in considering the rental request
Rental Location Injury Analysis	Rentals need to be carefully evaluated and conditioned if local public injury concerns are evident	Is the POD/POU for the rental within an area that has recently, is currently, or is likely to soon experience water quantity or quality concerns and is subsequently subject to increased administrative oversight? (ie: curtailment areas, CGWAs, GWMAs, areas of drilling concern, environmental concern areas, etc)		
		No	**Yes**	
Rental Location Injury Evaluation		There are no water quantity or quality concerns in the area in which the rental is proposed	There are serious water quantity/quality concerns for the area in which the rental is located and/or the proposed rental may negatively impact water quality and/or water quantity	**Injury Evaluation:** The rental request is reduced, conditioned or denied to avoid injury. Only beneficial uses that don't further impair water quality are permissible and only water rights leased to the Bank within the special administrative area are available to be rented
WR Availability	Is there a water right available for rental?	Is there a water right with sufficient volume/flow/acre elements sufficient to provide the necessary duty of water requested under the rental?		
		Yes	**No**	
Availability Evaluation	Is sufficient water available to provide the necessary duty of water for the rental?	Water duty requested is available from a leased right that can be rented for the duration of the propsed rental	The duty of water requested is unavailable under a leased right and/or a leased right is already/about to be rented and/or the leased right will expire before the proposed rental will expire	**Availability Evaluation:** The rental request is conditioned to a period that corresponds to the lease duration and/or the rental amounts are reduced or supplemented with other rentable water rights.
Change in source Analysis	A change in source is not permitted unless 24 hour, 50% depletion is proven	Is the water source for the right to be rented the same water source as the proposed rental POD?		
		Yes	**No**	
Change in source Evaluation	If nature of use is changing, only the consumptive use component of a right may be transferred through a rental	There are no concerns about a change in source	A change in source is not permissible unless an applicant provides modeling and confirms that 50% or more of the total volume diverted within 24 hours resulted in an equally large depletion in the other source	**Change in Source Evaluation:** Hydraulic connectivity is apparent, or modeling is provided and accepted to establish a connection between the lease and rental sources
Enhanced Source Analysis	The use of water cannot be enhanced at a rental location with an improved source	Would the water right leased to the Bank and requested for rent potentially be enlarged due to an increased/enhanced diversion of water at the rental location?		
		No	**Yes**	
Enhanced Source Evaluation		The water source at the authorized location is no different, or it is better than the source of water at the rental location	The source of water is more secure and is better than water at the authorized location and the rental must be limited to avoid enlargement through rental	**Enhanced source Evaluation:** Rentals are conditioned such that diversion are only authorized at times when water is available, in priority, at the original location, and only when local regulation of water rights are available, such as by a watermaster
Consumptive Use Analysis	Nature of use is evaluated to prevent enlargement of non-agriculture, irrigation rights	Will the nature of use for both the leased right and the rental right remain irrigation for agricultural purposes?		
		Yes	**No**	
Consumptive use Evaluation	If nature of use is changing, only the consumptive use component of a right may be transferred through a rental	The leased right and proposed rental are both for agricultural irrigation and a consumptive use evaluation is not required	The nature of use for the leased right and the requested rental use are not both irrigation for agricultural purposes, necessitating a consumptive use evaluation	**Consumptive Use Evaluation:** The consumptive use volume of the leased right is ascertained based on a historic use analysis, and only the consumptive use amount is rented, avoiding enlarging of the right
Groundwater Modeling Impact Analysis	A change in location may require an analysis of groundwater impacts at the old/new locations	If a rental request is made within an area subject to groundwater modeling (ie the ESPA), does the distance between the original POD location and the rental POD location require that a groundwater transfer analysis (modeling) be provided to evaluate the impacts of the transfer?		
		No	**Yes**	


Groundwater Modeling Impact Analysis
A change in location may require an analysis of groundwater impacts at the old/new locations
If a rental request is made within an area subject to groundwater modeling (ie the ESPA), does the distance between the original POD location and the rental POD location require that a groundwater transfer analysis (modeling) be provided to evaluate the impacts of the transfer?
No
Yes
Transfer Impact Evaluation
The impact of the transfer must be calculated and assessed
Rental area is not subject to special administration, or, distance between original and rental PODs is acceptable without further analysis
The distance between the authorized (lease) POD location and the rental POD location required that some form of transfer analysis accompany the request
Transfer Impact Evaluation: Necessary documentation has been provided and the impacts for the propposed rental have been evaluated and determined to be acceptable
Rental Location POD/POU Overlap Evaluation
The use of water at the rental POD/POU may be conditioned to avoid enlarging pre-existing rights or the right(s) being rented?
For rental PODs and/or POUs where licensed, decreed or permitted water rights already exist, would the use of rental water at the rental POD and/or POU complicate the licensing of a permit? Or could the use of rental water enlarge already present water rights or the right(s) being rented? Or are there any water-reduction and/or conservation contracts in effect at the POD/POU that may be impacted by a rental? (ie CREP program, NOVs, water right mitigation activities, etc.)
No
Yes
Rental Location POD/POU Overlap Analysis
Should the rental be conditioned to avoid enlargement?
No enlargement will occur to either the right being rented or to rights existing at the rental POD/POU, and no injury against water conservation activities is apparent
Historic use and conditions for decreed/licenced rights are considered to ensure no enlargement of any rights is permitted to occur under a rental and staff evaluate whether any water-use reduction activities might be impacted by a rental
Overlap Evaluation: the rental of water must be subordinated and/or conditioned to ensure no use of water is authorized that would result in an enlargement of any associated water rights and that no rental of water is authorized contrary to the contracted intent of a water reduction activity (CREP, ANTD, NOV, mitigation plan, etc)
Diversion Efficiency Analysis
Flow in excess of 0.02 cfs and inefficient diversion systems may represent non-beneficial use (non-conservation) of Idaho's water resources
If the use of rental water would result in an authorized flow that exceeds 0.02 cfs/AC, is this rate of flow reasonable? If the efficiency of the proposed diversionary system is the cause for needed excess flow, should the rental be conditioned to encourage a conservation of water resources and/or beneficial use?
No
Diversion Efficiency Evaluation
The efficiency of the diversionary system is not a concern and/or flow in excess of 0.02 cfs is reasonable and permissible
The efficiency of the diversionary system is a concern and/or flow in excess of 0.02 cfs is not reasonable or justified
Diversion Efficiency Evaluation: the rental of water must be conditioned to ensure that no use is permitted that would result in an authorized use of water that is contrary to the beneficial use of water and/or the conservation of Idaho's water resources
Local Public Interest Analysis
A rental is not permissible if it is contrary to the local public interest
Are there any protested or recently withdrawn applications for permit or transfer that propose a similar use of water as the rental, either at the POD/POU or within an immediately adjacent area?
No
Yes
Local Public Interest Evaluation
Staff have no reason to consider that the local public interest would be impaired through a rental
Concerns exist that the use of water under a rental may impair the reliability and/or quality of the local water source from which the rental proposes to divert
Local Public Interest Evaluation: The rental agreement is reduced, conditioned or refused to ensure local public interest concerns are adequately addressed and/or protected
Water Planning Analysis
Would the rental be contrary to state water planning efforts or to the planning efforts of other state and/or local government agencies?
No
Yes
Water Planning Evaluation
Review staff know of no state or local government plan that woule be negatively impacted by the proposed rental
Concerns exist that the rental would be contrary to state water planning efforts, or to other state and/or local government land use/water resource planning efforts
Water Planning Evaluation: The rental agreement is reduced, conditioned or refused to ensure water planning efforts are not undermined or impaired through the use of rental water
Watermaster / Regional Concerns
Are there concerns expressed by the watermaster of the district and/or IDWR regional staff?
No
Yes
There is no reason to limit the flow/volume of water available for lease proposed in this review
The district watermaster and/or regional staff have provided information that supports limiting/conditioning the rental
Amount acceptable for rent from the Bank
The $64,000 question!
The amount of flow, volume, acres that are permitted to be rented are reasonably known

Water Supply Bank Computer Infrastructure Development Report

Attachments C

IDAHO WATER RESOURCE BOARD

WATER SUPPLY BANK

Water Supply Bank Computer Infrastructure Development Plan

Plan version 1.0

September 22, 2014

Water Supply Bank Computer Infrastructure Development Plan

Cover photo of Bank IT Proposal presented to the Idaho Water Resource Board March 20, 2014

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Idaho Department of Water Resources

Water Supply Bank Program

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Water Supply Bank Computer Infrastructure Development Plan

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Water Supply Bank Computer Infrastructure Development Plan

Background

The Idaho Water Resource Board (IWRB, Board) has authority to operate the Idaho Water Supply Bank. Through the Board's water supply bank (Board's Bank), an initiative of the Water Supply Bank program, the Board leases valid water rights from water right owners and makes water available for rental to satisfy new and supplemental water uses. Managing lease contracts and administering rental agreements requires customized database software. Through passage of Bill H470, the 2014 Idaho Legislature appropriated $15 million in funding for the Idaho Water Resource Board to pursue water sustainability projects, of which $500,000 was allocated for development of computer infrastructure for the Water Supply Bank.

A comprehensive computer infrastructure development plan is proposed to improve how water right data is transmitted to the Bank, how it is managed and queried within the Bank, and how it is communicated from the Bank to the Board, water users, Idaho Department of Water Resources (IDWR) staff and the public. This document, the Water Supply Bank Computer Infrastructure Development Plan (plan), summarizes how computer infrastructure will be developed and/or enhanced to improve administration of lease and rental transactions within the Board's Bank.

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Development Strategy

The Water Supply Bank requires an IT platform to improve lease and rental transaction administration. The IT platform includes six specific components: 1) an enhanced version of the IDWR Application Review workflow program, to assist staff with initial review of paper applications to ensure completeness; 2) a new, centralized database program to assist staff with entering, reviewing and creating documents from lease and rental data; 3) enhanced geographic information system (GIS) analysis functionality provided through IDWR's water right edit (WREdit) program; 4) enhanced lease and rental transaction status communication to the public via an improved Water Supply Bank website; and, 5) enhanced spatial querying capabilities, achieved through displaying lease and rental information in GIS maps on IDWR's website; and, 6) an improved version of the IDWR Information Search tool that will allow the tool to directly query the WSB database.

In order to successfully develop new and improved computer software, project development plans are being established for the separate but interrelated IT components; development tasks for each of the six platform components will be detailed in component-specific project plans that will feature project descriptions, detailed work tasks, work roles, work assignments, development schedules, a communication strategy and a budget for any planned expenditures.

This plan summarizes the comprehensive development of the Water Supply Bank Computer Infrastructure platform as a whole. This plan does not go into programming details regarding each of the five components, but instead details high level project work roles and assignments, a timeline to summarize development phases, budget tracking for platform development, a summary of the Bank's workflow model that will be achieved through development of the IT platform, a detailed description of work assignments and the work breakdown schedule, as well as a progress tracking and reporting strategy for plan implementation.

Water Supply Bank Computer Infrastructure Development Plan

Project Description

Nine work roles have been identified to assist with completing the various tasks associated with development of the WSB IT platform. Multiple staff may be assigned for individual roles (eg, multiple software engineers). It is envisioned that IDWR workflow program enhancements will be developed in-house while initial development of the new database program will be contracted out before it is implemented, beta-tested and managed on IDWR's computer by IDWR technical staff. The following are critical development roles associated with implementation of this plan:

Role	Responsibilities	Individual Assigned
Project Coordinator	Drafts WSB IT platform development plan. Coordinates drafting of component-specific project development plans. Ensures development roles are identified, responsibilities are defined and work tasks are assigned. Receives development progress reports from development team members and tracks all development progress. Monitors development schedule to ensure development of project deliverables stays on track and goals are met. Communicates development progress to the Idaho Water Resource Board, IDWR staff and other stakeholders	Remington Buyer, Water Supply Bank Coordinator
Database Administrator / Architect	Performs an analysis on data management needs and makes recommendations on database design, programming and management resources to be integrated into the Bank database program. Works with Technical Writer to document all database development info	IT Database Analyst
GIS Programmer	Programs GIS applications. Ensures GIS programming needs are articulated in the development of the plan as well as successfully developed and functionally incorporated into the Bank platform. Assists Technical Writer to document all GIS programming information	IDWR IT Systems Programmer and/or Geographic Systems Analyst
Software Engineer(s)	Analyzes, designs, codes and assembles program components of the Bank database application, including the graphic user interface (GUI) used to input, analyze, query and manipulate data from Bank lease and rental transactions. Tests the interoperability of the GUI with the database, as well as other IDWR workflow applications. Assists the Technical Writer in documenting programming strategies and project hand-off to IDWR for future IT maintenance	Contracted Out
Software Quality Assurance Analyst or Software Tester *	Works closely with the software engineers to test the Bank database program, ensuring it functions according to articulated needs. Recommends design improvements to software engineers, programmers and project coordinator. Diagnoses and communicates root cause problems in programming the database and/or integrating the database program onto IDWR's network. Documents troubleshooting and problem-resolution steps with Technical Writer	Contracted Out
Network Administrator	Participates in selection, installation and programming of any network systems required to meet programming needs of the Bank platform	IDWR IT Systems Integration Analyst(s)
Technical Writer	Drafts and maintains technical, project process development documentation for all platform components (development methodology, programming approaches, data dictionaries, software support requirements, trouble shooting methods, etc)	Contracted Out
Web Developer	Codes, tests and debugs web-based applications, redesigns the Bank web site, and ensures relevant lease/rental data is properly displayed	IDWR IT Web Developer
Data Entry	Enters data into the database workflow system once it becomes	Contracted Out

Operator	operational in phase 3. Ensures data entry standards are maintained when entering new data or migrating old transaction data into the new system. Responsible for ensuring all available Water Supply Bank transaction data is transcribed into the new workflow system before the old systems are archived/retired

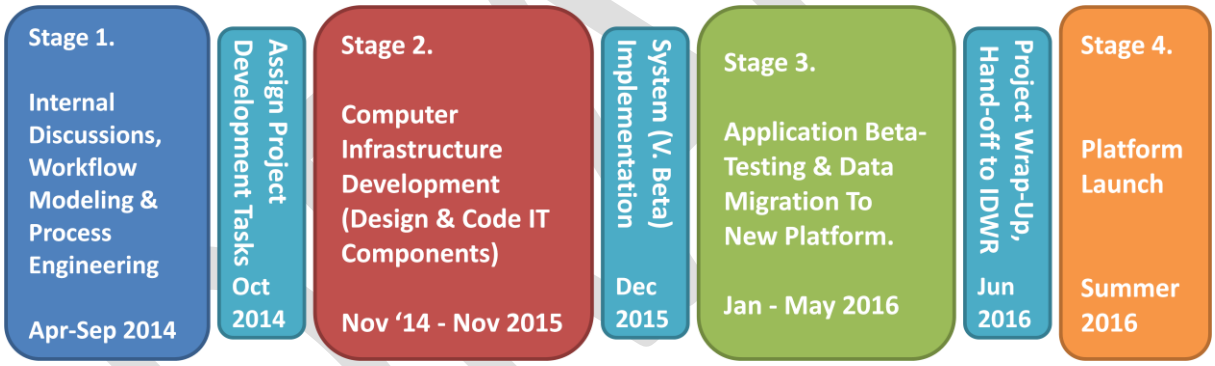
**** As database software development progresses, the responsibilities of the Software QA/Tester may be shifted to the Data Entry Operator. A foreseeable scenario would be for the Software QA/Tester to work full time testing the database program until it is migrated to IDWR's network, at which point additional testing can be assigned to a Data Entry Operator/Data Migration QA at IDWR.***

Project Timeline

The development of the Water Supply Bank program will be a collaborative endeavor between IDWR personnel and external contractors. Scheduled to be developed over a period of 18-24 months, the project will progress through four key phases or stages:

1) Workflow needs assessment and process engineering;
2) Platform component development, application coding, software engineering;
3) Application debugging, beta-testing and data migration to the new system,
4) System launch and archiving old WSB system and data.

Diagram1. Project Timeline



**Timeline reflects development plan as a whole. Specific project development schedule on page 14*

Phase one ran from April through September 2014. During this time, the Water Supply Bank Coordinator worked with the Water Supply Bank Lead Agent, the Water Rights Section Manager and the Water Rights Section Supervisor, GIS programmers, hydrologists and IT programmers to iterate a vision for a comprehensive workflow platform to meet Bank administrative and decisional needs.

The development plan was presented to Technical Services Bureau staff by the Water Supply Bank Coordinator at an internal IT steering committee meeting on September 8th, 2014. Technical Services Bureau staff provided feedback on which components for IT programming could be handled internally by IDWR staff, allowing the Water Supply Bank Coordinator to identify the remaining platform programming needs that can be contracted out to expedite development.

Phase one deliverables: 1) A water supply bank IT development plan (this document); **2**) Detailed work descriptions and development tasks for the assignment of internal staff and the external contractors to the development process **3)** A project development schedule.

Phase two will commence in fall 2014 and run for a year, during which time development of the following component applications of the Bank IT platform will be augmented, changed or developed:

1) **IDWR Application Review Workflow Program**: This program, currently utilized by water resource agents reviewing transfer applications, will be augmented to include questions related to initial review of Water Supply Bank lease and rental applications. Adding this functionality to the current workflow application will provide better up-front data quality analysis of lease/rental applications.

2) **Database Workflow Program**: Once paper applications are confirmed acceptable (via the above review process), application data will be entered into a comprehensive, networked database program that will facilitate data entry, analysis, management and querying. ***This is the nucleus of the Water Supply Bank IT development platform***. This database workflow program will enable Bank staff to input data from lease and rental applications and query the data to analyze transaction proposals. As proposals are approved, the program will automate production of lease contracts and rental agreements and improve contract management by enabling Bank staff to manipulate lease and rental variables (available/rented water volume, contract ownership, etc), cancel transactions, issue correspondence and manage payments. Comprehensive data management will provide accurate, real-time accounting of the availability of water being leased into and rented out of the Bank.

3) **GIS Workflow Program integration with WREdit**: The current WSB workflow program provides staff with a method to enter lease data into a static lease table from which GIS points and polygons are linked to lease and rental events via the WREdit program in ArcMap. The need to populate tabular data will be eliminated through implementation of the database workflow program; Bank staff will be able to directly link GIS data to transaction data stored in the WSB database via enhancements to WREdit. The current GIS workflow application will become redundant and will be phased out.

4) **Transaction Analysis & Audit Functionality Improvements in WREdit:** In addition to the ability to accurately associate lease and rental shapes with transaction data stored and managed through the database workflow application, lease and rental proposals can be reviewed more expediently through enhanced functionality in WREdit. Specifically, adding curtailment area shapes and information to the "Check Administrative Areas" function of WREdit, as well as adding the most recent (current year) Landsat imagery to the view extent menu under the Base Layers function.

5) **Water Supply Bank Website and Web Services**: The Bank requires an improved website that displays tabular data which can be automatically pulled from the WSB database workflow program. This will allow the public to access accurate, up to date information on water supplies available for rental that can be sorted by basin, region, water source or beneficial use type. A semi-secure subsection of the website can provide applicants with the opportunity to enter their clientID to review the status of recently submitted lease/rental applications, see active or expired transactions, download PDF copies of contracts and agreements and see a log of recent correspondence from the Bank.

6) **IDWR Web-Mapping Service**: IDWR provides the public with useful, water right spatial data through interactive maps that are accessible through our website. Currently, the public can display water right shapes and points associated with places of use and points of diversion for water right claims, adjudication recommendations, water right permits and water rights. Shapes and points for active leases and rentals should also be made available for viewing online to assist with communication about where and when water is being leased and rented.

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7) **IDWR Information search Improvement**: As lease and rental transaction information is captured in the water supply bank databases, IDWR staff will use an updated version of the current Information Search program to query whether a water right is leased into the Bank and whether there is an active rental in effect for the lease.

Phase two deliverables: Functional prototypes of the above seven components of the IT platform.

Phase three begins once a production version of the workflow database application is complete and can be installed on IDWR's computer network. This "beta" version of the application will be utilized by Bank staff to stress test the application's capabilities. Software conflicts in the program will be identified by Bank staff and communicated to the software engineer(s) and programmers for correction prior to the official system launch. Bank staff will test updated versions of the Application Review workflow program, the WREdit tool, as well as interact with a private and secure version of a new Bank website featuring web services to communicate available water supplies. Software bugs within these systems will be identified during stage three and communicated to programming/development staff.

As critical software shortcomings of the component pieces of the workflow platform are addressed and corrected, Water Supply Bank staff will begin migrating transaction data into the new database system. Once it is determined that the workflow database system is stable and functional, all new transaction data will be entered into the system. As the workflow program is confirmed stable, Bank staff will work backwards, populating into the database all active lease and rental data. Once all active lease and rental data is migrated to the new system, the workflow system can be made ready for official launch.

Phase three deliverables: 1) A fully functional, database workflow program; **2)** Active and functioning web services to relay proposed and accepted transaction data; **3)** A fully functional workflow application enabling easy geospatial creation/visualization of lease and rental contract data, as well templates for auditing lease and rental transactions; **4)** A completed project development technical report including all development documentation as well as future support documentation.

Phase four is the final phase during which the new Water Supply Bank platform will be officially launched and transaction data entry and contract management will be managed exclusively through the new system. Web services will be activated, allowing applicants to identify all proposed transactions, as well as any water leased into the bank that is available for new rentals. Once all data from active lease and rental transactions are input into the new workflow database application, Bank staff will endeavor to migrate to the new system all data from formerly active, now closed lease and rental transactions.

Stage four deliverables: 1) A fully functional, dynamic Water Supply Bank platform, including the workflow database program, improved GIS workflow programs and analysis templates and website data sharing functionality **2)** Successful migration of all past transaction data into the new system.

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Budget

Five hundred thousand dollars ($500,000) has been made available for development of the Water Supply Bank platform. Project funding has been earmarked for contracting the human resources necessary to develop the IT platform. Contracting needs have been preliminarily identified as follows:

Role	Duration of Active Involvement	IDWR Staff?	Cost
Project Coordinator	Project Coordinator manages the project full time for duration of the development timeline	Yes	$0.00
Database Administrator / Architect	DBA work is required full time in the first month of phase two and then full time for five months during phase three as the workflow program is integrated onto IDWR's network.	Yes	Unknown
GIS Programmer	Works on the project full time for televe months for the entirety of phase two, then part time through phase three.	Yes	Unknown
Software Engineer(s)	Software engineer works on the program full time for twelve months through phase two, then part time for up to six months through phase three.	Contracted out for stage two and transitioned to in-house staff during stage three	Unknown
Technical Writer	Documentation of project development is assigned as a full time role at the start of phase two, then goes down to part time through phase two through phase three. Handed off for completion in house phase three through four.	Contracted out to start before being handed-off and completed in house	Unknown
Network Administrator	Full time involvement for the first month of phase two and full/part time involvement through phase three.	Yes	Unknown
Web Developer	The Web Developer is assigned to the project full time at the start of phase two and goes down to part time through stage three	Yes	Unknown
Software Quality Assurance Analyst / Software Tester	As the platform nears roll out to production, midway through phase two, the Software QA/Tester is envisioned to work on the project full/part time through phase three	Contracted out to start, but done in-house as program rolls into production	Unknown
Data Entry Operator	Data entry operator will work on the project full time for 6 months (or part time for 12 months) to enter data into the workflow application in phases three and four	Contracted out	Unknown
Total Costs	The cost to fully fund eight positions necessary to develop this project		Unknown

Water Supply Bank Workflow Model

The Water Supply Bank workflow model describes how data will be transmitted to, through and from the Bank via the new database workflow program, as well as via other services, such as the Application Review workflow program, WREdit and the web-service function. The workflow model is a high level view of the workflow process by which data is transmitted through the Bank. Individual workflow processes are broken down in detail in component-specific development project plans.

The workflow model begins as paper lease or rental applications are received by the Department. Bank staff will launch the improved Application Review Workflow application to confirm that the applications received by the Department include the minimal information necessary to begin processing. Applications that don't meet minimal standards will be held for 30 days and any missing information will be requested of the applicant. Once all necessary information is received, Bank staff will launch the database workflow application and begin data entry for a new lease or rental application. All application data will be transcribed into the new database program. All data entered into the workflow database program is written to database tables stored on IDWR's network for easy retrieval. The database workflow system will match lease applications with water right numbers, as well as rental requests with lease contracts, to facilitate easy retrieval of relevant information for analysis of the application. Injury and enlargement analysis functionality will be programmed into the application review module.

ArcMap can be launched from within the database application, allowing staff to pull lease or rental information into GIS to visualize a lease or rental proposal. Within ArcMAP, staff can utilized an ehnaced version of the water right edit (WREdit) function to visually inspect lease/rental proposals, create/edit points or polygons, as well as connect spatial data to lease and rental tabular data stored in the database application. Connecting the data through WREdit will enable spatial data to be pushed to IDWR's website for viewing by the general public through IDWR's mapping service.

Once an application has been satisfactorily reviewed and is ready for approval, lease contracts and rental agreements, along with relevant correspondence (invoices, cover letters, etc) are automatically generated within the database workflow application. As contracts and agreements are signed and returned to IDWR for execution, the lease or rental of an application is updated to "active" in the database workflow program and water is deposited or withdrawn within a transaction table. Contract and agreement information will be automatically retrieved by computer script that will pull relevant data from the database and push it to the newly enhanced Water Supply Bank website, where it can be sorted, filtered and queried by the public, eliminating the need to manually enter application processing information in the current excel tracking list. This web service will thus automatically make lease and rental information available to the public, communicating the volumetric availability of water and the elements of water available for rental. Spatial information relevant to lease contracts, generated through WREdit, can be visualized online as well through IDWR's general mapping tool. The public can thus query tabular and spatial data to identify currently active/available lease and rental data. With improved information communication through the Bank's website, water users can use the data to submit new lease or rental applications, thus restarting the process.

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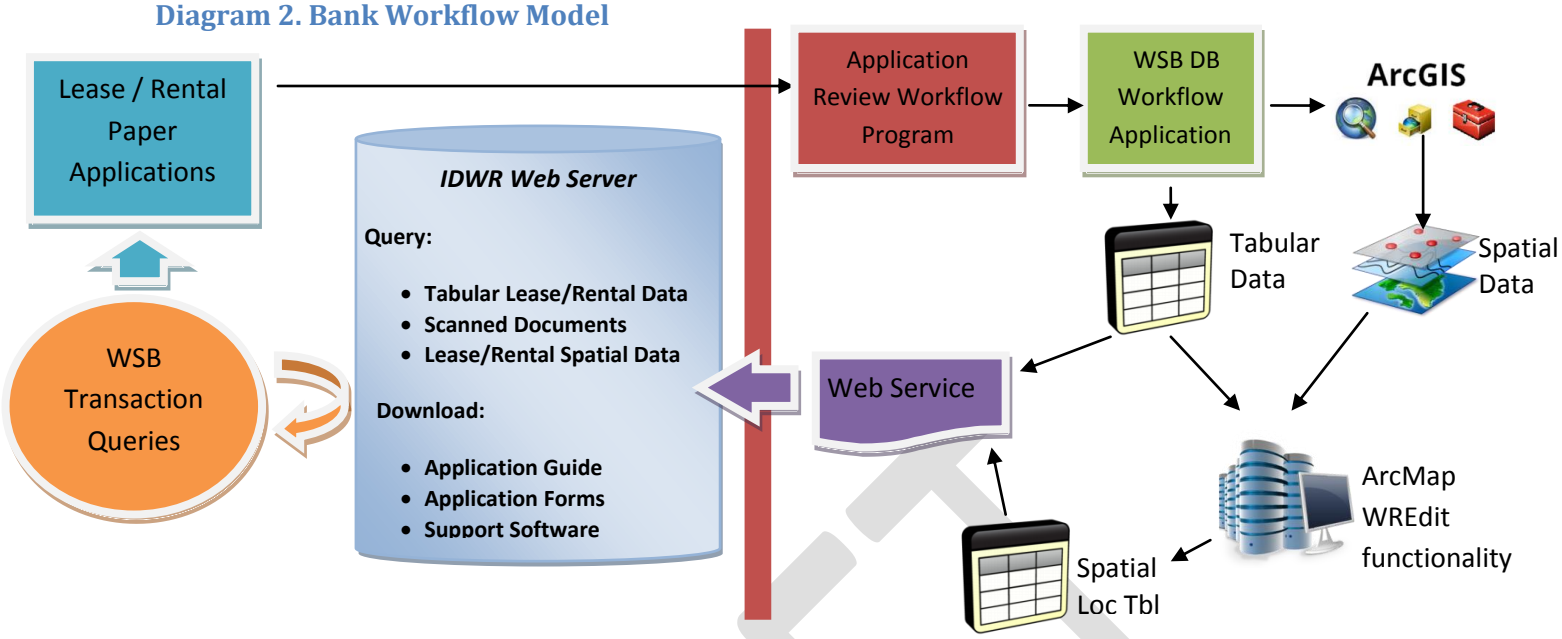
Diagram 2. Bank Workflow Model



IDWR Information Search program is a component of the platform not shown in the above model

Water Supply Bank Workflow Platform Components

The Water Supply Bank workflow platform consists of the following separate components:

Component	Functionality	Current Status	Development Required
IDWR Application Review Workflow Program	Workflow program is utilized to ask and prompt answers to basic questions regarding paper applications received by IDWR. This service will improve functionality by ensuring all necessary questions are answered by applicants prior to applications officially being receipted by IDWR, thus improving analysis of applications once begun	The current workflow program is used to evaluate transfer applications but there is no Bank functionality	The program will be updated to ask WSB specific questions and assist staff with initial reviews of applications
WSB Database Workflow Program	Centralized location to enter, review, store and manage of all data associated with lease and rental applications & approved contracts/agreements. The program includes the following modules: 1. Client management module, 2. Lease proposal review & management module (application receipt, review, approval/denial and contract creation/management), 3. Rental request review and management module (application receipt, review, approval/denial and agreement creation/management), 4. Transaction management module (rental fee invoicing/receipting and warrant payment requesting/issuance), 5. Data query module	Non-existent	This workflow program will be developed
ArcMap WREdit Service	Load near-infrared Landsat satellite imagery from the most recent year to improve review of lease and rental proposals. Update administrative areas to query against curtailment and mitigation plan areas	WREdit is functioning, limited improvements are required	Add specified functionality to WREdit

GIS Workflow Application	The current GIS workflow application enables Bank staff to write lease and rental transaction data to tables on IDWR's network and then use WREdit to match up rental shapes and points with rental data entered through the workflow application. Through creation of the WSB Database workflow program, it will be redundant to enter transaction data in the GIS workflow program; WREdit will connect directly to the database program and the current GIS workflow application can be phased out	The GIS workflow application is currently a standalone application, used to enter lease and rental data into tables against which GIS points shapes are matched in WREdit	The current workflow application will be phased out and the WREdit function will call information directly from the WSB database workflow program
Water Supply Bank Data Web Services	Web services is an encompassing term, referring to a new Bank website that will have enhanced data communication capacities. As lease or rental applications are entered into the workflow database, their processing status and other relevant information will be pulled from the WSB data tables by the web service and pushed to the Water Supply Bank website. As applications are approved, the lease availability and any rental reductions will be communicated to website in the same manner	There is one web service that is currently operational: a script retrieves and uploads a MS Excel tracking sheet nightly and uploads it to the WSB website	Scripts will need to be generated to pull and push tabular data to the Bank's website. The website will need to be updated to incorporate the ability to display data tables. IDWR's mapping tool should be updated to display active lease and rental spatial data.
IDWR General Mapping Tool	The IDWR general mapping tool is a browser-based mapping service that displays water right information maintained by IDWR. Lease and rental data will be visualized in the current general mapping tool to assist water users and the public with knowing where active leases and rentals are occurring	The general mapping tool is functioning on IDWR's website	Lease and rental shapes need to pushed to the IDWR server so they can be visualized through the mapping service
IDWR Information Search Program	The IDWR Information Search program is a comprehensive search tool used for querying all information stored in IDWR's enterprise database. The Information Search Program will be updated to enable two new types of queries: Water Supply Bank leases and rentals. The program will be able to directly query the WSB database using RightID (or a ContactID) to identify leases and rental associated with contacts in the WSB workflow database	The Information Search tool currently allows staff to query whether a right features a Water Supply Bank lease entry	The ability to directly query the Bank database tables from Information Search will be of assistance in identifying lease and rental information

More specific information about individual components is provided in component-specific project development plans.

Project Development Schedule

Development of the Water Supply Bank IT platform will occur over a period of 24 to 30 months and move through four distinct stages: 1) planning (6 months), 2) development (12 months), 3) implementation (6 months), and 4) launch (6 months). The following table summarizes development stages and key activities associated with the project.

	Phase 1	Phase 2	Phase 3	Phase 4
Project Stage	**Planning**	**Development**	**Implementation**	**Launch**
Timelength	6 months	12 months	6 months	6 months
Key Activities	- Conduct a needs assessment and complete workflow process engineering, - Establish a vision for the project, - Draft development plan, - Identify work tasks, - Assemble development team, - Assign work tasks to development team	Begin development of the new database workflow application, as well as improvement of current IT components.	Roll out "beta" version of the platform to the IDWR network and begin testing. Once testing confirms the platform is stable, engage in heavy use of the platform to identify glitches and bugs to be worked out. Begin data entry and review of all new lease/rental transactions using the IT platform	Once glitches are addressed, the program can be officially launched
Deliverables	- Development plan, - Project service order forms (to solicit requests for qualifications (RFQs) from contractors)	- Functional prototypes of IT platform components	- Functional versions of each of the IT platform components, Data captured for all active and recently received lease and rental transactions	Functional platform
Staff Involvement	Project manager	- Project manager, - Database admin /architect, - GIS programmer, - Software engineer, - Software quality tester, - Network admin, - Technical writer, - Web developer	- Project manager, - Database admin /architect, - GIS programmer, - Software engineer, - Software quality tester, - Network admin, - Technical writer, - Web developer - Data entry operator	-Project manager, - Data entry operator

The tables on the following pages detail work tasks and timeframes allotted for actions necessary to develop the IT Platform:

Water Supply Bank Computer Infrastructure Development Plan

Phase One

Step	Task / Action	Start Date	End Date	End Objective / Deliverable
1	Complete Project Scope of Work	Jan 2014	April 2014	Project scope of work
2	Hold Internal Discussions w/ IDWR staff	April 2014	Sept 2014	Vision for IT platform
3	Model Transaction Workflows	April 2014	Sept 2014	Needs assessment for IT platform
4	Document Process Engineering	April 2014	Sept 2014	Administrative functions to be programmed and/or automated
5	Identify Necessary Development Tasks	April 2014	Sept 2014	Work breakdown schedule
6	Draft Project Development Schedule	April 2014	Sept 2014	Project development schedule
7	Complete IT Development Plan	April 2014	Sept 2014	Complete the development plan

Transitioning from stage one to two will require the following:

1. Development of Project Service Orders (PSOs), used to issue a request for qualifications (RFQs) from potential contractors
2. Evaluation of qualifications (PSO Responses),
3. Selection of contractors for project development,
4. Selection of IDWR staff for project development,
5. Holding of a project development kick-off meeting, and
6. Assignment of project development tasks and reporting schedules

Phase Two

Step	Task / Action	Start Date	End Date	End Objective / Deliverable
1	Update the IDWR Application Review Workflow Program to incorporate questions and functions for Water Supply Bank staff	Nov 2014	Nov 2015	An updated version of the IDWR Application Review workflow program
1A	Confirm changes necessary for the Water Supply Bank	Nov 2014	Nov 2014	Draft and implement a project development plan for updating the Application Review workflow program
1B	Identify the software programming tasks required to implement	Nov 2014	Nov 2014	Tasks, roles and work assignments

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	necessary changes			
1C	Program changes to the workflow application software	Nov 2014	Jan 2015	An updated, improved prototype of the workflow program
1D	Test changes to the workflow application and provide feedback (change orders) to programmers	Jan 2015	Jan 2015	Issue change order request
1E	Complete a development version of the updated workflow application	Feb 2015	Mar 2015	An updated version of the IDWR Application Review workflow program
2	Program a Water Supply Bank Database Workflow Application (WSB DB App)	Nov 2014	Nov 2015	A comprehensive database management system for the Water Supply Bank
2A	Discuss as a team the database workflow application needs	Oct 2014	Nov 2014	Communicate workflow vision to programming staff
2B	Establish data standards for database workflow application functionality	Nov 2014	Nov 2014	Establish technical work requirements for project development
2C	Establish plan for development of a prototype workflow application	Nov 2014	Nov 2014	Draft and implement a project development plan for the WSB database program
2D	Engineer conceptual workflow application prototype	Nov 2014	Feb 2014	Develop a prototype of the database workflow application
2E	Demonstrate functional workflow application prototype	Feb 2014	Feb 2014	Demonstrate functional prototype to IDWR
2F	Identify prototype shortcomings and issue change orders	Feb 2014	Feb 2014	Change order request #1
2G	Implement changes and program a development version of the application	Feb 2014	May 2014	Functional development version of the database workflow program
2H	Demonstrate functional development version of application	Jun 2014	Jun 2014	Demonstrate development version of the program
2I	Confirm development program is sound and issue change orders	Jun 2015	Jun 2015	Change order request #2
2J	Enter production development stage for functional workflow application	Jul 2015	Oct 2015	Functional production version of the program
2K	Begin debugging production version	Aug 2015	Oct 2015	Debug production version of the program

	of application			
2L	Complete production version and prepare to roll out beta version to IDWR	Oct 2015	Oct 2015	Functional, debugged workflow application ready for roll out to IDWR network
3	Integrate the WSB DB App with WSB transaction functionality in WREdit	Nov 2014	Nov 2015	New, enhanced WREdit tool that integrates with WSB database program
3A	Discuss current WSB workflow-WREdit functionality and requested changes	Dec 2014	Dec 2014	Establish development plan for WREdit enhancements
3B	Ensure tabular data structure for WSB DB App is established	Dec 2014	Dec 2014	Prepare "dummy" versions of the WSB database workflow program
3C	Populate WSB DB App tables with junk data to test WREdit functionality	Dec 2014	Dec 2014	Populate "dummy" tables
3D	Program WSB WREdit functions to link directly to WSB DB App tables	Jan 2015	Mar 2015	Program enhancements to WREdit
3E	Demonstrate the enhanced version of WREdit, able to link points/shapes directly to WSB DB workflow tables	Apr 2015	April 2015	Demonstrate new WREdit function
3F	Identify shortcomings with WREdit functionality and request changes	Apr 2015	Apr 2015	Issue change order
3G	Program change requests to WREdit function ***AND*** implement any changes to WREdit (developed in step #4)	May 2015	Jun 2015	Implement changes
3H	Prepare enhanced WREdit for roll out to IDWR network	Jul 2015	Jul 2015	Make new tool ready for roll out
4	Improve WREdit functionality	Nov 2014	Nov 2015	Improved data loading functionality within WREdit
4A	Develop methodology to update base layers w/ Landsat imagery	Dec 2014	Dec 2014	Establish a vision and plan for base layer improvements
4B	Prepare near-IR irradience Landsat imagery to be incorported into WREdit	Jan 2015	Jan 2015	Ensure data is ready for incorporation into WREdit

4C	Implement Functionality into Base Layers Function	Feb 2015	Mar 2015	Program new functionality into WREdit
4D	Develop methodology for updating admin features of the tool	Dec 2014	Dec 2014	Establish a vision and plan for admin feature improvements
4E	Identify additional administrative features to be added (ie. Curtailment areas)	Jan 2015	Jan 2015	Discuss additional data to be incorporated into WREdit
4F	Digitize additional administrative features and prepare for inclusion into WREdit	Feb 2015	Mar 2015	Prepare data for inclusion into WREdit
4G	Implement Functionality into Base Layers Function	Apr 2015	May 2015	Program changes to WREdit
5	Develop & enhance WSB data web-based services	Nov 2014	Nov 2015	Improve the WSB website and data sharing capacities
5A	Discuss which/how tabular data from WSB DB App will be communicated online	Nov 2014	Nov 2014	Discuss the vision for the new website and web-services
5B	Discuss the look and function of an enhanced WSB website	Nov 2014	Nov 2014	Establish the vision for the new look of the WSB website
5C	Develop a new version of the WSB website featuring data display functionality	Dec 2014	Feb 2015	Develop an improved WSB website that can easily display and sort tabular data
5D	Develop web service to pull data from WSB DB app and push it to the Bank website	Dec 2014	Feb 2015	Program scripts to pull data from “dummy” tables (step 3C)
5E	Demonstrate the functionality of the tabular data push/pull automation services on the new Bank website	Mar 2015	Mar 2015	Demonstrate new website and data communication services
5F	Request changes to the website and tabular data push/pull service	Mar 2015	Mar 2015	Issue change order
5G	Program changes to the Bank website and the push/pull/display of tabular data and/or web-services	Apr 2015	May 2015	Program changes
5H	Demonstrate a confirmed stable version of the new WSB website with	Jun 2015	Jun 2015	Ready website and web services for launch

	data push/pull/display services			
5I	Develop a web lease/rental search tool to query against WSB DB App tabular data	Jul 2015	Sept 2015	Enable easy filtering of tabular data via website to identify rights that are leased in and rentable
5J	Test the web lease/rental search tool to ensure functionality	Sept 2015	Sept 2015	Demonstrate functional version of the enhanced website search function
5K	Request changes to the web search tool	Sept 2015	Sept 2015	Issue change order
5L	Implement changes and program development version of the website transaction search tool	Oct 2015	Nov 2015	Program final changes to development version
5M	Complete development and prepare search tool for roll out	Nov 2015	Nov 2015	Ready search tool for launch with Bank website
6	Update IDWR's web-based mapping tool with active lease and rental data from the WSB database	Nov 2014	Nov 2015	WSB data on active leases and rentals can be displayed in IDWR's internet mapping tool
6A	Discuss how to display WSB transactions points/shapes in the internet mapping application	Dec 2014	Dec 2014	Establish method for acquiring and displaying active lease and rental data from loc tables
6B	Implement a plan to display WSB transaction data on IDWR's wesbite mapping application	Dec 2014	Dec 2014	Establish a project development plan
6C	Develop web-based maps that include WSB transaction data	Jan 2015	Mar 2015	Develop a prototype version of the online mapping tool that incorporates Bank data
6D	Test web-based maps for WSB data visualization functionality	Apr 2015	April 2015	Demonstrate an interactive map that displays Bank data
6E	Request changes for integration of WSB data into web-based maps	Apr 2015	Apr 2015	Issue change order
6F	Incorporate changes and prepare to launch map service that displays Bank data	May 2015	Jul 2015	Prepare for launch of new system
7	Improve IDWR's Information Search ('Infosearch') workflow application	Nov 2014	Nov 2015	Incorporate the ability to directly query WSB database data from Information Search
7A	Discuss the vision for implementing	Dec 2014	Dec 2014	Establish project

	changes to Information Search and prepare a development plan			development plan
7B	Add WSB application and WSB transaction queries to Infosearch query types	Jan 2015	Feb 2015	Program changes to Information search and begin queries against "dummy" tables
7C	Demonstrate the ability to query WSB DB App tabular data from Infosearch	Mar 2015	Mar 2015	Demonstrate enhanced version of information search
7D	Issue change requests for programming of Information Search	Mar 2015	Mar 2015	Issue change order
7E	Incorporate changes and prepare updated version of Information Search for roll out to IDWR network	Apr 2015	Jun 2015	Updated Information Search tool that can directly query the WSB database

Transitioning from stage one to two will require the following:

1. Activating the new version of the IDWR Application Review Workflow Program with WSB functionality,
2. Rolling out the WSB Database workflow application to the IDWR network
3. Activating new WREdit functionality in ArcMap,
4. Handing off program development reporting and documentation to IDWR

Phase Three

Step	Task / Action	Start Date	End Date	End Objective / Deliverable
1	Ensure WSB DB App database table architecture is fully developed and functional	Dec 2015	Dec 2015	Ensure the database app is fully operational
2	Probe and assess the functionality of the beta WSB DB App through transaction data entry/review	Dec 2015	Feb 2016	Stress test the database program to identify bugs and glitches
3	Identify major shortcomings and software glitches associated with WSB DB App	Feb 2016	Feb 2016	Issue change order request
4	Implement changes and debugging of the WSB DB App	Mar 2016	Mar 2016	Improved glitches with WSB DB app
5	Evaluate debug version of DB App	Apr 2016	Apr 2016	Ensure DB app is operational
6	Begin data entry of all lease and rental	Apr2016		Begin shift to new database

	applications into the new system			system
7	Stress test integration of beta WSB DB App w/ Infosearch capabilities	Dec 2015	Jan 2016	Identify glitches in integration of DB workflow app with Infosearch
8	Request changes and debugging of the Infosearch workflow app	Jan 2016	Jan 2016	Issue change order request
9	Incorporate program improvements to Infosearch program	Feb 2016	Feb 2016	Improve Infosearch tool
10	Test integration of beta WSB DB App w/ ArcMap launch capabilities	Dec 2015	Dec 2015	Ensure WSB DB app is integrated with ArcMap and can display transaction data
11	Test integration of beta WSB DB App w/ ArcMap WREdit functionality	Dec 2015	Feb 2016	Identify glitches in linking GIS data to WSB database data
12	Issue change orders for WREdit programming to improve functionality	Feb 2016	Feb 2016	Issue change order
13	Activate a protected website to test data display of WSB DB App tabular data	Feb 2016	May 2016	Ensure data pushed to website is accurate and functional
14	Test functionality of web services by confirming tabular data can be pushed/pulled	Feb 2015	Feb 2016	Ensure tabular data is being pulled from the database and pushed to the web
15	Test web-based WSB transaction query capabilities through secure website	Mar 2016	Mar 2016	Ensure lease and rental data can be filtered and queried through website
16	Identify major shortcomings of web-service to display web-based WSB tabular data	Apr 2016	Apr 2016	Issue change order for web services programming
17	Test the changed and debugged version of the WSB website to confirm it is stable	May 2016	May 2016	Ensure website is ready to go live
18	Confirm WSB DB App is stable and ready for launch	May 2016	May 2016	Ready platform for launch

Transitioning from stage three to four will require the following:

1. Completing debugging of all WSB IT components

Phase Four

Step	Task / Action	Start Date	End Date	End Objective / Deliverable

Water Supply Bank Computer Infrastructure Development Plan

1	Launch the new WSB database application	Jun 2016	Jun 2016	Launch of the new WSB database application
2	Officially launch the new WREdit ArcMap service with WSB functionality	Jun 2016	Jun 2016	Launch of the new WREdit service for IDWR staff
3	Officially launch the new Infosearch tool with WSB querying capabilities	Jun 2016	Jun 2016	Launch of the improved Infosearch tool for IDWR staff
4	Officially launch the new WSB website with enhanced functionality	Jun 2016	Jun 2016	Launch of the new WSB website for staff and the public
5	Import and/or manually enter all WSB transaction data into the WSB DB App	Jun 2016	Nov 2016	Have all available WSB transaction data copied to new database system
6	Archive old WSB database for future storage and recall	Nov 2016	Nov 2016	Archive old WSB data/system
7	Complete technical reports and project documentation	Jun 2016	Nov 2016	Finish reports
8	Conclude IDWR Application Review Workflow program development project	Jun 2016	Nov 2016	Wrap-up
9	Conclude WSB database application development project	Jun 2016	Nov 2016	Wrap-up
10	Conclude WREdit enhancement development project	Jun 2016	Nov 2016	Wrap-up
11	Conclude WSB web services and website development project	Jun 2016	Nov 2016	Wrap-up
12	Conclude IDWR internet map service development project	Jun 2016	Nov 2016	Wrap-up
13	Conclude IDWR Information Search update development project	Jun 2016	Nov 2016	Wrap-up
14	Wrap-up WSB IT Platform Development Project	Nov 2016	Nov 2016	Wrap-up

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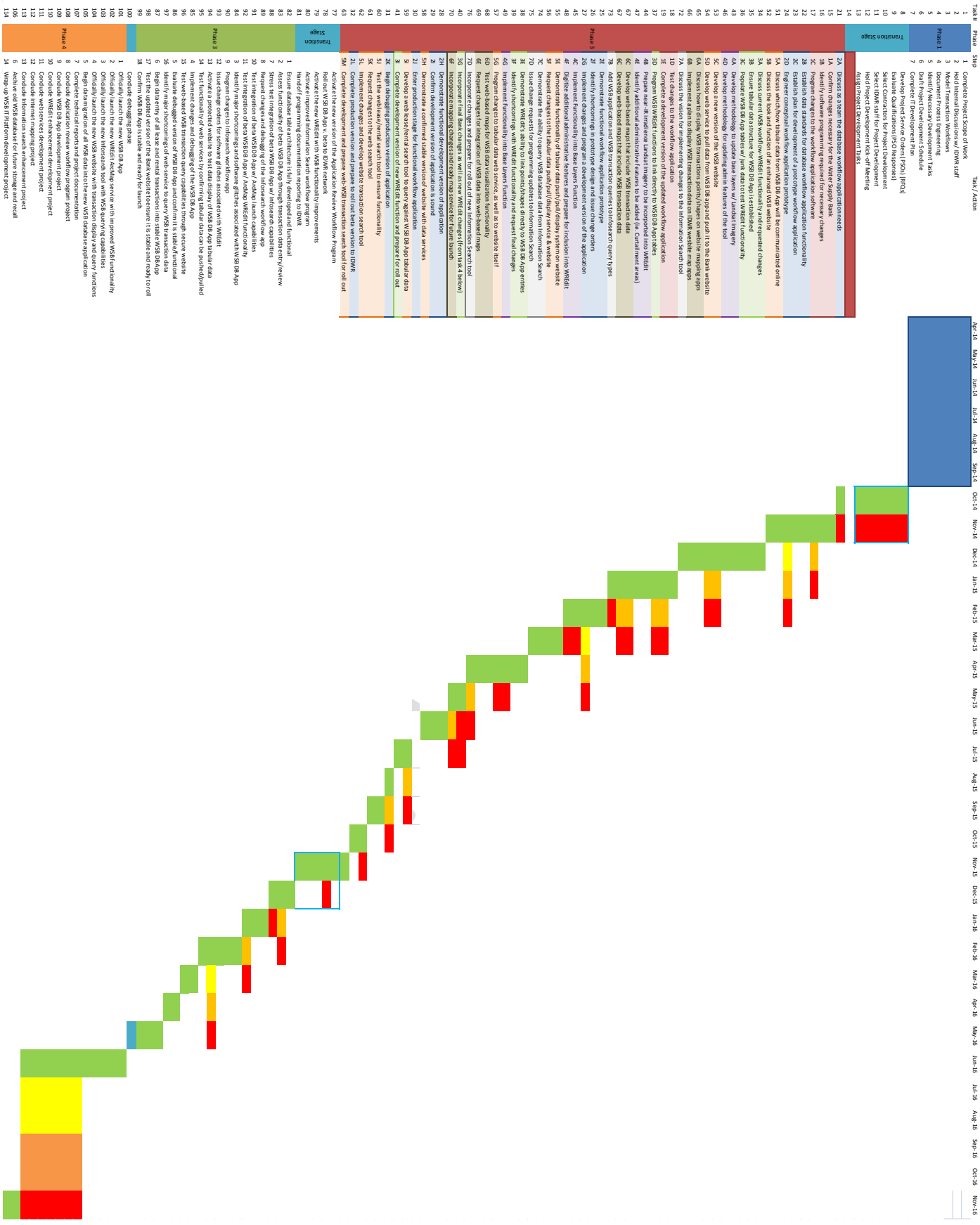
Water Supply Bank Computer Infrastructure Development Plan

Work Breakdown Schedule



Progress Tracking and Reporting

The successful completion and implementation of the individual IT platform components, as well as the IT platform as a whole, requires that synchronized progress is made on all development tasks. As development begins in phase two, the Water Supply Bank Coordinator will receive weekly updates from development teams and the coordinator will produce a monthly progress tracking report for the platform development project at large. Monthly progress tracking reports will identify objectives achieved, deliverables completed and note 'on track', 'behind schedule' or 'accelerated' tasks.

Project development stakeholders, such as the Idaho Water Resource Board, Idaho Department of Water Resources staff, members of the development teams and other involved parties will be kept informed on progress developments through access to monthly reports and through information communicated by the WSB Coordinator. The WSB Coordinator will be responsible for informing all key stakeholders if complications arise that may have unintended impacts on project development.

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Memorandum

To: Idaho Water Resource Board

From: Remington Buyer

Date: November 2, 2016

Re: Water Supply Bank ground water management policy for the Wood River Valley

Action Items: The Board may approve by resolution a renewal of the Wood River Valley interim ground water management policy for the Water Supply Bank and commit to crafting a new, long-term ground water management policy during calendar year 2017.

In recent years, the Water Supply Bank has been authorized by the Idaho Water Resource Board (Board) to regulate the movement of ground water right rental requests in the Wood River Valley pursuant to an interim ground water management policy. The policy seeks to balance the need to avoid injury via rentals, while simultaneously expediting rental request processing where possible, through restricting the movement of rentable ground water rights to within six zones. Modeling of ground water rental requests is only required if an application proposes to rent ground water across zone boundaries.

The interim management policy was implemented as a temporary measure, with the intent that the policy would only be in effect until such time as the Department of Water Resources (IDWR) issued a formal ground water management policy for the valley. When the interim policy was first implemented, IDWR was concluding collaborative work with the US Geological Survey (USGS) to develop a ground water model for the Wood River Valley. The Board authorized the interim ground water rental policy with the knowledge that the ground water model might be used at a future date to regulate the movement of ground water rights.

Development of the USGS-IDWR ground water model is now complete and the model is available for public use. However, no formal ground water management policy has yet been issued for the Wood River Valley, based on the Wood River Valley ground water model. Because the interim ground water management policy was intended to be a stop-gap measure, to be in place only until such time as the ground water model was available for use, and because the model is now available for public use, the time has come for the Board to contemplate sunsetting the interim policy so that it can be replaced with a more lasting ground water management policy for the Water Supply Bank based on the best available scientific information, which may be generated by the Wood River Valley ground water model.

The Board and its representatives are thus called upon to work IDWR staff, as well as regional Wood River Valley water users and their representatives, to evaluate the results of water rental scenarios run through the new ground water model. The use of the model and its results should be used to develop a logical, lasting, regional ground water management policy for the Water Supply Bank. Public engagement with local water users should be part of the policy making process. A series of Water Supply Bank Subcommittee meetings are recommended to be held during spring and summer 2017, to allow for public engagement and input in the modeling evaluation and policy making process.

However, until such time as the formal policy is established, the interim ground water rental policy should remain in effect, to allow for continuity of ground water rentals in the Wood River Valley during calendar year 2017. As such, the Board is called upon to approve a resolution that both authorizes a renewal of the interim ground water rental policy concurrent with a commitment to hold Water Supply Bank Subcommittee meetings during 2017, so that a long-term, ground water rental policy will be crafted for the Water Supply Bank in the Wood River Valley, prior to the end of calendar year 2017.

A draft version of the resolution is provided for consideration by the Board, along with a copy of interim ground water management policy, which is currently in effect until December 31, 2016.

BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF RENEWING AN INTERIM GROUND WATER RENTAL POLICY AND ESTABLISHING A LONG-TERM GROUND WATER RENTAL POLICY FOR THE WATER SUPPLY BANK IN THE WOOD RIVER VALLEY	)))))))	A RESOLUTION PERTAINING TO ADMINISTRATIVE POLICY OF THE WATER SUPPLY BANK

WHEREAS, section 42-1761, Idaho Code provides that the Idaho Water Resource Board shall have the duty of operating a Water Supply Bank; and

WHEREAS, section 42-1762, Idaho Code provides that the Idaho Water Resource Board shall adopt rules and regulations governing the management, control, delivery and use and distribution of water to and from the Water Supply Bank; and

WHEREAS, the Idaho Water Resource Board authorized the Water Supply Bank to implement a temporary ground water right rental policy in the Wood River Valley, to facilitate efficient administration of ground water rentals while the Department of Water Resources concluded work on a ground water model for the Wood River Valley; and

WHEREAS, development of the ground water model is now concluded but no formal policy has yet been issued regarding the use of the model and administration of rental requests for ground water rights in the Wood River Valley; and

WHEREAS, the Idaho Water Resources Board may now use the ground water model to identify impacts to water rights caused by the rental of Wood River Valley ground water rights from the Water Supply Bank; and

WHEREAS, the Idaho Water Resource Board may evaluate and utilize the results of modeled ground water rental scenarios to develop a long-term, ground water right rental policy for the Water Supply Bank in the Wood River Valley; and

WHEREAS, a series of Water Supply Bank Subcommittee meetings is the recommended forum in which modeled rental scenarios should be discussed as policy is crafted; and

WHEREAS, Wood River Valley water users should have the opportunity to engage the Board and its representatives in the policy making process, by attending and providing public comments at Water Supply Bank Committee meetings; and

WHEREAS, Wood River Valley water users would also benefit from the continuance of the interim rental policy for an additional year, while a new, long-term policy is crafted and enacted by the Idaho Water Resource Board;

NOW THEREFORE BE IT RESOLVED, that the Idaho Water Resource Board commits to holding a series Water Supply Bank Subcommittee meetings during calendar year 2017, in which Committee members, IDWR staff and interested members of the public will evaluate the modeled impacts of Wood River Valley ground water rental scenarios, and from which a long-term ground water rental policy will be established for the Water Supply Bank in the Wood River Valley; and

NOW THEREFORE BE IT FURTHER RESOLVED, that the Idaho Water Resource Board authorizes a renewal of the interim ground water rental policy, to be in effect until such time as the Idaho Water Resource Board formally authorizes and establishes a new, long-term policy to guide administration of Water Supply Bank ground water right rental requests within the Wood River Valley.

Dated this _____ day of November, 2016.

_____
ROGER W. CHASE
Idaho Water Resource Board Chairman

Attest: _____
VINCE ALBERDI
Secretary

State of Idaho
DEPARTMENT OF WATER RESOURCES
322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098
Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

10/16/2015

RE: Water Supply Bank Interim Ground Water Rental Policy for the Wood River Valley

The surface and ground waters of the Big Wood River drainage are interconnected and diversions of ground water from wells can deplete the surface water flow in streams and rivers. Wood River Valley water users can be injured if Water Supply Bank rentals authorize ground water pumping that in turn causes extended depletions of the Big Wood River. To protect prior appropriators in the Wood River Valley while simultaneously ensuring efficient operation of the Water Supply Bank, the Idaho Water Resource Board (IWRB) has approved a temporary ground water rental policy for the Water Supply Bank (Bank) in the Wood River Valley.

The interim ground water rental policy establishes a safe distance within which all ground water rental requests can be considered and it creates six ground water transaction zones to guide how the Water Supply Bank can process all other rental requests. The IWRB originally authorized the interim ground water rental policy for the Wood River Valley on January 23, 2015 and the policy was reauthorized by the IWRB September 18th, 2015. The interim policy is in effect until December 31, 2016.

The Water Supply Bank considers that where a point of diversion for a ground water rental request is equal to or less than 657 feet (200 meters) from a point of diversion for a water right leased to the Water Supply Bank, diversions of ground water from both the lease and the rental points of diversion will be similar. Therefore, subject to standard rental review procedures, all requests can be accepted where a rental of water is less than 657 feet from the original (leased) point of diversion.

Additionally, the Water Supply Bank accepts that impacts to surface and ground water resources caused by ground water pumping can be significantly limited and constrained if ground water pumping is restricted to specific areas or transaction zones. Under this interim ground water rental policy, when a point of diversion for a leased right and the point of diversion for a rental request are both found within the same transaction zone, the Bank will not necessarily require any additional information to accept and review the rental request. Subject to standard rental review procedures, the Bank may approve rental requests where the lease and rental points of diversion occur within the same transaction zone.

When the distance between the points of diversion for a leased right and a rental request is more than 657 feet however, and when such a request seeks to rent ground water from a well that is located in a different zone than that in which a leased water right is located, the Bank requires that a stream depletion analysis or a ground water impact analysis be submitted with the rental request. If the results of a stream depletion or ground water impact analysis reveal that a rental will cause surface water depletions within a zone that are larger than accretions to surface water within the zone (occurring through the lease into the Bank of the water right being rented) than mitigation is required to offset the impacts of the rental. Additionally, if a request is made to rent a water right across a transaction zone up gradient of the original location of the leased right, or into the River Zone, to within one hundred feet of the Big Wood River (or a major tributary), such rentals need to demonstrate that the timing, magnitude and location of impacts to surface water does not result in injury to the IWRB's minimum streamflow water rights, else the rental may be subject to curtailment once the minimum stream flow of the Big Wood River is not being satisfied

Wood River Valley Transaction Zones

This interim ground water rental policy delineates the Wood River aquifer into the following zones:

1) The Ketchum Zone,
2) The Hailey Zone,
3) The Bellevue Zone,
4 A) River Zone, northern reach (within the Ketchum Zone),
4 B) River Zone, central reach (within the Hailey Zone),
4 C) River Zone, southern reach (within the Bellevue Zone),
5) The Eastern Bellevue Triangle Zone, and
6) The Western Bellevue Triangle Zone.

The Ketchum Zone covers all ground water rights located north of the point of diversion for the Hiawatha Canal (effectively the intersection of Highway 75 and Ohio Gulch Road) and outside the 200 foot wide Northern River Zone. The Ketchum Zone includes all northern tributary valleys for the Big Wood River including Eagle Creek, East Fork, Greenhorn Creek, Lake Creek, Trail Creek and Warm Springs Creek. Stream depletion analyses may not be necessary for ground water rental requests that both originate (are leased) from and are satisfied within this zone, though all rental requests remain subject to standard rental review procedures to guard against injury and enlargement of water use.

The Hailey Zone covers all ground water points of diversion south of the Ketchum Zone, outside the Central River Zone and north of the point of diversion for the Irrigation District #45 Bellevue Canal. The Hailey Zone extends to all central tributaries of the Big Wood River including Croy Creek, Deer Creek, Indian Creek and Quigley Creek. Stream depletion analyses may not be necessary for ground water rental requests that both originate from and are satisfied within this zone, though rental requests remain subject to standard rental review procedures to guard against injury and enlargement of water use.

The Bellevue Zone extends from the southern end of the Hailey Zone to the point of diversion for the Bypass Canal (effectively Glendale Road) and includes all ground water points of diversion tributary to Seaman's Creek/Muldoon Canyon, but not ground water rights within the Southern River Zone. Stream depletion analyses may not be required for ground water rental requests that both originate from and are satisfied within this zone though rental requests remain subject to standard rental review procedures to guard against injury and enlargement of water use.

The River Zone is a two hundred foot wide buffering of the Big Wood River, from the northern end of the Ketchum Zone, to the Bypass Canal at the southern end of the Bellevue Zone. The River Zone includes major surface water tributaries of the Big Wood River, including Croy Creek, Deer Creek, East Fork, Trail Creek and Warm Springs Creek. The zone is segmented into a northern reach, a central reach and a southern reach, corresponding to the extent of the boundaries of the Ketchum, Hailey and Bellevue Zones. Due to the direct and immediate connection between surface and ground water within this two hundred foot wide River Zone, no stream depletion analysis is required for rentals within the zone because all ground water pumping within the zone is expected to have a direct and immediate impact on surface water resources. All ground water rentals within any of the three reaches of the zone should be satisfied by ground water rights that are leased into the Bank from within the same reach of the River Zone. Ground water users may also request to rent surface water rights.

The final two zones cover the western and eastern halves of the confined and unconfined aquifers of the Bellevue triangle. Ground water in the western half of the triangle is hydraulically connected to surface water flowing west into the Big Wood River while eastern ground water flows east into Silver Creek and the Little Wood River. The two zones correspond roughly to all lands east and west of Kingsbury Lane. No stream depletion analyses or ground water impact analyses are required for ground water to ground water rental requests that both originate from and are satisfied within a zone, though rental requests remain subject to standard rental review procedures to guard against injury and enlargement of water use. A Theis ground water analysis is required for all cross-zone rentals in the Bellevue Triangle.

For reference, a map of the rental transaction zones is provided in Figure 1, and detailed cross sections of the zone transitions is provided in Figures 2-4.

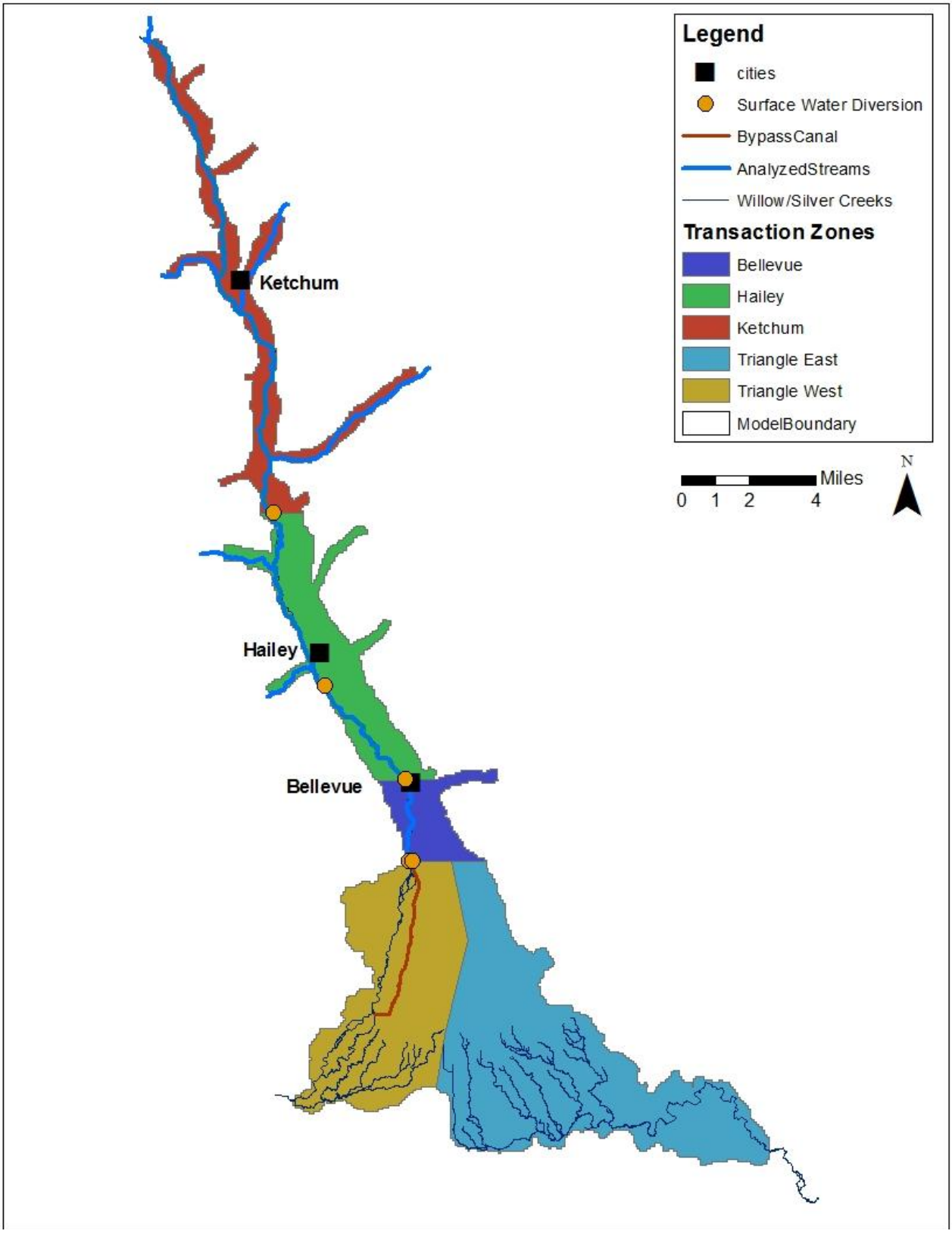

Figure 1. Map of the Water Supply Bank Transaction Zones within the Wood River Valley

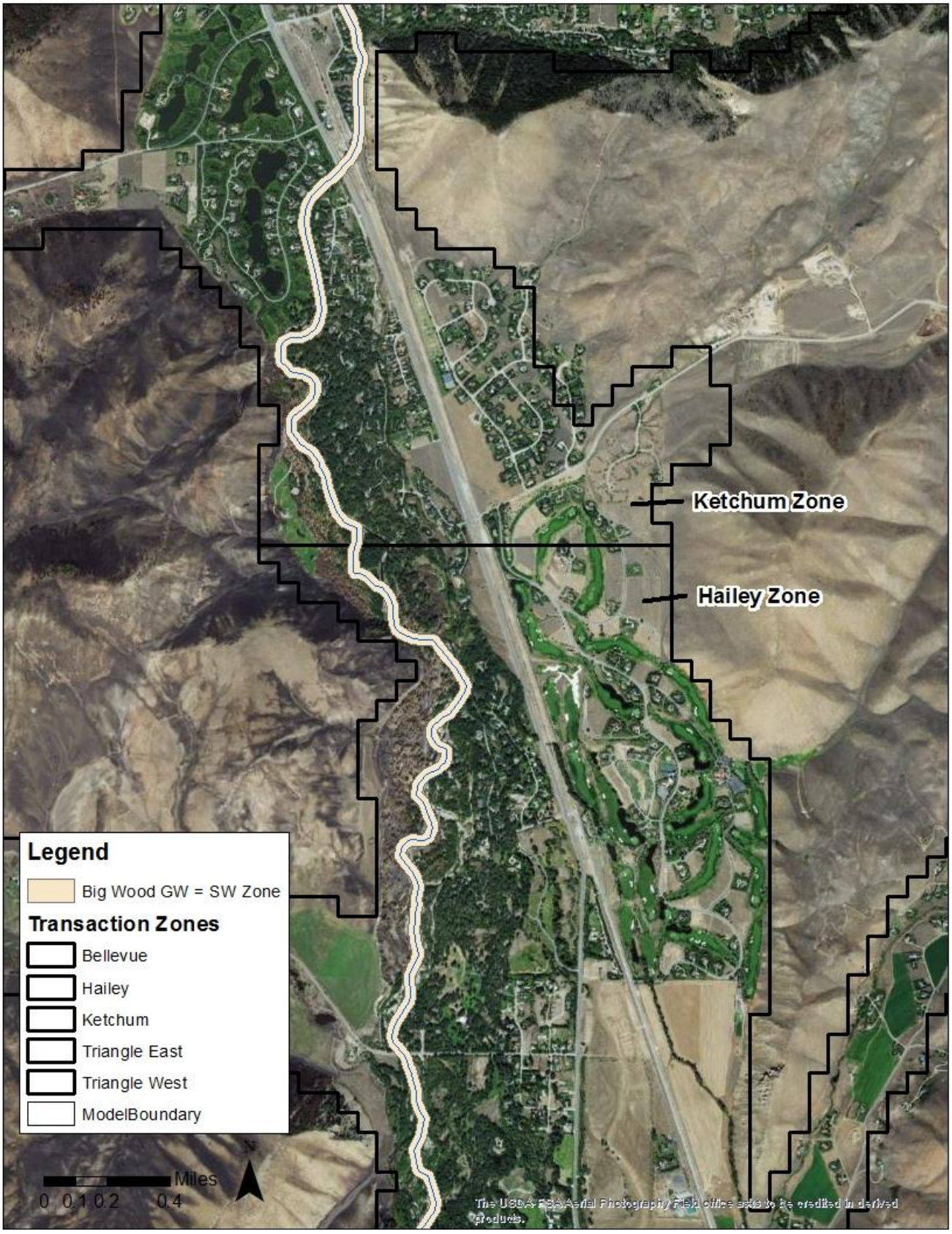

Figure 2. Transition between the Ketchum and Hailey Zones

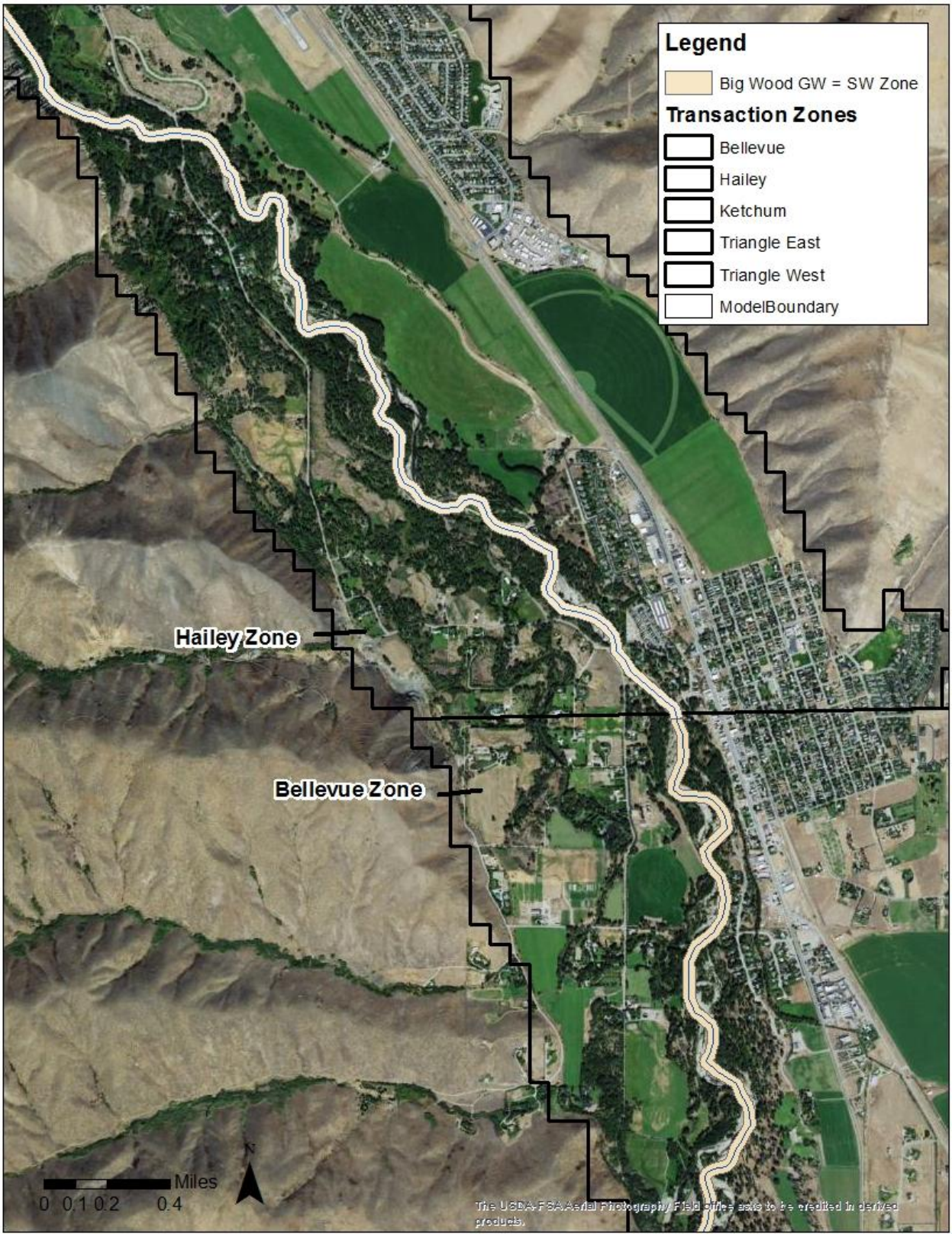

Figure 3. Transition between the Hailey and Bellevue Zones

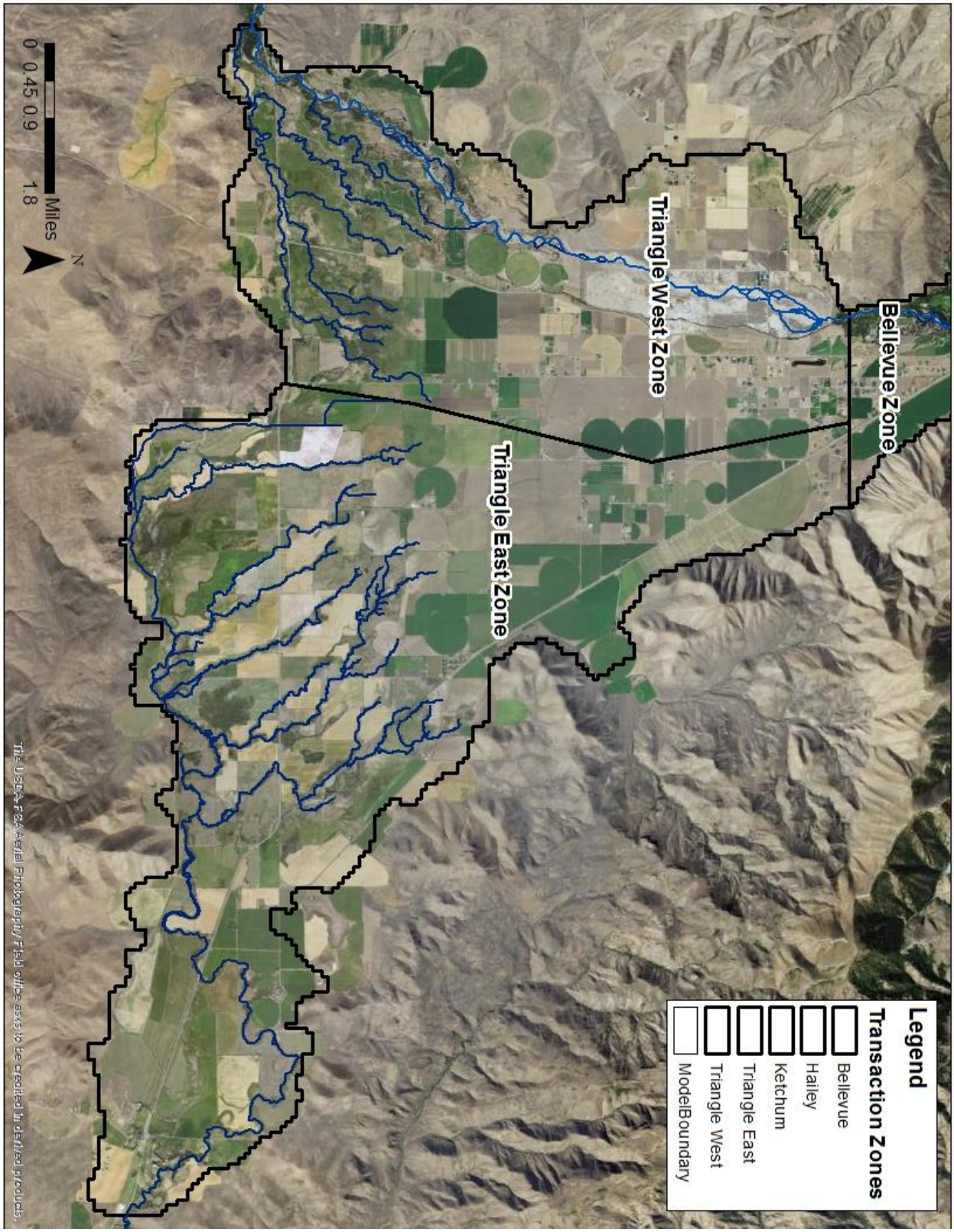

Figure 4. Transition between the Bellevue and Triangle Zones

Supplemental Impact Analyses for Cross-Zone Rental Transactions

Rental requests that both originate from and are satisfied within a transaction zone are not required to submit additional information with their rental application, however where a rental request is located further than 657 feet from a point of diversion of the leased water right sought for rent, such proposals may be required to conduct a stream depletion analysis and/or ground water impact analysis supplemental to the standard rental application. IDWR may request stream depletion analyses for intra-zone rentals if a review of water modeling data is necessary to ensure no injury occurs through a rental.

Stream depletion analyses are required for all cross-boundary rental requests within the River, Ketchum, Hailey or Bellevue Zones whereas a Theis ground water impact analysis should be submitted for cross-boundary ground water rental requests in the Bellevue Triangle. Where stream depletion or Theis ground water impact analyses indicate that a ground water rental will deplete surface and/or ground water in excess of any water accreted to the zone through a Water Supply Bank lease, mitigation may be required to ensure no injury is permitted against other water users. The Water Supply Bank will consider all stream depletion and Theis ground water impact analyses to advise rental applicants on whether mitigation is necessary. Applicants may also consult the decision matrix at the end of this information package to determine whether mitigation of their rental is likely to be required.

The type of stream depletion analysis submitted for a cross-zone rental request is to the discretion of the applicant however the Water Supply Bank can expedite processing of stream depletion analyses conducted using the Alluvial Water Accounting System (AWAS), which is free software available from Colorado State University at: http://www.ids.colostate.edu/projects.php?project=awas/awas.html.

The following may assist rental applicants utilizing AWAS to complete a cross-zone stream depletion analysis:

Start by selecting **new IDS (modified)** under the file menu to begin your modeling. Use **Year Type:** ***Calendar*** and **Time Scale:** ***Days*** or ***Months*** with the starting year and the ending year corresponding to the starting year of the rental request and ending year being the year following the final year of the rental request. In the initial screen (**Input)** click **New Well** twice, once to model the ground water point(s) of diversion for the leased water right being rented, and once to model the point(s) of diversion being utilized for the rental request. If multiple ground water rights are being rented to satisfy a single rental, multiple wells should be modeled.

The **Well Name** can be set as the water right being rented (for the leased right) and the renter's name for the rental point of diversion. **Type** should be set to ***Recharge*** for the leased right and ***Irrigation*** for the rental site. The aquifer **Boundary Condition** should be set to ***Alluvial Aquifer*** for both wells. The **W (Feet)** field should be populated with the linear distance (measured in feet) from the model boundary to the Big Wood River (or major tributary being modeled) at the location of the lease or the rental, while the **X (Feet)** field should be populated with the linear distance between the lease/rental points of diversion and the Big Wood River (or major tributary). The **Transmissivity (GPD/FT)** value may be ascertained by referencing the map in Figure 5, selecting a value between the minimum and maximum values of the corresponding color ramp, and multiplying the value by 7.48 to convert from feet/day to gallons/day. For applicants that have access to geographic information systems, GIS raster and spatial data can be downloaded from IDWR's website. **Specific Yield** should be set as 0.20 while **Show in Output** should be checked and **Use Partial Stream** should not be checked.

For the leased water right being rented, the radio button selection should be left as ***Recharge*** and the daily (or monthly) acre foot amounts can be populated by calculating the total acre foot volume of water available to be rented, divided by the total number of season of use days (or months) authorized by the water right. Similarly, the rental radio button should be left as ***Consumptive Use*** and daily or monthly acre-foot volumes should be populated based on the total intended rental volume, divided by the days or months of the intended season of use. **Run Start:** should be left as ***Jan year one*** to ***year two*** and the box should be checked for **Ignore pumping/recharge after:** ***Dec year one***.

Examples of model inputs are provided in Figures 6 and 7.

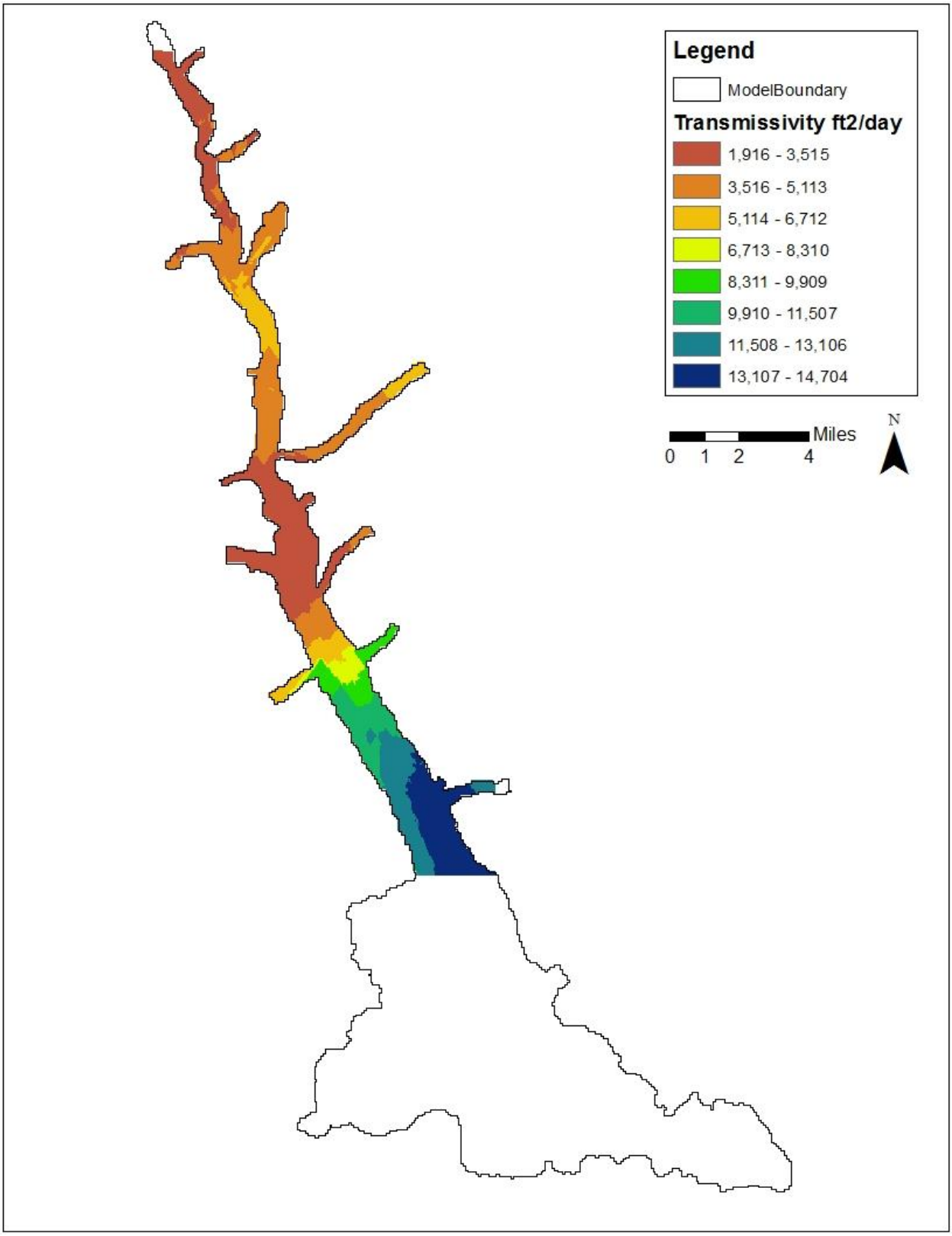

Figure 5. Transmissivity ratings for the Wood River Valley
This map models the speed of ground water movement through the Wood River Valley aquifer.

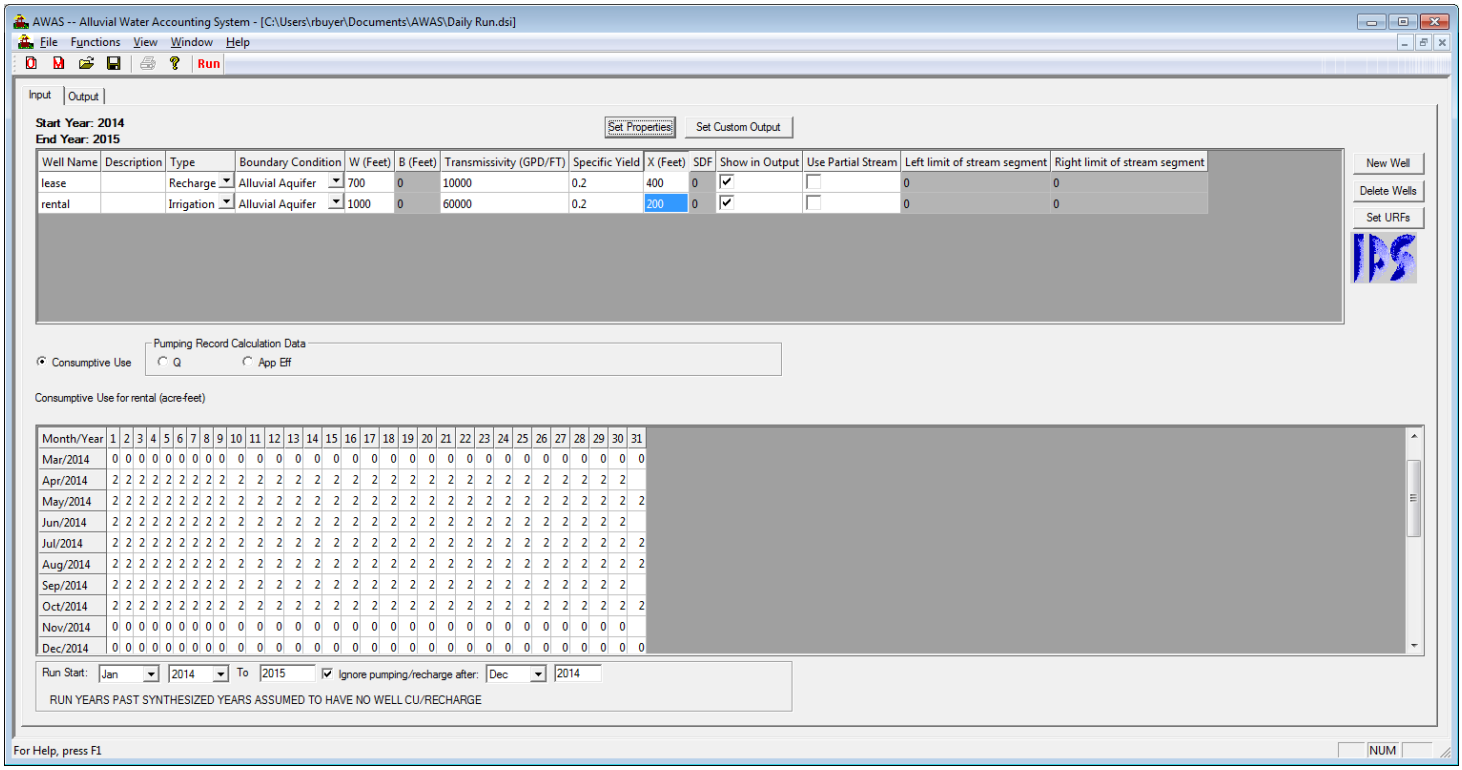

Figure 6. Daily Inputs

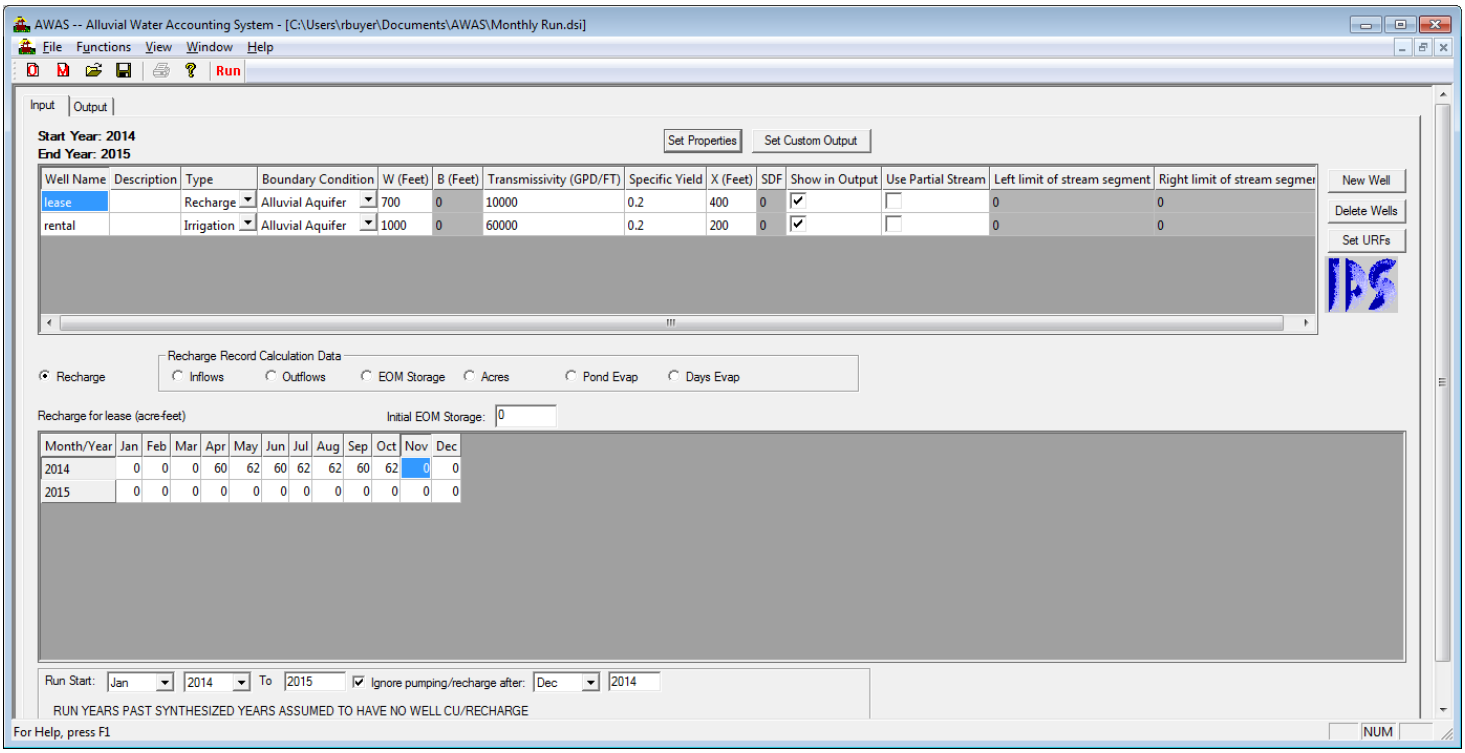

Figure 7. Monthly Inputs

Once all inputs are completed, the red ***Run*** button can be clicked. The **Net Impact on Stream** results for all rental years should be selected, and the scale should be set to Daily if such results have been modeled. A screen shot of the model results can be printed, or a printout of the model results printed from Excel is possible if the ***Export Open in Excel*** is selected under **Display Options**.

See Figure 8 for an example of the outputs of a model run.

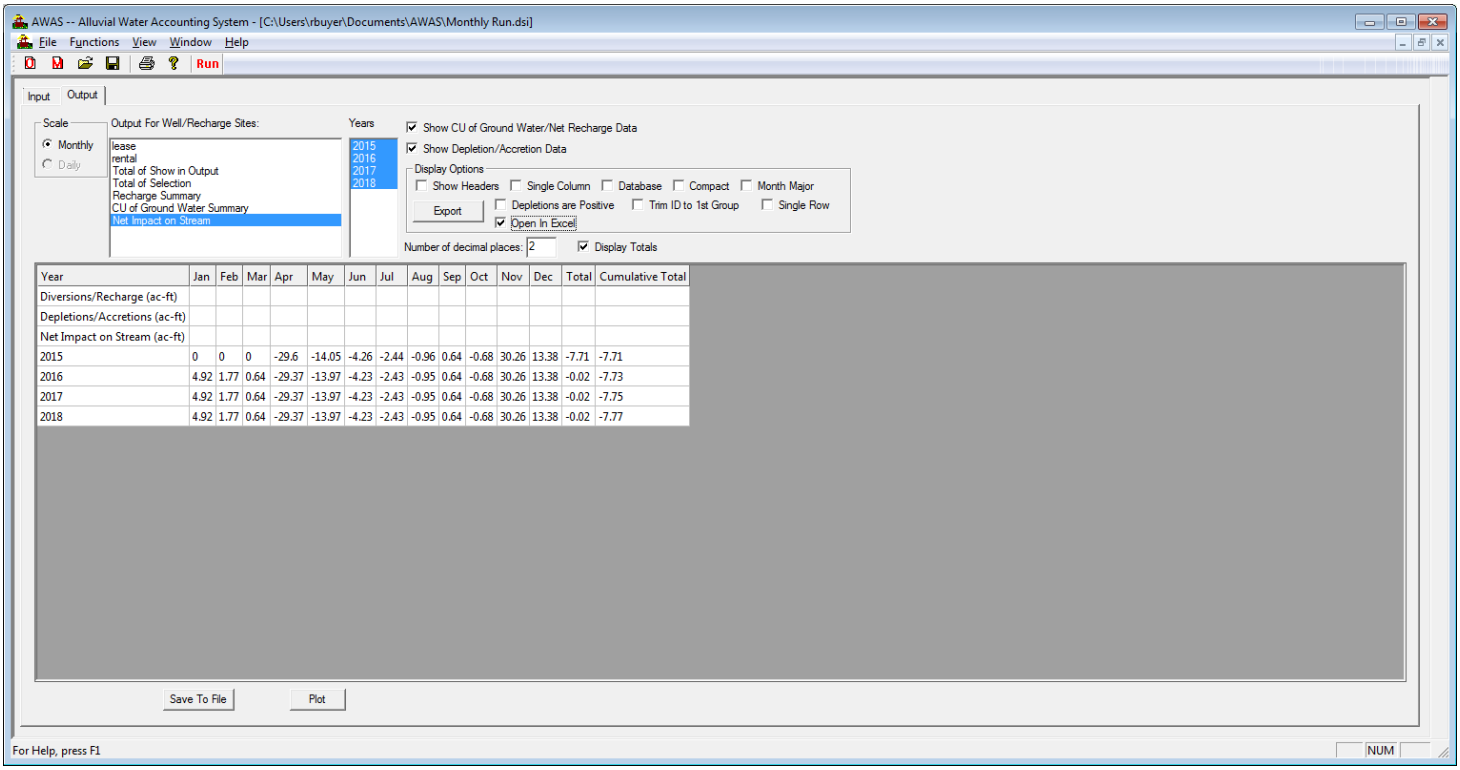

Figure 8. AWAS Model Outputs

For rental requests that seek to rent ground water rights across zones within the Bellevue Triangle, a Theis ground water impact analysis should be conducted. The Department of Water Resources is currently working on guidance that can be made available on how to complete a Theis analysis in the triangle. Any water users intending to submit a cross-zone rental request in the triangle can contact the Department for information on how they might complete a Theis analysis.

Mitigating the Impacts of Ground Water Rentals Causing Excessive Surface Water Depletions

For the Ketchum, Hailey, Bellevue and River Zones, injury shall be evaluated based on the monthly net change in surface water depletions of the Big Wood River (or major tributaries) that occur during the rental season of use within the reach of the River Zone where the rental is occurring. For example, the measurement of injury for a ground water rental located within the Ketchum Zone is measured based on the net change in depletions to the northern reach of the Big Wood River. To ensure no injury occurs under such a scenario, the sum of all monthly depletions of the northern reach of the Big Wood River (caused by the rental) must be equal to or less than all monthly accretions to the northern reach of Big Wood River (that stem from the water right being leased).

If accretions to the river are greater than depletions from the river, no mitigation is necessary. However, if depletions of the river within the reach of the rental zone are greater than accretions to the river within the zone, additional surface or ground water rights must be rented to offset injurious depletions of surface water within the reach. If no additional water rights are available to offset the rental, the rental should be reduced so that depletions do not exceed accretions. If a rental cannot be reduced to avoid injurious impacts, such a rental may not be approved, or it may be approved as subordinated to the IWRB's minimum streamflow water rights.

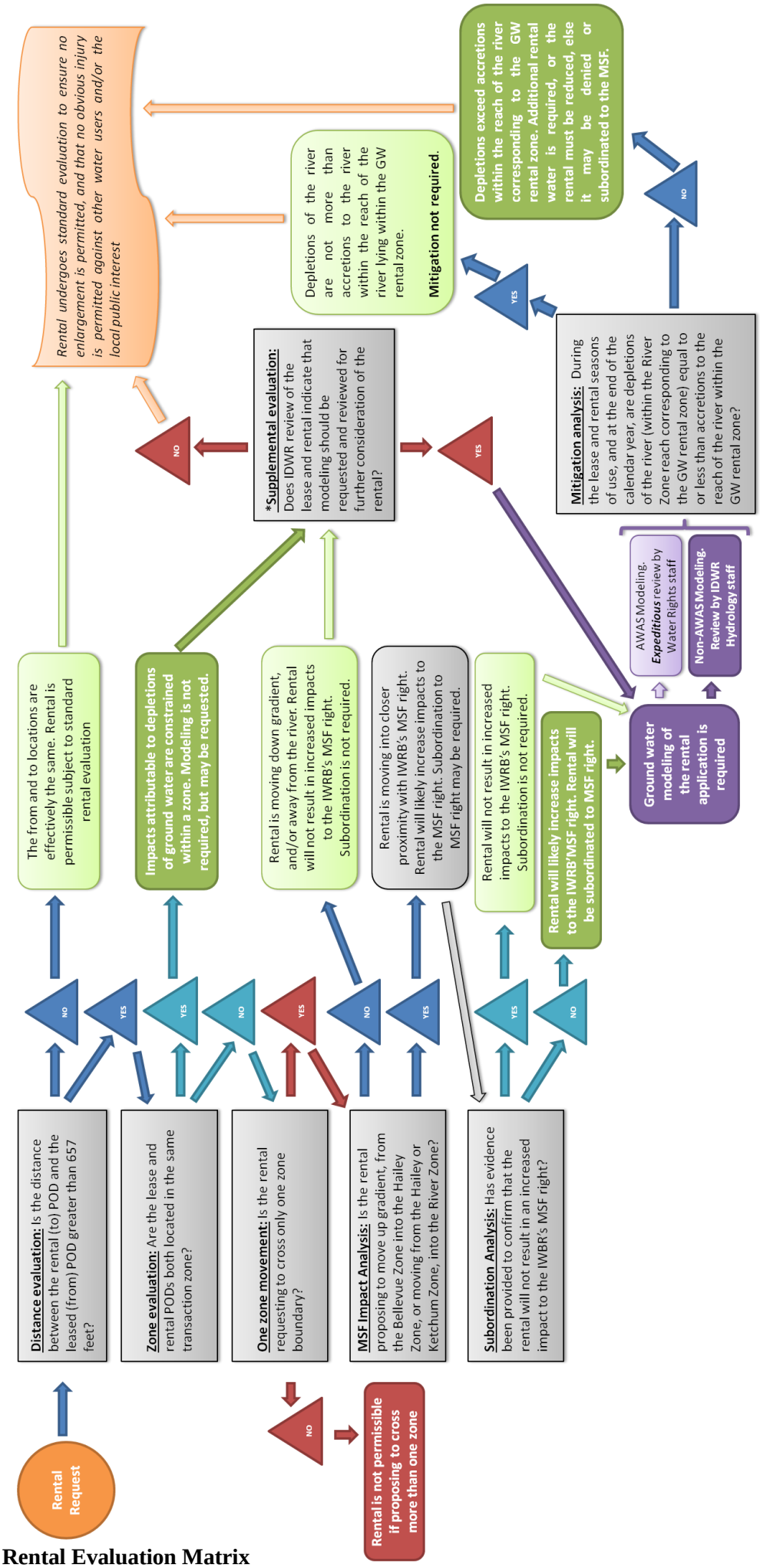

Figure 9. Rental Evaluation Matrix

Minimum Stream Flow Subordination

Ground water rental requests cannot result in increased depletions to Big Wood River within the reach of the river where the Idaho Water Resource Board (IWRB) holds minimum stream flow (MSF) water rights (from Ketchum, south to the District #45 Canal in Bellevue). If a ground water rental request proposes to move upgradient from the Bellevue Zone into the Hailey Zone, it is expected to have a greater impact on the minimum stream flow reach of the Big Wood River. Similarly, if a ground water rental request proposes to move from outside the River Zone into the River Zone, such a move is also expected to result in increased depletions to the surface waters within the minimum stream flow reach of the river. Such rentals must submit evidence that any depletions to the surface water within this reach will be offset by accretions to the reach through the leased right being rented, else they must rent additional water rights to ensure no injury comes to the IWRB's MSF right. If it is expected that a rental will have an impact on the IWRB's MSF water rights and the rental applicant does not provide evidence to confirm that the rental will not adversely impact the IWRB's MSF water rights, the rental will be subordinated to the MSF.

Additional Information on the Interim Ground Water Rental Policy

The Water Supply Bank has implemented this temporary ground water rental policy to ensure optimal administration of ground water rental requests in the Wood River Valley while the Idaho Department of Water Resources and the US Geological Survey continue to work toward completion and administrative use of a hydrologic ground water model of the Wood River Valley. The Water Supply Bank anticipates that IDWR will issue a directive on ground water transfers within the Wood River Valley once the Wood River Valley model has been completed, tested and approved for use in modeling ground water transfers.

In light of future IDWR policy pertaining to ground water transfers, this interim ground water rental policy has been approved for use until December 31, 2016. All ground water rental requests approved pursuant to this interim policy are only in effect for one year. The Water Supply Bank is monitoring the implementation of the interim ground water rental policy and welcomes public comment on the approach to administering ground water in the Wood River Valley.

Public comments can be sent to:

Remington Buyer
Water Supply Bank Coordinator
(208) 287-4918
remington.buyer@idwr.idaho.gov

MATERIALS MAY BE PROVIDED AT THE

IWRB MEETING

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