Work Plan: Scott Valley Groundwater Basin – Project 1

The primary goal of this project is to complete the necessary work needed to develop a Groundwater Sustainability Plan (GSP) for the Scott Valley Groundwater Basin, that can be utilized to track and manage the basin, and ensure its sustainability into the future. The basin is of great importance to those within and outside of the basin boundaries, and provides vital resources for agricultural, residential, environmental and tribal interests. Groundwater supplies, quality and sustainability are important in the overall health of Siskiyou County, and through the development of the GSP the District intends to secure the groundwater basin over the long-term. Development of this Work Plan was assisted by the University of California, Davis; specifically: Laura Foglia, PhD, Dr. Helen Dahlke, Dr. Thomas Harter and Gus Tolley, PhD student.

Task 1 – Public Outreach and Engagement: The GSA and County staff will engage the public through several different avenues including regular District/GSA meetings, special meetings held within the Scott Valley Groundwater Basin (Basin), outreach letters and emails, opportunities to provide comments, and through utilization off the Scott Valley Basin Advisory Board.

Subtask – Outreach during GSA Development: Public outreach for the Basin SGMA and GSP process has already begun through the GSA establishment process. There were several meetings held throughout Siskiyou County, with several of them occurring within the Basin boundary. These meetings were held to educate the public on SGMA and its requirements, including the District's intent to apply to be the GSA for the Basin. County staff has also included a section on the County's Natural Resources webpage for SGMA related documentation and has created an outreach email list which provides SGMA updates to the public. Other work would include developing a specific webpage or website for SGMA, which would outline the SGMA processes, the Districts ongoing and completed work, public documents, mapping and GIS tools, ways to contact and communicate with the District and County employees and announcements of public meetings/forums.

Deliverables: (1) Resolution establishing the District as the GSA, (2) link to website/webpage, (3) DWR inclusion on outreach list.

Subtask – Public Outreach During GSP Development: Work under this subtask would include organizing and hosting meetings and public outreach events, distributing public notices and documents, creating and maintaining a SGMA website and Facebook page, attending other public meetings to provide SGMA updates at city meetings, irrigation/water district meetings, and other meetings where there is expressed interest, and development of materials to meet public needs.

Deliverable: (1) Document to be included in GSP outlining the completed public outreach efforts.

Subtask – Advisory Committee Development: The Scott Valley Groundwater Advisory Board was developed when UC Davis started collaborating with the UC Extension Office, the County, and water users throughout the Scott Valley to study groundwater conditions, develop a groundwater plan and develop a groundwater model. Work under this task would include utilizing the current advisory board for the GSP development process. County staff will determine if any sector of water use is not being represented by the board, and if there are any vacancies that need to be filled, for which those spots would be filled.

It is anticipated that the advisory committee would meet at least quarterly, with more frequent meetings anticipated during critical planning times and critical GSP development phases. The advisory board will be utilized to provide water user feedback to the District and County staff, will review plan and documentation to determine feasibility and usefulness within the Basin, and will play a large role in assisting in developing a GSP that will benefit the Basin over the long-term and will be acceptable, manageable and useful to the water users within the basin, agriculturally, residentially, and municipally.

Work under this subtask would include outreach and appointment to the advisory board, organizing and hosting advisory board meetings, having a secretary present at every meeting, providing information and documentation to the advisory board, working with the advisory board to review and comment on produced data and documentation, and the general work required by the County to manage and administrate the advisory board.

Deliverables – (1) Resolution outlining formation of advisory board, (2) document outlining appointed members, and (3) advisory board meeting minutes.

Subtask – District Meeting Protocol: The District convenes during every Siskiyou County Board of Supervisors meeting, which allows any official business to be conducted and provides the opportunity for public comment. While it is anticipated that the public may comment during some of these meetings, the District will meet at least quarterly to fully review the GSP development process, convene with the advisory board and solicit public comment. During critical planning and decision phases, more frequent meetings may be required. In addition, County staff and at least one member of the District will host public meetings within the Basin provide opportunities for public involvement for those who are not able to attend Board of Supervisors meetings. Other work would include preparing for and holding District meetings to review and approve plans and documents, provide the public with regular updates, host meetings within Basin boundaries, produce and provide documentation, and have County Counsel and County Administrator review prior to District decisions.

Deliverables – (1) Document outlining finalized meeting protocol, and meeting dates, (2) District meeting minutes, and (3) notice of upcoming meetings.

Task 2 – Data Collection, Development and Management: Activities under Task 2 will include the data collection, compilation and organization needed to outline the information already developed and available, what data gaps need to be filled, and will provide the basis for informing the water budget, water model, and GSP development. Developing a data collection inventory and program is vital to the SGMA and GSP process in the Basin, and will assist in making the most informed and effective decisions. The GSA and County staff will collect data available and produced both within and outside of the County, including data from irrigation districts, individuals, public agencies, state and federal agencies, cities, and others.

Subtask - Data Collection: Work will include compiling and researching information on the following:

- Surface and groundwater water supply and use;
- Cropping and land use;
- Groundwater studies, models and budgets;
- Groundwater recharge and replenishment;

- Water conservation and water recycling;
- Efficient water management practices;
- Geography, climate, and landuse;
- Streamflow, water rights, and instream flow requirements;
- Groundwater-dependent ecosystems, stream ecology related to baseflow
- Geology and hydrogeology
- Description of beneficial uses and users;
- Existing water resources monitoring and management programs;
- Landuse plans and landuse elements of the general plan within the basin;
- Water quality data and TMDL data;
- Maps;
- Landuse plans and landuse elements of the general plan outside the basin that potentially impact basin groundwater and groundwater-surface water interaction

Deliverable: (1) Program that outlines data management protocols and material.

Subtask – County well program refinement: The County Environmental Health Department manages the "Water Wells" Program which is responsible to permitting and inspecting domestic, agricultural and groundwater monitoring wells. Records have been kept by the County since 1991, and records prior to this time are kept by DWR. The County's Environmental Health Division has a process for applying for and abandoning/destruction of groundwater wells. While the Environmental Health Department will retain the well permitting program, part of the data management process outlined in this Work Plan will include developing a simple process for the Natural Resources Department to be informed of when an applicant applies for and receives a groundwater well permit, and when a well is abandoned/destructed. Other tasks will include developing a GIS database that includes records of known wells drilled before and after 1991, and wells that will be drilled into the future. Information regarding wells that are abandoned/destructed will also be included in the GIS database.

Other actions will include performing a "well audit" to determine if there are existing wells that have not been recorded through the County or DWR, and if there are abandoned/destructed wells that have not been recorded.

Deliverables: (1) GIS database that outlines permitted and active groundwater wells, and abandoned and destroyed wells, and (2) document outlining the results of the well audit.

Subtask – County CASGEM Program Transition: Currently, the Environmental Health Division manages the CASGEM Program for the County. As part of the SGMA and GSP development process, the CASGEM Program will be transitioned over the Natural Resources Department. Work under this subtask will include reviewing and possibly modifying the county's CASGEM management process, training Natural Resources staff to manage this program and go out in the field to collect monitoring data, and developing a database to be monitored by the Natural Resource Department. Only the CASGEM work associated with the Basin will be utilized by grant funding, other CASGEM work associated with other basins will be covered by the County.

Deliverables: (1) Document outlining CASGEM program under the Siskiyou County Department of Natural Resources, and (2) well monitoring data.

Work Plan: Scott Valley Groundwater Basin – Project 1

Subtask - Identify Data Gaps: Work will include reviewing all data gathered to determine what data gaps there are and developing a document outlining what additional data is needed and what it will take to develop and fill these data gaps through other tasks outlined in this Work Plan.

Deliverable: (1) Document outlining data gaps and data needs.

Task 3: Conceptual Model, Numerical Model Development, and Water Budget (as outlined by UC Davis): The objective of this task is to develop and document a conceptual model of the groundwater basin, to develop an enhanced version and documentation of the Scott Valley Integrated Hydrologic Model, and to develop and document the Scott Valley water budget and its various components (groundwater, surface water, soil-landscape budgets) for average, wet, and dry years.

Subtask – Conceptual and Numerical Model:

Subtask: Develop and document a conceptual model of the basin, including mapping of recharge areas, and update the hydrologic numerical model. This subtask has been mostly completed and will summarize the work published by the University of California Davis, and a manuscript on calibrating a 1991-2011 model, currently in preparation).

Other work will include updating the integrated hydrologic model currently being developed by the University of California Davis to simulate more recent hydrologic history, post-2011, using more recent data for rainfall, streamflow, and landuse.

- The data assembled under Task 2 will be analyzed and prepared to append the existing Scott Valley Integrated Hydrologic Model input file.
- Simulations will be run with the updated Scott Valley Integrated Hydrologic Model from 1991 to 2017 (or later depending on data availability).
- Simulations will be assessed to determine, whether a model re-calibration is necessary or whether additional data may need to be collected prior to a re-calibration
- Simulation results will be processed to provide appropriate tables and maps; the updated model will be documented, and results prepared as part of a Task 2 Technical Memorandum

Deliverables: (1) Document outlining model development, (2) simulation results to provide appropriate tables and maps, and (3) a Technical Memorandum on the updated model and results.

Subtask – Water Budget:

Previous task results will be used to prepare a stream (surface water) budget, a soil-plant-crop-landscape budget, and a groundwater budget for the Scott Valley groundwater basin. Separate budgets will be developed for a typical wet year, a typical dry year, and for an average year. Seasonal budgets will be prepared as well for each of these year-types to illustrate both seasonal and interannual dynamics of the Scott Valley water budget.

Deliverable: (1) Document that outlines extraction sites, recharge and replenishment sites, water sources used for irrigation, and other information derived from the water budget, and (2) document outlining results of varied water year types.

Task 4 - Development of Sustainability Criteria: This task will include the work required to develop the protocols for achieving and/or maintaining sustainability throughout the Basin, and that information which will need to be included in the GSP. Through the work performed in the previous tasks the GSA will be able to determine if any undesirable results have been triggered within the Basin, and which sustainability criteria are being met. Other tasks will include identifying approaches and projects that work towards achieving or maintaining sustainability criteria, such as winter recharge activities.

Subtask – Identify Potentially Undesirable Results and Met Criteria: Work under this subtask will include taking the information from the tasks above to identify and study criteria that are being met and how to best sustain these over the long-term through implementation of the GSP. This task will also identify and study potential undesirable results, and options to recover from these through the work completed in other task, whether it include additional groundwater monitoring, recharge programs, or other activities. Other work will include analyzing and determining which criteria is not applicable to the Basin, which should be easily justifiable based on work performed in the previous tasks.

Deliverable: (1) Documentation to be included in the GSP that outlines what undesirable results are being triggered within the basin, and what criteria are being met at a sustainability level.

Subtask – Minimum Thresholds and Measurable Objectives: Work under this task will include establishing minimum thresholds for a given criteria and certain locations throughout the basin. There will be assessments of risks that could lead to exceeding minimum thresholds, and ways to avoid or mitigate for these. These minimum thresholds would be included as part of the information provided in the GSP and would outline ways that the District will work with water users and others to maintain these minimum thresholds to achieve sustainability within the Basin.

Other work will include developing reasonable measurable objectives that can be included in the GSP and can be implemented through management actions and on-the-ground projects. These measurable objectives can outline how to maintain healthy groundwater levels, how to maintain groundwater surface water interaction during given times throughout the year, and how the GSP can assist in TMDL requirements. Measurable objectives will be important in helping to develop a path forward in future groundwater activities throughout the basin and how to include water users in future planning efforts.

Deliverables: (1) Document to be included in the GSP which outlines the minimum thresholds that were established by the GSA in coordination with the advisory board, water users and the public, and (2) way towards achieving these measurable objectives.

Task 5 - Monitoring programs, protocols, and networks: This task will include developing a program to go along with the GSP which will monitor conditions throughout the Basin and will provide a centralized program/location for groundwater data and information to be housed and managed. This task will also outline those activities that may be needed to assist in obtaining sufficient and accurate data regarding groundwater conditions and activities.

Subtask - Develop Basin-Wide Groundwater Sustainability Monitoring Plan: To meet the measurable objectives of groundwater sustainability, a long-term monitoring plan, a monitoring program to collect data and monitor the basin is essential. The monitoring plan will include:

- Identification of a groundwater monitoring network by identifying the location of monitoring wells. The development of the network will involve analyzing whether existing wells can be used (sufficient well data and properly located) and whether new monitoring wells may need to be constructed.
- Update the current CASGEM program to include other monitoring activities, and possible addition of other monitoring wells. Updates the current program will include protocols for developing and analyzing reports, referencing them to the GSP to ensure that minimum thresholds are not being exceeded, and to determine the progress towards measurable objectives.
- Development of a database for assistance in organizing and collecting monitoring data for the basin.
- Provide a summary of the requirements of the Annual Report summarizing monitoring results and identification of the entity responsible for the monitoring (basin wide monitoring).
- Develop a stream gauging program for current stream gauging efforts and assess the need for additional stream gauging on the River and its tributaries.

Deliverables: (1) Document to be included in the GSP that outlines a monitoring plan for the basin, how it will be managed and updated, how reports will be submitted with the DWR, and how the plan will be coordinated with the water users into the future, and (2) document outlining how the monitoring plan will be utilized in the Basin.

Task 6: (Groundwater) Management Actions: Development, Assessment, and Implementation

Subtask - Develop Groundwater Management Programs: In 2016, Scott Valley Irrigation District (SVID) received a temporary permit to appropriate surface water for groundwater recharge and later instream fish and wildlife habitat enhancement. Surface water was recharged on five fields. A total of eight groundwater wells were instrumented with pressure transducers on the east side of the Scott River to monitor changes in the groundwater surface elevation in response to the artificial recharge activities and natural recharge of precipitation. Based on these measurements a clear response was observed in the elevation of the groundwater table. The Scott Valley Integrated Hydrologic Model, a surface water-groundwater model of the Scott Valley, was used to simulate the diversion and recharge occurring during the experiment as a simulation scenario. Comparison to the base case demonstrates that the recharged water ultimately benefitted streamflows downgradient and downstream from the recharge site during and after the actual diversion.

The District will perform projects similar to the pilot study to assist in groundwater recharge development and study beneficial impacts to the Scott River, when additional flows are needed during certain times in the year. This would include assessing additional options and locations for groundwater recharge, working with willing landowners, determining how much water can be applied to recharge the aquifer, studying transient time to the river, determining impacts to farming and ranching operations, and implementing recharge activities. This work is important to GSP development as it will help determine the best options available for on-ground projects to help maintain or attain sustainability over the long-term. Recharge will play a large role in groundwater management throughout California and the District would like to capitalize opportunities to better utilize excess winter flows that are not able to be stored within the Basin for times that it is critically needed.

Other would look at studying, exploring and implementing other projects to be utilized in the Basin such as in-lieu recharge, Beaver Dam Analogues, and other land and water management activities which would be beneficial for groundwater table levels, and surface water/groundwater interaction which will play a large role in the Basin's GSP. Current and ongoing water management projects occurring within the Basin will also be explored to assess the opportunity for future development and expansion.

Deliverables: (1) Document outlining work associated with development of groundwater programs, and (2) information regarding their practicality and future implementation.

Subtask – Scenario Development: Work under this task will go towards developing future modeling scenarios from which future water budgets will be prepared and with which an assessment will be implemented of the ability to maintain measurable objectives and of the risk that minimum thresholds will be exceeded. Future modeling scenarios will be developed by the District in collaboration with stakeholder groups. They may include:

- Climate change scenarios provided by DWR
- Any groundwater replenishment, augmentation, or other projects under consideration

Results will be used to assess relative impacts and benefits of each scenario relative to historic conditions simulated with the integrated hydrologic model. Model assumptions, data, changes in the conceptual model and model input, model results, and assessments will be documented through a Technical Memorandum.

Deliverable: (1) Technical Memorandum outlining model inputs, and results, with information regarding impacts to the minimum thresholds, measurable objectives, and sustainability criteria.

Subtask - Expand Groundwater Level Monitoring Program: Work in this task will build off other previous work and will identify those landowners who may want to be involved in groundwater monitoring, and identify options towards expanding groundwater monitoring if needed. This work will be done in complete collaboration with water user and their input into the approach and development of expanded groundwater monitoring. It is anticipated that portions of this work would include implementing some of the monitoring through on the ground work and equipment purchase but additional funds may be needed to fully implement, which would be determined as more information and opportunity become available, and would be obtained by the District. At this time this is a rough estimate of the work needed as more solid information will come to light during the data collection Task.

Deliverables: (1) Document outlining the needs and opportunities for groundwater monitoring, and (2) willing partners.

Subtask - Expand stream discharge and stream temperature monitoring: Work in this task will build off other previous work and will identify those areas where additional stream monitoring is needed and opportunities for achieving this. This work will be down in complete collaboration with water user and their input into the approach and development of expanded groundwater monitoring. It is anticipated that portions of this work would include implementing some of the stream gauging, but additional funds may be needed to fully implement, which would be determined as more information and opportunity become

available, and would be obtained by the District. At this time, this is a rough estimate of the work needed as more solid information will come to light during the data collection Task.

Deliverable: (1) Document outlining the needs and opportunities for expanded stream monitoring.

Task 7 - Writing and Reporting of Documents: Work under this task will include taking the work and analysis completed in the previous tasks and developing this into a comprehensive GSP for the Basin which of the GSP for; which will be submitted to the DWR and will be made available for water users and the publics review. The District intends to submit a GSP that can be utilized by not only the District and DWR, but can be used by those within the basin, and water users in their future planning efforts. The District is geared towards completing a document that is acceptable to both DWR and the Basin water users, and a GSP that can be easily understood, digested and implemented within the Basin. Work in pulling together and finalizing the GSP will require staff time, District time, advisory board time, County Counsel and County Administration time and working with any consultants/contractors hired throughout this process. The District also intends to work closely with DWR throughout the next several years and will submit a draft GSP at the 30%, 60% and 90% phases, prior to the final submittal on or before January 2022.

Deliverable: (1) GSP drafting and completion.

Work Plan: Shasta Valley Groundwater Basin – Project 2

The primary goal of this project is to complete the necessary work needed to develop a Groundwater Sustainability Plan (GSP) for the Shasta Valley Groundwater Basin, that can be utilized to track and manage the basin, and ensure its sustainability into the future. The basin is of great importance to those within and outside of the basin boundaries, and provides vital resources for agricultural, residential, environmental and tribal interests. Groundwater supplies, quality and sustainability are important in the overall health of Siskiyou County, and through the development of the GSP the District intends to secure the groundwater basin over the long-term. Development of this Work Plan was assisted by the University of California, Davis; specifically: Laura Foglia, PhD, Dr. Helen Dahlke, Dr. Thomas Harter and Gus Tolley, PhD student.

Task 1 – Public Outreach and Engagement: The GSA and County staff will engage the public through several different avenues including regular District/GSA meetings, special meetings held within the Shasta Valley Groundwater Basin (Basin), outreach letters and emails, opportunities to provide comments, and through development of a Shasta Valley Basin Advisory Board.

Subtask – Outreach during GSA Development: Public outreach for the Basin SGMA and GSP process has already begun through the GSA establishment process. There were several meetings held throughout Siskiyou County, with several of them occurring within the Basin boundary. These meetings were held to educate the public on SGMA and its requirements, including the District's intent to apply to be the GSA for the Basin. County staff has also included a section on the County's Natural Resources webpage for SGMA related documentation and has created an outreach email list which provides SGMA updates to the public. Other work would include developing a specific webpage or website for SGMA, which would outline the SGMA processes, the Districts ongoing and completed work, public documents, mapping and GIS tools, ways to contact and communicate with the District and County employees and announcements of public meetings/forums.

Deliverables: (1) Resolution establishing the District as the GSA, (2) link to website/webpage, (3) DWR inclusion on outreach list.

Subtask – Public Outreach During GSP Development: Work under this subtask would include organizing and hosting meetings and public outreach events, distributing public notices and documents, creating and maintaining a SGMA website and Facebook page, attending other public meetings to provide SGMA updates at city meetings, irrigation/water district meetings, and other meetings where there is expressed interest, and development of materials to meet public needs.

Deliverable: (1) Document to be included in GSP outlining the completed public outreach efforts.

Subtask – Advisory Committee Development: On November 7th, 2017 the District passed a resolution allowing for the formation of an advisory board for the Basin. In order to get varied representation of the Basin it is anticipated that there will be 7 to 9 members on the advisory board, but these details will be developed based on interest and feedback from the public.

It is anticipated that the advisory committee would meet at least quarterly, with more frequent meetings anticipated during critical planning times and critical GSP development phases. The advisory board will be utilized to provide water user feedback to the District and County staff, will review plan and documentation to determine feasibility and usefulness within the Basin, and will play a large role in

assisting in developing a GSP that will benefit the Basin over the long-term and will be acceptable, manageable and useful to the water users within the basin, agriculturally, residentially, and municipally.

Work under this subtask would include outreach and appointment to the advisory board, organizing and hosting advisory board meetings, having a secretary present at every meeting, providing information and documentation to the advisory board, working with the advisory board to review and comment on produced data and documentation, and the general work required by the County to manage and administrate the advisory board.

Deliverables – (1) Resolution outlining formation of advisory board, (2) document outlining appointed members, and (3) advisory board meeting minutes.

Subtask – District Meeting Protocol: The District convenes during every Siskiyou County Board of Supervisors meeting, which allows any official business to be conducted and provides the opportunity for public comment. While it is anticipated that the public may comment during some of these meetings, the District will meet at least quarterly to fully review the GSP development process, convene with the advisory board and solicit public comment. During critical planning and decision phases, more frequent meetings may be required. In addition, County staff and at least one member of the District will host public meetings within the Basin provide opportunities for public involvement for those who are not able to attend Board of Supervisors meetings. Other work would include preparing for and holding District meetings to review and approve plans and documents, provide the public with regular updates, host meetings within Basin boundaries, produce and provide documentation, and have County Counsel and County Administrator review prior to District decisions.

Deliverables – (1) Document outlining finalized meeting protocol, and meeting dates, (2) District meeting minutes, and (3) notice of upcoming meetings.

Task 2 – Data Collection, Development and Management: Activities under Task 2 will include the data collection, compilation and organization needed to outline the information already developed and available, what data gaps need to be filled, and will provide the basis for informing the water budget, water model, and GSP development. Developing a data collection inventory and program is vital to the SGMA and GSP process in the Basin, and will assist in making the most informed and effective decisions. The GSA and County staff will collect data available and produced both within and outside of the County, including data from irrigation districts, individuals, public agencies, state and federal agencies, cities, and others.

Subtask - Data Collection: Work will include compiling and researching information on the following:

- Surface and groundwater water supply and use;
- Cropping and land use;
- Groundwater studies, models and budgets;
- Groundwater recharge and replenishment;
- Water conservation and water recycling;
- Efficient water management practices;
- Geography, climate, and landuse;
- Streamflow, water rights, and instream flow requirements;

- Groundwater-dependent ecosystems, stream ecology related to baseflow
- Geology and hydrogeology
- Description of beneficial uses and users;
- Existing water resources monitoring and management programs;
- Landuse plans and landuse elements of the general plan within the basin;
- Water quality data and TMDL data;
- Maps;
- Landuse plans and landuse elements of the general plan outside the basin that potentially impact basin groundwater and groundwater-surface water interaction

Deliverable: (1) Program that outlines data management protocols and material.

Subtask – County well program refinement: The County Environmental Health Department manages the "Water Wells" Program which is responsible to permitting and inspecting domestic, agricultural and groundwater monitoring wells. Records have been kept by the County since 1991, and records prior to this time are kept by DWR. The County's Environmental Health Division has a process for applying for and abandoning/destruction of groundwater wells. While the Environmental Health Department will retain the well permitting program, part of the data management process outlined in this Work Plan will include developing a simple process for the Natural Resources Department to be informed of when an applicant applies for and receives a groundwater well permit, and when a well is abandoned/destructed. Other tasks will include developing a GIS database that includes records of known wells drilled before and after 1991, and wells that will be drilled into the future. Information regarding wells that are abandoned/destructed will also be included in the GIS database.

Other actions will include performing a "well audit" to determine if there are existing wells that have not been recorded through the County or DWR, and if there are abandoned/destructed wells that have not been recorded.

Deliverables: (1) GIS database that outlines permitted and active groundwater wells, and abandoned and destroyed wells, and (2) document outlining the results of the well audit..

Subtask – County CASGEM Program Transition: Currently, the Environmental Health Division manages the CASGEM Program for the County. As part of the SGMA and GSP development process, the CASGEM Program will be transitioned over the Natural Resources Department. Work under this subtask will include reviewing and possibly modifying the county's CASGEM management process, training Natural Resources staff to manage this program and go out in the field to collect monitoring data, and developing a database to be monitored by the Natural Resource Department. Only the CASGEM work associated with the Basin will be utilized by grant funding, other CASGEM work associated with other basins will be covered by the County.

Deliverables: (1) Document outlining CASGEM program under the Siskiyou County Department of Natural Resources, and (2) well monitoring data.

Subtask - Identify Data Gaps: Work will include reviewing all data gathered to determine what data gaps there are and developing a document outlining what additional data is needed and what it will take to develop and fill these data gaps through other tasks outlined in this Work Plan.

Deliverable: (1) Document outlining data gaps and data needs.

Task 3: Conceptual Model, Numerical Model Development, and Water Budget:

Deliverable: (1) Document outlining groundwater conditions within the Basin.

Subtask – Conceptual and Numerical Model: Work will include developing and documenting a conceptual model of the basin, including recharge areas. Existing information from previous studies will be reviewed to develop the hydrogeological conceptual model, and data from Task 2 will help develop assist in developing current and historical groundwater and streamflow conditions (including quality, land subsidence). to be utilized in the water model and water budget.

Similar work utilized during the Scott Valley Integrated Hydrologic Model will be studied to determine how to develop a model specific to the Shasta Valley Groundwater Basin, understanding that this Basins model will be separate from the Scott Valley Model. Other work will include utilizing information from previous tasks to build and inform the model

The final goal of the conceptual model is to provide an easy tool to develop preliminary understanding of the hydrologic/hydrogeologic characteristics of the basin and to help design future efforts (which can include both new data collection and more complex model development). Information to be expected from the HCM are (but not limited to):

- Aquifer thickness, general lithology and depositional environment, estimated storage capacity
- Average well depths and production values
- Range or average of hydraulic parameters; (i.e. transmissivity, storage coefficients, specific yields etc.)
- Distribution (mapping) of general water quality types
- Groundwater level trend analysis
- Groundwater flow
- Contribution from springs
- Surface water/ groundwater exchanges
- Estimates of changes in storage over time
- Identification of any undesirable results currently within the basins
- Forecasting of sustainable practices and subbasin responses

Information collected in the water budget and conceptual model can be integrated in a numerical model which will include all the components of the water budget and numerical model highlighted above. The numerical model will be an integrated model with the following main components:

1) Dynamic water budget calculations based on land applications, changes in water use, etc.
2) Groundwater model including surface water-groundwater interactions
3) Land subsidence

The three components will be integrated and the model will be evaluated using extensive sensitivity analysis, calibration and uncertainty evaluation. These will help better understand and project the basin condition, agricultural demand, proper sustainable yield, and significant current and/or eventually future

stresses for the basin. The numerical model will then facilitate the development and evaluation of different management scenarios.

Deliverables: (1) Document outlining model development, (2) simulation results to provide appropriate tables and maps, and (3) a Technical Memorandum on the updated model and results.

Subtask – Water Budget: A water budget will be developed that will serve to define the spatiotemporal distribution of groundwater pumping, surface water diversions, groundwater recharge, and evapotranspiration throughout the basin. After preliminary evaluation of the data and condition of the basin, we believe that the analytical tools that have already been developed, tested, and published for the Scott Valley Project (Foglia et al. 2013) can be modified and applied to the Shasta Valley basin. The following data will be incorporated into the water budget after its collection through the other outlined tasks in this application:

- Climate
  - Precipitation
  - Potential evapotransiration
- Streamflow
  - Daily streamflow data on all tributaries to the mainstem Shasta River, including mainstem forks
  - Subwatershed delineation
- Land use
  - Crops with crop coefficient
  - Irrigation method
  - Irrigation water sources
- Soil properties (digital USDA soil maps with properties)
  - Water holding capacity
- Hydrogeology

Other work will include using modeling results to develop a detailed water budget for typical dry, wet, and average water years. Previous tasks results will be used to prepare a stream (surface water) budget, a soil-plant-crop-landscape budget, and a groundwater budget for the Basin. Separate budgets will be developed for a typical wet year, a typical dry year, and for an average year. Seasonal budgets will be prepared as well for each of these year-types to illustrate both seasonal and interannual dynamics of the water budget.

Deliverable: (1) Document that outlines extraction sites, recharge and replenishment sites, water sources used for irrigation, and other information derived from the water budget, and (2) document outlining results of varied water year types.

Task 4 - Development of Sustainability Criteria: This task will include the work required to develop the protocols for achieving and/or maintaining sustainability throughout the Basin, and that information which will need to be included in the GSP. Through the work performed in the previous tasks the GSA will be able to determine if any undesirable results have been triggered within the Basin, and which sustainability criteria are being met. Other tasks will include identifying approaches and projects that work towards achieving or maintaining sustainability criteria, such as winter recharge activities.

Subtask – Identify Potentially Undesirable Results and Met Criteria: Work under this subtask will include taking the information from the tasks above to identify and study criteria that are being met and how to best sustain these over the long-term through implementation of the GSP. This task will also identify and study potential undesirable results, and options to recover from these through the work completed in other task, whether it include additional groundwater monitoring, recharge programs, or other activities. Other work will include analyzing and determining which criteria is not applicable to the Basin, which should be easily justifiable based on work performed in the previous tasks.

Deliverable: (1) Documentation to be included in the GSP that outlines what undesirable results are being triggered within the basin, and what criteria are being met at a sustainability level.

Subtask – Minimum Thresholds and Measurable Objectives: Work under this task will include establishing minimum thresholds for a given criteria and certain locations throughout the basin. There will be assessments of risks that could lead to exceeding minimum thresholds, and ways to avoid or mitigate for these. These minimum thresholds would be included as part of the information provided in the GSP and would outline ways that the District will work with water users and others to maintain these minimum thresholds to achieve sustainability within the Basin.

Other work will include developing reasonable measurable objectives that can be included in the GSP and can be implemented through management actions and on-the-ground projects. These measurable objectives can outline how to maintain healthy groundwater levels, how to maintain groundwater surface water interaction during given times throughout the year, and how the GSP can assist in TMDL requirements. Measurable objectives will be important in helping to develop a path forward in future groundwater activities throughout the basin and how to include water users in future planning efforts.

Deliverables: (1) Document to be included in the GSP which outlines the minimum thresholds that were established by the GSA in coordination with the advisory board, water users and the public, and (2) way towards achieving these measurable objectives.

Task 5 - Monitoring programs, protocols, and networks: This task will include developing a program to go along with the GSP which will monitor conditions throughout the Basin and will provide a centralized program/location for groundwater data and information to be housed and managed. This task will also outline those activities that may be needed to assist in obtaining sufficient and accurate data regarding groundwater conditions and activities.

Subtask - Develop Basin-Wide Groundwater Sustainability Monitoring Plan: To meet the measurable objectives of groundwater sustainability, a long term monitoring plan, a monitoring program to collect data and monitor the basin is essential. The monitoring plan will include:

- Identification of a groundwater monitoring network by identifying the location of monitoring wells. The development of the network will involve analyzing whether existing wells can be used (sufficient well data and properly located) and whether new monitoring wells may need to be constructed.
- Update the current CASGEM program to include other monitoring activities, and possible addition of other monitoring wells. Updates the current program will include protocols for

developing and analyzing reports, referencing them to the GSP to ensure that minimum thresholds are not being exceeded, and to determine the progress towards measurable objectives.
- Development of a database for assistance in organizing and collecting monitoring data for the basin.
- Provide a summary of the requirements of the Annual Report summarizing monitoring results and identification of the entity responsible for the monitoring (basin wide monitoring).
- Develop a stream gauging program for current stream gauging efforts and assess the need for additional stream gauging on the River and its tributaries.

Deliverables: (1) Document to be included in the GSP that outlines a monitoring plan for the basin, how it will be managed and updated, how reports will be submitted with the DWR, and how the plan will be coordinated with the water users into the future, and (2) document outlining how the monitoring plan will be utilized in the Basin.

Task 6: (Groundwater) Management Actions: Development, Assessment, and Implementation

Subtask - Develop Groundwater Management Programs: The District would perform projects similar to the Scott Valley Groundwater Recharge pilot study to assist in groundwater recharge development and study beneficial impacts to the Shasta River, when additional flows are needed during certain times in the year. This would include assessing the best options and locations for groundwater recharge, working with willing landowners, determining how much water can be applied to recharge the aquifer, studying transient time to the river, determining impacts to farming and ranching operations, and implementing recharge activities. This work is important to GSP development as it will help determine the best options available for on-ground projects to help maintain or attain sustainability over the long-term. Recharge will play a large role in groundwater management throughout California and the District would like to capitalize opportunities to better utilize excess winter flows that are not able to be stored within the Basin for times that it is critically needed.

Other would look at studying, exploring and implementing other projects to be utilized in the Basin such as in-lieu recharge, Beaver Dam Analogues, and other land and water management activities which would be beneficial for groundwater table levels, and surface water/groundwater interaction which will play a large role in the Basin's GSP. Current and ongoing water management projects occurring within the Basin will also be explored to assess the opportunity for future development and expansion.

Deliverables: (1) Document outlining work associated with development of groundwater programs, and (2) information regarding their practicality and future implementation.

Subtask – Scenario Development: Work will include using the integrated hydrologic model to assess impacts and benefits of each potential land and water management activity under various future climate conditions. Other work will include developing modeling scenarios from which future water budgets will be prepared to determine the ability to maintain measurable objectives, and what the risks are of exceeding minimum thresholds. Future modeling scenarios will be developed by the District in collaboration with stakeholder groups. They may include:

- scenarios provided by DWR
- Any groundwater replenishment, augmentation, or other projects under consideration

Results will be used to assess relative impacts and benefits of each scenario relative to historic conditions simulated with the integrated hydrologic model**.** Model assumptions, data, changes in the conceptual model and model input, model results, and assessments will be documented through a Technical Memorandum.

Deliverable: (1) Technical Memorandum outlining model inputs, and results, with information regarding impacts to the minimum thresholds, measurable objectives, and sustainability criteria.

Subtask - Expand Groundwater Level Monitoring Program: Work in this task will build off other previous work and will identify those landowners who may want to be involved in groundwater monitoring, and identify options towards expanding groundwater monitoring if needed. This work will be done in complete collaboration with water user and their input into the approach and development of expanded groundwater monitoring. It is anticipated that portions of this work would include implementing some of the monitoring through on the ground work and equipment purchase but additional funds may be needed to fully implement, which would be determined as more information and opportunity become available, and would be obtained by the District. At this time this is a rough estimate of the work needed as more solid information will come to light during the data collection Task.

Deliverables: (1) Document outlining the needs and opportunities for groundwater monitoring, and (2) willing partners.

Subtask - Expand stream discharge and stream temperature monitoring: Work in this task will build off other previous work and will identify those areas where additional stream monitoring is needed and opportunities for achieving this. This work will be down in complete collaboration with water user and their input into the approach and development of expanded groundwater monitoring. It is anticipated that portions of this work would include implementing some of the stream gauging but additional funds may be needed to fully implement, which would be determined as more information and opportunity become available, and would be obtained by the District. At this time this is a rough estimate of the work needed as more solid information will come to light during the data collection Task.

Deliverable: (1) Document outlining the needs and opportunities for expanded stream monitoring.

Task 7 - Writing and Reporting of Documents: Work under this task will include taking the work and analysis completed in the previous tasks and developing this into a comprehensive GSP for the Basin which of the GSP for; which will be submitted to the DWR and will be made available for water users and the publics review. The District intends to submit a GSP that can be utilized by not only the District and DWR, but can be used by those within the basin, and water users in their future planning efforts. The District is geared towards completing a document that is acceptable to both DWR and the Basin water users, and a GSP that can be easily understood, digested and implemented within the Basin. Work in pulling together and finalizing the GSP will require staff time, District time, advisory board time, County Counsel and County Administration time and working with any consultants/contractors hired throughout this process. The District also intends to work closely with DWR throughout the next several years and will submit a draft GSP at the 30%, 60% and 90% phases, prior to the final submittal on or before January 2022.

Deliverable: (1) GSP drafting and completion.

Work Plan: Butte Valley Groundwater Basin – Project 3

The primary goal of this project is to complete the necessary work needed to develop a Groundwater Sustainability Plan (GSP) for the Butte Valley Groundwater Basin, that can be utilized to track and manage the basin, and ensure its sustainability into the future. The basin is of great importance to those within and outside of the basin boundaries, and provides vital resources for agricultural, residential, environmental and tribal interests. Groundwater supplies, quality and sustainability are important in the overall health of Siskiyou County, and through the development of the GSP the GSA intends to secure the groundwater basin over the long-term. Development of this Work Plan was assisted by the University of California, Davis; specifically: Laura Foglia, PhD, Dr. Helen Dahlke, Dr. Thomas Harter and Gus Tolley, PhD student.

Task 1 – Public Outreach and Engagement: The GSA and County staff will engage the public through several different avenues including regular GSA/GSA meetings, special meetings held within the Butte Valley Groundwater Basin (Basin), outreach letters and emails, opportunities to provide comments, and through development of a Basin Advisory Board.

Subtask – Outreach during GSA Development: Public outreach for the Basin SGMA and GSP process has already begun through the GSA establishment process. There were several meetings held throughout Siskiyou County, with several of them occurring within the Basin boundary. These meetings were held to educate the public on SGMA and its requirements, including the GSA's intent to apply to be the GSA for the Basin. County staff has also included a section on the County's Natural Resources webpage for SGMA related documentation and has created an outreach email list which provides SGMA updates to the public. Other work would include developing a specific webpage or website for SGMA, which would outline the SGMA processes, the GSAs ongoing and completed work, public documents, mapping and GIS tools, ways to contact and communicate with the GSA and County employees and announcements of public meetings/forums.

Deliverables: (1) Resolution establishing the GSA as the GSA, (2) link to website/webpage, (3) DWR inclusion on outreach list.

Subtask – Public Outreach During GSP Development: Work under this subtask would include organizing and hosting meetings and public outreach events, distributing public notices and documents, creating and maintaining a SGMA website and Facebook page, attending other public meetings to provide SGMA updates at city meetings, irrigation/water GSA meetings, and other meetings where there is expressed interest, and development of materials to meet public needs.

Deliverable: (1) Document to be included in GSP outlining the completed public outreach efforts.

Subtask – Advisory Committee Development: On November 7th, 2017 the GSA passed a resolution allowing for the formation of an advisory board for the Basin. In order to get varied representation of the Basin it is anticipated that there will be 7 to 9 members on the advisory board, but these details will be developed based on interest and feedback from the public.

It is anticipated that the advisory committee would meet at least quarterly, with more frequent meetings anticipated during critical planning times and critical GSP development phases. The advisory board will be utilized to provide water user feedback to the GSA and County staff, will review plan and documentation to determine feasibility and usefulness within the Basin, and will play a large role in

assisting in developing a GSP that will benefit the Basin over the long-term and will be acceptable, manageable and useful to the water users within the basin, agriculturally, residentially, and municipally.

Work under this subtask would include outreach and appointment to the advisory board, organizing and hosting advisory board meetings, having a secretary present at every meeting, providing information and documentation to the advisory board, working with the advisory board to review and comment on produced data and documentation, and the general work required by the County to manage and administrate the advisory board.

Deliverables – (1) Resolution outlining formation of advisory board, (2) document outlining appointed members, and (3) advisory board meeting minutes.

Subtask – GSA Meeting Protocol: The GSA convenes during every Siskiyou County Board of Supervisors meeting, which allows any official business to be conducted and provides the opportunity for public comment. While it is anticipated that the public may comment during some of these meetings, the GSA will meet at least quarterly to fully review the GSP development process, convene with the advisory board and solicit public comment. During critical planning and decision phases, more frequent meetings may be required. In addition, County staff and at least one member of the GSA will host public meetings within the Basin provide opportunities for public involvement for those who are not able to attend Board of Supervisors meetings. Other work would include preparing for and holding GSA meetings to review and approve plans and documents, provide the public with regular updates, host meetings within Basin boundaries, produce and provide documentation, and have County Counsel and County Administrator review prior to GSA decisions.

Deliverables – (1) Document outlining finalized meeting protocol, and meeting dates, (2) GSA meeting minutes, and (3) notice of upcoming meetings.

Task 2 – Data Collection, Development and Management: Activities under Task 2 will include the data collection, compilation and organization needed to outline the information already developed and available, what data gaps need to be filled, and will provide the basis for informing the water budget, and GSP development. Developing a data collection inventory and program is vital to the SGMA and GSP process in the Basin, and will assist in making the most informed and effective decisions. The GSA and County staff will collect data available and produced both within and outside of the County, including data from irrigation GSAs, individuals, public agencies, state and federal agencies, cities, and others.

Subtask - Data Collection: Work will include compiling and researching information on the following:

- Surface and groundwater water supply and use;
- Cropping and land use;
- Groundwater studies and budgets;
- Groundwater recharge and replenishment;
- Water conservation and water recycling;
- Efficient water management practices;
- Geography, climate, and landuse;
- Streamflow, water rights, and instream flow requirements;
- Groundwater-dependent ecosystems, stream ecology related to baseflow

- Geology and hydrogeology
- Description of beneficial uses and users;
- Existing water resources monitoring and management programs;
- Landuse plans and landuse elements of the general plan within the basin;
- Water quality data and TMDL data;
- Maps;
- Landuse plans and landuse elements of the general plan outside the basin that potentially impact basin groundwater and groundwater-surface water interaction

Deliverable: (1) Program that outlines data management protocols and material.

Subtask – County well program refinement: The County Environmental Health Department manages the "Water Wells" Program which is responsible to permitting and inspecting domestic, agricultural and groundwater monitoring wells. Records have been kept by the County since 1991, and records prior to this time are kept by DWR. The County's Environmental Health Division has a process for applying for and abandoning/destruction of groundwater wells. While the Environmental Health Department will retain the well permitting program, part of the data management process outlined in this Work Plan will include developing a simple process for the Natural Resources Department to be informed of when an applicant applies for and receives a groundwater well permit, and when a well is abandoned/destructed. Other tasks will include developing a GIS database that includes records of known wells drilled before and after 1991, and wells that will be drilled into the future. Information regarding wells that are abandoned/destructed will also be included in the GIS database.

Other actions will include performing a "well audit" to determine if there are existing wells that have not been recorded through the County or DWR, and if there are abandoned/destructed wells that have not been recorded.

Deliverables: (1) GIS database that outlines permitted and active groundwater wells, and abandoned and destroyed wells, and (2) document outlining the results of the well audit.

Subtask – County CASGEM Program Transition: Currently, the Environmental Health Division manages the CASGEM Program for the County. As part of the SGMA and GSP development process, the CASGEM Program will be transitioned over the Natural Resources Department. Work under this subtask will include reviewing and possibly modifying the county's CASGEM management process, training Natural Resources staff to manage this program and go out in the field to collect monitoring data, and developing a database to be monitored by the Natural Resource Department. Only the CASGEM work associated with the Basin will be utilized by grant funding, other CASGEM work associated with other basins will be covered by the County.

Deliverables: (1) Document outlining CASGEM program under the Siskiyou County Department of Natural Resources, and (2) well monitoring data.

Subtask - Identify Data Gaps: Work will include reviewing all data gathered to determine what data gaps there are and developing a document outlining what additional data is needed and what it will take to develop and fill these data gaps through other tasks outlined in this Work Plan.

Deliverable: (1) Document outlining data gaps and data needs.

Task 3: Water Budget Development:

Subtask – Groundwater Conditions: Use data from Task 2 to assist in developing current and historical groundwater and streamflow conditions (including quality, land subsidence). to be utilized in a water budget. Other work will include utilizing specific data to determine what these conditions looked like and what they currently look like.

Deliverable: (1) Document outlining groundwater conditions within the Basin.

Subtask – Water Budget: A water budget will be developed that will serve to define the spatiotemporal distribution of groundwater pumping, surface water diversions, groundwater recharge, and evapotranspiration throughout the basin. After preliminary evaluation of the data and condition of the basin, we believe that the analytical tools that have already been developed, tested, and published for the Scott Valley Project (Foglia et al. 2013) can be modified and applied to the Butte Valley basin.
The following data will be incorporated into the water budget after its collection through the other outlined tasks in this application:

- Climate
    - Precipitation
    - Potential evapotransiration
- Streamflow
    - Daily streamflow data on creeks and streams
    - Subwatershed delineation
- Land use
    - Crops with crop coefficient
    - Irrigation method
    - Irrigation water sources
- Soil properties (digital USDA soil maps with properties)
    - Water holding capacity
- Hydrogeology

Previous tasks results will be used to prepare a stream (surface water) budget, a soil-plant-crop-landscape budget, and a groundwater budget for the Basin. Separate budgets will be developed for a typical wet year, a typical dry year, and for an average year. Seasonal budgets will be prepared as well for each of these year-types to illustrate both seasonal and interannual dynamics of the water budget.

Deliverable: (1) Document that outlines extraction sites, recharge and replenishment sites, water sources used for irrigation, and other information derived from the water budget, and (2) document outlining results of varied water year types.

Task 4 - Development of Sustainability Criteria: This task will include the work required to develop the protocols for achieving and/or maintaining sustainability throughout the Basin, and that information which will need to be included in the GSP. Through the work performed in the previous tasks the GSA will be able to determine if any undesirable results have been triggered within the Basin, and which

sustainability criteria are being met. Other tasks will include identifying approaches and projects that work towards achieving or maintaining sustainability criteria, such as winter recharge activities.

Subtask – Identify Potentially Undesirable Results and Met Criteria: Work under this subtask will include taking the information from the tasks above to identify and study criteria that are being met and how to best sustain these over the long-term through implementation of the GSP. This task will also identify and study potential undesirable results, and options to recover from these through the work completed in other task, whether it include additional groundwater monitoring, recharge programs, or other activities. Other work will include analyzing and determining which criteria is not applicable to the Basin, which should be easily justifiable based on work performed in the previous tasks.

Deliverable: (1) Documentation to be included in the GSP that outlines what undesirable results are being triggered within the basin, and what criteria are being met at a sustainability level.

Subtask – Minimum Thresholds and Measurable Objectives: Work under this task will include establishing minimum thresholds for a given criteria and certain locations throughout the basin. There will be assessments of risks that could lead to exceeding minimum thresholds, and ways to avoid or mitigate for these. These minimum thresholds would be included as part of the information provided in the GSP and would outline ways that the GSA will work with water users and others to maintain these minimum thresholds to achieve sustainability within the Basin.

Other work will include developing reasonable measurable objectives that can be included in the GSP and can be implemented through management actions and on-the-ground projects. These measurable objectives can outline how to maintain healthy groundwater levels, and adequate groundwater replenishment, among other things.. Measurable objectives will be important in helping to develop a path forward in future groundwater activities throughout the basin and how to include water users in future planning efforts.

Deliverables: (1) Document to be included in the GSP which outlines the minimum thresholds that were established by the GSA in coordination with the advisory board, water users and the public, and (2) way towards achieving these measurable objectives.

Task 5 - Monitoring programs, protocols, and networks: This task will include developing a program to go along with the GSP which will monitor conditions throughout the Basin and will provide a centralized program/location for groundwater data and information to be housed and managed. This task will also outline those activities that may be needed to assist in obtaining sufficient and accurate data regarding groundwater conditions and activities.

Subtask - Develop Basin-Wide Groundwater Sustainability Monitoring Plan: To meet the measurable objectives of groundwater sustainability, a long term monitoring plan, a monitoring program to collect data and monitor the basin is essential. The monitoring plan will include:

- Identification of a groundwater monitoring network by identifying the location of monitoring wells. The development of the network will involve analyzing whether existing wells can be used (sufficient well data and properly located) and whether new monitoring wells may need to be constructed.

- Update the current CASGEM program to include other monitoring activities, and possible addition of other monitoring wells. Updates the current program will include protocols for developing and analyzing reports, referencing them to the GSP to ensure that minimum thresholds are not being exceeded, and to determine the progress towards measurable objectives.
- Development of a database for assistance in organizing and collecting monitoring data for the basin.
- Provide a summary of the requirements of the Annual Report summarizing monitoring results and identification of the entity responsible for the monitoring (basin wide monitoring).
- Develop a stream gauging program for current stream gauging efforts and assess the need for additional stream gauging on the River and its tributaries.

Deliverables: (1) Document to be included in the GSP that outlines a monitoring plan for the basin, how it will be managed and updated, how reports will be submitted with the DWR, and how the plan will be coordinated with the water users into the future, and (2) document outlining how the monitoring plan will be utilized in the Basin.

Task 6: (Groundwater) Management Actions: Development, Assessment, and Implementation

Subtask - Develop Groundwater Management Programs: The GSA would perform projects similar to the Scott Valley Groundwater Recharge pilot study to assist in groundwater recharge development and study beneficial impacts to the Shasta River, when additional flows are needed during certain times in the year. This would include assessing the best options and locations for groundwater recharge, working with willing landowners, determining how much water can be applied to recharge the aquifer, studying transient time to the river, determining impacts to farming and ranching operations, and implementing recharge activities. This work is important to GSP development as it will help determine the best options available for on-ground projects to help maintain or attain sustainability over the long-term. Recharge will play a large role in groundwater management throughout California and the GSA would like to capitalize opportunities to better utilize excess winter flows that are not able to be stored within the Basin for times that it is critically needed.

Other would look at studying, exploring and implementing other projects to be utilized in the Basin such as in-lieu recharge, Beaver Dam Analogues, and other land and water management activities which would be beneficial for groundwater table levels, which will play a large role in the Basin's GSP. Current and ongoing water management projects occurring within the Basin will also be explored to assess the opportunity for future development and expansion.

Subtask - Develop groundwater replenishment and conjunctive use program: (e.g., Winter recharge)

Work under this subtask would include researching and developing a recharge pilot program within the Basin to explore the opportunities for recharge and replenishment. Information developed in the water budget would help determine the best options and locations for recharge, and those areas where recharge would be most beneficial. The GSA would explore a winter recharge pilot study similar to the one being conducted in the Scott Valley to study how much water can be applied to a given location, the potential impact to farming/ranching operations, and the potential for supplementing groundwater levels. This pilot study would work with willing landowners who are interested in performing recharge activities.

There would also be work towards expanding the pilot recharge study and determining what other recharge efforts are occurring throughout the Basin that could be attributed for in this program. Groundwater recharge is going to be an important component of the GSP and future activities, and an accurate accounting of these proactive activities is important to understand.

Deliverables: (1) Document outlining work associated with development of groundwater programs, and (2) information regarding their practicality and future implementation.

Subtask – Scenario Development: Work will include using budget scenarios to assess different scenarios and determine what the potential risks are of exceeding minimum thresholds. These scenarios may include:

- Any provided by DWR
- Any groundwater replenishment, augmentation, or other projects under consideration

Deliverable: (1) Technical Memorandum outlining budget inputs and outputs and results, with information regarding impacts to the minimum thresholds, measurable objectives, and sustainability criteria.

Subtask - Expand Groundwater Level Monitoring Program: Work in this task will build off other previous work and will identify those landowners who may want to be involved in groundwater monitoring, and identify options towards expanding groundwater monitoring if needed. This work will be done in complete collaboration with water user and their input into the approach and development of expanded groundwater monitoring. It is anticipated that portions of this work would include implementing some of the monitoring through on the ground work and equipment purchase but additional funds may be needed to fully implement, which would be determined as more information and opportunity become available, and would be obtained by the GSA. At this time this is a rough estimate of the work needed as more solid information will come to light during the data collection Task.

Deliverables: (1) Document outlining the needs and opportunities for groundwater monitoring, and (2) willing partners.

Subtask - Expand stream discharge and stream temperature monitoring: Work in this task will build off other previous work and will identify those areas where additional stream monitoring is needed and opportunities for achieving this. This work will be down in complete collaboration with water user and their input into the approach and development of expanded groundwater monitoring. It is anticipated that portions of this work would include implementing some of the stream gauging but additional funds may be needed to fully implement, which would be determined as more information and opportunity become available, and would be obtained by the GSA. At this time this is a rough estimate of the work needed as more solid information will come to light during the data collection Task.

Deliverable: (1) Document outlining the needs and opportunities for expanded stream monitoring.

Task 7 - Writing and Reporting of Documents: Work under this task will include taking the work and analysis completed in the previous tasks and developing this into a comprehensive GSP for the Basin which of the GSP for; which will be submitted to the DWR and will be made available for water users

and the publics review. The GSA intends to submit a GSP that can be utilized by not only the GSA and DWR, but can be used by those within the basin, and water users in their future planning efforts. The GSA is geared towards completing a document that is acceptable to both DWR and the Basin water users, and a GSP that can be easily understood, digested and implemented within the Basin. Work in pulling together and finalizing the GSP will require staff time, GSA time, advisory board time, County Counsel and County Administration time and working with any consultants/contractors hired throughout this process. The GSA also intends to work closely with DWR throughout the next several years and will submit a draft GSP at the 30%, 60% and 90% phases, prior to the final submittal on or before January 2022.

Deliverable: (1) GSP drafting and completion.