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## ATTACHMENT 3

### WORK PLAN

#### DRAFT FOR RESOLUTION: 10/16/2019

The following supplemental documentation is required and to be included in the beginning sections of the Work Plan as follows:

Grant Proposal Title: GSP Development and Critical Programs for Efficient and Effective Sustainable Groundwater Management under an Adaptive Management Approach

Applicant: Sierra Valley Groundwater Management District (SVGMD)

### PROJECT JUSTIFICATION

#### A. Project Description (maximum of 6 points possible)

##### Goals and Objectives

The goal of the proposed project is to create and begin implementing a vision to move Sierra Valley (Sierra Valley – Sierra Valley sub-basin 5-012.01) towards groundwater sustainability in a way that is cost effective, efficient and practical; protects and supports the regions unique ranching, environmental and ecological heritage; and complements and leverages regional efforts associated with improving land and water management, particularly in face of climate change pressures (e.g., increased droughts, increased fire, rising snow levels).

This proposal lays out a number of specific objectives to achieve the goal.

1. Develop a Groundwater Sustainability Plan (GSP);
2. Develop and implement a robust, defensible and cost effective data program;
3. Evaluate potential and novel adaptive management strategies and develop technical materials to promote consideration and adoption.

##### Background

Since the 1960s, groundwater levels, particularly for deeper groundwater approximately 300 feet or more below ground surface, have been in general decline in Sierra Valley (SV) due to pumping and overdraft. Aside from decreasing groundwater levels, groundwater overdraft has been linked to subsidence and loss of artesian wells. Dropping groundwater levels may also reduce surface flows in local streams and creeks as more stream reaches shift from gaining to losing stream reaches. Alterations to stream flows could impact local wildlife by changing habitat availability. SV has approximately 20,000 acres of wetland and 30,000 acres of montane meadow complex (FRLT, 2019). These waters benefit nearly 300 bird species, of which 25 are special status bird species, and over 1200 plant species, which represent 18% of California's flora (FRLT, 2019).

The new groundwater regulation in California, the Sustainable Groundwater Management Act (SGMA), mandates active monitoring and management of a groundwater basin's water resources. The regulation's goal is to achieve sustainability in a basin by preventing the significant and unreasonable occurrence of any of the six sustainability indicators: 1) groundwater level declines, 2) groundwater storage reductions, 3) seawater intrusion, 4) water quality degradation, 5) land subsidence and 6) surface water depletions. Groundwater Sustainability Agencies (GSAs) define when groundwater conditions become significant and unreasonable, at which point they become undesirable effects of groundwater use (DWR, 2016b).

The Sierra Valley Groundwater Management District (SVGMD) is the GSA for the SV Subbasin (DWR Basin 5-12.01) which includes representation by both Sierra and Plumas County supervisors. DWR (2019) designated the Subbasin a medium priority basin, due to the potential for undesirable effects, notably declining groundwater levels, subsidence and habitat loss. The SV groundwater basin received additional priority points for challenges to groundwater management outside the basin's control (e.g. precipitation, reservoir operations) (DWR, 2019).

Bachand et al. (2019a) have produced key hydrologic findings regarding SV hydrology and management opportunities and constraints:

- Water availability (groundwater, streamflow, rainfall and snowfall) is greater in the western and southwestern valley and lower in the northern, northeastern and eastern valley where irrigated agriculture is most prevalent.
- Water levels in wells drilled deeper into the aquifer are more sensitive to pumping and recharge than water levels in shallow wells. This effect likely results from fine grained low-permeability layers (aquitards) limiting downward flow into the deeper aquifer and retarding recharge and potentially pressurizing the deeper aquifer.
- Groundwater declines from historic conditions have occurred since the 1970s, resulting in a depression in groundwater elevations in the north and northeastern valley. Declines are primarily associated with deeper groundwater. Other factors such as seasonal and annual variance in precipitation and evapotranspiration (ET) affect both the groundwater pumping required for irrigation and groundwater inflow from the surrounding watershed. These and other considerations confound the relationship between groundwater pumping and groundwater declines.
- Frenchman Dam, constructed in the 1960s, has likely contributed to groundwater level declines by promoting agricultural growth with late season water availability and by limiting recharge by impounding spring flows.
- Deep and shallow groundwater elevations are much higher in the western and southwestern valley, which has not had the same history of long-term declines as the northeastern valley.
- The surface water channels in the west of the valley and the Smithneck Creek watershed likely have connectivity with shallow groundwater.
- Climate change will likely decrease late summer surface water availability, increase evaporative crop demand, and reduce groundwater recharge, all resulting in greater groundwater use.

Findings by others have shown subsidence has occurred in SV and implemented declining groundwater levels (XXXX).

### **Complexity complicates Modeling and Management thru Uncertainty**

Complex geology creates challenges to understanding and managing the valley's hydrology. A layering of fine-grained lacustrine silts and clays effectively creates shallow and deep groundwater zones and impedes vertical hydrologic connectivity. These fine-grained low permeability layers may restrict opportunities for infiltration recharge projects on the valley floor by limiting the rate and/or depth of water infiltration. Geologic features such as faults limit recharge flowing from the western valley to the northeast, thus forming boundaries for overdraft zones. Further, hydrologic flow paths from the surrounding watershed are not well characterized, introducing uncertainty associated with the volume, timing and locations of groundwater inputs into the basin (Bachand et al 2019a). In addition to these geologic considerations, a gradient of less precipitation and greater ET from west to east, annual variability on the timing and phase of precipitation, and future effects of climate change further complicate hydrologic analyses.

The total water budget for Sierra Valley is approximately XXX.<sup>1</sup> Bachand et al (2019b) estimate Sustainable Yield for the northern to eastern valley to be in the range of 5000 – 6000 Acre-Feet (AF), which is below the average annual groundwater pumping (8300 AF; 2000 – 2018) by about 40%. The temporal and spatial variability of precipitation, as well as unquantified groundwater inflows, create uncertainty in this estimate. The uncertainty also affects the utility of numerical models and other sophisticated modeling tools; errors associated with evaporation, precipitation, and subsurface flows transport likely exceed the magnitude of Sustainable Yield itself.

While models are useful and often invaluable tools for understanding a basin and predicting future basin conditions, in most cases, they are not the only available means for demonstrating that a basin has met its sustainability goal. Satisfactorily demonstrating that all undesirable results have been avoided and the sustainability goal has been met will be a function of the data collected and reported during GSP implementation.<sup>2</sup>

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<sup>1</sup> Kavas water budget information

<sup>2</sup> BMP 5 Modeling. December 2016. <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-5-Modeling.pdf>

## **Moving Forward Under Adaptive Management**

Given the hydrologic and geologic complexity found in Sierra Valley, the most promising approach towards sustainability will be –

1. Defining when sustainability indicators become undesirable results based upon criteria and thresholds that will define significant and unreasonable effects;
2. Identifying appropriate metrics as surrogates for the different sustainability indicators; and
3. Relying upon area data to guide adaptive management decisions.

## **Needs of the Proposed Project**

For this adaptive management approach in this complex system which lacks the financial resources of other agricultural areas in California more reliant on specialty crops, a number of needs are apparent:

### **1. Sustainability Vision and Goal**

A unified sustainability vision needs to be developed for Sierra Valley. Sierra Valley has a rich ranching heritage and also has rich environmental, ecological and cultural histories. The Feather River is considered a Wild and Scenic River, federally protected from impairments to flows and used regularly for recreation. SV has a rich history of wildlife utilizing wetlands, surface creeks and streams. Because of its biodiversity, many organizations recognize SV as a top conservation priority (e.g., TNC, 1999; Audubon, 2008; NRCS, 2016). Furthermore, native people of the Washoe and Maidu tribes claim SV as part of their ancestral territory and have an active role in the ongoing Upper Feather River Integrated Regional Water Management plan efforts (Waechter and Norton, 2002; Vestra, 2005; UFRRWGM, 2016).

Clearly, Sierra Valley is multi-dimensional and groundwater sustainability is an important issue for all. The establishment of conservation easements on many ranches throughout Sierra Valley<sup>3</sup> represent efforts towards a positive vision in Sierra Valley to protect both ranching and its culture, and the environment and ecological richness.

The Upper Feather River Watershed Integrated Regional Water Management Plan<sup>4</sup> represents another stakeholder driven collaboration which has brought together a wide range of local, regional, State and federal stakeholders to stabilize resource planning, management and coordination.

Developing a sustainability vision essentially needs to go beyond the specific groundwater sustainability goals mandated by SGMA to a broader vision of sustainability that considers sustainability of area natural resources; and sustainability and promotion of the culture and history that make Sierra Valley unique.

### **2. Defining defensible conditions under which Sustainability Indicators experience unreasonable and significant effects and thus become Undesirable Results.**

The Basin Prioritization for Sierra Valley classifies Sierra Valley as a medium priority basin primarily based upon groundwater reliance and level declines, measured subsidence, potential effects to surface water beneficial uses and groundwater dependent ecosystems, and area complexity in groundwater management, particularly as related to climate, hydrologic and management factors outside of local management controls.<sup>5</sup> Key sustainability indicators for Sierra Valley are thus groundwater levels and storage, subsidence and interconnected surface water. Water quality is discussed in the prioritization but falls into a more minor category.

A key need under this effort will be defining at what point effects become unreasonable and significant, resulting in sustainability indicators becoming undesirable results. Addressing this need will be required in the GSP process.

### **3. Effective, Efficient and Cost Effective Sustainable Management Criteria**

Sierra Valley has limited financial resources available. Ranching is the primary economic driver and the primary crops grown are hay crops. Thus, important for successfully implementing a sustainable groundwater management program will be that program being effective, efficient and cost effective. It will be important to develop a groundwater sustainability

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<sup>3</sup> XXXX RCPP project and State projects

<sup>4</sup> <http://featherriver.org/ufr-irwm-plan/>

<sup>5</sup> XXXX basin prioritization

program within the area's and stakeholder's economic constraints.

#### 4. Capacity Building

An important need for this project is capacity building for collecting, managing and analyzing data, and subsequently acting upon and documenting those actions. Results from capacity building need to provide sufficient, cost effective and defensible information and data to guide Adaptive Management strategies.

#### 5. Broader stakeholder engagement and the development of agreements.

The Basin Prioritization notes factors outside of the control of SVGMD complicates groundwater sustainability management. A broad group of stakeholders outside SGMA defined beneficial users have shared interest in groundwater sustainability actions and strategies. SV is at the headwaters of the Feather River, which provides water to the State Water Project through Lake Oroville. As identified in the basin reevaluation by DWR (2019), outside forces (e.g. Frenchman Dam operation, precipitation) have affected and continue to influence groundwater trends. The valley floor is predominantly privately owned, but 57% of the entire watershed is land publicly owned by the US Forest Service, Bureau of Land Management or California Department of Fish and Wildlife. Public land management to reduce forest fuels, restore forests and streams, and eliminate roads can benefit and potentially be leveraged with projects to improve regional groundwater conditions. Under SGMA, the federal government can enter into agreements with the GSA if there are shared interests in groundwater sustainability.

Broader stakeholder engagement inclusive of local, State and federal agencies and other organizations that affect groundwater management directly or indirectly is needed in Sierra Valley. Agreements, development of shared missions and priorities, and shared funding priorities are needed in Sierra Valley.

Progress has been made in the Upper Feather River Watershed under the IRWM development. Lessons and tools learned from those efforts need to be more effectively applied in Sierra Valley.

### **Tools for Development**

#### 1. Capacity Building Tools

Tools to aid in capacity building as related to collecting, managing and analyzing data are needed in Sierra Valley. These tools include:

- Standard Operating Protocols for data sampling, QAQC and storing
- Data Management System(s)
- Data analyses tools

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### **Components**

The Project includes three Components. Component 1 represents the work required to develop a legally defensible GSP. In general, Component 1 is expected to be led by a consultant team with expertise in implementing a defensible GSP and/or other similar regulatory documents. Component 2 covers implementation of infrastructure to upgrade the existing networks which are expected to need upgrades to meet the data standard for Adaptive Management. This Component focuses on providing the necessary data network creation and upgrade to support GSP data collection and analyses programs identified in Component 1. Component 3 represents a technical effort to provide technical information and data to promote better integration with area stakeholders through identifying potential multi-organizational, multi-mission opportunities. This component focuses on extending the reach and available human and financial resources of the GSP developed in Component 1 by defining and leveraging shared resource concerns.

#### **Component 1. Develop a Groundwater Sustainability Plan (GSP Development)**

GSP planning and development will provide the necessary information and meet the requirements as defined in the

legislation and summarized in DWR guidance document for GSP submittal:<sup>6 7</sup>

1. Introduction – Purpose, Sustainability Goal, Agency Information, GSP Organization
2. Plan Area and Basin Setting – Description (e.g., jurisdiction, water resources monitoring and management programs, land use elements, additional GSP elements, notice and communication); Basin Setting – current and historical, water budget, management areas.
3. Sustainable Management Criteria – Sustainability goal, measurable objective, minimum thresholds, undesirable results, monitoring network.
4. Projects and Management Actions to Achieve Sustainability Goal – Descriptions
5. Plan Implementation – estimated costs, schedule, annual reporting , periodic evaluations
6. References and Technical Studies
7. Necessary Appendices – coordination agreements, contact information, public meeting lists, groundwater model documentation, comments and responses.

Within this component is also Project Management. Project Management will include managing Component 1 and integrating and coordinating efforts under Components 2 through 3.

For Component 1, work in the basin has begun in developing the GSP<sup>8</sup> with primary focus on Sections 1 and 2 above. For this component there are a number of needs to be addressed and tools to be developed. These are discussed below and in some case reference work being conducted under additional components.

### **Component 2. Data Network Programs**

SV lacks sufficient data to fully understand groundwater impacts of current watershed management. A more robust monitoring network should be designed to provide sufficient coverage within a Management Area and to target sustainability indicators (e.g. groundwater level, subsidence) deemed to be at risk of becoming significant and unreasonable in that area. The GSA will define what constitutes significant and unreasonable with final approval by DWR upon review. These networks should leverage available data (e.g. California Statewide Groundwater Elevation Monitoring Program (CASGEM) wells, Interferometric Synthetic-Aperture Radar (INSAR) land surface deformation data, regulatory water quality programs currently in place).

This component focuses on upgrading the data networks for subsidence, groundwater monitoring, groundwater pumping, and groundwater dependent ecosystems.

These components are separated from GSP Planning and Development but will be integrated closely with XXX. This tasks focuses on upgrading and implementing the data network programs whereas Task XXX under the GSP focuses primarily on defining and identifying data gaps per XXXX of the GSP regulations.

These data networks will be critical for the proposed adaptive management approach.

### **Component 3. Adaptive Management Strategies Programs**

The goals of the component is to develop information necessary to promote local and regional adaptive management programs. These include defining financial burdens associated with different monitoring strategies and recommending approaches within the economic resources of the stakeholders; assessing opportunities for ranchers to improve irrigation efficiencies; and assessing the potential of larger scale watershed management programs (e.g. public land management and fuel reductions, reservoir operation changes, upstream recharge through restoration). These efforts seek to provide necessary technical information to promote coordinated, local and regional resource sustainability actions and programs.

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<sup>6</sup> Guidance Document for Sustainable Management of Groundwater, Preparation Checklist for GSP Submittal, Draft. November 2017. <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-6-Sustainable-Management-Criteria-DRAFT.pdf>

<sup>7</sup> Guidance Document for Sustainable Management of Groundwater, Groundwater Sustainability Plan (GSP) Annotated Outline, December 2016. [https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD\\_GSP\\_Outline\\_Final\\_2016-12-23.pdf](https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD_GSP_Outline_Final_2016-12-23.pdf)

<sup>8</sup> Sierra Valley Groundwater Management District. Sierra Valley Groundwater Sustainability Plan, Concept. Preliminary Draft. July 15, 2019 most recent version.

## **Coordination Efforts**

The Sierra Valley – Sierra Valley subbasin (5-012.01) is designated a medium priority basin under SGMA and is within both Plumas and Sierra Counties. The only adjacent sub-basin is Sierra Valley – Chilcoot 5-012.02. The Chilcoot subbasin is not designated a priority basin under SGMA. Thus, no coordination is needed with surrounding basins or within the basin for SGMA compliance.

Two GSAs are identified for the Sierra Valley sub-basin 5-012.01: SVGMD and Plumas Co. The SVGMD is the GSA for Sierra Valley – Sierra Valley sub-basin 5-012.01 that are within its boundaries. Serving on the 7-person SVGMD GSA board are a Plumas Co. Supervisor and a two additional Plumas Co. Appointees, a Sierra Co. Supervisor and two additional Sierra Co., and an at large appointment. Basin 5-012.01. Plumas Co. is the GSA for the small portion of the subbasin that extends outside of SVGMD boundaries. Plumas Co. is represented on the SVGMD Board. Plumas Co. also provides technical support to the SVGMD.

The SVGMD has identified the following interested parties as defined in Water Code Section 10723.2: All property owners in SVGMD and Sierra Valley Basin outside District; all Agricultural Producers; City of Loyalton; City of Loyalton Planning Commission; Sierraville Public Utilities District; Calpine Water District; Sierra County Water System; Plumas County Planning Department; Plumas County Planning Commission; Plumas County Flood Control District and Water Conservation District; Sierra County Planning Department; Sierra County Planning Commission; Sierra County Flood Control and Water Conservation District; US Forest Service; BLM; Grizzly Ranch CSD; California Dept. of Fish & Wildlife; Plumas Audubon Society; The Nature Conservancy; Plumas-Sierra Community Food Council; Plumas-Sierra Cattlemen's Association; Farm Bureau (local); Tribal contact lists (Mountain Maidu, Washoe); and the Sierra Valley Watermaster.

## **Previous SGM Program Funding (Round 2)**

No funding was received under Round 2.

## B. Project Benefits (maximum of 2 points possible)

### Tribes and DAs within the basin

The entire Sierra Valley sub-basin (the benefit area) is located about 40 miles north of Truckee and within both Plumas and Sierra Counties. The entire sub-basin is classified as a Disadvantaged Community (DA) under a census tract analyses (Attachment 6):

- Census Tract 3 in Plumas Co. has median incomes at 65% at 2016 California's Median Household Income (MHI); and
- Census Tract 100 covering Sierra Co. has median incomes at 69% of 2016 MHI.

Specific areas are identified as DAs under block group and places scale analyses. Loyalton and Sierra Brooks are classified as meeting DAC thresholds. 2012 – 2016 ACS data is not available for Sattley, Calpine, Sierraville and Chilcoot-Vinton. Block Groups with DAC status cover Loyalton, Sierra Brooks, Sattley and Sierraville.

The Washoe and Maidu tribes claim SV as part of their ancestral territory and have representation in the Upper Feather River Regional Water Management Group.

No SDAC are identified within the benefit area.

### Benefits List and Applicability to Tribes and DAs

- **Universal vision for groundwater sustainability.** Under the GSP Planning and Development, a universal vision for sustainability will be developed through the facilitation and engagement process. This vision for groundwater sustainability reaches provides stakeholders and beneficial users to participate in prioritizing Sustainability Indicators throughout the sub-basin and being included in the discussion of what represents significant and unreasonable effects. The process to develop this vision will include discussion beyond agricultural users and pumping and will include issues related to domestic wells used to supply drinking water as related to both groundwater level and groundwater quality; effects of subsidence on public well life and condition; and groundwater pumping effects on groundwater dependent ecosystems, such as marshes and wetlands in Sierra Valley which are critical to the flora and fauna. These benefits are relevant to tribes and DAs because of drinking water conditions, public health and environmental and ecological benefits. This vision will be developed beginning during Facilitation and Outreach (Tasks 2) and finalized in the publication of the GSP under (Task 6). Implementation of a universal vision with benefits across the sustainability indicators potentially provide employment opportunities (e.g., regulatory, recreation)
- **Extensive impact/vulnerability assessments in all Management Areas and DAs.** The GSP process conduct an impact and vulnerability assessment throughout the entire sub-basin and within Management Areas. This analyses covers DAs at census tract level but also will assess smaller communities that have been identified as DAs specifically in block and place analyses. These analyses will be integrated with and leverage other environmental and public health programs in the basin. These analyses conducted in Task 9 will directly benefit DAs. Input will be possible during Facilitation and Outreach (Task 2) during workshops and also as part of TACs.
- **Inclusion on TACs.** DAs, tribes, other community members and their representatives and spokespeople will be able to provide feedback through the entire process through participation in TACs. TACS will be conducted under the Facilitation and Outreach (Task2) and provide feedback on all technical GSP tasks. The projects will have different TACs that cover different GSP tasks. The development of different TACs will enable stakeholders and beneficial users to focus their time and energy on GSP tasks important to them. TAC feedback will be tracked and documented through the GSP process and for all Components discussed in this application.
- **Participation in workshops.** DAs, tribes, other community members and their representative and spokespeople will have the opportunity to participate in workshops. Some workshops will primarily be to provide information to the public in order to inform and maintain transparency, and some workshops will primarily for consensus building and decision making. Workshops will be tracked and documented through the GSP process and for all Components discussed in this application.
- **Greater integration of local, State and federal agencies.** GSAs under SGMA serve the purpose to integrate groundwater sustainability and related factors under a single organization. Essentially, the GSP compiles and develops a unified vision and action plan. At Sierra Valley, this effort is expected to include other resource

- management agencies. The integration of these agencies should benefit DAs and others by improving public health and help address environmental justice issues.

- **Capacity Building and Employment Opportunities.** This project represents a significant effort to improve resource management in Sierra Valley. Capacity building includes development of tools for efficiently implementing the GSP. Part of this effort will be determination of a funding level to implement a program (Task 16). This funding will support salaries and benefits for trained, high skilled position(s). The level of funding will determine how the funding is distributed and how many people will be funded. Regardless, this funding represents potential employment opportunities in Sierra Valley.

## Letters of Support

Letters of Support for the project are being supplied by:

- Plumas Co. – submitted by Plumas
- Sierra Co. – submitted by Jenny
- UFR – in prep by Uma
- Calpine – Jenny requesting – want to mention engagement and involvement and expected longterm benefits to drinking water supplies
- Sierra Brook - Jenny
- Sierraville – Jenny
- FRLT – Kristi
- Northern Sierra Partnership – Kristi
- Tribes – Leah. We could provide complete and suitable template and need just a signature of a representative
- Plumas FS – Would be good to note in this letter importance of sustainable resource management and that is consistent with the GSP process and interest in engagement in the process. This can be signed by a representative of the FS
- Loyaltan and Sierra Brooks? Is there someone representing them that we can approach

These Letters are where XXXX?

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**C. Technical Expertise (maximum of 5 points possible)**

Applicants must provide an explanation of their “Technical Need” for each proposed project. For example, the applicants may provide a justification of how this funding could assist in development of a monitoring network. The applicant must provide documentation that tasks associated with implementation components in the Work Plan will be prepared by or under the direction of a professional geologist or professional engineer, per Public Resources Code § 354.12 Subarticle 2.

The explanation for each proposed project must not exceed 3 pages using a minimum Arial, 10-point type font.

1. (3 points) Demonstrate the appropriate experience, knowledge, and skills necessary to complete the project.
  - Explain the different roles and responsibilities of the GSA(s) and cooperating entities within the GSAs. Expand to multiple GSAs within the same basin if separate GSPs are being developed.
  - Provide a description of successfully completed water bond grants (at DWR or other state agencies).
  - Provide a description on the experience with completing large-scale planning documents successfully and the outcome of those efforts.
  - Provide documentation that the required work within the GSP will be prepared by or under the direction of a professional geologist or professional engineer with the experience required to complete those tasks.
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2. (2 points) Provide assurances that the team selected knows what needs to be completed to meet Sustainable Groundwater Management Act (SGMA) regulations, and DWR requirements in the development of a GSP.
  - Provide letter of support from other GSAs surrounding the basin and within the basin supporting the efforts, per Section E. of this template, or explain why letters of support are not possible.
  - Provide assurances that the applicant will have a completed GSP that is adopted and submitted to DWR for review by the required due date.

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**TO BE COMPLETED**

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Work on this project will be completed through a competitive bid process. Important goals of this bid process will be –

- To develop a competitive and competent team;
- To incorporate local experts and specialist who have local knowledge, networks and institutional knowledge;
- To bring in a team with past experience in the regulatory requirements and process associated with developing a GSP or similar regulatory documents;
- To be cost competitive (but not necessarily the lowest bid);
- To have broad expertise across the scientific disciplines of geology, hydrology, climate, agriculture, water quality, and aquatic ecosystems;
- Has regulatory experience as related to water quality, wetlands and public health.
- To include professional facilitators;
- Has experience engaging and collaborating with tribes and disadvantaged communities.
- Professional Geologist or Engineers
- Others XXXX

Four general experts are needed:

- Environmental Engineering and Environmental Science Firm(s) (Environmental Lead). An Environmental Engineering and Environmental Science Firm(s) (Environmental Lead) is expected to lead all regulatory and administrative efforts associated with development of the GSP. These tasks are primarily tasks associated with project management and administration, regulatory compliance and planning, report development
- Science Team
- Facilitation
- Outreach.

Describe Bidding Process - XXXX

Describe support as IRMW project from Plumas Co.- XXXX

## PROJECT DETAILS

### D. Scope of Work and Deliverables (maximum of 3 points possible)

#### a. Scope of Work

##### Overview

The Scope of Work describes tasks included in Component 1, 2 and 3. Component 1 represents the work required to develop a legally defensible GSP. In general, Component 1 is expected to be led by a consultant team with expertise in implementing a defensible GSP and/or other similar regulatory documents. Component 2 covers implementation of infrastructure to upgrade the existing networks which are expected to need upgrades to meet the data standard for Adaptive Management. Component 3 represents a technical effort to provide technical information and data to promote better integration with area stakeholders through identifying potential multi-organizational, multi-mission opportunities.

##### Component 1. GSP Development

Component 1 is for GSP Development. Within Component 1 –

- Task 1 is for Project Administration,
- Task 2 is for Stakeholder Engagement,
- Tasks 3 through Task 5 are for Capacity Building,
- Task 6 through Task 11 are for GSP Planning and Development

This component will be led by a consultant team with expertise in implementing a legally and scientifically defensible GSP and/or other similar regulatory documents.

##### Project Administration

###### 1. Project Management and Administration

This task will be led primarily by GSA staff with GSA Board and Board committee oversight and with consultant support. It provides program supervision and coordination of the project team for the duration of the work to ensure the GSP preparation project is completed within cost, schedule and quality constraints and produces a work product that leads to successful attainment of the sustainability goal. This task will consist of the following activities:

1. Day-to-day project management during the project.
2. Regular tracking and control of task progress and costs, including the development and maintenance of project and task-level schedules and budgets.
3. Periodic project status meetings with DWR, consulting teams, and other agencies as necessary.
4. Preparation of quarterly and final progress reports.
5. Preparation and submittal of invoices.

##### Stakeholder Engagement

## 2. Facilitation Support and Outreach

### 2.1. Facilitation Support

Facilitation support will be led by a professional facilitator with staff support through this project including GSP adoption by January 2022. Facilitation support will be consistent with DWR BMP recommendations and guidelines.<sup>9,10</sup> Facilitation supports multiple tasks throughout GSP development and will ensure that:

1. Work is completed in an open, inclusive, and collaborative manner toward the development of a GSP.
2. The GSP is developed in an inclusive process for all interested parties.
3. Interested parties meet regularly and work diligently toward a clear and defined goal.
4. Meeting spaces are suitably located and sized.

This task will include the following activities:

1. Identification and engagement of interested parties.
2. Meeting facilitation (public, intra-basin, inter-basin).
3. Interest-based negotiation/consensus building.

### 2.2. Outreach

XXXXXX to be filled in

### 2.3. Technical Advisory Committees

XXXX to be filled in

## Capacity Building

Tasks under Capacity Building are consistent with GSP regulations and proposed content.<sup>7</sup>

### 3. Monitoring Protocols (§352.2)

This task relates to Article 3 of the GSP Regulations: Technical and Reporting Standards and will be led by a consultant with staff direction and support. Existing protocols will be evaluated relative to the SGMA BMP for Monitoring Protocols, Standards, and Sites and GSP Regulations and updated as needed to ensure compliance with SGMA.<sup>11</sup>

This task will include the following activities:

1. Identify and compile existing monitoring protocols currently in use in the subbasin.
2. Review and update monitoring protocols as needed for consistency with best management practices (BMPs) and GSP regulations.
3. Verify monitoring protocols and reporting plans and schedules comply with Data and Reporting Standards

### 4. Data and Reporting Standards (§352.4)

This task is related to Article 3 of the GSP Regulations, Technical and Reporting Standards, and will be led by a consultant

<sup>9</sup> Stakeholder Communication and Engagement, January 2018. <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Documents-for-Groundwater-Sustainability-Plan---Stakeholder-Communication-and-Engagement.pdf>

<sup>10</sup> Engagement with Tribal Government, January 2018. <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Documents-for-Sustainable-Management-of-Groundwater---Engagement-with-Tribal-Governments.pdf>

<sup>11</sup> Monitoring Protocols, Standards, and Sites. December 2016. <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-1-Monitoring-Protocols-Standards-and-Sites.pdf>

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with staff direction and support.

1. Prepare a summary and discussion of Data and Reporting Standards for inclusion in the GSP.
2. Review compiled existing data to be used in the GSP preparation and stored in the GSP data management system (DMS) for compliance with the Data and Reporting Standards. Correct, reformat and qualify, as necessary, through QAQC (quality assurance / quality control).
3. Determine data gaps resulting from non- or partial compliance with Data and Reporting Standards and develop data gap action plan.
4. Coordinate regulatory needs for addressing data gaps with technical assessment of opportunities, approaches and strategies conducted under Component 2.
5. Fill high priority data gaps to support GSP development.

#### 5. Data Management System (DMS) (§352.6)

This task is related to Article 3 of the GSP Regulations: Technical and Reporting Standards and will be led by a consultant with staff direction and support. The DMS developed is expected to include –:

- Development of specifications for initial design of DMS.
- Development, testing, and implementation of high priority quality control procedures.
- Compilation and import of high priority data to preliminary, non-proprietary DMS capable of future porting to other platforms.

DMS development will be completed during GSP preparation and will be informed by DWR reporting requirements, as well as DWR guidance documents. Final evaluation of DMS options will build upon the initial evaluation and will consider a range of available options, including proprietary systems, open-source systems developed by DWR or others, and custom applications.

This task will include the following activities:

1. Define DMS System specifications and requirements: e.g., data types, temporal and spatial requirements, data import needs. This assessment will be conducted in collaboration with technical efforts conducted under Component 2 to ensure approaches are taken to maximize the value of collected data.
2. Development, testing, and implementation of quality control procedures.
3. Compilation and import of high priority data to preliminary, non-proprietary DMS capable of future porting to other platforms.
4. Evaluate range of DMS options for long-term implementation, including proprietary, open source, and custom applications.
5. Select and implement DMS.

### **GSP Planning and Preparation**

#### 6. GSP Document Preparation and Adoption

This task will be led by a consultant with staff direction and support. The draft GSP will be assembled for public review by compiling various sections of the GSP, including review of each section to ensure that all required GSP content is included. GSP copies will be reproduced as needed to facilitate stakeholder review. GSP availability will be advertised within the sub-basin and within the Upper Feather River Watershed. Comments will be gathered and considered, and responses will be developed and when appropriate incorporated into the GSP. Additionally, this task will include facilitation of adoption of the GSP at one or more public hearings. This task will include the following activities:

1. Assemble draft GSP.
2. Distribute GSP for public review, gather, consider, document, and when appropriate incorporate public comments, and facilitate GSP adoption by GSAs.

#### 7. GSP Administrative Information (Subarticle 1)

This subtask is related to Article 5 of the GSP Regulations: Plan Contents, Subarticle 1 Administrative Information, and will be led by the consultant with staff support. Facilitation support will be utilized during this process, however these services

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will be completed and reported under Task 2. Subtasks are described below.

#### 7.1. **General Information (\$354.4)**

The goal of this subtask will be to track and incorporate references and past and current technical studies and develop an executive summary near the projects completion to provide and overview of the GSP. This subtask will include the following activities:

1. Compile and prepare list of references and technical studies relied upon.
2. Prepare executive summary.

#### 7.2. **Agency Information (\$354.6)**

This subtask is related to Article 5 of the GSP Regulations: Plan Contents, Subarticle 1, Administrative Information, and will be led by a consultant with staff direction and support. Agency information as required by the GSP regulations will be prepared primarily by staff at the start of GSP development. The estimate of GSP implementation costs will be prepared late in GSP development once activities to be conducted in implementing the GSP are better understood (monitoring, reporting, projects and management actions, etc.) and will likely be led by a consultant. This subtask will include the following activities:

1. Prepare summary of Agency information.
2. Prepare estimate of implementation costs.

#### 7.3. **Description of Plan Area ((\$354.8)**

1. Prepare map(s) of plan area, including GSAs; adjacent basins; adjudicated and alternative GSP areas; other jurisdictional boundaries; land uses, water use sectors, and water source types; well densities for ag, industrial, and domestic wells.
2. Prepare written description of plan area, including a summary of the jurisdictional areas and other features depicted on the map(s).
3. Describe existing water resource monitoring and management programs, including integration into monitoring network.
4. Describe how existing programs may limit operational flexibility.
5. Describe conjunctive use programs.
6. Describe land use elements in plain language including summary of general plans and specified considerations related to GSP development and implementation.
7. Describe additional GSP elements determined to be appropriate.

#### 7.4. **Notice and Communication (\$354.10)**

This subtask will include the following activities:

1. Describe beneficial uses and users.
2. Develop database of stakeholders for purposes of outreach and notification.
3. Compile list of public meetings related to GSP development.
4. Compile public comments received and responses by GSAs.
5. Prepare communication section describing GSA decision-making process, public engagement process, encouragement of active involvement, notification method(s) and process.
6. Conduct outreach activities, including regular stakeholder meetings.

#### 8. **Basin Setting (Subarticle 2)**

This task consists of all activities required to prepare GSP Basin Setting Information as described in Article 5, Subarticle 2 of the GSP Regulations, Subarticle 2: Basin Setting. Work will be led by the applied science team with consultant and staff support. Subtasks are described below. This task will rely upon appropriate DWR BMPs for guidance and be conducted in collaboration with DWR staff and experts as needed.

### 8.1. **Hydrogeologic Conceptual Model (HCM) (§354.14)**

This subtask includes the preparation of a descriptive hydrogeologic conceptual model of the basin:

1. Prepare written description of the basin including:
  - a. Regional geologic and structural setting.
  - b. Lateral basin boundaries and major geologic features potentially affecting groundwater flow.
  - c. Definable bottom of basin and base of freshwater.
  - d. Principal aquifers and aquitards, including formation names, physical properties (aquifer parameters), structural properties, general water quality, primary groundwater uses and users.
  - e. General description of consumptive water users and water sources
  - f. Primary data gaps and uncertainty.
2. Prepare graphical depiction of the HCM illustrating major features of the hydrologic system relevant to the water budget and flow
3. Compile and/or prepare at least two scaled cross-sections depicting major stratigraphic and structural features in the subbasin.
4. Prepare map(s) depicting the following:
  - a. Topography.
  - b. Surficial geology.
  - c. Surface soil characteristics.
  - d. Existing and potential recharge areas and discharge areas.
  - e. Significant surface water bodies.
  - f. Sources and points of delivery for imported supplies.

### 8.2. **Current and Historical Groundwater Conditions (§354.16)**

A description of current and historical groundwater conditions will rely on the best available information including data from the Department. This subtask will include the following:

1. Develop groundwater elevation maps and hydrographs demonstrating flow directions, lateral and vertical gradients, and regional pumping patterns, and changes in groundwater elevations over time for the principal aquifers in the subbasin.
2. Develop graphs estimating annual and cumulative change in groundwater storage, including annual use and water year type.
3. Describe and map groundwater quality issues, including known contamination sites and plumes.
4. Describe and map land subsidence.
5. Identify interconnected surface water and estimate quantity and timing of depletions.
6. Identify groundwater dependent ecosystems (GDEs).

### 8.3. **Water Budget Information (§354.18)**

This subtask will rely upon existing information developed for the area to define the water budget. Significant effort has been made in the basin and watershed to define the water budget. Complexity has resulted in uncertainty. This has been discussed in the earlier section of this work plan. This subtask will include the following activities:

1. Quantify historical and current water budget components.
2. Determine change in annual groundwater volume between seasonal high conditions
3. Determine if overdraft conditions exist
4. If overdraft exists, quantify overdraft using data from years with average conditions
5. Estimate and provide uncertainty and boundaries on sustainable yield.
6. Identify sources of uncertainty and error and quantify as able.
7. Evaluate historical water budget data and its utility for assessing future water budgets and sustainable yield

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- 8. Assess potential climate change issues and uncertainty. Use DWR guidance materials<sup>12</sup> and other peer reviewed materials
- 9. Use available materials and data to project future changes in water budget over 50 years.

#### 8.4. **Management Areas (§354.20)**

The creation of management areas may facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, given that undesirable results are defined consistently throughout the basin. This subtask will include the following activities:

1. Consider and define management areas as necessary.
2. Describe the following for each management area:
  - a. Reason for creation.
  - b. Minimum Thresholds (MTs) and Measurable Objectives (MOs) based on undesirable results defined with basin-wide consistency, as developed under Task 12, Subtasks 2 through 4.
  - c. Level of appropriate monitoring and analysis.
  - d. Explanation of how management area operations will not cause undesirable results in adjacent areas.
3. Prepare maps and descriptions to describe conditions in each management area.

#### 9. **Sustainable Management Criteria (Subarticle 3)**

This task will be completed in accordance with GSP Sustainable Management Criteria as described in Article 5, Subarticle 3: Sustainable Management Criteria and under the guidance of appropriate BMPs<sup>13</sup>. This task will be led by the applied science team with support from the consultant and staff. Sustainable Management Criteria define conditions that constitute sustainable groundwater management for the basin, including the process for characterizing undesirable results, establishing minimum thresholds, and defining measurement objectives for each applicable sustainability indicator.

##### 9.1. **Sustainability Goal (§354.24)**

The plan will establish a sustainability goal that culminates in the absence of undesirable results within 20 years. This will be done through the following activities:

1. Prepare general description of sustainability goal.
2. Describe information from basin setting used to establish goal.
3. Describe measures to ensure operation within sustainable yield.
4. Describe how sustainability goal is likely to be achieved within 20-year planning horizon, and then maintained.

##### 9.2. **Undesirable Results (§354.26)**

Undesirable results occur when significant and unreasonable effects for any sustainability indicator are caused by groundwater conditions. Activities are as following:

1. Describe processes and criteria to define undesirable results (URs)
2. Describe existing or potential URs and their causes, including:
  - a. Quantitative criteria based on a combination of minimum threshold (MTs) exceedances to define when and where URs occur.
  - b. Potential effects of URs on the beneficial uses and users of groundwater, land uses property interests and other potential effects.

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<sup>12</sup> Resource Guide for Climate Change Data and Guidance. August, 2018. [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Resource-Guide-Climate-Change-Guidance\\_v8.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Resource-Guide-Climate-Change-Guidance_v8.pdf)

<sup>13</sup> BMP 6 Sustainable Management Criteria DRAFT. November 2017. <https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents>

### 9.3. **Minimum Thresholds (§354.28)**

Minimum thresholds quantify groundwater conditions for sustainability indicators. Activities are as follows:

1. Establish MTs at representative monitoring sites that will avoid Significant and Unreasonable Conditions (SUCs).
  - a. Describe and justify SUCs for each sustainability indicator
  - b. Select representative monitoring site(s) for each SUC
2. Describe MTs, including:
  - a. Information and criteria to establish and justify MT.
  - b. Relationship between MTs for each sustainability indicator.
  - c. How MTs have been selected to avoid URs in adjacent basins.
  - d. How MTs may impact other beneficial uses and users of groundwater or land uses and property interests.
  - e. How other (State, Federal, etc.) standards relate to MTs.
  - f. How each MT will be quantifiably measured
  - g. How MTs satisfy requirements specific for each sustainability indicator.

### 9.4. **Measurable Objectives (§354.30)**

Measurable Objectives (MOs) and Interim Milestones (IMs) will be established through a collaborative, public process informed by technical data and analysis based on the basin setting, monitoring results, and other information. This subtask will include the following activities:

1. Establish MOs and 5-year IMs for each sustainability indicator.
2. Describe establishment of reasonable margin of operational flexibility.
3. Describe reasonable path to sustainability for 20-year planning horizon.

## 10. *Monitoring Networks (Subarticle 4)*

This task consists of all activities required to prepare GSP Monitoring Network information as described in Article 5, Subarticle 4: Monitoring Networks and will be led by a consultant with staff direction and support. This task will use appropriate BMPs<sup>14</sup> to guide work and be completed in collaboration with DWR experts and staff. Note existing monitoring networks are expected to be insufficient and the expected upgrades to those networks are described in Component 2.

### 10.1. **Monitoring Network (§354.34)**

This subtask will define the monitoring network required for each relevant sustainability indicator and conducted at appropriate scale (e.g., sub-basin, management area):

1. Define sustainability indicators and planning considerations of the GSP and sustainability goal
2. Describe the quantitative measurable objectives and minimum thresholds for each of the sustainability indicators
3. Describe data necessary to evaluate the sustainability indicators and other GSP requirements
4. Define the boundaries of the study area
5. Determine how the quantitative sustainability indicators will be evaluated
6. Determine data quality needed to yield accurate and reliable analyses and thus achieve objectives
7. Determine how these data should be collected. Existing data sources will be used when possible. Develop monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate GSP implementation.
8. Prepare map(s) and table(s) describing the location, type, monitoring frequency, and purpose of each site.

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<sup>14</sup> Monitoring Networks and Identification of Data Gaps. December 2016.

[https://water.ca.gov/LegacyFiles/groundwater/sqm/pdfs/BMP\\_Monitoring\\_Networks\\_Final\\_2016-12-23.pdf](https://water.ca.gov/LegacyFiles/groundwater/sqm/pdfs/BMP_Monitoring_Networks_Final_2016-12-23.pdf)

#### 10.2. **Representative Monitoring (§354.36)**

This subtask will determine the utility and approach for representative monitoring and/or other approaches for data collection and its assessment:

1. Designate representative monitoring sites or other measures to improve data collection and assessment.
2. Evaluate adequacy of groundwater levels as proxy for other sustainability indicators.
3. Describe adequacy of sites to represent general conditions in area.

#### 10.3. **Assessment and Improvement of Monitoring Network (§354.38)**

Monitoring network will be assessed in accordance with GSP regulations and appropriate DWR BMPs and in collaboration with DWR experts and staff:

1. Update initial data gap action plan.
2. Evaluate uncertainties and potential effect on GSP success.
3. Modify frequency and density of monitoring sites, as needed.

#### 10.4. **Reporting Monitoring Data to the Department (§354.40)**

This subtask will include the following activities:

1. Review DWR forms for reporting of monitoring data.
2. Format monitoring data and/or develop reports aligned with DWR requirements.

#### 11. **Projects and Management Actions (§354.44)**

This task is related to Article 5 of the GSP Regulations: Plan Contents, Subarticle 5: Projects and Management Actions (PMAs) will be led by a consultant with staff direction and support. PMAs are identified to achieve the sustainability goal for the basin. Identification and discussion of PMAs in potential areas of concern will be initiated early in GSP development through a collaborative, public process. Potential PMAs will be further assessed and selected based on the potential impact the PMA may have on sustainability, based on the best available information, best available science and accounting for uncertainty. This task will include the following activities:

1. Develop projects and management actions (PMAs) to achieve sustainability goal as needed.
2. Describe PMAs, including:
  - a. List of PMAs and associated MOs, including circumstances for implementation/termination and processes for determining associated conditions that have occurred and for notifying the public and other agencies.
  - b. Quantification of demand reduction or other methods to reduce overdraft.
  - c. Required permitting and regulatory processes.
  - d. Status of each PMA, including timeline for implementation and accrual of benefits.
  - e. Explanation of PMA benefits and process for evaluation.
  - f. Explanation of how PMA will be accomplished, including source and reliability of additional supplies.
  - g. Description of required legal authority.
  - h. Description of estimated cost and financing.
  - i. Description of management of extractions and recharge to ensure lowering of groundwater levels during drought is offset by increases during other periods.

### **Component 2. Data Network Programs**

Component 2 focuses on implementing different data network components to develop the necessary infrastructure for GSP implementation.

#### 12. **Implement Subsidence Network**

The goals for the subsidence monitoring network will be to leverage DWR INSAR data for tracking subsidence in Sierra Valley as related to significant and unreasonable effects as defined under GSP development. This task will be conducted in collaboration with GPS planning and development efforts under Component 1 and with DWR experts and staff as needed.

- 1. Define and map subsidence measurement areas needed to address significant and unreasonable subsidence identified under Task XXXX of Component 1.
- 2. Develop monitoring strategy to leverage and ground-truth INSAR. Strategy will be defined both spatially and temporally. Validate approach with DWR and secure approval by SVGMD.
- 3. Identify expected data and its processing based upon data and DMS defined in Task XXXX of Component 1.
- 4. Define any additional data processing tools for including in Task XXX of Component 1.
- 5. Develop reporting structure draft and necessary Standard Operating Procedures (SOPs) and confirm with DWR and SVGMD.
- 6. Finalize reporting structure, maps and SOPs.

### 13. Implement Groundwater Well Monitoring Network utilizing CASGEM

The goals for the groundwater monitoring network will be to 1) leverage and utilize available CASGEM and available private well data to maximize the value of well data for groundwater management; 2) minimize costs for new well installations and 3) develop appropriate methods and tools for cost effective and defensible groundwater monitoring to satisfy SMGA compliance needs. This task will be conducted in collaboration with GSP planning and development efforts under Component 1 and with DWR experts and staff as needed.

- 1. Review previous materials on assessing CASGEM wells and associated meta data: e.g., well depth, screening data, status. Consider private wells not currently in CASGEM network if well information is readily available.
- 2. Review current monitoring wells and identify spatial data gaps.
- 3. Identify potential CASGEM and/or other private wells for inclusion in SVGMD monitoring network.
- 4. Develop SOP and associated data management or analyses tools for well monitoring: e.g., frequency, relation to shallow and deep aquifer, instrumentation, monitoring frequency, data management and analyses. Gain approval by DWR and SVGMD.
- 5. Update CASGEM and District well information data.
- 6. Finalize SOP and associated data management and analyses tools. Include recommendations and justifications for new well installations.

### 14. Standardize and Implement Agricultural Pumping Program

The goals for the pumping program will be to 1) develop a standard method for flow monitoring programs in order to develop more defensible and complete groundwater pumping data; 2) develop a program that includes temporal records that can be linked with groundwater monitoring data in order to track relationships; and 3) provide funding to farmers/ranchers requiring a cost share to upgrade agricultural pumping. This task will be conducted in collaboration with GSP planning and development efforts under Component 1 and with DWR experts and staff as needed. The program will be designed based upon NRCS EQIP programs.

- 1. Develop SOPs for agricultural pump flow metering. Include SOPs for upgrades to current systems and for new installations. Specify equipment.
- 2. Develop cost share program: e.g., identify scoring criteria for awarding funds based on identified GSP needs and requirements; develop match requirements; identify preferred vendors and secure group discount from preferred vendors.
- 3. Conduct outreach solicitation to farmers.
- 4. Contract with farmers for funding. Provide necessary technical support. Track progress. Validate and certify installations.
- 5. Provide funds to farmers for installations upon completion and certification.

### 15. Implement Program for Groundwater Dependent Ecosystem Monitoring

The goal of this program will be to develop and implement an appropriate and cost-effective monitoring strategy in collaboration with efforts under Component 1. Sierra Valley has far-ranging environmental and ecological value as discussed earlier in the Work Plan (XXXXX). These values are proportionally above those of most SGMA designated groundwater basins. Further, area hydrologic and geologic complexity increase costs associated with monitoring. This program provides an avenue for broader solution consideration, development of appropriate monitoring strategies, and outreach to stakeholders specific to this need.

- 1. Develop monitoring strategy alternatives and define their costs, limits and opportunities. Develop process for selecting strategy. Discuss strategies and alternatives with DWR during development.
- 2. Conduct two outreach workshops to review opportunities and to solicit feedback from stakeholders. Discuss process for selecting strategy. Document feedback.
- 3. Approach potential funding partners to discuss funding opportunities and actions that might promote greater support.
- 4. Based upon above actions and to comply with SGMA, identify monitoring strategy.
- 5. Design infrastructure for monitoring.
- 6. Install infrastructure.
- 7. Develop necessary data collection, management and analyses SOPs and tools.

### **Component 3. Adaptive Management Strategies Programs**

The goals of this component are to develop information necessary to promote local and regional adaptive management programs. These include defining financial burdens associated with different monitoring strategies and recommending approaches within the economic resources of the stakeholders; assessing opportunities for ranchers to improve irrigation efficiencies; and assessing the potential of larger scale watershed management programs (e.g. public land management and fuel reductions, reservoir operation changes, upstream recharge through restoration). These efforts seek to provide necessary technical information to promote coordinated, local and regional resource sustainability actions and programs.

#### **16. Financial and Economic Resources Assessment**

The goal of this task will be to provide boundaries on the cost of the longterm GSP monitoring and implementation program to be defined by the GSP. Sierra Valley has limited financial resources and any sustainable effort needs to also be economically sustainable. If monitoring is too expensive, the only solution for Sierra Valley will be the loss of a significant amount of agriculture. Thus, consideration of solutions requires understanding financial constraints and limitations. This task will develop cost structures for monitoring based upon best available data and also estimate funding levels that still allow agriculture to be economically sustainable.

- 1. Estimate monitoring program and data management and analyses costs. This estimate will consider alternatives for different levels of monitoring, different approaches and different equipment. The monitoring programs will consider likely approaches for monitoring the different sustainability indicators that are identified or at risk of becoming significant and unreasonable. The analyses will recommend cost savings methods. The assessment will solicit input from DWR to determine potential limits, opportunities of different approaches.
- 2. Outreach workshop to ranchers and other stakeholders to discuss potential costs, likelihood for meeting funding needs and potential opportunities for cost share across agencies or other organizations.
- 3. Consolidate outreach findings and provide draft recommendation regarding economically sustainable costs, and related requirements. Submit for review by SVGMD and DWR.
- 4. Incorporate responses and finalize recommendation in Technical Memo.

#### **17. Irrigation Efficiency Alternatives Program**

This program considers potential improvement to ranch irrigation methods to improve water use efficiencies. A current study is underway assessing pivot technology. This program targets an additional year of data to create a more robust data set as well as to consider other modifications to irrigation that could improve irrigation efficiencies. Ranchers currently rely heavily upon manufacturers who have a conflict of interest. UC Cooperative extension has provided cost share on these studies to date and would be expected to continue to support the program. This program is critical to empowering local ranchers with opportunities for compliance and for economic sustainability and is thus critical to the region whose economy relies heavily upon agriculture.

- 1. Continue second year study of current pivot study currently funded through the Feather River Land Trust with support by UCCE. Final outcomes will be recommendations on implementing high efficiency pivot systems and likely affect on water use efficiencies and groundwater pumping. Material will be provided in technical memorandum.
- 2. Solicit from manufacturers recommendations on potential operational or structural changes to improve water use efficiencies. Conduct engineering analyses and literature review to provide an independent assessment of those

- recommendations and the likely hood to improve irrigation efficiencies. Confer with irrigation and crop specialists (e.g. UC Davis, UCCE. San Luis Obispo Polytechnic).
- 3. Document recommendations in fact sheet. Provide to stakeholders through outreach and potentially through Cal Agriculture publication.

#### 18. Watershed Management Opportunities Program

The goal of this task is to develop and provide technical materials to local, State and federal agencies in or involved in the Upper Feather River watershed and affecting groundwater and resource sustainability in Sierra Valley. As discussed in this document (XXXX), the DWR Basin Prioritization acknowledges factors outside of the control of the basin are affecting groundwater sustainability and this includes climate change, of which Sierra Valley is particularly vulnerable; operation of Frenchman Dam and other public water infrastructure; and public land management, including fuels reduction to help combat climate change and to promote healthy forests. Many of these programs have been identified in the UFR IRWM<sup>15</sup>. Given the limited financial resources within Sierra Valley, and the potential impacts of outside factors and resource management, it is critical that SVGMD can identify potential opportunities for shared resource management, benefits and funding. Towards this end, technical materials will be required to motivate and justify cross agency collaboration.

1. Outreach efforts with key resource agencies and stakeholders in Sierra Valley (e.g., U.S. Forest Service, UFR, DWR, FRLT). Culmination in two workshops to define shared resource management opportunities amongst different stakeholders with SVGMD. Document potential areas of cooperation.
2. Develop agreements and MOUs as needed.
3. Conduct and complete three technical studies/memorandum. Potential topics include 1) regional public land management opportunities to improve groundwater recharge; 2) opportunities to adjust operation of Frenchman Dam and related infrastructure to promote groundwater recharge and sustainability; 3) Opportunities for upland recharge through ecosystem restoration and related efforts.
4. Follow-up with agencies and identify next steps. Technical memorandum.

#### **b. Project Deliverables**

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<sup>15</sup> Upper Feather River Integrated Watershed Management Plan XXXXX

T#	D#	Task(T) and Deliverable (D) Description
<b>Component 1. GSP Planning and Development</b>		
<b>Project Administration</b>		
1		<b>Project Management and Administration</b>
	1.1	Quarterly and final progress reports.
	1.2	Reimbursement requests.
<b>Stakeholder Engagement</b>		
2		<b>Facilitation Support</b>
	2.1	A Public Outreach Plan which documents specifically who stakeholders are, how they will be engaged, and when they will be engaged. This could also incorporate high level Task 3 information.
	2.2	Meeting announcements, agendas, presentations, and minutes or meeting summaries when applicable
<b>Capacity Building</b>		
3		<b>Monitoring Protocols</b>
	3.1	Document monitoring protocols for inclusion in the GSP and verify compliance with Data and Reporting Standards.
4		<b>Data and Reporting Standards</b>
	4.1	Summary and discussion of Data and Reporting Standards for inclusion in the GSP
	4.2	Inventory of compiled data and datasets organized and formatted to comply with Data and Reporting Standards for use in GSP development.
	4.3	Refined and expanded data gap action plan to support GSP development.
	4.4	Documentation of actions taken to fill high priority data gaps.
5		<b>Data Management System (DMS)</b>
	5.1	Final DMS evaluation and selection technical memorandum.
	5.2	DMS user guide.
	5.3	DMS software, including data used in the development and implementation of the GSP and required to support annual reporting.
<b>GSP Planning and Preparation</b>		
6		<b>GSP Planning and Preparation</b>
	6.1	Draft GSP documents, including documentation of comments received and responses provided.
	6.2	Final GSP documents, including documentation of comments received and responses provided.
7		<b>GSP Administrative Information</b>
	7.1	1. General information section of GSP including Executive Summary 2. List of references and technical studies, for inclusion in the GSP.
	7.2	Summary of Agency information and GSP implementation costs for inclusion in the GSP.
	7.3	Description of Plan Area section of GSP as defined in subtask.
	7.4	Notice and communication section of GSP as defined in subtask.
8		<b>Hydrogeologic Conceptual Model (HCM)</b>
	8.1	Written description of the subbasin, graphical depiction of the HCM, geologic map and cross sections, and other maps as required by the GSP Regulations for inclusion in the GSP.
	8.2	Maps, hydrographs, and other data associated with groundwater, surface water, groundwater dependent ecosystems, and subsidence. Prepared as required by the Regulations for inclusion in the GSP.
	8.3	Water budget section including required content for inclusion in the GSP.
	8.4	Descriptions and maps of management areas as required by the GSP Regulations for inclusion in the GSP.

<b>T#</b>	<b>D#</b>	<b>Task(T) and Deliverable (D) Description</b>
<b>9</b>		<b>Sustainability Management Criteria</b>
	<b>9.1</b>	Description of sustainability goal and supporting information required by the GSP Regulations for inclusion in the GSP.
	<b>9.2</b>	Description of processes and criteria used to define Undesirable Results. Description of Undesirable Results as required by the GSP Regulations for inclusion in the GSP.
	<b>9.3</b>	Description of MTs as required by the GSP Regulations for inclusion in the GSP.
	<b>9.4</b>	Description of MOs and IMs as required by the Regulations for inclusion in the GSP.
<b>10</b>		<b>Monitoring Networks</b>
	<b>10.1</b>	Monitoring Networks: regulatory requirements
		1. Description of the monitoring network capable of yielding representative information about groundwater and related surface conditions in the subbasin, including monitoring objectives, rationale for the selection of monitoring locations, parameters and frequencies for each sustainability indicator.
		2. Maps and tabular summary of the existing and proposed monitoring network.
		3. Implementation plan for proposed monitoring network.
	<b>10.2</b>	Description of the Representative Monitoring sites, including supporting information justifying why each site reflects general conditions in the area, as required by the GSP Regulations for inclusion in the GSP.
	<b>10.3</b>	
		1. Assessment of the number and locations of monitoring sites, monitoring frequencies and the quality of the data collected, as required by the GSP Regulations for inclusion in the GSP.
		2. Recommendations for improvements to the monitoring network.
	<b>10.4</b>	3. Description of the process for evaluating the monitoring network during five-year reviews.
		1. DMS updates to produce monitoring data to be included in Annual Reports and electronic submittals on DWR forms.
		2. Description of the DMS functionality for Annual reporting for inclusion in the GSP.
<b>11</b>		<b>Projects and Management Actions</b>
		Description of Projects and Management Actions as required by the GSP Regulations for inclusion in the GSP.
<b>Component 2: Data Network Programs</b>		
<b>12</b>		<b>Implement Subsidence Network</b>
	<b>12.1</b>	Subsidence monitoring strategy draft
	<b>12.2</b>	Approval documentation
	<b>12.3</b>	Finalize reporting materials
	<b>12.4</b>	Approval documentation
	<b>12.5</b>	Finalize reporting materials
<b>13</b>		<b>Implement Groundwater Well Monitoring Network utilizing CASGEM</b>
	<b>13.1</b>	Groundwater program draft.
	<b>13.2</b>	Approval documentation
	<b>13.3</b>	Finalize reporting materials

T#	D#	Task(T) and Deliverable (D) Description
14		<b>Standardize and Implement Agricultural Pumping Program</b>
	14.1	SOPs for agricultural pump upgrades and installations
	14.2	Cost share program
	14.3	Document outreach session
	14.4	Award list
15		<b>Implement Program for Groundwater Dependent Ecosystem Monitoring</b>
	15.1	Monitoring strategies alternatives and selection process.
	15.2	Workshops documentation
	15.3	Final technical memorandum regarding monitoring strategy
	15.4	Document installation
<b>Component 3. Adaptive Management Strategies Programs</b>		
16		<b>Financial and Economic Resources Assessment</b>
	16.1	Outreach workshop
	16.2	Draft findings, technical memorandum
17	16.3	Final findings and recommendations, technical memorandum
		<b>Irrigation Efficiency Alternatives Program</b>
	17.1	Technical Memorandum - Pivot study results and recommendations
18	17.2	Assessment of opportunities to improve irrigation efficiencies by ranchers
	17.3	Outreach workshop
		<b>Watershed Management Opportunities Program</b>
18	18.1	Outreach workshop and documentation
	18.2	Agreements
	18.3	Technical memorandums/Fact Sheets: Resource management opportunities to promote groundwater sustainability
	18.4	Technical Memorandum: Next steps

**MISCELLANEOUS**  
**E. Project Support**

Applicants should provide documentation to demonstrate the proposed project support by the local entities, where possible, and should include the following items for proposals. If letters of support are not possible for the region, a brief explanation should be included explaining why letters of support are not included.

- If one GSA is established in the basin, describe and provide documentation of any communication with GSA(s) in neighboring basins regarding groundwater sustainability planning and GSP development.
- Describe and provide documentation of any communication with beneficial users of groundwater in the basin that may potentially be affected by implementation of the project, including, but not limited to DAs, agricultural water users, municipal water users, wildlife refuges, or other stakeholders.

Project support must not exceed 2 pages using a minimum Arial, 10-point type font, not including letters of support.

TO BE COMPLETED: