

September 9, 2017

Project No.: 755-10-17-01.007  
SENT VIA: EMAIL

Ms. Angela Spain  
City of Chico  
411 Main Street  
Chico CA 95928

**SUBJECT:** City of Chico Storm Water Resource Plan—Initial Projects and Initial Project Screening

Dear Ms. Spain:

This letter presents the Big Chico Creek (BCC) and Little Chico Creek (LCC) Storm Water Resource Plan (SWRP) Initial Projects and Initial Project Screening. This letter includes the following sections:

- Submitted Initial Projects
- Grouped/Consolidated Initial Projects
- Initial Project Screening

### **SUBMITTED INITIAL PROJECTS**

As part of the development of the SWRP, Initial Projects to be included in the SWRP were requested from the public, stakeholders, and Technical Advisory Committee (TAC) members, as summarized below:

- TAC Meeting 1 – Ideas for Initial Projects were requested at this meeting, which was held on April 25, 2017. The City of Chico (City) provided a preliminary list of potential projects. Timmarie Hamill (stakeholder) verbally submitted projects. These projects were entered into the City of Chico SWRP website by West Yost Associates (West Yost) on behalf of the City.
- Public Meeting 1 – One Initial Project submission form was completed and submitted at this meeting, which was held on May 17, 2017. Other project ideas were discussed with a view to future submittals. Data from the one submitted form was entered into the City of Chico SWRP website by West Yost on behalf of the meeting attendee.
- Public Meeting 2 - Two Initial Project ideas were discussed during the meeting; one of which was submitted by email and the other was hand delivered to City offices.
- By email to [swrp@chicoca.gov](mailto:swrp@chicoca.gov) – no initiated projects were received via this email address.
- By email to [dmoore@westyost.com](mailto:dmoore@westyost.com) – Projects were emailed to Doug Moore by Skyler Lipski. Also, one member of the public submitted additional information for 16 of the projects initially submitted via the City of Chico SWRP website.

- City of Chico SWRP Website – As of August 9, 2017, 83 projects have been submitted through the website). The projects identified at TAC Meeting 1, Public Meeting 1, Public Meeting 2, and the emailed projects were submitted via the website also (by West Yost staff), and are included in the list of 85 projects.

We anticipate additional projects may be submitted as preparation of the SWRP progresses. All the Initial Projects will be documented and summarized in the SWRP. However, a maximum of 16 projects will be evaluated in detail, ranked, and prioritized in the SWRP (called SWRP Projects). The purpose of the Initial Project Screening is to identify the 16 SWRP Projects.

The submitted Initial Projects are summarized in Table 1. In Table 1, the project descriptions are not shown to prevent the table from being over 100 pages long (note that the project descriptions are either fully displayed or summarized in Table 2).

### **GROUPED/CONSOLIDATED INITIAL PROJECTS**

The submitted Initial Projects are listed in Table 2 (at the end of this letter), including the full project descriptions or summaries of the project descriptions. For some projects, the descriptions are five to eight pages long. Those long descriptions are briefly summarized in Table 2, and the full project descriptions are provided in Attachment A.

Several of the submitted Initial Projects were nearly duplications of other submitted Initial Projects (for example, there are four projects that include improvements at the Teichert Ponds). The submitted projects are listed with project numbers 1 through 85 in Table 2. Even though there are duplications of projects, each submitted project was screened in Table 2 as submitted.

Several submitted projects included multiple project elements. Some of the projects elements were related to each other and some were unrelated to each other (within the submitted project). Even though there are multiple related or unrelated project elements in a single submitted project, each submitted project was screened in Table 2 as submitted.

Several submitted projects were revisions of projects submitted earlier by the same person. The earlier versions were replaced by the revised submissions and therefore were not included in the screening analysis. However, they remain in the table with a grey text and a note identifying their duplicate status. The original projects were retained in the table to ensure that all submitted projects were documented in this letter and will ultimately be documented in the SWRP.

Several additional projects were developed by West Yost or the City by grouping related projects or consolidating elements of submitted projects into a set of Grouped/Consolidated Projects. The Grouped/Consolidated Projects are included in the bottom section of Table 2. For most of the submitted projects, the right column of Table 2 provides a reference from the submitted project to a Grouped/Consolidated project. The grouped/consolidated Initial Projects are listed in the bottom of Table 2 with letters A through R (rather than numbers as used for the submitted Initial Projects).

### **INITIAL PROJECT SCREENING**

The purpose of the Initial Project screening is to identify the 16 SWRP Projects. The Initial Project screening criteria was described in a letter to Ms. Angela Spain, dated June 19, 2017. The screening criteria are discussed below:

- Location – The SWRP Projects must be located in the BCC/LCC watersheds as defined in the Planning Area Description, Map, and Boundaries letter from West Yost to Angela Spain, dated April 27, 2017. This criterion was evaluated as either Yes or No. All the Initial Projects (submitted and Grouped/Consolidated) meet this criterion.
- Benefits – As required by the State SWRP Guidelines, each SWRP Project must have at least two main benefits and one additional benefit. See Table 4 of the Guidelines for the list of main and additional benefits. This criterion was evaluated as either Yes or No. All the Initial Projects met this criterion.
- Publicly Owned Land – The SWRP Guidelines recommend that projects be sited on publicly owned lands (page 15 of the Guidelines). This criterion was evaluated as High, Medium, or Low. High indicates the project is fully located on publicly owned land, medium indicates the project is not completely on publicly owned land, but the private land owner appears to be supportive of the project, and low indicates that the project is not on publicly owned land and the land owner’s support is unknown.
- Project Sponsor – The SWRP Project must have a sponsor that will be able to fund the initial capital costs and the annual operations and maintenance of the project. This criterion was evaluated as either Yes or No, and the sponsor was identified. Many of the projects are sponsored by the City. The City determined whether they could sponsor projects through a series of questions:
  - Are there already funds available for the project?
  - Are funds available through grants that are already in process?
  - Is the project/effort required to meet State or Federal regulations?
- Estimated Affordability – The SWRP Projects must be affordable to the sponsoring agency. This criterion was evaluated as High, Medium, or Low. Cost estimates for the projects were not developed, and this categorization was based on preliminary/approximate/anticipated project costs relative to each other. High indicates the project is affordable, while low indicates the project is not affordable.
- Implementability – SWRP Projects must be feasible. This criterion includes compliance with all applicable federal and state laws (including compliance with Trash Amendment), rules, guidelines, regulations, and requirements, the cost of potential environmental impacts, permitting, complexity, anticipated community support/opposition. This criterion was evaluated as High, Medium, or Low. High indicates the project is relatively easy to implement, while low indicates that the project may be complex or hard to implement.

Based on this approach, each Initial Project is identified in Table 2 (second column from the right) as either:

- Initial – These projects will be included in the SWRP as Initial Projects and could be considered for implementation in the future.
- SWRP – These projects will be evaluated in greater detail in the SWRP. These projects will be ranked, prioritized, and included in the SWRP’s project implementation plan.

After screening the Initial Projects using the above criteria, there are 16 potential SWRP projects. The 16 SWRP Projects are (listed in no particular order):

- Project M: Big Chico Creek 21<sup>st</sup> Century Management Plan
- Project N: Little Chico Creek 21<sup>st</sup> Century Management Plan
- Project O: Comanche Creek Management Plan
- Project P: Updating the City's Stormwater Master Plan and Policies
- Project I: Trash Capture Plan and Projects
- Project Q: Teichert Ponds Improvement Project
- Project R: Fair Street Detention Basin Improvement Project
- Project 40: Parking Lot #4 Rehabilitation, Project 50019
- Project 44: 5 Mile and Lindo Channel Diversion Structures Study
- Project 47: Medical Waste Program for Unused Medicine
- Project 59: Routine Community Creek Clean Up Project (Program)
- Project 65: Laxson South Bioswale
- Project 73: Bidwell/Grape Ave Stormwater Protection and Restoration Project
- Project 77: Revised Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools
- Project 85: Chapman Mulberry Rain Garden
- Project G: Storm Water Monitoring for compliance with MS4 permit

## DISCLOSURE STATEMENT

Funding has been provided in full or in part through an agreement with the State Water Resources Control Board, using funds from Proposition 1. The contents of this document do not necessarily reflect the views and policies of the foregoing, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

This letter is part of the work product for Task 4.5 of Grant Agreement No. D1612613 between the City of Chico and the California State Water Resource Control Board.

Please contact me at (530) 792-3275 or [dmoore@westyost.com](mailto:dmoore@westyost.com) with any questions or comments.

Sincerely,  
WEST YOST ASSOCIATES



Douglas T. Moore  
Engineering Manager  
RCE #58122  
DTM:lh

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
1	5/8/2017 18:40	21st Century Management Program: Big Chico Creek and Mud Creek Watershed.	From the headwaters of Big Chico Creek and Mud Creek to the Sacramento River	Wetland enhancement, Riparian enhancement, Instream flow improvement	Improve or create recreation or public use area		Matt Thompson	530-513-1911	Matt.Thompson@ChicoCA.gov	Email
2	5/8/2017 18:58	Teichert Ponds Improvement Project	Teichert Ponds: Little Chico Creek at Highway 99	Increased filtration or treatment of runoff, Conjunctive use, Wetland enhancement, Riparian enhancement, Public education	Nonpoint source pollution control, Improve or create recreation or public use area		Matt Thompson	530-879-6959	Matt.Thompson@ChicoCA.gov	Email
3	5/8/2017 18:45	21st Century Management Program: Little Chico Creek to Butte Creek Diversion.	Little Chico Creek to Butte Creek	Conjunctive use, Wetland enhancement, Riparian enhancement, Increased urban green space	Improve or create recreation or public use area		Matt Thompson	530-879-6959	Matt.Thompson@ChicoCA.gov	Email
4	5/23/2017 14:58	Big Chico Creek bank erosion	Big Chico Creek at Hooker Oak Park	Water supply reliability, Riparian enhancement	Re-establishment of the natural hydrograph		Susan Mason	530 321-3406	smason908@gmail.com	Email
5	5/23/2017 14:55	Big Chico Creek storm water detention	Big Chico Creek	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Re-establish natural water drainage and treatment		Susan Mason	530 321-3406	smason908@gmail.com	Email
6	5/23/2017 14:09	Comanche Creek flow improvements	Comanche Creek	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement, Public education	Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Community involvement	Comanche Creek Management Plan	Susan Mason	530 321-3406	smason908@gmail.com	Email
7	5/23/2017 14:07	Comanche Creek water quality	Comanche Creek	Increased filtration or treatment of runoff, Public education	Nonpoint source pollution control, Community involvement		Susan Mason	530 321-3406	smason908@gmail.com	Email
8	5/23/2017 15:06	Lindo Channel infiltration enhancement	Lindo Channel	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement	Re-establishment of the natural hydrograph		Susan Mason	530 321-3406	smason908@gmail.com	Email
9	5/23/2017 15:05	Lindo Channel nonpoint pollution	Lindo Channel	Increased filtration or treatment of runoff, Riparian enhancement	Nonpoint source pollution control, Community involvement		Susan Mason	530 321-3406	smason908@gmail.com	Email
10	5/23/2017 14:16	Little Chico Creek flooding problems	Little Chico Creek	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas, Increased urban green space, Instream flow improvement, Public education	Community involvement	Little Chico Creek property ownership maps (available from Brad Pierce)	Susan Mason	530 321-3406	smason908@gmail.com	Email
11	5/23/2017 14:20	Little Chico Creek water quality	Little Chico Creek downstream of Stilson Canyon Diversion	Decreased flood risk by reduced runoff rate or volume, Instream flow improvement, Public education	Nonpoint source pollution control, Community involvement	LCC arundo mapping information, arundo in-kind contribution tracking spreadsheet. (available from Susan Mason)	Susan Mason	530 321-3406	smason908@gmail.com	Email
12	5/23/2017 14:47	Mitigating new impacts to Sycamore Bypass	Sycamore Bypass/Sycamore Creek	Increased urban green space, Public education	Nonpoint source pollution control, Improve or create recreation or public use area	Chico Bicycle Plan	Susan Mason	530 321-3406	smason908@gmail.com	Email
13	5/23/2017 14:26	Teichert Ponds retention basins	Teichert Ponds	Increased filtration or treatment of runoff, Public education	Re-establish natural water drainage and treatment, mosquito control	Teichert Ponds Restoration Plan	Susan Mason	530 321-3406	smason908@gmail.com	Email
14	5/23/2017 14:28	Teichert Ponds vegetation, trash and public access	Teichert Ponds	Increased filtration or treatment of runoff, Increased urban green space, Public education	Nonpoint source pollution control, Community involvement	Teichert Ponds Restoration Plan	Susan Mason	530 321-3406	smason908@gmail.com	Email
15	5/22/2017 22:07	Bank Slope Reduction and Stabilization	Rural roadside ditches and agricultural drainage channels	Increased filtration or treatment of runoff, Riparian enhancement, Instream flow improvement	Re-establish natural water drainage and treatment		West Yost		nmuradian@westyost.com	Email
16	5/19/2017 18:02	Channel Stabilization	Varies (see 1997 Amendment to 1987 SDMP)	Increased filtration or treatment of runoff, Riparian enhancement	Re-establish natural water drainage and treatment	1997 Amendment to SDMP, Streambank Protection Standards	West Yost		nmuradian@westyost.com	Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
17	5/19/2017 17:55	Detention Basins on Comanche Creek	Varies (see 1997 Amendment to 1987 SDMP)	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas, Increased urban green space	Water temperature improvement, Community involvement	1997 Amendment to 1987 Storm Drain Master Plan	West Yost		nmuradian@westyost.com	Email
18	5/19/2017 17:58	Detention Basins on Little Chico Creek	Varies (see 1997 Amendment to 1987 SDMP)	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas, Increased urban green space	Nonpoint source pollution control, Water temperature improvement, Community involvement	1997 Amendment to 1987 Storm Drain Master Plan	West Yost		nmuradian@westyost.com	Email
19	5/19/2017 18:05	Grassy Swale in Bidwell Park	Bidwell Park (if this does not already exist).	Increased filtration or treatment of runoff, Instream flow improvement	Nonpoint source pollution control	1997 Amendment to 1987 SDMP	West Yost		nmuradian@westyost.com	Email
20	5/22/2017 22:04	Green Streets and Parking Lots	Various streets or parking lots around City	Increased filtration or treatment of runoff, Increased urban green space	Nonpoint source pollution control		West Yost		nmuradian@westyost.com	Email
21	5/22/2017 22:09	Make City Corp Yards Storm Water Friendly	City Corp Yards	Increased filtration or treatment of runoff, Increased urban green space	Nonpoint source pollution control		West Yost		nmuradian@westyost.com	Email
22	5/19/2017 18:06	Outreach and Maintenance of Parks	Parks, along creek banks	Increased filtration or treatment of runoff, Riparian enhancement, Employment opportunities created, Public education	Nonpoint source pollution control, Improve or create recreation or public use area	Stream Bank Protection Standards	West Yost		nmuradian@westyost.com	Email
23	5/22/2017 22:01	Trash Capture Devices	City owned detention basins or other outfalls	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement	Nonpoint source pollution control		West Yost		nmuradian@westyost.com	Email
24	5/23/2017 12:59	Waterwise and Habitat and River Friendly Landscape Program	Big Chico Creek, Little Chico Creek and Comanche Creek watersheds. Targets DAC neighborhoods, parks and greenways, and City-owned properties.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education	example of manuals and existing creekside habitat manual is available.	Timmarie Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
25	5/23/2017 13:11	Chico Green Streets and Low Impact Development Implementation Project	City of Chico and Butte County, Big Chico, Little Chico, and Comanche Creek Watersheds. Title 1 Schools. DAC neighborhoods	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring		T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
26	5/23/2017 13:24	Bidwell Park and Greenway Integrated Storm Water, Ground Water Recharge, and Recycled Water Project	Projects are located in Bidwell Park and Greenways within the Big Chico Creek, Little Chico Creek and Comanche Creek drainage basins. Projects target DAC neighborhoods and schools. Demo project locations selected to provide high visibility for public and Green Job training. Locations selected to target hot spots for erosion/trash	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Available upon request	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
27	5/23/2017 13:31	Cal Park Green Streets Project	California Park neighborhood California Park lakes and open spaces Little Chico Creek Marsh Junior High Murphy Commons Low-income housing and community garden Bike and walking paths along Little Chico Creek and within Cal Park	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs, citizen monitoring, and storm water education	Upon request.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
28	5/23/2017 13:34	City of Chico Long-term Trash Reduction Project	The project is located in Big Chico, Little Chico, and Comanche creek watersheds. Targets DACs, schools, and public parks and greenways.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, TMDL , citizen monitoring, and storm water education	Upon request.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
29	5/23/2017 13:39	LID Technical Design Manual and Demonstration Project	Entire City of Chico and will target DAC neighborhoods (Chapman Mulberry) and commercial (Hagen Lane) and public properties. Butte County Schools Big Chico Creek, Little Chico Creek, and Comanche Creek watersheds.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education, citizen monitoring,	Upon request.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
30	5/23/2017 13:42	Chico State University LID Implementation and Stream Habitat Enhancement Project	Project is located in Big Chico Creek watershed on the CSU Chico Campus Demo and training projects located throughout the City of Chico and Bidwell Parks and greenways (Big Chico, Little Chico, and Comanche Creek watersheds).	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, citizen monitoring, storm water education, green job training	Upon request	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
31	5/23/2017 13:45	Five Mile, Lindo Channel, and Sycamore Flood Diversion Storm Water Treatment and Habitat Enhancement Project	Big Chico, Little Chico, and Comanche Creek watersheds Five Mile / Lindo Channel / Sycamore Flood Diversion Channel Title 1 Schools City of Chico and/or Butte County	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, Green job training, citizen monitoring	Upon request.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
32	5/23/2017 13:53	Chapman/Mulberry Neighborhood Green Infrastructure and Natural Storm Water Treatment Project	Chapman Mulberry Neighborhood Dorothy Johnson Center Chapman School Teichert Pond Little Chico and Comanche Creek watersheds (and associated parks and greenways)	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring	Upon request.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
33	5/23/2017 13:57	Mud and Rock Creek Flood Protection Project	Mud Rock Creek Reclamation District and Mud/Rock Creek watershed Airport Neighborhood commercial roads, parking lots and buildings (including renovating Airport Building and parking lot).Mud and Rock Creek Residential Neighborhoods targeting creek-side neighbors Nord School Orchard buffer strips and riparian habitat improvements (reduce pesticide and erosion runoff) of channel storm water detention areas (to reduce flooding)	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring	Upon request	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
34	5/23/2017 14:01	Little Chico Creek, Lindo channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project	Project is located in Big Chico Creek, Little Chico Creek watersheds	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring	Upon request	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
35	5/23/2017 14:04	Flood Detention Pond (Comanche, Fair Street, Home Depot, Teichert) Enhancement and LID Implementation Project	Projects are located in Big Chico, Little Chico and Comanche watersheds. Target retrofitting and improving existing detention ponds.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs, citizen monitoring, public health		T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
36	5/23/2017 14:26	Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools	The Project is located in the Big Chico Creek, Lille Chico Creek, and Comanche Creek Watersheds and includes 25 schools.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, citizen monitoring, green jobs, STEM/NGSS education	Yes, entire plans are available for each school.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email



**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
37	5/23/2017 14:29	City of Chico storm water capture and reuse project	Projects are located throughout the City of Chico (and Butte County), within Big Chico, Little Chico and Comanche Creek watersheds. City owned roads, sidewalks, medians, parks, commercial buildings and parking lots. Children's Park and City Plaza	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs, citizen monitoring, STEM/NGSS	Upon request	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
38	5/23/2017 14:32	Urban Landscape Water Conservation and Pesticide Reduction Project	Entire City of Chico and will target DAC neighborhoods (Chapman Mulberry) and commercial (Hagen Lane) and public property. Butte County Schools Big Chico Creek, Little Chico Creek, and Comanche Creek watersheds.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring, storm water education linked with NGSS/STEM		T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
39	5/23/2017 18:00	NSV IRWM Projects (submitted by CA Urban Streams Alliance-The Stream Team)	Butte County Watersheds	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced sanitary sewer overflows, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, Citizen monitoring, green jobs training	NSV IRWMP full project description's and budgets are available upon request	T. Hamill	530 342-6620	timmariehamill@gmail.com	Phone; Email
40	5/24/2017 13:43	Parking Lot 4 Rehabilitation #50019	City Parking Lot 4 Corner of Salem St & W 5th St	Increased filtration or treatment of runoff, Water supply reliability, Conjunctive use, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Improve or create recreation or public use area, Dedicated funding source (parking funds)	Capital Improvement Budget Page 58	Matt Thompson	530-87-6959	matt.thompson@chicoca.gov	Email
41	5/26/2017 8:33	Improve Lindo Channel	Lindo Channel	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Improve or create recreation or public use area		West Yost		nmuradian@westyost.com	Email
42	5/26/2017 8:59	Teichert Ponds Improvement	Teichert Ponds	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume	Improve or create recreation or public use area		Skyler Lipski		skyler.lipski@Chicoca.gov	Email
43	5/26/2017 9:00	Fair Street Detention Basin Improvements	Fair Street Detention Basin	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume	Improve or create recreation or public use area		Skyler Lipski		skyler.lipski@Chicoca.gov	Email
44	5/26/2017 9:03	5 Mile and Lindo Channel Diversion Structures Study	5 Mile and Lindo Channel Diversion Structures	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	improve riparian habitat		Skyler Lipski		skyler.lipski@Chicoca.gov	Email
45	5/26/2017 10:35	Big Chico Creek and Lindo Channel Diversions Study and Improvements	Big Chico Creek and Lindo Channel gates, and Sycamore weir Creek diversion	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Re-establish natural water drainage and treatment	Mid Upper Regional Flood Management Plan Chico Area	West Yost		nmuradian@westyost.com	Email
46	5/26/2017 10:41	Lindo Channel Management Plan	Lindo Channel	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement, Instream flow improvement	Improve or create recreation or public use area	Mid Upper Regional Flood Management Plan Chico Area	West Yost		nmuradian@westyost.com	Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
47	5/26/2017 11:09	Medical Waste Program for unused medicine	Drop off points throughout the City	Increased filtration or treatment of runoff, Public education	Community involvement		West Yost		nmuradian@westyost.com	Email
48	5/26/2017 11:19	Sycamore and Mud Creek Flood Control	Sycamore Diversion and Mud Creek	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Re-establishment of the natural hydrograph	Mid Upper Regional Flood Management Plan Chico Area	West Yost		nmuradian@westyost.com	Email
49	5/26/2017 11:38	Sheep Hollow Off-stream Storage Area	South of Chico Municipal Airport	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas	Provides a carbon sink, Improve or create recreation or public use area	Mid Upper Regional Flood Management Plan Chico Area	West Yost		nmuradian@westyost.com	Email
50	5/26/2017 12:22	Early Flood Warning System	Big Chico Creek, Upstream	Decreased flood risk by reduced runoff rate or volume, Public education	Community involvement	Mid Upper Regional Flood Management Plan Chico Area	West Yost		nmuradian@westyost.com	Email
51	5/26/2017 12:32	Identification and Evaluation of Groundwater Recharge	Big Chico Creek and Little Chico Creek	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas	Improve or create recreation or public use area		West Yost		nmuradian@westyost.com	Email
52	6/2/2017 9:35	Upper Watershed	Big Chico Creek / Little Chico Creek Watersheds	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Instream flow improvement, Public education	Re-establish natural water drainage and treatment, Reduced energy use, Re-establishment of the natural hydrograph, Community involvement		Natalie Carter	530-891-6424	natalie.carter@becnet.org	Phone; Email
53	6/2/2017 9:38	Urban Riparian Restoration	Big Chico Creek / Little Chico Creek Watersheds	Riparian enhancement, Public education	Nonpoint source pollution control, Community involvement, Improve or create recreation or public use area		Natalie Carter	530-891-6424	natalie.carter@becnet.org	Phone; Email
54	6/2/2017 9:40	Big Chico Creek West of Nord Ave.	Big Chico Creek Watershed	Increased filtration or treatment of runoff, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Instream flow improvement, Public education	Re-establish natural water drainage and treatment, Provides a carbon sink, Re-establishment of the natural hydrograph, Community involvement		Natalie Carter	530-891-6424	natalie.carter@becnet.org	Phone; Email
55	6/2/2017 9:43	Erosion Management/Prevention	Big Chico Creek / Little Chico Creek Watersheds	Wetland enhancement, Riparian enhancement, Public education	Community involvement, Improve or create recreation or public use area, Improve health of the natural ecosystem		Natalie Carter	530-891-6424	natalie.carter@becnet.org	Phone; Email
56	6/2/2017 9:47	Diversion Channels	Big Chico Creek / Little Chico Creek Watersheds	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Riparian enhancement, Instream flow improvement, Public education	Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Community involvement, Improve or create recreation or public use area		Natalie Carter	530-891-6342	natalie.carter@becnet.org	Phone; Email
57	6/2/2017 9:50	Storm Water Detention Basins	Big Chico Creek / Little Chico Creek Watersheds	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement, Public education	Re-establish natural water drainage and treatment, Community involvement, Improve or create recreation or public use area	<a href="http://www.chico.ca.us/building_development_services/sewer/StormWaterResourcePlan.asp">http://www.chico.ca.us/building_development_services/sewer/StormWaterResourcePlan.asp</a>	Natalie Carter	530-891-6424	natalie.carter@becnet.org	Phone; Email
58	6/5/2017 14:53	Updating the City's storm water plan (to make it proactive)	Relevant to the entire City	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced sanitary sewer overflows, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area	The City's old storm drain master plan.	West Yost		dmoore@westyost.com	Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
59	6/5/2017 15:52	Routine Community Creek Clean Up Project (Program)	Relevant to the entire watershed, but primarily within the City	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement	Nonpoint source pollution control, Community involvement, Improve or create recreation or public use area		West Yost		dmoore@westyost.com	Email
60	6/5/2017 15:55	Fair Street Detention Ponds	Fair Street Detention Ponds	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Nonpoint source pollution control, Re-establish natural water drainage and treatment		Angela Spain	530-879-6953	angela.spain@chicoca.gov	Email
61	6/5/2017 15:55	Teichert Ponds Project	At the Teichert Ponds	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Riparian enhancement, Increased urban green space, Instream flow improvement, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area		West Yost		dmoore@westyost.com	Email
62	6/5/2017 15:57	Meyers Industrial Park	Meyers Industrial Park	Increased filtration or treatment of runoff, Public education	Nonpoint source pollution control, Improve or create recreation or public use area		Angela Spain	530-879-6953	angela.spain@chicoca.gov	Email
63	6/5/2017 15:58	Update the City's storm water policies and regulations	Relevant to the entire City	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced sanitary sewer overflows, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area		West Yost		dmoore@westyost.com	Email
64	6/5/2017 16:04	Upper Park Road Improvements - Erosion Control	Upper Bidwell Park	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement, Public education	Improve or create recreation or public use area		Angela Spain	530-879-6953	angela.spain@chicoca.gov	Email
65	2017/07/11 3:13:02 PM MDT	Laxson South Bioswale	Located at the south end of Laxson Auditorium, adjacent to the roundabout at 1st St. and Salem.	Increased filtration or treatment of runoff; Decreased flood risk by reduced runoff rate or volume; Public education	Nonpoint source pollution control; Water conservation; This project will also create an educational opportunity for campus visitors		Michael Alonzo	530.898.3909	mealonzo@csuchico.edu	Email
66	2017/07/18 8:54:46 PM MDT	Create Bioswales @ storm drain outfalls	On all streams where landforms and access allow	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Creation of new wetland areas; Riparian enhancement; Employment opportunities created; Public education	Nonpoint source pollution control; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement	Verbena Fields documents	Roger Cole	15303215017	streamrc89@gmail.com	Email
67	2017/07/18 8:56:55 PM MDT	Teichert Ponds cleansing wetland	Teichert Ponds on Little Chico creek	Increased filtration or treatment of runoff; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Employment opportunities created; Public education	Nonpoint source pollution control		Roger Cole	15303215017	streamrc89@gmail.com	Email
68	2017/07/18 8:58:40 PM MDT	Create Hydrologic Floodplains on streams	All streams	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Creation of new wetland areas; Riparian enhancement	Nonpoint source pollution control; Re-establish natural water drainage and treatment		Roger Cole	15303215017	streamrc89@gmail.com	Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
69	2017/07/19 5:55:41 PM MDT	Multiple Off-Stream Detention/Wetland Basins	Along Little Chico Creek, southwest of Marsh Jr.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Re-establish natural water drainage and treatment; Water conservation; Reduced sanitary sewer overflows; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Community involvement; Improve or create recreation or public use area		Robin McCollum	530-354-6337	robinmccollum@sbcglobal.net	Phone; Email
70	2017/08/08 2:31:30 PM MDT	Lindo Channel Stormwater Infiltration and Floodplain Enhancement Project	Lindo Channel (target City-owned and public right of ways)	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	MS4 permit; Updated General Plan; City BMP Manual, Climate Action, Urban Forest, and Bike Plan; Existing Citizen Monitoring Program, Clean Water Science Ambassador Program (CUSD), Soil and Flood maps; Creekside Habitat Manual,	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
71	2017/08/09 10:57:40 AM MDT	Bidwell Park Stormwater Management Project (Green Infrastructure-LIDs, Floodplain Improvement, and Ground Water Recharge)	Bidwell Park (Big Chico Creek Watershed)	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
72	2017/08/09 11:31:15 AM MDT	Revised Chapman/Mulberry Neighborhood Green Infrastructure and Natural Stormwater Treatment Project	Chapman/Mulberry neighborhoods, Teichert Pond, Little Chico Creek (Public-owned greenways and parks in Little Chico Creek watershed)	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
73	2017/08/09 11:54:40 AM MDT	Bidwell/Grape Ave Stormwater Protection and Restoration Project	Big Chico Creek (near Grape and Bidwell Ave)	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Riparian enhancement; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
74	2017/08/09 12:04:27 PM MDT	(Revised) Cal Park Green Streets Project	Little Chico Creek, Teichert Pond, Cal Park Residential Neighborhoods	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
75	2017/08/09 12:18:48 PM MDT	Revised Chico State University LID Implementation and Stream Habitat Enhancement Project	Big Chico Creek Watershed and creek reaches adjacent to Creek	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
76	2017/08/09 12:31:27 PM MDT	Revised Little Chico Creek, Lindo Channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project	Little Chico Creek, Lindo Channel, Mud/Rock Creek	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area		T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
77	2017/08/09 12:40:56 PM MDT	Revised Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools	Big Chico Creek / Little Chico Creek Watersheds	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Technical reports for each project school have been developed through a previous SWRCB Technical grant. The reports include project designs, treatment volumes, discharge maps, etc. with enough detail to be provided in a Prop. 1 grant, including budgets, PAEP, QAPP, MP, and all.	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
78	2017/08/09 12:47:27 PM MDT	Revised Urban Landscape Water Conservation and Pesticide Reduction Project	Big Chico Creek Little Chico Creek watersheds	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
79	2017/08/09 12:56:32 PM MDT	Revised Five Mile, Lindo Channel, and Sycamore Flood Diversion Stormwater Treatment and Habitat Enhancement Project	Big Chico Creek, Mud Creek, Five Mile, Lindo Channel, and Sycamore Flood Diversion	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
80	2017/08/09 1:03:30 PM MDT	Revised City of Chico Long-term Trash Reduction Project	Big Chico Creek, Little Chico Creek Watersheds	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email

**Table 1. Submitted Initial Projects**

Project Number or Letter	Timestamp	Title of Recommended Project	Location of the Recommended Project	Main Benefits	Additional Benefits	Reference Documents	Name	Phone number	E-mail	Preferred contact method
81	2017/08/09 1:12:49 PM MDT	Revised Chico Green Streets and Low Impact Development Implementation Project	Big Chico Creek/Little Chico Creek Watersheds	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
82	2017/08/09 1:21:12 PM MDT	The Stream Team NSV IRWM Projects	Big Chico Creek Little Chico Creek Watersheds	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	See attachment for more details	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
83	2017/08/09 1:37:50 PM MDT	Teichert Pond Water Quality Improvement Project	Teichert Pond	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Existing City, regional, and state-wide plans provided upon request including Teichert Pond management plan	T. Hamill	530 342-6620	timmariehamill@gmail.com	Email
84	7/25/2017 0:00	Comanche Creek Flood Control Study	Comanche Creek from Little Chico Creek Diversion to Dayton Road	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume.	Improve or created public use area		Les Heringer		LesH@MTChicoRanch.com	Email
85	8/9/2017 0:00	Chapman Mulberry Rain Garden	E. 12th Street, Parcel 005-142-50-000	Increased infiltration, conjunctive use, public education	nonpoint pollution control, carbon sink, enhance public space		Steve Breedlove	530-210-9352	srbreedlove@gmail.com	Email, phone

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
1	21st Century Management Program: Big Chico Creek and Mud Creek Watershed.	From the headwaters of Big Chico Creek and Mud Creek to the Sacramento River	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system of diversions and levees from Five Mile Recreation Area in Chico to the Sacramento River. The goals of the project would be to: -Ensure the integrity of the flood control system. -Fully assess the system using modern analysis techniques and increased data, and assure that the system can protect the urban area while considering possible climatic changes. -Manage gravel deposition at Five Mile and assure proper gravel migration downstream. -Develop management strategies that maximize benefits to salmon populations. -Coordinate with the Bicycle Plan. -Optimize recreational opportunities. -Identify opportunities to enhance riparian habitat, with an emphasis on endangered species such as the Sacramento Valley Long-horned Beetle. -Ensure system provides 200-yr level of protection per State regulations. -Maximize the use of County Service Area 24 funds.	Wetland enhancement, Riparian enhancement, Instream flow improvement	Improve or create recreation or public use area	Yes	Yes	Medium	Yes, City of Chico	Medium	High	SWRP, combined into M	Big Chico 21st Century Management
2	Teichert Ponds Improvement Project	Teichert Ponds: Little Chico Creek at Highway 99	Reconstruction of inlet to provide capture of trash, suspended solids, hydrocarbons, etc. Reconstruction of outlet to Little Chico Creek to provide control, accessibility, and maintainability. Vegetation management to eradicate non-native plants and help manage illegal camping.	Increased filtration or treatment of runoff, Conjunctive use, Wetland enhancement, Riparian enhancement, Public education	Nonpoint source pollution control, Improve or create recreation or public use area	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP, combined into Q (Includes POE!*) Trash filtering component combined into I	Little Chico 21st Century Management
3	21st Century Management Program: Little Chico Creek to Butte Creek Diversion.	Little Chico Creek to Butte Creek	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system of diversions and levees from Little Chico Creek to Butte Creek. The goals of the project would be to: - Ensure the integrity of the flood control system. - Fully assess the system using modern analysis techniques and increased data, and assure that the system can protect the urban area while considering possible climatic changes. - Identify improvements required to achieve FEMA certification. - Coordinate with the Bicycle Plan. - Optimize recreational opportunities. - Identify opportunities to enhance riparian habitat, with an emphasis on endangered species such as the Sacramento Valley Long-horned Beetle. - Ensure system provides 200-yr level of protection per State regulations.	Conjunctive use, Wetland enhancement, Riparian enhancement, Increased urban green space	Improve or create recreation or public use area	Yes	Yes	Medium	Yes, City of Chico	Medium	High	SWRP, combined into N	Little Chico 21st Century Management
4	Big Chico Creek bank erosion	Big Chico Creek at Hooker Oak Park	The creek bank just a few feet away from CARD's water well on BCC at Hooker Oak Park is eroding. A solution for this problem has been designed; implementation could be part of a future storm water grant application.	Water supply reliability, Riparian enhancement	Re-establishment of the natural hydrograph	Yes	Yes	High	Yes, City of Chico	High	Medium	SWRP, combined into M, includes POE!*	Big Chico 21st Century Management
5	Big Chico Creek storm water detention	Big Chico Creek	Create a storm water detention area in Lower Bidwell Park just west of the east most parking area off Peterson Memorial Drive. This area has previously flooded (i.e. Scout's Island) and has the capacity to occasionally detain enough water to reduce downstream flooding without affecting any major infrastructure such as Petersen Dr.  Consider making a small detention basin on the right (north) bank of BCC just downstream of the Vallombrosa Bridge. This is part of the city-owned Lost Park area. Currently several north side properties closer to the Esplanade Bridge as well as the south side of Lost Park experience flood water conditions during high water events.  Correcting a scour problem at Big Chico Creek's Vallombrosa Bridge is listed in the city's Capital Projects plan. Incorporate this fix into a grant proposal as an in-kind match.	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Re-establish natural water drainage and treatment	Yes	Yes	High	No	Low	Medium	SWRP, combined into M	Big Chico 21st Century Management
6	Comanche Creek flow improvements	Comanche Creek	Develop a plan to remove invasive yellow flag iris from CC. This plant spreads via seeds and rhizomes and, by filling the stream bed with plants, widens the stream bed, causing bank erosion and flooding (especially at Paseo Campaneros) The upstream-most infestation is at Neighborhood Church. Downstream-most location is unknown. Starting area for removal could be at CCG, with outreach to upstream and downstream property owners to educate them about the problem and provide solutions.  Survey CC starting at the Fair St. Detention Basin to identify obstacles in the creek and develop a plan to remove them. Reduce silt buildup in CC through the residential and business area from the Detention Basin outlet to Midway. Reduce silt entering CC via the Basin.	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement, Public education	Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Community involvement	Yes	Yes	Medium	No	Medium	Medium	SWRP, combined into O	Comanche Creek Management Program
7	Comanche Creek water quality	Comanche Creek	Provide better trash filtering at outlet from Fair St. Detention basin into CC. Provide filtering of storm water runoff at northwest outlet at Midway Bridge and at outlets at Valine and Wrex. Provide filtering of storm water runoff from Hegan Lane Business Park (outlet into CC is west of CCG, pollutants are probably mostly hydrocarbons from the large amount of impervious surfaces of parking lot and street parking). Encourage alternative transportation for employees of businesses in this area, as currently all of Otterson Dr. is used by employee parking for Build.com.  Develop a working relationship with M&T Ranch to coordinate communications about their control of the water level in CC with creek cleanups and other in-stream activities. Develop a better understanding of when they reduce water flows and plan in-stream activities based on this information. Provide real-time online information about water flow diversion into Comanche Creek (CC) at Phelan Dam to help with trash removal efforts downstream, especially at Comanche Creek Greenway (CCG).	Increased filtration or treatment of runoff, Public education	Nonpoint source pollution control, Community involvement	Yes	Yes	High	No	Medium	Medium	SWRP, combined into O	Comanche Creek Management Program
8	Lindo Channel infiltration enhancement	Lindo Channel	Use the city-owned area of upstream of the Madrone bike bridge for storm water infiltration	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement	Re-establishment of the natural hydrograph	Yes	Yes	Yes	Yes, City of Chico	Medium	Low	SWRP, combined into M, includes POE!*	Big Chico 21st Century Management
9	Lindo Channel nonpoint pollution	Lindo Channel	Re-do access roads into to channel to make it easier to haul out debris from homeless camp cleanups. Identify areas where camping and associated camp cleanups regularly occur and develop and implement solutions to reduce camping at those locations (e.g. elevating vegetation, regular monitoring, etc.).  Add trash filter at Chico Nut storm water drain  Add bioswales to storm water outlets from Manzanita to Esplanade, where stream channel is wide enough to accommodate.	Increased filtration or treatment of runoff, Riparian enhancement	Nonpoint source pollution control, Community involvement	Yes	Yes	High	No	Medium	High	SWRP, combined into M, includes POE!*	Big Chico 21st Century Management
10	Little Chico Creek flooding problems	Little Chico Creek	Due to the increase in impervious surfaces (e.g. East 8th St road reconstruction project) downstream of the Little Chico Creek (LCC) diversion into Butte Creek at the Stilson Canyon diversion, the diversion point needs to be recalibrated.  Provide infiltration area on city property just downstream of the diversion. Consider using the city's Linear Parks and Greenways Fund to purchase the small amount of open space land in this area that's not already owned by the city so that this infiltration area can be maximized. Look at the many other city-owned properties along the creek for other infiltration opportunities.  Consider using the city-owned former RDA property north of the Boucher St. bridge into a storm water infiltration area. The creek bank is low in that area and the property is already subject to occasional flooding.  LCC's carrying capacity has been reduced by excessive growth of invasive plants and tree-falls that block storm water flows. Develop a plan in coordination with DWR to identify the worst areas and provide ongoing maintenance to keep them clear. Also, provide a mechanism for residents to report new problems to the appropriate agency.  Correcting a scour problem at LCC's Walnut St Bridge is listed in the city's Capital Projects plan. Incorporate this fix into a grant proposal as an in-kind match.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas, Increased urban green space, Instream flow improvement, Public education	Community involvement	Yes	Yes	Medium	No	Medium	Medium	SWRP, combined into N (Includes POE!*)	Little Chico 21st Century Management

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
<div style="display: flex; justify-content: space-between; font-size: small;"> <div> <p><span style="background-color: #ffffcc;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #ccccff;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #ccccff;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div> <p><span style="background-color: #ffffcc;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #ccccff;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #ccccff;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div> <p><span style="background-color: #ccffcc;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #ccffcc;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #ffffff;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													
11	Little Chico Creek water quality	Little Chico Creek downstream of Stilson Canyon Diversion	For the last several years, the city has been treating arundo donax on city properties along LCC and removing it using volunteer labor (1100+ hours of volunteer work so far, plus other donations for associated removal costs). Continue this process, work with other public agencies that also own LCC creek bank property (e.g. Butte County Housing Authority, Chico Unified School District) to help remove their arundo and develop a protocol for private property owners who wish to remove their arundo. As needed, work with the Chico Fire Dept. to develop regulations requiring arundo removal, as a fire hazard. Work with USDA's Natural Resources Conservation Service, which has offered to help property owners downstream of the Chico city limits also remove their arundo.  Identify areas along LCC where creek bank erosion is a significant problem (e.g. the left bank downstream of the Chestnut St. Bridge) and develop solutions to reduce future erosion in these areas).	Decreased flood risk by reduced runoff rate or volume, Instream flow improvement, Public education	Nonpoint source pollution control, Community involvement	Yes	Yes	Yes	No	High	Medium	SWRP, combined into N (Includes POEI*)	Little Chico 21st Century Management
12	Mitigating new impacts to Sycamore Bypass	Sycamore Bypass/Sycamore Creek	There are several large new residential subdivisions to the south of Sycamore Bypass. Improve outdoor recreational opportunities for these residents by completing the planned bike path along the Bypass to connect to the Floral Ave bike path and by creating well-designed paths into the Bypass area (instead of letting each user create his/her own path). Provide educational signage and materials to the homeowners associations to discourage yard waste and trash dumping into the Bypass.	Increased urban green space, Public education	Nonpoint source pollution control, Improve or create recreation or public use area	Yes	Yes	Yes	Yes, City of Chico	High	High	SWRP, combined into M, includes POEI*	Big Chico 21st Century Management
13	Teichert Ponds retention basins	Teichert Ponds	Reroute the small east side storm drains so that they don't dump directly into Pond 1. Remove the silt buildup in the ponds and its associated contaminants. Separate Pond 1 (freshwater) from Ponds 2-3 and rework Ponds 2 and 3 so that Pond 2 can be periodically drained and cleaned. Work with the Butte County Mosquito and Vector Control District to develop a plan that will reduce the need for mosquito control.	Increased filtration or treatment of runoff, Public education	Re-establish natural water drainage and treatment, mosquito control	Yes	Yes	Yes	Yes, City of Chico	Medium	Low	SWRP, combined into Q (Includes POEI*)	Little Chico 21st Century Management
14	Teichert Ponds vegetation, trash and public access	Teichert Ponds	Remove the major invasive plant species: parrot's feather, tree of heaven, Himalayan blackberry, Chinese tallow tree, pyracantha and arundo (1-2 small stands). The dirt roadway on the north side floods almost every winter. Solve this problem. Finish removing the chain link fencing around Pond 1 to improve access for invasive plant control and trash cleanup. Construct a walking trail on the east side of the Ponds to improve public access and reduce undesirable behavior (camping, encroachments by east side neighbors, yard waste dumping). Homeless camping is a major problem here; however, most of the camps are outside of the storm water area so they don't directly affect the amount of trash going into Little Chico Creek. Improve trash filtering on major east side storm water inlet and add filter on south inlet.	Increased filtration or treatment of runoff, Increased urban green space, Public education	Nonpoint source pollution control, Community involvement	Yes	Yes	Yes	Yes, City of Chico	High	Low	SWRP, combined into Q (Includes POEI*)  Trash filtering component combined into I	Little Chico 21st Century Management
15	Bank Slope Reduction and Stabilization	Rural roadside ditches and agricultural drainage channels	Many of the rural roadside ditches and agricultural drainage channels have overly-steep banks, which leads to bank erosion, deposition of sediment in the channel, and damage to public roads, maintenance roads and farmland. Bank segments with severe bank erosion could be identified and evaluated for bank slope reduction. Potential stabilization methods that could be evaluated include slope reduction, vegetation with deep rooted native California grasses, and/or stabilization with articulated block pavers.	Increased filtration or treatment of runoff, Riparian enhancement, Instream flow improvement	Re-establish natural water drainage and treatment	Yes	Yes	Medium	Yes, City of Chico	Medium	Medium	SWRP, Combined into P	Update Storm Water Master Plan and Policies
16	Channel Stabilization	Varies (see 1997 Amendment to 1987 SDMP)	Provide structural erosion at outfalls, along bridges and structures, major bends in waterways, revegetate various stream segments, acquire property along streams to allow for a "buffer" zone. This will meet the Water Quality benefits as well as riparian enhancement.	Increased filtration or treatment of runoff, Riparian enhancement	Re-establish natural water drainage and treatment	Yes	Yes	Medium	Yes, City of Chico	Medium	Medium	SWRP, Combined into P	Update Storm Water Master Plan and Policies
17	Detention Basins on Comanche Creek	Varies (see 1997 Amendment to 1987 SDMP)	Construct detention basins per the 1997 Amendment to SDMP, but include storm water wetlands, or community parks as appropriate.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas, Increased urban green space	Water temperature improvement, Community involvement	Yes	Yes	Medium	Yes, City of Chico	Low	Low	SWRP, combined into O	Comanche Creek Management Program
18	Detention Basins on Little Chico Creek	Varies (see 1997 Amendment to 1987 SDMP)	The Project will provide flood control along little Chico Creek per the SDMP, but will have water quality wetlands or community park as appropriate.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume,	Nonpoint source pollution control, Water temperature improvement, Community involvement	Yes	Yes	Medium	Yes, City of Chico	Low	Low	SWRP, combined into N	Little Chico 21st Century Management
19	Grassy Swale in Bidwell Park	Bidwell Park (if this doesn't already exist).	Install grassy swale in Bidwell Park to provide natural treatment and some minor detention, along with infiltration	Increased filtration or treatment of runoff, Instream flow improvement	Nonpoint source pollution control	Yes	Yes	High	Yes, City of Chico	Medium	Low	SWRP, combined into M, includes POEI*	Big Chico 21st Century Management
20	Green Streets and Parking Lots	Various streets or parking lots around City	Street segments and parking lots could be retrofitted into green streets or green parking lots using vegetated swales, vegetated buffer strips, bioretention planters, and mechanical treatment systems	Increased filtration or treatment of runoff, Increased urban green space	Nonpoint source pollution control	Yes	Yes	High	Yes, City of Chico	Low	Medium	SWRP, Combined into P (Includes POEI*)	Update Storm Water Master Plan and Policies
21	Make City Corp Yards Storm Water Friendly	City Corp Yards	The City/County Corporation Yards could be evaluated for implementation of best management practices such as grassy swales, infiltration trenches, rock infiltration wells and other water quality treatment and low flow/dry weather runoff infiltration facilities.	Increased filtration or treatment of runoff, Increased urban green space	Nonpoint source pollution control	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP, combined into N (Includes POEI*)	Little Chico 21st Century Management
22	Outreach and Maintenance of Parks	Parks, along creek banks	Establish a stream maintenance inspection and monitoring program, include trash and debris removal, exotic plant eradication, revegetation and stream bank repair and maintenance. Could lean heavily on volunteers.	Increased filtration or treatment of runoff, Riparian enhancement, Employment opportunities created, Public education	Nonpoint source pollution control, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, Combined into P (Includes POEI*)	Update Storm Water Master Plan and Policies
23	Trash Capture Devices	City owned detention basins or other outfalls	Use City's land use map and storm water system map to locate and size trash capture devices. These trash capture devices can be implemented along with other modifications to detention basins, including grassy swales, infiltration trenches, rock infiltration wells, and low flow/dry weather runoff infiltration facilities.	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement	Nonpoint source pollution control	Yes	Yes	Medium	Yes, City of Chico	Low	High	SWRP, Combined into I (Includes POEI*)	Trash Capture
24	Waterwise and Habitat and River Friendly Landscape Program	Big Chico Creek, Little Chico Creek and Comanche Creek watersheds. Targets DAC neighborhoods, parks and greenways, and City-owned properties.	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use	Yes	Yes	Medium	No	Low	Medium	Initial	F, G, H, I, K
25	Chico Green Streets and Low Impact Development Implementation Project	City of Chico and Butte County, Big Chico, Little Chico, and Comanche Creek Watersheds. Title 1 Schools. DAC neighborhoods	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	Duplicate, Replaced by 81





Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
<div style="display: flex; justify-content: space-between; font-size: small;"> <div style="width: 25%;"> <p><span style="background-color: #f0e68c; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div style="width: 25%;"> <p><span style="background-color: #f0e68c; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div style="width: 25%;"> <p><span style="background-color: #f0e68c; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													
32	Chapman/Mulberry Neighborhood Green Infrastructure and Natural Storm Water Treatment Project	Chapman Mulberry Neighborhood Dorothy Johnson Center Chapman School Teichert Pond Little Chico and Comanche Creek watersheds (and associated parks and greenways)	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	Duplicate, Replaced by 72
33	Mud and Rock Creek Flood Protection Project	Mud Rock Creek Reclamation District and Mud/Rock Creek watershed Airport Neighborhood commercial roads, parking lots and buildings (including renovating Airport Building and parking lot), Mud and Rock Creek Residential Neighborhoods targeting creek-side neighbors Nord School Orchard buffer strips and riparian habitat improvements (reduce pesticide and erosion runoff) of channel storm water detention areas (to	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	A, D, F, G, H, K
34	Little Chico Creek Lindo channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project	Project is located in Big Chico Creek, Little Chico Creek watersheds	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	Duplicate, Replaced by 76
35	Flood Detention Pond (Comanche, Fair Street, Home Depot, Teichert) Enhancement and LID Implementation Project	Projects are located in Big Chico, Little Chico and Comanche watersheds. Target retrofitting and improving existing detention ponds.	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs, citizen monitoring, public health	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP, combined into O (Includes POE1*)	Comanche Creek Management Program
36	Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools	The Project is located in the Big Chico Creek, Little Chico Creek, and Comanche Creek Watersheds and includes 25 schools.	Project includes: - Implementation of low impact development techniques and water quality best management practices on specific school sites. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, citizen monitoring, green jobs, STEM/NGSS education	Yes	Yes	Medium	Yes, Chico Unified School District	Low	Medium	Initial	Duplicate, Replaced by 77
37	City of Chico storm water capture and reuse project	Projects are located throughout the City of Chico (and Butte County), within Big Chico, Little Chico and Comanche Creek watersheds. City owned roads, sidewalks, medians, parks, commercial buildings and parking lots. Children's Park and City Plaza	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs, citizen monitoring, STEM/NGSS	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP, Combined into P (Includes POE1*)	Update Storm Water Master Plan and Policies

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
<div style="display: flex; justify-content: space-between; font-size: small;"> <div> <p><span style="background-color: #f4a460; padding: 2px;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #d9ead3; padding: 2px;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #f4a460; padding: 2px;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div> <p><span style="background-color: #f4a460; padding: 2px;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #d9ead3; padding: 2px;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #f4a460; padding: 2px;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div> <p><span style="background-color: #66b3ff; padding: 2px;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #d9ead3; padding: 2px;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #f4a460; padding: 2px;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													
38	Urban Landscape Water Conservation and Pesticide Reduction Project	Entire City of Chico and will target DAC neighborhoods (Chapman Mulberry) and commercial (Hagen Lane) and public property. Butte County Schools Big Chico Creek, Little Chico Creek, and Comanche Creek watersheds.	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Water temperature improvement, Community involvement, Improve or create recreation or public use area, green jobs training, citizen monitoring, storm water education linked with NGSS/STEM	Yes	Yes	Medium	No	Low	Medium	Initial	Duplicate, Replaced by 78
39	NSV IRWM Projects (submitted by CA Urban Streams Alliance-The Stream Team)	Butte County Watersheds	Project includes: - Implementation of low impact development techniques and water quality best management practices. - Public outreach, education, and involvement related to storm water and other issues. - Citizen based storm water monitoring. See detailed project description provided in Attachment A.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced sanitary sewer overflows, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, Citizen monitoring, green jobs training	Yes	Yes	Medium	No	Low	Medium	Initial	Duplicate, Replaced by 82
40	Parking Lot 4 Rehabilitation #50019	City Parking Lot 4 Corner of Salem St & W 5th St	Replacement of existing deteriorated asphalt paving with permeable pavement or pavers.	Increased filtration or treatment of runoff, Water supply reliability, Conjunctive use, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Improve or create recreation or public use area, Dedicated funding source (parking funds)	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP (Includes POE1*)	
41	Improve Lindo Channel	Lindo Channel	Remove vegetation, debris, rock, silt, repair outfalls, and reestablish channel capacity to reduce flooding and erosion of public infrastructure. Include a bikeway to increase public open space.	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Low	SWRP, combined into M	Big Chico 21st Century Management
42	Teichert Ponds Improvement	Teichert Ponds	Remove vegetation, limit illegal encampment to reduce trash buildup, improve paths/roads round the pond. Improve outfall screening to reducing buildup and flooding.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume	Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into Q (Includes POE1*)	Little Chico 21st Century Management
43	Fair Street Detention Basin Improvements	Fair Street Detention Basin	Remove vegetation to limit illegal encampments (trash buildup), improve paths/roads around pond. Improve outfall screening to reduce buildup and flooding.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume	Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into R (Includes POE1*)	Comanche Creek Management Program
44	5 Mile and Lindo Channel Diversion Structures Study	5 Mile and Lindo Channel Diversion Structures	Review effectiveness of current gate settings, adjust as needed. This past year, we visually observed a lot of capacity in Mud/Sycamore Creek, when Big Chico Creek and Lindo Channel were running so high that localized flooding developed. Balancing of flows could decrease scour, provide flood protection, and improve habitat.	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Improve riparian habitat	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP	Big Chico 21st Century Management
45	Big Chico Creek and Lindo Channel Diversions Study and Improvements	Big Chico Creek and Lindo Channel gates, and Sycamore weir Creek diversion	Evaluate the current capacities of the Big Chico Creek Gates, the Lindo Channel Gates, and the Sycamore Weir in relation to the Sycamore Pool capacity and water surface elevations. Consider the establishment of a regular sediment removal process and implementation of a routine maintenance agreement between the City/County and DWR.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Re-establish natural water drainage and treatment	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP, combined into M	Big Chico 21st Century Management
46	Lindo Channel Management Plan	Lindo Channel	Establish a long term management plan for Lindo Channel in order to re-establish the channel capacity back to its original design and to ensure the occurrence of regular maintenance. Consider need for flood control easement for managing vegetation growth and debris buildup, and limiting flow distribution issues. Study the capacity of Mud Creek to evaluate the potential to re-route flows.	Decreased flood risk by reduced runoff rate or volume, Riparian enhancement, Instream flow improvement	Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Low	SWRP, combined into M	Big Chico 21st Century Management
47	Medical Waste Program for unused medicine	Drop off points throughout the City	Providing medical waste drop off points would decrease the amount of leftover medication that gets flushed in toilets and thus discharged to WWTPs. WWTPs struggle to remove these medications so they get discharged in WWTP effluent to the creeks.	Increased filtration or treatment of runoff, Public education	Community involvement	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP (Includes POE1*)	
48	Sycamore and Mud Creek Flood Control	Sycamore Diversion and Mud Creek	A combination of sediment and vegetation management projects are needed at various locations throughout Mud and Sycamore Creeks to maintain the existing design capacity of the system: the construction of grade control structures would in theory stabilize the slope of the channel upstream of Cohasset Road and downstream of the Diversion Channel. The structures could also act as sediment catchments to allow for the removal of excess sediment and to prevent the transport of additional sediment downstream where it negatively affects other parts of the system. Benefits include reducing long term O&M. An off-stream area may provide for the detention of peak flood flows along Sycamore Creek. There may be potential to reduce flood risk by removing or notching the right bank levee to allow high water to flow into the right overbank area in the open space area located just south of the Chico Municipal Airport, behind the right bank levee of Sheep Hollow near the confluence with Sycamore Creek. This potential enhancement is strictly conceptual at this stage and further evaluation is needed to confirm its feasibility, and to evaluate whether or not the open space area is needed for interior drainage.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Re-establishment of the natural hydrograph	Yes	Yes	High	Yes, City of Chico	Low	Low	SWRP, combined into M	Big Chico 21st Century Management
49	Sheep Hollow Off-stream Storage Area	South of Chico Municipal Airport	An off-stream area may provide for the detention of peak flood flows along Sycamore Creek. There may be potential to reduce flood risk by removing or notching the right bank levee to allow high water to flow into the right overbank area in the open space area located just south of the Chico Municipal Airport, behind the right bank levee of Sheep Hollow near the confluence with Sycamore Creek. This potential enhancement is strictly conceptual at this stage and further evaluation is needed to confirm its feasibility, and to evaluate whether or not the open space area is needed for interior drainage.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas	Provides a carbon sink, Improve or create recreation or public use area	Yes	Yes	Low	No	Low	Medium	Initial	A
50	Early Flood Warning System	Big Chico Creek, Upstream	Upstream gages to improve upon the availability and reliability of real-time flow data upstream along Big Chico Creek, allowing more lead time for local responders to prepare for and manage a high flow event. The warning system could include water level sensors and telemeters to transmit flood information so that any abnormally large inflows and/or issues with debris on the gate structures could be noticed immediately.	Decreased flood risk by reduced runoff rate or volume, Public education	Community involvement	Yes	Yes	Yes	Yes, City of Chico	High	High	SWRP, combined into M, includes POE1*	Big Chico 21st Century Management
51	Identification and Evaluation of Groundwater Recharge	Big Chico Creek and Little Chico Creek	Groundwater recharge could help with water supply reliability, increase infiltration and provide treatment, and provide habitat (depending on how projects are implemented). The ability to recharge groundwater using various methods needs to be investigated.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Creation of new wetland areas	Improve or create recreation or public use area	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP, Combined into P	Update Storm Water Master Plan and Policies

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
<div style="display: flex; justify-content: space-between; font-size: small;"> <div style="width: 25%;"> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div style="width: 25%;"> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div style="width: 25%;"> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													
52	Upper Watershed	Big Chico Creek / Little Chico Creek Watersheds	-Ecosystem restoration -Improving groundwater recharge/storm water infiltration (i.e. wetland enhancement/creation) -Public education about watersheds, water systems and water quality.  ***This project recommendation is the result of a collaborative brains	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Instream flow improvement, Public education	Re-establish natural water drainage and treatment, Reduced energy use, Re-establishment of the natural hydrograph, Community involvement	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP, combined into M	Big Chico 21st Century Management
53	Urban Riparian Restoration	Big Chico Creek / Little Chico Creek Watersheds	Community Creek Cleanups Annual Bidwell Park and Chico Creeks Cleanup (September) Regular neighborhood cleanups Invasive species removal (i.e. Arundo) in Little Chico Creek. Removal of anadromous fish migration blockages (i.e. rouge dams but	Riparian enhancement, Public education	Nonpoint source pollution control, Community involvement, Improve or create recreation or public use area	Yes	Yes	Yes	Yes, City of Chico	Medium	Medium	SWRP, combined into M, includes POE1*	Big Chico 21st Century Management
54	Big Chico Creek West of Nord Ave.	Big Chico Creek Watershed	-Ecosystem restoration -Improving groundwater recharge/storm water infiltration (i.e. wetland enhancement/creation) -Public education about watersheds, water systems and water quality.  ***This project recommendation is the result of a collaborative brain	Increased filtration or treatment of runoff, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Instream flow improvement, Public education	Re-establish natural water drainage and treatment, Provides a carbon sink, Re-establishment of the natural hydrograph, Community involvement	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP, combined into M, includes POE1*	Big Chico 21st Century Management
55	Erosion Management/Prevention	Big Chico Creek / Little Chico Creek Watersheds	Upper Park Road erosion control/mitigation Biofilters before water enters creeks to reduce sediment in creek due to erosion from cyclists and runners on trails near the creeks. Identify and prioritize erosion hot spots to reduce sediments in creek	Wetland enhancement, Riparian enhancement, Public education	Community involvement, Improve or create recreation or public use area, Improve health of the natural ecosystem	Yes	Yes	High	Yes, City of Chico	High	High	SWRP, combined into M, includes POE1*	Big Chico 21st Century Management
56	Diversion Channels	Big Chico Creek / Little Chico Creek Watersheds	Utilize diversion channels for groundwater recharge/storm water infiltration. Biofilters before diversion channels drain to creeks (i.e. Little Chico creek diversion to Butte creek) Public education about watersheds, water systems and water quality.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Riparian enhancement, Instream flow improvement, Public education	Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	No	Medium	Medium	Initial	A, B, F, H
57	Storm Water Detention Basins	Big Chico Creek / Little Chico Creek Watersheds	-Major storm water basin restoration (i.e. Teichert Ponds Restoration Project - 2009 ) to mitigate polluted runoff that drains to the creeks. -Biofilters before water drains to waterways. -Public education about watersheds, water systems and water quality.	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement, Public education	Re-establish natural water drainage and treatment, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	No	Medium	Medium	Initial	C, J
58	Updating the City's storm water plan (to make it proactive)	Relevant to the entire City	Update the City's storm water master plan to make it proactive. This update would include developing computer models of the City's drainage system that are capable of modeling water quality. It would include evaluating drainage and flood control, implementation of low impact development, water quality best management practices, and would include programs like creek clean ups, water quality monitoring, and habitat enhancement, etc. It would include opportunities to use storm water for landscape irrigation or other uses. It should have a public education element too. A goal should be to address hydromodification from development.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced sanitary sewer overflows, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP, Combined into P	Update Storm Water Master Plan and Policies
59	Routine Community Creek Clean Up Project (Program)	Relevant to the entire watershed, but primarily within the City	This program includes organizing annual community creek clean up events. The events should include a morning of cleaning litter and trash from the creeks and associated wetland and riparian habitat. After the clean up there should be a community outreach and education event and barbecue.	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement	Nonpoint source pollution control, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP (Includes POE1*)	
60	Fair Street Detention Ponds	Fair Street Detention Ponds	Trash Interception at the Fair Street Detention Ponds including BD Ditch Repairs to reduce flooding	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement	Nonpoint source pollution control, Re-establish natural water drainage and treatment	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into R (Includes POE1*) Trash Interception component combined into I	Comanche Creek Management Program
61	Teichert Ponds Project	At the Teichert Ponds	Improve the Teichert Ponds by removing non-native vegetation and improving the pond hydraulics and water quality.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Riparian enhancement, Increased urban green space, Instream flow improvement, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into Q (Includes POE1*)	Little Chico 21st Century Management
62	Meyers Industrial Park, Otterson Business Park	Meyers Industrial Park, Otterson Business Park	Trash collection at Meyers Industrial Park and Otterson Business Park to benefit Comanche Creek. Potential to combine this project with improvement of Comanche Creek bike lanes/paths.	Increased filtration or treatment of runoff, Public education	Nonpoint source pollution control, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into I (Includes POE1*)	Comanche Creek Management Program
63	Update the City's storm water policies and regulations	Relevant to the entire City	Update the City's development standards to clearly identify what water quality improvements and facilities are needed, how the improvements should be sized, what process is to be used for achieving approval of the storm water quality improvements and facilities by the City, and identification of storm water quality development impact fees. The project should also identify what the annual O&M costs are for the improvements and facilities, estimate the annual O&M costs, and identify a method like establishment of a water quality zone of benefit or community facilities district that results in monthly storm water fees being paid by new development. Additionally, regulations and policies for the existing City should be established or updated, and a funding mechanism for generating storm water funds from the existing City areas should be evaluated, hopefully leading to a secure O&M funding source.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced sanitary sewer overflows, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	High	SWRP, Combined into P	Update Storm Water Master Plan and Policies
64	Upper Park Road Improvements - Erosion Control	Upper Bidwell Park	Improvement of Upper Bidwell Park Road to reduce erosion into Big Chico Creek and to improve access to Upper Bidwell Park.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Riparian enhancement, Public education	Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into M, includes POE1*	Big Chico 21st Century Management
65	Laxson South Bioswale	Located at the south end of Laxson Auditorium, adjacent to the roundabout at 1st St. and Salem.	The proposed project will collect surface runoff from City streets and neighboring parking lots into a bioswale to be constructed at the N.E. corner of the Arts & Humanities building / S. Laxson Auditorium, where the campus meets the roundabout at W. 1st St. and Salem St. Currently, the area receives lots of runoff during moderate and heavy rainstorms, which creates flooding of sidewalks. The flooded areas are safety concerns, and the rainwater has nowhere to go but out into campus. This project would create improved drainage and catchment for surface runoff, allowing pollutants and fine particulates to settle before entering the storm drain system.  The project will incorporate a bioswale and catchment system into campus to allow for infiltration and filtration of stormwater runoff. Existing City and Campus storm drain infrastructure will be improved and incorporated to direct water directly into the bioswale, rather than across sidewalks and into roadways. Shaping & grading of the site for collection of water, along with the installation of boulders, cobble and appropriate plant material will slow runoff velocity and allow for further infiltration and filtration.	Increased filtration or treatment of runoff; Decreased flood risk by reduced runoff rate or volume; Public education	Nonpoint source pollution control; Water conservation; This project will also create an educational opportunity for campus visitors	Yes	Yes	Medium	Yes, CSU Chico	High	High	SWRP	

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

<div style="display: flex; justify-content: space-between; font-size: 8px;"> <div style="width: 20%;"> <p><b>SWRP</b> Project is combined into Big Chico Creek 21st Management Plan</p> <p><b>SWRP</b> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><b>SWRP</b> Project is combined into Comanche Creek Management Plan</p> </div> <div style="width: 20%;"> <p><b>SWRP</b> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><b>SWRP</b> Project is combined into Trash Capture Projects and Plans</p> <p><b>SWRP</b> Project is combined into Teichert Ponds Improvement Project</p> </div> <div style="width: 20%;"> <p><b>SWRP</b> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><b>SWRP</b> Project is an Individual SWRP Project</p> <p><b>Initial</b> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
66	Create Bioswales @ storm drain outfalls	On all streams where landforms and access allow	Where there is room between the channel and the borders of the Greenbelt, pull back storm drain outfalls and install Bioswales, with spreading slabs and Energy dissipation before the channel, similar to what was done at Verbena Fields. This can also be done at locations such as Lost Park.	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Creation of new wetland areas; Riparian enhancement; Employment opportunities created; Public education	Nonpoint source pollution control; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement	Yes	Yes	Medium	Yes, City of Chico	Low	Low	SWRP, Combined into P (Includes POEI*)	Update Storm Water Master Plan and Policies													
67	Teichert Ponds cleansing wetland	Teichert Ponds on Little Chico creek	Convert some portion of the first pond and the adjacent area to a cleanable settling and trash removing basin and a constructed wetland to absorb toxins and sediment and to be removed periodically.	Increased filtration or treatment of runoff; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Employment opportunities created; Public education	Nonpoint source pollution control	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into Q (Includes POEI*)	Little Chico 21st Century Management													
68	Create Hydrologic Floodplains on streams	All streams	Along streams small floodplains can be constructed and vegetated with natives, as Streaminders has done in the past. Such opportunities exist along E. Lindo Ave. behind Diamond nut and upstream almost to Mangrove.	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Creation of new wetland areas; Riparian enhancement	Nonpoint source pollution control; Re-establish natural water drainage and treatment	Yes	Yes	Medium	Yes, City of Chico	Medium	Medium	SWRP, combined with 16 (Includes POEI*)	Update Storm Water Master Plan and Policies													
69	Multiple Off-Stream Detention/Wetland Basins	Along Little Chico Creek, southwest of Marsh Jr.	Create channel(s) to intercept peak flows in large basins to mitigate flood risk and erosion as well as enhance recharge and create wetland for wildlife and public enjoyment.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Re-establish natural water drainage and treatment; Water conservation; Reduced sanitary sewer overflows; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Low	SWRP, combined into N (Includes POEI*)	Little Chico 21st Century Management													
70	Lindo Channel Stormwater Infiltration and Floodplain Enhancement Project	Lindo Channel (target City-owned and public right of ways)	Work with City to develop a plan to prioritize exact locations for channel improvements (city-owned properties and right-of-ways) and storm drain system improvements (outfall repairs, outfall setbacks w/bioswales, trash reduction structures at outfalls, and inlet filters). It is also intended to build on the efforts of previous floodplain improvement and stormwater protection grant projects awarded to the City (Prop. 84, DROPS, Verbena/Bidwell Ave., CUSA) and CUSD (DROPS), including continuing stormwater education, LID Implementation efforts, and citizen monitoring efforts tracking long-term effects of stormwater management efforts on improving habitat and water quality.	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	Yes	Yes, City of Chico	High	High	SWRP, combined into M	Big Chico 21st Century Management													
71	Bidwell Park Stormwater Management Project (Green Infrastructure-LIDs, Floodplain Improvement, and Ground Water Recharge)	Bidwell Park (Big Chico Creek Watershed)	Project will implement LID practices designed to improve the capacity of natural drainage areas to infiltrate and treat stormwater runoff throughout Bidwell Park, including green Infrastructure-LIDs, floodplain improvement, and ground water recharge. See attachment for more details	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Low	Medium	SWRP, combined into M, includes POEI*	Big Chico 21st Century Management													
72	Revised Chapman/Mulberry Neighborhood Green Infrastructure and Natural Stormwater Treatment Project	Chapman/Mulberry neighborhoods, Teichert Pond, Little Chico Creek (Public-owned greenways and parks in Little Chico Creek watershed)	Convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering creeks in disadvantaged communities	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	Medium	Yes, City of Chico	Medium	Medium	SWRP, combined into N (Includes POEI*)	Little Chico 21st Century Management													
73	Bidwell/Grape Ave Stormwater Protection and Restoration Project	Big Chico Creek (near Grape and Bidwell Ave)	Implement green infrastructure, remove invasive plants, plan native species, bioswales for ground water recharge, stream bank stabilization and reduce bank erosion, restore floodplain functions, and implement green jobs training. See attachment for more details.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Riparian enhancement; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, Grape Way Agricultural Farm. Brendon Smith, 916-471-0311	Medium	Medium	SWRP														
74	(Revised) Cal Park Green Streets Project	Little Chico Creek, Teichert Pond, Cal Park Residential Neighborhoods	Convert impervious areas into vegetated plots that soak up rainwater in Cal Park. See attachment for more details.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	Medium	Yes, City of Chico	Medium	Medium	SWRP, combined into N (Includes POEI*)	Little Chico 21st Century Management													

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

<div style="display: flex; justify-content: space-between; font-size: 8px;"> <div style="width: 20%;"> <p><span style="background-color: #f0e68c; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div style="width: 20%;"> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div style="width: 20%;"> <p><span style="background-color: #d9ead3; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #f4cccc; border: 1px solid black; padding: 2px;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #fff2cc; border: 1px solid black; padding: 2px;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
75	Revised Chico State University LID Implementation and Stream Habitat Enhancement Project	Big Chico Creek Watershed and creek reaches adjacent to Creek	Implement green infrastructure, remove invasive plants, plan native species, bioswales for stormwater treatment, stream bank stabilization and reduce bank erosion, restore floodplain functions, improve walking and biking trails, implement green jobs training, trash reduction structures, outreach and education. See attachment for more details.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	No	Low	Medium	Initial														
76	Revised Little Chico Creek, Lindo Channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project	Little Chico Creek, Lindo Channel, Mud/Rock Creek	Removing invasive plants, installing natives, removing debris and deposition. See attachment for additional project details	Increased filtration or treatment of runoff; Water supply reliability; Decreased flood risk by reduced runoff rate or volume; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	Medium	No	High	Medium	Initial														
77	Revised Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools	Big Chico Creek / Little Chico Creek Watersheds	Project features a long term approach for integrating LID practices into present and future maintenance and landscape design standards to assist the CUSD and BCOE schools in meeting existing storm water management goals. In addition, the Project will integrate a cohesive storm water educational program, targeting after-school programs.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, Chico Unified School District	Medium	Medium	SWRP (Includes POE!*)														
78	Revised Urban Landscape Water Conservation and Pesticide Reduction Project	Big Chico Creek Little Chico Creek watersheds	Project features developing a City wide LID design and BMP Manual, implementing demo LID projects, riparian vegetation management, trash reduction program, develop green jobs training, develop water wise and habitat guide, rain-scapes reward program. See attachment for more details.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	No	Medium	Medium	Initial														
79	Revised Five Mile, Lindo Channel, and Sycamore Flood Diversion Stormwater Treatment and Habitat Enhancement Project	Big Chico Creek, Mud Creek, Five Mile, Lindo Channel, and Sycamore Flood Diversion	This Project will also enhance natural habits and wildlife corridors, and improve the function of an existing flood diversion system in need of repair to include fully functioning USGS gages, and telemetry. See attachment for more details	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combined into M	Big Chico 21st Century Management													
80	Revised City of Chico Long-term Trash Reduction Project	Big Chico Creek, Little Chico Creek Watersheds	Establish a long-term trash reduction program to achieve outcomes to meet State Trash TMDL and MS4 permit requirements. See attachment for more details	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement	Yes	Yes	High	Yes, City of Chico	Medium	Medium	SWRP, combine into I	Trash Capture													
81	Revised Chico Green Streets and Low Impact Development Implementation Project	Big Chico Creek/Little Chico Creek Watersheds	The proposed Project features a long-term approach for integrating LID practices into present and future development design standards to assist the City in meeting State-mandated Municipal Stormwater Permit (MS4) requirements. See attachment for details	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Low	Medium	SWRP, Combined into P	Update Storm Water Master Plan and Policies													
82	The Stream Team NSV IRWM Projects	Big Chico Creek Little Chico Creek Watersheds	Continue existing efforts of The Stream Team to educate and engage community members on how to monitor water quality in local watersheds. See attachment for details.  Existing Projects - K-12 Watershed Education and Science Ambassador Program - Regional K-12 Watershed Education - North Sac. Valley Regional Water Quality Assessment Project 2016 list - Drought Response and Outreach Program For Schools including LID Implementation Projects - North Sac. Valley Regional Water Quality Assessment and Education Project	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	No	High	Low	Initial														

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
<div style="display: flex; justify-content: space-between; font-size: small;"> <div> <p><span style="background-color: #f4cccc;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #e6f2ff;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #d9ead3;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div> <p><span style="background-color: #f4cccc;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #e6f2ff;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #d9ead3;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div> <p><span style="background-color: #f4cccc;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #e6f2ff;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #d9ead3;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													
83	Teichert Pond Water Quality Improvement Project	Teichert Pond	Implement trash reduction outreach campaign, trash and water quality surveys, install trash reduction structures in the inlets and outlets associated with Teichert Pond, initiate invasive plant removal projects and replant appropriate natives, initiate a homeless encampment reduction plan, collaborate with existing citizen monitoring to track project effectiveness and to provide related public stormwater education and outreach (target DACs, schools, businesses contributing runoff to Teichert Pond), green job training to assist with project implementation, develop outreach and education plan with roles for interested community organizations, connect bike path, initiate outdoor classroom curriculum linked with project objectives, LID implementation and green streets retrofit to reduce runoff carried to pond, improve wildlife and riparian habitat, recreation opportunities, picnic areas, walking/biking paths, informational signage, etc.	Increased filtration or treatment of runoff; Water supply reliability; Conjunctive use; Decreased flood risk by reduced runoff rate or volume; Wetland enhancement; Creation of new wetland areas; Riparian enhancement; Increased urban green space; Instream flow improvement; Employment opportunities created; Public education	Nonpoint source pollution control; Re-establish natural water drainage and treatment; Water conservation; Reduced energy use; Reduced greenhouse gas emissions; Provides a carbon sink; Re-establishment of the natural hydrograph; Water temperature improvement; Community involvement; Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Low	Medium	SWRP, combined into Q (Includes POE1*)  Trash reduction structures combined into I	Little Chico 21st Century Management
84	Comanche Creek Flood Control Study	Comanche Creek from Little Chico Creek Diversion to Dayton Road	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system along Comanche Creek from the Little Chico Creek Diversion Channel to Dayton Road. The goals of the project would be to: - Ensure the integrity of the flood control system. - Assess existing runoff flows and mitigate for increased flows due to development - Fully assess the system using modern analysis techniques and increased data, and ensure that the system can protect the urban and agricultural areas while considering possible climatic changes. - Identify improvements required to achieve FEMA certification. - Coordinate with the Bicycle Plan. - Optimize recreational opportunities. - Identify opportunities to enhance riparian habitat.	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume.	Improve or created public use area	Yes	Yes	Medium	Yes, City of Chico	High	High	SWRP, combined into O	Comanche Creek Management Program
85	Chapman Mulberry Rain Garden	E. 12th Street, Parcel 005-142-50-000	This project benefits Little Chico Creek by intercepting nonpoint pollution and infiltrating it in basins mulched with appropriate species of fungus for mycoremediation. This project hopes to be an anchor project by beautifying the open space (052 zoned) for residents nearby, as well as serve as a demo garden for water-wise Native landscaping.	Increased infiltration, conjunctive use, public education	nonpoint pollution control, carbon sink, enhance public space	Yes	Yes	High	Yes, Earthshed Solutions	High	High	SWRP	
<b>Consolidated/Grouped Projects</b>													
A	Big Chico Creek and Mud Creek Watershed Wide Flood Control, Urban Drainage, Habitat, Public Open Space/Recreation Management Plan	Big Chico Creek and Mud Creek Watersheds	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system of diversions and levees from Five Mile Recreation Area in Chico to the Sacramento River. The goals of the project would be to: - Ensure the integrity of the flood control system. - Fully assess the system using modern analysis techniques and increased data, and assure that the system can protect the urban area while considering possible climatic changes. - Manage gravel deposition at Five Mile and assure proper gravel migration downstream. - Develop management strategies that maximize benefits to salmon populations. - Coordinate with the Bicycle Plan. - Optimize recreational opportunities. - Identify opportunities to enhance riparian and wetland habitat, with an emphasis on endangered species such as the Sacramento Valley Long-horned Beetle. - Ensure system provides 200-yr level of protection per State regulations. - Maximize the use of County Service Area 24 funds. - Include LID where feasible. - Identify and correct erosion problems. - Install flow gages throughout creek (particularly in the upper watershed) to improve upon the availability and reliability of real-time flow data allowing more lead time for local responders to prepare for and manage a high flow event. The warning system could include water level sensors and telemeters to transmit flood information so that any abnormally large inflows and/or issues with debris on the gate structures would generate a alarm.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	No	Medium	High	Initial	
B	Little Chico Creek Watershed Wide Flood Control, Urban Drainage, Habitat, Public Open Space/Recreation Management Plan	Little Chico Creek and Comanche Creek Watersheds	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system of diversions and levees from Little Chico Creek to Butte Creek. The goals of the project would be to: - Ensure the integrity of the flood control system. - Fully assess the system using modern analysis techniques and increased data, and assure that the system can protect the urban area while considering possible climatic changes. - Identify improvements required to achieve FEMA certification. - Coordinate with the Bicycle Plan. - Optimize recreational opportunities. - Identify opportunities to enhance riparian habitat, with an emphasis on endangered species such as the Sacramento Valley Long-horned Beetle. - Ensure system provides 200-yr level of protection per State regulations. - Include LID where feasible. - Identify and correct erosion problems. - Install flow gages throughout creek (particularly in the upper watershed) to improve upon the availability and reliability of real-time flow data allowing more lead time for local responders to prepare for and manage a high flow event. The warning system could include water level sensors and telemeters to transmit flood information so that any abnormally large inflows and/or issues with debris on the gate structures would generate a alarm.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Yes	No	Medium	High	Initial	
C	Teichert Ponds	Teichert Ponds	Update the Teichert Ponds Restoration Project Plan to evaluation and potential implementation of: - Reduction of homeless impacts to the ponds - Vegetation management - Erosion repairs - Trash Capture, suspended solids capture, water quality treatment of inflows - Reconstruct the outlet to be able to manage releases - Reroute the small east side storm drains so that they don't dump directly into Pond 1. - Remove the silt buildup in the ponds and its associated contaminants. - Separate Pond 1 (freshwater) from Ponds 2-3 and rework Ponds 2 and 3 so that Pond 2 can be periodically drained and cleaned. - Work with the Butte County Mosquito and Vector Control District to develop a plan that will reduce the need for mosquito control. - Remove the major invasive plant species: parrot's feather, tree of heaven, Himalayan blackberry, Chinese tallow tree, pyracantha and arundo (1-2 small stands). - The dirt roadway on the north side floods almost every winter. Solve this problem. - Finish removing the chain link fencing around Pond 1 to improve access for invasive plant control and trash cleanup. - Construct a walking trail on the east side of the Ponds to improve public access and reduce undesirable behavior (camping, encroachments by east side neighbors, yard waste dumping). Homeless camping is a major problem here, however, most of the camps are outside of the storm water area so they don't directly affect the amount of trash going into Little Chico Creek. - Improve trash filtering on major east side storm water inlet and add filter on south inlet.			Yes	Yes	High	No	Medium	High	SWRP combined into Q	
D	Creek Bank and Bed Stabilization Plan and Specific Projects, including:	Big and Little Chico Creek Watersheds	Develop a Creek Bank and Bed Stabilization Plan and specific projects, including: - Left bank downstream of the Chestnut St. Bridge - Upper Bidwell Park road where runners and bicyclists cause erosion - Lindo channel pools	Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Employment opportunities created,	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water temperature improvement, Community involvement, Improve or create recreation or public use area	Yes	Yes	Low	No	Medium	High	Initial	
E	Homeless Camping Reduction Program		Develop a program (or continue and improve current efforts) to help reduce storm water impacts from homeless encampment along creek, detention basins, bridges, and other areas where water quality I impacted.	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement,	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Improve or create recreation or public use area	Yes	Yes	Yes	No	Medium	Medium	Initial	

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
<div style="display: flex; justify-content: space-between; font-size: small;"> <div> <p><span style="background-color: #ffffcc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Big Chico Creek 21st Management Plan</p> <p><span style="background-color: #ccccff; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Little Chico Creek 21st Century Management Plan</p> <p><span style="background-color: #ccccff; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Comanche Creek Management Plan</p> </div> <div> <p><span style="background-color: #ffffcc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Updating City's Storm Water Master Plan and Policies</p> <p><span style="background-color: #ccccff; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Trash Capture Projects and Plans</p> <p><span style="background-color: #ccccff; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Teichert Ponds Improvement Project</p> </div> <div> <p><span style="background-color: #ccffcc; border: 1px solid black; padding: 2px;">SWRP</span> Project is combined into Fair Street Detention Basin Improvement Project</p> <p><span style="background-color: #ccffcc; border: 1px solid black; padding: 2px;">SWRP</span> Project is an Individual SWRP Project</p> <p><span style="background-color: #ffffff; border: 1px solid black; padding: 2px;">Initial</span> Project will remain in SWRP as an initial project, but will not be evaluated further as a SWRP project</p> </div> </div>													
F	Storm Water Public Outreach, Education, and Involvement Program		Modify the City's existing outreach program to include storm water education, LID/BMP education, trash clean up events. Include activities that engage and involve the public in storm water events. +F96	Increased filtration or treatment of runoff, Water supply reliability, Wetland enhancement, Riparian enhancement, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Yes	No	Medium	High	Initial	
G	Storm Water Monitoring for compliance with MS4 permit		Continue the City's storm water monitoring activities as needed to meet the requirements of the MS4 permit.	Increased filtration or treatment of runoff, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Yes	Yes, City of Chico	High	High	SWRP	
H	Low Impact Development and Water Quality Best Management Practices Management Plan and Specific Projects	Big and Little Chico Creek Watersheds, but primarily within the City	Develop a Low Impact Development and Water Quality Best Management Practices Management Plan and Specific Projects, including: <ul style="list-style-type: none"> <li>- Hagen Lane Business Park outlet filtering</li> <li>- Valine outlet filtering</li> <li>- Wrex outlet filtering</li> <li>- Midway Bridge northwest outlet filtering</li> <li>- RDA property north of the Boucher St. Bridge for storm water infiltration</li> <li>- Bidwell Park Enhancements</li> <li>- Green street and parking lot retrofits</li> <li>- City and County Corp. Yard retrofits</li> <li>- Demonstration projects for public</li> <li>- City of Chico LID and BMP Design Manual</li> <li>- Target LID to disadvantaged communities</li> </ul> The program would identify specific LID projects and activities to be implements over a 25-year time period using a rational approach that provides the greatest potential benefits and is affordable and fundable by the City.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	
I	Trash Reduction Master Plan and Specific Projects, including:	Big and Little Chico Creek Watersheds, but primarily within the City and targeting commercial, industrial, and high density residential land uses	Implement specific trash capture projects at Teichert ponds, Fair Street Detention Basin, and Meyers and Otterson Industrial Parks  Develop a Trash Reduction Master Plan and Specific Projects: The master plan would identify specific trash reduction projects and activities to be implemented over a 20-year time period that meets the requirements of the Trash Amendments and uses a rational approach that provides the greatest potential benefits and is affordable and fundable by the City.	Increased filtration or treatment of runoff, Wetland enhancement, Riparian enhancement,	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Re-establishment of the natural hydrograph, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	Yes, City of Chico	Low	Medium	SWRP (Includes POEI*)	Trash Capture
J	Detention Basin Implementation and Modification Plan	Little Chico Creek Watersheds, but primarily within the City	Develop a Detention Basin Implementation and Modification Plan and specific projects including: - Fair Street Detention Basin	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	
K	Habitat Improvement Plan and Specific Projects	Big and Little Chico Creek Watersheds	Develop a Habitat Improvement Plan and Specific Projects, including: <ul style="list-style-type: none"> <li>- Remove invasive yellow flag iris from Comanche Creek</li> <li>- Arundo removal from Little Chico Creek (develop a management plan and conduct removal projects)</li> <li>- Restoration projects in the upper watershed</li> <li>- Restoration projects in the City</li> </ul>	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	
L	Energy Conservation and Greenhouse Gas Reduction Program	Big and Little Chico Creek Watersheds	Develop a program to help reduce energy use and greenhouse gas production. Also includes sequestering greenhouse gases through tree planting and other means.	Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	No	Low	Medium	Initial	
M	Big Chico Creek 21st Century Management	Big Chico Creek and Mud Creek Watersheds	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system of diversions and levees from Five Mile Recreation Area in Chico to the Sacramento River. The goals of the project would be to: - Ensure the integrity of the flood control system: Fully assess the system using modern analysis techniques and increased data, and assure that the system can protect the urban area while considering possible climatic changes; review settings of diversion structures. Balance flows to decrease scour, improve flood protection, and improve habitat; Ensure system provides 200-yr level of protection per State regulations; Evaluate expanding floodplain; Install flow gages, water level sensors, and telemeters to transmit flood information so that any abnormally large inflows and/or issues with debris on the gate structures would generate an alarm. - Optimize recreational opportunities; Coordinate with the Bicycle Plan; i.e. complete the planned bike path along the Bypass to connect to the Floral Ave bike path - Maximize the use of County Service Area 24 funds. - Include LID where feasible: Improve GW recharge and stormwater infiltration in upper watershed, Infiltration in Lindo Channel, Bidwell Park SW Management: Infiltration, grassy swales, - Identify and correct erosion problems: Biofilters before water enters creeks to reduce sediment in creek due to erosion from cyclists and runners; Improve Upper Bidwell Park Road to reduce erosion in BCC and improve access to the Park; Erosion at Hooker Oak Park - Detention Basins: Create detention area in Lower Bidwell Park just west of the east most parking area off Peterson Memorial Drive; Create small detention basin on the right (north) bank of BCC just downstream of the Vallombrosa Bridge (part of the city-owned Lost Park area). - Restore ecosystem: Manage gravel and sediment deposition at Five Mile and assure proper gravel migration downstream; Community Creek cleanups; invasive species removal; removal of fish migration blockages; Identify opportunities to enhance riparian and wetland habitat, with an emphasis on endangered species such as the Sacramento Valley Long-horned Beetle.	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Yes	Yes	Medium	Yes, City of Chico	Medium	High	SWRP Includes POEI*	



Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)	
N	Little Chico Creek 21st Century Management	Little Chico Creek and Comanche Creek Watersheds	The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system of diversions and levees from Little Chico Creek to Butte Creek. The goals of the project would be to: <ul style="list-style-type: none"> <li>- Ensure the integrity of the flood control system.</li> <li>- Recalibrate LCC diversions into Butte Creek</li> <li>- Fully assess the system using modern analysis techniques and increased data, and assure that the system can protect the urban area while considering possible climatic changes.</li> <li>- Identify improvements required to achieve FEMA certification.</li> <li>- Coordinate with the Bicycle Plan.</li> <li>- Optimize recreational opportunities.</li> <li>- Identify opportunities to enhance riparian habitat, with an emphasis on endangered species such as the Sacramento Valley Long-horned Beetle.</li> <li>- Ensure system provides 200-yr level of protection per State regulations.</li> <li>- Include LID where feasible.                             <ul style="list-style-type: none"> <li>- Evaluate City corp yards</li> <li>- Evaluate Chaptman/Mulberry neighborhoods</li> <li>- Cal Park Green Streets</li> </ul> </li> <li>- Identify and correct erosion problems.</li> <li>- Install flow gages throughout creek (particularly in the upper watershed) to improve upon the availability and reliability of real-time flow data allowing more lead time for local responders to prepare for and manage a high flow event. The warning system could include water level sensors and telemeters to transmit flood information so that any abnormally large inflows and/or issues with debris on the gate structures would generate an alarm.</li> <li>- Create channel(s) to intercept peak flows in large basins to mitigate flood risk and erosion as well as enhance recharge and create wetland for wildlife and public enjoyment.</li> </ul>	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	Yes, City of Chico	Medium	High	SWRP		
	O	Comanche Creek Management Program	Comanche Creek watershed	- The proposed project is to develop and implement a multifaceted, holistic program to manage the flood protection system along Comanche Creek from the Little Chico Creek Diversion Channel to Dayton Road. The goals of the project would be to: <ul style="list-style-type: none"> <li>- Ensure the integrity of the flood control system.</li> <li>- Assess existing runoff flows and mitigate for increased flows due to development</li> <li>- Fully assess the system using modern analysis techniques and increased data, and ensure that the system can protect the urban and agricultural areas while considering possible climatic changes.</li> <li>- Identify improvements required to achieve FEMA certification.</li> <li>- Optimize recreational opportunities and Coordinate with the Bicycle Plan.</li> <li>- Identify opportunities to enhance riparian habitat.</li> <li>- Identify where LID projects can be implemented, i.e. convert southwest outlet at Midway Bridge into a bioswale.</li> <li>- Construct detention basins per the 1997 SDMP amendment</li> <li>- Improve bike paths around Comanche Creeks                             <ul style="list-style-type: none"> <li>- Encourage alternative transportation for employees of businesses in this area, as currently all of Otterson Dr. is used by employee parking for Build.com.</li> </ul> </li> <li>- Quality                             <ul style="list-style-type: none"> <li>- Provide filtering of stormwater runoff at northwest outlet at Midway Bridge and at outlets at Valine and Wrex.</li> <li>- Provide filtering of stormwater runoff from Hegan Lane Business Park (outlet into CC is west of CCG, pollutants are probably mostly hydrocarbons from the large amount of impervious surfaces of parking lot and street parking).</li> </ul> </li> <li>- Gain a better understanding of Comanche Creek water levels and operations                             <ul style="list-style-type: none"> <li>- Develop a working relationship with M&amp;T Ranch to coordinate communications about their control of the water level in CC with creek cleanups and other in-stream activities.</li> <li>- Develop a better understanding of when they reduce water flows and plan in-stream activities based on this information.</li> <li>- Provide real-time online information about water flow diversion into Comanche Creek (CC) at Phelan Dam to help with trash removal efforts downstream, especially at Comanche Creek Greenway (CCG).</li> </ul> </li> <li>- Enhance CC operations                             <ul style="list-style-type: none"> <li>- Remove invasive vegetation</li> <li>- Reduce silt buildup in CC</li> <li>- Reduce silt entering CC from Fair Street Detention Basin</li> </ul> </li> </ul>	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	Yes, City of Chico	Medium	High	SWRP	
	P	Updating the City's stormwater planning and policies	Relevant to entire City	- Update City's SW policies and regulations to include developing computer models of the City's drainage system that are capable of modeling water quality. It would include evaluating drainage and flood control, implementation of low impact development, water quality best management practices, and would include programs like creek clean ups, water quality monitoring, and habitat enhancement, etc. It would include opportunities to use storm water for landscape irrigation or other uses. It should have a public education element too. A goal should be to address hydromodification from development. <ul style="list-style-type: none"> <li>- Update the City's development standards to clearly identify what water quality improvements and facilities are needed, how the improvements should be sized, what process is to be used for achieving approval of the storm water quality improvements and facilities by the City, and identification of storm water quality development impact fees. The project should also identify what the annual O&amp;M costs are for the improvements and facilities, estimate the annual O&amp;M costs, and identify a method like establishment of a water quality zone of benefit or community facilities district that results in monthly storm water fees being paid by new development. Additionally, regulations and policies for the existing City should be established or updated, and a funding mechanism for generating storm water funds from the existing City areas should be evaluated, hopefully leading to a secure O&amp;M funding source.</li> <li>- Identify where channel stabilization and riparian habitat enhancement is needed</li> <li>- Establish a stream maintenance inspection and monitoring program, include trash and debris removal, exotic plant eradication, revegetation and stream bank repair and maintenance. Could lean heavily on volunteers.</li> <li>- Develop stormwater capture and reuse plan</li> <li>- Identify and evaluate groundwater recharge</li> <li>- Identify street segments and parking lots that can be retrofitted into green streets or green parking lots using vegetated swales, vegetated buffer strips, bioretention planters, and mechanical treatment systems</li> <li>- Evaluate where LID is needed, including Bidwell Park</li> <li>- Where there is room between the channel and the borders of the Greenbelt pull back storm Drain outfalls and install Bioswales, with spreading slabs and Energy dissipation before the channel.</li> <li>- Create Hydrologic Floodplains on streams</li> <li>- Bank Slope Reduction and Stabilization in ag and rural areas</li> </ul>	Increased filtration or treatment of runoff, Water supply reliability, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Creation of new wetland areas, Riparian enhancement, Increased urban green space, Instream flow improvement, Employment opportunities created, Public education	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Water conservation, Reduced energy use, Reduced greenhouse gas emissions, Provides a carbon sink, Re-establishment of the natural hydrograph, Water temperature improvement, Community involvement, Improve or create recreation or public use area, storm water education and citizen monitoring	Yes	Yes	Medium	Yes, City of Chico	Medium	High	SWRP	

Table 2. Updated Screening of the Initial Projects following TAC 3 (8/21/2017)

Project Number or Letter	Title of Recommended Project	Location of the Recommended Project	Project Description	Main Benefits	Additional Benefits	Location Evaluation (Yes, No)	Provides Two Primary and at least One Additional Benefit (Yes, No)	Publicly Owned Land Evaluation (High, Medium, Low)	Project Sponsor Evaluation (Yes, No)	Estimated Affordability Evaluation (High, Medium, Low)	Implementability Evaluation (High, Medium, Low)	Evaluate as a SWRP Project or Retain as an Initial Project (note A) (SWRP or Initial)	Related Grouped/ Consolidated Project Below (Project Letter)
Q	Teichert Ponds Improvement Project	Teichert Ponds	<p><b>Pond Improvements</b>                      Reroute the small east side storm drains so that they don't dump directly into Pond 1. Remove the silt buildup in the ponds and its associated contaminants. Separate Pond 1 (freshwater) from Ponds 2-3 and rework Ponds 2 and 3 so that Pond 2 can be periodically drained and cleaned. Work with the Butte County Mosquito and Vector Control District to develop a plan that will reduce the need for mosquito control. Remove the major invasive plant species: parrot's feather, tree of heaven, Himalayan blackberry, Chinese tallow tree, pyracantha and arundo (1-2 small stands). Improve outfall screening to reducing buildup and flooding. Convert some portion of the first pond and the adjacent area to a cleanable settling and trash removing basin and a constructed wetland to absorb toxins and sediment and to be removed periodically.</p> <p><b>Site Improvements</b>                      The dirt roadway on the north side floods almost every winter. Solve this problem. Finish removing the chain link fencing around Pond 1 to improve access for invasive plant control and trash cleanup. Construct a walking trail on the east side of the Ponds to improve public access and reduce undesirable behavior (camping, encroachments by east side neighbors, yard waste dumping). limit illegal encampment to reduce trash buildup connect bike path, LID implementation and green streets retrofit to reduce runoff carried to pond</p> <p><b>Community Outreach/Education</b>                      Implement trash reduction outreach campaign and trash and water quality surveys collaborate with existing citizen monitoring to track project effectiveness and to provide related public stormwater education and outreach (target DACs, schools, businesses contributing runoff to Teichert Pond), green job training to assist with project implementation, develop outreach and education plan with roles for interested community organizations, initiate outdoor classroom curriculum linked with project objectives</p>	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement,	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Low	Low	SWRP	
R	Fair Street Detention Basin Improvement Project	Fair Street Detention Basin	<p>Remove vegetation to limit illegal encampments (trash buildup), Improve paths/roads around pond. Improve outfall screening to reduce buildup and flooding. BD Ditch Repairs to reduce flooding</p>	Increased filtration or treatment of runoff, Decreased flood risk by reduced runoff rate or volume, Wetland enhancement, Riparian enhancement	Nonpoint source pollution control, Re-establish natural water drainage and treatment, Community involvement, Improve or create recreation or public use area	Yes	Yes	High	Yes, City of Chico	Low	Low	SWRP	
<p>Note: For "Initial" rated projects, see related grouped/consolidated projects at bottom of this table (lettered projects).                      * POEI = Public outreach, education, and involvement</p>												<p>Total Number of SWRP Projects: 101                      Number of Projects Identified as Initial Projects: 28                      Number of Projects Identified as SWRP Projects: 73                      Number of SWRP Projects when Projects are Combined as Described Above: 16                      Projects that Include Public, Outreach, Education, or Involvement: 40</p>	

## ATTACHMENT A

---

### Project Descriptions

Several of the project descriptions submitted through the City of Chico SWRP Website were five to eight pages in length, and are too long to include in Table 2. Ms. Timmarie Hamill provided these complete projects submittals, including the full project descriptions, as pdf files. Table 2 includes a brief summary of the project description and a referral to this attachment for the complete project description.

## **Project Proponent**

CA Urban Streams Alliance-The Stream Team

## **Potential Partners**

City of Chico, Cal Park Homeowners Association, Public Utilities, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Calwater, and others.

## **Project Title**

Waterwise and Habitat “River Friendly Landscape Program”

## **Proposed Project**

The proposed (Project) will implement Low Impact Development (LID) practices designed to improve the capacity of natural drainage areas to reduce urban runoff from entering Chico’s Creeks and ultimately the Sacramento River.

The proposed Project will integrate LID practices into landscape design and maintenance practices, to reduce irrigation and stormwater runoff from urban landscapes to assist the City in meeting State-mandated Municipal Stormwater Permit (MS4) requirements. In addition, the Project will encourage collaborations among existing stormwater protection efforts, and neighboring MS4 entities (i.e. CSU Chico, Chico Unified School District, and other local jurisdictions) seeking to align individual stormwater program objectives, share resources, develop consistent public messaging, and identify cost-saving opportunities.

## **Goals and Objectives:**

The Project’s goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

## **Project objectives will:**

- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions. Integrate LID practices into commercial and residential landscape designs to conserve water, reduce pesticide runoff, and to demonstrate and educate to the community about the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Link LID project objectives to satisfy MS4 permit requirements and to leverage City

funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.

- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution.
- Increase employment opportunities for DACs and tribes by providing LID and green infrastructure job training and certification workshops utilizing LID demo projects as training tools. Coordinate with CCC's to provide hands-on job training during LID implementation to reduce project costs.
- Develop a Waterwise and Habitat "River Friendly Landscape Guide" specific to Butte County including the following principles: install local native species, nurture the soil (compost on site), reduce yard waste to landfill, conserve water, conserve energy, protect water quality (decrease pesticide use), and create wildlife habitat.
- Implement a Rainscapes Reward - Incentive program to provide rebates implementing green infrastructure and turf removal projects to capture and treat stormwater onsite.
- Include environmentally friendly landscape practices for landscape professionals and residents.
- Update or integrate existing creek-side and street tree handbooks.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.
- Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

### **Purpose and Need:**

The water quality in Chico's Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

## **Project Elements: (Capture-Retention)**

- 1) Develop and implement a Citywide/Countywide LID Design and BMP Manual, and Landscape planning and design practices and manuals (“Maintaining Green Infrastructure through proper landscape maintenance”). Include specific chapters or manuals targeting specific neighborhoods and commercial areas with different water quality issues (shallow ground water, etc.). Include generic plans for each type of LID.
- 2) Implement LID demo projects in each neighborhood type to provide training opportunities and replicable examples.
- 3) Develop River Friendly Landscape Guide and provide training for residents, city staff, and landscape professionals. Include LID demo projects to utilize as training tools.
- 4) Establish Rainscapes and LID Implementation Reward - Incentive program. Target DAC neighborhoods (Chapman Mulberry), neighborhoods with flooding and drainage issues (north Chico and PV drainages) and California Park.
- 5) Implement LID demonstration and Green Streets projects targeting City-owned properties. Include a variety of examples of LID practices, such as “day-lighting” storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.
- 6) Implement riparian vegetation management to improve habitat and water quality, reduce flooding, recharge ground water, decrease heat island effects (GHG) and fire hazards (remove Arrundo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).
- 7) Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-of sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc.
- 8) Implement “Green Jobs in Your Community” Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCC’s and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- 9) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City’s stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of

community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

### **Treatment Volumes:**

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential, commercial, and public buildings and centers.

The approximate quantity and origin of the stormwater flows to be treated and/or captured will be determined.

### **Project locations:**

- Project is located within the Big Chico Creek, Little Chico Creek and Comanche Creek drainage basins.
- Targets DAC neighborhoods, parks and greenways, and City-owned properties.

### **Project Approach:**

Implement LID practices to retain as much stormwater as possible on site by implementing LID practices aimed at reducing landscape related runoff and associated pollutants.

The Project will implement the following LID practices: pervious surfaces, bioswales, vegetated trenches, downspout disconnects, infiltration leach fields, rain barrels and cisterns, efficient irrigation, and drought tolerant and native species.

Cost comparisons, and long-term maintenance issues will be considered, and appropriate LID practices determined to be best suited for the Chico area.

Specific Project site locations will be determined based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff, feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway, disadvantaged neighborhood, and the appropriateness of the site location for educating the public and City staff.

### **Consistent project plans:**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

Existing studies supporting the feasibility of the Project include:

1) The City of Chico has an updated General Plan that addresses stormwater runoff and is updating the associated Best Management Practices (BMP) Manual to include design standards for LID practices. Through this project the City will implement LID practices,

which will form the basis for promoting and prioritizing LID design standards that are most cost-effective into the updated BMP Manual and stormwater ordinances.

2) The City of Chico Water Pollution Control Plant has effluent data that can be used to understand whether constituents of concern (chloropyrifos and diazinon) have the potential to pass through treatment and be discharged into the Sacramento River. This data can also be used to indicate project effectiveness in reducing these constituents.

3) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.

4) An existing citizen-monitoring program maintains ten years of baseline water quality data including, habitat, and bioassessment data. Data monitoring station are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.

5) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices that will be most effective based on existing site conditions. For example, original construction plans are available for Project 1 (Parking Lot LID Retrofit) showing existing grades, and depths of impervious pavement and road base to be excavated and replaced with pervious pavement and infiltration leach fields.

6) Historical monitoring well data exists for comparing pre and post Project outcomes.

### **Additional relative plans**

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.



## **Project Proponent**

CA Urban Streams Alliance-The Stream Team

## **Potential Partners**

City of Chico, Park Watch, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Cal Park Homeowners Association, CHIP, Habitat for Humanity, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Health clubs, Community Event Coordinators, Utilities, Calwater, and others.

## **Project Title**

Bidwell Park and Greenway Integrated Stormwater, Ground Water Recharge, and Recycled Water Project

## **Project Description**

The proposed Project (Project) will implement Low Impact Development (LID) practices designed to improve the capacity of natural drainage areas to reduce urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

The proposed Project will integrate LID practices into park management practices, and park infrastructure design standards to assist the City in meeting State-mandated Municipal Stormwater Permit (MS4) requirements. In addition, the Project will encourage collaborations among existing stormwater protection efforts, and neighboring MS4 entities (i.e. CSU Chico, Chico Unified School District, and other local jurisdictions) seeking to align individual stormwater program objectives, share resources, develop consistent public messaging, and identify cost-saving opportunities.

Stormwater management, groundwater recharge and recycled water projects integrated into Bidwell Park and other greenway management efforts will provide a multi-benefit clean water project that will improve water quality while also restoring natural resources. Natural channels, riparian habitat and intermittent wetlands (including benefits for endemic Vernal Pools) will be enhanced or established to improve opportunities for integrated stormwater management with multi-benefit outcomes.

## **Goals and Objectives**

The Project's goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

Project objectives will:

- Integrate LID practices into Bidwell Park and Greenway drainage improvement projects to demonstrate and educate to the community the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Implement LID project objectives to satisfy MS4 permit requirements.
- Leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities. This effort will also compliment and assist the City's Park volunteer efforts in leading public work sessions to enhance habitat and park infrastructure.
- Link existing citizen monitoring and storm water efforts with City Stormwater Management objectives to facilitate public involvement, leverage previous State funding, and utilize existing baseline water quality data.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

### **Purpose and Need:**

The water quality in Chico's Creeks continues to decline as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Thirteen years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

### **Project Elements (Capture-Retention)**

- 1) Storm drain improvement. Retrofit storm drains with pervious pipe, move outfalls away from the creek and install bioswails to allow a portion of the runoff to leach into the ground prior to reaching waterways. Currently most outfalls empty runoff directly into the creeks at the banks edge without no pretreatment.
- 2) Natural drainage improvement. Enhance the capacity of natural drainage channels carrying stormwater runoff to waterways to improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the

creek, by removing invasive plants, installing natives, removing debris and deposition, and repairing or resizing culverts.

- 3) Reduce bank erosion. Repair and stabilize creek banks where intensive recreational uses (and fallen trees in channel) are causing erosion and sedimentation (rope swing swim areas, bike jumps, creek crossings). Install signage to inform the public about the impacts of their actions on water quality.
- 4) Improve public transport pathways. Repair walking and biking trails, and dirt roads adjacent or near waterways to reduce erosion.
- 5) Green job training targeting DACs and CCC's. Integrate training workshops and work sessions to assist with implementing project elements to reduce costs and provide hands-on learning to improve employment opportunities. Include CAVE/ Team Team/Nature Center/CSU Chico internship collaboration program.
- 6) Trash reduction structures (full and partial capture) and outreach campaigns.
- 7) Community engagement and stormwater education. LID demonstration projects will target participation and benefits for DACs, tribes, schools, existing community stormwater efforts, and the City's Park volunteer program. Opportunities for the public to participate in LID design, implementation and effectiveness monitoring will be provided. Include park volunteer/stormwater outreach coordinator position.
- 8) Stormwater Education. Combine Clean Water Science Ambassador and Clean Creeks in the Classroom efforts to offer outdoor stormwater education classrooms (STEM and NGSS curriculum) in parks and greenways located within walking distance of most schools.
- 9) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

## Treatment Volumes

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential, commercial, and park landscapes.

The approximate quantity and origin of the stormwater flows to be treated and/or captured by each Project Area is estimated in the following Table\*.

Project Element	Runoff Source	Contributing Runoff Area	Treatment Area	Volume Treated
Storm drain and improvements	Parking lots, streets, sidewalks, residential,	400 acres	TBD	80%

	commercial, dirt roads and trails			
Improve natural drainage channels	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	100 acres	TBD	80%
Reduce bank erosion	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	20 miles	TBD	80%
Improve Public transport pathways	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	20 miles	TBD	80%
Green Jobs	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	Entire watersheds	TBD	80%
Trash reduction	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	Entire watersheds	TBD	80%
Community engagement	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	Entire Watersheds	TBD	80%
STEM and Stormwater outdoor classroom	Parking lots, streets, sidewalks, residential, commercial, dirt roads and trails	Entire Watersheds	TBD	80%

\* Drainage areas and treatment volumes will be calculated using the equations recommended in the California Storm Water Best Management Practices Handbook and SWRCB LID Sizing Tool for determining the unit basin storage volume to achieve 80 percent or more volume treatment

### Project Location

- Projects are located in Bidwell Park and Greenways within the Big Chico Creek, Little Chico Creek and Comanche Creek drainage basins.
- Projects target DAC neighborhoods and schools.
- Demo project locations selected to provide high visibility for public and Green Job training.
- Locations selected to target hot spots for erosion/trash

### Project Approach

Implement LID practices to retain as much stormwater as possible on site, disconnect stormwater collections systems by providing setbacks for outfalls to provide infiltration/treatment opportunities (pervious pipe, bioswales) prior to delivering runoff to receiving waters. In addition, LID practices with multiple benefits including preventing erosion and nutrient runoff to improve aquatic habitat, recreation, employment training targeting DACs, public health, public education, transport pathways, etc will be included. Consideration regarding the relative ease of integrating the various LID practices into existing park landscapes and infrastructure, and targeting benefits for DACs will also be considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, habitat restoration, dirt road and trail improvements, and restore riparian habitat and stream channel functions to reduce runoff pollution.

Cost comparisons, and long-term maintenance issues will also be considered, and appropriate LID practices determined to be best suited for the Chico area.

Specific Project site locations will be determined based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff, feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood and schools, and the appropriateness of the site location to serve as a demo or LID educational tool for training the public, City staff, and for Green Jobs employment training.

#### Other Outcomes:

- Reduced flooding
- Increased groundwater recharge
- Increased stormwater capture, treatment, and reuse
- Improved public health
- Increased employment opportunities
- Increased public understanding of benefits of stormwater management and LIDs
- Increased opportunities for schools and stormwater education
- Increased public walking and biking transport pathways (public health)
- Improved natural habitat (endangered fish and wildlife, vernal pools, oak woodlands, wetlands, springs, seeps)
- Reduced trash and other runoff pollutants
- Increased collaborations amongst community groups and City in stormwater management
- Improved water quality
- Improved Water Supply

#### More Implementation project ideas:

- Reduce flooding by reconnecting floodplains (Similar to Verbena Fields project).
- Improve storm drain conveyance system by moving outfalls away from creek

banks and “day-lighting” sections through detention swales, wetlands and pervious pipe.

- Capture or redirecting runoff from park buildings, roads, and other infrastructure to park landscaping.
- Reduce erosion from bike and walking paths by decommissioning or repairing trails adjacent to waterways.
- Replace culverts blocking runoff infiltration pathways to reduce nuisance water, pathogens and nutrient loading in receiving waters to meet TMDL requirements.
- Enhance or restore wetland areas, seeps and springs, to treat runoff. Also, runoff through meadows making connections to vernal pools. Improve Oak woodland regeneration by removing turf so trees are not being watered during summer months or move trails so they are not being trampled.
- Implement City-wide (or county-wide) trash reduction plan (install full and partial capture structures, and implement ed/outreach campaign targeting homeless camps, public parks, events and centers (require use of recycled materials and reusable water bottle filling stations).
- Install water bottle filling stations in parks, and baseball/soccer fields.
- Expand outdoor learning opportunities for schools by identifying and improving infrastructure for outdoor learning classrooms (beyond the nature center). Link objectives of Clean Water Ambassador Program, Clean Creeks in the Classroom, Adopt-a-Picnic-Spot programs to include focused and collaborative stormwater education utilizing parks as outdoor classrooms.
- Provide checklists and training for Park Watch, Stream Team, and other park volunteers to document trash hot-spots, and wet weather trail and road erosion (modeled on the Urban Tides Initiative program in SoCal, and SWRCB CWT rapid trash assessment methodology).
- Increase volunteer workforce opportunities to remove invasive plants and plant natives and to implement and maintain stormwater treatment project areas.
- Also integrate Stream Team’s rapid trash assessment.
- Integrate Green Jobs training utilizing existing community stormwater groups to train volunteers in LID implementation and maintenance practices (and project effectiveness monitoring).
- Utilize CCC’s, target DACs, and integrate Clean Water Business Partners and other existing stormwater training programs into Green Jobs training project. Utilize stormwater treatment project areas as training tools to provide hands-on learning work sessions and training events to improve employment opportunities and reduce project implementation costs.
- Improve and add trails to connect transportation corridors between downtown areas and schools to encourage safe walking and biking pathways between residential neighborhoods and commercial downtown areas including integrating sitting areas for relaxing in nature (improved public health).
- Repair vita-health exercise circuit in park, and host events and provide maps to highlight use of this public health improvement infrastructure. Coordinate with Health Clubs to expand use and offer Yoga, running races, etc.
- Reduce pesticide and landscape overwatering by targeting LID workshops for DAC neighborhoods and schools and offer tours and training for them to learn

about stormwater projects in the parks. Training will include practices they can implement on their own residential landscapes.

- Reduce runoff pollution by installing stormwater treatment bioswales, wetlands, and LID practices throughout parks and greenways to capture, reuse, and treat runoff.
- Reduce pathogens in runoff by implementing LID practices in park and greenways to protect beneficial uses of receiving waters for water recreation (swimming).

### **Consistent project plans**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.

2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.

3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.

4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.

5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

### **Additional relative plans**

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.



## **Project Proponent**

CA Urban Streams Alliance-The Stream Team

## **Potential Partners**

City of Chico, Waste Management and other trash companies, DWR, Rock Creek Reclamation District, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Calwater, Mechoopda, and others.

## **Project Title**

City of Chico Long-term Trash Reduction Project

## **Project Description**

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

Trash and litter are a pervasive problem in California. Controlling trash is a priority, because trash adversely affects our use of California's waterways. Trash impacts aquatic life in streams, rivers, and the ocean as well as terrestrial species in adjacent riparian and shore areas. Trash, particularly plastics, persists for years. It concentrates organic toxins, entangles and ensnares wildlife, and disrupts feeding when animals mistake plastic for food and ingest it. Additionally, trash creates aesthetic impacts, impairing our ability to enjoy our waterways (SWRCB, 2017).

## **Goals and Objectives**

The Project's goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### **Project objectives will:**

- Establish a long-term trash reduction program to achieve outcomes to meet State Trash TMDL and MS4 permit requirements.
- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions and reducing trash, which is a pollutant impacting water quality.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Increase employment opportunities for DACs and tribes by providing LID and green

infrastructure job training and certification workshops utilizing LID demo projects as training tools. Coordinate with CCC's to provide hands-on job training during LID implementation to reduce project costs.

- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.

## **Purpose and Need**

The water quality in Chico's Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Ten years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

## **Project Elements: (Capture-Retention)**

- 1) Develop and implement a Citywide/Countywide LID Design and BMP Manual ("Maintaining Green Infrastructure through proper landscape maintenance").
- 2) Implement LID demonstration and Green Streets projects targeting City-owned properties. Include a variety of examples of LID practices, such as "day-lighting" storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.
- 3) Implement riparian vegetation management to improve habitat and water quality, reduce flooding, decrease heat island effects (GHG) and fire hazards (remove Arrundo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).
- 4) Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large

household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-off sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc. specific elements include: a) ID and map trash hot spots (visual assessments); b) ID sources of trash (Trash Generation characterized by category-commercial, industrial, residential, schools, parks, other and Trash Loading- how much is entering receiving waters); c) delineate and prioritize trash management areas; d) ID and select trash control measures (full and partial capture devices, and community engagement (cig but ashtrays outside businesses, reduce single use products, anti-littering campaigns, illegal dumping ordinances, etc), ; e) develop method for tracking progress in reducing trash levels (CWT trash surveys, water quality monitoring); f) implement control measures; g) access progress in reducing trash; h) modify management areas of reprioritize to address problems.

- 5) Implement “Green Jobs in Your Community” Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCC’s and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- 6) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City’s stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City’s stormwater protection efforts.

## **Treatment Volumes**

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential and commercial landscapes throughout the City.

The approximate quantity and origin of the stormwater flows to be treated and/or captured by each Project Area will need to be determined.

## **Project locations:**

- The project is located in Big Chico, Little Chico, and Comanche creek watersheds.
- Targets DACs, schools, and public parks and greenways.

## **Project Approach:**

One of the most promising improvements to how we develop land is the implementation

of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project's approach was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and firescaping.

Specific Project sites will be selected based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff and construction consultants, the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood, and the appropriateness of the site location for educating the public.

### **Consistent project plans**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.

2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.

3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.

4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.

5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

### **Additional relative plans**

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

## **Project Proponent**

CA Urban Streams Alliance-The Stream Team

## **Potential Partners**

City of Chico, Park Watch, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Cal Park Homeowners Association, CHIP, Habitat for Humanity, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Health clubs, Community Event Coordinators, Utilities, Calwater, and others.

## **Project Title**

LID Technical Design Manual and Demonstration Project

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

The proposed Project features a long-term approach for integrating LID practices into present and future development design standards to assist the City in meeting State-mandated Municipal Stormwater Permit (MS4) requirements. In addition, the Project will encourage collaborations among existing stormwater protection efforts, and neighboring MS4 entities (i.e. CSU Chico, Chico Unified School District, and other local jurisdictions) seeking to align individual stormwater program objectives, share resources, develop consistent public messaging, and identify cost-saving opportunities.

## **Goals and Objectives**

The Project's goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### **Project objectives will:**

- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Implement LID project objectives to satisfy MS4 permit requirements.
- Leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities.

- Link existing citizen monitoring and storm water efforts with City Stormwater Management objectives to facilitate public involvement, leverage previous State funding, and utilize existing baseline water quality data.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

## **Purpose and Need**

The water quality in Chico's Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Ten years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

## **Project Elements: (Capture-Retention)**

- 1) Develop and implement a Citywide/Countywide LID Design and BMP Manual, and Landscape planning and design practices and manuals ("Maintaining Green Infrastructure through proper landscape maintenance"). Include specific chapters or manuals targeting specific neighborhoods and commercial areas with different water quality issues (shallow ground water, etc.). Include generic plans for each type of LID. Include designs for schools.
- 2) Implement LID demo projects in each neighborhood type to provide training opportunities and replicable examples.
- 3) Implement LID demonstration and Green Streets projects targeting City-owned properties. Include a variety of examples of LID practices, such as "day-lighting" storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.
- 4) Implement riparian vegetation management to improve habitat and water quality, reduce flooding, decrease heat island effects (GHG) and fire hazards (remove Arrundo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).

- 5) Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-off sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc.
- 6) Implement “Green Jobs in Your Community” Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCC’s and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- 7) Include pesticide and overwatering campaigns targeting DACs and implementation of LID demo projects.
- 8) Develop a Waterwise and Habitat “River Friendly Landscape Guide” specific to Butte County including the following principles: install local native species, nurture the soil (compost on site), reduce yard waste to landfill, conserve water, conserve energy, protect water quality (decrease pesticide use), and create wildlife habitat.
- 9) Implement a Rainscapes Reward - Incentive program to provide rebates implementing green infrastructure and turf removal projects to capture and treat stormwater onsite.
- 10) Include environmentally friendly landscape practices for landscape professionals and residents.
- 11) Update or integrate existing creek-side and street tree handbooks.
- 12) Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.
- 13) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City’s stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City’s stormwater protection efforts.

### **Treatment Volumes:**

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential and commercial landscapes throughout the City.



The approximate quantity and origin of the stormwater flows to be treated and/or captured by each Project Area will need to be determined.

Drainage areas and treatment volumes will be calculated using the equations recommended in the California Storm Water Best Management Practices Handbook and SWRCB LID Sizing Tool for determining the unit basin storage volume to achieve 80 percent or more volume treatment.

### **Project locations:**

- Entire City of Chico and will target DAC neighborhoods (Chapman Mulberry) and commercial (Hagen Lane) and public properties.
- Butte County Schools
- Big Chico Creek, Little Chico Creek, and Comanche Creek watersheds.

### **Project Approach:**

One of the most promising improvements to how we develop land is the implementation of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project's approach was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and firescaping.

Specific Project sites will be selected based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff and construction consultants, the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood, and the

appropriateness of the site location for educating the public.

### **Consistent project plans**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.

2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.

3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.

4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.

5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

### **Additional relative plans**

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

## **Project Proponent**

CA Urban Streams Alliance-The Stream Team

## **Potential Partners**

City of Chico, Rock Creek Reclamation District, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Calwater, Mechoopda, and others.

## **Project Title**

Mud and Rock Creek Flood Protection Project

## **Project Description**

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

## **Goals and Objectives**

The Project's goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### **Project objectives will:**

- Integrate LID practices into Mud Rock Creek drainage improvement projects to demonstrate and educate to the community about the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Link project objectives with City MS4 permit requirements to leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities.
- Target implementation of LID demonstration projects on public properties within Mud Rock Creek drainages.
- Increase employment opportunities for DACs and tribes by providing LID and green infrastructure job training and certification workshops utilizing LID demo projects as training tools.
- Coordinate with CCC's to provide hands-on job training in LID implementation practices and to reduce project costs.

- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.

### **Purpose and Need:**

The water quality in Chico's Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Ten years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

Mud and Rock Creek drainages have flooding issues that can be addressed by utilizing LID practices. The City of Nord regularly floods, and improving habitat and creating off-channel detention areas can improve the capacity of Mud and Rock creek watersheds to reduce flooding as well as runoff pollution.

Flooding issues in some of these neighborhoods results in backing up raw sewage into houses, and prevents access to homes at creek-crossings. There is also orchard land adjacent to Mud/Rock Creek that are eroding as well as roads, bridges, and levees that are in need of repair.

### **Project Elements: (Capture-Retention)**

- 1) Develop and implement a Citywide/Countywide LID Design and BMP Manual ("Maintaining Green Infrastructure through proper landscape maintenance"). Include a specific guide for Mud/Rock Creek watersheds targeting residential, agricultural, and commercial landscapes.
- 2) Implement LID and Green Streets demonstration projects targeting residential and commercial landscapes within Rock and Mud Creek Watersheds. Include a variety of examples of LID practices, such as "day-lighting" storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and

gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.

- 3) Implement vegetation management in Mud and Rock creek to improve habitat and water quality, reduce flooding, heat island effects (GHG) and fire hazards, increase recreation potential, improve public health, and improve wildlife corridors between Mud/Rock and Sacramento watersheds. Target improving habitat for wildlife corridors, and capacity for off-channel storage during rain events.
- 4) Implement “Green Jobs in Your Community” Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCC’s and other existing work training programs and utilize training workshops to implement LID project elements to save costs.
- 5) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City’s stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City’s stormwater protection efforts.

**Treatment Volumes:**

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential and commercial landscapes throughout the City.

The approximate quantity and origin of the stormwater flows to be treated and/or captured by each Project Area is depicted in the following Table\*.

Project Element	Runoff Source	Contributing Pervious Area (acres)	Treatment Area (acres)	Volume Treated
Rock Mud Creek LID Implementation Manual	Commercial, residential	100	TBD	80%
LID Demo and Green Streets Project	Commercial, residential	10	TBD	80%
Vegetation Management	Commercial, residential	10	TBD	80%
Green Jobs	Commercial,	60	TBD	80%

	residential			
Stormwater Outreach and Education Plan	Commercial, residential	60	TBD	80%

\* Drainage areas and treatment volumes will be calculated using the equations recommended in the California Storm Water Best Management Practices Handbook and SWRCB LID Sizing Tool for determining the unit basin storage volume to achieve 80 percent or more volume treatment.

**Project locations:**

- Mud Rock Creek Reclamation District and Mud/Rock Creek watersheds
- Airport Neighborhood commercial roads, parking lots and buildings (including renovating Airport Building and parking lot).
- Mud and Rock Creek Residential Neighborhoods targeting creek-side neighbors
- Nord School
- Orchard buffer strips and riparian habitat improvements (reduce pesticide and erosion runoff)
- Off channel stormwater detention areas (to reduce flooding)

**Project Approach:**

One of the most promising improvements to how we develop land is the implementation of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project’s approach was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and firescaping.

Specific Project sites will be selected based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City and County staff and Rock Creek Reclamation District, the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to a waterway and disadvantaged neighborhood, and the appropriateness of the site location for educating the public.

### **Consistent project plans**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.
- 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

### **Additional relative plans**

Rock Creek Reclamation District Plans, Sacramento Watershed Flood Improvement Plan

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.



## **Project Proponent**

CA Urban Streams Alliance-The Stream Team

## **Potential Partners**

City of Chico, Park Watch, Cal Park Homeowners Association, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Health clubs, Community Event Coordinators, and others.

## **Project Title**

Flood Detention Pond (Comanche, Fair Street, Home Depot, Teichert) Enhancement and LID Implementation Project

Teichert Pond Trash Reduction and Little Chico Creek LID Implementation Project

## **Project Description**

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico's Creeks and ultimately the Sacramento River. Project focus will implement LID practices to reduce runoff directed to detention ponds, increase detention, infiltration and treatment of pollutants, and capture and remove pollutants at detention pond inlets and outlets prior to discharging to receiving waters.

## **Goals and Objectives**

The Project's goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### **Project objectives will:**

- Integrate LID practices into drainage improvement projects to demonstrate and educate to the community the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Implement LID project objectives to satisfy MS4 permit requirements.
- Leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities. This effort will also compliment and assist

the City's Park volunteer efforts in leading public work sessions to enhance habitat and park infrastructure.

- Link existing citizen monitoring and storm water efforts with City Stormwater Management objectives to facilitate public involvement, leverage previous State funding, and utilize existing baseline water quality data.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

### **Purpose and Need:**

The water quality in Chico's Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Ten years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

### **Project Elements: (Capture-Retention)**

- 1) LID Design Manual for commercial and residential areas to reduce runoff carried to detention ponds.
- 2) Storm drain improvement. Retrofit storm drains with pervious pipe, move outfalls away from the creek and install bioswails to allow a portion of the runoff to leach into the ground prior to reaching waterways and detention ponds. Currently most outfalls empty runoff directly into the creeks at the banks edge without pretreatment.
- 3) Natural drainage improvement. Enhance the capacity of natural drainage channels carrying stormwater runoff to waterways to improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the detention ponds and receiving waters, by removing invasive plants, installing natives, removing debris and deposition, and repairing or resizing culverts.
- 4) Integrate public transport pathway improvements into LID projects. Repair walking and biking trails, and dirt roads adjacent or near waterways to reduce erosion carried to detention ponds.
- 5) Green job training targeting DACs and CCC's. Integrate training workshops and work sessions to assist with implementing project elements to reduce costs and provide hands-on learning to improve employment opportunities. Include CAVE/ Team Team/Nature Center/CSU Chico internship collaboration program.

- 6) Include Trash reduction structures (full and partial capture) and outreach campaigns.
- 7) Community engagement and stormwater education. LID demonstration projects will target participation and benefits for DACs, tribes, schools, existing community stormwater efforts, and the City's Park volunteer program. Opportunities for the public to participate in LID design, implementation and effectiveness monitoring will be provided. Include park volunteer/stormwater outreach coordinator position.
- 8) Stormwater Education. Combine Clean Water Science Ambassador and Clean Creeks in the Classroom efforts to offer outdoor stormwater education classrooms (STEM and NGSS curriculum) in parks and greenways located within walking distance of most schools.
- 9) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

### **Treatment Volumes:**

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential and commercial landscapes throughout the City.

The approximate quantity and origin of the stormwater flows to be treated and/or captured by each Project Area will need to be determined.

Drainage areas and treatment volumes will be calculated using the equations recommended in the California Storm Water Best Management Practices Handbook and SWRCB LID Sizing Tool for determining the unit basin storage volume to achieve 80 percent or more volume treatment.

### **Project locations:**

- Projects are located in Big Chico, Little Chico and Comanche watersheds.
- Target retrofitting and improving existing detention ponds.

### **Project Approach:**

One of the most promising improvements to how we develop land is the implementation of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project's approach

was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and firescaping.

Specific Project sites will be selected based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff and construction consultants, the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood, and the appropriateness of the site location for educating the public.

### **Consistent project plans**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.

5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

### **Additional relative plans**

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

# Stormwater Resource Plan Proposal

---



## **Project Proponents**

CSU, Chico State; Facilities Management and Services and Environmental Health & Safety

## **Potential Partners**

City of Chico, CSU Chico State University Advancement

## **Project Title**

Laxson South Bioswale

## **Project Description**

The proposed project will collect surface runoff from City streets and neighboring parking lots into a bioswale. This site is located at the N.E. corner of the Arts & Humanities building / S. Laxson Auditorium, where the campus meets the roundabout at W. 1<sup>st</sup> St. and Salem St. Currently, the area receives lots of runoff during moderate and heavy rainstorms, which creates flooding of sidewalks. The flooded areas are safety concerns, and the rainwater has nowhere to go but out into campus. This project would create improved drainage and catchment for surface runoff, allowing pollutants and fine particulates to settle and allow water to infiltrate back into the ground.

## **Goals and Objectives**

The project goals are: to improve stormwater collection and percolation into the water table; reduce pollutants entering local waterways, eliminate the flooding of accessible pathways, eliminate the potential for landscape damage and cleanup due to flooding. Additionally, an educational component will be involved, incorporating signage that inform visitors of the function and purpose & benefits of the bioswale.

## **Project Objectives will:**

- Integrate new drainage and stormwater capture systems along 1<sup>st</sup> St. as it runs through campus.
- Reduce stormwater volume and pollutant loading from stormwater runoff by pre-treating the water prior to entering storm drains.
- Allow Chico State academic programs to sample runoff water and conduct outdoor labs focused on reducing urban runoff, stormwater retention & filtration, plant materials and landscape elements that aid in pollutant filtration.
- Provide an educational opportunity to the community with the inclusion of informative signage.
- Link existing City and Campus infrastructure for a more efficient runoff collection & filtration system.

# Stormwater Resource Plan Proposal



- Improve fish and wildlife habitat downstream of the collection site.

## **Purpose and Need:**

Chico State has an obligation to manage stormwater runoff. The integration of the campus with the City has resulted in less-than desirable drainage situations, where large amounts of runoff enter the campus at the W. 1<sup>st</sup> St. and Salem roundabout. The runoff water can contain any combination of trash, excess nutrients, oil, grease, other hydrocarbons and chemicals, bodily fluids, fecal bacteria.

Stormwater pollution is closely related to large portions of impervious surfaces constructed from asphalt and concrete, such as driveways, roadways, sidewalks, and parking lots. The area at the intersection of W. 1<sup>st</sup> St. and Salem contains all of these impervious surfaces. The parking lot at the Bidwell Presbyterian Church runs off into the sidewalk along 1<sup>st</sup> St., out into the roadway & roundabout and sidewalk along campus, which then sheets into campus and floods sidewalks, driveways, a drop-off zone, all which head toward a small storm-drain inlet that leads to the creek.

## **Project Elements: (Capture, Retention & Education)**

### Storm drain improvement

- Add a new drain inlet in the lawn area at the S. side of Laxson Auditorium and tie it into existing drainage to the west. The new drain inlet will be located within the proposed bioswale feature.
- Drainage along the sidewalk of W. 1<sup>st</sup> St. and Salem roundabout to be improved and tied-into the proposed bioswale feature.

### Natural drainage improvement

- Minor shaping and grading of the lawn area at the S. side of Laxson is needed to create a collection area for runoff not collected by storm drains.
- Cistern/Catch Basin installation
- Catch basin are to be installed in the bioswale, ahead of the storm drain inlet to allow more water to infiltrate into the ground

### Sampling area

- For academic purposes, two sampling areas would be incorporated. The first would be up stream (near the church parking lot & sidewalk) to take 'before' samples, and the second would be at the end of the

# Stormwater Resource Plan Proposal



bioswale, nearest the storm drain inlet to allow for comparison samples which can show the effectiveness of the system.

## Landscape features

- Boulders, cobble, and appropriate plant material will be incorporated to slow down the flow of water and to further filter the runoff water prior to entering the water table or storm drain system.

## Educational signage

- In order to reach-out and engage the campus community and campus visitors, signage would be included that explains the need to manage stormwater in a responsible manner, and how bioswales and similar features can be incorporated in commercial and residential sites to help clean runoff before entering waterways.

## Treatment Volumes:

The project will implement LID practices to treat and/or reduce stormwater runoff originating from commercial landscape, parking lots & roadways at the intersection of W. 1<sup>st</sup> St. and Salem St.

The approximate quantity and exact origin of the stormwater flows to be treated and/or captured at the Project Area will need to be determined.

Drainage areas and treatment volumes will be calculated using the equations recommended in the California Stormwater Best Management Practices Handbook and SWRCB LID Sizing Tool for determining the unit basin storage volume to achieve 80 percent of more volume treatment.

## Project Location

The project site is the lawn area to the S. of Laxson Auditorium & N.E. corner of the Arts and Humanities building, adjacent to the roundabout at W. 1<sup>st</sup> St. and Salem St.

## Project Approach

The project will incorporate a bioswale and catchment system into campus to allow for infiltration and filtration of stormwater runoff. Existing City and Campus storm drain infrastructure will be improved and incorporated to direct water directly into the bioswale, rather than across sidewalks and into roadways. Shaping & grading of the site for collection of water, along with the installation of boulders, cobble and appropriate plant material will slow runoff velocity and allow for further infiltration and filtration.



# Stormwater Resource Plan Proposal

---



## **Consistent Project Plans**

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.
- 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

## **Additional relative plans**

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (Chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

# Stormwater Resource Plan Proposal

---

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

## Project Proponent

CA Urban Streams Alliance-The Stream Team

## Potential Partners

City of Chico, Park Watch, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Cal Park Homeowners Association, CHIP, Habitat for Humanity, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Health clubs, Community Event Coordinators, Utilities, Calwater, and others.

## Project Title

### NSV IRWMP projects:

#### 2015 list

- K-12 Watershed Education and Science Ambassador Program
- Regional K-12 Watershed Education
- North Sac. Valley Regional Water Quality Assessment Project

#### 2016 list

- Drought Response and Outreach Program For Schools including LID Implementation Projects
- North Sac. Valley Regional Water Quality Assessment and Education Project

## Project Description

The proposed Project (Project) will implement Low Impact Development (LID) practices designed to improve the capacity of natural drainage areas to reduce urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

The proposed project is a summary of projects included in the NSV IRWM. All Projects include all of the same objectives as the City SWRP. Full proposals can be provided upon request. The following is a combined summary of the project descriptions:

Projects will leverage collaborative resources and local knowledge to gain efficiency in implementing projects to achieve water resource management goals. Proposed project concepts are targeted for work within Butte, Glenn, and Tehama County watersheds, but can be easily adapted to compliment projects in other NSV IRWMP watersheds.

Objectives: Demonstrate the benefits of leveraging citizen involvement and knowledge to accomplish low-cost watershed assessments and ecosystem restoration;  
Demonstrate the role collaborative watershed stewardship actions can play in helping achieve federal, state, and local resource management objectives

Utilizing a multi pronged approach, which engages community members in citizen monitoring and ecosystem enhancement projects, compiles and analyses data collected, and provides information and education to promote understanding and community action related to protecting watershed health.

Project Support: This project is supported by schools, stormwater programs, resource managers, and DAC community groups within Butte county The Stream Team has a 17-year track record and maintains existing partnerships to support implementation of stormwater enhancement projects and associated educational programs as proposed.

Supports municipal stormwater permits, flood management plans, Sacramento River Basin Management Plans, New Generation Science Standards, Science Math and engineering and Technology (STEM), Environmental Education Initiative, State Ambient Monitoring Plan (SWAMP) and Urban Greening strategies:

- Reducing flood risk by reducing the number and intensity of flash flood events reducing volume and speed of stormwater runoff, decreasing erosion, and pollutant loading.
- Increase water conservation using native and drought tolerant species, rain barrels, etc.
- Improve water quality by reducing urban runoff volume and pollutant loading using LIDs.
- Capture stormwater for use of augmentation of local water supplies by directing runoff to planted areas on school campuses.
- Restoring aquatic habitat by reducing the amount of stormwater reaching waterways helping to maintain natural stream channel functions and habitat.
- Increase awareness of sustainability by supporting water quality improvements, consistent with MS4 permits and 2030 General Plan and the State 2020 Climate Action Plans.
- Reduce carbon dioxide emissions or address climate change, and reduce energy consumption by creating pocket-like parks and greenways in DAC communities.

Project Elements:

Assess water quality in Butte County watersheds using trained volunteers.

Continue existing efforts of The Stream Team to educate and engage community members on how to monitor water quality in local watersheds. Conduct monitoring at regular intervals at locations described in an associated Monitoring Plan (MP) and Quality Assurance Project Plan (QAPP)

Provide data to fill in spatial and temporal data gaps. Increase data for better representation in project waterways.

Reduce non-point source pollutants in project waterways.

Implement Low Impact Development (LID) projects, trash removal events, reduce residential landscape irrigation runoff, implement Science Ambassador program.

Implement ecosystem enhancements.

Facilitate effective stewardship training and opportunities for volunteers to assist with invasive plant removal, riparian, forest, wetland fish habitat restoration.

Share data, present data, and host interpretation workshops.

Public education and outreach.

Outreach materials (fact sheets, flyers, reports, GIS maps, web posting).

Supports municipal stormwater permits, flood management plans, Sacramento River Basin Management Plans, New Generation Science Standards, Science Math and engineering and Technology (STEM), Environmental Education Initiative, State Ambient Monitoring Plan (SWAMP) and Urban Greening strategy.

- Reducing flood risk by reducing the number and intensity of flash flood events reducing volume and speed of stormwater runoff, decreasing erosion, and pollutant loading.
- Increase water conservation using native and drought tolerant species, rain barrels, etc.
- Improve water quality by reducing urban runoff volume and pollutant loading using LIDs.
- Capture stormwater for use of augmentation of local water supplies by directing runoff to planted areas on school campuses.
- Restoring aquatic habitat by reducing the amount of stormwater reaching waterways helping to maintain natural stream channel functions and habitat.
- Increase awareness of sustainability by supporting water quality improvements, consistent with MS4 permits and 2030 General Plan and the State 2020 Climate Action Plans.
- Reduce carbon dioxide emissions or address climate change, and reduce energy consumption by creating pocket-like parks and greenways in DAC communities.

## Goals and Objectives

The Project's goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

Project objectives will:

- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Implement LID project objectives to satisfy MS4 permit requirements.
- Leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.

- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities.
- Link existing citizen monitoring and storm water efforts with City Stormwater Management objectives to facilitate public involvement, leverage previous State funding, and utilize existing baseline water quality data.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

## Purpose and Need

The water quality in Chico's Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Ten years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

## Project Elements: (Capture-Retention)

- Develop and implement a Citywide/Countywide LID Design and BMP Manual, and Landscape planning and design practices and manuals ("Maintaining Green Infrastructure through proper landscape maintenance"). Include specific chapters or manuals targeting specific neighborhoods and commercial areas with different water quality issues (shallow ground water, etc.). Include generic plans for each type of LID. Include designs for schools.
- Implement LID demo projects in each neighborhood type to provide training opportunities and replicable examples. Target LID methods to reduce pesticide and landscape irrigation runoff.
- Implement LID demonstration and Green Streets projects targeting City-owned properties. Include a variety of examples of LID practices, such as "day-lighting" storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.
- Implement riparian vegetation management to improve habitat and water quality, reduce flooding, decrease heat island effects (GHG) and fire hazards (remove

Arrundo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).

- Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-off sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc.
- Implement “Green Jobs in Your Community” Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCC’s and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- Include pesticide and overwatering campaigns targeting DACs and implementation of LID demo projects.
- Develop a Waterwise and Habitat “River Friendly Landscape Guide” specific to Butte County including the following principles: install local native species, nurture the soil (compost on site), reduce yard waste to landfill, conserve water, conserve energy, protect water quality (decrease pesticide use), and create wildlife habitat.
- Implement a Rainscapes Reward - Incentive program to provide rebates implementing green infrastructure and turf removal projects to capture and treat stormwater onsite.
- Include environmentally friendly landscape practices for landscape professionals and residents.
- Update or integrate existing creek-side and street tree handbooks.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.
- Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City’s stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City’s stormwater protection efforts.

Treatment Volumes

The Project will implement LID practices to treat and/or reduce stormwater runoff originating from both residential and commercial landscapes throughout the City.

The approximate quantity and origin of the stormwater flows to be treated and/or captured by each Project Area will need to be determined.

Drainage areas and treatment volumes will be calculated using the equations recommended in the California Storm Water Best Management Practices Handbook and SWRCB LID Sizing Tool for determining the unit basin storage volume to achieve 80 percent or more volume treatment.

#### Project locations

- Butte County and City of Chico
- Butte County Schools
- Big Chico Creek, Little Chico Creek, and Comanche Creek watersheds.

#### Project Approach

One of the most promising improvements to how we develop land is the implementation of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project's approach was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and firescaping.

Specific Project sites will be selected based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff and construction consultants, the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the



proximity to an urban waterway and disadvantaged neighborhood, and the appropriateness of the site location for educating the public.

#### Consistent project plans

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.

2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.

3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.

4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.

5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

#### Additional relative plans

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

## Lindo Channel Stormwater Infiltration and Floodplain Enhancement Project

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to maximize stormwater infiltration and treatment capacity including:

- 1) Floodplain restoration -
  - a) Hydrologic: reconnect stream to the floodplain and restore natural hydrology;
  - b) Vegetative: remove invasive species (include herbicide treatment) and replant native plants;
  - c) Habitat Restoration: reduce bank erosion, improve wildlife habitat, expand width of riparian buffer, strategic grading in channel to form "low flow" channel meander to reduce isolated pools trapping native fish species and nutrients.
- 2) Enhance storm drain system
  - a) Repair damaged outfalls: replace broken conduit, repair pipe seams and gates, stabilize erosion surrounding outfalls
  - b) Add bioswale areas below outfalls: set outfalls back away from stream banks, realign to allow expanded infiltration areas
  - c) Re-grade / realign outfalls: to enhance drainage (some outfalls "trap" runoff for long periods of time (weeks/months), accumulating nutrients and pollutants carried to receiving waters during subsequent rain events.
  - d) Install trash reduction structures: target "hot spots" (Mangrove to Esplanade), install inlet filters, trash racks, debris cages.
- 3) Reduce homeless encampments-
  - a) Increase surveillance
  - b) Schedule regular creek clean-ups
  - c) Develop strategy to reduce homeless encampments
- 4) Reduce urban landscape irrigation runoff-
  - a) Provide public education: LID implementation/water conservation and training (target voluntary residential implementation)
  - b) Clean Water Business Partners: target education and incentive program for businesses located where inlets carry runoff to Lindo Channel (Chico Nut, S&S, Lifescapes, In-Motion Fitness, Nissan, Holiday Inn, Dennys, etc.) and others where inlets carry water to Lindo Channel.
- 5) Enhance Recreational Opportunities -
  - a) Improve Trails, Bike Paths and Transportation Pathways: Improve existing access points (Manzanita, Madrone, Esplanade, Sheridan, Holly, Esplanade, etc. where rogue trails and access pathways cause erosion)
  - b) Improve picnic and sitting areas: Verbena Fields, Madrone, bike path under freeway (cul-de-sacs could allow expanded access).
- 6) Project Effectiveness Monitoring -
  - a) Utilize existing citizen monitoring program to track project effectiveness including water quality and habitat improvements
  - b) Pre and post project trash surveys
  - c) Pre and post project outfall surveys

This project seeks a collaboration with the City of Chico (sponsor?) to prioritize exact locations for channel improvements (city-owned properties and right-of-ways) and stormdrain system improvements (outfall repairs, outfall setbacks w/bioswales, trash reduction structures at outfalls, and inlet filters). It is also intended to build on the efforts of previous floodplain improvement and stormwater protection grant projects awarded to the City (Prop. 84, DROPS, Verbena/Bidwell Ave., CUSA) and CUSD (DROPS),

including continuing stormwater education, LID Implementation efforts, and citizen monitoring efforts tracking long-term effects of stormwater management efforts on improving habitat and water quality.

## **Bidwell Park Stormwater Management Project (Green Infrastructure-LIDs, Floodplain Improvement, and Ground Water Recharge)**

The proposed Project (Project) will integrate stormwater management with Bidwell Park management efforts. Project will implement LID practices designed to improve the capacity of natural drainage areas to infiltrate and treat stormwater runoff.

### Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology and improve water quality in the Sacramento River by managing urban runoff at its source.

Project objectives will:

- Integrate LID practices into Bidwell Park and Greenway drainage improvement projects to demonstrate and educate to the community the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume, pollutant loading, and flooding.
- Leverage funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and residents living adjacent to Park.
- Assist City Park volunteer efforts in leading public work sessions to enhance habitat and park infrastructure (associated w/project implementation/maintenance).
- Link with existing citizen monitoring and stormwater education efforts to improve outcomes of stormwater management, facilitate public involvement, leverage previous State funding, utilize existing baseline water quality data, and to track project effectiveness.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

Suggested Project elements include: (Capture-Retention)

1)Improve storm drain conveyance system. Retrofit sections of storm drain conduit with pervious pipe; install bioswales below outfalls (consider realigning piping system to allow longer path of infiltration) and setback/daylight discharge points away from creek edge; repair damaged outfalls (broken conduit, control gates, housing, undercut banks and erosion around housing); install trash reduction structures and filters at inlets and outlets (such as Mangrove Safeway parking lot, CARD).

2)Natural drainage improvement. Enhance the capacity of natural drainage channels carrying stormwater runoff. Improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the creek, by removing invasive plants, installing natives, removing debris and deposition, and repairing or resizing culverts. Re-grade natural bioswales/drainage channels where deposition has reduced channel capacity and pockets nuisance water (mosquitoes) sometimes for weeks after rains, which then is carried during subsequent rains directly to creek (nutrients); realign culverts under paths that block runoff from spreading between channels (bisected by paths).

3)Reduce bank erosion. Repair and stabilize creek banks where intensive recreational uses (and fallen trees in channel) are causing erosion and sedimentation (rope swing swim areas, bike jumps, creek crossings, golf course).

- 4) Enhance ground water recharge. Enhance wetlands and seeps in upper-park where the Tuscan aquifer is recharged. Install bioswales to increase recharge.
- 5) Enhance or restore wetland areas, seeps and springs, to treat runoff. Also, runoff through meadows making connections to vernal pools (Wildwood Park). Improve Oak woodland regeneration by removing turf so trees are not being watered during summer months or move trails so they are not being trampled.
- 6) Repair/relocate bike paths and roads to reduce erosion and improve transportation pathways (lower, middle and upper park roads and trails). Increase signage, enforce separation of biking and walking trails (Yahi trail), close trails/roads during rain events, integrate trails repair with stream bank improvement, oak woodland regeneration, endurance course repair projects.
- 7) Implement LID management practices in Bidwell Park infrastructure. Trails, paths, picnic areas, parking lots, sport fields, and buildings (replace impervious w/pervious, capture runoff and reuse for irrigation (golf course, Card Center, Nature Center, Hooker Oak Park).
- 8) Improve and restore floodplain functions. a) Hydrologic: reconnect stream to the floodplain and restore natural hydrology; b) Vegetative: remove invasive species and replant native plant communities appropriate to the site and condition; c) Habitat Restoration: Install structures to improve wildlife habitat (bird boxes, etc.). Habitat is also gained through re-planting native plant communities.
- 9) Green job training targeting DACs and CCC's. Integrate Clean Water Business Partners and other existing stormwater training programs into Green Jobs training project. Utilize stormwater treatment project areas as training tools to provide hands-on learning work sessions and training events to improve employment opportunities and reduce project implementation costs. Increase volunteer resources to assist in park maintenance and stormwater implementation projects. Include CAVE/Stream Team/Nature Center/BEC/CSU Chico internship program.
- 10) Reduce nutrient loading targeting Sycamore Pool. Install swim diaper dispensers, repair/increase # of showers, informational signage, pet waste bag stations, trashcans, etc. Consider revising creek bottom scrubbing plan at Sycamore Pool to reduce downstream sedimentation and harm to fish displaced during cleaning events. Initiate trash reduction campaigns, creek clean-ups and homeless encampment reduction plan.
- 11) Community engagement. Encourage collaborations among existing stormwater protection efforts (i.e. CSU Chico, CUSD, BCOE, City of Chico, The Stream Team, and other interested community groups) seeking to align individual stormwater program objectives, share resources, develop consistent public messaging, and identify cost-saving opportunities.
- 12) Hire park rangers/volunteer and stormwater outreach coordinator positions.
- 13) Stormwater Education. Combine Clean Water Science Ambassador and Clean Creeks in the Classroom efforts to offer outdoor stormwater education classrooms (STEM and NGSS curriculum) in parks and greenways located within walking distance of most schools.
- 14) Implement a Stormwater Outreach and Education Plan. Designate a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.
- 15) Provide checklists and training for Park Watch, Stream Team, and other park volunteers to document trash hot-spots, and wet weather trail and road erosion (modeled on the Urban Tides Initiative program in SoCal, and SWRCB CWT rapid trash assessment methodology).
- 16) Install water bottle filling stations in parks, and baseball/soccer fields.

17) Repair vita-health exercise circuit in park, and host events and provide maps to highlight use of this public health improvement infrastructure and stormwater projects.

18) Reduce pesticide and landscape overwatering by targeting LID workshops for DAC neighborhoods, schools and offer tours and training to learn about stormwater projects in the parks. Training will include practices they can implement on their own residential landscapes.

#### Purpose and Need:

The water quality in Chico's Creeks continues to decline as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Seventeen years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

#### Project Location

Projects are located in Bidwell Park and Greenways within the Big Chico Creek, drainage basins.

- Projects target DAC neighborhoods and schools.
- Demo project locations selected to provide high visibility for public and Green Job training.
- Locations selected to target hot spots for erosion/trash/infiltration channel and storm drain system improvements/wetland and habitat protection/public education.

Specific Project site locations will be determined based on reviewing illicit discharge information noted in the City's outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff, feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood and schools, and the appropriateness of the site location to serve as a demo or LID educational tool for training the public, City staff, and for Green Jobs employment training.

#### Consistent project plans:

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15 1)

The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.

2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.

3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.

4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.

5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.



# Revised Chapman/Mulberry Neighborhood Green Infrastructure and Natural Stormwater Treatment Project

## Project Proponent

CA Urban Streams Alliance-The Stream Team

Potential Sponsors: City of Chico collaboration

## Potential Partners

City of Chico, SWRCB CWT, CSU Chico, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Mechoopda, and others.

## Project Description

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

## Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### Project objectives will:

- Integrate LID practices into Chapman Mulberry Neighborhood drainage improvement projects to demonstrate and educate to the community about the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff from project neighborhoods.
- Link project objectives with City MS4 permit requirements to leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities.
- Target implementation of LID demonstration projects on City-owned properties within DACs (such as the Dorothy Johnson Center).
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.
- Implement LID demonstration projects targeting Chapman Mulberry neighborhood, the Dorothy Johnson Center, Humboldt Park, Torres and Jesus Center homeless shelters, Chapman Elementary (and 8 other Title I schools), and other City owned properties. Include a variety of examples of LID practices, such as day-lighting storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and

gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.

- Implement vegetation management (Arrundo, Broom, etc.) in waterways to improve habitat and water quality, reduce flooding, heat island effects (GHG) and fire hazards, increase recreation potential, improve public health and well-being (research shows being in nature improves health and well-being). Target Little Chico, greenways, and Teichert Ponds.

- Implement trash reduction programs to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-off sites, compost green-waste on-site campaigns, creek clean-ups, etc.

- Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCCs and other existing work training programs and utilize training workshops to implement LID project elements to save costs.

- Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

#### Project locations:

Chapman Mulberry Neighborhood, Dorothy Johnson Center, Chapman School, Teichert Pond, Little Chico Creek public right of ways/city-owned parcels

#### Reference Docs:

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.
- 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

## **Bidwell/Grape Ave Stormwater Protection and Restoration Project**

Project Ideas Submitted by:

CA Urban Streams Alliance-The Stream Team (Stream Team)

Project Sponsor: City of Chico / County / Grape Way Agricultural Farm (Brenden Smith-property owner)

Identified Partners:

City of Chico, Stream Team, SWRCB CWT, CSU Chico, River Partners, FOBP, BEC, School Districts (CUSD/BCOE), Waterkeepers Alliance, CA State Parks, Mechoopda, Department of Fish and Wildlife, and landowner.

Project Description

The Project goals are to maintain and restore pre-development hydrology and improve water quality in the Sacramento River by managing urban runoff at its source.

Project objectives will:

- Integrate LID practices into drainage improvement projects (targeting Bidwell Ave, Grape Way) to demonstrate and educate to the community the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume, pollutant loading, and flooding.
- Leverage funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and residents living adjacent to Bidwell Ave, Grape Way.
- Link with existing citizen monitoring and stormwater education efforts to improve outcomes of stormwater management, facilitate public involvement, leverage previous State funding, utilize existing baseline water quality data, and to track project effectiveness.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

Specific Project elements include:

- 1) Improve storm drain conveyance system. Retrofit sections of storm drain conduit with pervious pipe; install bioswales below outfalls (consider realigning piping system to allow longer path of infiltration) and setback/daylight discharge points away from creek edge; repair damaged outfalls (broken conduit, control gates, housing, undercut banks and erosion around housing); install trash reduction structures and filters at inlets and outlets (below Nord Ave.)
- 2) Natural drainage improvement. Enhance the capacity of natural drainage areas carrying stormwater runoff. Improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the creek, by removing invasive plants, installing natives, removing debris and deposition.
- 3) Reduce bank erosion. Repair and stabilize creek banks along Big Chico Creek below Nord Ave and near Grape Way causing erosion and sedimentation.

- 4) Enhance ground water recharge. Install setback levees, and bioswales to increase recharge (target Ag properties near Grape Way, and where houses are falling into creek along Bidwell Ave.)
- 5) Improve and restore floodplain functions. a) Hydrologic: reconnect stream to the floodplain and restore natural hydrology; b) Vegetative: remove invasive species and replant native plant communities appropriate to the site and condition; c) Habitat Restoration: Install structures to improve wildlife habitat (bird boxes, etc.). Habitat is also gained through re-planting native plant communities.
- 6) Green job training targeting DACs and CCCs. Integrate Clean Water Business Partners and other existing stormwater training programs into Green Jobs training project. Utilize stormwater treatment project areas as training tools to provide hands-on learning work sessions and training events to improve employment opportunities and reduce project implementation costs. Increase volunteer resources to assist in park maintenance and stormwater implementation projects. Include CAVE/ Stream Team/Nature Center/BEC/CSU Chico internship program.
- 7) Implement a Stormwater Outreach and Education Plan. Designate a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City stormwater protection efforts.
- 8) Creek clean-up at mouth of Big Chico Creek near canoe launch and CA State Park access. Will require excavator to remove large amount of trash (tires, appliances, etc.).

#### Reference Documents

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.
- 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (Chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.

## **(Revised) Cal Park Green Streets Project**

### Project Proponent

CA Urban Streams Alliance-The Stream Team

Potential Sponsors: City of Chico, The Stream Team, Cal Park collaboration

### Potential Partners

City of Chico, Park Watch, SWRCB CWT, CSU Chico, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Cal Park Homeowners Association, Market For Green Infrastructure, CA State Parks, Calwater, and others.

### Project Title

Cal Park Green Streets Project

### Project Description

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico Creeks and ultimately the Sacramento River.

### Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

#### Project objectives will:

- Integrate LID practices into California Park drainage improvement projects and homeowners association management efforts to demonstrate and educate residents about the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Link project objectives with City MS4 permit requirements to leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution.
- Target implementation of LID demonstration projects on City-owned properties (roadways, sidewalk tree strips, and open areas) within California Park neighborhoods.
- Increase employment opportunities for DACs and tribes by providing LID and green infrastructure job training and certification workshops utilizing LID demo projects as training tools. Coordinate with CCCs to provide hands-on job training during LID implementation to reduce project costs.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education,

project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.

- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

#### Project Elements: (Capture-Retention)

- 1)Develop and implement a Citywide/Countywide LID Design and BMP Manual (Maintaining Green Infrastructure through proper landscape maintenance). Include a Cal Park LID Implementation Manual.
- 2)Implement LID demonstration and Green Streets projects targeting California Park neighborhood (and Murphy Commons, March Junior High). Include a variety of examples of LID practices, such as, day-lighting storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for recycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc
- 3)Implement vegetation management (remove turf and invasive plants and plant natives) around the neighborhood lake and open space system to improve habitat and water quality, reduce flooding, decrease heat island effects (GHG) and fire hazards, increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).
- 4)Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-of sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc.
- 5)Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCCs and other existing work training programs and utilize training workshops to implement LID project elements to save costs.
- 6)Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City stormwater protection efforts.

#### Project locations:

California Park neighborhood  
California Park lakes and open spaces  
Little Chico Creek  
Marsh Junior High  
Murphy Commons Low-income housing and community garden  
Bike and walking paths along Little Chico Creek and within Cal Park

## Project References

The Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.
- 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (Chapman/Mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans. Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.

# Revised Chico State University LID Implementation and Stream Habitat Enhancement Project

## Project Proponent

CA Urban Streams Alliance-The Stream Team

Potential Project Sponsors: CSU Chico, City of Chico, CA State Parks

## Potential Partners

City of Chico, Park Watch, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Cal Park Homeowners Association, CHIP, Habitat for Humanity, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Health clubs, Community Event Coordinators, Utilities, Calwater, and others.

## Project Title

Chico State University LID Implementation and Stream Habitat Enhancement Project

## Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### Project objectives will:

- Integrate LID practices into drainage improvement projects to demonstrate and educate to the community the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater run off.
- Implement LID project objectives to satisfy MS4 permit requirements.
- Leverage City/CSU Chico funds allocated for scheduled maintenance and repair projects to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution.
- Link existing citizen monitoring and storm water efforts with existing Stormwater Management objectives to facilitate public involvement, leverage previous State funding, and utilize existing baseline water quality data.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

## Project Elements: (Capture-Retention)

1)Storm drain improvement. Retrofit storm drains with pervious pipe, move outfalls away from the creek and install bioswales to allow a portion of the runoff to leach into the ground prior to reaching waterways. Currently most outfalls empty runoff directly into the creeks at the banks edge without no pretreatment.



- 2) Natural drainage improvement. Enhance the capacity of natural drainage channels carrying stormwater runoff to waterways to improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the creek, by removing invasive plants, installing natives, removing debris and deposition, and repairing or resizing culverts.
- 3) Reduce bank erosion. Repair and stabilize creek banks where intensive recreational uses (and fallen trees in channel) are causing erosion and sedimentation (rope swing swim areas, bike jumps, creek crossings). Install signage to inform the public about the impacts of their actions on water quality.
- 4) Improve public transport pathways. Repair walking and biking trails, and dirt roads adjacent or near waterways to reduce erosion.
- 5) Green job training targeting DACs and CCCs. Integrate training workshops and work sessions to assist with implementing project elements to reduce costs and provide hands-on learning to improve employment opportunities. Include CAVE/ Team Team/Nature Center/CSU Chico internship collaboration program.
- 6) Trash reduction structures (full and partial capture) and outreach campaigns.
- 7) Community engagement and stormwater education. LID demonstration projects will target participation and benefits for DACs, tribes, schools, existing community stormwater efforts, and the City Park volunteer program. Opportunities for the public to participate in LID design, implementation and effectiveness monitoring will be provided. Include park volunteer/stormwater outreach coordinator position.
- 8) Stormwater Education. Combine Clean Water Science Ambassador and Clean Creeks in the Classroom efforts to offer outdoor stormwater education classrooms (STEM and NGSS curriculum) in parks and greenways located within walking distance of most schools.
- 9) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.
- 10) Natural drainage improvement. Enhance the capacity of natural drainage channels carrying stormwater runoff. Improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the creek, by removing invasive plants, installing natives, removing debris and deposition, and repairing or resizing culverts.
- 11) Reduce bank erosion. Repair and stabilize creek banks causing erosion and sedimentation (near Warner).

#### Project locations:

Project is located in Big Chico Creek watershed and along creek reaches adjacent to the CSU Chico Campus.

#### Reference Documents

City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located

appropriately to detect improving water quality associated with implementing LID practices implemented through this Project. 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices. 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (Chapman/Mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.

## **Revised Little Chico Creek, Lindo Channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project**

Target removal of Arundo and broom in Little Chico Creek, Mud/Rock creeks, and Lindo Channel.

Potential Sponsors: County, City of Chico

### Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

Project objectives will:

- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Remove invasive Arundo and Broom.
- Link existing citizen monitoring and storm water management efforts to facilitate public involvement, and track project effectiveness.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.
- Reduce fire hazard.

Project Elements: (Capture-Retention)

- 1) Natural drainage improvement. Enhance the capacity of natural drainage channels carrying stormwater runoff to waterways to improve infiltration and reduce erosion and the pollutants carried with the sediment ending up in the creek, by removing invasive plants, installing natives, removing debris and deposition.
- 2) Green job training targeting DACs and CCCs. Integrate training workshops and work sessions to assist with implementing project elements to reduce costs and provide hands-on learning to improve employment opportunities. Include CAVE/ Stream Team/Nature Center/CSU Chico internship collaboration program.
- 3) Community engagement and stormwater education. Combine Clean Water Science Ambassador and Clean Creeks in the Classroom efforts to offer outdoor stormwater education classrooms (STEM and NGSS curriculum) in parks and greenways located within walking distance of most schools.
- 4) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City stormwater protection efforts.
- 5) Include community park improvements and connecting transport pathways when feasible. Humboldt Park, etc.

# **Revised Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools**

## Project Proponent

CA Urban Streams Alliance-The Stream Team

Project Sponsor: CUSD/BCOE

## Potential Partners

City of Chico, SWRCB CWT, CSU Chico, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Mechoopda, Mosquito Abatement, Utilities, Calwater, and others.

## Project Description

The proposed Project (Project) will implement Low Impact Development (LID) practices designed to improve the capacity of natural drainage areas to reduce urban runoff from entering Chico Creeks and ultimately the Sacramento River.

The Project features a long-term approach for integrating LID practices into present and future maintenance and landscape design standards to assist the CUSD and BCOE schools in meeting existing storm water management goals. In addition, the Project will integrate a cohesive storm water educational program, targeting after-school programs.

Collaborations will be promoted with neighboring School Districts, community organizations, and municipal storm water programs seeking to align storm water protection efforts, share resources, identify cost-saving opportunities, and to develop consistent public messaging and understanding regarding storm water issues and solutions. This project builds on an existing DROPS grant (Prop. 84).

## Project Goals, Objectives and Outcomes

Project goals: 1) maintain and restore pre-development hydrology; 2) improve water quality by limiting urban based pollution carried in stormwater runoff; 3) encourage use of LID practices for managing urban runoff.

Project objectives: 1) construct LID demonstration projects to educate students and their families on the importance of stormwater management and LID-based solutions; 2) reduce volume and pollution in stormwater runoff; 3) leverage CUSD funds allocated for scheduled maintenance and repair to integrate LID practices; 4) Link existing citizen monitoring program efforts to assist with project implementation, facilitate public involvement, leverage previous funding, and utilize existing baseline watershed data which tracks water quality; 5) Integrate stormwater education in existing after-school programs; 6) Target DAC schools and neighborhoods.

Project outcomes include: 1) improved habitat and water quality through effective stormwater management; 2) increased public knowledge of storm water management best practices and LID strategies through integrated stormwater education.

## Project Integration

Schools Built Environment: LID strategies will be integrated into staff training events through project site tours; Landscape design and maintenance plans; Facility inspection checklist to identify and prioritize LID practices to correct, and/or to reduce operation and maintenance costs.

## Stormwater Education

Project education will be integrated into CUSD/BCOE afterschool program curriculum and will include opportunities for students and their families to participate in Project implementation and monitoring. Curriculum units will include: watershed ecology; stormwater issues and LID solutions; hands-on Project implementation; and Project site effectiveness monitoring.

## Project Elements: (Capture-Retention)

- 1) Integrate LID practices into CUSD and BCOE landscape planning and design practices and manuals.
- 2) Implement LID demonstration projects on each project school. Develop River Friendly Landscape Guide and provide training for residents, city staff, and landscape professionals.
- 3) Utilize LID demonstration projects as outdoor STEM learning classrooms.
- 4) Engage families and the community in developing and implementing LID projects on each campus, and include workshops providing a River Friendly LID Landscape and Habitat guide to residents to implement stormwater BMPs on residential landscapes.
- 5) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City stormwater protection efforts.
- 6) Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCC and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- 7) Install water bottle filling stations on each campus.

## Project Location

The Project is located in the Big Chico Creek, Lille Chico Creek, and includes 25 schools.

Technical reports for each project school have been developed through a previous SWRCB Technical grant. The reports include project designs, treatment volumes, discharge maps, etc. with enough detail to be provided in a Prop. 1 grant, including budgets, PAEP, QAPP, MP, and all. Project will assist the City in addressing eight key elements of the City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data.

Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project. 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices. 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.

## Revised Urban Landscape Water Conservation and Pesticide Reduction Project

### Project Proponent

CA Urban Streams Alliance-The Stream Team

### Potential Partners

City of Chico, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Cal Park Homeowners Association, CHIP, Habitat for Humanity, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Mechoopda, Mosquito Abatement, Health clubs, Community Event Coordinators, Utilities, Calwater, and others.

### Project Description

The proposed Project (Project) will implement Low Impact Development (LID) practices designed to improve the capacity of natural drainage areas to reduce urban runoff from entering Chico Creeks and ultimately the Sacramento River.

### Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### Project objectives will:

- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Implement LID project objectives to satisfy MS4 permit requirements.
- Leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution targeting City staff, DACs, schools, and neighboring MS4 entities.
- Link existing citizen monitoring and storm water efforts with City Stormwater Management objectives to facilitate public involvement, leverage previous State funding, and utilize existing baseline water quality data.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

### Purpose and Need

The water quality in Chico Creeks are declining as a result of urban development and increasing stormwater runoff. Known constituents of concern include trash, nutrients, fecal bacteria, household chemicals, pesticides and herbicides, oil, grease, and other hydrocarbons, heavy metals, mercury, and landscape irrigation runoff.

Sources of stormwater contamination are directly related to urbanization and the large percentage of urban land covered with impervious surfaces (roads, sidewalks, driveways, and parking lots), which have caused increased volume and velocity of surface runoff. Applying the methodology for calculating impervious surface coefficients, 23% of Chico's 21,000 acres are paved (OEHHA, 2010). The Center for Watershed Protection (2003) assumes stream water quality declines when impervious surfaces exceed ten percent. Ten years of monthly watershed assessment data exists for Big Chico Creek supporting this claim, indicating aquatic invertebrate species decline, and elevated bacteria, turbidity, temperature, and trash levels.

#### Project Elements: (Capture-Retention)

- Develop and implement a Citywide/Countywide LID Design and BMP Manual, and Landscape planning and design practices and manuals (Maintaining Green Infrastructure through proper landscape maintenance). Include specific chapters or manuals targeting specific neighborhoods and commercial areas with different water quality issues (shallowground water, etc.). Include generic plans for each type of LID. Include designs for schools.
- Implement LID demo projects in each neighborhood type to provide training opportunities and replicable examples. Target LID methods to reduce pesticide and landscape irrigation runoff.
- Implement LID demonstration and Green Streets projects targeting City-owned properties. Include a variety of examples of LID practices, such as, day-lighting storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for re cycling and use by community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.
- Implement riparian vegetation management to improve habitat and water quality, reduce flooding, decrease heat island effects (GHG) and fire hazards (remove Arrundo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).
- Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-off sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc.
- Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCCs and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- Include pesticide and overwatering campaigns targeting DACs and implementation of LID demo projects.
- Develop a Waterwise and Habitat River Friendly Landscape Guide specific to Butte County including the following principles: install local native species, nurture the soil (compost on site), reduce yard waste to landfill, conserve water, conserve energy, protect water quality (decrease pesticide use), and create wildlife habitat.
- Implement a Rainscapes Reward - Incentive program to provide rebates implementing green infrastructure and turf removal projects to capture and treat stormwater onsite.
- Include environmentally friendly landscape practices for landscape professionals and residents.
- Update or integrate existing creek-side and street tree handbooks.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued



community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.

-Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City stormwater protection efforts.

### Project locations

Entire City of Chico and will target DAC neighborhoods (Chapman Mulberry) and commercial (Hagen Lane) and public properties.

Butte County Schools

Big Chico Creek, Little Chico Creek watersheds.

### Project Approach

One of the most promising improvements to how we develop land is the implementation of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project approach was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and firescaping.

Specific Project sites will be selected based on reviewing illicit discharge information noted in the City outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City staff and construction consultants, the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood, and the appropriateness of the site location for educating the public.

## Reference Documents

City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15

- 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances.
- 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices.
- 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project.
- 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices.
- 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions.

Additional relative plans

City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others.

State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more.

Federal Plans: Clean Water Act and all related plans.

# **Revised Five Mile, Lindo Channel, and Sycamore Flood Diversion Stormwater Treatment and Habitat Enhancement Project**

## Project Proponent

CA Urban Streams Alliance-The Stream Team

## Potential Partners

City of Chico, DWR, Rock Creek Reclamation District, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Calwater, Mechoopda, and others.

## Project Title

Five Mile, Lindo Channel, and Sycamore Flood Diversion Stormwater Treatment and Habitat Enhancement Project

## Project

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to prevent or reduce urban runoff from entering Chico's Creeks and ultimately the Sacramento River. This Project will also enhance natural habits and wildlife corridors, and improve the function of an existing flood diversion system in need of repair to include fully functioning USGS gages, and telemetry.

## Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

### Project objectives will:

- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Link LID project objectives to satisfy MS4 permit requirements and to leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.
- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution.
- Increase employment opportunities for DACs and tribes by providing LID and green infrastructure job training and certification workshops utilizing LID demo projects as training tools. Coordinate with CCCs to provide hands-on job training during LID implementation to reduce project costs.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education,

project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.

- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

#### Project Elements: (Capture-Retention)

- 1)Improve flood system function through the development of a maintenance agreement between DWR, County and City to remove deposited gravels, trim and remove vegetation in channels targeting invasive plants, and install or repair real-time USGS gages, continuous monitoring equipment (flow, pH, temp, Do, Turbidity, etc.) and telemetry. Coordinate with DWR and citizen monitoring efforts to reduce costs for maintaining USGS real-time gages including equipment calibration and maintenance requirements (weekly cleaning of turbidity meters during rain events, flow calibration curves, etc.).
- 2)Implement floodplain connection projects (similar to Verbena Fields) in Lindo, Sycamore, and Mud/Rock Creek Channels.
- 3)Implement habitat improvements with stormwater treatment to enhance wetlands, seeps, springs, and vernal pool habitats.
- 4)Include trails and public transport pathways and exercise opportunities into stormwater treatment projects.
- 5)Include wildlife corridors and connections between foothills, stream channels and Sacramento River.
- 5)Include trash reduction strategies in high traffic or hot-spot areas.
- 7)Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCCs and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort. Target training work sessions on improving knowledge and skills in habitat restoration practices to improve Lindo and Sycamore flood diversion capacity.
- 8)Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

#### Project locations

Big Chico, Mud Creeks

Five Mile / Lindo Channel / Sycamore Flood Diversion Channel

Title 1 Schools

City of Chico and/or Butte County

#### Reference Documents

City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances. 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy

and includes LID practices. 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project. 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices. 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans. Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.

## Revised City of Chico Long-term Trash Reduction Project

### Project Proponent

CA Urban Streams Alliance-The Stream Team

Potential Project Sponsor (City of Chico)

### Potential Partners

City of Chico, Waste Management and other trash companies, DWR, Rock Creek Reclamation District, SWRCB CWT, CSU Chico, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Calwater, Mechoopda, and others.

### Project Description

Trash and litter are a pervasive problem in California. Controlling trash is a priority, because trash adversely affects our use of California's waterways. Trash impacts aquatic life in streams, rivers, and the ocean as well as terrestrial species in adjacent riparian and shore areas. Trash, particularly plastics, persists for years. It concentrates organic toxins, entangles and ensnares wildlife, and disrupts feeding when animals mistake plastic for food and ingest it. Additionally, trash creates aesthetic impacts, impairing our ability to enjoy our waterways (SWRCB, 2017).

### Goals and Objectives

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

Project objectives will:

- Establish a long-term trash reduction program to achieve outcomes to meet State Trash TMDL and MS4 permit requirements.
- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions and reducing trash, which is a pollutant impacting water quality.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Increase employment opportunities for DACs and tribes by providing LID and green infrastructure job training and certification workshops utilizing LID demo projects as training tools. Coordinate with CCC, A&S to provide hands-on job training during LID implementation to reduce project costs.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes.

### Project Elements: (Capture-Retention)

- 1)Develop and implement a Citywide/Countywide LID Design and BMP Manual (Maintaining Green Infrastructure through proper landscape maintenance).
- 2)Implement LID demonstration and Green Streets projects targeting City-owned properties. Include a variety of examples of LID practices, such as, day-lighting storm drains through bioswales and pervious piping, outfall setbacks away from creek banks, roadway curb cuts to vegetated plots and infiltration trenches, pervious sidewalks and gutter pans, downspout disconnects to cisterns for recycling and use by

community gardens, integrate safe walking and biking transportation pathways into LID project designs, etc.

3) Implement riparian vegetation management to improve habitat and water quality, reduce flooding, decrease heat island effects (GHG) and fire hazards (remove Arrondo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).

4) Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-off sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc. specific elements include: a) ID and map trash hot spots (visual assessments); b) ID sources of trash (Trash Generation characterized by category-commercial, industrial, residential, schools, parks, other and Trash Loading-how much is entering receiving waters); c) delineate and prioritize trash management areas; d) ID and select trash control measures (full and partial capture devices, and community engagement (cig but ashtrays outside businesses, reduce single use products, anti-littering campaigns, illegal dumping ordinances, etc); e) develop method for tracking progress in reducing trash levels (CWT trash surveys, water quality monitoring); f) implement control measures; g) access progress in reducing trash; h) modify management areas of reprioritize to address problems.

5) Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCCs and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.

6) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

## Reference Documents

City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances. 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices. 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project. 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices. 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans. Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.

# Revised Chico Green Streets and Low Impact Development Implementation Project

## Project Proponent

CA Urban Streams Alliance-The Stream Team

## Potential Sponsor (City of Chico)

## Potential Partners

City of Chico, Public Utilities, SWRCB CWT, CSU Chico, Rock Creek Reclamation District, Butte and Tehama Counties, BCAG, River Partners, FOBP, BEC, school districts (CUSD/BCOE), Waterkeepers Alliance, Love Chapman, Market For Green Infrastructure, CA State Parks, Forest Ranch, Butte Meadows, SPI, Forest Service, Calwater, Mechoopda, and others.

## Project Description

Proposed Project (Project) will implement Low Impact Development (LID) practices designed to convert impervious areas into vegetated plots that soak up rainwater to limit urban runoff from entering Chico's Creeks and ultimately the Sacramento River.

The proposed Project features a long-term approach for integrating LID practices into present and future development design standards to assist the City in meeting State-mandated Municipal Stormwater Permit (MS4) requirements. Project will encourage collaborations among existing stormwater protection efforts, and neighboring MS4 entities (i.e. CSU Chico, Chico Unified School District, and other local jurisdictions) seeking to align individual stormwater program objectives, share resources, develop consistent public messaging, and identify cost-saving opportunities.

Coordinate with Public Utilities to achieve sustainable storm water management through low impact design (LID) approaches that can help mitigate the effects of urbanization on stormwater. Integrate LID practices (pervious gutter pans and sidewalks, curb cuts to vegetated strips, etc.) into streetscape improvements (roundabouts, utility improvement projects) to reduce the volumes and peak flows of stormwater entering the stormwater conveyance system, alleviate flooding, and contribute to neighborhood greening. Develop conceptual designs for the number, type, location, and size of LID features that could reasonably be implemented. Identify collaboration opportunities (Caltrans, etc.).

## Goals and Objectives:

The Project goals are to maintain and restore pre-development hydrology at Project sites and improve water quality in the Sacramento River by managing urban runoff at its source.

## Project objectives will:

- Integrate LID practices into drainage improvement projects to demonstrate and educate the community on the importance of stormwater management and the benefits of LID-based solutions.
- Reduce stormwater volume and pollutant loading in stormwater runoff.
- Link LID project objectives to satisfy MS4 permit requirements and to leverage City funds allocated for scheduled maintenance and repair to integrate LID practices that would not otherwise be possible.



- Conduct public outreach and training that raises understanding of sources of runoff pollution and use of BMPs to prevent water pollution.
- Increase employment opportunities for DACs and tribes by providing LID and green infrastructure job training and certification workshops utilizing LID demo projects as training tools. Coordinate with CCCs to provide hands-on job training during LID implementation to reduce project costs.
- Link existing citizen monitoring and stormwater / watershed protection efforts with City Stormwater Management Program objectives to facilitate public involvement, leverage previous State funding for stormwater projects and programs, utilize existing baseline water quality data, and empower continued community group involvement by ensuring they have a role in assisting with outreach and education, project implementation, and project effectiveness monitoring. These groups represent key-stakeholders and can facilitate their involvement to improve overall project outcomes. A significant amount of project match hours can be contributed.
- Improve public health and reduce obesity.
- Improve employment opportunities.
- Improve fish and wildlife and vernal pool and wetland habitat.

#### Project Elements: (Capture-Retention)

- 1) Implement a Citywide/Countywide LID project utilizing Landscape planning and design practices and manuals (Maintaining Green Infrastructure through proper landscape maintenance). Include generic plans for each type of LID, River Friendly Landscape Guide, Rainscapes and LID Implementation Reward - Incentive program. Target DAC neighborhoods (Chapman Mulberry), neighborhoods with flooding and drainage issues (north Chico and PV drainages) and California Park. Include LID demo projects in each neighborhood type to provide training opportunities and replicable examples. Include Develop and provide training for residents, city staff, and landscape professionals. Include LID demo projects to utilize as training tools.
- 2) Implement Green Streets Demonstration Projects on City roadways, target Hagen Lane Commercial Business Park, Cal Park roads and sidewalk strips, DAC neighborhoods (Chapman Mulberry) Dorothy Johnson Center, Esplanade street improvements, Habitat and CHIP apartment complexes, and community centers (CARD, Cal Park Pavilion, Elks Lodge, Chico Masonic Lodge, etc). Include Clean Water Business Partner and residential water-wise landscaping incentive/rebate program.
- 3) Implement riparian vegetation management to improve habitat and water quality, reduce flooding, recharge ground water, decrease heat island effects (GHG) and fire hazards (remove Arrundo), increase recreation potential, and improve public health and well-being (research shows being in nature improves health and well-being).
- 4) Implement Chico Trash Reduction program to reduce runoff pollution and trash dumped in waterways, such as landfill coupons and curbside pick-up of large household items (couches, carpets, refrigerators, tires, etc), prescription drug and hazardous household waste recycling campaigns, free yard waste drop-of sites, compost green-waste on-site campaigns, lake and creek clean-ups, etc.
- 5) Implement Green Jobs in Your Community Training Program (Maintaining Green Infrastructure and Stormwater Systems Certification Training Program). Target DACs, CCCs and other existing work training programs and utilize hands-on training workshops to implement LID project elements to save costs. Integrate Clean Water Business Partners into this effort.
- 6) Implement a Stormwater Outreach and Education Plan that identifies a role for existing community groups involved in stormwater and watershed protection efforts. Link this plan with the City's stormwater program goals and utilize these groups to provide public outreach and education, stormwater education in schools (combine the efforts of the Clean Creeks in the Classroom and Clean Water Science Ambassador programs), public involvement in LID project implementation, and to track project effectiveness. Include a long-term budget plan to continue these efforts beyond this project

including enumeration of community Match hours generated by community groups that can be associated to the City's stormwater protection efforts.

Project locations:

City of Chico streets  
Big Chico, Little Chico Creek watersheds  
Title 1 Schools  
DAC neighborhoods

Project Approach:

One of the most promising improvements to how we develop land is the implementation of LID practices to retain as much stormwater as possible on site and disconnect impervious surfaces from flowing directly into stormwater collections systems providing an opportunity for infiltration, filtration, and capture and reuse. The Project approach was based on this understanding, and the efficacy of specific LID practices, which have been documented, in previous studies (EPA, 2000; Coffman, 2002; NRDC, 1999) to achieve desired Project goals. For example, reducing pesticide runoff is a desired Project goal, thus an appropriate LID practice (rain gardens/vegetated trenches, downspout disconnects) will be implemented to slow and redirect flows to infiltration or bioretention cells to allow the vegetation to trap up to 90% of the pesticide runoff (Moore, 2001). In addition, LID practices that provide other benefits including preventing erosion and nutrient runoff to improve aquatic habitat were selected. Consideration regarding the relative ease of integrating the various LID practices into existing urban landscapes, including residential areas, parking lots, buildings, and streets was also considered.

The Project will implement the following LID practices: pervious pavements and sidewalks, bioswales, vegetated trenches, infiltration leach fields, rain gardens to allow for infiltration and filtration; downspout disconnects directing flows to recharge areas, rain gardens, and vegetated buffer strips; rain barrels to capture and reuse rain water; restoration to restore riparian habitat and stream channel functions; xeriscape landscaping to reduce water consumption, use of pesticides, and fireescaping.

The Southern California Low Impact Development Manual (2008), and the Contra Costa County Stormwater Guidebook (2006) provided the technical basis for determining the feasibility of the various LID practices, in regards to existing Project site conditions (topography, soil types, ground water depth). Cost comparisons, and long-term maintenance issues, were considered, and appropriate LID practices determined to be best suited for the Chico area were selected. Consultations with the City landscape Inspector provided feedback on appropriate plant species that match local conditions.

Additionally, Project sites will be selected based on reviewing illicit discharge information noted in the City outfall survey reports, soils maps, information gathered during visual site inspections, consultations with City and County staff and construction consultants (Foothill Associates), the feasibility of implementing LID practices to significantly reduce runoff and pollutant loading, the proximity to an urban waterway and disadvantaged neighborhood, and the appropriateness of the site location for educating the public and City staff.

## Reference Documents

City's 2013 MS4 permit, including: E.7, E.8, E.8, E.9, E.10, E.11, E.13, E.15 1) The City of Chico has an updated General Plan that (BMP) Manual. Through this project LID practices and design standards that are most cost-effective will be integrated into BMP Manual and any pertinent stormwater ordinances. 2) The City of Chico Climate Action Plan includes elements to protect water quality and conserve energy and includes LID practices. 3) An existing citizen-monitoring program maintains 13 years of baseline water quality data including, habitat, and bioassessment data. Data monitoring stations are also located appropriately to detect improving water quality associated with implementing LID practices implemented through this Project. 4) Soils maps, and building plans are available for each Project site, which can be used to confirm existing site conditions and selection of appropriate LID practices. 5) The City has urban forest plan being developed, which will reduce greenhouse gas emissions. Additional relative plans City Plans: General Plan, MS4 Permit, BMP Handbook/Best Practices Manual, Keep Chico Clean and Storm Water Management and Education Plan, Post Construction Standards Plan, Erosion and Sediment Control Plan, Economic Development Plan Residential and Green Building Codes, Parkway, Parkstrip Conversion Guidelines, Park volunteer program, neighborhood plans (chapman/mulberry, etc), medical waste and disposal plan, leaf pickup and compost program, Chico Tree Guide, Street Tree Municipal Code, Tree Preservation regulations and standards, Neighborhood Planting Lists, Bidwell Park Master Management Plan and EIR, Don't Plant a Pest, Sustainable indicators report, Sustainability/Climate Action Plan, Urban Forest Plan, and others. State Plans: SWAMP, NSV IRWM, Water Efficient Landscape Ordinance (AB 1881), CA Green Infrastructure Plan, California Water Code, Prop. 1, and more. Federal Plans: Clean Water Act and all related plans.