

**Water Use Management** is pretty well defined in the 2004 NDAA where **in Sec. 321 (b)** they state: “Congress hereby recognizes the **Upper San Pedro Partnership**, Arizona, a partnership of Fort Huachuca, Arizona, other Federal, State, and local governmental and nongovernmental entities, and its efforts to establish a collaborative **water use management** program in the Sierra Vista Subwatershed, Arizona, **to achieve the sustainable yield of the regional aquifer**, so as to protect the Upper San Pedro River, Arizona, and the San Pedro Riparian National Conservation Area, Arizona.”  
(Reference: <https://www.congress.gov/bill/108th-congress/house-bill/1588/text> )

**And in Sec 321 (c) (1)** they state: “In general.--The Secretary of the Interior shall prepare, in consultation with the Secretary of Agriculture and the Secretary of Defense and in cooperation with the other members of the Partnership, a report on the **water use management** and conservation measures that have been implemented and are needed **to restore and maintain the sustainable yield of the regional aquifer by and after September 30, 2011.**”

**Proposal for USPP PLAN for Restoration of the  
Sustainable Yield of the Sierra Vista Sub-Watershed Aquifer**

## Introduction

There is growing concern that the Sierra Vista Sub-watershed caused annual water use caused **deficit** will likely begin having a more adverse impact on the river, and the local economy.

As most are aware, the 2004 National Defense Authorization Act mandated restoration of the sustainable yield of the aquifer by and “**after**” 30 September 2011. That meant completely eliminating the **deficit** by and “**after**” 30 September 2011. But neither was or has been achieved, and to date there is no overall formal plan for eliminating that deficit.

This plan serves to formally document what is planned for mitigating the annual deficit. It starts off with the 4 TNC and NRCD detention basin projects that will produce a little over 1000 acre feet of deficit mitigation. That’s followed by a number of planned detention basins at priority locations to mitigate another about 5000 acre feet as collectively needed to protect the river and fully mitigate the deficit.

With the Palominas and Bella Vista projects as engineering models for all future projects, and without a lot of costly study and with very little major engineering effort, that remaining about 5000 acre feet deficit can be mitigated in a relatively easy manner. **For example** this can be accomplished by merely planning to remove earth with heavy duty earth moving equipment, as needed to level the upstream bottom of a number basic “V” shaped Stantec-like basins at priority location in and/or near the SPRNCA. And then, similar to the Woodcutter basin located west of Buffalo Soldier Trail on the Fort, by expanding the width of the basins upstream of the dams with that heavy duty earth moving equipment, the size of the recharge areas can be easily expanded 8 to 10 or more times, and the volume of water that can be detained in the basins during each rain event can be expanded similarly to collectively achieve the annual recharge needed to support fully mitigating the annual deficits.

The summaries that follow include planned locations for the projects, estimated acre feet of annual recharge that is expected for each project, estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes, estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller adjustable detention basin drain pipes to enable optimizing drain time to accommodate variable size storm events and to do so potentially real time, actual or estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin, the estimated start and completion dates, expected cost and funding sources, and responsible agencies. All of the details are not currently available but they can be added and revised and/or updated as data comes available and as best estimates and/or monitoring data evolves.

## **SUMMARY OF PROJECTS**

<b><u>Projects</u></b>	<b><u>Deficit Mitigation</u></b>
<b>Palominas Project</b>	<b>190 af</b>
<b>Horseshoe Draw Project</b>	<b>40 af</b>
<b>Bella Vista Project</b>	<b>600 af</b>
<b>Riverstone Project</b>	<b>~300 af</b>
<b>Stump Canyon Wash Project</b>	<b>400 af</b>
<b>Hunter Canyon Wash Project</b>	<b>~230 af</b>
<b>Miller Canyon Wash Project</b>	<b>~410 af</b>
<b>Ramsey Canyon Wash Project</b>	<b>~1120 af</b>
<b>Lewis Springs Wash Project</b>	<b>610 af</b>
<b>Woodcutter Canyon Project</b>	<b>~760 af</b>
<b>Graveyard Gulch Project</b>	<b>~735 af</b>
<b>Greenbush Draw Project</b>	<b><u>~600 af</u></b>
	<b>5995 af</b>

## **Palominas Project**

**190 af**

Geographical location: Palominas Wash in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 190 af

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: 1871 CFS (based upon CC 9)

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 489 CFS

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin:

Estimated start date: Completed

Estimated completion date: 2013

Expected cost:

Funding sources: Charitable foundations & grants

Responsible agency: TNC

## **Horseshoe Draw Project**

**40 af**

Geographical location: Ladd Ranch east of the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 40 af

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes:

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes:

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin:

Estimated start date: This project is in progress

Estimated completion date:

Expected cost:

Funding sources: Charitable foundations & grants

Responsible agency: NRC

## **Bella Vista Project**

**600 af**

Geographical location: Coyote Wash North of Charleston Road near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 600 af

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: 2027 CFS (based upon SV 3)

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 774 CFS

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin:

Estimated start date: This project is in progress

Estimated completion date:

Expected cost:

Funding sources: Charitable foundations & grants

Responsible agency: TNC

## **Riverstone Project**

**~300 af**

Geographical location: Garden Canyon Wash East of Moson Road near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 300 af?

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: 3861 CFS (based upon SV 14)

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 825 CFS

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin:

Estimated start date: The project is in the planning stage

Estimated completion date:

Expected cost:

Funding sources: Charitable foundations & grants

Responsible agency: TNC



## **Stump Canyon Wash Project**

**400 af**

Geographical location: Stump Canyon Wash In or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 400 af (based upon the 40 af Stantec estimate for CC 8)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: ~2441 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 626 CFS

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Stump Canyon Wash location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: \$465,000 for basic Stantec Basin + \$168,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Hunter Canyon Wash Project**

**230 af**

Geographical location: Hunter Canyon Wash in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 230 af (based upon the 23 af Stantec estimate for CC 7)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: ~1416 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 363 CFS.

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Hunter Canyon Wash location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: \$309,000 for basic Stantec Basin + \$108,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Miller Canyon Wash Project**

**~410 af**

Geographical location: Miller Canyon Wash in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: ~410 af (based upon the 41 af Stantec estimate for CC 6)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: ~4657 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 1194 CFS

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Miller Canyon Wash location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: \$464,000 for basic Stantec Basin + \$172,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Ramsey Canyon Wash Project**

**~1120 af**

Geographical location: Ramsey Canyon Wash in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: ~1120 af (based upon the 112 af Stantec estimate for CC 5)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: ~8112 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 2080 CFS

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Ramsey Canyon Wash location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: \$1,064,000 for basic Stantec Basin + \$428,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Lewis Springs Wash Project**

**610 af**

Geographical location: Lewis Springs Wash in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 610 af (based upon the 61 af Stantec estimate for SV 13)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: 1180 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 393 CFS

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Lewis Springs Canyon Wash location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: \$368,000 for basic Stantec Basin + \$248,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Woodcutter Canyon Project**

**~760 af**

Geographical location: Woodcutter's Canyon in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: 760 af (based upon about a 76 af Stantec estimate for SV 2)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: 3235 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 712 CFS

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Woodcutter Canyon location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: ~\$794,000 for basic Stantec Basin + \$296,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & *grants*

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Graveyard Gulch Project**

**~735 af**

Geographical location: Graveyard Gulch Wash in or near the SPRNCA

Estimated acre feet of annual recharge that is expected for this project: ~735 af (based upon the 73.5 af Stantec estimate for FH 10)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes: ~2204 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes: 565 CFS

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Graveyard Gulch location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: ~\$454,000 for basic Stantec Basin + \$288,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP

## **Greenbush Draw Project**

**~600 af**

Geographical location: Greenbush Draw Drainage where it flows into the east side of the river north of Highway 92

Estimated acre feet of annual recharge that is expected for this project: about 600 af (based upon an estimated 60 af Stantec like basin)

Estimated cubic feet per second of 100 year storm event inflow as need to size the facility outflow pipes of CC 3/CC 12 average sized basin: about ~2917 CFS

Estimated average maximum cubic feet per second inflow per storm event as needed to size the smaller detention basin drain pipes of a CC 3/CC 12 averaged size basin: about ~748 CFS:

Detention basin design should be similar to that employed for the Palominas Project, but with adjustable detention basin drain pipe sizing. And where feasible, drain pipe sizing should be remotely adjustable to facilitate real time adjustment of the size of at least one of the drain pipes for optimizing recharge during unpredictable flow rate rain events. And the amount of recharge at this Greenbush Draw location can be increased up to 10 or more times what is provided by the Stantec basic V-shaped recharge facility at this location. This can be done similar to what was done at the Woodcutters Wash storm water management facility located on the fort along Buffalo Soldier Trail south of the Veterans Memorial Cemetery.

Estimated length and height of the dams as needed to safely provide a 6 foot deep detention basin: as determined by an onsite visit to the prioritized location.

Estimated start date:

Estimated completion date:

Expected cost: ~\$500,000 for basic Stantec Basin + \$240,000 for additional earth evacuation

Funding sources: Federal funds and/or charitable foundations & grants.

Responsible agency: DOI/BLM, as the principal beneficiary of the project, and/or a sustainable yield concerned organization such as TNC and the NRCD or the CCRN as negotiated by the USPP



## USPP Water Use Management Plan Recommendation

**In this Call to the Public** I would like to remind those who may not be fully aware that the **2004 NDAA** states in Section 321 (b) that: “Congress hereby recognizes the **Upper San Pedro Partnership** as a partnership of Fort Huachuca, Arizona, other Federal, State, and local governmental and nongovernmental entities **and its efforts to establish a collaborative water use management** program in the Sierra Vista Subwatershed.” And in Section 321 (c) (1) it states: “In general.--The Secretary of the Interior shall prepare, in consultation with the Secretary of Agriculture and the Secretary of Defense and in cooperation with the other members of the Partnership, a report on the **water use management** and **conservation measures** that have been implemented and are needed **to restore and maintain the sustainable yield of the regional aquifer by and after September 30, 2011.**”

Reference: <https://www.congress.gov/bill/108th-congress/house-bill/1588/text>

And it should be noted that a **Draft “USPP Plan for Restoration of the Sustainable Yield of the Sierra Vista Subwatershed Aquifer”** was submitted with a December 2017 recommendation to the City to develop 12 detention basins that would **restore and maintain the sustainable yield of the Subwatershed** and eliminate the annual deficits. It provided very specific data based upon technology known at the time, However, times have changed and new technology shows that, for example, **expandable recharge area detention basins** would provide up to twice or more the annual recharge of the basins shown in the **Draft “USPP Plan for Restoration of the Sustainable Yield of the Sierra Vista Subwatershed Aquifer”**.

I see in today’s agenda where you are seeking funding for **Water Conservation grants**. When you address that issue today, I would like to know whether you are also seeking funding for a very much needed **“Water Use Management Plan”** as briefly summarized on page 2 of this document.

In the meantime I believe that it’s time for the **USPP** to be more proactive in compliance with **2004 NDAA** required **water use management** planning. I recommend that a key member of the **Administrative Committee** assume the lead in the **USPP** developing a detailed **Water Use Management Plan**. A brief summary for such a plan is described on page 2 of this document. After some 14 years formal plans are desperately needed for managing all of the water issues that need to be addressed throughout the **Sierra Vista Subwatershed**.

**Please include this document and attachments with the minutes for this meeting.**

Gene Fenstermacher  
Concerned Citizen

Attachments: a. USPP 2044 NDAA Extracts  
b. Draft USPP Plan submitted to City Council in December 2017

Summary of a: **Water Use Management Plan**

- a. **Revision of the Draft USPP Plan to Restore the Sustainable Yield of the Regional Aquifer, that was submitted to City Council in December 2017, needs to be done to employ expandable recharge area detention basins instead of the originally planned detention basins, the estimated cost for construction of each of the expandable recharge area basins is needed, and the estimated annual recharge expected at each location is needed.**
- b. **Employment of expandable recharge area detention basins throughout the Subwatershed is needed, and retrofit of existing storm water management facilities to function as expandable recharge area detention basins is needed.**
- c. **Grant Funding for construction of expandable recharge area basins instead of the originally planned detention basins is needed. And the agencies that have volunteered or been tasked as responsible for seeking grant funding for each expandable recharge area basin need to be identified along with their plans to do so.**
- d. **A detailed Water Conservation plan needs to cover projects from conception to completion.**
- e. **Other Water Use Management projects need to be fully documented with estimated start dates, completion dates, etc. for each Project.**
- f. **Current Cost Estimates are needed for each Project.**
- g. **Priorities, Summary of Annual Deficits, etc. need to be tracked and frequently updated in this plan.**