

# COMPREHENSIVE PHASE I WORK PLAN

Section 4.2 of the Funding and Management Agreement requires the Implementing Committee to develop and approve by March 1, 2012, a Comprehensive Phase I Work Plan (the “Comprehensive Plan”). The Comprehensive Plan must include descriptions, schedules, and cost estimates for the Phase I Conservation Measures and all Program activities conducted or managed by the Parties and Program Manager that are to be funded from the HCP program Account for the Phase I period through December 31, 2019. This document is intended to satisfy that requirement. The description, schedules, and cost estimates contained herein are taken largely from Chapters 5, 6, and 7 of the Habitat Conservation Plan (“HCP”). The description of the measures is not intended to reiterate all of the details in the HCP. To the extent this Comprehensive Plan conflicts with the HCP, the HCP controls. The measures briefly described below are organized by the Party or Parties responsible for that measure.

## I. Conservation Measures

### A. Edwards Aquifer Authority

#### 1. San Marcos National Fish Hatchery and Technology Center, Uvalde National Fish Hatchery, and Inks Dam National Fish Hatchery – Refugia (§ 5.1.1)

EAA will support and coordinate the work of the USFWS San Marcos NFHTC’s operation and maintenance of a series of off-site refugia at USFWS’s San Marcos, Uvalde, and Inks Dam facilities. A series of refugia, with back-up populations at other facilities, will preserve the capacity for these species to be re-established in the event of the loss of population due to a catastrophic event such as the unexpected loss of springflow or a chemical spill.

EAA’s support of the refugia will augment the existing financial and physical resources of these facilities, and provide supplementary resources for appropriate research activities, as necessary, to house and protect adequate populations of Covered Species and expanded knowledge of their biology, life histories, and effective reintroduction techniques.

The use of this support will be limited to the Covered Species in this HCP.

#### 2. Voluntary Irrigation Suspension Program Option (§ 5.1.2)

The Voluntary Irrigation Suspension Program Option (VISPO) program is intended to minimize and mitigate the impacts of incidental take from low springflows by suspending the withdrawal of Aquifer water for irrigation purposes during drought. This measure will require EAA irrigation permit-holders who voluntarily participate in the program to suspend the use of Aquifer water for irrigation purposes during drought to maintain springflow.

The volume goal for the VISPO program is to remove 40,000 ac-ft/yr from pumping during periods of drought. Irrigation permit-holders in Atascosa, Bexar, Comal, and Hays counties will be approached for enrollment in the program. It is hoped that at least 10,000 ac-ft can be

enrolled in these counties. Assuming that this goal can be obtained, the goal is to enroll 15,000 ac-ft/yr each in Medina and Uvalde counties.

If an irrigation permit-holder desires to enroll less than its full permitted volume, their withdrawals will be monitored by real time automated meters installed by the EAA. The suspension of pumping by the participants in the program will be triggered if the J-17 index well in Bexar County is at or below 635 ft-MSL on the annual trigger date of October 1. Irrigators will be offered the option of committing to the program for either five- or ten-year programs. The following payment structure will be offered for the voluntary commitments.

**Five-year program:**

- A standby fee of \$50/acre-foot that increases 1.5 percent per year will be paid to the enrollee every year of the term, regardless of Aquifer conditions; and
- A fee of \$150/acre-foot that increases 1.5 percent per year will be paid for each year when temporary pumping suspensions are required.

**Ten-year program:**

- A standby fee of \$57.50/acre-foot for years 1-5 and \$70.20/acre-foot for years 6-10 will be paid to the enrollee every year of the term, regardless of Aquifer conditions; and
- A fee of \$172.50/acre-foot for years 1-5 and \$210.60 for years 6-10 will be paid for each year when temporary pumping suspensions are required.

**3. Regional Water Conservation Program (§ 5.1.3)**

The Regional Water Conservation Program will minimize and mitigate the impacts of pumping from the Aquifer by building on the expertise of the successful programs to realize savings throughout the Edwards Aquifer region. The goal of the Regional Water Conservation Program is to conserve 20,000 ac-ft/yr of permitted or exempt Edwards Aquifer withdrawals. In exchange for technical assistance and incentives for implementing the various measures, one-half of the conserved water (10,000 ac-ft) will remain in the Aquifer unpumped, but still owned by participating permit-holders, for 15 years to benefit springflow levels and contribute to species protection. The other one-half of the conserved water will remain available to the participating entity.

To ensure that the benefit from this program is reasonably certain to be realized, SAWS and certain municipal purveyors will initially commit not to withdraw an amount equal to 10,000 ac-ft/yr from the Aquifer.

The EAA will administer the Regional Water Conservation Program targeting municipal water users and owners of exempt domestic wells. The Regional Water Conservation Program will focus on implementation of incentive programs encouraging: (1) reduction of “lost water” through leak detection; (2) installation of high-efficiency plumbing fixtures and high-efficiency

toilets; (3) large-scale commercial/industrial retrofit rebate; and (4) water reclamation for efficient water use.

The EAA will organize a Regional Conservation Monitoring Committee to be initially comprised of one representative knowledgeable in water conservation from SAWS, the City of San Marcos, the City of New Braunfels, and a small water purveyor which utilizes the Edwards Aquifer.

#### **4. Critical Period Management – Stage V (§ 5.1.4)**

By December 31, 2012, EAA will amend its Critical Period Management Program to add a new emergency Stage V reduction of 44 percent applicable in both the San Antonio and Uvalde pools. Stage V is designed to be triggered only when other measures have not proven sufficiently effective in maintaining springflow during drought conditions. For the San Antonio Pool, Stage V would be triggered by a combination of monthly average J-17 levels below 625 feet or springflows of either 45 cfs based on a ten-day rolling average at Comal Springs or 40 cfs based on a three-day rolling average. The Uvalde Pool would trigger Stage V using the Uvalde County Index Well (J-27) water level of 840 ft-MSL.

#### **5. Expanded Water Quality Monitoring (§ 5.7.2)**

The EAA and its predecessor agency have conducted a program of water quality data collection since 1968. The EAA will continue to maintain a network of groundwater and surface water monitoring sites, including sites in the Comal and San Marcos springs.

EAA will manage and oversee the expanded monitoring of water quality around Landa Lake and the Comal River, and Spring Lake and the San Marcos River to include stormwater sampling and additional groundwater and surface water sampling as necessary. Particular focus will be placed on point and non-point sources. Areas that are to be targeted include, but are not limited to, large areas of impervious cover, golf courses, swimming pools, and industrial runoff areas. In the event that certain constituents of concern are detected at levels indicating the potential for adverse effects, Best Management Practices (BMPs) will be evaluated to reduce and/or eliminate the constituent of concern if potential sources can be identified. Examples of constituents that could lead to BMP implementation and/or modifications include, but are not limited to, polycyclic aromatic hydrocarbons (PAHs), pesticides, ash, herbicides, turbidity, fertilizers, and bacteria from human and animal/pet waste.

EAA will consult with the cities of New Braunfels and San Marcos regarding sampling locations within their respective jurisdictions.

#### **6. Recharge Monitoring (§ 6.2.3)**

The EAA will accurately measure the amount of water (in ac-ft) recharging the Edwards Aquifer in the area described in Section 1.2 of this Plan. EAA will publish this measurement not later than June 1<sup>st</sup> of each year for the purposes of guiding the activities in Section 5.5.1 of the HCP. EAA will then maintain this information on an ongoing basis in an appropriate publication.

#### **7. Biological Monitoring (§ 6.3.1)**

A comprehensive biological monitoring plan (Variable Flow Study) was established by the EAA in 2000 to gather baseline and critical period data to fill important gaps in the ecological condition of the Comal and San Marcos springs and river ecosystems. The EAA will continue this comprehensive sampling plan for the term of the ITP (with modifications as identified through the AMP process) and will provide a means of monitoring changes to habitat availability and the

population abundance of the Covered Species that may result from Covered Activities. The current Variable Flow Study has the following monitoring components:

- Aquatic vegetation mapping for select reaches;
- Fountain darter sampling (drop nets, dip nets, visual);
- San Marcos salamander sampling;
- Texas wild-rice physical observations and annual mapping;
- Comal Springs riffle beetle monitoring;
- Comal invertebrate sampling;
- Comal Springs salamander sampling;
- Parasite evaluations concerning the fountain darter; and
- Ramshorn and other exotic snail monitoring.

Additional components to be incorporated into the Variable Flow Study upon permit issuance will include sampling for two additional non-listed species, the Edwards Aquifer diving beetle, and Texas troglobitic water slater. The monitoring will also increase in magnitude, including increased frequency and number of parameters examined, as discharge falls to specific levels. In addition to long-term monitoring efforts that increase in intensity in response to the specified trigger events, a critical period monitoring component is incorporated into the Variable Flow Study that initiates full-scale sample efforts at specified trigger levels. The scope of the Variable Flow Study currently can be modified on a yearly basis as provided in the FMA with agreement by the USFWS.

## **8. Groundwater Modeling (§ 6.3.2)**

The MODFLOW model was used during the EARIP process to provide the model results for assessing the efficacy of the minimization and mitigation measures identified in Chapter 5 of the HCP. Like all groundwater models, the MODFLOW model has limitations and data gaps that manifest uncertainty in model results. By December 31, 2014, the EAA will take appropriate steps to reduce the level of uncertainty in the MODFLOW model by filling in the data gaps to the extent practicable and by reducing the number of structural limitations in the model. As part of the adaptive management commitment, the EAA will create another model to reduce uncertainty in the model results for use during the AMP and to provide assurance/confirmation that modeling results for the Aquifer and springflows are more reliable and defensible. This additional groundwater model is expected to be a finite element model. This additional model will be developed and ready for use by December 31, 2014.

## **9. Ecological Modeling (§ 6.3.3)**

The EAA will oversee and retain a contractor to develop a predictive ecological model to evaluate potential adverse ecological effects from Covered Activities and to the extent that such effects are determined to occur, to quantify their magnitude. The model will provide the ability to investigate potential impacts to these ecosystems from extreme short-term and sustained long-term impacts from natural and anthropogenic factors, including local and regional groundwater withdrawals.

**10. Applied Research Facility Experimental Channel at the USFWS National Fish Hatchery and Technology Center (§ 6.3.4)**

**a. Description of the Applied Research Facility (§ 6.3.4.1)**

The EAA will support and coordinate the NFHTC's construction and maintenance of the Applied Research Center. EAA will contract for the research activities in the Applied Research Center identified in this Section or developed as part of the AMP. The Program Manager will coordinate, supervise and oversee the implementation of all such research.

An applied research experimental facility will be constructed at the USFWS National Fish Hatchery and Technology Center (NFHTC) in San Marcos, Texas. The NFHTC has the existing infrastructure (Aquifer exempt wells, ponds, containment areas, recirculation and reuse capabilities, etc.) to allow for construction and operation of an applied research facility to inform Phase II decisions regarding the Covered Species and, to the extent possible, adjustments to Conservation Measures during Phase I.

The conceptual design is a series of man-made channels with earthen substrate intertwined with the existing ponds available at the NFHTC. This will allow water use and reuse through the plumbing already in place while allowing the flexibility to pump water through several research channels for experimentation. To recreate the natural environment to the extent possible, considerable effort will be needed to simulate channel configuration, substrate, instream debris, riparian zone structure (trees, shrubs, grass), aquatic vegetation, and other natural and anthropogenic conditions present in the Comal River. These components will be carefully designed and constructed to provide the most authentic simulation practicable. A riffle beetle upwelling and spring run area will be created at the headwaters of two of the research channels.

**b. Research in the Experimental Channels (§ 6.3.4.2)**

The main focus of the research channels will be to evaluate the effects of low-flow on Covered Species and their habitat. This evaluation will include springflow conditions that bracket the range of 5 cfs to 100 cfs. The applied research at the NFHTC facility for Phase I will focus on the fountain darter relative to Comal and the Comal Spring riffle beetle, as these are the two species with the greatest potential for impact relative to the Phase I package. This applied research will be further divided into three tiers. Tier A will focus on habitat requirements and responses; Tier B will focus on low-flow impacts directly on the fountain darter and Comal Springs riffle beetle; and Tier C will investigate the implications of the timing, frequency, and duration of multiple events in varying sequences and include specific research efforts designed to assess ecological model predictions (*e.g.*, model validation). The research projects are enumerated below

Tier A – Fountain Darter Habitat and Food Supply

- Low-flow effects on native aquatic vegetation
- Low-flow effects on macroinvertebrates (fountain darter food source)

Tier A – Comal Springs Riffle Beetle Habitat Associations and Movement

- Effects of flow levels on Comal Springs riffle beetle movement

- Extended Low-flow period effects on Comal Springs riffle beetles
- Test spring run connectivity

Tier B – Direct Impacts to Covered Species

- Low-flow effects on fountain darter movement, survival, and reproduction
- Low-flow effects on Comal Springs riffle beetle survival and reproduction

Tier C – Testing repeat occurrences of low-flow or combination of effects.

- System Memory
- Ecological Model Validation

**11. Coal Tar Sealants (§ 5.7.6)**

The EAA will put together materials regarding the value of a ban on the use of coal tar sealants and work with local governments to explore and encourage their consideration of such a ban.

**12. Science Review Panel (FMA § 7.10)**

Not later than December 31, 2013, the EAA will enter into a contract with the National Academy of the National Academies of Science to establish an independent Science Review Panel, select its members, and undertake the ongoing role of overseeing the Panel’s activities.

**13. Program Management**

**B. City of New Braunfels**

**1. Flow-Split Management in the Old and New Channel (§ 5.2.1)**

To minimize and mitigate the impacts of low flows, the City of New Braunfels staff will manipulate at least once monthly the valves and culverts to the Old Channel and New Channel of the Comal River for the protection of existing and restored native aquatic vegetation in the river, based on EAA’s real-time flow gauges in these channels and as often as appropriate for the maintenance of a beneficial hydrologic condition of the Old Channel habitat. Prior to this, the City of New Braunfels will replace and repair existing gates and control mechanisms to restore the operability of all four water paths to the Old Channel from Landa Lake: the two small culverts, the one large culvert, and the Springfed Pool inlet.

**2. Native Aquatic Vegetation Restoration and Maintenance (§§ 5.2.2; 6.3.4.3)**

To minimize and mitigate the impacts of incidental take from low-flow events by providing better habitat conditions for the ecological community, the City of New Braunfels will undertake a program of native aquatic vegetation restoration within key, sustainable reaches of the Comal River by planting native vegetation in unoccupied areas and in areas previously occupied by non-native aquatic vegetation, with the latter preceded by non-native vegetation removal.

The amounts and types of vegetation removed and restored in this program will be established by Table 4-5 and 4-6 of the HCP respectively. Prior to initiating restoration activities, models and other studies will be used to evaluate the potential for success of the native vegetation restoration.

The focus of native vegetation restoration will be on Landa Lake downstream of Spring Run 3 but above the New Channel USGS weir and on the portions of the Old Channel bordered on both sides by City of New Braunfels' property, including the Old Channel ERPA. Restoration efforts will also include establishing additional *Cabomba* along the eastern shoreline of Landa Lake and along the New Braunfels' golf course property to create valuable fountain darter habitat.

**a. Old Channel Environmental Restoration and Protection Area (Old Channel ERPA) (§§ 5.2.2.1, 6.3.4.3)**

To minimize and mitigate the impacts of recreation and pumping during periods of low flow, the City of New Braunfels will remove problematic non-native vegetation, restore native habitat (per Table 4-6), undertake limited channel modification to enhance fountain darter habitat, and remove a small sediment island. The Old Channel Environmental Restoration and Protection Area (ERPA) includes the EAA Variable Flow Study reach below Elizabeth Avenue upstream to the culverts feeding the Old Channel from Landa Lake where the preferred native aquatic vegetation of the fountain darter, native has been scoured and replaced over time with less-preferred non-native aquatic vegetation.

One specific area of targeted sediment removal is a small island that has formed just behind the Springfed Pool and immediately downstream of Landa Lake. This sediment island continues to grow, has established destructive non-native cane, and has displaced/destroyed fountain darter habitat.

**b. Comal River Restoration (§ 5.2.2.2)**

Upon final determination of locations suitable for fountain darter habitat for restoration in the Comal River proper (below the USGS gauging weir, aka Stinky Falls), the City of New Braunfels will conduct native vegetation restoration and yearly maintenance to establish additional fountain darter habitat. Areas for targeted restoration preferred by the City of New Braunfels include the portion of the Comal River between Last Tubers Exit and the confluence of the Guadalupe River and portions of the Comal River that allow for protection on one side of the river and safe passage of recreators on the other side of the river. Once the habitat has been established, City of New Braunfels will work with the TPWD will to pursue the creation of State Scientific Areas to protect fountain darter habitat.

**c. Native Aquatic Vegetation Maintenance (§ 5.2.2.3)**

To sustain the restored native vegetation within the Comal system, the City of New Braunfels will conduct yearly maintenance of native aquatic vegetation restoration sites in Landa Lake and the Old Channel, and the flow-split management discussed above in Section 5.2.1 of the HCP.

Native aquatic vegetation maintenance consists of actively monitoring and maintaining planted stands of native vegetation. Temporal monitoring will incorporate some form of quantitative measurement system to assess whether plantings are increasing, decreasing, or remaining stable. Additionally, intensive non-native vegetation control in the adjacent areas will be implemented until the native vegetation is well-established. It will include additional activities following natural disturbances such as floods, periods of limited recharge, and/or herbivory, as well as anthropogenic disturbances such as recreation or vandalism. Anytime a disturbance is

observed, the monitoring/maintenance schedule will be modified temporarily in order to provide the stability for the native vegetation re-establishment.

### **3. Management of Public Recreational Use of Comal Springs and River Ecosystems (§ 5.2.3)**

To minimize and mitigate the impacts of recreation, the City of New Braunfels will manage recreational use of the Comal Springs and Comal River Ecosystem through two methods:

- 1) The City of New Braunfels will not reduce current protections provided by City Ordinance or Policy and will continue to enforce these regulations, including:
  - a. Limiting recreation on Landa Lake to Paddle Boats
  - b. Prohibiting recreational access to the Spring Runs in Landa Park to the Wading Pool in Spring Run 2.
  - c. Prohibiting on water recreation on the Old Channel; with the exception of Schlitterbahn operations within its present location.
- 2) Pursuant to Section 9.2 of the IA, the City of New Braunfels will issue Certificates of Inclusion (COIs) to those commercial outfitting businesses that facilitate recreational activities on the Comal River (Outfitters) that comply with the requirements of the COI program established in this section.

### **4. Decaying Vegetation Removal and Dissolved Oxygen Management (§ 5.2.4)**

To minimize and mitigate the impact of incidental take from low-flow events, upon receipt of DO data indicating a water quality concern created by decaying vegetation and the total Comal springflow drops below 80 cfs, the City of New Braunfels will implement a dissolved oxygen management program. The program will be focused on ensuring adequate DO levels for the ecosystem. Techniques to accomplish this objective may include artificial aeration of areas of Landa Lake or other solutions. If appropriate, the program may include removal of decaying vegetation. Removal techniques for decaying vegetation, if necessary, may include using rakes/pitch forks and a jon boat to transfer material to the banks for subsequent disposal.

### **5. Control of Harmful Non-Native Animal Species (§ 5.2.5)**

To minimize and mitigate the impacts of low flows, the City of New Braunfels will conduct non-native animal species control on an annual basis. Initial control efforts will be intense and take place during the winter's first freeze, with continued control every winter. Control of non-natives will include annual maintenance and monitoring and non-natives will be disposed of out of the floodplain. The non-native species animal species that will be addressed include the suckermouth catfish, tilapia, nutria, and ramshorn snail.

### **6. Monitoring and Reduction of Gill Parasites (§ 5.2.6)**

To minimize and mitigate for the impact of low flows, the City of New Braunfels will retain and oversee the work of a contractor to establish a gill parasite monitoring and reduction. The

program may consist of non-native snail removal based on the pilot study conducted by USFWS and BIO-WEST (*Id.*).

The initial activity will be the evaluation of alternative methods for snail removal so that removal can be accomplished in the most effective, yet least destructive manner. The second activity deals with understanding the magnitude of snail removal necessary to affect downstream cercaria concentrations in the water column. Once the magnitude of snail removal for effective control of water column cercaria is identified, a study is necessary to evaluate the long-term benefits of that removal.

Additionally, although cercarial densities may be abating in the Comal system (Johnson *et al.* 2011), *C. formosanus* still poses a threat to fountain darters in the Comal River, especially during low-flows. As such, continued monitoring is essential and the following activities are included within this HCP conservation measure:

- A system-wide survey of snail population density and cercarial concentrations will be conducted to provide a baseline condition;
- Based on that system-wide survey, a decision will be made following the process set out in the AMP Agreement as to whether an initial system-wide removal effort is necessary, and if so, how to facilitate the performance of that effort;
- Based on the system-wide survey, a gill parasite monitoring program will be designed and implemented. Cercarial concentrations will be monitored in multiple areas along the Comal River on at least a semi-annual basis, and more frequently when spring flow drops initially below 150 cfs or other springflow triggers that are developed. Corresponding fountain darter sampling to examine correlations between cercariae densities and fountain darter impacts in the wild will also be part of that monitoring effort.

#### **7. Prohibition of Hazardous Materials Transport Across the Comal River and Its Tributaries (§ 5.2.7)**

The City of New Braunfels will coordinate with the Texas Department of Transportation (TDOT) to prohibit transportation of hazardous materials on routes that cross the Comal River and its tributaries. This effort may include legislation, City of New Braunfels ordinances, additional signage, and TDOT approval.

#### **8. Native Riparian Habitat Restoration (Comal Springs riffle beetle) (§ 5.2.8)**

To minimize and mitigate the impacts of low flow, the City of New Braunfels will restore native riparian zones, where appropriate, to benefit the Comal Springs riffle beetle by increasing the amount of usable habitat and food sources (*i.e.*, root structures and associated biofilms). The method of riparian zone establishment will include the removal of non-natives and replanting of native vegetation representative of a healthy, functioning riparian zone. Trees and plants with extensive root systems will be given preference to create the maximum beetle habitat. Fine sediment covering exposed roots and springs will also be removed. The riparian zone will be monitored (at least annually) for continued success and removal of reestablished non-natives. Riparian zones will be protected until the preferred riparian zone is established. Riparian habitat zones will be created along both sides of Spring Run 3 and along the portion of the western shoreline that is owned by City of New Braunfels.

In addition, riparian restoration also benefits the system through bank stabilization and nutrient and sediment processes. The City of New Braunfels will develop a program to incentivize private landowners on the Comal River and its tributaries to establish riparian zones along the western shoreline.

**9. Reduction of Non-Native Species Introduction and Live Bait Prohibition (§ 5.2.9)**

To mitigate the impacts of recreation and pumping from the Aquifer during drought, the City of New Braunfels will undertake measures to stop or substantially reduce the introduction of non-native species from aquarium dumps and prohibit the use of live bait species.

The City of New Braunfels will prohibit by Ordinance introductions of domestic and non-native aquatic organisms, targeting specifically bait species and aquarium trade species into the Comal system. This action will include signage at key entrance points to parks on Landa Lake and the Comal River.

**10. Litter Collection and Floating Vegetation Management (§ 5.2.10)**

To minimize and mitigate the impacts of recreation and pumping during low flow periods, the City of New Braunfels will clean litter and debris from and manage floating vegetation in the Comal Springs, Landa Lake, and Old and New Channels of the Comal River. Litter and debris collection both flood-related and routine, will utilize self-contained underwater breathing apparatus (SCUBA). Debris removal also includes the removal of litter from floating vegetation mats before dislodging the vegetation mat and allowing it to continue downstream.

**11. Management of Golf Course Diversions and Operations (§ 5.2.11)**

The City of New Braunfels will develop a golf course management plan that will document current practices and include an Integrated Pest Management Plan (IPMP). The golf course management plan and IPMP will incorporate environmentally sensitive techniques to minimize chemical application, improve water quality, and reduce negative effects to the Covered Species. Expanded water quality sampling targeted at Golf Course operations will be conducted per Section of 5.7.2. of the HCP.

**12. Management of Household Hazardous Wastes (§ 5.7.5)**

To reduce the potential for future water quality problems, the City of New Braunfels will initiate a hazardous household waste (HHW) program that will include accepting prescription drugs and Freon, through the TCEQ and/or the waste disposal division of the City of New Braunfels. The City of New Braunfels will establish a four-times-a-year program that could be recognized in the City's anticipated MS4 compliance and storm water permit as a contributing activity.

**13. Impervious Cover/Water Quality Protection (§ 5.7.6)**

The City of New Braunfels will establish criteria related to desired impervious cover and provide incentives to reduce existing impervious cover on public and private property in New Braunfels. The City of New Braunfels will establish criteria and incentives for the program based upon the

low impact development (LID)/Water Quality Work Group Final Report (Appendix Q) recommendations for Implementation Strategies and best management practices (BMPs).

#### **14. Native Riparian Habitat Restoration (§ 5.7.1)**

The City of New Braunfels will undertake a program to increase the area of the riparian zone along the Old Channel, the golf course and in the vicinity of Clemens Dam. As plans take shape for the reestablishment of the riparian zone, private landowners will be asked to participate in the plan. Reimbursement for the price of native plants will be provided to private landowners. Criteria to qualify for reimbursement will be established along with a list of preferred natives to replant.

### **C. City of San Marcos and Texas State University**

#### **1. Texas Wild-Rice Enhancement and Restoration (§§ 5.3.1, 5.4.1, 6.3.5)**

Based on BIO-WEST and TPWD monitoring data collected over the past decade and Hardy (2011) model results, the City of San Marcos, in partnership with Texas State University, will implement a Texas wild-rice enhancement and restoration program.

Initially, these activities will involve an applied research component. Methods for Texas wild-rice enhancement will need to be investigated to understand the potential for increased areal coverage of Texas wild-rice through implementation of this measure. Non-native vegetation mixed in with Texas wild-rice or surrounding existing Texas wild-rice plants but still located within optimal habitat areas will be removed to see if areal coverage of Texas wild-rice will expand in those areas. The specific areas chosen for evaluation will include only areas that would be suitable over the full range of discharges between the long term average and Phase I minimum flows.

#### **2. Management of Recreation in Key Areas (§§ 5.3.2, 5.4.2)**

Texas State University and the City of San Marcos will control recreation in Spring Lake and the San Marcos River within Texas State University campus boundaries.

To minimize the impacts from recreation, Texas State University will establish permanent access points on the east and west banks of the San Marcos River between Spring Lake dam and the Aquarena Drive bridge, and other areas as determined during the AMP. These areas will serve as entry and exit ways that could be used by canoeists, tubers, swimmers, etc. Areas between access points will be planted with vegetation that discourages streamside access (*e.g.*, prickly pear and acacia).

To minimize the impacts from recreation, the City of San Marcos will establish permanent river access points. Permanent access will be located at Dog Beach, Lion's Club Tube Rental, Bicentennial Park, Rio Vista Park, the Wildlife Annex, and potentially other areas (as determined through the AMP). Areas between access points will be densely planted with vegetation that discourages streamside access.

To support the TPWD's creation of State Scientific Areas in the San Marcos Springs ecosystem and River, the City of San Marcos and Texas State University will install kiosks showing access points, exclusion zones, and associated educational components at key locations.

### **3. Native Riparian Habitat Restoration (§ 5.7.1)**

The City of San Marcos will undertake a program to increase the area of the riparian zone on public lands from City Park to IH-35 using native vegetation. Texas State University will undertake a similar program to restore the riparian zone with native vegetation in upper Sewell Park. As plans take shape for the reestablishment of the riparian zone, private landowners will be asked to participate in the plan. Reimbursement for the price of native plants will be provided to private landowners. Criteria to qualify for reimbursement will be established along with a list of preferred natives to replant.

### **4. Control of Non-Native Plant Species (§§ 5.3.8, 5.4.12)**

Texas State University and the City of San Marcos will implement a non-native plant replacement program from Spring Lake to city limits. Non-native species of aquatic, littoral, and riparian plants will be replaced with native species to enhance Covered Species habitat. The divers that will be conducting sediment control will first remove non-native aquatic plant species from the area to be worked that day. Removal will initially focus on hydrilla (*Hydrilla verticillata*) as this species causes sediment deposition and adds turbidity to the water column when disturbed. The non-native aquatic plants will be shaken and bagged for removal from the system in the same manner described in Section 5.4.3.1. Areas will be "weeded" until the natives become established at the site.

The riparian zone will be restored to at least 15 meters in width where possible. Areas will be planted at a ratio of three hard mast trees to one soft mast tree, with 20 percent of the vegetation consisting of fruit-bearing shrubs. Vegetation such as big bluestem, switchgrass, Indian grass, live oak, Texas red oak, bur oak, pecan, bald cypress, American beautyberry, and buttonbush will be used. Fencing may be required for the first two years to allow for the establishment of the species.

### **5. Control of Harmful Non-Native and Predator Species (§§ 5.3.9, 5.4.13)**

To mitigate the impacts of incidental take by pumping and recreational activities, the City of San Marcos and Texas State University, will implement non-native and predator species control for the San Marcos River on a periodic basis with expanded effort of control, if needed, at low flows. The species include suckermouth catfish, tilapia, and *Melanoides* and *Marisa* snails.

### **6. Reduction of Non-Native Species Introduction (§§ 5.3.5, 5.4.11)**

To mitigate the impacts of recreation and pumping from the aquifer during drought, Texas State University and the City of San Marcos to undertake a program of non-native and predator species control for Spring Lake and the San Marcos River within the University's campus boundaries as described in Section 5.3.9 of the HCP. Dumping aquariums into the San Marcos River and its tributaries will be minimized through education, including signage and brochures, and offering alternative disposal to citizens wanting to get rid of unwanted aquatic pets. The

City of San Marcos and Texas State University will partner with the River Systems Institute, and local citizen groups to help distribute educational materials. Partnerships with the school districts will also be considered. Educational materials will also be provided to local pet shops.

#### **7. Sediment Removal below Sewell Park (§§ 5.3.6, 5.4.4)**

The City of San Marcos will remove sediment from the river bottom at various locations from City Park to IH-35. These areas include but are not limited to reaches of the river in City Park, Veramendi Park, Bicentennial Park, Rio Vista Park and Ramon Lucio Park. To minimize and mitigate the impacts of incidental take from recreation and pumping during low flow periods, the City of San Marcos will remove sediment from key areas of Texas wild-rice habitat below Sewell Park. Texas State University will mitigate the impacts of incidental take from diving activities, research activities, recreation and pumping during low flow periods by removing sediment from key areas of Texas wild-rice habitat in Spring Lake and from Spring Lake Dam to City Park.

Sediment samples will be sent to TCEQ for contaminant testing per TCEQ requirements.

### **D. City of San Marcos**

#### **1. Minimizing Impacts of Contaminated Runoff (§ 5.7.4)**

The City of San Marcos will construct two sedimentation ponds along the river to help reduce the amount of contaminated materials that enters the river as a result of rain events. The ponds will also reduce runoff velocity which will help to reduce bank erosion, and subsequently the amount of sediment that enters the river. The sedimentation ponds will be constructed by excavating and stabilizing a specified area, and building a controlled-release structure. Water source for the ponds is solely runoff from rain events. Specific details for all ponds will be submitted through the AMP as each pond is contracted for design. Each construction area will be surrounded by silt fence/rock berm to minimize runoff. Sediment controls will be monitored daily during construction and the construction area will be covered with a tarp in the event of rain.

The first pond will be located in Veramendi Park beside Hopkins Street bridge. The first pond will be designed to remove sediment and street pollutants from runoff prior to entering the river. The size, shape, and depth will be determined based on an analysis of the volume of water discharging from the storm drains. The City of San Marcos will detain as much as possible for treatment purposes. The City of San Marcos will undertake required maintenance of the sedimentation ponds on a regular basis.

The second pond will be created by widening of drainage ditches that run alongside Hopkins Street and cut directly to the San Marcos River. Widened areas will be designed to store water for a short period of time, but long enough to collect sediments and associated pollutants from roadway runoff.

#### **2. Management of Public Recreational Use of San Marcos Springs and River Ecosystem (§ 5.3.2.1)**

Public recreational use of the San Marcos Spring and River ecosystems include, but are not limited to swimming, wading, tubing, boating, canoeing, kayaking, golfing, scuba diving,

snorkeling and fishing. To minimize the impacts of incidental take resulting from recreation, the City of San Marcos will implement the Recreation Mitigation Measures adopted by the San Marcos City Council on February 1, 2011 (Resolution 2011-21) (Appendix N of the HCP). In addition, pursuant to Section 9.2 of the IA, the City of San Marcos will issue Certificates of Inclusion (COIs) to those commercial outfitting businesses (businesses and nonprofit entities that rent tubes, canoes, kayaks, or similar equipment to facilitate recreational activities on the San Marcos River) (Outfitters) that comply with the requirements of the COI program established in section 5.3.2.1 of the HCP.

### **3. Management of Aquatic Vegetation and Litter below Sewell Park (§ 5.3.3)**

To minimize the impacts of recreation on Texas wild-rice and other Covered Species from Sewell Park to IH-35, the City of San Marcos will perform activities to manage floating vegetation and litter to enhance habitats for Covered Species. Management activities will include removal of vegetation mats that form on top of the water surface as well as on top of Texas wild-rice plants, particularly during low flows, and removal of litter.

The City of San Marcos will push floating vegetation downstream of any Texas wild-rice stands. The City will monitor downstream Texas wild-rice stands to keep the stands clear of drifting vegetation.

Inorganic litter will be removed from the San Marcos River from City Park to IH-35 during the recreational season (May through September) and less often during offseason. Litter in or around Texas wild-rice stands will not be removed.

### **4. Prohibition of Hazardous Materials Transport Across the San Marcos River and Its Tributaries (§ 5.3.4)**

Hazardous materials transported by truck across the watershed of the San Marcos River and its tributaries presents the possibility of accidental spills or releases into the environment. The limited geographic distribution of the endangered species at San Marcos Springs could cause the species to be highly impacted by such a spill.

The City of San Marcos will coordinate with the Texas Department of Transportation to designate hazardous materials routes which minimize the potential for spills entering the San Marcos River. This effort will include legislation, if necessary, and additional signage.

### **5. Designation of Permanent Access Points/Bank Stabilization (§ 5.3.7)**

To minimize the impacts of recreation, permanent access points will be combined with bank stabilization at various locations. They will serve as entry and exit ways that could be used by canoeists, tubers, swimmers, etc., while stabilizing highly eroded banks. The City of San Marcos will stabilize banks in eroded areas, to include City Park, Hopkins Street Underpass, Bicentennial Park, Rio Vista Park, Ramon Lucio Park, and Cheatham Street underpass.

Natural rock will be used to create a stone terrace for access and bank stabilization with the bank on either side restored with riparian vegetation. Native riparian vegetation will be planted

in areas adjacent to the access/stabilization areas in order to discourage river users from entering the river in places other than the access point. Prior to each construction period, the area will be swept clean of darters and enclosures will be put into place to keep darters out of the construction area.

**6. Septic System Registration and Permitting Program (§ 5.7.3)**

The City of San Marcos will undertake an aerobic and anaerobic septic system registration, evaluation, and permitting program to prevent subsurface pollutant loadings from potentially being introduced to the San Marcos Springs ecosystem within its city limits.

**7. Management of Household Hazardous Wastes (§ 5.7.5)**

The City of San Marcos will maintain a HHW program that involves the periodic collection of HHW and its disposal.

**8. Impervious Cover/Water Quality Protection (§ 5.7.6)**

The City of San Marcos will establish a program to protect water quality and reduce the impacts of impervious cover (such as through LID). The City of San Marcos will develop criteria and incentives for the program based upon the LID/Water Quality Work Group Final Report (Appendix Q) recommendations for Implementation Strategies and BMPs.

## **E. Texas State University**

**1. Management of Submerged and Floating Aquatic Vegetation in Spring Lake (§ 5.4.3.1)**

To mitigate the impacts of incidental take on Covered Species from recreation, Texas State University will manage aquatic vegetation in Spring Lake through use of its harvester boat and through hand cutting of vegetation by divers authorized to dive in Spring Lake.

Each week about five springs will be cut, thus returning to cut the same springs every two to three weeks. During summer algal blooms, the springs will be managed more frequently (up to four springs per day), but mostly to remove algae. Texas State employees and supervised volunteers will fin the area around the springs to remove accumulated sediment, and then clear a 1.5-meter radius around each spring opening in Spring Lake with a scythe. Over the next 1.5-meter radius around the spring opening, they will shear vegetation to a height of 30 cm, and then to one meter over the following three meter radius. Plant material will not be collected, but carried away by the current. Cumulatively, about six meters of vegetation around each spring opening will be modified. Mosses will not be cut. The volume of plant material to be removed will vary by the amount of time between cuttings, and season.

The harvester boat will remove a range of 15-to-20 boatloads of plant material a month from Spring Lake. The harvester will clear the top meter of the water column, cutting vegetation from sections one, two, and three once a week. The harvested vegetation will be visually checked by driver for fauna caught in the vegetation. If the driver observes fauna, he/she will stop work and put the animal(s) back into Spring Lake if appropriate. Texas State employees and supervised volunteers are trained to recognize the Covered Species through the Diving for Science program, and avoid contact with them.

Vegetation mats will be removed from zones four and five on an as-needed basis. The total area cut will equal about nine surface acres.

The Spring Lake Area Supervisor will also schedule cleanup of nuisance floating species such as water hyacinth and water lettuce from Spring Lake. The floating plants will be collected by hand and shaken prior to removal from the river to dislodge any aquatic species caught in the plant. The plants will be deposited into dump trucks and taken to the River System Institute compost area.

## **2. Management of Aquatic Vegetation from Sewell Park to City Park (§ 5.4.3.2)**

To mitigate the impacts of incidental take from recreational activities, Texas State University will push floating vegetation downstream of any Texas wild-rice stands. Inorganic litter will be picked up weekly from the San Marcos River from Sewell Park to City Park during the recreational season (Memorial Day to Labor Day) and monthly during offseason.

Texas State University will monitor downstream Texas wild-rice stands to keep the stands clear of drifting vegetation. Divers will not pick up litter in or around Texas wild-rice stands.

University employees or others will be trained by the TPWD to recognize Texas wild-rice and to protect the plant stand while removing the accumulated floating plant material. On Texas wild-rice stands, Texas State University employees will lift (not push) the floating material from the top of the Texas wild-rice stands and allow it to float downstream. Downstream accumulations of plant material will be removed by the City of San Marcos to avoid impacts to Texas wild-rice further downstream.

## **3. Diversion of Surface Water (§ 5.4.5)**

Under TCEQ Certificates 18-3865 and 18-3866, Texas State University's total diversion rate from the headwaters of the San Marcos River for consumptive use is limited to 8.1 cfs. The total diversion rate from Spring Lake is limited to 4.88 cfs; the total diversion rate from the San Marcos River at Sewell Park is limited to 3.22 cfs. To minimize the impacts of these diversions, when flow at the USGS gauge at the University Bridge reaches 80 cfs, Texas State University will reduce the total rate of surface water diversion by 2 cfs, *i.e.*, to a total of approximately 6.1 cfs. This reduction in pumping will occur at the pump just below Spring Lake Dam in order to maximize the benefits to salamanders, Texas wild-rice, and other aquatic resources in the San Marcos River below Spring Lake Dam. The University will reduce the total rate of surface water diversion by an additional 2 cfs when the USGS gauge reaches 60 cfs. The additional 2 cfs reduction will be made from the pumps located in the slough arm of Spring Lake, and, therefore, maximize the benefits to the aquatic resources within the main stem San Marcos River below Spring Lake Dam. When the USGS gauge reaches 49 cfs, Texas State University will reduce the total diversion rate to 1 cfs. This further reduction will be made by restricting the pumps located in the Sewell Park reach. The diversion of water will be suspended when the springflow reaches 45 cfs.

The reductions in Texas State University's total diversion rate for consumptive use is summarized in the Table below:

<b>Streamflow (cfs)</b>	<b>Spring Lake Diversions (cfs) Cert. No. 18-3865</b>	<b>San Marcos River Diversions (cfs) Cert. No. 18-3866</b>	<b>Total Diversion Rate (cfs)</b>
>80	4.9	3.2	8.1
80 – 60	2.9	3.2	6.1
60 – 49	0.9	3.2	4.1
49-45	1.0	0	1.0
<45	0	0	0

To avoid or minimize the impacts of the surface water diversions, the University will routinely monitor the screens to determine if any entrainment occurs and will make any necessary modifications to the screens to minimize any incident take from the operation of the diversions.

#### **4. Sessom Creek Sand Bar Removal (§ 5.4.6)**

For decades, a sand and gravel bar has been building with each major rain event at the confluence of Sessom Creek and the San Marcos River. The bar is about two-thirds meter deep, 7 meters wide, and 21 meters long (98.5 m<sup>3</sup>). Over time it has widened, deepened, and constricted the river channel; furthermore, the continued expansion has covered a stand of Texas wild-rice. The bar has become vegetated with both littoral and terrestrial plants, and is used heavily by recreationists as it provides a shallow swimming area.

To minimize and mitigate the impacts of incidental take from recreation, Texas State University and the City of San Marcos will conduct a study of sediment removal options to determine the best procedure to remove this sand and gravel bar that minimizes impacts to listed species. Texas State University will submit the study for review through the AMP and implement the actions coming out of that process.

A separate sediment retention pond has been constructed to minimize additional deposition to this area and will be maintained to maintain an effective level of performance.

#### **5. Diving Classes in Spring Lake (§ 5.4.7)**

##### **a. The Diving for Science Program**

To minimize the impacts of the Diving for Science Program that trains and authorizes individuals to dive in Spring Lake, individuals authorized through this program must demonstrate a knowledge of listed species found in the lake and their habitat, laws and regulations impacting these species, good buoyancy control, the ability to avoid contact with listed species, the ability to avoid disturbing critical habitat, and the ability to stay off the bottom of the lake. The program is taught as a two-day class with a maximum class size of 20 and is taught in the Dive Training Area. The program averages 350 trainees per year. Upon completion of this class, divers are allowed anywhere in Spring Lake to perform specific volunteer tasks such as finning spring areas covered with algae, and picking up litter. Projects are structured to minimize contact with listed species in an effort to ensure protection of listed species and their habitat.

The Diving Supervisor coordinates and supervises all volunteer diving. No more than sixteen volunteer divers will be allowed in the lake per day, with no more than eight at one time.

Any individual diving outside of the Dive Training Area has to have completed the Diving for Science Program.

**b. Texas State University Continuing Education**

Texas State University Continuing Education classes for check-out dives will be conducted in the Dive Training Area. To minimize the impacts of these classes, class size will be limited to 12 students and no more than three classes will be conducted per day.

**c. Texas State SCUBA Classes**

Texas State SCUBA classes will be conducted in the Dive Training Area. To minimize the impacts of these classes, class size will be limited to 12 students and no more than three classes will be conducted per day.

**6. Research Programs in Spring Lake (§ 5.4.8)**

To minimize the impacts of its research programs, all proposals to conduct research in Spring Lake will be reviewed by the River Systems Institute to ensure there is no impact on Covered Species or their habitat. If incidental take cannot be avoided, it will be minimized by educating the researchers as to the area where the listed species are located and by requiring measures to minimize any potential impacts. All diving in support of a research study will be provided by individuals who have completed the Diving for Science program.

**7. Management of Golf Course and Grounds (§ 5.4.9)**

To minimize any impacts of the use of fertilizers and pesticides to maintain the golf course and grounds, Texas State University will develop a golf course management plan that will document current practices and include an Integrated Pest Management Plan (IPMP). The golf course management plan and IPMP will incorporate environmentally sensitive techniques to minimize chemical application, improve water quality, and reduce negative effects to the ecosystem. Expanded water quality sampling targeted at Golf Course operations will be conducted as described in Section of 5.7.2. of the HCP.

**8. Boating in Spring Lake and Sewell Park (§ 5.4.10)**

To minimize the impacts of boating on the Covered Species' habitat in Spring Lake, boats in Spring Lake will be confined to areas that are mowed by the harvester, thereby not impacting vegetation and specifically avoiding Texas wild-rice stands. Individuals will enter and exit boats at specified access points to avoid impacting the flora and fauna along the bank. All boats launched into Spring Lake will undergo a USFWS-approved process for cleaning.

Further, canoeing/kayaking classes in the lake will be limited to no more than 2 classes per day and each class will be in the water no more than 1 hour. Classes will have a maximum of 20 students in 10 canoes. All classes will be supervised.

To minimize the impacts of boating on the Covered Species' habitat in Sewell Park, canoeing/kayaking classes in Sewell Park will be confined to the region between Sewell Park

and Rio Vista dam. Students will enter/exit canoes/kayaks at specified access points to avoid impacting the flora and fauna along the bank. Classes will be no longer than two hours and up to three classes will be held per day. Classes will have a maximum of 20 students in 10 canoes. All classes will be supervised.

## **F. San Antonio Water System**

### **1. Use of the SAWS ASR for Springflow Protection (§ 5.5.1)**

To minimize the impacts of incidental take from extended drought, the SAWS ASR facility will be used to store and deliver Aquifer water leased by the EAA. When triggers are reached, SAWS will use water stored in the ASR to serve as a baseload supply in its service area near to the springs. As described below, an amount equivalent to the water recovered from the ASR will be used to offset SAWS's Edwards demand.

EAA will acquire through lease and option 50,000 ac-ft/yr of EAA-issued Final Initial Regular Permits. The leases and options will be used to fill, idle, and maintain a portion of the capacity of the SAWS ASR Project for subsequent use to protect springflows.

The lease program is comprised of three components. The first one-third, approximating 16,667 acre-feet of permits, will be leased for immediate storage in the ASR. The remaining pumping rights will be placed under a lease option. One-third (16,667 ac-ft) of the total will be options exercised in the year after the 10-year moving annual average of Edwards recharge falls below 572,000 ac-ft/yr, as determined by the EAA, and is likely to continue to decrease. The last one-third will be options exercised when the 10-year moving recharge average is less than 472,000 ac-ft/yr, as determined by the EAA. When the leases are in place, this water will either be pumped to fill the SAWS ASR or not pumped for any reason. When the ASR is in recovery mode (*i.e.*, when water is being returned from the ASR), the leased water will not be pumped. Trigger levels for implementation of ASR management in accordance with the HCP will be 630 ft-MSL at the J-17 index well during an identified repeat of drought conditions similar to the drought of record as indicated by the ten-year rolling average of Edwards recharge of 500,000 ac-ft, as determined by the EAA. When triggered, the ASR or other supplies capable of utilizing shared infrastructure will be activated to deliver up to 60 million gallons per day to SAWS distribution system during a repeat of drought of record-like conditions. When the monthly average groundwater levels at J-17 are below 630 ft-MSL and the ten-year rolling average of Aquifer recharge is 500,000 ac-ft or less, pumping of selected wells on the northeast side of SAWS water distribution system will be reduced in an amount that on a monthly basis equals the amount of water returned from the ASR only to the extent of the Aquifer water provided by the EAA for storage in the ASR. SAWS will use up to 100 percent of the conveyance capacity of existing SAWS ASR facilities to off-set SAWS' Edwards Aquifer demand.

SAWS will attempt, to the extent practicable, to mimic the pattern of delivery developed by HDR Engineering (HDR 2011). However, the actual pattern of delivery of water from the ASR may differ from that HDR used in its modeling simulations depending on the actual course of the drought.

The use of the SAWS ASR is predicated on an assumption informed by HDR Engineers' groundwater modeling that the SAWS ASR will be utilized to deliver approximately 126,000 ac-

ft of water to SAWS distribution system during a decadal drought similar to the drought of record. It is further predicated on the assumption from HDR 2011 that the maximum amount of HCP water that will be delivered in a given year is 46,300 ac-ft.

SAWS will make the day-to-day decisions necessary to fulfill the ASR commitment. A 12-person Regional Advisory Group consisting of four representatives of SAWS, the Program Manager, and one representative each from EAA, EAA permit holder for irrigation purposes, small municipal pumpers, the Spring cities, environmental (including Texas Parks and Wildlife), industrial pumpers, and downstream interests will provide advice to SAWS regarding the implementation of the program. The Advisory Group will meet as needed but no less than quarterly. SAWS will organize and facilitate the Advisory Group.

## **G. Texas Parks and Wildlife Department**

### **1. State Scientific Areas (§ 5.6)**

Texas Parks and Wildlife Department (TPWD) has the authority to establish state “scientific areas” for the purposes of education, scientific research, and preservation of flora and fauna of scientific or educational value. (TPW Code § 81.501). To minimize the impacts of recreation, TPWD will pursue creation of state scientific areas in the San Marcos Springs ecosystem. The scientific areas will be designed to protect Texas wild-rice by limiting recreation in these areas during low flow conditions. The regulations are intended to preserve at least 1,000 m<sup>2</sup> of Texas wild-rice.

With the exception of the eastern spillway immediately below Spring Lake Dam, none of the protected areas will extend across the entire river channel; thus, allowing longitudinal connectivity for recreation and access to be maintained downstream throughout the river.

Interlocal agreements between the City of San Marcos and TPWD and Texas State University and TPWD will be used to allow for local in-water enforcement of the protected zones.

In order to protect existing and restored fountain darter habitat, TPWD will pursue creation of state scientific areas in the Comal Springs ecosystem. The goal of the regulations will be to minimize impacts to habitat from recreation activities. An interlocal agreement between the City of New Braunfels and TPWD will be used to allow for local in-water enforcement of the protected zones.

## **II. Costs**

The estimated cost of the HCP and the schedule by which those costs are expected to be realized are set out in Table 7.1 of the HCP and are hereby incorporated by reference in this Comprehensive Plan. The cost estimates are arrayed in the Table below according to the entity assigned by the HCP.