

## *Agenda Item 6a*

**WPD Staff Briefing on Wet Ponds in  
response to questions raised by the  
Environmental Board at their March 24, 2011  
meeting**

## **WPD Staff Briefing on Wet Ponds**

### **WPD Staff to Questions Posed by the Environmental Board regarding Wet Ponds in the Recharge Zone**

- 1. How many wet ponds are located over the recharge zone (BSZ and north segment)?**

Residential Ponds North Edwards RZ-6 BSZ-5

Commercial Ponds North Edwards RZ-31 BSZ-4

- 2. How often do make water assembly's have to trigger? They probably have meters...how much water did they use during the last drought? (ALL) and recharge zone?**

The City (WPD, PDRD and AWU) does not currently track whether ponds have make up water assemblies. Inspection staff in the BSZ, where pond operating permits are required, did identify two ponds with known makeup water assemblies.

- Hwy 71 Wet pond uses water from a well for makeup water.
- Costco Wet Pond(Shops at Arbor Trail) is a decorative pond, additional water is stored over and above the permanent pool elevation and irrigated on the site. The pond has a potable water make-up system but the EV Inspector has stated that the owners have not yet used this system.

Other non BSZ ponds with known makeup water assemblies include:

- Mueller Redevelopment Pond
- Central Market Wet Pond

As problems with wet ponds have been identified, the City has routinely revised their wet pond criteria to address these concerns, including revisions to pond liner requirements to help address water loss, as well as revisions to prohibit the use of potable or reclaimed water as a make up water source. The sections of the ECM referencing the recommendation for make up water as well as a water balance study are included for your review below.

### ***ECM 1.6.6 Design Guidelines for Wet Ponds***

#### ***C. Basin Elements***

##### ***5. Pond Liner***

- ***Pond Water Losses, Performance Criteria and Supplemental Water Requirements – While fluctuation of the permanent pool level is to***

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be expected due to climatic conditions, type and extent of vegetation, phased developments and other factors, the minimum level acceptable at any time is 12" below the permanent pool (the lower limit of the marsh zone). A nearby source for make-up (supplemental) water is recommended as a way to maintain an adequate permanent pool level should the level drop. A water balance based on local data must be performed in order to demonstrate compliance with these performance criteria. The water balance should use a daily time step and account for all significant inflows (rainfall, runoff, supplemental water) and outflows (evaporation of open water, evapotranspiration of wetland vegetation/vegetated bench, seepage, water withdrawals). A range of climatic conditions should be modeled, including but not limited to, average and dry years. The water balance serves two purposes. First, it is necessary to provide information for determining pond sizing requirements and any supplemental (makeup) water requirements, as applicable. A minimum water level is necessary for both aquatic plant survival and, if the liner material is clay, to keep the clay moist to prevent cracking. Wet ponds that are operated and/or maintained by the City of Austin must meet the performance criteria assuming that no supplemental water is provided, unless as approved by the Director. Second, a water balance is necessary in order to determine if the pond is experiencing a water loss in excess of normal anticipated losses. It must be performed in order to develop performance criteria for the pond to be measured against upon completion of the pond construction. The engineer must specify criteria for acceptance testing of the pond over a specified period of time, using actual daily water level measurements, actual daily precipitation data, and other required data to determine whether the pond is losing water in excess of anticipated losses.

One reason the permanent pool may stabilize lower than the design level is if development in the contributing watershed is phased in over a long period of time, such that the impervious cover and runoff coefficient at the early phases of construction are less than the final, build-out values. In this case the amount of water available to fill the wet pond may be lower at the earlier development phase, which would strand the vegetated bench below the permanent pool level, an unacceptable situation. The designer and contractor must ensure that the vegetated bench is submerged per the above criteria for wetland plant survival and to maintain liner integrity. It is unacceptable for the water level to remain low for an extended period of time, such that the health of the wetlands plants is threatened due to lack of moisture.

### ECM 1.6.6 Design Guidelines for Wet Ponds

#### E. Biological Elements

##### 4. Water

After the pond liner is completed, the basin must fill up with water within a reasonable time period, preferably within one week. Safety concerns and

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*pond liner integrity concerns must be properly addressed during pond construction.*

...

*Make-up Water - A nearby source for make-up (supplemental) water is **recommended** as a way to maintain an adequate permanent pool level should the level drop to a severe drought. **Potable and effluent [including reclaimed] water is not an acceptable make-up water source.** Demonstrate that the quality of the make-up water is in compliance with all applicable regulations and will not harm the pond biology.*

### 3. Who does the maintenance?

COA-Field Operations maintains the wet ponds in the residential ponds program and the commercial ponds are maintained by the private property owners.

### 4. How many wet ponds were inspected last year and what are the results?

69 City maintained wet ponds were inspected by the City in FY 9-10. 24 work orders were generated as a result of these inspections. Categories of work resulting from these inspections included:

- Willows/Trees
- Standing water
- Sediment
- Trash
- Erosion
- Inlet issues
- Mowing
- Outlet issues
- Excessive marsh vegetation

Out of the 136 Commercial Wet Ponds, 74 were inspected by City Inspectors in FY 9-10. 17 Notices of Violations were issued. Categories of work requested included:

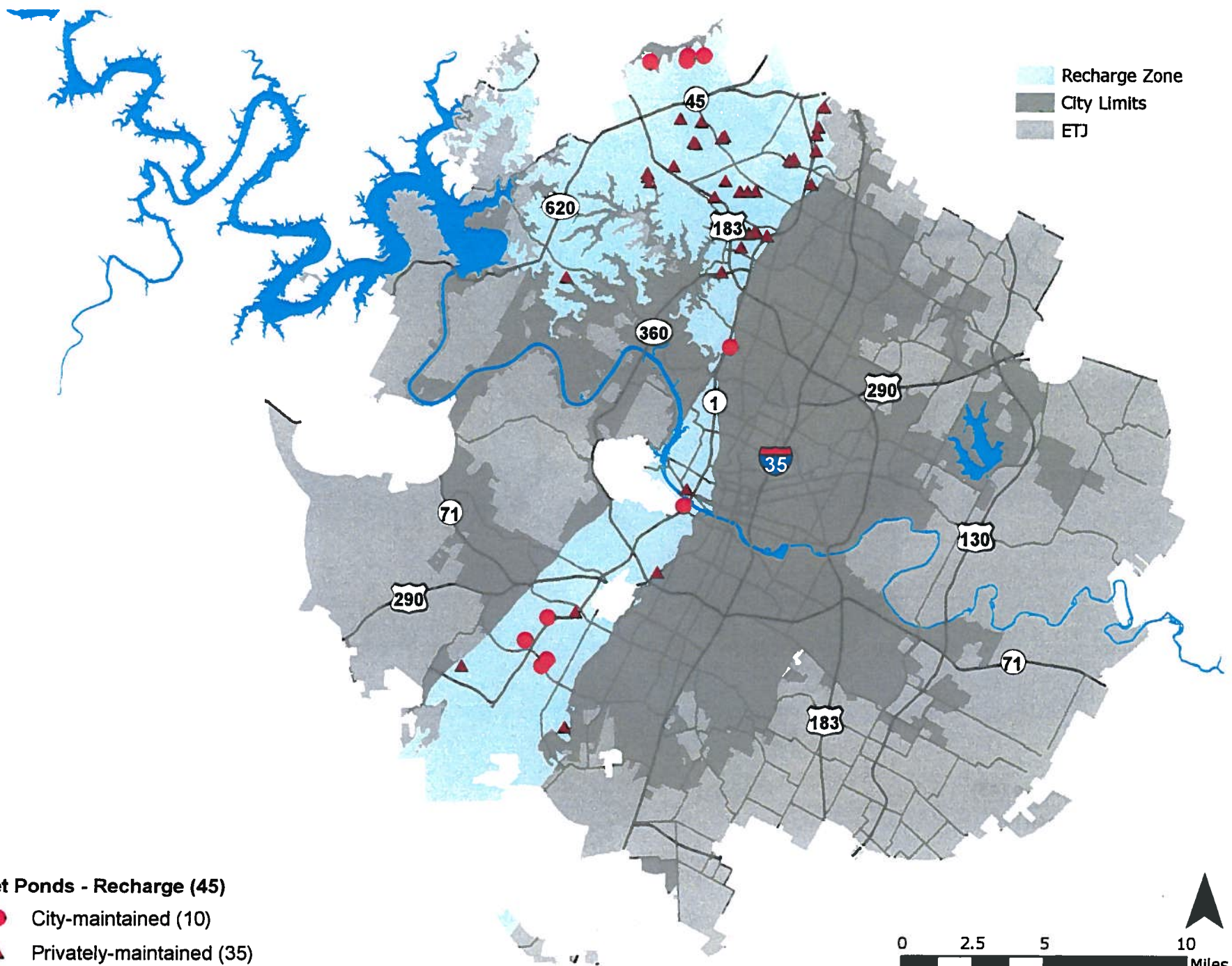
- Excessive Vegetation
- Trash/Debris
- Willows/Trees
- Structural Integrity/Soil Erosion
- Sediment

## **WPD Staff Briefing on Wet Ponds**

- **Standing Water**

There are two non-functional residential wet ponds in the BSZ. WPD is currently working to bring these ponds into compliance.

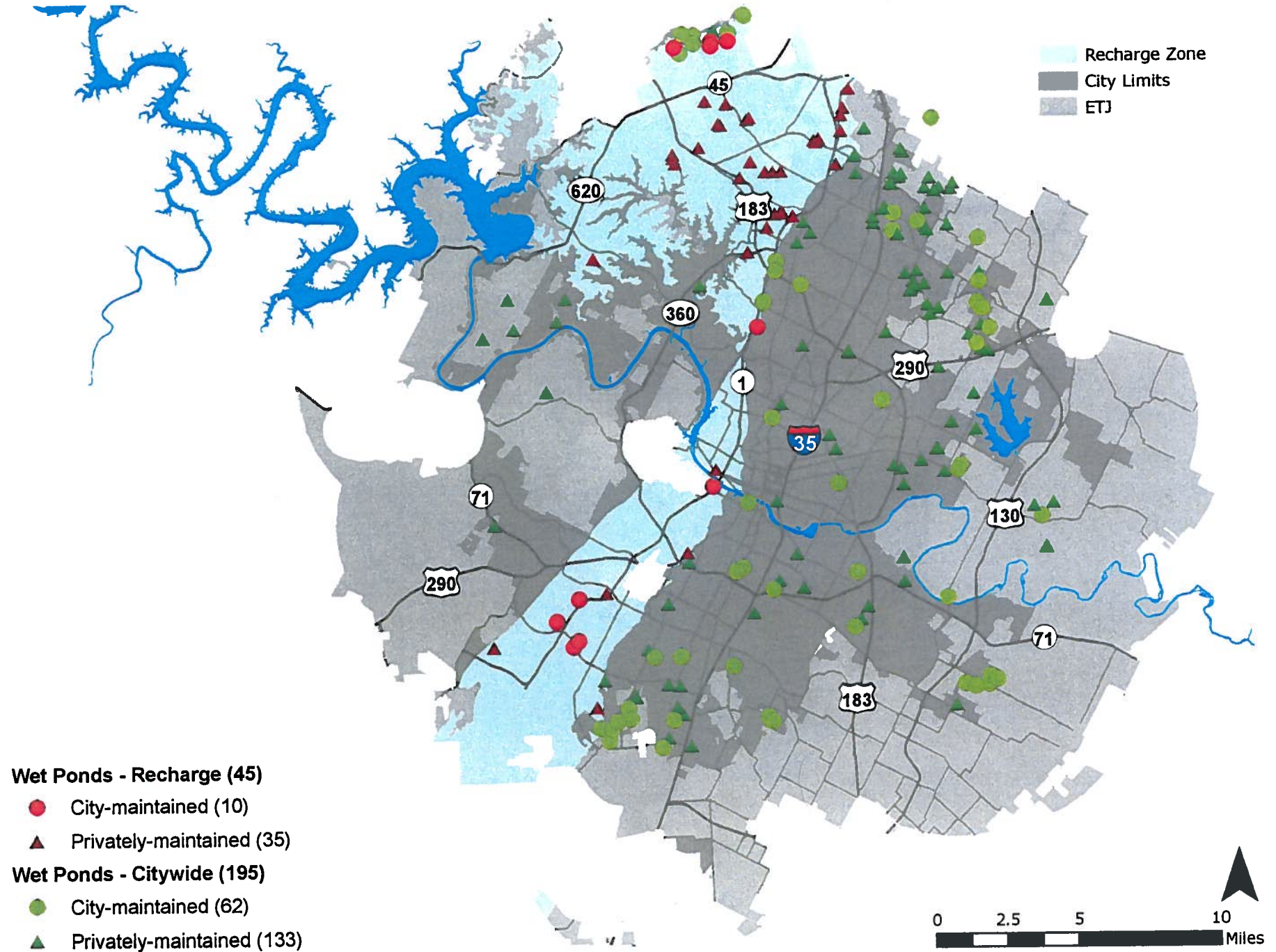
- **Village of Western Oaks Wet Pond** - Maintenance responsibility with this pond resides with the HOA, but WPD is working with the owner, Lumberman's Investment, to take over ownership and maintenance of the pond.
- **Sendera South Wet Pond** – This pond was built and accepted under the original wet pond criteria, prior to the above referenced improvements being included. The pond does not function properly, and ERM staff is evaluating the pond to determine how to retrofit it for improved function. One alternative under consideration is a retrofit to a biofiltration pond.

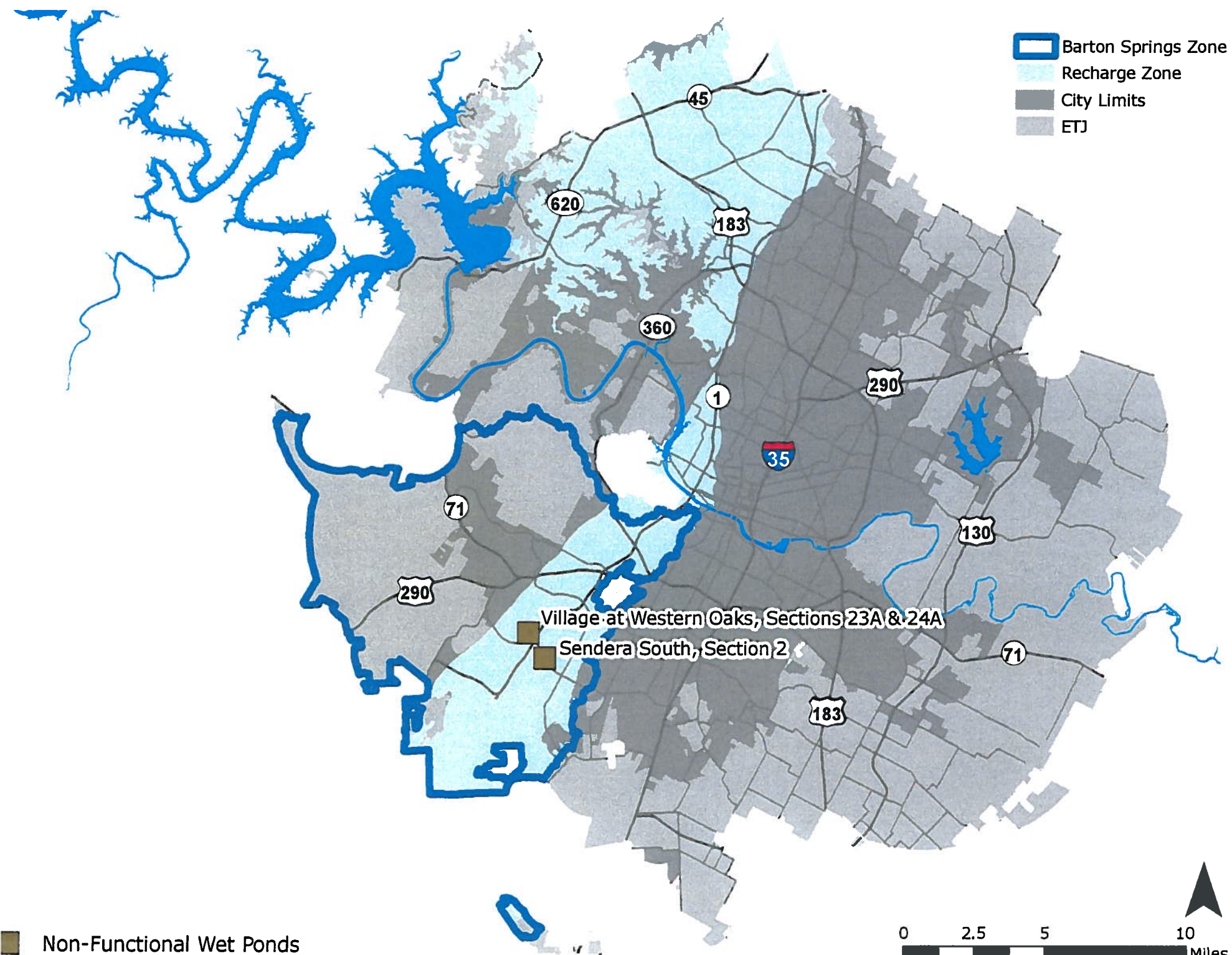


**Wet Ponds - Recharge (45)**

- City-maintained (10)
- ▲ Privately-maintained (35)







- Barton Springs Zone
- Recharge Zone
- City Limits
- ETJ

Village at Western Oaks, Sections 23A & 24A  
Sendra South, Section 2

Non-Functional Wet Ponds



## **Shops at Arbor Trails Wet Pond (BSZ Recharge Zone)**



**Satellite View**

## **Shops at Arbor Trails Wet Pond (BSZ Recharge Zone)**



**Field Photo**

## **Shops at Arbor Trails Wet Pond (BSZ Recharge Zone)**



**Liner Replacement**

## Hwy 71 Wet Pond (BSZ Contributing Zone)



**Bird's Eye View**

## **Hwy 71 Wet Pond (BSZ Contributing Zone)**

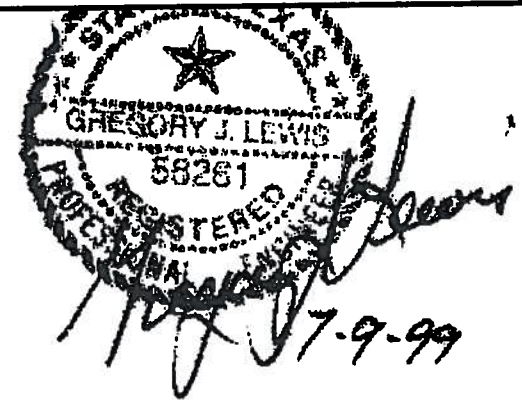


**Field Photo**

## Hwy 71 Wet Pond (BSZ Contributing Zone)

Correction No.1 was prepared under the supervision of  
Gregory J. Lewis, P.E., Serial Number 58261  
And generally include the following changes:

- Topographic Survey to reflect the as-constructed conditions.
- Modifications to the wet pond permanent pool elevation from 958 to 959.2
- Addition of a make-up water supply well.



These corrections are presented on Sheets 9A and 9B,  
which have been added to and referenced on the original  
plans.

Correction No. 1

Reviewed

By:

*Gregory J. Lewis P.E.* Date: *7/14/99*

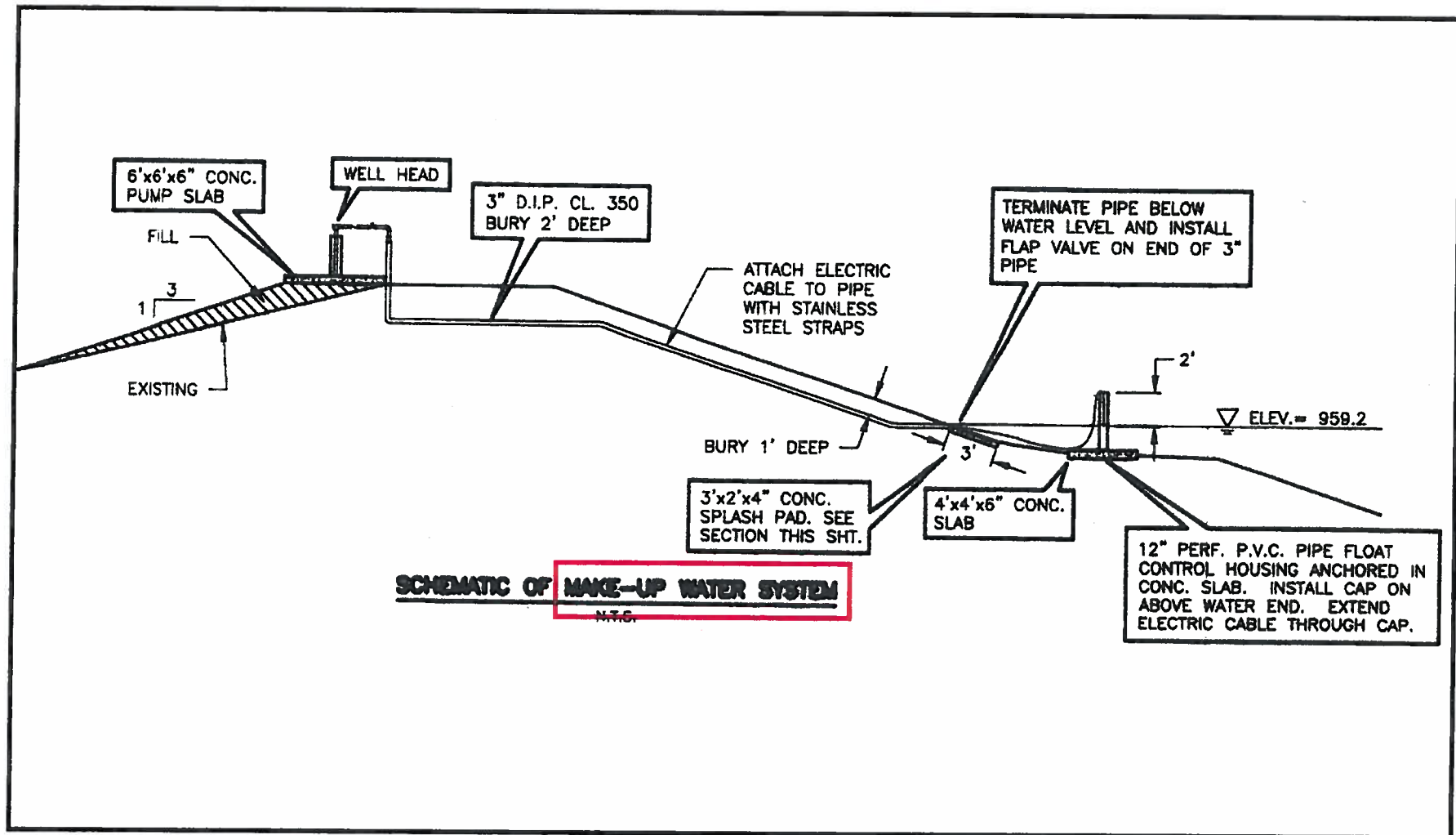
Development Review and Inspection Department

Development Permit Number C8-78-09-.01.1C

*ENVIRONMENTAL*  
*WSP*

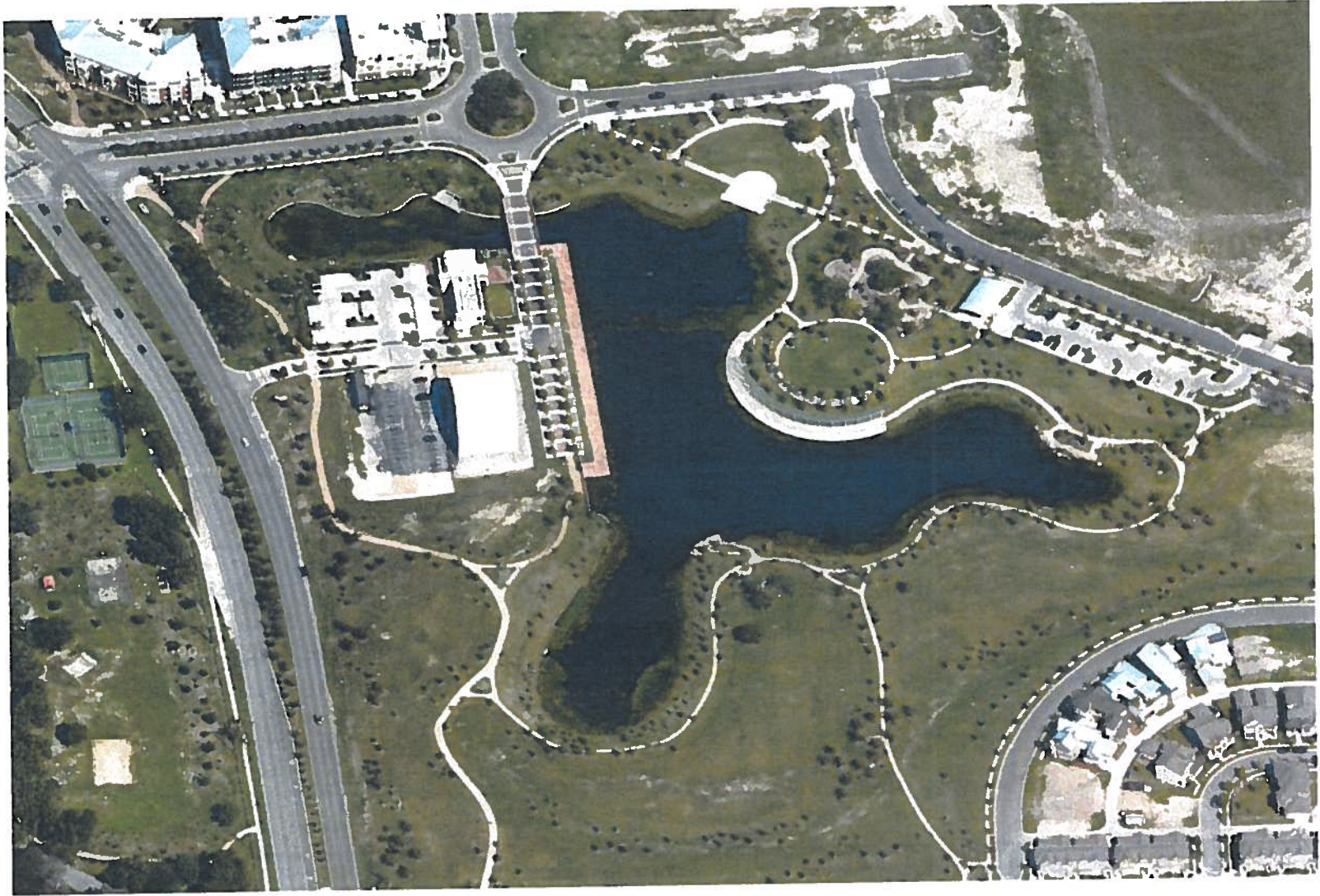
Cover Sheet Detail

## Hwy 71 Wet Pond (BSZ Contributing Zone)



Site Plan Detail

## **Mueller – Lake Park Wet Pond (Urban)**



**Bird's Eye View**

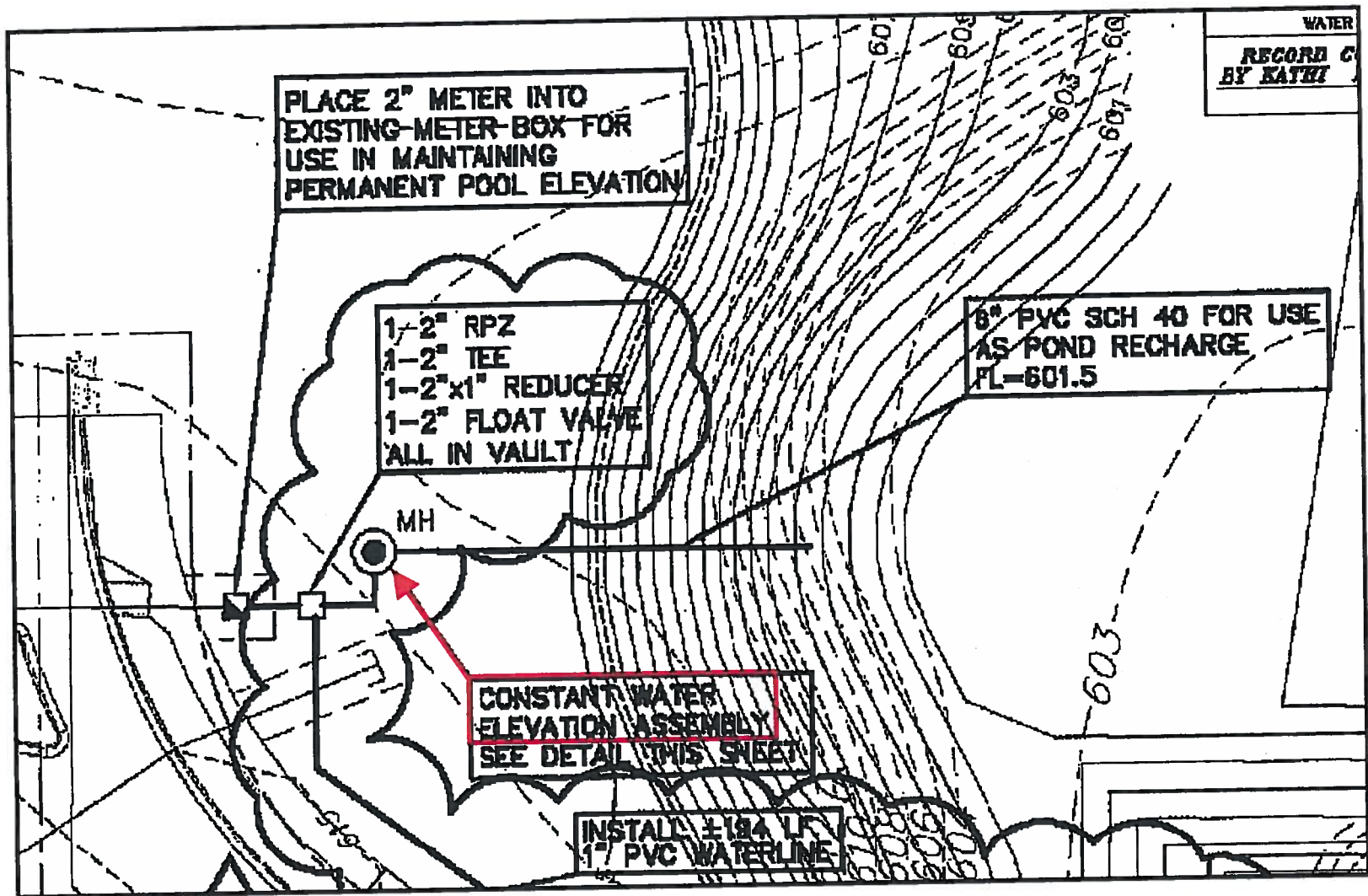
## Mueller – Lake Park Wet Pond (Urban)



[http://www.flickr.com/photos/nc\\_hiker](http://www.flickr.com/photos/nc_hiker)

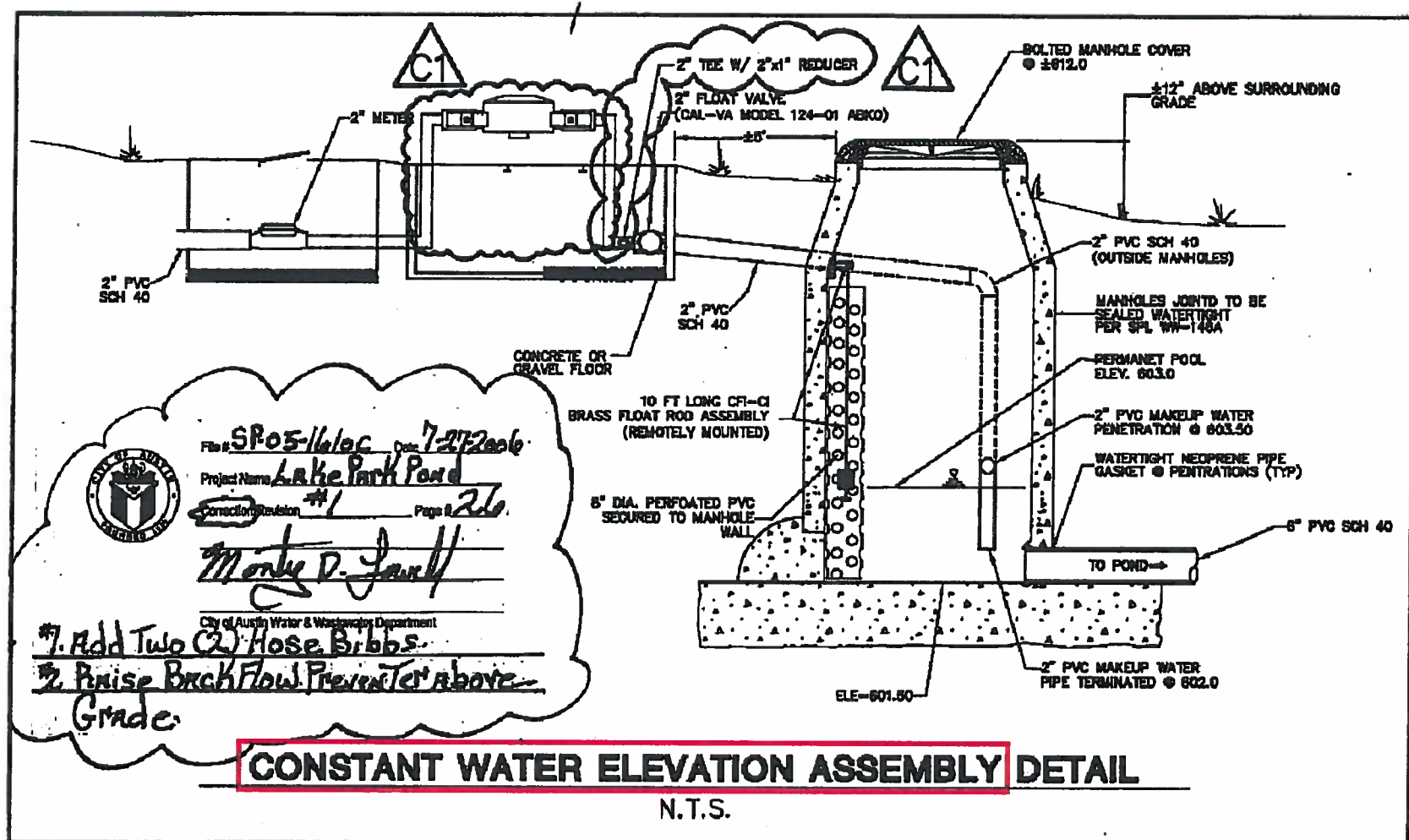
**Web Photo**

## Mueller – Lake Park Wet Pond (Urban)



Site Plan Detail

# Mueller – Lake Park Wet Pond (Urban)



Site Plan Detail

## Central Market Wet Pond (Urban)



**Bird's Eye View**

## Central Market Wet Pond (Urban)



Field Photo