TECHNICAL INTERCHANGE MEETING NO. 3
MEETING MINUTES
WATER AND WASTEWATER EVALUATION AND WATER SYSTEM REHABILITATION AT
CAMP STANLEY STORAGE ACTIVITY, TEXAS
FA8903-04-D-8675/DELIVERY ORDER 0022
PARSONS 745006-01000

Date: Wednesday, 25 October 2006

Time: 9:15 am – 12:30 pm.

Place: Camp Stanley Storage Activity (CSSA)

Subject: Progress Meeting for Discussing Results of the Water System Engineering and Modeling Efforts at CSSA.

Attendees:

Attendee	Organization	**Phone**
Glaré Sanchez	CSSA ENV	(210) 698-5208
Tom Tijerina	CSSA Engineering	(210) 336-2372
Marcel Dulay	Parsons	(512) 471-6202
BrianVanderglas	Parsons	(512) 719-6059
Julie Burdey	Parsons	(512) 719-6000
Henry Dress	Parsons	(512) 719-6063
Eric Dawson	Parsons	(512) 719-6029
Brian Siegfried	Portage/AFCEE	(210) 536-5208
Chris Beal	Portage/CSSA	(210) 336-1171
Joe Ovalle	CSSA Public Works	Not provided
Elisa Wright	CSSA Public Works	(210) 336-0077

*Minutes prepared by Henry Dress, Eric Dawson, Marcel Dulay and Brian Vanderglas, Parsons

Meeting Objectives

The meeting was started by discussing the meeting objectives. Brian Vanderglas listed the objectives as follows: (1) Determine the design criteria for the Implementation Work Plan (IWP); (2) Refresh the project team's memory on the budget basis and current status; (3) Provide an overview of engineering and modeling results; and (4) Determine the priority for pipe replacement.

Data Collection Items

Marcel Dulay reported that overall system demand from data collection efforts appears to be about 25,000 gallons per day (gpd) based on one week of apparently stable and consistent flow data. Joe Ovalle inquired if a water balance looking at the difference between overall inflows and outflows had been done. Mr. Dulay noted that a water balance had not been done due to the large number of unknowns, such as flows to septic systems, leaks from the wastewater lines, consumption, wastewater treatment plant use, and the volume of water use from construction activities.

Brian Vanderglas stated that the model used the building surveys completed by CSSA to assign a number of water users per building. Surveys were submitted for buildings comprising approximately 75% of the 140 reported residents/workers at CSSA and the water users assigned accordingly. The remaining post population was uniformly spread across the remaining buildings.

Model Calibrations

Marcel indicated that, overall, the model matches the calibrated measurements quite well. Marcel reported Parsons calibrated CSSA water system using measurements collected over four days at 5 spots in the system during the most stable period of data collection while CS-1 was the only well pumping water into the system. The model uses a C value of 80 for the existing pipe. Joe Ovalle indicated that recently removed corroded pipe had about ¼-inch loss on each side of the inner diameter (or ½-ID) which compares with C value = 80). A map showing the pipe diameters used in the model was handed out (attached) for discussion purposes, and to verify its accuracy. The following modeling items were discussed:

(1) Tom Tijerina asked whether it would be possible to downsize the pipe after Parsons indicated the model reflected replacing pipe with like-size diameter pipe. Parsons responded that the pipe size is being driven by fire flow design parameters. Parsons expressed concern that pipe may be susceptible to surge damage if flow is too high during fire flows, and that it is important to try to keep those flow rates below 10 feet per second. If the modeled fire flows indicate velocities exceed 4 feet per second, then a surge analysis should be run. Tom said he wants our engineering report to discuss what design parameters were used for designing the replacement pipe sizes. He also asked if the pipe size differences could be shown graphically on a map.

(2) The map shows segment 29 pipe near the reservoir is only 6 inches in diameter, but CSSA said that the segment is actually 12 inch diameter. Parsons will review all of the pipe segment numbers and diameters with Joe Ovalle.

(3) Segment 247 has been abandoned by CSSA and is no longer in use, and needs to be removed from the model runs.

(4) Joe Ovalle asked about stagnant conditions would be a problem if a new production well is installed in the North Pasture. Marcel indicated that Parsons looked into that scenario, and that a well in the North Pasture would actually help prevent stagnant conditions. However, if a new supply well feeding the system

from north of the planned North Pasture warehouse is not installed, then water stagnation could become a problem. Joe Ovalle wanted to know if in-line pumps in the vicinity of Building 200 would be a feasible option. [Joe indicated that a pump supplier recommended a 7-horse pump in this area.] Tom Tijerina requested that Parsons look into the use of pumps if the model indicates that water stagnation might be a problem. Eric Dawson indicated that the decision to install in-line pumps would need to be weighed against other alternatives, such as periodic flushing.

(5) CSSA indicated that the new warehouse will be north of the existing loop and would use a 6-inch or 8-inch dedicated line off that loop, so future scenario model runs should check to see if those diameters are appropriate. Tom Tijerina requested that Parsons look at the model with 6-inch instead of 8-inch line, and to size the pipe for fire flows. If a pump is needed for fire protection of the new warehouse, a dedicated fire line with BFP and pump would be required, and a smaller line could then be used for regular potable supply.

(6) Tom Tijerina inquired why the line to the East Pasture is not included in the model run for the existing system. Parsons explained that the model does not include any 2-inch pipes. Tom requested that we model the East Pasture lines for peak flow and determine what size pipe CSSA should be using to supply water to those buildings. This line will only supply water for toilets, bathroom sinks, and kitchenettes. CSSA determined earlier to not provide fire protection for the East Pasture buildings, so no replacement is planned for the East Pasture lines.

(7) Model was not calibrated using chlorine residual information, but it is capable of tracking the age of water in the system. Parsons has not yet used that feature, but CSSA requested that we include an analysis on water age in the engineering report, and be able to identify locations where samples could be collected to test for worst-case disinfection residuals.

(8) Parsons suggested that some spot tests of pressure be measured to assess fire flow pressure drops that verify the results in the model runs.

(9) To reduce the pipe lengths requiring replacement, Parsons discussed a model scenario run that was tested that removed segments 91, 93, 95, 97, and 99 (from near reservoir to Northwest corner of system loop). Removing these segments had no impact on the model since there are no users, however, Joe Ovalle said that turning those segments off is not an option because that would leave them with no contingency if the line needed to be worked in another portion of the post. Creating a smaller loop by bypassing most of the above sections (except a portion of segment 91) and installing a new line along the East-West road to tap into the water system main loop was suggested, and received concurrence from all meeting attendees. Joe Ovalle requested that we look at using an 8-inch line for this new leg.

Fire Flow Analysis

Parsons presented a table that showed the duration of water availability based on volume in the reservoir and various fire flow demands to stress the point that CSSA has limited capacity and volumes to support fire fighting. CSSA acknowledged that they are aware of this issue, but that they do not want the duration of fire flows to be a consideration in our model, or IWP design.

CSSA confirmed that no definitive fire flow design criteria have been established for the site. The existing fire flow types include data from "Roy", which were apparently based on building type and recommended flow rates of the hydrants, and actual flow data measured by Camp Bullis fire department. The Camp Bullis fire department indicated that the minimum required hydrant flow is 1,000 gpm. CSSA requested that Parsons compare fire flows from "Roy's" numbers to Camp Bullis' fire hydrant flows and hydrant ratings.

Fire hydrants in the Housing area are on a separate system, but it is not clear if the model accounted for this.

Pipe Replacement Prioritization

Parsons presented a table that reflected our logic for prioritizing which segments of pipe should be replaced first if there are not sufficient funds to replace all non-C900 PVC pipe as originally desired. The prioritization is as follows:

(1) All non-ductile and non-C900 PVC pipe would receive highest priority for replacement.

(2) All pipes that need to be replaced to modify pipe diameter (based on model results) or to repair leaks (only two leaks identified) receive next highest priority;

(3) Age and condition of pipe is the final priority.

CSSA requested that Parsons prepare a map showing the different pipe replacement priorities, and the segments of pipe that fall under each priority. The map should show pipe type and diameter and have a separate table that reflects the segment number, length, and estimated cost to replace with C900 PVC. For Priority 3, it will be necessary to also include an additional qualifier to note the age of the pipe to distinguish old ductile from new ductile pipe. CSSA will use these figures as a tool to assign priorities to various segments of ductile and transite pipe that they would like to preferentially replace.

Current Budget Status

Brian Vanderglas presented some additional powerpoint slides that depicted how the budget for TO-22 was originally developed which required some difficult assumptions be made with regard to the linear footage and diameters of pipe requiring replacement and the reduction of SCADA monitoring locations along the distribution system to lower the cost by more than $500,000 than vendor's proposed costs.

Parsons included a current budget status and the project's estimate to complete based on what has been spent to date, and the existing project funding levels. By

removing the Wastewater System IWP and some of the associated Wastewater studies, approximately $100,000 of charges related to the Wastewater system can be applied toward the water system rehabilitation. However, Mr. Vanderglas also reported that the well rehabilitation efforts on Wells 9 & 10 have cost $50,000 more than originally budgeted.

At the completion of the IWP for the water system, and after obtaining "actual" subcontractor cost estimates, Parsons will be able to reassess how much funding remains to rehabilitate the system, add a new production well, and replace as much older pipe as possible. The main reason for prioritizing the pipe for replacement is because it does not appear that there will be sufficient funds to replace all of the non-C900 pipe at CSSA.

Other TO-22 Discussion Topics

The location of the new production well was discussed in depth during the meeting. Parsons suggested that a pump test be performed on the existing Well CS-H in the North Pasture to determine if that area of CSSA will be able to sustain high productive flows to complement the existing well network. CSSA requested that Parsons contact Fair Oaks about operation of their production wells in the general vicinity of their production wells. Glaré Sanchez also requested that Parsons sample the well at the start of the pump test and upon its conclusion for coliforms and full volatile organic compounds (including MTBE and BTEX). Parsons does not recommend using Well CS-H itself as a production well for several reasons. An appropriate production pump will not fit inside the 4-inch cased well, and the stainless steel screen would be subject to fouling. A location between Well CS-H and the new North Pasture warehouse would be more suitable, and would be a good location for avoiding the contamination problems in the Inner Cantonment.

If the pump test confirms that a production well in the North Pasture would be a suitable location, Parsons will prepare the IWP to include the new production well along with the new configuration discussed at this meeting. This configuration includes new East-West piping (8-inch) from Segment 91 along roadway until it ties into main system loop (segment 251), plugging of segment 247 and segments 93-99, and extending a new line into the North Pasture by the new warehouse building to a new production well. CSSA requested that the IWP include a map that shows the current locations of SCADA and the Engineer's recommendation for other locations where SCADA metering might be beneficial under this task order.

FOLLOW-UP ISSUES AND ACTION ITEMS

- Joe Ovalle and Chris Beal will do one last review of shape file data to double check that all existing materials and pipe diameters are correct. *This action was completed on October 27, 2008.*
- Parsons will implement a pump test at CS-Well H, and will attempt to monitor or ascertain whether there was any drawdown affected at the Fair Oaks wells. *Test performed October 31-November 2, 2006, Tech memo being prepared.*

- Parsons will prepare a series of maps depicting the pipe replacement priorities, including one showing Priority 1 pipe (cast iron, transite, etc.) and Priority 2 pipe (those locations associated with two leaks), and a second figure depicting the location of ductile iron pipe differentiating it by age. All maps will list the existing pipe diameter, pipe type, segment number with separate tables showing segment length and the cost to replace. A third map will be prepared depicting the water age.
- Parsons will compare fire flows from "Roy's" numbers to the Bullis hydrant flows and the hydrant ratings, and will rerun the model for fire flows based on a minimum 1,000 gpm flows for each hydrant.
- Parsons will implement some spot tests of pressure to verify modeled fire flow results of existing system to evaluate whether the C values used in the existing system model need to be modified.
- Parsons will evaluate whether an in-line pump is required to maintain flow to the North Pasture warehouse if no production well is installed. *Reviewing again based on fireflow evaluation for new warehouse.*
- Parsons will include the 2-inch East Pasture line in one model run (assuming peak usage) to provide an assessment of the capacity of the 2-inch line for continuing to meet the needs of the East Pasture facilities.
- *An appendix to the water system engineering report will include estimated costs for wastewater system repair recommendations.*
- *A new production well, if necessary, will require a permit which can take at least 3 months to get.*
- *Construction of the water line is anticipated to begin in February 2007 at the earliest and would not likely be completed by the end of the task order period of performance (June 30, 2007).*

DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY, RRAD
25800 RALPH FAIR ROAD, BOERNE, TX 78015-4800

Agenda for TIM#3 Topics include Water System Modeling & Engineering Report Progress at CSSA

Water & Wastewater System Evaluation and Water System Rehabilitation

CDRL B006

AFCEE WERC, Task Order 22

Time: Wednesday, October 25, 2006; 9:00 am to 12:00 pm

Place: Camp Stanley Storage Activity, Boerne, Texas, Environmental Office

Proposed Order of Discussion

Date & Time	Topic
09:00 am– 09:15 am	Meeting Objectives
	Determine Design Criteria for IWP Preparation
	Refresh Basis for Current Budget
	Provide an Overview of Engineering Results
	Determine Priority for Pipe Replacement
09:15 am – 09:45 am	Model Calibrations
	Existing vx Simulated
	Scenarios Evaluated
	CSSA Comments & Questions
09:45 am – 10:15 pm	Fire Flow Analysis
	Reservoir levels and Flow Rates/Duration
	Land Use and Future Use/Requirements Scenarios
	CSSA Comments & Questions
10:15 am – 11:00 pm	Pipe Replacement Priorization
	Overview
	Cost & Decisions
11:00 am – 11:30 am	Current Budget Status
	Expended to Date by WBS (Task)
	Funds Remaining to Complete Rehabilitation
11:30 am – 11:45 am	Other TO-22 Discussion Topics and Action Items
	Wastewater Repair Costs
	Well 9 Rehab/Status
	Other (SCADA, etc.)

Task Order No. 0022
Technical Progress Meeting #3

Water and Wastewater System Evaluation and
Water System Rehabilitation at

Camp Stanley Storage Activity
Boerne, TX

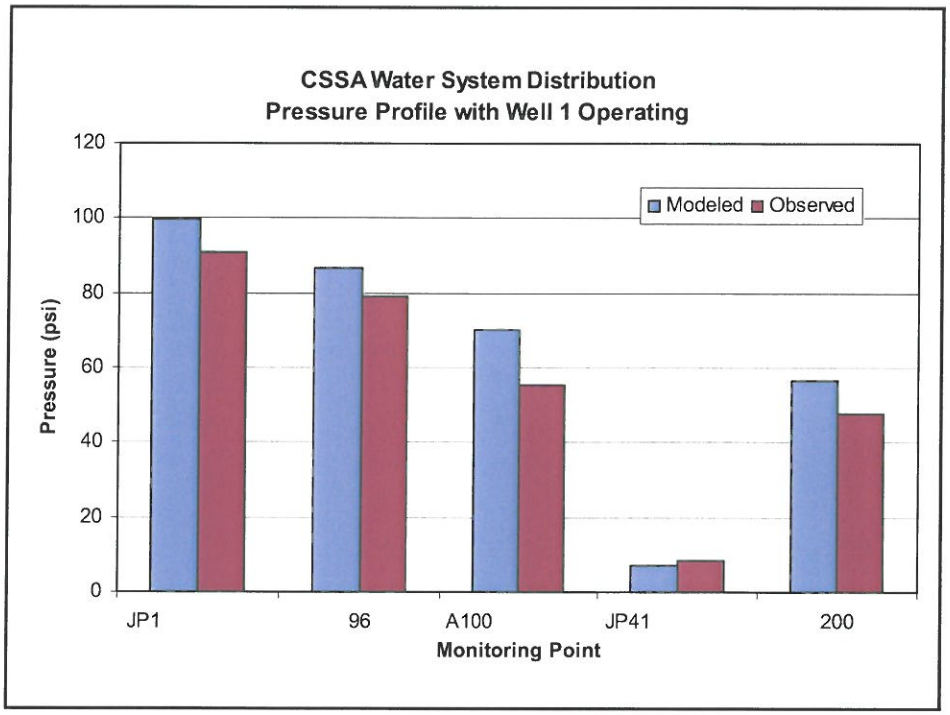
October 25, 2006

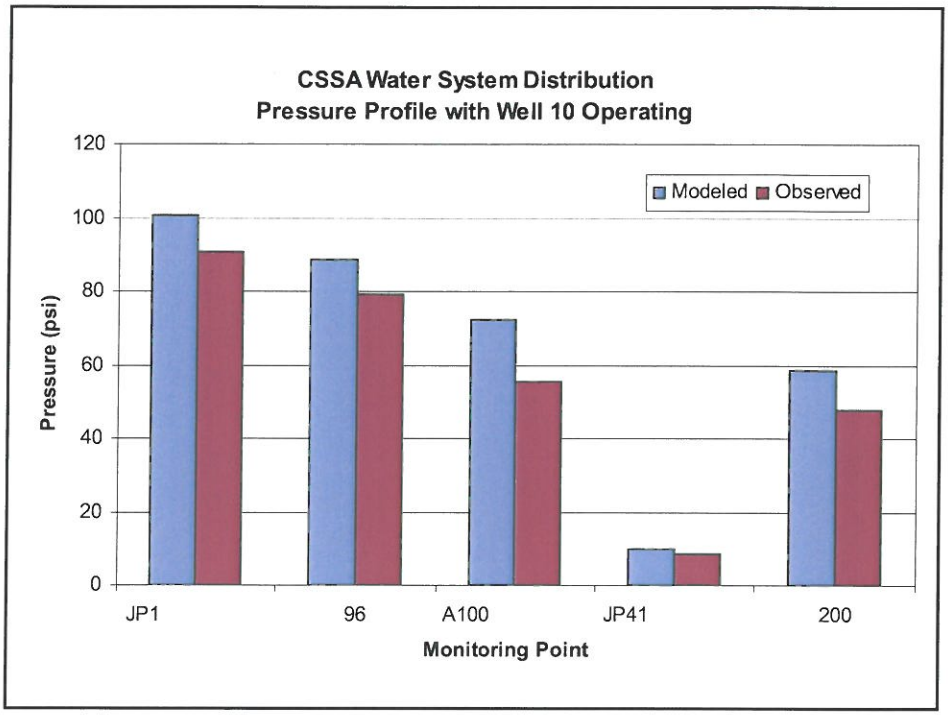
Project Objectives

- Main objectives of project
  - Determine Future water and wastewater needs
  - Evaluate existing water and wastewater systems
  - Provide recommendations for rehabilitation and upgrades
  - Prepare detail implementation work plans
  - Perform construction
  - Perform quality control and prepare as-built drawings

Meeting Objectives

- Main objectives of Meeting:
  - Determine Design Criteria for IWP Preparation
  - Refresh Basis for Current Budget
  - Provide an Overview of Engineering Results
  - Determine Priority for Pipe Replacement
  - Other Considerations
    - WW repair
    - Well 9 rehab/investigation
    - Fire flow analysis





Existing System Analysis

- No replacement as per model
- 2 leaks
- Well Issues

Future Scenario 1

- No new well
- Replace 49,000 LF with like size diameter
- Abandon sections 91, 93, 95, 97, 99
  - 5,300 LF
  - No hydraulic impact

Future Scenario 2

- Add new well to optimize system
- Add 6,200 LF of new transmission line
  - Diameter depends on water demands
  - Questions about possible warehouse
- Similar network to Scenario 1
  - Replace 49,000 LF with like size diameter
  - Abandon sections 91, 93, 95, 97, 99

Fire flows

- Existing CSSA fire flow information
  - Included fire flow demand at points
  - No duration included
- Fire Standards
  - Applied various duration curves by flow rate
  - Discussion on capacity

Fire flow

Sustainable Fire Flow Duration, Hours

	Fire Flow (gpm)					
Percent Full of Reservoir	500	750	1000	1500	2500	3200
50%	4.2	2.8	2.1	1.4	0.8	0.7
100%	8.3	5.6	4.2	2.8	1.7	1.3

Pipe Replacement Priority Criteria

Priority	Leak Test	Modeling	Age/Type
1-cast iron	Cast iron pipe will be replaced due to maintenance issues		
2-leak&model	Yes	Yes	na
3a - mix 3b	No yes	Yes no	na
4-ductile iron	no	no	Yes
5-NW loop			Yes

Pipe Replacement Priority Criteria

(Proposed Pipe Budget = $1.56)

Priority	Linear Feet	Cost (Millions)	Cumulative
1-cast iron	21,800	$ 1.0	$ 1.0
2-leak/model	none		
3-leaks	317	Repaired?	
4-ductile iron	22,400	1.1	2.1
5-NW loop	5,600	0.3	2.4
New well (well & pipe)	6,200	0.6	3.0
Total		$ 3.0	

Proposal Assumptions versus CSSA Possible Needs

- Linear feet estimated footage shown on Figure 1.
  -New 8" pipe service is assumed from new production well to tie-in in Southeast corner of existing water distribution system. ***No new Well in SE corner of water system.***
  -New 4" pipe service will be installed in the East Pasture to connect B-709 Test Facility. ***No Longer Included in Scope?***
- Only of 36 new gate valve boxes are assumed along the length of the water distribution network: ***Actual number of boxes depends on final design.***
  -12 for 12-inch pipe, 12 for 8-inch pipe, and 12 for 4-inch pipe.
- One service tap is assumed for each of the 50 buildings receiving new service.
  -17 will be 12-inch service taps, 17 will be 8-inch service taps, and 16 will be 4-inch service taps.
- Resulting linear footage estimates include 11,342 LF of 12" pipe, 11,342 LF + 1,520 LF of new 8" to production well for total of 14,896 LF 8-inch pipe, and 11,342 LF of 4" pipe + 850 LF for new service line in East Pasture for total of 12,192 LF. ***ACTUAL: Ductile pipe = 4,060 LF 12", 893 LF 10", 7,261 LF 8", and 4,758 LF 6".***

  Replacement (mostly cast iron) pipe = 140 LF 12", 1,707 LF 10", 9,239 LF 8", and 16,050 LF 6".

Current Budget Status

WBS	Task Description	Budget	Spent to Date
90	TO Mgmt (37% complete)	$71k	$27k
01	Meetings (26% complete)	$46k	$12k
02	Water/WW Evaluation & Engineering	$282k	$152k
03	Water & WW IWPs	$119k	$2k
04	Rehab Construction	$2,421k	$193k
05	Final Reports	$58k	$1k
		$2,998k	$387k

Budget Status by WBS

- WBS 90000, Task Order Management, is in line with percent complete.
- WBS 01000, Meetings, are in line with percent complete.
- WBS 02000, Water/WW Evaluation and Engineering Study, (see next slides)
- WBS 03000, Water/WW IWPs, (see next slides)
- WBS 04000, Rehab Construction, (see next slides)
- WBS 05000, Reporting, not really started yet.

WBS 02000 – Water/WW Evaluation and Engineering

(through October 20, 2006)

	Budget	Spent	Difference
Water Evaluation & Engineering Study Labor	$68,540	$89,901	-$21,361
WW Evaluation & Engineering Study Labor	$56,078	$1,574	+$54,504
Task ODCs & Subcontracts (100% complete for task)	$157,084	$64,593	+$92,490
			+$125,633

WBS 03000 – Water/WW Implementation Work Plans

(through October 20, 2006)

	Budget	Spent	Status
Water IWP (includes CATEX, engineering & bid)	$91,960	$1,574	Only 4% complete
WW IWP	$27,468	$0	None planned
			+$27,468

WBS 04000 – Rehab Construction

(through October 20, 2006)

	Budget	Spent	Difference
New Well &Wells 9&10 Rehabilitation Labor	$26,452	$83,307	-$56,855
New Well &Wells 9&10 Rehab ODCs	$111,286	$110,742	+$544
SCADA Labor & ODCs (water pressures/flows)	$178,186	$0	TBD
Pipe Replacement Rehab labor and ODCs	$2,090,213	$0	TBD
			CSSA Decision

Budget Status Overview

Budget Status Overview

- By removing most of WW study and Engineering, approximately $102,847 becomes available for other WBS tasks.
- Other decisions that will affect final price:
  - How much pipe to replace & where it is located.
  - Number of SCADA inputs required (flow and pressure meters)

Other Topics

- WW Repair Costs (from smoke test)
  - Unit cost for cleanout repair = $860 x 6 needing repair.
  - Unit cost for manhole repair = $2k to seal manhole frame, $4k to replace manhole frame and cover.
  - Unit cost for sewer main and lateral repair = $9,860 x 9 needing repair.
  - Repairs for Floor drains in houses and Bldg 98 requires more information.

Schedule

- 1/20/06 - Award notice
- 2/8/06 - KO meeting
- 2/22/06 – CWP & HS
- 3/22/06 - CQP
- 6/16/06 – W/WW evaluation report
- 7/21/06 – EIA & permits
- 9/29/06 – W/WW IWP
- 11/17/06 – Construction subcontracts
- 12/15/06 – 2/16/07- Well construction
- 1/15/07 to 4/13/07 – Miscellanous reports
- 4/2/07 – Pre-final inspection
- 4/27/07- Final inspection report
- 5/18/07 – As-builts, O&M manuals
- 5/21/07 - Training
- Monthly reports