of the diaphragm could be closed and sealed while water supply would be maintained using the other two interior gates.

Cutting the existing outer structural wall to form the new large openings would likely be accomplished by divers using diamond wire saw equipment. Removal of the four existing intake gates, guides and lift mechanisms on one-half of the intake structure could proceed while continuing to provide flow capacity through the other half of the intake. Once all new screens, structural steel, bulkheads, gantry and guides are installed, the same process will be repeated to modify the opposite half of the intake. Similar removal, modification and replacement of the interior gates will proceed, one gate at a time, until all four new larger gates are placed and secured.

Concrete cutting equipment could include a diamond wire saw positioned on the working deck of the pump building, with cutting wires routed down through the existing removable deck grating openings. Alternatively, portable underwater hydraulic cutting equipment could be used directly to cut the necessary openings. In this way, it is expected that a minimum plant capacity of at least 14 MGD could be maintained throughout the construction period.

A 1- to 2-day shutdown of may be required to allow workers to move equipment and occupy the new construction work area. Although it is unlikely to be required, a backup plan for providing water to the plant during construction is to operate a temporary portable pump coupled to a cylindrical T-screen that could be barge-mounted and floated in the river and manned as necessary. It would pump directly into the existing pump wells in the intake structure by closing the isolation valve.

3.2 Phase 2: Grit Removal and West Treatment Train Addition

3.2.1 Overview

Phase 2 would begin with a comprehensive Preliminary Design Report. The report will identify the design, permitting and construction issues associated with this project. Based on the poor condition of the plant, especially with respect to structural integrity, the rehabilitation will require removing an individual train from service, demolishing that train, and reconstruction. In order to accomplish that, a new treatment train must first be constructed to enable the City to continue to meet water demand while the existing trains are rehabilitated. Phase 2 includes installing a new treatment train (the "West Treatment Train") west of the existing plant as well as new solids removal and handling facilities. After this new train has been constructed, the remaining trains will be removed from service and replaced in the manner described below.

This plan envisions continued use of conventional coagulation, flocculation, sedimentation and granular media filtration as the core treatment processes at the plant to date. These processes have performed well to meet finished water quality regulatory requirements for Longview.

3.2.2 Gravity Grit Removal Basins

This phase also includes a new gravity grit removal system. The intake improvements are expected to reduce the load of sand, grit, and ash that enter the treatment plant; however, a grit removal process is prudent to provide grit removal capability within the plant itself. This process will provide the capacity to deal with higher loads of solids, such as during storm events, and avoid accumulation of solids in the flocculation basins.

The current hydrocyclone degritter is undersized, particularly with respect to the removal of particles smaller than 100 microns (0.1 mm). Based on the letter provided by Hydro International in November 2003, the existing Grit King (hydrocyclone) separator removes 81% of particles greater than 100 microns, and essentially no particles smaller than that size, at a flow of 12 MGD. However, up to 80% of the grit in the plant influent is smaller than 100 micron, and a substantial quantity of grit passes through the separator and into the flocculation basins.

A gravity sedimentation process is proposed because it removes a greater proportion of smaller particles. The material that currently passes through the existing degritter readily settles by gravity in the flocculation basins despite the mixing that occurs those basins. A quiescent sedimentation basin is anticipated to be appropriate for readily removing these solids.

A rectangular basin is appropriate for this application. Preliminary sizing of a gravity sedimentation basin has been performed in order to develop a conceptual layout of the new treatment facilities on the plant site. Two basins, each with the following working dimensions, have been selected for this analysis:

- Width: 20 feet
- Length: 80 feet
- Water depth: 12 feet.

The gravity grit removal basins have been sized to remove particles larger than 10 microns (0.01 mm), or approximately 80% of the solids currently passing through the existing hydrocyclone degritter. A preliminary design is required to verify basin sizing and investigate available equipment from qualified vendors.

3.2.3 Raw Water Pipeline Improvements

The gravity grit basins will be fed by a new 36-inch pipeline. This new pipeline will be constructed along the western side of the treatment plant property. When this pipe is ready to be placed into service, the existing 18- and 20-inch raw water lines will be shut down for a brief period (approximately 1 day) and connected to the new pipe. A preliminary design is required to further investigate the site conditions, develop a detailed construction plan, and confirm the required downtime.

Once the new pipe is connected, all raw water will pass through the new grit basins, improving the performance of the new and existing treatment processes.

3.2.4 West Treatment Train

The West Treatment Train will include a flocculation/sedimentation basin and three filters. Because the existing conventional treatment process has worked well for the City, processes with essentially the same dimensions are expected to be appropriate. The existing west coagulation mixing basin will feed this train coagulated water via the existing effluent weir on the western side of the coagulation basin.

In the existing plant, the flocculation basins appear to be somewhat oversized, whereas the sedimentation basins could be somewhat undersized. The previous plant evaluation study found that the flocculation basins have an effective capacity of 37 MGD, while the sedimentation process has an effective capacity of 19 MGD. It may be appropriate to decrease the size of the flocculation process and correspondingly increase the size of the sedimentation process to match their capacities more closely. At this level of planning, it is reasonable to assume that the new flocculation/ sedimentation basins will have the same overall footprint as the existing ones. The new West Treatment Train will be connected to Clearwell No. 2.

3.2.5 Sludge Drying Beds and Residuals Basin Improvements

The new gravity grit removal basins will take the space currently occupied by the existing sludge drying beds. These beds can be relocated to the west of the residuals basins. The sludge drying bed sizing should be examined in a preliminary design study to determine whether it is prudent to increase the bed size to provide additional sludge drying area. At this level of planning, two beds slightly larger than the existing ones are planned to the west of the existing residuals pumps.

3.2.6 Solids Handling Improvements

The gravity grit removal process is expected to reduce the load of solids to the residuals basins. However, deficiencies in the residuals basins will be addressed to help to improve their performance. The flat bottom of the basins makes sludge removal difficult. Moreover, an additional sludge pump that was installed during the 1998 improvements has failed and is no longer in use. Each of the two basins will be taken offline, one at a time, in order to retrofit the basins with a sloped bottom and submersible pumps for sludge removal. The supernatant from these basins will be pumped to the head of the plant to avoid discharge to the river and to increase plant efficiency.

3.2.7 New Finished Water Pipe to Hillside Reservoir

Also during this phase, the finished water pipeline and distribution system line in the immediate vicinity of the plant will be upgraded to relieve existing hydraulic bottlenecks and provide additional CT (product of disinfectant residual concentration and contact time). This approach for providing added disinfection CT is consistent with the 2005 Water Comprehensive Plan. The analysis performed by the Culp VE team concurred with the conclusion that the pipeline CT approach is more cost effective than building additional clearwell volume at the plant.

3.3 Phase 3: Demolition and Replacement of Trains 2 and 3

3.3.1 Overview

Phase 3 includes demolition of the two oldest treatment trains, Trains 2 and 3. These trains are near the end of their useful life and require complete replacement. This can be accommodated by removing them from service, leaving the new West Treatment Train and the existing Train 1 in service, to provide a minimum of 14 MGD of treatment capacity at the plant. Treated flows above 14 MGD are likely given the improved raw water quality obtained by a new grit removal system and intake improvements.

3.3.2 Conceptual Construction Phasing Plan

Trains 2 and 3 will be removed from service and demolished. The structural analysis of these trains indicated that they are at the end of their useful life, and numerous water leaks have required several patchwork repairs of the structure of these facilities.

With Trains 2 and 3 down, some existing filters will be required only intermittently and could be removed from service. Rehabilitation of the existing filters will include replacing the existing hydraulic valve operators on those filters, updating instrumentation and controls, and adding the capability for automatic backwashing, using a consistent protocol for all filters.

This phase will also include upgrades to the existing building to rectify code compliance issues and other miscellaneous improvements. Electrical upgrades will also be included. A preliminary design is required to define a plan for relocating the electrical service to avoid submergence of the electrical equipment during a flood.

3.4 Phase 4: Train 1 Disposition

3.4.1 Overview

In Phase 4, Train 1 will be addressed. The need for demolition and construction of a new train to replace Train 1 should be further investigated. It is anticipated that the newly rehabilitated three treatment trains will reliably provide 20 MGD of finished water without Train 1; therefore, it is unlikely that a fourth treatment train will be required for many years.

Section 4: PLANNING LEVEL COST ESTIMATE AND SCHEDULE

Planning level costs for the recommended improvements are presented in this section. All costs are 2008 dollars unless otherwise noted.

4.1 Phase 1 Improvements

4.1.1 Intake and River Training Study

A preliminary numerical modeling evaluation of the river is required to screen alternative river training structures. This effort is expected to cost between $40,000 and $75,000. A physical modeling study is required to confirm the results of the preliminary computer modeling and is expected to cost between $250,000 and $400,000. For planning purposes, the total cost is estimated to be $500,000 for a study to define the type and configuration of river training structures and to better define the required improvements for the intake.

4.1.2 Intake Improvements

The intake improvements include the following:

- Modification of the existing intake wall using diamond wire saw directed by divers (approximately between $50,000 and $100,000).

- Demolition and removal of existing mechanical gate control systems and installation of a new small gantry and rail bulkhead lift system (approximately between $25,000 and $50,0000)

- Construction of the proposed steel frame and screen/bulkhead guides (approximately between $150,000 and $250,000).

- Construction and installation of the screen panels, bulkheads and porosity control panels (approximately between $25,000 and $75,000).

- Modification of the existing screen chamber control gates to increase their net opening size (approximately in the range of $25,000 and $50,000 per gate).

Based on these individual component estimates, the total cost for the intake rehabilitation will be between $400,000 and $1,500,000. For planning purposes, the upper limit of this range has been retained for Phase 1 planning level cost estimation. A preliminary design study is required to refine the intake rehabilitation cost.

4.1.3 River Training Structures

River training structures, such as rock dike fields, unsubmerged pile dikes or Iowa vanes, are required in order to improve water flow in the vicinity of the intake. Table 1 summarizes approximate cost ranges for alternative river training structures. It is not possible to know which alternative would be most feasible and appropriate for this application until the river training study is completed. For planning purposes, a cost of $2,000,000 for the river training structures has been retained as a conservative estimate.

Table 1: Approximate Cost Ranges for Alternative River Training Structures

River Training Alternative	Description	Cost Range (2008 Dollars)
Submerged Rock, River Training Dike Field	Submerged rock dikes constructed across the left descending portion of the channel width to force permanent thalweg near the intake structure.	> $1,000,000 (depending on number and size of dike structures)
Pile Dike Field	Wooden or steel pile dike rows driven in a closely spaced line perpendicularly across the river channel.	$1,200,000 to $3,000,000 (depending on number and size of dike structures)
Iowa Vane Scour Generators	Concrete precast or steel prefabricated and anchored vanes driven into the river bed in the vicinity of the intake, and upstream and downstream.	$250,000 to $1,000,000 (depending on number, size, placement and anchorage method)

Table 2 presents planning level costs for all of the proposed Phase 1 improvements. The planning level costs are in 2008 dollars and have been adjusted to an ENR construction cost index of 8621.

Table 2: Phase 1 Planning Level Cost Estimate

Cost Element	Cost (2008 dollars)
Planning Studies:	
Intake Rehabilitation and River Training Study	$500,0000
Construction Elements:	
Intake Rehabilitation	$1,000,000
Intake Structural Upgrades	$500,000
River Training Structure Implementation	$2,000,000
Construction Subtotal	$3,500,000
Contingency (30%)	$1,050,000
Construction Subtotal with Contingency	$4,550,000
Design (12.5%)	$568,750
Construction Management (12.5%)	$568,750
Phase 1 Total	$6,187,500

4.1.4 Phase 2 and 3 RWTP Improvements

Planning level costs for the RWTP restoration have been developed based upon a similar plant rehabilitation project for the City of Napa, California, at the Jamieson Canyon Water Treatment Plant. That project included replacement of 15 MGD of flocculation/sedimentation treatment capacity, two new filters, solids handling improvements, chemical feed and storage rehabilitation and other improvements. Kennedy/Jenks Consultants completed the design in 2007, and construction was ongoing at the time of the submission of this report. Because that rehabilitation project had similar project elements and the engineer's cost estimate closely matched actual project bids, Kennedy/Jenks Consultants used those project costs as the basis for the estimates for the Longview RWTP rehabilitation.

Planning level costs for the RWTP rehabilitation were developed by selecting the appropriate costs for the corresponding project elements from the Jamieson Canyon plant and reviewing to retain only the relevant cost values. The costs were then adjusted for the treatment capacity and location of the Longview RWTP project.

Planning level costs for Phases 3 and 4 are presented in Tables 2 and 3. The planning level costs are in 2008 dollars and have been adjusted to an ENR construction cost index of 8621. After completion of Phases 1, 2 and 3, the plant will reliably produce 20 MGD (the treatment capacity goal of this project), without running the existing Train 1. A fourth project phase could include Train 1 improvements, if deemed necessary to reliably provide up to 28 MGD of treatment capacity.

Table 3: Phase 2 Planning Level Cost Estimate, West Treatment Train Construction

Cost Element	Cost (2008 dollars)
Planning Studies:	
RWTP Preliminary Design (all Phases)	$500,0000
Construction Elements:	
West Train Site Work	$800,000
RWTP Train Yard Piping	$800,000
RWTP Raw Water Line	$162,000
RWTP Gravity Grit Removal Basins	$1,840,393
West Train Flocculation/Sedimentation	$2,660,318
West Train Filtration	$2,327,980
West Train Chemical Feed Storage	$1,643,011
Finished Water Piping/Pumping Improvements	$800,000
RWTP Finished Water Pipe to Hillside Reservoir	$4,080,000
RWTP Sludge Drying Beds	$106,000
RWTP Solids Handling Improvements	$540,000
Construction Subtotal	$15,759,924
Contingency (30%)	$4,727,977
Construction Subtotal with Contingency	$20,487,901
Design (12.5%)	$2,560,987
Construction Management (12.5%)	$2,560,987
Phase 2 Total	$26,109,876

Table 4: Phase 3 Planning Level Cost Estimate, Replace Treatment Trains 2 and 3

Cost Element	Cost (2008 dollars)
Demolition	$250,000
Phase 3 Site Work	$400,000
Phase 3 Yard Piping	$400,000
Phase 3 Flocculation / Sedimentation	$5,320,637
Phase 3 Chemical Feed / Storage	$821,506
Existing Filter Upgrades	$400,000
Building Improvements	$300,000
Electrical Service Relocation	$500,000
Construction Subtotal	$8,392,143
Contingency (30%)	$2.517,643
Construction Subtotal with Contingency	$10,909,785
Design (12.5%)	$1,363,723
Construction Management (12.5%)	$1,363,723
Phase 3 Total	$13,637,232

Figure 2 presents the project schedule for all phases of construction. The schedule is viewed as realistic, based upon completion of similar plant rehabilitation projects. The schedule allows 12 months to conduct the intake and river training alternatives evaluation study. The construction of the intake improvements and river training structures will occur in the following 16 months. A pre-design study for Phase 2 and 3 RWTP improvements will be performed concurrently with the intake design effort. Phase 3 design will occur concurrently with Phase 2 construction. Phase 3 construction will begin once the new West Treatment Train is debugged and fully operational.

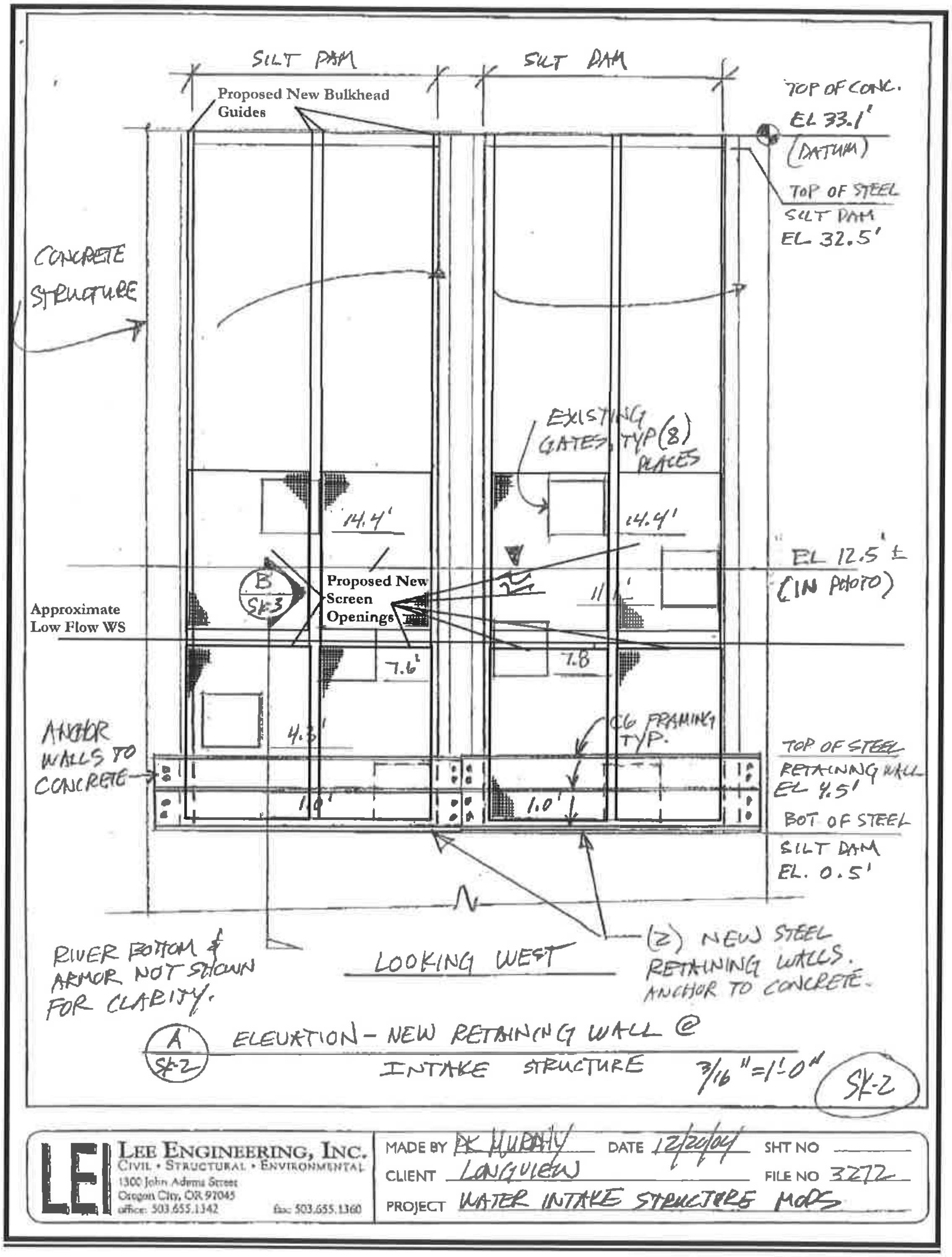
Table 5 presents a projection of the project costs through the year 2015. Costs are escalated at 5% each year. These projections will help the City to plan annual capital improvement expenditures for the anticipated life of this project.

Table 5: RWTP Rehabilitation Cost Escalation Planning

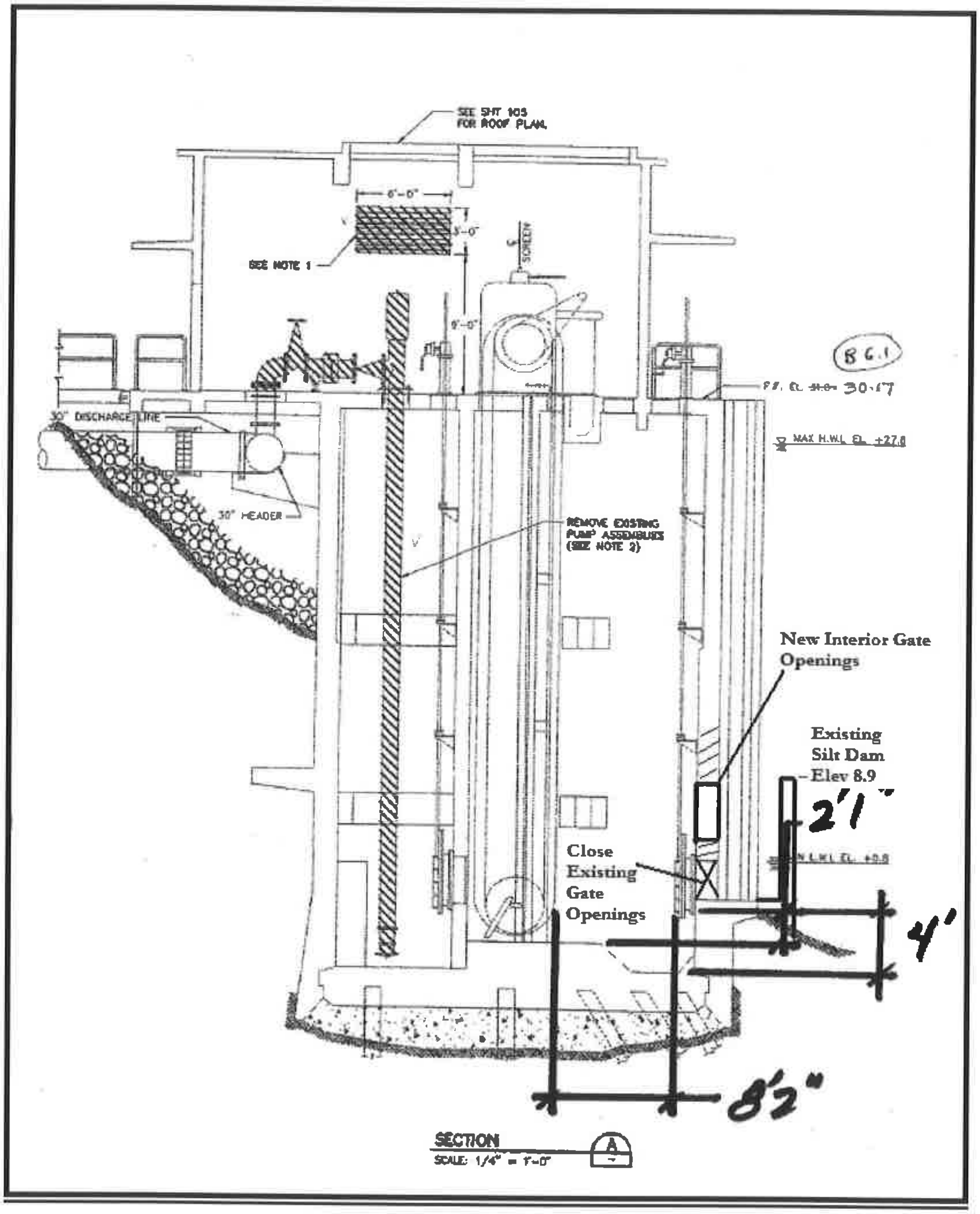
	Project	2008
Escalated Cost:	**$55,449,219**	**$250,000**
Project Phases:		
Phase 1: Intake Rehabiltation and River Training Structures		
Study		$250,000
Design		
Construction Management		
Construction		
Escalation		
Phase 2: West Treatment Train		
Preliminary Design (All RWTP Phases)		
Design		
Construction Management		
Construction		
Escalation		
Phase 3: Treatment Train 2 and 3 Replacement		
Design		
Construction Management		
Construction		
Escalation		
Phase 4: Repair, Replace, or Abandon Train 1		
Design		
Construction Management		
Construction		
Escalation		

ID	Task Name	Duration	Start	Finish
1	**Phase 1: Intake Rehabilitation and River Training Structures**	**800 days**	**Tue 7/1/08**	**Mon 7/25/11**
2	Conduct Intake Study, River Training Study,and Identify Fatal Flaws.	12 mons	Tue 7/1/08	Mon 6/1/09
3	Design and Obtain Permits for Restoration of Existing Intake and River Training Structures.	12 mons	Tue 6/2/09	Mon 5/3/10
4	Construct Intake Improvements and Implement River Training Option.	16 mons	Tue 5/4/10	Mon 7/25/11
5	**Phase 2: West Treatment Train**	**1100 days**	**Tue 6/2/09**	**Mon 8/19/13**
6	Prepare Pre-Design Report for All Phases of Plant Restoration including Regulatory Considerations, Surveying and Geotechnical Considerations. Include Transmission Main Routing Study.	12 mons	Tue 6/2/09	Mon 5/3/10
7	Design West Treatment Train Facility including New Grit Removal Basins and Drying Beds and Design Transmission Main.	12 mons	Tue 5/4/10	Mon 4/4/11
8	Construct West Treatment Train Facility including New Grit Removal Basins and Drying Beds. Provide improvements to Finished Water Piping and Pumping Facility. Construct Transmission Main from RWTP to the Hillside Reservoir	24 mons	Tue 7/26/11	Mon 5/27/13
9	Start-Up West Treatment Train.	3 mons	Tue 5/28/13	Mon 8/19/13
10	**Phase 3: Replace Treatment Trains 2 and 3**	**803 days**	**Thu 3/1/12**	**Mon 3/30/15**
11	Update Pre-Design Report.	3 mons	Thu 3/1/12	Wed 5/23/12
12	Design New Treatment Trains 2 and 3 including Demolition Plan and Improvements to Existing Facility.	12 mons	Fri 6/1/12	Thu 5/2/13
13	Construct New Treatment Trains 2 and 3 and Improvements to the Existing Facility.	18 mons	Tue 8/20/13	Mon 1/5/15
14	Start-Up Treatment Trains 2 and 3.	3 mons	Tue 1/6/15	Mon 3/30/15
15	**Phase 4: Repair, Replace or Abandon Treatment Train 1.**	**60 days**	**Tue 1/6/15**	**Mon 3/30/15**
16	Identify the need to Maintain Train 1 Capacity.	3 mons	Tue 1/6/15	Mon 3/30/15

Appendix A: Intake Schematics



Existing intake opening configuration elevation view



Intake section (Showing existing outboard silt dam and proposed new interior gate openings).

Appendix B: Typical River Training Structures

SHOALING PROTECTION

The cooling-water intake of Unit 3 at the Iowa Resources' power plant on the Missouri River near Council Bluffs, Iowa, experienced recurrent sediment blockage following reduction of the river discharge and stage at the end of the navigation season each year. The shoaling was so severe that annual dredging was required to keep the intake open.

The Iowa Institute of Hydraulic Research conducted a model study for Iowa Resources on the effectiveness of flow- and sediment-training vanes in moving sediment away from the intake as a means to prevent shoaling. Test results were so good that the array of vanes recommended by the Institute was installed in March, 1985 just outside the plant's intake structure, as shown in Figure 5.

Since the installation of the vanes, no objectionable sediment deposition has occurred outside the intake, and no further dredging has been required.

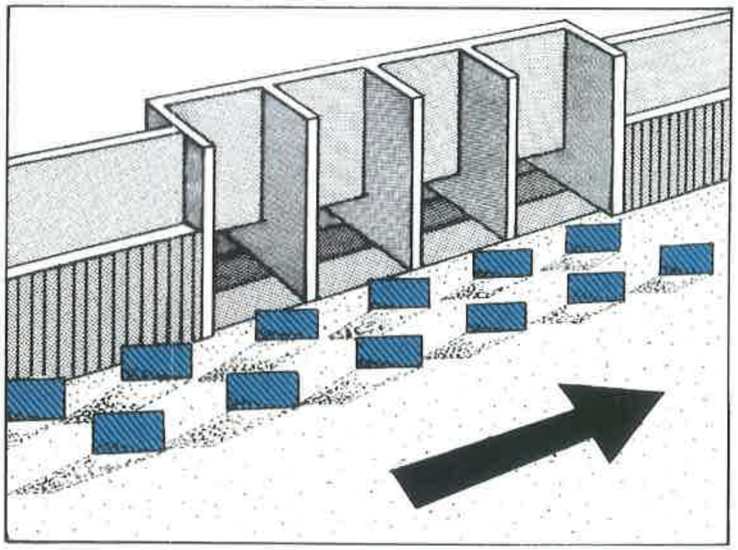


Figure 5: Schematic illustration showing flow- and sediment-training vanes that were installed outside the cooling-water intake of Iowa Resources' power plant near Council Bluffs, Iowa. The vanes produce a scour trench which prevents sediment blockage of the pump intake.

Iowa vanes used as anti-shoaling device at intake

Rock dike field to develop constrained uniform navigation channel (USACE)

Stone blunt chevron navigation aid dikes (USACE)

Trail dike for improvement of navigation channel (USACE)

Appendix C: Federal Permitting Requirements

Permit conditions for maintenance from Section 3 of 33 CFR 330.3 of the Federal Register 2007 are summarized as follows:

3. Maintenance.

(a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of and within existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the district engineer under separate authorization. The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation or beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). Where maintenance dredging is proposed, the pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404) Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

A brief summary of the Corps' nationwide permit conditions for outfall and associated intake structure activities may be found in Section 7 of 33 CFR 330.3 as follows:

7. Outfall Structures and Associated Intake Structures.

Activities related to the construction or modification of outfall structures and associated intake structures, where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted by, or that are otherwise in compliance with regulations issued under the National Pollutant Discharge Elimination System Program (Section 402 of the Clean Water Act). The construction of intake structures is not authorized by this NWP, unless they are directly associated with an authorized outfall structure.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

A brief summary of the Corps' nationwide permit conditions for minor dredging work may be found in Section 19 of 33 CFR 330, as follows:

19. Minor Dredging.

Dredging of no more than 25 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the United States (i.e., section 10 waters). This NWP does not authorize the dredging or degradation through siltation of coral reefs, sites that support submerged aquatic vegetation (including sites where submerged aquatic vegetation is documented to exist but may not be present in a given year), anadromous fish spawning areas, or wetlands, or the connection of canals or other artificial waterways to navigable waters of the United States (see 33 CFR 322.5(g)). (Sections 10 and 404).

All dredging in excess of 25 cubic yards must be preceded by a successful application for a Section 404 permit. All activities, including temporary construction that may fall under the nationwide permit program, are covered in Section 33 of 33 CFR 330.3 as follows:

33. Temporary Construction, Access, and Dewatering.

Temporary structures, work, and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites, provided that the associated primary activity is authorized by the Corps of Engineers or the U.S. Coast Guard. This NWP also authorizes temporary structures, work, and discharges, including cofferdams, necessary for construction activities not otherwise subject to the Corps or

U.S. Coast Guard permit requirements. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. The use of dredged material may be allowed if the district engineer determines that it will not cause more than minimal adverse effects on aquatic resources. Following completion of construction, temporary fill must be entirely removed to upland areas, dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. The affected areas must also be revegetated, as appropriate. This permit does not authorize the use of cofferdams to dewater wetlands or other aquatic areas to change their use. Structures left in place after construction is completed require a section 10 permit if located in navigable waters of the United States. (See 33 CFR part 322.)

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). The pre-construction notification must include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. (Sections 10 and 404).

Appendix D: References

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