Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

TO: Board Members

THROUGH: Kevin Patteson, Executive Administrator
Les Trobman, General Counsel
Jeff Walker, Deputy Executive Administrator, Water Supply & Infrastructure
Matt Nelson, Director, Water Use Projections & Planning

FROM: Temple McKinnon, Team Lead, Regional Water Planning

DATE: August 29, 2014

SUBJECT: Consider approving the adopted Minor Amendment to the 2011 Region N Regional Water Plan, for a Recommended Seawater Desalination Water Management Strategy; and authorizing TWDB staff to develop notice for a public hearing for an associated amendment to the 2012 State Water Plan.

ACTION REQUESTED

Approve the adopted minor amendment to the 2011 Region N Regional Water Plan; and, authorize TWDB staff to develop the corresponding amendment to the 2012 State Water Plan, and post notice for a public hearing, as appropriate per 31 TAC §357.51(f).

BACKGROUND

At the May 8, 2014 Coastal Bend (Region N) Regional Water Planning Group meeting, the planning group approved requesting a minor amendment determination from the Executive Administrator for a seawater desalination water management strategy (WMS). This action was documented in a letter received May 13, 2014. The seawater desalination WMS was fully evaluated for the 2011 Region N Regional Water Plan but was classified as an alternative WMS rather than a recommended WMS.

Though this is a fully evaluated alternative WMS that was reviewed with the content of the 2011 Region N Regional Water Plan, a minor amendment determination was found to be the appropriate process rather than an alternative substitution because no recommended WMS is being replaced or considered as no longer being feasible.

The seawater desalination WMS is a project to be sponsored by the City of Corpus Christi. The strategy has an online date of 2020 and is to provide 28,000 acre-feet per year through 2060 to

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the City's manufacturing, mining, and steam-electric power generation customers. The capital cost associated with the strategy is $260.9 million.

The Executive Administrator made a determination that adding seawater desalination as a recommended WMS constitutes a minor amendment under 31 TAC §357.51(c), based on the amendment having met the following criteria:

1. Does not result in over-allocation of an existing or planned source of water;
2. Does not relate to a new reservoir;
3. Does not have a significant effect on instream flows, environmental flows or freshwater flows to bays and estuaries;
4. Does not have a significant substantive impact on water planning or previously adopted management strategies; and
5. Does not delete or change any legal requirements of the plan.

The Executive Administrator provided a written response to the Coastal Bend (Region N) Regional Water Planning Group for this minor amendment determination on June 6, 2014 (Attachment 1). Following comments received from the City of Corpus Christi regarding the project projected to be online in the 2020 decade, Region N revised the online date of the WMS and adopted the minor amendment at their August 14, 2014 meeting. Following this adoption, a two-week public comment period was held and no public comments were received. No subsequent revision to the proposed minor amendment was made by the regional water planning group.

KEY ISSUES

1. The Region N Regional Water Planning Group submitted to the TWDB on August 28, 2014, the required written documentation of their adopted minor amendment, including comments received, and an addendum to the current 2011 Region N Water Plan (Attachment 2).
2. TWDB staff have reviewed the adopted amendment and determined that statutory and rule requirements have been met.
3. If approved, an associated amendment to the 2012 State Water Plan will be presented for the Board's consideration following a 30-day notice period and public hearing in accordance with 31TAC §358.4 (a).

RECOMMENDATION

The Executive Administrator recommends approval of this item.

This recommendation has been reviewed by legal counsel and complies with applicable statutes and Board rules.

_____

Les Trobman, General Counsel

Attachments:

1. June 6, 2014 Executive Administrator Minor Amendment Determination Response Letter.
2. Minor amendment documentation, including the addendum to the 2011 Region N Regional Water Plan.

ATTACHMENT 1

Texas Water Development Board

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Phone (512) 463-7847, Fax (512) 475-2053

June 6, 2014

Ms. Rocky Freund
Deputy Executive Director
Nueces River Authority
400 Mann Street, Suite 1002
Corpus Christi, Texas 787401

Re: Coastal Bend (Region N)'s written request, received May 13, 2014, for a determination regarding whether or not amending the 2011 Region N Regional Water Plan to include Seawater Desalination as a recommended water management strategy would be a minor amendment under 31 TAC §357.51(c).

Dear Ms. Freund:

I have reviewed Region N's request and, based on Region N's request and supporting materials, have determined that adding Seawater Desalination as a recommended water management strategy constitutes a minor amendment under 31 TAC §357.51(c).

If Region N adopts the proposed minor amendment, Region N will need to:

1. Provide the Texas Water Development Board (TWDB) with documentation of the planning group action adopting this water management strategy as a minor amendment;
2. Issue and distribute an addendum to the 2011 Region N Regional Water Plan updating the plan accordingly;
3. Provide TWDB with corrected DB12 data to reflect all the associated changes to the 2011 Region N Regional Water Plan and the 2012 State Water Plan; and,
4. Request that the City of Corpus Christi obtain a web link from TWDB staff in order to fill out an associated online Infrastructure Financing Survey regarding how the entity plans to finance the project associated with the amendment.

If Region N makes any substantive changes to the project components or configuration during the minor amendment process, TWDB will need to review the modified proposed amendment to ensure that the modified project still meets all of the criteria under 31 TAC §357.51(c).

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Kevin Patteson, Executive Administrator

If you have any questions concerning this approval or its associated requirements, please contact Connie Townsend, the Board's designated regional water planning project manager for this region.

Sincerely,

Kevin Patteson
Executive Administrator

cc: Connie Townsend, TWDB

ATTACHMENT 2

Coastal Bend Regional Water Planning Group

400 Mann Street, Suite 1002, Corpus Christi, Texas 78401
Phone: 361-653-2110; Fax: 361-653-2115

Executive Committee:
Mr. Scott Bledsoe, III, Co-Chair
Water Districts
Ms. Carola Serrato, Co-Chair
Water Utilities
Mr. Lonnie Stewart, *Secretary*
GMA 13
Dr. Pancho Hubert
Small Business
Mr. Tom Reding, Jr.
River Authorities

Members:
Mr. Tom Ballou
Industries
Mr. Chuck Burns
Agriculture
Ms. Teresa Carrillo
Environmental
Mr. Bill Dove
Small Businesses
Mr. Lavoyger Durham
Counties
Mr. Gary Eddins
Electric Utilities
Mr. Andy Garza
GMA 16
Mr. Bill Hennings
Other
Mr. Lindsey Koenig
Public
Mr. Robert Kunkel
Industries
Mr. Martin Ornelas
Public
Mr. Charles Ring
Agriculture
Mr. Mark Scott
Municipalities
Mr. Bill Stockton
Counties
Mr. Mark Sugarek
GMA 15
Mr. Jace Tunnell
Environmental

Non-Voting Members:
Ms. Connie Townsend
TWDB
Mr. Tomas Dominguez
NRCS
Dr. Jim Tolan
TPWD
Ms. Nelda Garza
TDA
Mr. Robert Fulbright, Liaison
Rio Grande RWPG
Mr. Con Mims, Liaison
South Central TX RWPG
Mr. Haskell Simon, Liaison
Lower Colorado RWPG

Staff:
Ms. Rocky Freund
Nueces River Authority

August 28, 2014

Mr. Kevin Patteson
Executive Administrator
P.O. Box 13231
Austin, Texas 78711-3231

RE: Minor Amendment materials for the 2011 Coastal Bend Regional (Region N) Water Plan and 2012 State Water Plan to include Seawater Desalination as a Recommended Water Management Strategy for the Coastal Bend Region (Region N)

Dear Mr. Patteson:

On August 14, 2014, the Coastal Bend Regional Water Planning Group approved adoption of minor amendment to the 2011 Region N Water Plan to update Seawater Desalination from an alternative to a recommended water management strategy including revising the decade of need from Year 2040 to Year 2020 for Nueces and San Patricio County Manufacturing water users.

A status update of items requested in the TWDB letter dated June 6, 2014, confirming this revision as a minor amendment, is as follows:

1. TWDB documentation of the planning group action adopting the minor amendment. *(Completed - this letter)*
2. Addendum to the 2011 Region N Regional Water Plan *(Completed - this letter; the addendum was posted on the Nueces River Authority website at https://www.nueces-ra.org/CP/RWPG/ and replacement pages sent to county clerks and libraries who received the 2011 Plans)*
3. DB12 corrections to reflect changes to the 2011 Plan and 2012 State Water Plan (*In progress - HDR has contacted TWDB staff and are working together to complete DB12 update)*
4. Request that the City of Corpus Christi obtain a web link for Infrastructure Financing Survey (IFS) *(Completed - Email sent by the City of Corpus Christi to TWDB on August 28, 2014 requesting IFS web link)*

The recommended seawater desalination water management strategy has been fully evaluated in accordance with statute, rule, and contractual guidelines for the approved 2011 Region N Plan and meets the criteria set forth in 31 TAC Ch. 357.51 (c)(2). TWDB guidance and rules on the minor amendment process were followed and met, including public notice and comment period.

Background information is provided in Attachment 1. The addendum to the 2011 Region N Regional Water Plan is provided in Attachment 2.

Please contact me at 361-653- 2110 with any comments or questions.

Sincerely,

Rocky Freund

Rocky Freund
Deputy Executive Director, Nueces River Authority

Attachments

CC: Connie Townsend, TWDB
Sabrina Anderson, TWDB
Temple McKinnon, TWDB
Matt Nelson, TWDB

ATTACHMENT 1-
Background Information

The City of Corpus Christi, as a Wholesale Water Provider, is evaluating seawater desalination options, including variable desalination programs and combinations with brackish groundwater resources. The results of these on-going studies will be considered in the 2016 Region N Plan.

The City of Corpus Christi is pursuing financing programs and requests inclusion of desalination as a recommended strategy in the 2011 Region N Plan and the 2012 State Water Plan for financing eligibility. A timeline of events pertinent to the 2011 Plan amendment is as follows:

- February 13, 2014- Interest to revise the 2011 Plan to include Seawater Desalination as a recommended water management strategy is expressed during general public comment at the Coastal Bend Regional Water Planning Group (RWPG) meeting.

- April 29, 2014- Corpus Christi City Council votes to accept a federal, U.S. Bureau of Reclamation grant of $400K and transfers $1.08M from the City's Raw Water Supply Development Fund for a City of Corpus Christi Desalination Program Pilot Study.

- May 8, 2014- The Coastal Bend RWPG approves submitting a request to the Texas Water Development Board (TWDB) for minor amendment determination to revise seawater desalination from an alternative to a recommended strategy in the 2011 Plan.

- June 6, 2014- TWDB letter to Region N confirming the addition of seawater desalination as a recommended water management strategy constitutes a minor amendment.

- July 29, 2014- Corpus Christi City Council considers a resolution to the 84th Texas Legislature to appropriate funding for FY 16-17 biennium and partnering with local sponsors to implement desalination projects.

- August 4, 2014- HDR confirms with Corpus Christi staff a revision to change the decade of need from 2040 to 2020 to match the City's Water Management Plan 2015-2050.[1]

On August 14, 2014, the Coastal Bend RWPG adopted the minor amendment to revise seawater desalination from an alternative to a recommended water management strategy in the 2011 Plan. The public comment period to receive comments on the proposed minor amendment was open from July 31 to August 28, 2014. A comment to revise the decade of need was addressed prior to Coastal Bend RWPG adoption.

[1] Resolution adopted by City Council on June 17, 2014.

ATTACHMENT 2-

Section 4B Replacement for the 2011 Region N Plan
(adopted by the Coastal Bend RWPG on August 14, 2014, updates associated with the minor amendment have been underlined)

Replacement for Section 4B.11.4 in the 2011 Region N Plan (Volume I)

4B.11.4 City of Corpus Christi

The City of Corpus Christi meets its demands with its own water rights in the CCR/LCC System and through a contract with the Lavaca-Navidad River Authority (LNRA) that provides water from Lake Texana. Although no shortages are projected for the City's own municipal needs, the City also provides surface water to SPMWD, STWA, and manufacturing and steam-electric water user groups in Nueces and San Patricio Counties. The City's contract with LNRA expires in 2035; however, it is anticipated that this contract will be renewed when it expires. Therefore, water supply tables in Section 4 and in the water supply plans for Nueces County-Manufacturing (Section 4B.11.11) and San Patricio County-Manufacturing (Section 4B.12.12) include Lake Texana contract water as existing supply throughout the 60-year planning horizon.

In addition to these water supply sources, the City has a permit to divert up to 35,000 acft/yr of run-of-river water under its interbasin transfer permit on the Colorado River (via the Garwood Irrigation Co.). While the City owns the water right on the Colorado River, it does not have the facilities to divert and convey this water to the City. In the long-term (beyond 2030), the City will have to access this water—either directly or via a trade—to help offset the manufacturing shortages in Nueces and San Patricio Counties.

Replacement for Section 4B.11.11 in the 2011 Region N Plan (Volume I)

4B.11.11 Manufacturing

4B.11.11.1 Description

The City of Corpus Christi provides the surface water for manufacturing in Nueces County from the CCR/LCC/Texana System. Additional manufacturing supplies are from the Gulf Coast Aquifer. The City also provides surface water for manufacturing in San Patricio County. *In the analysis that follows, the manufacturing needs of Nueces and San Patricio Counties are considered jointly*. Since water management strategies for this water user will likely be developed by Wholesale Water Providers, the total project costs and supplies are shown in the water supply plan. Appendix C.6 delineates water management strategy supplies and costs by water user group and county. A shortage in manufacturing supply occurs in 2020.

4B.11.11.2 Options Considered

Over 90 percent of the water supplied to Manufacturing users in Nueces and San Patricio Counties is from the CCR/LCC/Lake Texana System via Wholesale Water Providers (City of Corpus Christi and SPMWD). Beginning in 2020, shortages begin to appear and grow to a combined 46,005 acft/yr in 2060 (39,550 acft/yr in Nueces County and 6,455 acft/yr in San Patricio County). Table 4B.11-6 lists the water management strategies, references to the report section discussing the strategy, total project cost, and unit costs that were considered for meeting the shortage for manufacturing in Nueces and San Patricio Counties.

Table 4B.11-6.
Water Management Strategies Considered for
Manufacturing in Nueces and San Patricio Counties

Option	Yield (acft/yr)	Approximate Cost[1]	
		Total	Unit ($/acft)
Manufacturing Conservation (Section 4C.3)	up to 2,050	N/A	N/A
O.N. Stevens Water Treatment Plant Improvements (Section 4C.19)	32,996 to 42,329	$31,324,000[2]	$459 to $524[2]
Reclaimed Wastewater Supplies (Section 4C.5)	250	N/A	$826[3]
Gulf Coast Aquifer Groundwater Supplies (Section 4C.7)	up to 18,000	$59,245,000[4]	$853[4]
Lavaca River Diversion & Off-Channel Reservoir (Section 4C.13)[5]	16,242	$224,183,000	$1,027
Garwood Pipeline (Section 4C.14)	35,000	$112,798,000[6]	$685[6]
Off-Channel Reservoir[7]	30,340[8]	$105,201,950[8]	$715[8]
CCR/LCC Pipeline[7]	21,905[9]	$48,324,000[9]	$588[9]
Stage II Lake Texana (Palmetto Bend) (Section 4C.13)[5]	12,964	$232,828,000	$1,213
Brackish Groundwater Desalination[10]	18,000	$108,331,000	$977
Seawater Desalination[10]	28,000	$260,914,000	$1,696

[1] Unless otherwise noted, costs are Total Project Cost and Unit Cost ($/acft/yr) for treated water delivered by wholesale water provider to the water supply entity or entities. Unit cost is for full utilization of project capacity.

[2] Total project cost includes improvements to the following WTP components: raw influent, raw water intake pump station, and O.N. Stevens solids handling facilities. Unit cost includes $326/acft for treatment.

[3] See Section 4C.5. Costs to maintain ongoing Nueces Delta studies are $500,000 per year (assumed cost associated with Allison Demonstration Project is 25 percent). Water supply for Allison Project based on ratio of yield recovered by a 2-MGD project as compared to an 8.8-MGD project. Costs to supply Allison discharge to delta includes $326/acft for treatment of additional yield. Annual cost not subject to 20 year debt service.

[4] Source of Cost Estimate: Section 4C.7, Table 4C.7-17. Unit cost includes $326/acft for treatment. Treatment may not be required if separate pipeline is constructed so that groundwater would not be blended with water in Mary Rhodes pipeline.

[5] Supplies are estimated based on assuming Region P/L industrial needs of 10,000 acft/yr. Unit costs are estimated based on a raw water cost of $701/acft for the Lavaca River Diversion and $887/acft for the Stage II of Lake Texana plus $326/acft for treatment. Total cost shown is not prorated between regions; however, it is understood that Region N is responsible for a portion of the total project cost.

[6] Source of Cost Estimate: Section 4C.14, Table 4C.14-2. Unit cost = $326/acft for treatment + $359/acft for raw water supply development.

[7] Total costs and unit costs are based on Federal or State funding participation of 65 percent for debt service costs. Water supplied is 65 percent of project potential, with 35 percent dedicated for ecosystem restoration or State/Federal purpose. $326/acft added for treatment of water supplied for CCR/LCC Pipeline option.

[8] Yield and costs shown assume Federal and/or State participation of 65%. Without this funding, the full yield of the project is 46,677 acft/yr, the total project cost is $300,577,000 and the unit cost is $896/acft including treatment.

[9] Yield and costs shown assume Federal and/or State participation of 65%. Without this funding, the full yield of the project is 33,700 acft/yr, the total project cost is $138,067,000 and the unit cost is $728/acft including treatment.

[10] Projects may have opportunities for federal or state participation. However, based on assumptions of 65% of federal or state funding participation for debt service costs and water supplies of 65% of project potential (with 35% dedicated for ecosystem restoration or state/federal purposes), federal or state participation would not be anticipated to reduce annual unit costs of water and therefore is not included in the cost estimate.

4B.11.11.3 Water Supply Plan

Working within the planning criteria established by the Coastal Bend RWPG and TWDB, the following water supply plan is one potential plan to meet the projected 2020 through 2060 shortages for manufacturing in Nueces and San Patricio Counties:

- Manufacturing Water Conservation;
- O.N. Stevens Water Treatment Plant Improvements;
- Seawater Desalination;
- Reclaimed Wastewater Supplies;
- Garwood Pipeline[2];
- Off-Channel Reservoir;
- Gulf Coast Aquifer Groundwater Supplies; and
- Lavaca River Diversion and Off-Channel Reservoir.

The City of Corpus Christi, as a Wholesale Water Provider, is continuing to evaluate seawater desalination options, including variable desalination programs and combining with brackish groundwater resources. The results of these on-going studies will be considered during development of the 2016 Coastal Bend Regional Water Plan.

In addition to the recommended projects listed above, three projects are considered to be alternative water management strategies.

- CCR/LCC Pipeline;
- Stage II of Lake Texana; and
- Brackish Groundwater Desalination.

In addition to the management strategies listed above, the RWPG supports strategies for increased conservation and reuse of existing supplies.

4B.11.11.4 Costs

The recommended Water Supply Plan including anticipated costs is summarized by decade in Table 4B.11-7.

[2] Since development of the 2011 Coastal Bend Regional Water Plan, the Garwood Pipeline project has been renamed Mary Rhodes Pipeline Phase II project and will be referred to, accordingly, in the 2016 Coastal Bend Regional Water Plan.

Table 4B.11-7. Potential Plan Costs by Decade for Manufacturing in Nueces and San Patricio Counties[1]

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Recommended Water Management Strategies						
Projected Surplus/(Shortage)[2] (acft/yr)	—	(7,411)	(15,203)	(24,459)	(33,913)	(46,005)
Manufacturing Water Conservation[3]						
Supply From Plan Element (acft/yr)	1,260	1,418	1,576	1,734	1,892	2,050
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
O.N. Stevens Water Treatment Plant Improvements[4]						
Supply From Plan Element (acft/yr)	42,329	40,048	38,102	36,366	34,817	32,996
Annual Cost ($/yr)	$21,334,000	$20,625,000	$19,965,000	$16,692,000	$16,190,000	$15,574,000
Unit Cost ($/acft)	$504	$515	$524	$459	$465	$472
Reclaimed Wastewater Supplies[5]						
Supply From Plan Element (acft/yr)	250	250	250	250	250	250
Annual Cost ($/yr)	$206,500	$206,500	$206,500	$206,500	$206,500	$206,500
Unit Cost ($/acft)	$826	$826	$826	$826	$826	$826
Garwood Pipeline						
Supply From Plan Element (acft/yr)	—	35,000	35,000	35,000	35,000	35,000
Annual Cost ($/yr)	—	$23,958,000	$23,958,000	$23,958,000	$14,054,000	$14,054,000
Unit Cost ($/acft)	—	$685	$685	$685	$402	$402
Off-Channel Reservoir[6]						
Supply From Plan Element (acft/yr)	—	—	30,340	30,340	30,340	30,340
Annual Cost ($/yr)	—	—	$21,696,800	$21,696,800	$21,696,800	$17,536,500
Unit Cost ($/acft)	—	—	$715	$715	$715	$578
Gulf Coast Aquifer Groundwater Supplies						
Supply From Plan Element (acft/yr)			11,000	11,000	11,000	18,000
Annual Cost ($/yr)			$9,383,000	$9,383,000	$9,383,000	$10,188,000
Unit Cost ($/acft)			$853[7]	$853[7]	$853[7]	$566[7]
Lavaca River Diversion and Off-Channel Reservoir[8]						
Supply From Plan Element (acft/yr)	—	—	—	—	—	16,242
Annual Cost ($/yr)	—	—	—	—	—	$16,681,000
Unit Cost ($/acft)	—	—	—	—	—	$1,027
Seawater Desalination[9]						
Supply From Plan Element (acft/yr)	**—**	**28,000**	**28,000**	**28,000**	**28,000**	**28,000**
Annual Cost ($/yr)	**—**	**$47,498,000**	**$47,498,000**	**$47,498,000**	**$24,750,000**	**$24,750,000**
Unit Cost ($/acft)	**—**	**$1,696**	**$1,696**	**$1,696**	**$884**	**$884**
Total Annual Cost ($/yr)	$21,540,500	**$92,287,500**	**$122,707,300**	**$119,434,300**	**$86,280,300**	**$98,990,000**
Total Unit Cost ($/acft)	$491	**$881**	**$851**	**$837**	**$611**	**$608**
Alternative Water Management Strategies						
CCR/LCC Pipeline[10]						
Supply From Plan Element (acft/yr)	—	—	—	21,905	21,905	21,905
Annual Cost ($/yr)	—	—	—	$12,869,980	$12,869,980	$12,869,980
Unit Cost ($/acft)	—	—	—	$588	$588	$588
Stage II Lake Texana (Palmetto Bend)						
Supply From Plan Element (acft/yr)	—	—	—	—	—	12,964
Annual Cost ($/yr)	—	—	—	—	—	$15,725,000
Unit Cost ($/acft)	—	—	—	—	—	$1,213
Brackish Groundwater Desalination[9]						
Supply From Plan Element (acft/yr)	—	—	—	18,000	18,000	18,000
Annual Cost ($/yr)	—	—	—	$17,584,000	$17,584,000	$17,584,000
Unit Cost ($/acft)	—	—	—	$977	$977	$977

Table 4B.11-7 (Concluded)

[1] Supplies shown exceed shortages in the event growth in demands exceeds TWDB projections or supplies are reduced under the City's contract with LNRA for Lake Texana water. Supplies and costs shown in this table represent full project yields. For delineation by water user group, see Appendix C.6.

[2] Surplus/(Shortage) includes manufacturing for both Nueces and San Patricio Counties. Note: Shortages for Nueces County- Steam and Electric, Nueces County- Mining, and Aransas County- Other are identified in separate tables (i.e. total combined shortage is 62,255 acft/yr in Year 2060).

[3] Water supply represents water saved by blending of Lake Texana water with Nueces River water. There may be an opportunity for additional water savings of up to 591 acft/yr with an interconnection to the Mary Rhodes Pipeline for industries with intakes in the Nueces River (See Section 4C.3). Annual cost of interconnection pipeline to MRP is $132,000. Impacts to other water users would need to be considered, prior to implementing project.

[4] Supplies include 16,000 acft/yr generated with new sludge handling ponds and additional treated water supplies with improvements of plant capacity from 159 MGD to 200 MGD (average day) constrained by existing raw water supplies. Costs include $326/acft for treatment.

[5] Costs to maintain ongoing Nueces Delta studies are $500,000 per year (assumed cost associated with Allison Demonstration Project is 25 percent). Water supply for Allison Project based on ratio of yield recovered by a 2-MGD project as compared to an 8.8-MGD project (See Section 4C.5). Costs to supply Allison discharge to delta includes $326/acft for treatment of additional yield. Annual cost not subject to 20 year debt service.

[6] Annual costs and unit cost are based on Federal funding participation of 65 percent. Water supplied is 65 percent of project potential, with 35 percent dedicated for ecosystem restoration. $326/acft added for treatment of water supplied. Costs reduced in Year 2060 with debt service paid for pipeline. Debt service is 40 years for reservoir.

[7] Assumes full utilization of project. Unit cost based on 18,000 acft project + $326/acft for treatment (See Section 4C.7) although treatment may not be required if separate pipeline is constructed so that groundwater would not be blended with water in Mary Rhodes pipeline.

[8] Supplies are estimated based on assuming Region P/L industrial needs of 10,000 acft/yr. Unit costs are estimated based on a raw water cost of $701/acft and $326/acft for treatment.

[9] Projects may have opportunities for federal or state participation. However, based on assumptions of 65% of federal or state funding participation for debt service costs and water supplies of 65% of project potential (with 35% dedicated for ecosystem restoration or state/federal purposes), federal or state participation would not be anticipated to reduce annual unit costs of water and therefore is not included in the cost estimate.

[10] Annual costs and unit cost are based on Federal or State funding participation of 65 percent for debt service costs. Water supplied is 65 percent of project potential, with 35 percent dedicated for ecosystem restoration or State/Federal purpose. $326/acft added for treatment of water supplied for CCR/LCC Pipeline option.