Conclusion

A summary of the pumping station recommendations for the GBRA Regional Water System Project for portions of Comal, Kendall, and Bexar Counties is as follows:

Raw Water Pump Station

- Provide floating barge intake on Canyon Lake.
- Provide vertical turbine pumps.
- Provide 3 pumps (750 hp motors) in parallel for 10 mgd base project (1 pump is redundant).
- Add 1 pump in parallel for phased project expansion (1 pump is redundant).

WTP Pump Station

- Provide vertical turbine pumps.
- Provide VFDs.
- Provide 3 pumps (200 hp motors) in parallel for 10 mgd base project (1 pump is redundant).
- Modify 3 pumps for additional stages required and add 1 new pump (all 400 hp motors) in parallel for phased project (1 pump is redundant).
- Provide pump and barrel design with consideration for additional stages that need to be added for future expansion.

Remote Pump Station

- Provide vertical turbine pumps.
- Provide VFDs.
- Provide 3 pumps (250 hp motors) in parallel for 10 mgd base project (1 pump is redundant)
- Add 1 pump in parallel for phased project expansion (1 pump is redundant).

TM No. 4 Appendix

Conceptual Pump Station Layouts

OVERSIZED Document

To View OVERSIZED Document(s) Or

For any questions;

you can call CENTRAL RECORDS

main Line

(512) 936.7180

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
20" Steel Pipe	150	LF	$ 63	$ 9,450
20" Spool Piece	2	EA	$ 980	$ 1,960
20" 90-degree bend	2	EA	$ 1,900	$ 3,800
20" Butterfly Valve	2	EA	$ 3,900	$ 7,800
20" 45-degree bend	2	EA	$ 1,900	$ 3,800
20" Inlet Diffuser	1	EA	$ 3,000	$ 3,000
18" Steel Pipe	150	LF	$ 63	$ 9,450
18" Spool Piece	2	EA	$ 700	$ 1,400
18" 90-degree bend	2	EA	$ 1,200	$ 2,400
18" Butterfly Valve	2	EA	$ 3,650	$ 7,300
18" 45-degree bend	2	EA	$ 1,200	$ 2,400
18" Inlet Diffuser	1	EA	$ 3,000	$ 3,000
Division #16 - Electrical and Instrumentation				
Level meter (Ultrasonic)	2	EA	$ 4,500	$ 5,000
Conduit and Cabling	1	LS	$ 1,000	$ 1,000
			Subtotal this Page	$ 61,760
			Subtotal - All Pages for Task	$ 342,060
			Miscellaneous Items and Contingencies (10%)	$ 34,206
			Subtotal	$ 376,266
			Mobilization (2%)	$ 7,525
			Contractor's Overhead and Profit (12%)	$ 45,152
			Total Construction Cost	$ 428,943

Cost Estimate

Project Guadalupe-Blanco River Authority
Regional Water System
Task Remote Storage Tank
Task No. Basis of Design Report

Date March, 2000
Estimator C.Gaylord
Checked By D.Whitis
Check Date

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
none				
Division #2 - Site Work				
Site Preparation and Grading	1	LS	$ 300	$ 300
Division #3 - Concrete				
none				
Division #4 - Masonry				
none				
Divison #5 - Metals				
none				
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
none				
Division #9 - Finishes				
none				
Division # 10 Specialties				
none				
Division # 11 - Equipment				
none				
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
250,000 gallon glass fusion-bonded tank (installed complete)	1	EA	$ 280,000	$ 280,000
Division #14 - Conveying Systems				
none				
			Subtotal this Page	$ 280,300

Revision Date: 6/10/00

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
30" Steel Pipe	150	LF	$ 63	$ 9,450
30" Spool Piece	2	EA	$ 1,400	$ 2,800
30" 90-degree bend	2	EA	$ 4,500	$ 9,000
30" Butterfly Valve	2	EA	$ 3,500	$ 7,000
30" 45-degree bend	2	EA	$ 4,500	$ 9,000
30" Inlet Diffuser	1	EA	$ 3,000	$ 3,000
Division #16 - Electrical and Instrumentation				
Level meter (Ultrasonic)	1	EA	$ 4,500	$ 5,000
Conduit and Cabling	1	LS	$ 500	$ 500
			Subtotal this Page	$ 45,750
			Subtotal - All Pages for Task	$ 186,550
			Miscellaneous Items and Contingencies (15%)	27,983
			Subtotal	$ 214,533
			Mobilization (2%)	$ 4,291
			Contractor's Overhead and Profit (12%)	$ 25,744
			Total Construction Cost	$ 244,567

Cost Estimate

Project Guadalupe-Blanco River Authority
Regional Water System
Task Raw Water Storage Tank
Task No. Basis of Design Report

Date March, 2000
Estimator C.Gaylord
Checked By D.Whitis
Check Date

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
none				
Division #2 - Site Work				
Site Preparation and Grading	1	LS	$ 300	$ 300
Division #3 - Concrete				
none				
Division #4 - Masonry				
none				
Divison #5 - Metals				
none				
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
none				
Division #9 - Finishes				
none				
Division # 10 Specialties				
none				
Division # 11 - Equipment				
none				
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
132,200 gallon glass fusion-bonded tank (installed complete)	1	EA	$ 140,500	$ 140,500
Division #14 - Conveying Systems				
none				
		Subtotal this Page		$ 140,800

Revision Date: 6/10/00

Cost Estimate

Project	Guadalupe-Blanco River Authority	**Date**	March, 2000
	Regional Water System	**Estimator**	C.Gaylord
Task	SCADA	**Checked By**	N. Graff
Task No.	Basis of Design Report	**Check Date**	4/11/00

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
none				
Division #2 - Site Work				
none				
Division #3 - Concrete				
none				
Division #4 - Masonry				
none				
Divison #5 - Metals				
none				
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
none				
Division #9 - Finishes				
none				
Division # 10 Specialties				
none				
Division # 11 - Equipment				
none				
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
Customer Connections/Valves	1	LS	$ 400,000	400,000
Division #14 - Conveying Systems				
none				
Division # 15 - Mechanical				
accounted for in Div 13				
Division #16 - Electrical and Instrumentation				
SCADA	1	LS	$695,000	695,000
			Subotal	1,095,000
			Miscellaneous Items and Contingencies (10%)	110,288
			Subtotal	1,205,288
			Contractor's Overhead and Profit (15%)	181,187
			Total Construction Cost	1,386,480

Revision Date: 6/10/00

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
Piping				
Unit costs are for installed piping and appurtenances, including valves, thrust restraint systems, air vacuum valves, blow-off valves.. Costs do not include crossings.				
30-inch Diameter				
Press. Class. 250 psi	2060	LF	$ 117	241,020
200 psi	68288	LF	$ 102	6,965,376
150 psi	2805	LF	$ 92	258,060
24-inch Diameter				-
Press. Class: 200 psi	11407	LF	$ 89	1,015,223
150 psi	7488	LF	$ 79	591,552
100 psi	29772	LF	$ 70	2,084,040
20-inch Diameter				-
Press. Class: 100 psi	27138	LF	$ 60	1,628,280
18-inch Diameter				-
Press. Class: 150 psi	11790	LF	$ 60	707,400
14-inch Diameter				-
Press. Class: 250 psi	4853	LF	$ 69	334,857
200 psi	22572	LF	$ 62	1,399,464
150 psi	3018	LF	$ 58	175,044
12-inch Diameter				-
Press. Class: 150 psi	22340	LF	$ 47	1,049,980
Division #16 - Electrical and Instrumentation	-			
none				
			Subtotal this Page	16,450,296
			Subtotal - All Pages for Task	18,377,756
			Miscellaneous Items and Contingencies (5%)	918,887.80
			Subtotal	19,296,644
			Mobilization (2%)	385,933
			Bonds and Insurance (3%)	578,899
			Contractor's Overhead and Profit (12%)	2,315,597
			Total Construction Cost	22,577,073

Cost Estimate

Project	Guadalupe-Blanco River Authority	**Date**	March, 2000
	Regional Water System	**Estimator**	C.Gaylord
Task	TW Transmission Line	**Checked By**	N. Graff
Task No.	Basis of Design Report	**Check Date**	4/11/00

HDR Engineering

Note: Costs are based on alignment used for hydraulic evalution of the transmission system.

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
Shop Drawings, O&M Manuals, Testing, Start-up	1	LS	$ 220,000	220,000
Division #2 - Site Work				
Trench Safety System	205320	LF	$ 1	205,320
Revegetation	470	ACRE	$ 200	94,000
Fence Repair/Replacement	205320	LF	$ 0.75	153,990
Erosion Control @ Pipe Installation	10200	LF	$ 2	20,400
Silt Fence, @ River Crossings Only	1,200	LF	$ 2	1,800
Erosion Control Blanket, @ River Crossings Only	560	SY	$ 1	560
Cement Stabilized Embedment, @ River Crossings Only	500	LF	$ 45	22,500
Reno type Gabion Mattress	5,000	SF	$ 3	12,500
Road Crossings by Tunneling/Boring	1,500	LF	$ 750	1,125,000
Division #3 - Concrete				
Miscellaneous Concrete	1	LS	$ 17,000	17,000
Division #4 - Masonry				
none				
Divison #5 - Metals				
none				
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
none				
Division #9 - Finishes				
none				
Division # 10 Specialties				
none				
Division # 11 - Equipment				
none				
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
Waterline Markers	273	EA	$ 30	8,190
Corrosion Monitoring Stations	154	EA	$ 300	46,200
Division #14 - Conveying Systems				
none				
			Subtotal this Page	1,927,460

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
Piping				
Unit costs are for installed piping and appurtenances, including valves, thrust restraint systems, air vacuum valves, blow-off valves Costs do not include crossings.				
30-inch Diameter				
Press. Class: 250 psi	10530	LF	$ 111	1,168,830
Press. Class: 200 psi	15150	LF	$ 102	1,545,300
Press. Class: 100 psi	90	LF	$ 85	7,650
Division #16 - Electrical and Instrumentation				
none				
			Subtotal this Page	2,721,780
			Subtotal - All Pages for Task	3,239,308
			Miscellaneous Items and Contingencies (5%)	161,965
			Subtotal	3,401,273
			Mobilization (2%)	68,025
			Bonds and Insurance (3%)	102,038
			Contractor's Overhead and Profit (12%)	408,153
			Total Construction Cost	3,979,490

Cost Estimate

Project	Guadalupe-Blanco River Authority	**Date**	March, 2000
	Regional Water System	**Estimator**	C.Gaylord
Task	Raw Water Piping	**Checked By**	N. Graff
Task No.	Basis of Design Report	**Check Date**	4/11/00

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
Shop Drawings, O&M Manuals, Testing, Start-up	1	LS	$ 62,000	62,000
Division #2 - Site Work				
Trench Safety System	25770	LF	$ 1	25,770
Revegetation	65	ACRE	$ 200	13,000
Fence Repair/Replacement	25770	LF	$ 1.00	25,770
Erosion Control @ Pipe Installation	1300	LF	$ 2	2,600
Silt Fence, @ River Crossings Only	60	LF	$ 2	90
Erosion Control Blanket, @ River Crossings Only	28	SY	$ 1	28
Cement Stabilized Embedment, @ River Crossings Only	25	LF	$ 45	1,125
Reno type Gabion Mattress	250	SF	$ 3	625
Road Crossings by Tunneling/Boring	500	LF	$ 750	375,000
Division #3 - Concrete				
Miscellaneous Concrete	1	LS	$ 2,500	2,500
Division #4 - Masonry				
none				
Divison #5 - Metals				
none				
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
none				
Division #9 - Finishes				
Painting of Exposed Piping	1	LS	$ 2,000	2,000
Division # 10 Specialties				
none				
Division # 11 - Equipment				
none				
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
Waterline Markers	34	EA	$ 30	1,020
Corrosion Monitoring Station	20	EA	$ 300	6,000
Division #14 - Conveying Systems				
none				
			Subtotal this Page	517,528

Revision Date: 6/10/00

Cost Estimate

Project Guadalupe-Blanco River Authority
Regional Water System
Task In-Line Booster Pump Station along piping to
Task No. Cordillera Ranch

Date May, 2000
Estimator C.Gaylord
Checked By
Check Date

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
None				
Division #2 - Site Work				
Excavation	1	LS	$ 1,500	$ 1,500
Fencing	200	LF	$ 15	$ 3,000
Site Work/Driveway	1	LS	$ 10,000	$ 10,000
Division #3 - Concrete				
Miscellaneous Concrete	1	LS	$ 2,500	$ 2,500
Division #4 - Masonry				
None				
Divison #5 - Metals				
None				
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
None				
Division #9 - Finishes				
Painting	1	LS	$ 2,500	$ 2,500
Division # 10 Specialties				
Identification, Stenciling, Tagging of Equipment, Pipes, etc.	1	LS	$ 500	$ 500
Division # 11 - Equipment				
30 HP Vertical Turbine Can Pump	2	EA	$ 25,000	$ 50,000
Division # 12 - Furnishings				
None				
Division # 13 - Special Construction				
None				
Division #14 - Conveying Systems				
None				
Division # 15 - Mechanical				
Miscellaneous Valving and Piping	1	LS	$ 30,000	$ 30,000
Division #16 - Electrical and Instrumentation				
Misc. Electrical and Instrumentation	1	LS	$ 45,000	$ 45,000
			Subotal	$ 145,000
			Miscellaneous Items and Contingencies (10%)	14,500
			Subtotal	$ 159,500
			Mobilization (5%)	7,975
			Contractor's Overhead and Profit (12%)	$ 19,140
			Total Construction Cost	$ 186,615

Revision Date: 6/10/00

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
Miscellaneous Piping and Valving	1	LS	$ 150,000	$ 150,000
12" VT Pump Control	3	EA	$ 90,000	$ 270,000
Division #16 - Electrical and Instrumentation				
MCC				
SCADA/Instrumentation	1	LS	$ 30,000	$ 30,000
Misc. Electrical	1	LS	$ 55,000	$ 55,000
			Subtotal this Page	$ 505,000
			Subtotal - All Pages for Task	$ 1,022,735
			Miscellaneous Items and Contingencies (10%)	$ 102,274
			Subtotal	$ 1,125,009
			Mobilization (2%)	$ 22,500
			Contractor's Overhead and Profit (12%)	$ 135,001
			Total Construction Cost	$ 1,282,510

Cost Estimate

Project Guadalupe-Blanco River Authority
Regional Water System
Task Remote Pump Station
Task No. Basis of Design Report

Date March, 2000
Estimator C.Gaylord
Checked By D.Whitis
Check Date

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
none				
Division #2 - Site Work				
Site Preparation and Grading	1	LS	$ 500	$ 500
Excavation	100	CY	$ 6	$ 600
Backfill	50	CY	$ 11	$ 550
Gravel Paving (3/4" stone base, 3" deep)	500	SY	$ 5	$ 2,300
Fencing	240	LF	$ 15	$ 3,600
Division #3 - Concrete				
Concrete Fill (Encasement)	4	CY	$ 150	$ 600
Precast Concrete: (Vaults, etc.)	1	LS	$ 6,600	$ 6,600
Division #4 - Masonry				
(Included w/Building)				
Divison #5 - Metals				
Aluminum Grating	125	SF	$ 25	$ 3,125
Misc. Structural Metals	1	LS	$ 5,000	$ 5,000
Pipe Bollards (8-inch dia.)	4	EA	$ 350	$ 1,400
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
Doors and Frames	3	EA	$ 1,500	$ 4,500
Overhead Door (Rolling Steel)	1	EA	$ 8,500	$ 8,500
Division #9 - Finishes				
Painting	1	LS	$ 10,000	$ 10,000
Division # 10 Specialties				
Identification, Stenciling, Tagging of Equipment, Pipes, etc.	1	LS	$ 2,500	$ 2,500
Division # 11 - Equipment				
250 HP Vertical Turbine Can Pump, Variable Speed Motor	3	EA	$ 36,600	$ 109,800
250 HP Variable Speed Drive	3	EA	$ 50,000	$ 150,000
30-inch Diameter Vertical Turbine Pump Barrel	4	EA	$ 4,500	$ 18,000
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
Pump/Control Building, complete	1168	SF	$ 120	$ 140,160
Division #14 - Conveying Systems				
Bridge Crane	1	LS	$ 50,000	$ 50,000
			Subtotal this Page	$ 517,735

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
Miscellaneous Piping and Valving	1	LS	$ 176,000	$ 176,000
12" VT Pump Control (w/panel)	3	EA	$ 90,000	$ 270,000
16" Surge Valve	1	LS	$ 23,000	$ 23,000
Division #16 - Electrical and Instrumentation				
Med. Voltage MCC *(Included w/ WTP)*				
SCADA/Instrumentation	1	LS	$ 33,000	$ 33,000
Misc. Electrical	1	LS	$ 33,000	$ 33,000
Subtotal this Page				$ 535,000
Subtotal - All Pages for Task				$ 1,067,700
Miscellaneous Items and Contingencies (10%)				$ 106,770
Subtotal				$ 1,174,470
Mobilization (2%)				$ 23,489
Contractor's Overhead and Profit (12%)				$ 140,936
Total Construction Cost				$ 1,338,896

Cost Estimate

Project Guadalupe-Blanco River Authority
Regional Water System
Task Water Treatment Plant PS
Task No. Basis of Design Report

Date March, 2000
Estimator C.Gaylord
Checked By D.Whitis
Check Date

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
none				
Division #2 - Site Work				
Assume site work outside of PS building as part of WTP Estimate (not included here)				
Site Preparation and Grading	1	LS	$ 500	$ 500
Excavation	110	CY	$ 6	$ 660
Backfill	55	CY	$ 11	$ 605
Division #3 - Concrete				
Concrete Fill (Encasement)	4	CY	$ 150	$ 600
Precast Concrete (Vaults, etc.)	1	LS	$ 9,600	$ 9,600
Division #4 - Masonry				
(Included w/Building)				$ -
Divison #5 - Metals				
Aluminum Grating	115	SF	$ 25	$ 2,875
Misc. Structural Metals	1	LS	$ 5,000	$ 5,000
Pipe Bollards (8-inch dia.)	4	EA	$ 350	$ 1,400
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
Doors and Frames	2	EA	$ 4,500	$ 9,000
Overhead Door (Rolling Steel)	1	EA	$ 8,500	$ 8,500
Division #9 - Finishes				
Painting	1	LS	$ 10,000	$ 10,000
Division # 10 Specialties				
Identification, Stenciling, Tagging of Equipment, Pipes, etc.	1	LS	$ 2,000	$ 2,000
Division # 11 - Equipment				
200 HP Vertical Turbine Can Pump, Variable Speed Motor	3	EA	$ 33,600	$ 100,800
200 HP Variable Speed Drive	2	EA	$ 40,000	$ 80,000
Backwash Pumps	2	EA	$ 42,000	$ 84,000
30-inch Diameter Vertical Turbine Pump Barrel	6	EA	$ 4,500	$ 27,000
Division # 12 - Furnishings				
none				
Division # 13 - Special Construction				
Pump/Control Building, complete	1168	SF	$ 120	$ 140,160
Division #14 - Conveying Systems				
Bridge Crane	1	LS	$ 50,000	$ 50,000
			Subtotal this Page	$ 532,700

Cost Estimate Continued - Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division # 15 - Mechanical				
Intake Barge Piping	1	LS	$ 30,000	$ 30,000
18" High Pressure Hose and Connections (300 psi)	1000	LF	$ 175	$ 175,000
18" Steel Piping w/ supports	590	LF	$ 300	$ 177,000
30" Steel Header	24	LF	$ 600	$ 14,400
18" Surge Anticipator Valve	1	LS	$ 24,000	$ 24,000
18" Pressure Relief Valve	1	LS	$ 22,000	$ 22,000
12" Pump Control Valves	3	EA	$ 15,000	$ 45,000
Miscellaneous Valving	1	LS	$ 50,000	$ 50,000
Division #16 - Electrical and Instrumentation				
Med. Voltage MCC	1	LS	$ 200,000	$ 200,000
SCADA/Instrumentation	1	LS	$ 30,000	$ 30,000
Misc. Electrical	1	LS	$ 30,000	$ 30,000
Subtotal this Page				$ 797,400
Subtotal - All Pages for Task				$ 2,229,825
Miscellaneous Items and Contingencies (15%)				334,474
Subtotal				$ 2,564,299
Mobilization (5%)				128,215
Contractor's Overhead and Profit (12%)				$ 307,716
Total Construction Cost				$ 3,000,230

Cost Estimate

Project Guadalupe-Blanco River Authority
Regional Water System
Task Floating Intake & On-Shore Control Bldg
Task No. Basis of Design Report

Date March, 2000
Estimator C.Gaylord
Checked By D.Whitis
Check Date

HDR Engineering

Description	Quantity	Unit	Unit Price ($/unit)	Total ($)
Division #1 - Special Conditions				
Site Constraints	1	LS	$ 37,600	$ 37,600
Division #2 - Site Work				
Site Preparation and Grading (On-shore)	1	LS	$ 1,700	$ 1,700
Excavation	150	CY	$ 6	$ 900
Backfill	60	CY	$ 11	$ 660
Paving	3500	SY	$ 12	$ 42,000
Fencing	175	LF	$ 15	$ 2,625
Division #3 - Concrete				
Precast Concrete Vaults	2	EA	$ 4,000	$ 8,000
Misc. Concrete	20	CY	$ 300	$ 6,000
Division #4 - Masonry				
(Included w/Building)				
Divison #5 - Metals				
Pipe Bollards (8-inch dia.)	4	EA	$ 350	$ 1,400
Miscellaneous Metals	1	LS	$ 7,500	$ 7,500
Division #6, 7, & 8 - Wood & Plastics, Thermal & Moisture Protection, Doors, and Windows				
(Included w/Building)				
Division #9 - Finishes				
Painting	1	LS	$ 10,000	$ 10,000
Division # 10 Specialties				
Identification, Stenciling, Tagging of Equipment, Pipes, etc.	1	LS	$ 2,500	$ 2,500
Division # 11 - Equipment				
750 HP Vertical Turbine Can Pump	3	EA	$ 102,000	$ 306,000
Division # 12 - Furnishings				
None				
Division # 13 - Special Construction				
Control Building, complete	192	SF	$ 120	$ 23,040
Boat Dock w/ Lift	1	LS	$ 150,000	$ 150,000
Boat Barrier	1	LS	$ 25,000	$ 25,000
Floating Intake Structure w/ Architectural Treatment	1	LS	$ 750,000	$ 750,000
Division #14 - Conveying Systems				
Work Boat	1	LS	$ 50,000	$ 50,000
Monorail Hoist on Barge	1	LS	$ 7,500	$ 7,500
			Subtotal this Page	$ 1,432,425

Appendix F
Detailed Cost Estimates

5. Water delivery must be made to a water storage tank through an air gap except for In-District public non-community customers, with approval of GBRA. A reduced-pressure zone backflow preventer is also required if the customer's tank is not located on a tract of land that is contiguous with the GBRA's easement for the flow meter and flow control valve.
6. Water storage capacity in conjunction with other water supplies (if any) must be shown to be sufficient to provide water supply at average day flow rates during outages of GBRA supplied water of up to 24 hours.
7. The customer must provide a minimum 20'x30' easement to locate delivery and control facilities, including an underground concrete valve vault, control/radio cabinet, antenna mast, and other required facilities.
8. The customer must provide electric service to control enclosure.
9. The customer must provide a license agreement for the GBRA to install a level transmitter and associated SCADA equipment and radio telemetry on and/or adjacent to the customer's tank. Furnish electrical power to the equipment.
10. The customer must have a Certificate of Convenience and Necessity.

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5.0 Public Drinking Water System Regulations

30 TAC 290 and other chapters of the water code include regulations for public drinking water systems. Potential purveyors of GBRA-supplied water will be required to show that they will conform to these regulations including operation and maintenance by certified operator, standards for storage distribution and treatment and sufficient emergency (fire protection) supply of above ground storage.

6.0 Other Items

6.1 Density

Systems will be required to conform to local impervious coverage restrictions. (See Edwards Aquifer Contributing Zone Regulations)

6.2 Edwards Aquifer Contributing Zone Regulations

Regulations regarding development in the Edwards Aquifer (30 TAC 213) relate to the recharge zone (Subchapter A) and include rules related to the contributing zone (Subchapter B). Subchapter B focuses on the regulation of nonpoint source pollution activities such as stormwater runoff from construction sites and post-construction industrial and residential sites. A regulated activity includes, but is not limited to:

- Construction or installation of buildings, utility stations, utility lines, underground and aboveground storage tank systems, roads, highways, or railroads.
- Clearing, excavation or any other activities that alter or disturb the topographic or existing stormwater runoff characteristics of a site and
- Any other activities that may pose a potential for contaminating stormwater runoff are also regulated

7.1 Connection Design Criteria

1. Existing pipeline taps installed during pipeline construction must be utilized where available. Pipeline taps will be installed on the pipeline for all customers identified at the time of design.
2. Minimum delivery volume is 100 acft per year delivered uniformly throughout the year (approximately 60 gpm) delivered through a minimum 2-inch diameter meter. With approval of GBRA, In-District public non-community customers could receive less water than this minimum.
3. Minimum pipeline diameter from the transmission pipeline to the customer's storage tank is 4 inches. The actual diameter required may be larger depending on the customer's commitment and will be determined by GBRA after an engineering review of the pipeline hydraulics.
4. Taps on the customer's approach main between the GBRA transmission pipeline and the customer's storage tank will not be allowed without written approval of the GBRA.

Appendix E
Proposed Customer Connection Criteria

Proposed Criteria for Connection to GBRA Regional Water System in Western Comal and Southern Kendall Counties

(Modified per Draft Basis of Design Report Comments, May 2000)

1.0 Purpose and Scope

In order for the GBRA to evaluate requests for water purchase contracts to obtain water made available by the Regional Water System in Western Comal and Southern Kendall Counties, a set of connection criteria has been developed. The following criteria is to be used both by applicants in developing their request for water and by the GBRA in reviewing applications.

2.0 Customer Classifications

Customers of the system must fall within one of the following classifications:

a. In-district Community Customers, which are "Community Water Systems" as defined by TAC §290.2 and possess a Certificate of Convenience and Necessity issued by the Texas Natural Resource Conservation Commission. Community water systems are entities that provide retail service to at least 15 customers.

b. In-district Public Noncommumity Customers, which are "Noncommunity Water Systems" as defined by TAC §290.2 and are owned by public entities such as school districts, state agencies, or other political subdivisions. Noncommunity Water Systems are entities that provide service to at least 25 persons at least 60 days out of the year.

c. Out-of-district Community customers, which are "Community Water Systems" as defined by TAC §290.2. Out-of-district Community customers are limited to San Antonio Water System, San Antonio River Authority, and Bexar Metropolitan Water District, or as authorized by the GBRA Board of Directors.

d. In-district Retail Customers, which are Customer served directly by GBRA on a retail basis.

3.0 Water System Information

Applicants must provide the following information about their water system.

1. Water system name
2. Owner name and type of ownership
3. Number of customers
4. Annual water use
5. Current Sources
6. Age of system
7. Alternative water sources considered
8. Forecasted population growth at five year increments through year 2050
9. Current per capita use
10. Forecasted per capita use

11. Forecasted annual demand at five year increments through year 2050
12. Water Conservation Plan
13. Other water supplies:
    - Annual delivery capacity of current and planned water supplies
    - Description of how current and planned supplies will be integrated with GBRA water supply to meet annual and summer peak water demands
    - Water chemistry/compatibility issues of other sources
14. Water storage capacity, location, and overflow elevation

4.0 Water Conservation and Drought Contingency Plans

Chapter 288 of the TAC, which outlines requirements for wholesale water suppliers, includes a provision which states that all of the entities to which they sell water are required to have a water conservation plan. The parts of this regulation that relate specifically to the water purveyors begin with section F:

> *(F) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the water conservation plan (by either ordinance, resolution, or tariff) and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter; if the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;*
> *(G) a drought management plan including:*
> *(i) an education and information program concerning the plan;*
> *(ii) notification procedures to identify the initiation and termination of the drought and the corresponding implementation and termination of the drought measures;*
> *(iii) trigger conditions signaling the start of any identified drought period; and*
> *(iv) drought water-use measures corresponding to each trigger condition; and*
> *(H) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and*
> *(I) a means for implementation and enforcement which shall be evidenced by: a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan*
> *(2) Additional conservation strategies. Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements above, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the goals of the water conservation plan to be achieved:*
> *(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;*
> *(B) a program to assist customers in the development of conservation pollution prevention and abatement plans;*
> *(C) a program for reuse and/or recycling of wastewater and/or greywater; and*
> *(D) any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.*
> *Source: The provisions of this § 288.5 adopted to be effective May 3, 1993, 18 TexReg 2558*

Customers must comply with the "Guadalupe-Blanco River Authority, Water Conservation Plan, Wholesale Water Supplier" (Adopted October 1998, as revised). Customer must also comply with the GBRA Drought Contingency Plan.