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ADMITTED TO PRACTICE IN:
ARIZONA, COLORADO, MONTANA,
NEVADA, TEXAS, WYOMING,
DISTRICT OF COLOMBIA

December 7, 2005

Colleen Ryan, Supervisor
Docket Control
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

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AZ CORP COMMISSION
DOCUMENT CONTROL

Re: Las Quintas Serenas Water Company
Docket No. W-01583A-04-0178, W-01583A-05-0326 and W-
01583A-05-0340 (Consolidated)

Dear Ms. Ryan:

Enclosed for filing in the above-referenced consolidated docketed proceedings are fifteen (15) copies of the prepared direct case testimony of the following witnesses for Las Quintas Serenas Water Company ("LQS"):

Mike Wood
Mark Taylor
Kimberly Yaglowski

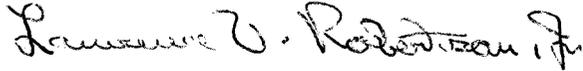
Also enclosed for filing are fifteen (15) copies of LQS's Exhibits A-1 through A-7 and A-13, as marked for identification. The prepared Direct Case Testimony of Ronald L. Kozoman and Exhibits A-8 through A-12 will be filed directly by him.

Colleen Ryan
December 7, 2005
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Copies of the enclosed prepared direct case testimony and exhibits are also being hand-delivered or mailed today to all known parties of record. The testimony and exhibits being filed by Mr. Kozoman will be hand-delivered or mailed by him.

Please let me know if you have any questions. Thank you for your assistance.

Sincerely,



Lawrence V. Robertson, Jr.

Cc: Hon. Jane L. Rodda
Jason Gellman
John Gay
Ronald L. Kozoman

PREPARED DIRECT TESTIMONY OF
MIKE WOOD
ON BEHALF OF
LAS QUINTAS SERENAS WATER COMPANY
IN
DOCKET NOS. W-01583A-04-0178, W-01583A-05-0326
AND W-01583A-05-0340

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PREPARED DIRECT TESTIMONY OF
MIKE WOOD
ON BEHALF OF
LAS QUINTAS SERENAS WATER COMPANY
IN

DOCKET NOS. W-01583A-04-0178, W-01583A-05-0326 AND W-01583A-05-0340

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5
6 Q.1 Please state your name and your business relationship with the Applicant in these
7 proceedings.

8
9 A.1 My name is Mike Wood, and I am a member of the Board of Directors and Vice
10 President of Las Quintas Serenas Water Company ("LQS"). I have served in each of
11 those capacities since June, 2003.

12
13 Q.2 Are you testifying as LQS's policy witness in these proceedings?

14 A.2 Yes.

15
16 Q.3 What is the purpose of your direct case testimony?

17
18 A.3 There are several purposes of my testimony. First, I will generally describe each of the
19 applications or motions which are the subject of these consolidated proceedings, and
20 explain how they are interrelated. Second, I will generally describe the process used by
21 the Board of Directors and LQS's management to determine the manner in which LQS
22 proposes to put itself in a position to comply with the United States Environmental
23 Protection Agency's ("EPA") arsenic concentration regulations. Third, I will describe
24 how LQS proposes to finance the construction of the capital improvements needed to
25 achieve compliance with EPA's arsenic concentration regulations. Finally, I will
26 generally describe how LQS proposes to service the long-term debt that LQS is seeking
27
28

1 authorization from the Commission to incur, in order to fund the construction of the
2 arsenic-related capital improvements.

3
4 In addition to my testimony, LQS is presenting the direct case testimony of three other
5 direct case witnesses. Mark Taylor, an owner and Principal of WestLand Resources, Inc.
6 ("WestLand") will describe the professional engineering services that his firm provided
7 in connection with the development of a Water System and Arsenic Master Plan ("Plan")
8 for LQS, which was adopted by the Board of Directors in March, 2005. That Plan, in
9 large measure, provides the basis for the proposed arsenic-related capital improvements
10 to LQS's water system, which are the subject of these consolidated proceedings. In that
11 regard, Mr. Taylor will discuss the considerations which led WestLand to select the
12 arsenic removal technology which it has recommended. Kimberley Yaglowski, a Vice
13 President and Branch Manager with Commerce Bank of Arizona, will describe the nature
14 of the proposed loan arrangement between the bank and LQS under which LQS would
15 obtain the funds to finance construction of the arsenic-related capital improvements.
16 That loan arrangement is a part of the financing authorization from the Commission that
17 LQS is seeking in Docket No. W-01583A-05-0326. Finally, Ron Kozoman, an
18 experienced utility rate design consultant who has testified before the Commission on
19 numerous occasions, will describe how the Arsenic Cost Recovery Mechanism
20 ("ACRM") that LQS has proposed would operate, and how revenues received by LQS
21 through the ACRM would be used to service the long-term debt incurred to finance the
22 arsenic-related capital improvements. He will also describe LQS's proposed recovery of
23 an annualized amount for arsenic treatment operating expense.
24
25
26

27 Q. 4 Please describe the applications or motions which are the subject of these consolidated
28 proceedings.

1 A. 4 My description will be in layman's language, and of a general nature. By means of a
2 motion filed in Docket No. W-01583A-04-0178, LQS has asked the Commission to
3 revisit and amend Decision No. 67455, which the Commission issued on January 4, 2005
4 in LQS's 2004 rate case. The purpose of the amendment or amendments to that decision
5 would be to authorize LQS to recover, as part of its monthly rates and charges for water
6 service, an amount of money sufficient to enable LQS to service the long-term debt it is
7 proposing to incur in connection with construction of the proposed arsenic-related capital
8 improvements, together with the annualized arsenic treatment related operating expense.
9 The additions to LQS's previously authorized rates and charges that LQS is proposing are
10 the ACRM and the annualized operating expense, and it is that proposal which is the
11 subject of LQS's application in Docket No. W-01583A-05-0340. In this regard, it is
12 important to note that LQS is not seeking to recover any rate of return on the arsenic-
13 related capital improvements that would be financed with the proposed long-term debt;
14 and we are pleased that the Commission's Staff recognized that fact in the Staff Response
15 filed on May 23, 2005 in Docket No. W-01583A-04-0178. The proposed long-term debt
16 to which I refer is the subject of LQS's application in Docket No. W-01583A-05-0326.
17 Thus, as you can see, the motion and the two applications are interrelated.
18
19
20

21 Q.5 Please describe the process that the Board of Directors and LQS's management used to
22 determine what LQS should do in order to place itself in a position whereby it could
23 comply with the EPA's arsenic concentration regulations.
24

25 A. 5 By way of background, both in terms of professional training and experience, I would
26 note that I have been involved in the field of environmental regulation and compliance
27 for many years; and that a significant portion of my responsibilities have pertained to
28

1 water quality issues. Thus, assuring that LQS would select and construct an arsenic
2 removal methodology and facilities that would enable it to fully comply with the EPA
3 regulations, and, simultaneously, discharge its public service corporation obligation to
4 provide adequate and reliable water service to its customers at reasonable rates, was a
5 priority for me. That was also the view of the other two members of the Board of
6 Directors and LQS's management.

7
8 At the time that LQS was in hearings in its 2004 rate case last fall, LQS was exploring
9 several arsenic removal methodologies and media. Malcolm Pirnie Engineering had
10 recently concluded a study for the company, which included four (4) options, with the
11 capital costs associated with these options ranging from \$1,080,00 to \$1,280,000, and
12 yearly operation and maintenance expenses ranging from \$166,000 to \$318,000. In
13 addition, LQS had requested proposals from several other consulting firms, which
14 involved similar or alternative remediation approaches, and was beginning to review
15 them. Finally, it had requested and received information from several Arizona water
16 utility associations, which it had also begun to review.

17
18
19 That continued to be the situation in early January, 2005, when the Commission issued
20 Decision No. 67455, which did not include any recovery of arsenic removal costs in the
21 rates and charges for water service which were authorized. In fact, the Commission
22 expressly declined to make any findings or reach any conclusions as to such matters at
23 that time. However, in Decision No. 67455, the Commission did direct LQS to prepare
24 and submit a plan indicating how it intended to comply with the EPA's arsenic
25 regulations. In the interim, the Board of Directors had concluded that LQS needed to
26 update the master water plan for its system which had been prepared by Buck Lewis
27 Engineering in September, 1991. After considering several alternative proposals, LQS
28

1 retained WestLand to prepare a plan which would address system upgrades or additions
2 necessary to enable the company to continue to discharge its public service corporation
3 responsibilities, and those capital improvements that would allow it to fully comply with
4 the EPA's arsenic concentration regulations. The result was the Plan prepared by
5 WestLand in March, 2005, which, as I have previously indicated, LQS's Board of
6 Directors adopted. A copy of the Plan has been marked as Exhibit A-1 for identification.

7
8 Mark Taylor of WestLand will describe in his direct case testimony the factual
9 circumstances on the LQS system and the design, operating and economic considerations
10 which led his firm to recommend the arsenic treatment methodology and related capital
11 facilities which are reflected and discussed in the Plan. As I have previously indicated,
12 from the perspective of the Board of Directors and LQS's management, I believe that the
13 arsenic treatment program and related facilities set forth in the Plan will enable LQS to
14 fully comply with the EPA's arsenic concentration regulations, and allow LQS to
15 continue to discharge its public service obligation to provide adequate and reliable water
16 service to its customers at reasonable rates.

17
18
19 Q.6 How does LQS propose to finance construction of the arsenic-related capital
20 improvements reflected in the Plan?

21
22 A.6 In the financing authorization application which LQS has filed in Docket No. W-
23 01583A-05-0326, LQS has requested that the Commission authorize it to incur long-term
24 indebtedness in the amount of \$1,648,750. In Section III of the Application, the company
25 indicated that it intended to submit an application to the Water Infrastructure Authority of
26 Arizona ("WIFA") for a loan in that amount; and, in fact, LQS submitted such an
27 application to WIFA on or about June 13, 2005. A copy of that application has been
28

1 marked as Exhibit A-2 for identification. In that regard, I would like to point out that, as
2 a result of a discussion with the Commission's Staff in late June, the amount of loan
3 authorization now being requested in Docket No. W-01583A-05-0326 is less than the
4 amount of the loan requested in the initial application filed with WIFA. That is because
5 approximately \$140,625 of the capital improvements contained in the original \$1,789,375
6 amount set forth in the Plan was determined by LQS and the Commission's Staff not to
7 be related to the proposed arsenic treatment program. Accordingly, on July 7, 2005 LQS
8 amended its application in Docket No. W-01583A-05-0326 to reduce the amount of the
9 requested loan authorization from \$1,789,375 to \$1,648,750. In the event the
10 Commission approves LQS's loan authorization request, as so amended, then LQS will
11 amend its loan request of WIFA as it proceeds to the next step in the WIFA loan
12 application process.

13
14
15 However, and as discussed in Section III of its financing application, because LQS did
16 not want to presume that WIFA would automatically grant its loan request, LQS has also
17 pursued an alternative course of action and sought to obtain a loan arrangement with a
18 commercial bank as a "back-up", so to speak. I am pleased to report in that regard that
19 the company's efforts have been successful. By means of a September 2, 2005 letter,
20 Commerce Bank of Arizona extended a loan commitment to LQS. That loan
21 commitment was accepted by LQS in late September, and a copy of the loan commitment
22 letter has been marked as Exhibit A-3 for identification. Subsequently, in late October,
23 the bank sent LQS a package of loan documents to be used for purposes of finalizing the
24 loan arrangement, in the event that the Commission approves LQS's loan authorization
25 request and the proposed ACRM. Kimberley Yaglowksi, a Vice President and Branch
26
27
28

1 Manager of Commerce Bank of Arizona, will identify and describe each of these
2 documents in her direct case testimony.

3
4 In the event that the Commission approves the loan authorization request, LQS enters
5 into the indicated loan arrangement with Commerce Bank of Arizona, and WIFA
6 thereafter approves LQS's loan request, the terms of the arrangement with the bank
7 would allow LQS to pay off that loan in full without a prepayment penalty. Thus, and
8 thanks to the bank's willingness to work with us, LQS would be in a position to finance
9 construction of the arsenic-related capital improvements at the lowest lender rate
10 available to it.

11
12 Q.7 Did LQS give any consideration to internally financing the capital improvements that
13 would be necessary in order for it to comply with EPA's arsenic concentration
14 regulations?

15
16 A.7 Yes, but only for a brief period of time. As early as the beginning of 2004, the Company
17 was contemplating the need to explore external financing. That feeling was confirmed as
18 we began to examine the arsenic treatment options from a system-wide perspective,
19 beginning with the Malcolm Pirnie Engineering study in June, 2004. At that point in
20 time, it became readily apparent that the cost of the capital improvements we were likely
21 going to be required to construct were well beyond the ability of the company to
22 internally finance, even with a rate increase. As I have previously noted, the rates and
23 charges authorized in Decision No. 67455 do not include any increase for that purpose.

24
25
26 Q.8 How does the company propose to acquire the funds necessary to service the long-term
27 debt it is requesting authorization to incur?
28

1 A.8 That is the purpose of the ACRM, which is the subject of LQS's application in Docket
2 No. W-01583A-05-0340. Ron Kozoman will be presenting direct case testimony and
3 exhibits describing and illustrating the nature of the proposed ACRM and how it would
4 operate as a part of LQS's authorized rates and charges for water service. In layman's
5 language, I would describe it as a mechanism by means of which the company recovers
6 from its customers each month the direct costs of its borrowing from the bank or WIFA,
7 as the case may be. In other words, the company would not be earning any return on the
8 capital improvements financed with the borrowed funds by means of the ACRM, and the
9 revenues received from its customers through the ACRM would be a direct function of its
10 debt service obligation.
11

12 The funds for the arsenic treatment related operating expense would be acquired through
13 a slight increase in the Company's current rate schedule, the details of which also will be
14 explained in Ron Kozoman's direct case testimony.
15

16 Q.9 Do you have anything you wish to add to your direct case testimony?
17

18 A.9 Yes. On behalf of LQS, and myself, I would like to express our appreciation to the
19 Commission and the Commission's Staff for their willingness to reopen the 2004 rate
20 case for the purpose of considering our ACRM proposal. We recognize that what LQS is
21 proposing may require Commission approval of a type that has not been previously
22 forthcoming, and that we may be asking the Commission to move into uncharted waters.
23 In that regard, LQS and its witnesses will do their best to answer any questions and
24 provide any information the Commission, the Commission's Staff or any other party may
25 have or desire.
26

27 Q.10 Does that complete your direct case testimony?
28

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A.10 Yes, it does.

PREPARED DIRECT TESTIMONY OF

MARK TAYLOR

ON BEHALF OF

LAS QUINTAS SERENAS WATER COMPANY

IN

DOCKET NOS. W-01583A-04-0178, W-01583A-05-0326

AND W-01583A-05-0340

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1 PREPARED DIRECT TESTIMONY OF

2 MARK TAYLOR

3 ON BEHALF OF

4 LAS QUINTAS SERENAS WATER COMPANY

5 IN

6 DOCKET NOS. W-01583A-04-0178, W-01583A-05-0326,

7 AND W-01583A-05-0340

8

9

10

Q.1 Please state your name and business relationship with the Applicant as that relationship pertains to these proceedings.

11

12

13

A.1 My name is Mark Taylor. I am an Owner and Principal of WestLand Resources, Inc. ("WestLand"). WestLand has performed various professional engineering services for Las Quintas Serenas Water Company ("LQS") relating to matters that are the subject of these proceedings. Central to those matters is the Las Quintas Serenas Water Company Water System and Arsenic Master Plan ("Plan"), dated March 24, 2005, that WestLand prepared and submitted to LQS. The Plan, and the recommended capital improvements discussed in the Plan, were adopted by the Board of Directors of LQS that same month and occasioned the filing of the applications that are now before the Commission in Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and W-01583A-05-0340.

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23

1 Q. 2 Please describe WestLand and the nature of the professional engineering services
2 it offers to water utilities such as LQS.

3
4 A. 2 WestLand is an engineering and environmental consulting firm located in Tucson,
5 Arizona, and we provide services throughout the southwestern United States.
6 WestLand specializes in civil engineering (water and wastewater), environmental
7 planning, permitting, resource management, landscape architecture, and cultural
8 resources.

9
10 WestLand was founded in 1997 and has grown steadily to its current staff level of
11 over 98 engineers, scientists, environmental planners, landscape architects,
12 archaeologists, GIS and cartographic specialists, and administrative support staff.
13 Our growth is attributed to an impressive track record for repeat clients, the
14 expertise and experience of our staff, and stringent internal quality assurance and
15 quality control programs.

16
17 Engineering services offered by our firm include water resources planning; water
18 and wastewater system planning and design; wastewater treatment design; arsenic
19 treatment system design; biological systems engineering, irrigation and water
20 harvesting system design; constructed wetland design; groundwater recharge
21 system design; and construction management.

22
23 WestLand performs engineering and consulting services for the private and public
24 sectors. Our engineering staff specializes in water planning, permitting, and

1 infrastructure design for private and municipal water providers. WestLand has
2 continuously provided master planning and design services for 35 public and
3 private water systems, and we are the Engineer-of-Record for ten Arizona
4 Corporation Commission-regulated water companies. WestLand also provides
5 construction management and inspection services for water and wastewater
6 treatment systems, booster stations, wells, reservoirs, and water distribution
7 systems designed by our firm. These services include contract administration,
8 field inspections, submittal review, and pay request evaluation.

9
10 Q. 3 Were you the Principal at WestLand who supervised the provision of those
11 professional engineering services that resulted in the development of the Plan and
12 the capital improvements recommendations submitted to LQS?
13

14 A. 3 Yes.
15

16 Q. 4 Please describe your professional background that qualified you to perform this
17 service.
18

19 A. 4 I am a professional civil engineer specializing in water and wastewater system
20 design analysis and treatment technologies. I have practiced in the civil
21 engineering field for more than 22 years, and during the majority of my
22 engineering career, I have specialized in the field of water and wastewater
23 engineering.
24

1 My background includes 20 years of water and wastewater system master
2 planning for large master-planned communities, multiple large municipal and
3 private water companies in Arizona and Nevada, design and construction
4 administration of numerous large- and small-diameter water system mains,
5 booster stations, wells, reservoirs, lift stations for water and wastewater treatment
6 facilities. I have overseen these programs from the initial master-planning of the
7 project through design, permitting, bidding, construction, certification, and project
8 startup.

9
10 Approximately nine years ago, along with my partner, I founded WestLand to
11 create a firm whose engineering department specializes in the field of water and
12 wastewater design and construction.

13
14 I am a registered civil engineer in the states of Arizona, California, Nevada, and
15 New Mexico.

16
17 In addition, I obtained a Grade 2 Operator's License for water treatment, water
18 distribution, wastewater treatment, and wastewater collection systems in the State
19 of Arizona.

20
21 My education includes a Bachelor of Science in Civil Engineering (1981) and a
22 Master of Business Administration (1983). Both of these degrees were conferred
23 upon me by the University of Arizona.

24

1 Q.5 Have you previously testified before the Commission, and, if so, in what type(s)
2 of proceedings and on how many occasions?

3

4 A. 5 Yes, I have testified before the Commission on two or three occasions. These
5 proceedings were related to rate cases and the establishment of off-site
6 infrastructure tariffs.

7

8 Q.6 Please describe the nature of the assignment that WestLand received from LQS
9 that resulted in the development of the Plan.

10

11 A. 6 LQS contracted with WestLand in January 2005 to provide water master
12 planning. The focus of the request was two-fold: first, LQS requested an analysis
13 of the water system with respect to the engineering considerations of providing
14 adequate and reliable service to customers in order to update a plan prepared for
15 the water system in 1991. Second, because the three existing wells that serve this
16 water system exceed the EPA arsenic standard that will become effective in 2006,
17 LQS requested that the Plan address the methodology for arsenic treatment and
18 determine the most appropriate arsenic treatment technology. WestLand worked
19 with the LQS Board of Directors to develop a Plan that would enable LQS to
20 comply with the upcoming EPA arsenic regulations and simultaneously continue
21 to discharge its ongoing public service corporation obligation to provide adequate
22 and reliable water service at reasonable rates.

23

1 Q.7 Please describe how WestLand performed the assignment that resulted in the Plan
2 and include in your description a discussion of the types of personnel that were
3 used and the types of data and information that the firm took into account.
4

5 A.7 The scope and approach to develop the Plan included defining key issues,
6 identifying water resources, source capacity, and water quality including arsenic
7 requirements, and outlining source, treatment, storage, pressure and distribution
8 system requirements. The engineering criteria used to size and locate system
9 upgrades in the Plan are based on typical design criteria for potable water systems
10 in accordance with Arizona Department of Environmental Quality (ADEQ)
11 standards. WestLand began the development of the Plan by compiling
12 information about the existing water system, including water quality; system
13 operation; and the capacity, condition, and location of existing water system
14 infrastructure. WestLand worked with the water system operator and LQS Board
15 members to review water system operational and pressure considerations and
16 conducted field visits to review items pertinent to the development of the Plan.
17 We utilized LQS water usage records and customer data, along with typical
18 engineering criteria for water systems, to determine the current and projected
19 water system demands for average and peaking conditions.
20

21 This information was used to analyze several options for integrating arsenic
22 treatment into the water system and determine what other water system
23 infrastructure was required to address the issues of system reliability and
24 compliance with ADEQ standards. The water system infrastructure considered

1 included well, reservoir, booster station, and pipeline capacity requirements to
2 provide arsenic treatment and adequate source, storage, and distribution capacity.
3 Several options for arsenic treatment were developed, and Opinions of Probable
4 Construction Cost were prepared. WestLand and the LQS Board of Directors met
5 several times throughout the development of the Plan to discuss the various
6 options and the costs associated with construction and operation and maintenance
7 of the facilities, until the final option was selected. The result of this process was
8 the development of the Plan, which was filed with the Commission.

9
10 The work to develop the Plan was performed by me; Kara Festa, another
11 registered Professional Engineer with our firm; and Jeff Lowy, an Engineer-in-
12 Training under our direct supervision.

13
14 Q.8 With reference to the Plan, which has been marked as Exhibit A-1 for
15 identification, please describe the arsenic removal program that WestLand
16 ultimately recommended to LQS, including the methodology and technology
17 selected and the major capital improvements related to the methodology.

18
19 A. 8 Combined arsenic treatment was recommended for Well Nos. 6 and 7, at the Well
20 Site No. 6, while a smaller individual treatment system was recommended for
21 Well No. 5, as seen in Exhibit 1 of the Plan. A new dedicated raw water main
22 from Well No. 7 will bring raw water to the arsenic treatment plant at Well Site
23 No. 6 site for treatment. Both Well Nos. 6 and 7 will pump raw water through the
24 treatment facility at Well Site No. 6, and a combination of blended and treated

1 water will fill the new onsite storage reservoir as seen in Exhibit 2 of the Plan. A
2 new booster station will pump the treated water from the reservoir into the water
3 system at system pressures in accordance with water system demands. Control of
4 the booster station will be based on the level of water in the existing highwater
5 storage tanks located on the tailings dam. A backup generator will be provided to
6 supply the system with treated water during emergencies.

7
8 After considering several arsenic treatment technologies, an adsorption media
9 arsenic removal process was selected, with Severn Trent as the selected vendor.
10 Ferric Oxide arsenic adsorption media removes arsenic from water by adsorbing
11 arsenic onto the surface of the media. The non-treated well water is pumped
12 through a pressure vessel containing the media where arsenic is adsorbed into the
13 media within the pressure vessel. This removal process occurs until all of the
14 available sites within the media are exhausted. The exhausted media can be
15 discarded in landfills and is classified as non-hazardous waste. The major capital
16 improvements for this adsorption media system are steel pressure vessels and a
17 backwash tank.

18
19 Q.9 Directing your attention to the line item descriptions set forth on Page 1 of
20 Appendix "A" to the Plan, please identify those recommended capital
21 improvements that are related to the arsenic removal program WestLand
22 recommended to LQS.
23

1 A.9 All capital improvements listed in the referenced table are directly related to the
2 recommended arsenic treatment facilities, with the exception of approximately
3 150,000 gallons of storage volume that was added to the proposed reservoir at
4 Well No. 6 for purposes of overall water system improvement. Of the
5 \$1,789,375. total capital improvements shown on Line 14 of Page 1, all but
6 \$140,625., is arsenic removal related, for a total arsenic-related amount of
7 \$1,648,750. If LQS did not have to address the arsenic treatment issues, the
8 recommended master plan facilities to address issues such as existing system
9 requirements for reliability and upgrades for future growth would incorporate
10 different locations and sizes of facilities than those contemplated in the Plan.
11

12 Q.10 Please describe those criteria or considerations that influenced WestLand in its
13 selection of the arsenic removal methodology, technology, and facilities it
14 recommended in the Plan.
15

16 A. 10 WestLand analyzed a number of options related to water system infrastructure
17 and arsenic removal technologies as a part of the development of the Plan.
18 Examples of the options considered included separate wellhead treatment for each
19 well site, consolidated treatment of all well sites, and several combinations
20 thereof. Cost analyses of the various options, along with an engineering review of
21 how the options related to the system as a whole, were used to select the most
22 appropriate option. The analysis of required facilities included an engineering
23 review of the existing water system and various methods for addressing the
24 infrastructure requirements and pressure losses through the arsenic treatment.

1 Hydraulic modeling of the water system was used to review the existing water
2 system and the impact of the proposed modifications to the water system on
3 system pressures and anticipated pressure fluctuations.

4
5 Due to concerns about system operational pressures and pressure fluctuations due
6 to receiving pipeline sizes, the best operational solution for the two larger wells
7 was determined to be the use of low pressure well pumps to deliver raw water to
8 the arsenic treatment plant, with bypass flow and treated flow blended for
9 delivery to a finished water storage tank. A booster station will pump from the
10 finished water storage tank into the system using booster pumps that will deliver
11 at system pressure and at appropriate capacity in response to water system
12 demands. This methodology allows for consistent pressure delivery to and
13 through the arsenic treatment system with different combinations of wells in
14 operation and under varying water system demands and energy efficient delivery
15 to the water system with minimal pressure fluctuations and without
16 overpressurizing the system.

17
18 A number of arsenic treatment technologies were considered, including ion
19 exchange, adsorption, membrane processes, and precipitation processes. The
20 adsorption treatment process was selected as the preferred alternative for arsenic
21 treatment because of the simplicity of this method in terms of treatment and
22 operation and maintenance; low backwash volume and no hazardous waste
23 generation; options for the use of various media suppliers; and the successful
24 history of this process for arsenic treatment in the United States and abroad.

1 Severn Trent was selected to provide both the arsenic treatment facilities and
2 Bayoxide E33 media based on anticipated capital and operation and maintenance
3 costs, storage and handling characteristics of the Bayoxide media, the positive
4 reputation and history of Severn Trent in the environmental services industry, and
5 the ability to utilize other medias in the equipment provided.
6

7 Q.11 What is a design report, and how would it differ from a report in the nature of the
8 Plan?
9

10 A.11 The purpose of a master plan is to analyze the demands, water supply, and
11 infrastructure of a water system and to develop a water service concept that
12 addresses the various issues facing a water company. The master plan describes
13 the infrastructure required to accomplish LQS's goals and provides costs and
14 general information regarding the required infrastructure, such as capacity and
15 location.
16

17 A design report supports the construction plans and provides detailed information
18 for review agencies. This report is specific to those facilities that are planned for
19 a certain phase of the recommended master plan improvements and provides
20 much more detailed engineering design, including sufficient computations,
21 figures, and specifications to describe the exact facilities to be constructed and the
22 sizing and details of said facilities.
23

1 Q.12 Has WestLand prepared a design report for LQS as a follow-up to the arsenic
2 treatment program recommended in the Plan?

3

4 A.12 Yes. An Arsenic Treatment Design Report was prepared by WestLand for LQS
5 in September 2005. This report has been marked as Exhibit A-13 for
6 identification. It was prepared under my supervision.

7

8 Q.13 Was a copy of that Arsenic Treatment Design Report provided to the Commission
9 Staff at that time?

10

11 A. 13 Yes. LQS and WestLand agreed to do so at the technical meeting held with the
12 Commission's Staff in late June 2005, which is the meeting referenced in Answer
13 No. 6 of Mike Wood's prepared direct case testimony.

14

15 Q.14 Did the Arsenic Treatment Design Report alter in any meaningful way the
16 conclusions WestLand had reached and the recommendations it had made in the
17 Plan as to an appropriate arsenic removal methodology and the related capital
18 improvements for the LQS water system?

19

20 A.14 No. It confirmed those conclusions and recommendations.

21

22 Q.15 Is there anything else you wish to add to your direct case testimony at this time?

23

1 A. 15 Yes. The Commission's Staff has submitted a number of technical data requests
2 relating to the arsenic removal methodology that WestLand recommended and
3 LQS adopted. WestLand assisted LQS in responding to these data requests, and
4 we hope that the responses have been helpful to the Commission's Staff.

5

6 Q.16 Does that complete your direct case testimony?

7

8 A. 16 Yes.

PREPARED DIRECT TESTIMONY OF
KIMBERLY YAGLOWSKI
ON BEHALF OF
LAS QUINTAS SERENAS WATER COMPANY
IN
DOCKET NOS. W-01583A-04-0178, W-01583A-05-0326
AND W-01583A-05-0340

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PREPARED DIRECT TESTIMONY OF
KIMBERLY YAGLOWSKI
ON BEHALF OF
LAS QUINTAS SERENAS WATER COMPANY
IN
DOCKET NOS. W-01583A-04-0178, W-01583A-05-0326 AND W-01583A-05-0340

Q.1 Please state your name and business address.

A.1 My name is Kimberly Yaglowski, and my business address is 2285 West Ina Road,
Tucson, Arizona, 85641.

Q. 2 By whom are you employed, and in what capacity?

A. 2 I am employed by Commerce Bank of Arizona. I am a Vice President and Branch
Manager.

Q. 3 Please generally describe the responsibilities associated with your position(s).

A. 3 In addition to my duties as manager of the branch office, I am a commercial loan officer
for the bank and have full lending responsibilities consistent with Commerce Bank of
Arizona Loan Policy.

Q. 4 In connection with your responsibilities relating to commercial loans, did you have
occasion to meet earlier this year with representatives of Las Quintas Serenas Water
Company ("LQS") in connection with a possible loan arrangement by means of which
LQS would obtain funds in order to finance the construction of certain capital
improvements to its water system which would enable the company to comply with
arsenic concentration regulations promulgated by the United States Environmental
Protection Agency ("EPA")?

1 A. 4 Yes. On August 11, 2005, Fred Dawson, Executive Vice President of the bank, and I
2 met for approximately an hour with representatives of LQS to discuss a possible loan
3 arrangement for that purpose. The following people were in attendance on behalf of
4 LQS: Mike Wood, a member of its Board of Directors; Steve Gay, General Manager of
5 LQS; Kaycee Conger, Office Manager of LQS; Ron Kozoman, a utility rate design
6 consultant for LQS; and you, as its attorney.
7

8
9 Q.5 Subsequent to that meeting, did the bank give further consideration to LQS's request for
10 a loan for that purpose; and, if so, what was the result?
11

12 A. 5 Yes. Mr. Dawson and I discussed the matter further and continued our review of LQS's
13 request. In connection with our review, we obtained additional financial information
14 from Ms. Conger at LQS and Mr. Kozoman. We ultimately submitted the results of our
15 review to the bank's Loan Committee, together with a recommendation that the request
16 be approved and a letter of commitment sent to LQS. The Loan Committee accepted that
17 recommendation, and on September 2, 2005 I wrote a letter of commitment to LQS
18 outlining the terms of the loan arrangement the bank was prepared to extend. That letter
19 of commitment was accepted by LQS in late September, 2005. Subsequently, during the
20 latter part of October, 2005, the bank transmitted to LQS several loan documents that
21 would be used to formalize the loan arrangement in the event the necessary approvals
22 were obtained from the Commission.
23

24
25 Q.6 Is the September 2, 2005 letter from you to LQS, which has been marked for
26 identification as Exhibit A-3, the loan commitment letter which you have just described?
27

28 A. 6 Yes.

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Q.7 Please describe the central features of the proposed loan arrangement between Commerce Bank of Arizona and LQS.

A.7 The principal amount of the loan would be \$1,650,000 and the interest rate would be fixed at 8%. The loan would be structured so as to provide a 180-day non-revolving line of credit, with monthly interest payments, during the period that the arsenic-related capital improvements were being constructed. Once construction had been completed, the loan would be fully amortized over a 10-year period with monthly principal and interest payments. Funding of the line of credit and the loan would be subject to, and conditioned upon, the Commission having approved the loan authorization request and the Arsenic Cost Recovery Mechanism ("ACRM") proposal which are the subject of these proceedings. The commitment letter also provides for a 3/4 point loan fee and a \$300 documentation fee at closing.

As collateral, the bank would require a "blanket assignment" or senior security interest in LQS's water system assets. In addition, the bank would be provided with a loss payable endorsement from an insurance company acceptable to the bank for property damage to or loss of the assets in which the bank had a security interest.

As noted by Mr. Wood, in his direct case testimony, there would be no prepayment penalty in the event that LQS subsequently obtained a more favorable loan arrangement with the Water Infrastructure Financing Authority of Arizona ("WIFA") or any other lender. In the event of a payoff, the bank's security interest in the assets of LQS would be extinguished.

1 Q.8 I would ask you now to examine the following documents, which have been marked as
2 follows for identification: Exhibit A-4 [Corporate Resolution To Borrow/Grant
3 Collateral]; Exhibit A-5 [Promissory Note]; Exhibit A-6 [Commercial Security
4 Agreement]; and Exhibit A-7 [Business Loan Agreement]. Are these the loan documents
5 that the bank sent to LQS in late October, 2005 that would be used to formalize the loan
6 arrangement with LQS in the event that the Commission should approve the same?
7

8 A.8 Yes. However, the "Loan Date" and the "Maturity Date" shown on each would be
9 revised, as necessary, to reflect the passage of time between when these documents were
10 prepared and when the Commission issued a final decision in these proceedings
11 approving LQS's financing authorization request and the proposed ACRM.
12

13 Q.9 Is the bank's willingness to enter the loan arrangement with LQS expressly contingent
14 upon the Commission's approval of both that request and that proposal?
15

16 A.9 Yes, it is.
17

18 Q.10 Please generally describe the nature and purpose of the documents which have been
19 marked for identification as Exhibit Nos. A-4, A-5, A-6, and A-7.
20

21 A.10 Exhibit A-4 Corporate Resolution: The individual officers/signers named on this
22 document are authorized to represent company in matters pertaining to this loan.
23 Specifically, they have company approval to sign loan documents, borrow funds, and
24 encumber collateral.

25 Exhibit A-5 Promissory Note: This is the borrowing instrument itself. It details the
26 terms and conditions of the loan agreement including payment terms, interest rate,
27 maturity date, etc.
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Exhibit A-6 Security Agreement: This is the pledge agreement and it specifies the collateral for the loan and authorizes the lender to secure a proper security interest in the collateral.

Exhibit A-7 Business Loan Agreement: This document lays out the borrower's responsibilities over the life of the loan with regard to business operations, financial reporting obligations, and future indebtedness, among other issues. Also, it provides certain warranties from the borrower as to the validity and veracity of information and documentation provided in the loan process.

Q.11 Is there anything else you wish to add to your direct case testimony at this time?

A. 11 Only to say that I will try to answer any questions that the Commission, the Commission's Staff or any other parties may desire to ask me.

Q.12 Does that complete your direct case testimony?

A. 12 Yes, it does.

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and

W-01583A-05-0340

**Applicant's
Exhibit A-1**

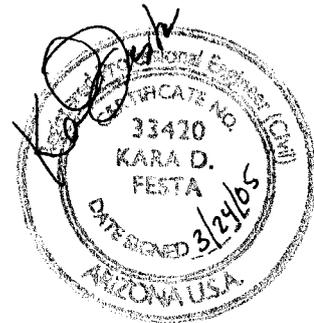
**LAS QUINTAS WATER COMPANY
WATER SYSTEM AND ARSENIC
MASTER PLAN**

Prepared for:

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MARCH 2005
Job No. 1148.01 A 8000

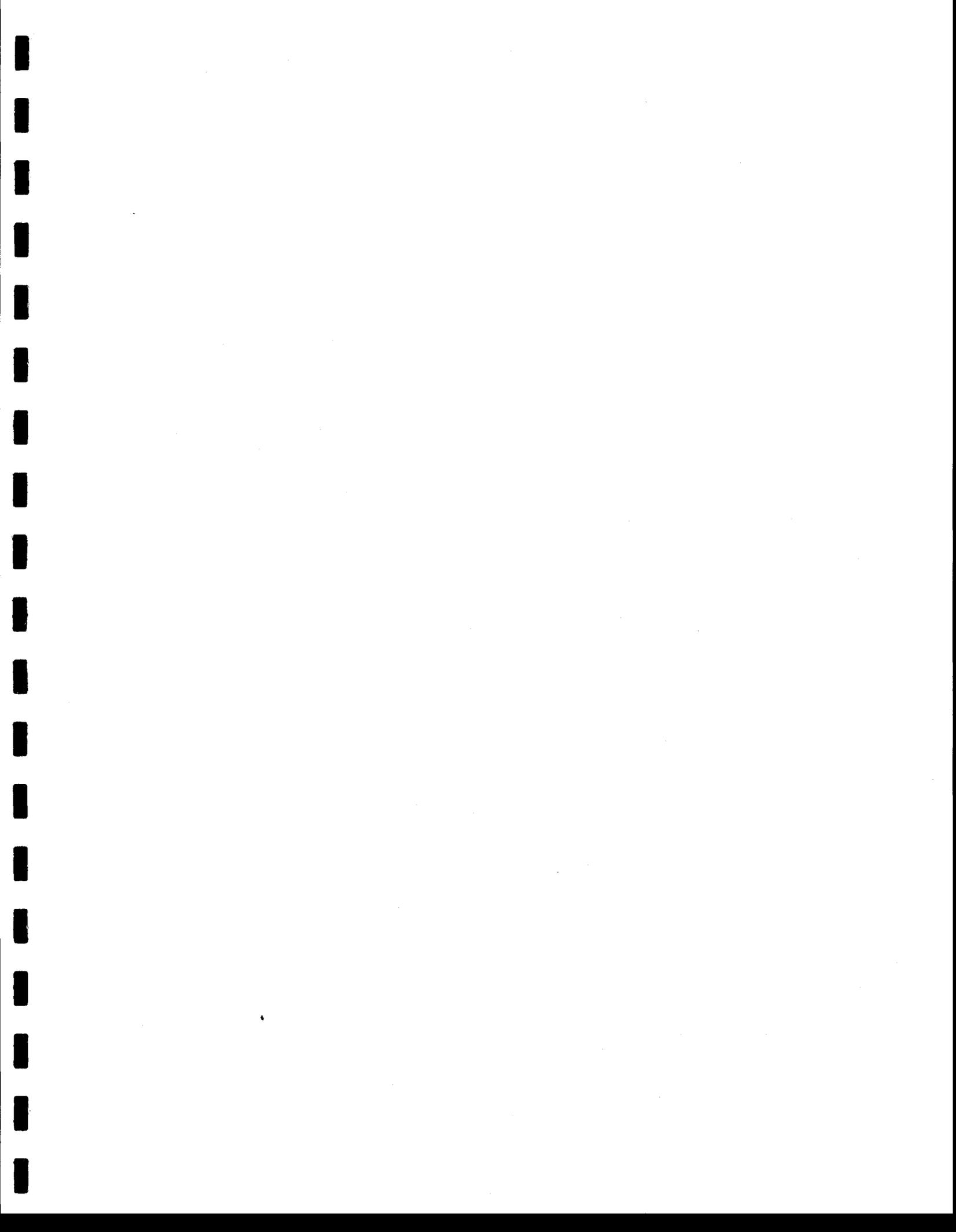


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LIST OF ACRONYMS

ADD	average daily demand
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
CC&N	Certificate of Convenience and Necessity
EPA	Environmental Protection Agency
gpcd	gallons per capita per day
gpm	gallons per minute
lf	lineal feet
MCL	Maximum Contaminant Level
OPCC	opinion of probable construction cost
PDD	peak day demand
PHD	peak hour demand
POE	point of entry
ppb	parts per billion
pphu	persons per housing unit
ppm	parts per million
psi	pounds per square inch
VFD	variable frequency drives

CHAPTER 1. INTRODUCTION AND SITE CONSIDERATIONS

The purpose of this report is to provide a potable water system Master Plan document for the Las Quintas Serenas Water Company, to address water system infrastructure needs of the current and future system including arsenic treatment issues. This document will provide a planning basis for present and future operation of the Las Quintas Serenas system in a manner consistent with the existing facilities, physical constraints, and resources of Las Quintas Serenas Water Company. The infrastructure requirements will be developed based on Arizona Department of Environmental Quality (ADEQ) requirements and standard engineering practices.

This Master Plan is intended to be a flexible, working document allowing Las Quintas Serenas Water staff to adjust planning and water system facilities to meet future conditions. However, this document cannot anticipate every future outcome and, as such, should be reviewed periodically to update the assumptions for water system boundaries, population growth, projected water usage, and infrastructure requirements. It is recommended that these updates be provided at five-year intervals, or as appropriate, to allow timely updates to the capital improvement program and funding issues.

The Las Quintas Serenas Water System Certificate of Convenience and Necessity (CC&N) includes portions of Township 17 South, Range 13 East, Sections 21, 22, 23, 26, and 27, west of Interstate 19 between El Toro Road and Anamax Mine Road (Exhibit 1). The water system currently operates on a single pressure zone. The existing system's water demands are provided by three wells which all pump to two storage tanks floating the pressure zone. The Water Company currently serves approximately 1,000 residential units. The water system also has two standpipes that are used by water-haulers to provide water to approximately 500 homes. There are approximately 50 commercial customers in the water system.

CHAPTER 2. SCOPE AND APPROACH

2.1. DEFINE KEY ISSUES

The development of a Master Plan requires defining a strategic approach, key issues, and policies early in the planning process. These key issues and policies, and their initial assumptions, are required to design the ultimate water system. The policies set within this section will affect the required water system layout, facility sizing, reliability, and costs of the required infrastructure.

2.2. WATER RESOURCES AND DEVELOPMENT

The Las Quintas Serenas water system currently relies solely on groundwater supplies for its water source production. It is anticipated the water company will continue to develop new groundwater wells to serve drinking water needs. The planning of well locations must take into account a number of factors, including the hydrologic availability of water, potential contamination from surrounding industry, location of the demand, and the ability to integrate treatment capacity into the system, as it will likely be required in the future. Water resources will also be impacted by future regulations dealing with limitations on arsenic content in the water, as discussed in Section 2.3.1, below.

2.3. WATER SOURCE CAPACITY AND QUALITY REQUIREMENTS

The ADEQ standards require that the well system be capable of providing peak-day demand (PDD) for the entire system with the largest well out of service. This Master Plan will develop the capacity requirements and locations for wells to meet this requirement. Water quality regulations for arsenic will require the treatment of groundwater prior to distribution. The layout of new wells within the distribution system should be designed to allow the integration of future treatment facilities into the water system.

2.3.1. Arsenic Requirements

In January 2001, the Environmental Protection Agency (EPA) modified 40 CFR Parts 9, 141, and 142, to adopt a new arsenic Maximum Contaminant Level (MCL) for drinking water. The rule modification lowered the MCL for arsenic from 50 parts per billion (ppb) to 10 ppb. This rule applies to all community water systems and non-transient non-community water systems, including the Las Quintas Serenas water system. The date established for compliance with this ruling is January 23, 2006. Compliance must be obtained at all points of entry (POEs) within the system, meaning that all water sources that serve directly into the system must be providing an arsenic level of 10 ppb or less by January 23, 2006.

2.5. STORAGE REQUIREMENTS

Storage capacity is a highly critical element in the design and operation of water systems. Proper storage provides operational flexibility and system reliability. Reservoir storage is used primarily to accommodate hourly fluctuations and demand, PDD fluctuations, fire-flow requirements, and emergency reserve storage. Each of these requirements added together form the required storage capacity. Current ADEQ criteria typically require 1.25 times the average daily demand (ADD) of the peak month plus fire-flow requirements to be the minimum storage capacity per zone. Under certain circumstances, in service areas with excess well capacities, the storage capacity may be lowered. Due to the excess available well capacity, this Master Plan will develop storage criteria using 1.0 times ADD, rather than 1.25 times ADD of the peak month.

The goal of this Master Plan is to develop storage capacity using floating storage wherever possible. The water surface of the storage tank is set at the high water elevation for the zone, which is generally about 100 feet above the highest home in the zone. This allows the homes within the zone boundary to be served directly from the storage tank by gravity and the system pressure regulated by the storage tank elevation. This method provides a highly reliable system with very low-pressure fluctuations. The system will also continue to operate during power outages using the remaining water in the storage tank system. However, because of the location of the storage tank on an easement on a mine tailing embankment, some storage located within the distribution system may also be appropriate, for redundancy.

2.6. PRESSURE REQUIREMENTS

Pressure extremes in water systems result in a potential for contamination to enter the system. Low pressures may allow polluted fluids to be forced into the system. High pressures may cause ruptures or breaks. Normal working pressure in the distribution system should not be less than 40 pounds per square inch (psi). System pressures under peak-day conditions should not drop below 35 psi anywhere within the system. The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. This is generally understood to mean that the minimum residual pressure must be 20 psi for each customer during a flow condition of peak day plus fire flow. As discussed below, because Las Quintas does not currently provide fire flow, peak hour demand (PHD) would be considered the worst-case condition for analyzing the current system. Maximum pressures of as much as 100 psi can be allowed in small, low-lying areas not subject to high-flow rates and surge pressure. The Uniform Plumbing Code limits water pressure within the individual property owners' plumbing to 15 to 80 psi. Boosting or regulating the pressure from the meter to the customer is the responsibility of the customer.

2.7. FIRE-FLOW POLICY

The Las Quintas Serenas Water Company does not provide fire flow to any customers at this time. Fire-flow requirements for homes typically vary from 1,000 to 1,500 gallons per minute (gpm), depending on the size of the homes. The typical residential subdivision is assumed to have a fire-flow requirement of 1,000 gpm for a two-hour duration. Commercial facility fire-flow requirements also vary depending on the square footage of the commercial building, occupancy type, building material type, exposure distance to other buildings, and whether the structure is sprinklered. Typical commercial facilities have fire-flow requirements of at least 1,500 gpm for a two-hour duration. The local fire district can adjust fire flow requirements, if the nature of the system or the rural nature of the area precludes the full fire flow per the Uniform Fire Code (UFC).

The goal of this Master Plan is to develop adequately sized storage, properly designed pressure zones, and water transmission mains sized to provide as much fire flow as practical to existing areas, and to provide adequate fire flow for new development. This Master Plan will develop criteria and propose infrastructure upgrades to improve overall fire protection of the water system. The fire flow requirement assumed for the review of future system infrastructure in this Master Plan will be 1,500 gpm.

2.8. WATER MAIN REQUIREMENTS

The goal for this Master Plan is to develop a water transmission system that will integrate the existing infrastructure with system upgrades that can take advantage of the floating storage. Transmission and distribution systems should be sized and arranged to minimize friction-generated line losses and provide fire flows. The water transmission and distribution system should be looped wherever possible. In addition, appropriate valving locations and intervals should be provided to isolate small sections of main during breakages and reduce the number of residences out of service.

2.9. SYSTEM UPGRADES

This Master Plan will develop the system design criteria to guide the water company in designing new water facilities. The system design criteria will include methods for demand calculations, peaking factors, water supply requirements, the number and capacity of wells required, storage tank capacity requirements, emergency backup systems, distribution system sizing, and treatment requirements.

The Master Plan will identify upgrade requirements for the existing water system and for the future anticipated system, and specify the required new facilities and/or facility upgrades. These facilities may include additional or upgraded wells, storage tank capacity additions, transmission and distribution main augmentations, and arsenic treatment facilities. Projected cost estimates will be provided for these facilities.

CHAPTER 3. ENGINEERING CRITERIA

Based on the information presented in Chapter 2, the system design criteria for the Master Plan are described below in terms of demand, supply, storage, and distribution system assumptions.

3.1. DEMAND CRITERIA

Demand, residency estimates, and peaking factors are based on the typical criteria for similar systems and from empirical data provided by the water company. This report used a variety of sources to determine the number of persons per residence, annual usage per person, and peaking factors. Numbers of persons per residence for Las Quintas Serenas Water Company are taken from Arizona Department of Water Resources, (ADWR) census information provided to the Water Company. Commercial demands are incorporated into the ADD for the residential customers.

- Average daily per capita water usage for residential customers..... 110 gpcd
- Average number of persons per single-family residence per ADWR2.910
- Average number of persons per multi-family residence per ADWR2.484
- Average number of persons per standpipe residence per ADWR3.040
- Average number of persons per single-family residence for future development..... 3.0
- Ratio of peak-day to average-day use.....2.0
- Ratio of average-day use of peak month to average-day use..... 1.25
- Ratio of peak-hour to average-day use3.5

gpcd – gallons per capita per day

3.2. SUPPLY CRITERIA

- Well capacity to meet PDD with the largest well out of service.
- Minimum supply to the system to meet PHD or PDD plus fire flow, whichever is larger, for systems without floating storage, or PDD for systems with floating storage.

3.3. STORAGE CRITERIA

- Provide storage volume equal to a minimum of 1.0 times the ADD (for multi-well systems).
- Provide additional storage volume required to provide 1,500 gpm fire flow for a two-hour duration for future system infrastructure sizing.

3.4. DISTRIBUTION SYSTEM CRITERIA

- System design and construction to meet ADEQ requirements.
- Maximum friction head loss for lines up to and including eight inches in size to be 8 feet per 1,000 feet or less. Head loss for lines over eight inches in size to be 5 feet per 1,000 feet or less, according to pipe size.
- Distribution lines to be sized and arranged to provide fire flows to the extent possible.
- Water will be supplied at the customer's meter within a static pressure range of 35 to 85 psi. Due to localized conditions, certain locations may receive water pressure slightly less or greater.

CHAPTER 4. EXISTING SYSTEM ANALYSIS

The purpose of this chapter is to provide information about the existing water system facilities and the sufficiency of those facilities to meet the current system demands. The proposed infrastructure upgrades to address inadequacies in the existing system are discussed in Section 4.5, and shown on Exhibit 1.

4.1. EXISTING SYSTEM OPERATION

The Las Quintas Water system currently operates as a single pressure zone, with an elevation range from approximately 2860 to 2990 feet. The system has two storage tanks with a combined capacity of 90,000 gallons, which provide floating storage for the single zone. The highwater elevation of the storage tanks is approximately 3057 feet. The zone is supplied normal operating pressure by the storage tanks, which are supplied by three wells pumping directly into the system. Most of the mains are 6-inch and 4-inch, with minor amounts of 2-inch. There are some 10-inch and 12-inch water mains near Well No. 6 and the storage tanks. The water company has supplied the system's hydraulic data and layout. The location of existing system facilities is shown in Exhibit 1.

4.2. DEMANDS

The demand calculations for the existing water system are based upon the demand criteria in Chapter 3. The water company has provided the number of customers for each type of residence. Table 1 provides a summary of the existing system demands.

- Single Family Residence971
- Multi Family Residence42
- Standpipe Residence504
- Total Population = [(971*2.910) + (42*2.484) + (504*3.040)].....4,462

Table 1: Existing System Demands

Population	Average Day Demand (gpd)	Average Day Demand (gpm)	Average Day of Peak Month (gpm)	Peak Day Demand (gpm)	Peak Hour Demand (gpm)
4,462	490,820	341	426	681	1,194

4.3. WELLS

The Las Quintas Serenas Water Company currently operates three wells, Well Nos. 5, 6, and 7. These three wells provide a combined maximum capacity of 1,475 gpm. Well No. 7 is located near the southern end of the CC&N and provides between 600 to 850 gpm. This well has a variable frequency drive that changes the operational speed of the well based on pressure in the water system at the well site. Well

No. 6 is located near the southwest corner of the CC&N. Both an electric motor and a natural gas engine operate Well No. 6. The electric motor provides 350 gpm, while the natural gas engine provides 425 gpm. This type of operation is required for Las Quintas Serenas Water Company because of their interruptible power agreement with Trico Electric. Well No. 5 is located near the middle of the southern portion of the water system. This well has a submersible motor and provides 200 gpm. Well No. 5 has shown signs of decay and may be in the process of collapsing. Although currently producing 200 gpm, Well No. 5 is not considered a reliable asset to the water system's long-term supply requirements, although it will be utilized in the short-term as an emergency backup until such time as additional well capacity upgrades are provided.

As shown in Table 1, the current system PDD is calculated at 681 gpm. The largest well in the system, Well No. 7, appears capable of supporting the current PDD of the water system. The current system is also capable of providing PDD with the largest well out of service, provided that the capacity of Well No. 5 is available.

Water quality analysis for the wells indicates that all three have arsenic levels that will not meet the EPA requirement of less than 10 ppb by January 23, 2006 unless corrective measures are taken. Arsenic treatment will play a significant role in the location of the POE for the wells into the system. The POE is the point at which the water from the well enters the distribution system and may be consumed by the public. All required treatment and testing requirements must be performed before the POE. Well capacity and arsenic levels are provided in Table 2.

Table 2: Existing Wells

Facility	Well Capacity (gpm)	90th percentile Arsenic Levels (ppb)
Well No. 5	200	10.4
Well No. 6	350-425	15
Well No. 7	600-850	12

4.4. STORAGE

The existing system has two storage tanks. Both storage tanks are at the same site, located on the eastern edge of the tailings dam on the nearby mine property. The tanks have a total capacity of 90,000 gallons, split between a 60,000-gallon storage tank and a 30,000-gallon storage tank. The storage requirement for the existing system is 1.0 times ADD, assuming fire flow storage will not be provided for the existing system. For this system the ADD is 341 gpm, or 490,820 gpd. The total existing storage requirement is, therefore, approximately 490,820 gallons, which leaves an existing storage deficit of approximately 400,000 gallons. Table 3 gives a summary of the existing facilities.

Table 3. Existing Storage Requirements

Existing Capacity (Gallons)	Existing Storage Requirement (Gallons)	Existing Storage Deficit (Gallons)
90,000	490,820	400,820

4.5. EXISTING SYSTEM INFRASTRUCTURE REQUIREMENTS

The approach to the construction of new infrastructure to serve the existing water system must take into account the various requirements to provide a comprehensive plan that addresses the issues related to water quality, and storage deficiencies. Long-term well capacity issues will be addressed under the future system requirements section, as it is assumed that the existing well capacity will be sufficient for the short-term needs of the water system. The recommended infrastructure as discussed in this chapter is shown on Exhibit 1.

The first priority for Las Quintas Serenas Water Company is to construct facilities that will allow the water system to provide water meeting the new arsenic standard. The secondary priority is to address the shortage in storage capacity. A variety of options were considered to address these concerns including arsenic treatment at each well site, various combinations of centralized arsenic treatment, and various storage tank locations. The alternative selected to address existing system requirements allows the integration of both arsenic treatment and storage facilities into one water system project. In general, it is most efficient to treat or test well water by concentrating numerous sources into a single centralized system before pumping into the distribution system. The water system facilities proposed for the existing system include a combined treatment system for Well Nos. 6 and 7, with a new storage tank and booster station for delivering treated water, and a small separate treatment system at Well No. 5. An Opinion of Probable Construction Cost (OPCC) for the existing system facilities is provided in Appendix A.

4.5.1. Well Nos. 6 and 7 Arsenic Treatment

The existing system infrastructure to address arsenic concerns at Well No. 6 and 7 will include a new 1,275-gpm iron-media adsorption arsenic treatment system, 400,000-gallon storage tank, and 850-gpm transfer booster station at the existing Well No. 6 site. A new 8-inch water main approximately 2,500 feet in length will be required to connect Well No. 7 to the site. The Well No. 6 site was selected for the treatment system due to visibility concerns at Well No. 7. Site piping will allow either or both of the wells to deliver directly into the arsenic treatment system. The treated water meeting the new arsenic standard will fill a new 400,000-gallon tank located at the Well No. 6 site. A variable frequency drive (VFD) transfer booster station with a capacity of 850 gpm will then pump treated water from the tank into the system. A concept site layout for the new facilities at the Well No. 6 site is shown on Exhibit 2.

The arsenic treatment unit constructed at the Well No. 6 site will be a dual-vessel layout for redundancy purposes. The actual vessels will be sized to accommodate the total capacity of both wells operating

together, approximately 1,275 gpm, so that the system can be operated in this manner as future demands increase. However, it is anticipated that only one of the two wells will need to be running under the current system operation scenario, which will result in longer media life than at full capacity.

The arsenic treatment system will be designed with a flow bypass, to allow treatment of only a percentage of the full flow from either or both wells. The total flow actually going through the arsenic treatment unit will be lower than the well capacity, and the bypass flow will be blended back with the treated water from the arsenic treatment facility. The flow split will be designed to allow treatment to a blended arsenic level of approximately 8 ppb. Because the exact flow split will be determined during final design, and the overall site addresses the total flow from the wells, the total capacity of the treatment system is listed as that of the wells, although not that much flow will actually go through the adsorption vessels.

The transfer booster station will have two 425-gpm VFD pumps, and an extra suction and discharge space for a future pump as demand increases. It is anticipated that this booster station will be a pre-packaged, skid-mounted VFD pump station. Until pipeline deficiencies in the system are addressed as part of the future system upgrades, this booster station cannot actually be upgraded to a higher flow rate. This booster station will typically operate by level control based upon the elevation of the water level in the elevated storage tanks. This booster station could also be designed to be pressure controlled to increase fire protection to the surrounding area. It is anticipated that the booster station will be built with a VFD that will allow the booster pumps to minimize over-pressurization of the water system due to small pipeline sizes in the system. A back-up generator would be included at this facility for emergency power.

Both Wells 6 and 7 will undergo modifications during this process due to the new pressure requirements of pumping to the new storage facility with lower total dynamic pumping head. When these modifications are made the water company will explore options for increasing the flow rate from both wells. Further analysis is needed to determine the maximum safe yield of both wells.

4.5.2. Well No. 5 Arsenic Treatment

Well No. 5 will be equipped with a pre-packaged skid-mounted 200-gpm arsenic treatment facility. Well No. 5 will be equipped only to allow for emergency operation when one of the other wells go offline. This new arsenic treatment facility will be skid mounted to provide the option of moving it to a future location. The facility will include a bypass with blending to minimize the size of the adsorption vessels.

4.5.3. Storage Capacity

The initial storage capacity needs of the existing system will be addressed through the addition of the new 400,000 gallon tank at the Well No. 6 site as a part of the arsenic treatment system. This storage tank will provide additional flexibility in the operation of the water system for meeting peak hour demands. This storage tank will not provide floating storage.

CHAPTER 5. FUTURE SYSTEM ANALYSIS

The water system design criteria, as previously provided, were used to develop the future water system capacity requirements. Future system requirements include the capacity of wells, storage, arsenic treatment, and water mains to serve future demands. The proposed infrastructure upgrades to address inadequacies in the existing system are discussed in the following chapter.

5.1. POPULATION PROJECTIONS

The water system analysis is based on approximate number of units at build-out for the water system. The focus of the infrastructure requirements of this Master Plan will be on development within the existing water system pressure zone boundary. This section of the water system has an approximate buildout of 700 additional single-family residential units based on current land uses and anticipated development, as shown in Exhibit 3.

There is a small section within the CC&N to the west of the existing water system that will require a new pressure zone to be developed to serve the area. Two subdivisions, Twin Buttes and Palo Seco have a combined 100 single-family residential units planned in this area. Two other tracts of land will likely see similar development. All of these areas are located within the CC&N but are outside of the existing water system zone. These sections will be required to develop their own infrastructure independent of the existing system. The sizing, layout, and locations of the infrastructure to serve this area will be developer-driven and will be covered under a separate master plan, as appropriate.

5.2. FUTURE SYSTEM DEMANDS

The demand criteria in Section 3.1 were used in calculating the buildout demands for the anticipated 700 additional units. Table 4 provides a summary of the future system demands.

- Total Population [4,462 (existing) + 700*3.0 (future)]6,562

Table 4: Future System Demands

Population	Average Day Demand (gpd)	Average Day Demand (gpm)	Average Day of Peak Month (gpm)	Peak Day Demand (gpm)	Peak Hour Demand (gpm)
6,562	721,820	501	627	1,002	1,753

5.3. WELLS

Well production requirements are based on meeting PDD with the largest well out of service. PDD for the system at buildout is calculated to be 1,000 gpm.

5.4. STORAGE

The additional 700 units anticipated for buildout will increase this storage requirement by 231,000 gallons. Including fire flow storage capacity requirement would increase the storage requirement by another 180,000 gallons. The total calculated storage requirement for the future system buildout is approximately 900,000 gallons, as shown in Table 5.

Table 5: Future Storage Requirements

Available Capacity (Gallons)	Future Storage Requirement (Gallons)	Future Storage Deficit (Gallons)
400,000*	901,820	501,820

*Based upon 400,000 gallons at Well No. 6 site and assuming the existing 90,000 gallons at the floating storage site is replaced or otherwise not available for use.

5.5. FUTURE SYSTEM INFRASTRUCTURE REQUIREMENTS

Well and reservoir projects, which are recommended as future system upgrades are shown on Exhibit 3. There will also be various pipeline projects to address headloss issues in the water system and improve the looping and operation of the water system, although these are not discussed specifically in this report. An Opinion of Probable Construction Cost for the future system upgrades is included in Appendix A.

5.5.1. Well Requirements

The water company will be exploring options to increase the capacity of Well Nos. 6 and 7 as part of the arsenic treatment project. If it is determined that the new well capacity is sufficient to meet 1,000 gpm PDD with the largest well out of service then no additional wells would be required. In order to meet this requirement each well would need to be increased to at least 1,000 gpm capacity. The need for more source capacity should be continually monitored by Las Quintas Serenas Water Company to ensure that the water company is able to supply PDD with largest well out of service. For purposes of this master plan, we have assumed that a new well would be required, as it is currently unknown whether the well capacities at Well No. 6 and 7 can be increased sufficiently to accommodate all future demands. The actual well capacity required will depend on the required capacity, and pump test results, but this report provides for a new 600 gpm well, based on the existing capacity of the other wells. Several factors will determine the probable location of this new well including, well spacing, proximity to efficient hydrologic aquifer supply, water quality, proximity to the existing distribution system to pump the excess water to

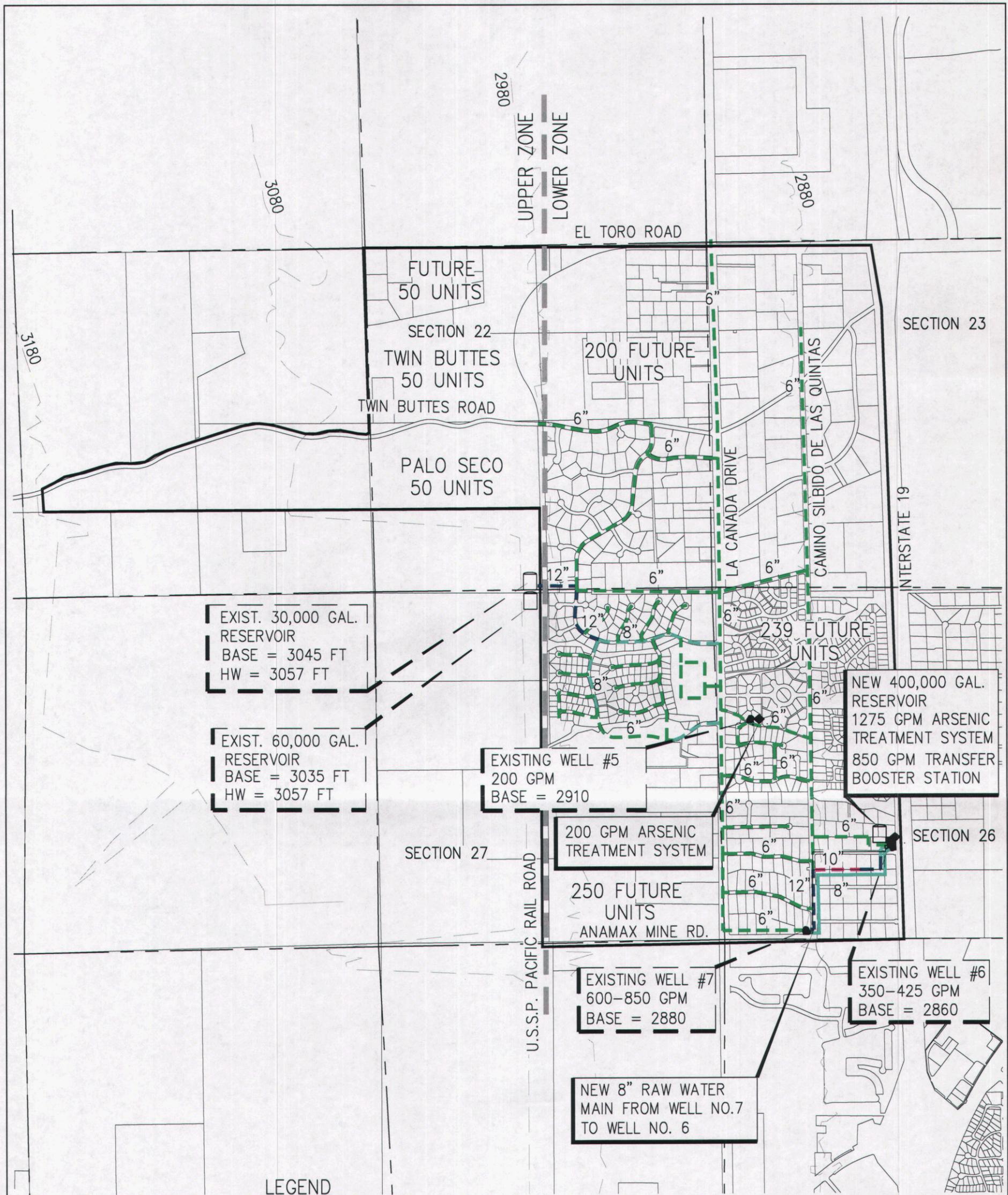
deficient portions of the water system, and land availability. There is a potential well site located near the north end of the CC&N area that could be used for the new well site.

Any new well will likely require an additional onsite arsenic treatment facility, although studies can be performed at the time of well construction to try and reduce arsenic levels through specific well construction methods. The arsenic treatment will be able to pump directly into the system and will not require an additional storage facility or booster station. Appropriately sized mains will also be required from the new well to convey the water to the system, and to the floating reservoir.

5.5.2. Storage Requirements

The recommendation for addressing the storage deficit for the buildout condition is to add storage capacity at the floating reservoir site on the mine tailings. The new storage tank at this site should be constructed as a taller tank or at a higher elevation, to raise the system high water level from 3,057 to at least 3,070 feet and address low-pressure issues at the top of the existing pressure zone. It is assumed that the 30,000-gallon storage tank will be abandoned to make a space for the new tank, and that the 60,000 gallon tank will not be available for normal use, because of the different highwater elevation of the new tank. The existing 60,000-gallon tank could be kept in place for temporary use to allow the future reservoir to be taken out of service for maintenance. Assuming a 400,000-gallon storage tank is constructed at the Well No. 6 site as part of the arsenic treatment upgrades and the capacity of the existing tanks is not available, the total buildout scenario storage requirement will be approximately 500,000 gallons at the mine tailings floating reservoir site.

EXHIBITS



EXIST. 30,000 GAL. RESERVOIR
BASE = 3045 FT
HW = 3057 FT

EXIST. 60,000 GAL. RESERVOIR
BASE = 3035 FT
HW = 3057 FT

EXISTING WELL #5
200 GPM
BASE = 2910

200 GPM ARSENIC TREATMENT SYSTEM

250 FUTURE UNITS
ANAMAX MINE RD.

EXISTING WELL #7
600-850 GPM
BASE = 2880

NEW 8" RAW WATER MAIN FROM WELL NO.7 TO WELL NO. 6

NEW 400,000 GAL. RESERVOIR
1275 GPM ARSENIC TREATMENT SYSTEM
850 GPM TRANSFER BOOSTER STATION

EXISTING WELL #6
350-425 GPM
BASE = 2860

LEGEND

-  EXISTING 6 INCH TRANSMISSION MAIN
-  EXISTING 8 INCH TRANSMISSION MAIN
-  EXISTING 10 INCH TRANSMISSION MAIN
-  EXISTING 12 INCH TRANSMISSION MAIN
-  C C & N BOUNDARY
-  ZONE BOUNDARY
-  NEW 8 INCH TRANSMISSION MAIN
-  WELL
-  ARSENIC TREATMENT SYSTEM
-  RESERVOIR

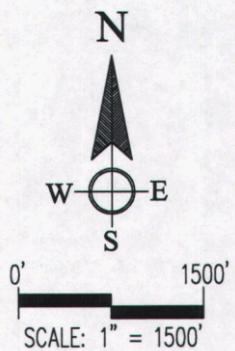
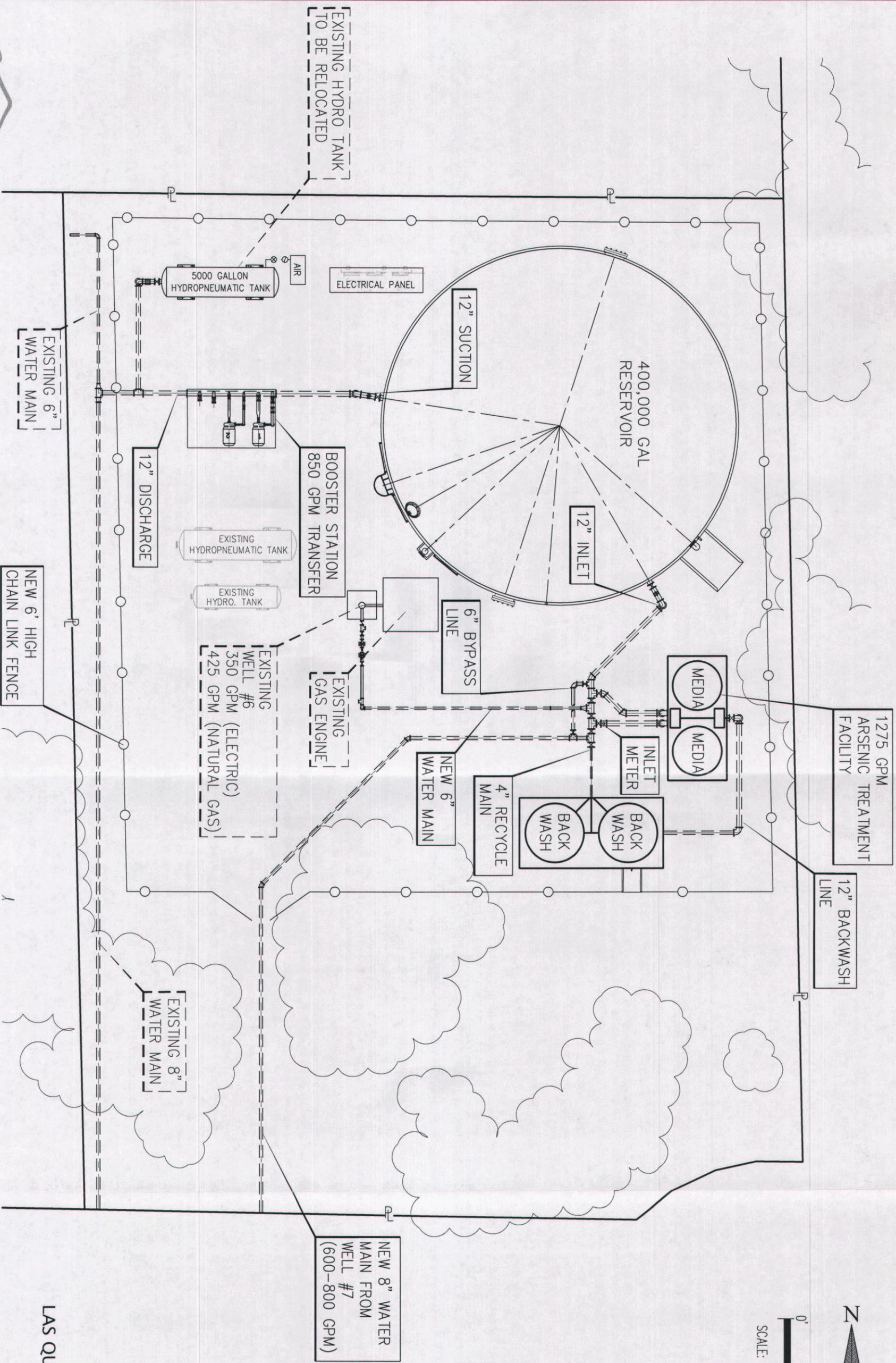


Exhibit 1
LAS QUINTAS SERENAS WATER COMPANY
Water System Infrastructure
EXISTING SYSTEM LAYOUT AND UPGRADES

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WestLand Resources Inc.
Engineering and Environmental Consultants
2343 E. Broadway Blvd., Suite 202
Tucson, Az 85719 (520) 206-9585

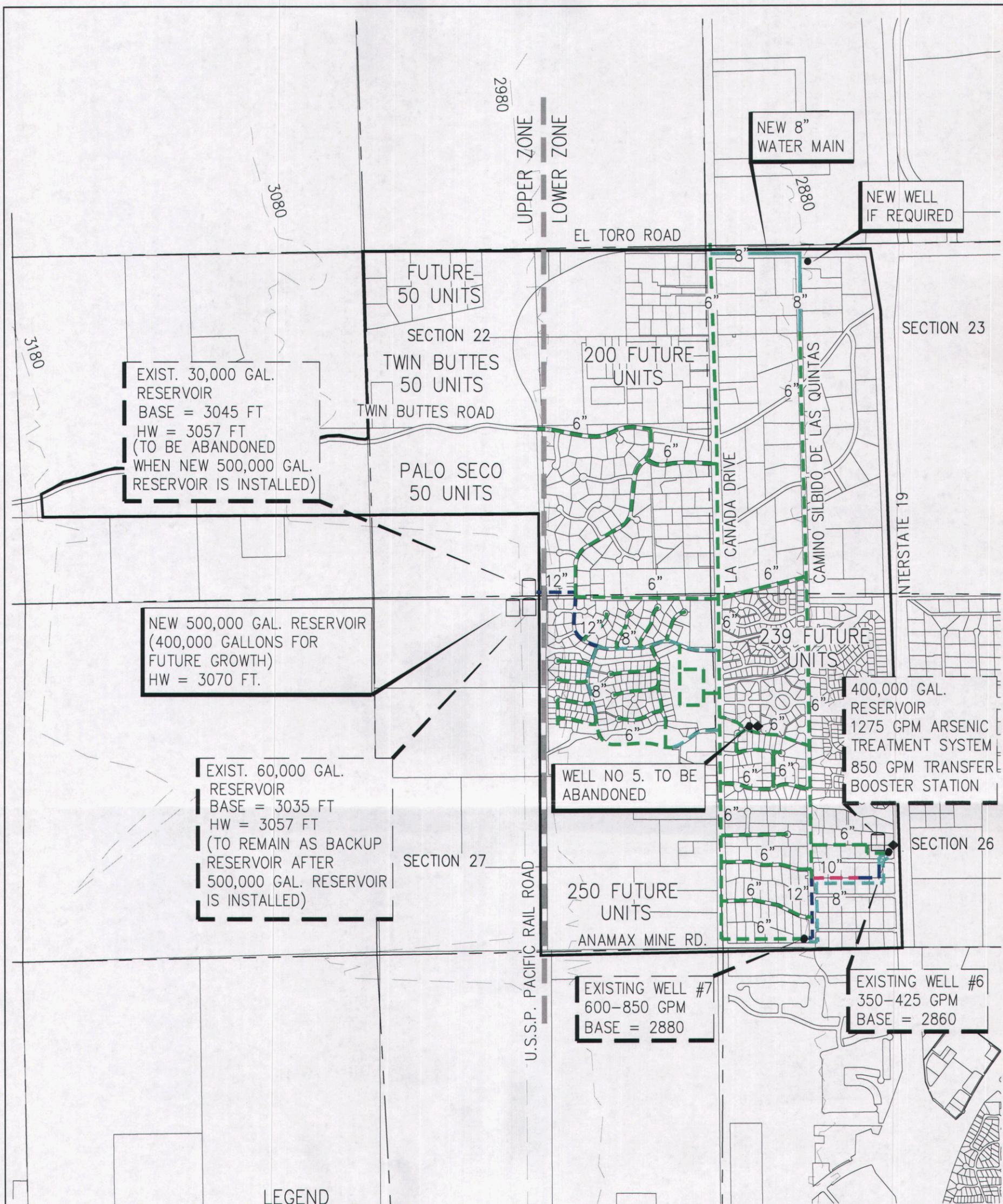
MARCH 24, 2005



Westland Resources Inc.
 Engineering and Environmental Consultants
 2343 E. Broadway Blvd., Suite 202
 Tucson, AZ 85719

Exhibit 2
LAS QUINTAS SERENAS WATER COMPANY
 Well No. 6

PROPOSED UPGRADES
 MARCH 24, 2005



LEGEND

- - - - - EXISTING 6 INCH TRANSMISSION MAIN
- - - - - EXISTING 8 INCH TRANSMISSION MAIN
- - - - - EXISTING 10 INCH TRANSMISSION MAIN
- - - - - EXISTING 12 INCH TRANSMISSION MAIN
- NEW 8 INCH TRANSMISSION MAIN
- C C & N BOUNDARY
- ZONE BOUNDARY
- WELL
- ARSENIC TREATMENT SYSTEM
- RESERVOIR



0' 1500'
SCALE: 1" = 1500'

Exhibit 3

LAS QUINTAS SERENAS WATER COMPANY

Water System Infrastructure

FUTURE SYSTEM UPGRADES

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WestLand Resources Inc.
Engineering and Environmental Consultants
2343 E. Broadway Blvd, Suite 202
Tucson, Az 85719 (520) 206-9585

MARCH 24, 2005

APPENDIX A

**OPINIONS OF
PROBABLE
CONSTRUCTION
COST**

OPINION OF PROBABLE CONSTRUCTION COST

Project Name: Las Quintas Serenas Existing System Upgrades

Project No.: 1148.01 A 8000

Location: Sahuarita, Arizona

Description: Combined Arsenic Treatment at Well Site 6

Prepared by: JL

Date: 03/24/05

Checked by: KF

Date: 03/24/05

Client: Las Quintas Serenas Water Company

Item No.	Item Description	Unit	Quantity	Unit Price	Amount	Remarks
1	Site Demolition and Removal of Abandoned Facilities at Well Sites	LS	1	\$10,000	\$10,000	Well No. 6. Assumes that existing hydro tank will be reused.
2	Site Piping Well Site No. 6	EA	1	\$100,000	\$100,000	Includes flow control valves and connections to treatment units
3	Concrete Slabs for Site Equipment	CY	40	\$350	\$14,000	Well Nos. 5 and 6
4	8-inch water main	LF	2,500	\$45	\$112,500	Well No. 7 to Well No. 6
5	400,000 gallon reservoir	LS	1	\$325,000	\$325,000	Well No. 6
6	850-gpm transfer booster station	LS	1	\$120,000	\$120,000	Well No. 6 (pre-packaged VFD pump station)
7	1,250 gpm Adsorption Arsenic Treatment System	LS	1	\$500,000	\$500,000	To treat Well Nos. 6 and 7 (Severn Trent)
8	200 gpm Adsorption Arsenic Treatment System	LS	1	\$100,000	\$100,000	To treat Well No. 5
9	Back-up Generator	LS	1	\$80,000	\$80,000	Well No. 6
10	Fencing and Site Work at Well Sites	EA	1	\$40,000	\$40,000	Well No. 6, includes grading for floodplain
11	Re-equip well	EA	2	\$15,000	\$30,000	Well Nos. 6 and 7, to remove bowls
12	Subtotal				\$1,431,500	
13	25% Engineering and Contingencies				\$357,875	
14	TOTAL				\$1,789,375	

OPINION OF PROBABLE CONSTRUCTION COST

Project Name: Las Quintas Serenas Future System Upgrades

Project No.: 1148.01 A 8000

Location: Sahuarita, Arizona

Description: Future well with individual arsenic treatment and over sizing of reservoir

Prepared by: JL

Date: 03/24/05

Checked by: KF

Date: 03/24/05

Client: Las Quintas Serenas Water Company

Item No.	Item Description	Unit	Quantity	Unit Price	Amount	Remarks
1	500,000-gallon Reservoir	EA	1	\$440,000	\$440,000	At existing two tank site. Includes grading, site work, fencing and piping
2	New well	EA	1	\$650,000	\$650,000	If required, includes 16-inch casing, chain link fence, geophysical logging, and zonal sampling. Excludes off-site piping, but assumes appropriate sized line in available in La Canada
3	Arsenic Treatment	EA	1	\$350,000	\$350,000	If required.
4	Subtotal				\$1,440,000	
5	25% Engineering and Contingencies				\$360,000	
6	TOTAL				\$1,800,000	

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and
W-01583A-05-0340

**Applicant's
Exhibit A-2**

DWRF Funding Cycle 2005 Priority List Application

Side 1 of 2 (Use Separate Form for Each Project)

Application # DW - 2005 (WIFA use only)

SECTION 1: APPLICANT INFORMATION

- 1.1 Applicant: **Las Quintas Serenas Water Company** Contact: **Steve Gay; Manager/Operator**
- 1.2 Address: **P.O. Box 68, Sahuarita Arizona 85629**
- 1.3 Phone: **520.625.8040** Fax: **520.648.3520**
E-mail: **LQSWATER@aol.com**
- 1.4 County in Which Project is Located: **Pima**
- 1.5 Number of Benefiting Connections: **1,000** Population Served by the System: **4,000**
- 1.6 Average Monthly User Fees/Charges (base & use) for an Average Residential User: **\$**
- 1.7 Total Debt (Principal Only) Payable by System Users: **\$0.0**
- 1.8 ADEQ System Identification Number: **10064**

SECTION 2: PROJECT DESCRIPTION

- 2.1 Project Title/Name: **LQS Water Company Arsenic Remediation /Storage Addition**
- 2.2 Briefly summarize the reason for the proposed project and/or attach a summary: (Include conditions initiating the proposed project and give details regarding any Notice of Violation(s) and/or Consent Order from a regulating agency. Attach copy.)

The Environmental Protection Agency has mandated acceptable levels of arsenic in the drinking water to be below 10ppb. All water companies that currently provide water with arsenic levels that exceed that amount have until January 23, 2006 to comply.

Las Quintas Serenas Water Company falls into this category and is posturing the company to meet these requirements by the January 23rd deadline. The company has had a Water System and Arsenic Master Plan done through WestLand Resources, Inc. and is requesting funding to build the arsenic treatment facilities necessary.

The Master Plan also includes a recommendation for an additional 150,000 gallons of above-ground storage in order to place the company in functional compliance. The increase in storage at this time will be cost effective as it requires only an increase in reservoir size – to add the necessary storage at a later date would result in the purchase of additional tank(s).

2.3 Project Description

- a. Facilities (Check appropriate boxes) **N/A**

	Repair	Rehab	Upgrade	Replace	Expand
Well or Spring Box					
Storage					
Distribution & Booster Pumps					
Treatment & Disinfection					

- b. Secure a New Water Source (Check appropriate box) **N/A**

Ground Water Surface Water Ground Water under Direct Surface Influence

2.4 Type of Loan required during funding cycle 2005 (check appropriate box)

- Design Construction

DWRF Funding Cycle 2005 Priority List Application

Side 2 of 2 (Use Separate Form for Each Project)

2.5 Consolidation and Regionalization (Check appropriate boxes) N/A

- Consolidate Existing Physical Facilities
- Consolidate Existing Operations
- Consolidate Existing Service Areas
- Consolidate Existing Ownerships

SECTION 3: AMOUNT OF FINANCIAL ASSISTANCE

<u>Total Project Costs</u>	<u>Amount Requested from WIFA</u>	<u>Amount Funded Locally</u>	<u>Amount Funded from Other Sources</u>
\$ 1,789,375.00	= \$1,789,375.00	+ \$0.00	+ \$0.00

List Names of Other Funding Sources:

SECTION 4: READINESS TO PROCEED INDICATORS

4.1 Debt Authorization (Authorization through election or special district creation or process.) (Check appropriate box):

- Authorized – Enclose copy of official election canvas or special district proceedings (governmental)
- Authorized – Enclose Arizona Corporation Commission Order authorizing long term financing (non-governmental)
- Scheduled – Anticipated Authorization Date (insert date): **Pending – Procedural Conference June 23, 2005**
- No Plans to Schedule within Funding Cycle – January 2005 through December 2005.

4.2 Project Plans & Specifications: (Check appropriate box)

- Approved – Enclose Approval Notification.
- Scheduled for Approval – Anticipated Approval Date (insert date):
- Engineer Selected – Anticipated Start Date **WestLand Resources, Inc. – January 2005**
- Engineer Not Selected

4.3 Applicable Local, State, and Federal Project Permits: (Check appropriate box)

- Obtained – Enclose Approval Notification(s).
- Scheduled to Obtain Permit(s) – Anticipated Permit(s) Date (insert date):
- Date of Approval Unknown
- Not Applicable – Explain:

4.4 Project Bids: (Check appropriate box)

- Accepted **Received quotes from Severn Trent for Arsenic Filter(s), as submitted in Master Plan. LQS will need current pricing for final construction plans**
- Scheduled to Solicit Bids – Anticipated Solicitation Date (insert date):
- Date of Bid Solicitation Unknown
- Not Applicable – Explain:

SECTION 5: CERTIFICATION & APPROVAL

As the Authorized Representative, I certify that the information contained in this application is, to the best of my knowledge, true, accurate, and correct.

Signature:

Name: Steve Gay

Title: Operator/Manager

Date: 06/13/05

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and

W-01583A-05-0340

**Applicant's
Exhibit A-3**

 **Commerce Bank**
of Arizona

Mr. John S. Gay, President
Las Quintas Serenas Water Co.
P.O. Box 68
Sahuarita, AZ 85629
RE: Commercial Line of Credit
Cc: Mr. Lawrence V. Robertson, Jr.

September 2, 2005

Dear Mr. Gay:

On behalf of Commerce Bank Of Arizona (Bank), I am pleased to inform you that the loan request to Las Quintas Serenas Water Co. (Company) has been approved on the following terms and conditions:

Loan Amount: \$1,650,000

Interest Rate: 8% fixed

Terms: 180 day non-revolving line of credit with monthly interest payments. Advances in construction phase are subject to providing acceptable invoices. Then, loan is fully amortized over ten years with monthly principal and interest payments.

Fees: $\frac{3}{4}$ point fee, \$300 documentation fee, due at closing

Pre-payment penalty: None

Collateral: Blanket assignment of the assets of Las Quintas Serenas Water Co.

Insurance: The bank shall be provided with a loss payable endorsement from an insurance company satisfactory to the bank for property damage and loss.

Banking: The Company shall maintain its general and operating accounts at Commerce Bank of Arizona, in the event that the bank establishes a banking office in Green Valley, AZ.

Loan funding is subject to approval of the requested rate increase from Arizona Corporation Commission as per information previously provided to the bank.

The company shall provide all such agreements as the bank shall require including but not limited to promissory notes, security agreements, UCC filings, and any other documents as may be required by the bank and for the bank to perfect the referenced security interests.

Broadway Office
3805 East Broadway Blvd. • Tucson, Arizona 85716
520.325.5200 • Fax 520.327.0513

Ina/La Cholla Office
2285 West Ina Rd. • Tucson, Arizona 85741
520.797.4160 • Fax 520.797.4180

www.commercebankaz.com

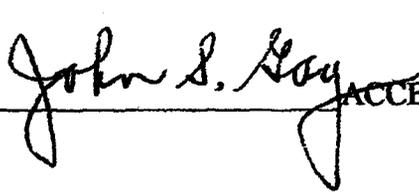
This commitment is conditional upon the preparation, execution, and legal documentation in form and substance satisfactory to Bank incorporating substantially all of the terms and conditions outlined or referred to above. However, it is understood and acknowledged by the company that this commitment does not contain all of the terms and conditions of the loan agreement and/or promissory note.

If you are in agreement with the terms and conditions of this letter, please sign below and return this letter by September 30, 2005, the date that this commitment letter will expire.

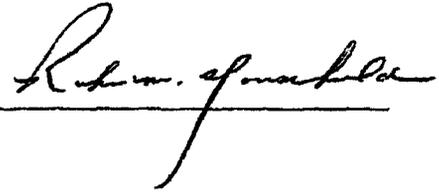
Sincerely,


Kimberly M. Yaglowski
Vice President

ACCEPTED: _____



ACCEPTED: _____



Broadway Office
3805 East Broadway Blvd. • Tucson, Arizona 85716
520.325.5200 • Fax 520.327.0513

Ina/La Cholla Office
2285 West Ina Rd. • Tucson, Arizona 85711
520.797.4160 • Fax 520.797.4180

www.commercebankaz.com

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and

W-01583A-05-0340

**Applicant's
Exhibit A-4**

CORPORATE RESOLUTION TO BORROW / GRANT COLLATERAL

Principal	Loan Date	Maturity	Loan No	Call / Coll	Account	Officer	Initials
\$1,650,000.00	10-26-2005	04-26-2016	100007-100	04A0 / BL		05	
References in the shaded area are for Lender's use only and do not limit the applicability of this document to any particular loan or item. Any item above containing "****" has been omitted due to text length limitations.							

Corporation: Las Quintas Serenas Water CO.
16961 S. Camino De Las Quintas
Sahuarita, AZ 85629

Lender: Commerce Bank of Arizona
Main Office
3805 E. Broadway Blvd.
Tucson, AZ 85716
(520) 325-5200

I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT:

THE CORPORATION'S EXISTENCE. The complete and correct name of the Corporation is Las Quintas Serenas Water CO. ("Corporation"). The Corporation is a corporation for profit which is, and at all times shall be, duly organized, validly existing, and in good standing under and by virtue of the laws of the State of Arizona. The Corporation is duly authorized to transact business in all other states in which the Corporation is doing business, having obtained all necessary filings, governmental licenses and approvals for each state in which the Corporation is doing business. Specifically, the Corporation is, and at all times shall be, duly qualified as a foreign corporation in all states in which the failure to so qualify would have a material adverse effect on its business or financial condition. The Corporation has the full power and authority to own its properties and to transact the business in which it is presently engaged or presently proposes to engage. The Corporation maintains an office at 16961 S. Camino De Las Quintas, Sahuarita, AZ 85629. Unless the Corporation has designated otherwise in writing, the principal office is the office at which the Corporation keeps its books and records. The Corporation will notify Lender prior to any change in the location of The Corporation's state of organization or any change in The Corporation's name. The Corporation shall do all things necessary to preserve and to keep in full force and effect its existence, rights and privileges, and shall comply with all regulations, rules, ordinances, statutes, orders and decrees of any governmental or quasi-governmental authority or court applicable to the Corporation and The Corporation's business activities.

RESOLUTIONS ADOPTED. At a meeting of the Directors of the Corporation, or if the Corporation is a close corporation having no Board of Directors then at a meeting of the Corporation's shareholders, duly called and held on **October 26, 2005**, at which a quorum was present and voting, or by other duly authorized action in lieu of a meeting, the resolutions set forth in this Resolution were adopted.

OFFICER. The following named person is an officer of Las Quintas Serenas Water CO.:

NAMES	TITLES	AUTHORIZED	ACTUAL SIGNATURES
John S. Gay	President	Y X	_____

ACTIONS AUTHORIZED. The authorized person listed above may enter into any agreements of any nature with Lender, and those agreements will bind the Corporation. Specifically, but without limitation, the authorized person is authorized, empowered, and directed to do the following for and on behalf of the Corporation:

Borrow Money. To borrow, as a cosigner or otherwise, from time to time from Lender, on such terms as may be agreed upon between the Corporation and Lender, such sum or sums of money as in his or her judgment should be borrowed; however, not exceeding at any one time the amount of **One Million Six Hundred Fifty Thousand & 00/100 Dollars (\$1,650,000.00)**, in addition to such sum or sums of money as may be currently borrowed by the Corporation from Lender.

Execute Notes. To execute and deliver to Lender the promissory note or notes, or other evidence of the Corporation's credit accommodations, on Lender's forms, at such rates of interest and on such terms as may be agreed upon, evidencing the sums of money so borrowed or any of the Corporation's indebtedness to Lender, and also to execute and deliver to Lender one or more renewals, extensions, modifications, refinancings, consolidations, or substitutions for one or more of the notes, any portion of the notes, or any other evidence of credit accommodations.

Grant Security. To mortgage, pledge, transfer, endorse, hypothecate, or otherwise encumber and deliver to Lender any property now or hereafter belonging to the Corporation or in which the Corporation now or hereafter may have an interest, including without limitation all of the Corporation's real property and all of the Corporation's personal property (tangible or intangible), as security for the payment of any loans or credit accommodations so obtained, any promissory notes so executed (including any amendments to or modifications, renewals, and extensions of such promissory notes), or any other or further indebtedness of the Corporation to Lender at any time owing, however the same may be evidenced. Such property may be mortgaged, pledged, transferred, endorsed, hypothecated or encumbered at the time such loans are obtained or such indebtedness is incurred, or at any other time or times, and may be either in addition to or in lieu of any property theretofore mortgaged, pledged, transferred, endorsed, hypothecated or encumbered.

Execute Security Documents. To execute and deliver to Lender the forms of mortgage, deed of trust, pledge agreement, hypothecation agreement, and other security agreements and financing statements which Lender may require and which shall evidence the terms and conditions under and pursuant to which such liens and encumbrances, or any of them, are given; and also to execute and deliver to Lender any other written instruments, any chattel paper, or any other collateral, of any kind or nature, which Lender may deem necessary or proper in connection with or pertaining to the giving of the liens and encumbrances.

Deposit Accounts. To open one or more depository accounts in the Corporation's name and sign and deliver all documents or items required to fulfill the conditions of all banking business, including without limitation the initiation of wire transfers, until authority is revoked by action of the Corporation on written notice to Lender.

Negotiate Items. To draw, endorse, and discount with Lender all drafts, trade acceptances, promissory notes, or other evidences of indebtedness payable to or belonging to the Corporation or in which the Corporation may have an interest, and either to receive cash for the same or to cause such proceeds to be credited to the Corporation's account with Lender, or to cause such other disposition of the proceeds derived therefrom as he or she may deem advisable.

Further Acts. In the case of lines of credit, to designate additional or alternate individuals as being authorized to request advances under such lines, and in all cases, to do and perform such other acts and things, to pay any and all fees and costs, and to execute and deliver such other documents and agreements, **including agreements waiving the right to a trial by jury**, as the officer may in his or her discretion deem reasonably necessary or proper in order to carry into effect the provisions of this Resolution.

ASSUMED BUSINESS NAMES. The Corporation has filed or recorded all documents or filings required by law relating to all assumed business names used by the Corporation. Excluding the name of the Corporation, the following is a complete list of all assumed business names under which the Corporation does business: **None**.

NOTICES TO LENDER. The Corporation will promptly notify Lender in writing at Lender's address shown above (or such other addresses as Lender may designate from time to time) prior to any (A) change in the Corporation's name; (B) change in the Corporation's assumed business name(s); (C) change in the management of the Corporation; (D) change in the authorized signer(s); (E) change in the Corporation's principal office address; (F) change in the Corporation's state of organization; (G) conversion of the Corporation to a new or different type of business entity; or (H) change in any other aspect of the Corporation that directly or indirectly relates to any agreements between the Corporation and Lender. No change in the Corporation's name or state of organization will take effect until after Lender has received notice.

CERTIFICATION CONCERNING OFFICERS AND RESOLUTIONS. The officer named above is duly elected, appointed, or employed by or for the Corporation, as the case may be, and occupies the position set opposite his or her respective name. This Resolution now stands of record on the books of the Corporation, is in full force and effect, and has not been modified or revoked in any manner whatsoever.

NO CORPORATE SEAL. The Corporation has no corporate seal, and therefore, no seal is affixed to this Resolution.

CONTINUING VALIDITY. Any and all acts authorized pursuant to this Resolution and performed prior to the passage of this Resolution are hereby ratified and approved. This Resolution shall be continuing, shall remain in full force and effect and Lender may rely on it until written notice of its revocation shall have been delivered to and received by Lender at Lender's address shown above (or such addresses as Lender may designate from time to time). Any such notice shall not affect any of the Corporation's agreements or commitments in effect at the time notice is given.

IN TESTIMONY WHEREOF, I have hereunto set my hand and attest that the signature set opposite the name listed above is his or her genuine signature.

I have read all the provisions of this Resolution, and I personally and on behalf of the Corporation certify that all statements and representations made in this Resolution are true and correct. This Corporate Resolution to Borrow / Grant Collateral is dated **October 26, 2005**.

**CORPORATE RESOLUTION TO BORROW / GRANT COLLATERAL
(Continued)**

Loan No: 100007-100

Page 2

CERTIFIED TO AND ATTESTED BY:

X

John S. Gay, President of Las Quintas Serenas Water
CO.

NOTE: If the officer signing this Resolution is designated by the foregoing document as one of the officers authorized to act on the Corporation's behalf, it is advisable to have this Resolution signed by at least one non-authorized officer of the Corporation.

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and

W-01583A-05-0340

**Applicant's
Exhibit A-5**

PROMISSORY NOTE

Principal	Loan Date	Maturity	Loan No	Call / Coll	Account	Officer	Initials
\$1,650,000.00	10-26-2005	04-26-2016	100007-100	04A0 / BL		05	

References in the shaded area are for Lender's use only and do not limit the applicability of this document to any particular loan or item.
Any item above containing "****" has been omitted due to text length limitations.

Borrower: Las Quintas Serenas Water CO.
16961 S. Camino De Las Quintas
Sahuarita, AZ 85629

Lender: Commerce Bank of Arizona
Main Office
3805 E. Broadway Blvd.
Tucson, AZ 85716
(520) 325-5200

Principal Amount: \$1,650,000.00

Interest Rate: 8.000%

Date of Note: October 26, 2005

PROMISE TO PAY. Las Quintas Serenas Water CO. ("Borrower") promises to pay to Commerce Bank of Arizona ("Lender"), or order, in lawful money of the United States of America, the principal amount of One Million Six Hundred Fifty Thousand & 00/100 Dollars (\$1,650,000.00) or so much as may be outstanding, together with interest on the unpaid outstanding principal balance of each advance. Interest shall be calculated from the date of each advance until repayment of each advance.

PAYMENT. Borrower will pay this loan in accordance with the following payment schedule: 6 monthly consecutive interest payments, beginning November 26, 2005, with interest calculated on the unpaid principal balances at an interest rate of 8.000% per annum; 119 monthly consecutive principal and interest payments of \$20,025.75 each, beginning May 26, 2006, with interest calculated on the unpaid principal balances at an interest rate of 8.000% per annum; and one principal and interest payment of \$20,026.03 on April 26, 2016, with interest calculated on the unpaid principal balances at an interest rate of 8.000% per annum. This estimated final payment is based on the assumption that all payments will be made exactly as scheduled; the actual final payment will be for all principal and accrued interest not yet paid, together with any other unpaid amounts under this Note. Unless otherwise agreed or required by applicable law, payments will be applied first to any unpaid collection costs; then to any late charges; then to any accrued unpaid interest; and then to principal. Interest on this Note is computed on a 365/365 simple interest basis; that is, by applying the ratio of the annual interest rate over the number of days in a year, multiplied by the outstanding principal balance, multiplied by the actual number of days the principal balance is outstanding. Borrower will pay Lender at Lender's address shown above or at such other place as Lender may designate in writing.

EFFECTIVE RATE. Borrower agrees to an effective rate of interest that is the rate specified in this Note plus any additional rate resulting from any other charges in the nature of interest paid or to be paid in connection with this Note.

PREPAYMENT. Borrower agrees that all loan fees and other prepaid finance charges are earned fully as of the date of the loan and will not be subject to refund upon early payment (whether voluntary or as a result of default), except as otherwise required by law. Except for the foregoing, Borrower may pay without penalty all or a portion of the amount owed earlier than it is due. Early payments will not, unless agreed to by Lender in writing, relieve Borrower of Borrower's obligation to continue to make payments under the payment schedule. Rather, early payments will reduce the principal balance due and may result in Borrower's making fewer payments. Borrower agrees not to send Lender payments marked "paid in full", "without recourse", or similar language. If Borrower sends such a payment, Lender may accept it without losing any of Lender's rights under this Note, and Borrower will remain obligated to pay any further amount owed to Lender. All written communications concerning disputed amounts, including any check or other payment instrument that indicates that the payment constitutes "payment in full" of the amount owed or that is tendered with other conditions or limitations or as full satisfaction of a disputed amount must be mailed or delivered to: Commerce Bank of Arizona, Main Office, 3805 E. Broadway Blvd. Tucson, AZ 85716.

LATE CHARGE. If a payment is 10 days or more late, Borrower will be charged 5.000% of the regularly scheduled payment.

INTEREST AFTER DEFAULT. Upon default, including failure to pay upon final maturity, Lender, at its option, may, if permitted under applicable law, increase the interest rate on this Note 6.000 percentage points. The interest rate will not exceed the maximum rate permitted by applicable law.

DEFAULT. Each of the following shall constitute an event of default ("Event of Default") under this Note:

Payment Default. Borrower fails to make any payment when due under this Note.

Other Defaults. Borrower fails to comply with or to perform any other term, obligation, covenant or condition contained in this Note or in any of the related documents or to comply with or to perform any term, obligation, covenant or condition contained in any other agreement between Lender and Borrower.

False Statements. Any warranty, representation or statement made or furnished to Lender by Borrower or on Borrower's behalf under this Note or the related documents is false or misleading in any material respect, either now or at the time made or furnished or becomes false or misleading at any time thereafter.

Insolvency. The dissolution or termination of Borrower's existence as a going business, the insolvency of Borrower, the appointment of a receiver for any part of Borrower's property, any assignment for the benefit of creditors, any type of creditor workout, or the commencement of any proceeding under any bankruptcy or insolvency laws by or against Borrower.

Creditor or Forfeiture Proceedings. Commencement of foreclosure or forfeiture proceedings, whether by judicial proceeding, self-help, repossession or any other method, by any creditor of Borrower or by any governmental agency against any collateral securing the loan. This includes a garnishment of any of Borrower's accounts, including deposit accounts, with Lender. However, this Event of Default shall not apply if there is a good faith dispute by Borrower as to the validity or reasonableness of the claim which is the basis of the creditor or forfeiture proceeding and if Borrower gives Lender written notice of the creditor or forfeiture proceeding and deposits with Lender monies or a surety bond for the creditor or forfeiture proceeding, in an amount determined by Lender, in its sole discretion, as being an adequate reserve or bond for the dispute.

Events Affecting Guarantor. Any of the preceding events occurs with respect to any guarantor, endorser, surety, or accommodation party of any of the indebtedness or any guarantor, endorser, surety, or accommodation party dies or becomes incompetent, or revokes or disputes the validity of, or liability under, any guaranty of the indebtedness evidenced by this Note.

Change In Ownership. Any change in ownership of twenty-five percent (25%) or more of the common stock of Borrower.

Adverse Change. A material adverse change occurs in Borrower's financial condition, or Lender believes the prospect of payment or performance of this Note is impaired.

Insecurity. Lender in good faith believes itself insecure.

LENDER'S RIGHTS. Upon default, Lender may declare the entire unpaid principal balance on this Note and all accrued unpaid interest immediately due, and then Borrower will pay that amount.

ATTORNEYS' FEES; EXPENSES. Lender may hire or pay someone else to help collect this Note if Borrower does not pay. Borrower will pay Lender that amount. This includes, subject to any limits under applicable law, Lender's attorneys' fees and Lender's legal expenses, whether or not there is a lawsuit, including attorneys' fees, expenses for bankruptcy proceedings (including efforts to modify or vacate any automatic stay or injunction), and appeals. However, Borrower will only pay attorneys' fees of an attorney not Lender's salaried employee, to whom the matter is referred after Borrower's default. If not prohibited by applicable law, Borrower also will pay any court costs, in addition to all other sums provided by law.

JURY WAIVER. Lender and Borrower hereby waive the right to any jury trial in any action, proceeding, or counterclaim brought by either Lender or Borrower against the other.

GOVERNING LAW. This Note will be governed by federal law applicable to Lender and, to the extent not preempted by federal law, the laws of the State of Arizona without regard to its conflicts of law provisions. This Note has been accepted by Lender in the State of Arizona.

DISHONORED ITEM FEE. Borrower will pay a fee to Lender of \$15.00 if Borrower makes a payment on Borrower's loan and the check or preauthorized charge with which Borrower pays is later dishonored.

RIGHT OF SETOFF. To the extent permitted by applicable law, Lender reserves a right of setoff in all Borrower's accounts with Lender (whether checking, savings, or some other account). This includes all accounts Borrower holds jointly with someone else and all accounts Borrower may open in the future. However, this does not include any IRA or Keogh accounts, or any trust accounts for which setoff would be prohibited by law. Borrower authorizes Lender, to the extent permitted by applicable law, to charge or setoff all sums owing on the indebtedness against any and all such accounts, and, at Lender's option, to administratively freeze all such accounts to allow Lender to protect Lender's charge and setoff rights provided in this paragraph.

COLLATERAL. Borrower acknowledges this Note is secured by the following collateral described in the security instrument listed herein: inventory, accounts, equipment and general intangibles described in a Commercial Security Agreement dated October 26, 2005.

LINE OF CREDIT. This Note evidences a straight line of credit. Once the total amount of principal has been advanced, Borrower is not entitled to further loan advances. Advances under this Note may be requested either orally or in writing by Borrower or as provided in this paragraph. Lender may, but need not, require that all oral requests be confirmed in writing. All communications, instructions, or directions by telephone or otherwise to Lender are to be directed to Lender's office shown above. The following person currently is authorized to request advances and authorize payments under the until Lender receives from Borrower, at Lender's address shown above, written notice of revocation of his or her authority: John S. Gay, President of Las Quintas Serenas Water CO. Borrower agrees to be liable for all sums either: (A) advanced in accordance with the instructions of an authorized person or (B) credited to any of Borrower's accounts with Lender. The unpaid principal balance owing on this Note at any time may be evidenced by endorsements on this Note or by Lender's internal records, including daily computer print-outs.

SUCCESSOR INTERESTS. The terms of this Note shall be binding upon Borrower, and upon Borrower's heirs, personal representatives, successors and assigns, and shall inure to the benefit of Lender and its successors and assigns.

NOTIFY US OF INACCURATE INFORMATION WE REPORT TO CONSUMER REPORTING AGENCIES. Please notify us if we report any inaccurate information about your account(s) to a consumer reporting agency. Your written notice describing the specific inaccuracies should be sent to us at the following address: Commerce Bank of Arizona Main Office 3805 E. Broadway Blvd. Tucson, AZ 85716.

GENERAL PROVISIONS. Lender may delay or forgo enforcing any of its rights or remedies under this Note without losing them. Borrower and any other person who signs, guarantees or endorses this Note, to the extent allowed by law, waive presentment, demand for payment, and notice of dishonor. Upon any change in the terms of this Note, and unless otherwise expressly stated in writing, no party who signs this Note, whether as maker, guarantor, accommodation maker or endorser, shall be released from liability. All such parties agree that Lender may renew or extend (repeatedly and for any length of time) this loan or release any party or guarantor or collateral; or impair, fail to realize upon or perfect Lender's security interest in the collateral; and take any other action deemed necessary by Lender without the consent of or notice to anyone. All such parties also agree that Lender may modify this loan without the consent of or notice to anyone other than the party with whom the modification is made. The obligations under this Note are joint and several.

PRIOR TO SIGNING THIS NOTE, BORROWER READ AND UNDERSTOOD ALL THE PROVISIONS OF THIS NOTE. BORROWER AGREES TO THE TERMS OF THE NOTE.

BORROWER ACKNOWLEDGES RECEIPT OF A COMPLETED COPY OF THIS PROMISSORY NOTE.

BORROWER:

LAS QUINTAS SERENAS WATER CO.

By: John S. Gay, President of Las Quintas Serenas
Water CO.

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and
W-01583A-05-0340

**Applicant's
Exhibit A-6**

COMMERCIAL SECURITY AGREEMENT

Principal	Loan Date	Maturity	Loan No	Call / Coll	Account	Officer	Initials
\$1,650,000.00	10-26-2005	04-26-2016	100007-100	04A0 / BL		05	
References in the shaded area are for Lender's use only and do not limit the applicability of this document to any particular loan or item. Any item above containing "****" has been omitted due to text length limitations.							

Grantor: Las Quintas Serenas Water CO.
16961 S. Camino De Las Quintas
Sahuarita, AZ 85629

Lender: Commerce Bank of Arizona
Main Office
3805 E. Broadway Blvd.
Tucson, AZ 85716
(520) 325-5200

THIS COMMERCIAL SECURITY AGREEMENT dated October 26, 2005, is made and executed between Las Quintas Serenas Water CO. ("Grantor") and Commerce Bank of Arizona ("Lender").

GRANT OF SECURITY INTEREST. For valuable consideration, Grantor grants to Lender a security interest in the Collateral to secure the Indebtedness and agrees that Lender shall have the rights stated in this Agreement with respect to the Collateral, in addition to all other rights which Lender may have by law.

COLLATERAL DESCRIPTION. The word "Collateral" as used in this Agreement means the following described property, whether now owned or hereafter acquired, whether now existing or hereafter arising, and wherever located, in which Grantor is giving to Lender a security interest for the payment of the Indebtedness and performance of all other obligations under the Note and this Agreement:

All Inventory, Accounts, Equipment and General Intangibles

In addition, the word "Collateral" also includes all the following, whether now owned or hereafter acquired, whether now existing or hereafter arising, and wherever located:

- (A) All accessions, attachments, accessories, tools, parts, supplies, replacements of and additions to any of the collateral described herein, whether added now or later.
- (B) All products and produce of any of the property described in this Collateral section.
- (C) All accounts, general intangibles, instruments, rents, monies, payments, and all other rights, arising out of a sale, lease, consignment or other disposition of any of the property described in this Collateral section.
- (D) All proceeds (including insurance proceeds) from the sale, destruction, loss, or other disposition of any of the property described in this Collateral section, and sums due from a third party who has damaged or destroyed the Collateral or from that party's insurer, whether due to judgment, settlement or other process.
- (E) All records and data relating to any of the property described in this Collateral section, whether in the form of a writing, photograph, microfilm, microfiche, or electronic media, together with all of Grantor's right, title, and interest in and to all computer software required to utilize, create, maintain, and process any such records or data on electronic media.

RIGHT OF SETOFF. To the extent permitted by applicable law, Lender reserves a right of setoff in all Grantor's accounts with Lender (whether checking, savings, or some other account). This includes all accounts Grantor holds jointly with someone else and all accounts Grantor may open in the future. However, this does not include any IRA or Keogh accounts, or any trust accounts for which setoff would be prohibited by law. Grantor authorizes Lender, to the extent permitted by applicable law, to charge or setoff all sums owing on the Indebtedness against any and all such accounts, and, at Lender's option, to administratively freeze all such accounts to allow Lender to protect Lender's charge and setoff rights provided in this paragraph.

GRANTOR'S REPRESENTATIONS AND WARRANTIES WITH RESPECT TO THE COLLATERAL. With respect to the Collateral, Grantor represents and promises to Lender that:

Perfection of Security Interest. Grantor agrees to take whatever actions are requested by Lender to perfect and continue Lender's security interest in the Collateral. Upon request of Lender, Grantor will deliver to Lender any and all of the documents evidencing or constituting the Collateral, and Grantor will note Lender's interest upon any and all chattel paper and instruments if not delivered to Lender for possession by Lender.

Notices to Lender. Grantor will promptly notify Lender in writing at Lender's address shown above (or such other addresses as Lender may designate from time to time) prior to any (1) change in Grantor's name; (2) change in Grantor's assumed business name(s); (3) change in the management of the Corporation Grantor; (4) change in the authorized signer(s); (5) change in Grantor's principal office address; (6) change in Grantor's state of organization; (7) conversion of Grantor to a new or different type of business entity; or (8) change in any other aspect of Grantor that directly or indirectly relates to any agreements between Grantor and Lender. No change in Grantor's name or state of organization will take effect until after Lender has received notice.

No Violation. The execution and delivery of this Agreement will not violate any law or agreement governing

Grantor or to which Grantor is a party, and its certificate or articles of incorporation and bylaws do not prohibit any term or condition of this Agreement.

Enforceability of Collateral. To the extent the Collateral consists of accounts, chattel paper, or general intangibles, as defined by the Uniform Commercial Code, the Collateral is enforceable in accordance with its terms, is genuine, and fully complies with all applicable laws and regulations concerning form, content and manner of preparation and execution, and all persons appearing to be obligated on the Collateral have authority and capacity to contract and are in fact obligated as they appear to be on the Collateral. At the time any account becomes subject to a security interest in favor of Lender, the account shall be a good and valid account representing an undisputed, bona fide indebtedness incurred by the account debtor, for merchandise held subject to delivery instructions or previously shipped or delivered pursuant to a contract of sale, or for services previously performed by Grantor with or for the account debtor. So long as this Agreement remains in effect, Grantor shall not, without Lender's prior written consent, compromise, settle, adjust, or extend payment under or with regard to any such Accounts. There shall be no setoffs or counterclaims against any of the Collateral, and no agreement shall have been made under which any deductions or discounts may be claimed concerning the Collateral except those disclosed to Lender in writing.

Location of the Collateral. Except in the ordinary course of Grantor's business, Grantor agrees to keep the Collateral (or to the extent the Collateral consists of intangible property such as accounts or general intangibles, the records concerning the Collateral) at Grantor's address shown above or at such other locations as are acceptable to Lender. Upon Lender's request, Grantor will deliver to Lender in form satisfactory to Lender a schedule of real properties and Collateral locations relating to Grantor's operations, including without limitation the following: (1) all real property Grantor owns or is purchasing; (2) all real property Grantor is renting or leasing; (3) all storage facilities Grantor owns, rents, leases, or uses; and (4) all other properties where Collateral is or may be located.

Removal of the Collateral. Except in the ordinary course of Grantor's business, including the sales of inventory, Grantor shall not remove the Collateral from its existing location without Lender's prior written consent. To the extent that the Collateral consists of vehicles, or other titled property, Grantor shall not take or permit any action which would require application for certificates of title for the vehicles outside the State of Arizona, without Lender's prior written consent. Grantor shall, whenever requested, advise Lender of the exact location of the Collateral.

Transactions Involving Collateral. Except for inventory sold or accounts collected in the ordinary course of Grantor's business, or as otherwise provided for in this Agreement, Grantor shall not sell, offer to sell, or otherwise transfer or dispose of the Collateral. While Grantor is not in default under this Agreement, Grantor may sell inventory, but only in the ordinary course of its business and only to buyers who qualify as a buyer in the ordinary course of business. A sale in the ordinary course of Grantor's business does not include a transfer in partial or total satisfaction of a debt or any bulk sale. Grantor shall not pledge, mortgage, encumber or otherwise permit the Collateral to be subject to any lien, security interest, encumbrance, or charge, other than the security interest provided for in this Agreement, without the prior written consent of Lender. This includes security interests even if junior in right to the security interests granted under this Agreement. Unless waived by Lender, all proceeds from any disposition of the Collateral (for whatever reason) shall be held in trust for Lender and shall not be commingled with any other funds; provided however, this requirement shall not constitute consent by Lender to any sale or other disposition. Upon receipt, Grantor shall immediately deliver any such proceeds to Lender.

Title. Grantor represents and warrants to Lender that Grantor holds good and marketable title to the Collateral, free and clear of all liens and encumbrances except for the lien of this Agreement. No financing statement covering any of the Collateral is on file in any public office other than those which reflect the security interest created by this Agreement or to which Lender has specifically consented. Grantor shall defend Lender's rights in the Collateral against the claims and demands of all other persons.

Repairs and Maintenance. Grantor agrees to keep and maintain, and to cause others to keep and maintain, the Collateral in good order, repair and condition at all times while this Agreement remains in effect. Grantor further agrees to pay when due all claims for work done on, or services rendered or material furnished in connection with the Collateral so that no lien or encumbrance may ever attach to or be filed against the Collateral.

Inspection of Collateral. Lender and Lender's designated representatives and agents shall have the right at all reasonable times to examine and inspect the Collateral wherever located.

Taxes, Assessments and Liens. Grantor will pay when due all taxes, assessments and liens upon the Collateral, its use or operation, upon this Agreement, upon any promissory note or notes evidencing the indebtedness, or upon any of the other Related Documents. Grantor may withhold any such payment or may elect to contest any lien if Grantor is in good faith conducting an appropriate proceeding to contest the obligation to pay and so long as Lender's interest in the Collateral is not jeopardized in Lender's sole opinion. If the Collateral is subjected to a lien which is not discharged within fifteen (15) days, Grantor shall deposit with Lender cash, a sufficient corporate surety bond or other security satisfactory to Lender in an amount adequate to provide for the discharge of the lien plus any interest, costs, attorneys' fees or other charges that could accrue as a result of foreclosure or sale of the Collateral. In any contest Grantor shall defend itself and Lender and shall satisfy any final adverse judgment before enforcement against the Collateral. Grantor shall name Lender as an additional obligee under any surety bond furnished in the contest proceedings. Grantor further agrees to furnish Lender with evidence that such taxes, assessments, and governmental and other charges have been paid in full and in a timely manner. Grantor may withhold any such payment or may elect to contest any lien if Grantor is in good faith conducting an appropriate proceeding to contest the obligation to pay and so long as Lender's interest in the Collateral is not jeopardized.

Compliance with Governmental Requirements. Grantor shall comply promptly with all laws, ordinances, rules and regulations of all governmental authorities, now or hereafter in effect, applicable to the ownership, production, disposition, or use of the Collateral, including all laws or regulations relating to the undue erosion of

highly-erodible land or relating to the conversion of wetlands for the production of an agricultural product or commodity. Grantor may contest in good faith any such law, ordinance or regulation and withhold compliance during any proceeding, including appropriate appeals, so long as Lender's interest in the Collateral, in Lender's opinion, is not jeopardized.

Hazardous Substances. Grantor represents and warrants that the Collateral never has been, and never will be so long as this Agreement remains a lien on the Collateral, used in violation of any Environmental Laws or for the generation, manufacture, storage, transportation, treatment, disposal, release or threatened release of any Hazardous Substance. The representations and warranties contained herein are based on Grantor's due diligence in investigating the Collateral for Hazardous Substances. Grantor hereby (1) releases and waives any future claims against Lender for indemnity or contribution in the event Grantor becomes liable for cleanup or other costs under any Environmental Laws, and (2) agrees to indemnify and hold harmless Lender against any and all claims and losses resulting from a breach of this provision of this Agreement. This obligation to indemnify shall survive the payment of the Indebtedness and the satisfaction of this Agreement.

Maintenance of Casualty Insurance. Grantor shall procure and maintain all risks insurance, including without limitation fire, theft and liability coverage together with such other insurance as Lender may require with respect to the Collateral, in form, amounts, coverages and basis reasonably acceptable to Lender and issued by a company or companies reasonably acceptable to Lender. Grantor, upon request of Lender, will deliver to Lender from time to time the policies or certificates of insurance in form satisfactory to Lender, including stipulations that coverages will not be cancelled or diminished without at least fifteen (15) days' prior written notice to Lender and not including any disclaimer of the insurer's liability for failure to give such a notice. Each insurance policy also shall include an endorsement providing that coverage in favor of Lender will not be impaired in any way by any act, omission or default of Grantor or any other person. In connection with all policies covering assets in which Lender holds or is offered a security interest, Grantor will provide Lender with such loss payable or other endorsements as Lender may require. If Grantor at any time fails to obtain or maintain any insurance as required under this Agreement, Lender may (but shall not be obligated to) obtain such insurance as Lender deems appropriate, including if Lender so chooses "single interest insurance," which will cover only Lender's interest in the Collateral.

Application of Insurance Proceeds. Grantor shall promptly notify Lender of any loss or damage to the Collateral, whether or not such casualty or loss is covered by insurance. Lender may make proof of loss if Grantor fails to do so within fifteen (15) days of the casualty. All proceeds of any insurance on the Collateral, including accrued proceeds thereon, shall be held by Lender as part of the Collateral. If Lender consents to repair or replacement of the damaged or destroyed Collateral, Lender shall, upon satisfactory proof of expenditure, pay or reimburse Grantor from the proceeds for the reasonable cost of repair or restoration. If Lender does not consent to repair or replacement of the Collateral, Lender shall retain a sufficient amount of the proceeds to pay all of the Indebtedness, and shall pay the balance to Grantor. Any proceeds which have not been disbursed within six (6) months after their receipt and which Grantor has not committed to the repair or restoration of the Collateral shall be used to prepay the Indebtedness.

Insurance Reserves. Lender may require Grantor to maintain with Lender reserves for payment of insurance premiums, which reserves shall be created by monthly payments from Grantor of a sum estimated by Lender to be sufficient to produce, at least fifteen (15) days before the premium due date, amounts at least equal to the insurance premiums to be paid. If fifteen (15) days before payment is due, the reserve funds are insufficient, Grantor shall upon demand pay any deficiency to Lender. The reserve funds shall be held by Lender as a general deposit and shall constitute a non-interest-bearing account which Lender may satisfy by payment of the insurance premiums required to be paid by Grantor as they become due. Lender does not hold the reserve funds in trust for Grantor, and Lender is not the agent of Grantor for payment of the insurance premiums required to be paid by Grantor. The responsibility for the payment of premiums shall remain Grantor's sole responsibility.

Insurance Reports. Grantor, upon request of Lender, shall furnish to Lender reports on each existing policy of insurance showing such information as Lender may reasonably request including the following: (1) the name of the insurer; (2) the risks insured; (3) the amount of the policy; (4) the property insured; (5) the then current value on the basis of which insurance has been obtained and the manner of determining that value; and (6) the expiration date of the policy. In addition, Grantor shall upon request by Lender (however not more often than annually) have an independent appraiser satisfactory to Lender determine, as applicable, the cash value or replacement cost of the Collateral.

Financing Statements. Grantor authorizes Lender to file a UCC financing statement, or alternatively, a copy of this Agreement to perfect Lender's security interest. At Lender's request, Grantor additionally agrees to sign all other documents that are necessary to perfect, protect, and continue Lender's security interest in the Property. Grantor will pay all filing fees, title transfer fees, and other fees and costs involved unless prohibited by law or unless Lender is required by law to pay such fees and costs. Grantor irrevocably appoints Lender to execute documents necessary to transfer title if there is a default. Lender may file a copy of this Agreement as a financing statement. If Grantor changes Grantor's name or address, or the name or address of any person granting a security interest under this Agreement changes, Grantor will promptly notify the Lender of such change.

GRANTOR'S RIGHT TO POSSESSION AND TO COLLECT ACCOUNTS. Until default and except as otherwise provided below with respect to accounts, Grantor may have possession of the tangible personal property and beneficial use of all the Collateral and may use it in any lawful manner not inconsistent with this Agreement or the Related Documents, provided that Grantor's right to possession and beneficial use shall not apply to any Collateral where possession of the Collateral by Lender is required by law to perfect Lender's security interest in such Collateral. Until otherwise notified by Lender, Grantor may collect any of the Collateral consisting of accounts. At any time and even though no Event of Default exists, Lender may exercise its rights to collect the accounts and to notify account debtors to make payments directly to Lender for application to the Indebtedness. If Lender at any time has possession of any Collateral, whether before or after an Event of Default, Lender shall be deemed to have exercised reasonable care in the custody and preservation of the Collateral if Lender takes such action for that

purpose as Grantor shall request or as Lender, in Lender's sole discretion, shall deem appropriate under the circumstances, but failure to honor any request by Grantor shall not of itself be deemed to be a failure to exercise reasonable care. Lender shall not be required to take any steps necessary to preserve any rights in the Collateral against prior parties, nor to protect, preserve or maintain any security interest given to secure the indebtedness.

LENDER'S EXPENDITURES. If any action or proceeding is commenced that would materially affect Lender's interest in the Collateral or if Grantor fails to comply with any provision of this Agreement or any Related Documents, including but not limited to Grantor's failure to discharge or pay when due any amounts Grantor is required to discharge or pay under this Agreement or any Related Documents, Lender on Grantor's behalf may (but shall not be obligated to) take any action that Lender deems appropriate, to the extent permitted by applicable law, including but not limited to discharging or paying all taxes, liens, security interests, encumbrances and other claims, at any time levied or placed on the Collateral and paying all costs for insuring, maintaining and preserving the Collateral. All such expenditures incurred or paid by Lender for such purposes will then bear interest at the rate charged under the Note from the date incurred or paid by Lender to the date of repayment by Grantor. All such expenses will become a part of the indebtedness and, at Lender's option, will (A) be payable on demand; (B) be added to the balance of the Note and be apportioned among and be payable with any installment payments to become due during either (1) the term of any applicable insurance policy; or (2) the remaining term of the Note; or (C) be treated as a balloon payment which will be due and payable at the Note's maturity. The Agreement also will secure payment of these amounts. Such right shall be in addition to all other rights and remedies to which Lender may be entitled upon Default and shall be exercisable by Lender to the extent permitted by applicable law.

DEFAULT. Each of the following shall constitute an Event of Default under this Agreement:

Payment Default. Grantor fails to make any payment when due under the indebtedness.

Other Defaults. Grantor fails to comply with or to perform any other term, obligation, covenant or condition contained in this Agreement or in any of the Related Documents or to comply with or to perform any term, obligation, covenant or condition contained in any other agreement between Lender and Grantor.

False Statements. Any warranty, representation or statement made or furnished to Lender by Grantor or on Grantor's behalf under this Agreement or the Related Documents is false or misleading in any material respect, either now or at the time made or furnished or becomes false or misleading at any time thereafter.

Defective Collateralization. This Agreement or any of the Related Documents ceases to be in full force and effect (including failure of any collateral document to create a valid and perfected security interest or lien) at any time and for any reason.

Insolvency. The dissolution or termination of Grantor's existence as a going business, the insolvency of Grantor, the appointment of a receiver for any part of Grantor's property, any assignment for the benefit of creditors, any type of creditor workout, or the commencement of any proceeding under any bankruptcy or insolvency laws by or against Grantor.

Creditor or Forfeiture Proceedings. Commencement of foreclosure proceedings, whether by judicial proceeding, self-help, repossession or any other method, by any creditor of Grantor or by any governmental agency against any collateral securing the indebtedness. This includes a garnishment of any of Grantor's accounts, including deposit accounts, with Lender. However, this Event of Default shall not apply if there is a good faith dispute by Grantor as to the validity or reasonableness of the claim which is the basis of the creditor or forfeiture proceeding and if Grantor gives Lender written notice of the creditor or forfeiture proceeding and deposits with Lender monies or a surety bond for the creditor or forfeiture proceeding, in an amount determined by Lender, in its sole discretion, as being an adequate reserve or bond for the dispute.

Events Affecting Guarantor. Any of the preceding events occurs with respect to any guarantor, endorser, surety, or accommodation party of any of the indebtedness or guarantor, endorser, surety, or accommodation party dies or becomes incompetent or revokes or disputes the validity of, or liability under, any Guaranty of the indebtedness.

Adverse Change. A material adverse change occurs in Grantor's financial condition, or Lender believes the prospect of payment or performance of the indebtedness is impaired.

Insolvency. Lender in good faith believes itself insecure.

RIGHTS AND REMEDIES ON DEFAULT. If an Event of Default occurs under this Agreement, at any time thereafter, Lender shall have all the rights of a secured party under the Arizona Uniform Commercial Code. In addition and without limitation, Lender may exercise any one or more of the following rights and remedies:

Accelerate Indebtedness. Lender may declare the entire indebtedness, including any prepayment penalty which Grantor would be required to pay, immediately due and payable, without notice of any kind to Grantor.

Assemble Collateral. Lender may require Grantor to deliver to Lender all or any portion of the Collateral and any and all certificates of title and other documents relating to the Collateral. Lender may require Grantor to assemble the Collateral and make it available to Lender at a place to be designated by Lender. Lender also shall have full power to enter upon the property of Grantor to take possession of and remove the Collateral. If the Collateral contains other goods not covered by this Agreement at the time of repossession, Grantor agrees Lender may take such other goods, provided that Lender makes reasonable efforts to return them to Grantor after repossession.

Sell the Collateral. Lender shall have full power to sell, lease, transfer, or otherwise deal with the Collateral or proceeds thereof in Lender's own name or that of Grantor. Lender may sell the Collateral at public auction or private sale. Unless the Collateral threatens to decline speedily in value or is of a type customarily sold on a recognized market, Lender will give Grantor, and other persons as required by law, reasonable notice of the time and place of any public sale, or the time after which any private sale or any other disposition of the Collateral is to be made. However, no notice need be provided to any person who, after Event of Default occurs, enters into and authenticates an agreement waiving that person's right to notification of sale. The requirements of reasonable notice shall be met if such notice is given at least ten (10) days before the time of

the sale or disposition. All expenses relating to the disposition of the Collateral, including without limitation the expenses of retaking, holding, insuring, preparing for sale and selling the Collateral, shall become a part of the Indebtedness secured by this Agreement and shall be payable on demand, with interest at the Note rate from date of expenditure until repaid.

Appoint Receiver. Lender shall have the right to have a receiver appointed to take possession of all or any part of the Collateral, with the power to protect and preserve the Collateral, to operate the Collateral preceding foreclosure or sale, and to collect the Rents from the Collateral and apply the proceeds, over and above the cost of the receivership, against the Indebtedness. The receiver may serve without bond if permitted by law. Lender's right to the appointment of a receiver shall exist whether or not the apparent value of the Collateral exceeds the Indebtedness by a substantial amount. Employment by Lender shall not disqualify a person from serving as a receiver.

Collect Revenues, Apply Accounts. Lender, either itself or through a receiver, may collect the payments, rents, income, and revenues from the Collateral. Lender may at any time in Lender's discretion transfer any Collateral into Lender's own name or that of Lender's nominee and receive the payments, rents, income, and revenues therefrom and hold the same as security for the Indebtedness or apply it to payment of the Indebtedness in such order of preference as Lender may determine. Insofar as the Collateral consists of accounts, general intangibles, insurance policies, instruments, chattel paper, choses in action, or similar property, Lender may demand, collect, receipt for, settle, compromise, adjust, sue for, foreclose, or realize on the Collateral as Lender may determine, whether or not Indebtedness or Collateral is then due. For these purposes, Lender may, on behalf of and in the name of Grantor, receive, open and dispose of mail addressed to Grantor; change any address to which mail and payments are to be sent; and endorse notes, checks, drafts, money orders, documents of title, instruments and items pertaining to payment, shipment, or storage of any Collateral. To facilitate collection, Lender may notify account debtors and obligors on any Collateral to make payments directly to Lender.

Obtain Deficiency. If Lender chooses to sell any or all of the Collateral, Lender may obtain a judgment against Grantor for any deficiency remaining on the Indebtedness due to Lender after application of all amounts received from the exercise of the rights provided in this Agreement. Grantor shall be liable for a deficiency even if the transaction described in this subsection is a sale of accounts or chattel paper.

Other Rights and Remedies. Lender shall have all the rights and remedies of a secured creditor under the provisions of the Uniform Commercial Code, as may be amended from time to time. In addition, Lender shall have and may exercise any or all other rights and remedies it may have available at law, in equity, or otherwise.

Election of Remedies. Except as may be prohibited by applicable law, all of Lender's rights and remedies, whether evidenced by this Agreement, the Related Documents, or by any other writing, shall be cumulative and may be exercised singularly or concurrently. Election by Lender to pursue any remedy shall not exclude pursuit of any other remedy, and an election to make expenditures or to take action to perform an obligation of Grantor under this Agreement, after Grantor's failure to perform, shall not affect Lender's right to declare a default and exercise its remedies.

MISCELLANEOUS PROVISIONS. The following miscellaneous provisions are a part of this Agreement:

Amendments. This Agreement, together with any Related Documents, constitutes the entire understanding and agreement of the parties as to the matters set forth in this Agreement. No alteration of or amendment to this Agreement shall be effective unless given in writing and signed by the party or parties sought to be charged or bound by the alteration or amendment.

Attorneys' Fees; Expenses. Grantor agrees to pay upon demand all of Lender's costs and expenses, including Lender's attorneys' fees and Lender's legal expenses, incurred in connection with the enforcement of this Agreement. Lender may hire or pay someone else to help enforce this Agreement, and Grantor shall pay the costs and expenses of such enforcement. Costs and expenses include Lender's attorneys' fees and legal expenses whether or not there is a lawsuit, including attorneys' fees and legal expenses for bankruptcy proceedings (including efforts to modify or vacate any automatic stay or injunction), appeals, and any anticipated post-judgment collection services. However, Grantor will only pay attorneys' fees of an attorney not Lender's salaried employee, to whom the matter is referred after Grantor's default. Grantor also shall pay all court costs and such additional fees as may be directed by the court.

Caption Headings. Caption headings in this Agreement are for convenience purposes only and are not to be used to interpret or define the provisions of this Agreement.

Governing Law. This Agreement will be governed by federal law applicable to Lender and, to the extent not preempted by federal law, the laws of the State of Arizona without regard to its conflicts of law provisions. This Agreement has been accepted by Lender in the State of Arizona.

No Waiver by Lender. Lender shall not be deemed to have waived any rights under this Agreement unless such waiver is given in writing and signed by Lender. No delay or omission on the part of Lender in exercising any right shall operate as a waiver of such right or any other right. A waiver by Lender of a provision of this Agreement shall not prejudice or constitute a waiver of Lender's right otherwise to demand strict compliance with that provision or any other provision of this Agreement. No prior waiver by Lender, nor any course of dealing between Lender and Grantor, shall constitute a waiver of any of Lender's rights or of any of Grantor's obligations as to any future transactions. Whenever the consent of Lender is required under this Agreement, the granting of such consent by Lender in any instance shall not constitute continuing consent to subsequent instances where such consent is required and in all cases such consent may be granted or withheld in the sole discretion of Lender.

Notices. Any notice required to be given under this Agreement shall be given in writing, and shall be effective when actually delivered, when actually received by telefacsimile (unless otherwise required by law), when deposited with a nationally recognized overnight courier, or, if mailed, when deposited in the United States mail, as first class, certified or registered mail postage prepaid, directed to the addresses shown near the

beginning of this Agreement. Any party may change its address for notices under this Agreement by giving formal written notice to the other parties, specifying that the purpose of the notice is to change the party's address. For notice purposes, Grantor agrees to keep Lender informed at all times of Grantor's current address. Unless otherwise provided or required by law, if there is more than one Grantor, any notice given by Lender to any Grantor is deemed to be notice given to all Grantors.

Power of Attorney. Grantor hereby appoints Lender as Grantor's irrevocable attorney-in-fact for the purpose of executing any documents necessary to perfect, amend, or to continue the security interest granted in this Agreement or to demand termination of filings of other secured parties. Lender may at any time, and without further authorization from Grantor, file a carbon, photographic or other reproduction of any financing statement or of this Agreement for use as a financing statement. Grantor will reimburse Lender for all expenses for the perfection and the continuation of the perfection of Lender's security interest in the Collateral.

Severability. If a court of competent jurisdiction finds any provision of this Agreement to be illegal, invalid, or unenforceable as to any circumstance, that finding shall not make the offending provision illegal, invalid, or unenforceable as to any other circumstance. If feasible, the offending provision shall be considered modified so that it becomes legal, valid and enforceable. If the offending provision cannot be so modified, it shall be considered deleted from this Agreement. Unless otherwise required by law, the illegality, invalidity, or unenforceability of any provision of this Agreement shall not affect the legality, validity or enforceability of any other provision of this Agreement.

Successors and Assigns. Subject to any limitations stated in this Agreement on transfer of Grantor's interest, this Agreement shall be binding upon and inure to the benefit of the parties, their successors and assigns. If ownership of the Collateral becomes vested in a person other than Grantor, Lender, without notice to Grantor, may deal with Grantor's successors with reference to this Agreement and the indebtedness by way of forbearance or extension without releasing Grantor from the obligations of this Agreement or liability under the indebtedness.

Survival of Representations and Warranties. All representations, warranties, and agreements made by Grantor in this Agreement shall survive the execution and delivery of this Agreement, shall be continuing in nature, and shall remain in full force and effect until such time as Grantor's indebtedness shall be paid in full.

Time is of the Essence. Time is of the essence in the performance of this Agreement.

Waive Jury. All parties to this Agreement hereby waive the right to any jury trial in any action, proceeding, or counterclaim brought by any party against any other party.

DEFINITIONS. The following capitalized words and terms shall have the following meanings when used in this Agreement. Unless specifically stated to the contrary, all references to dollar amounts shall mean amounts in lawful money of the United States of America. Words and terms used in the singular shall include the plural, and the plural shall include the singular, as the context may require. Words and terms not otherwise defined in this Agreement shall have the meanings attributed to such terms in the Uniform Commercial Code:

Agreement. The word "Agreement" means this Commercial Security Agreement, as this Commercial Security Agreement may be amended or modified from time to time, together with all exhibits and schedules attached to this Commercial Security Agreement from time to time.

Borrower. The word "Borrower" means Las Quintas Serenas Water CO. and includes all co-signers and co-makers signing the Note and all their successors and assigns.

Collateral. The word "Collateral" means all of Grantor's right, title and interest in and to all the Collateral as described in the Collateral Description section of this Agreement.

Default. The word "Default" means the Default set forth in this Agreement in the section titled "Default".

Environmental Laws. The words "Environmental Laws" mean any and all state, federal and local statutes, regulations and ordinances relating to the protection of human health or the environment, including without limitation the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. Section 9601, et seq. ("CERCLA"), the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499 ("SARA"), the Hazardous Materials Transportation Act, 49 U.S.C. Section 1801, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq., or other applicable state or federal laws, rules, or regulations adopted pursuant thereto.

Event of Default. The words "Event of Default" mean any of the events of default set forth in this Agreement in the default section of this Agreement.

Grantor. The word "Grantor" means Las Quintas Serenas Water CO..

Guaranty. The word "Guaranty" means the guaranty from guarantor, endorser, surety, or accommodation party to Lender, including without limitation a guaranty of all or part of the Note.

Hazardous Substances. The words "Hazardous Substances" mean materials that, because of their quantity, concentration or physical, chemical or infectious characteristics, may cause or pose a present or potential hazard to human health or the environment when improperly used, treated, stored, disposed of, generated, manufactured, transported or otherwise handled. The words "Hazardous Substances" are used in their very broadest sense and include without limitation any and all hazardous or toxic substances, materials or waste as defined by or listed under the Environmental Laws. The term "Hazardous Substances" also includes, without limitation, petroleum and petroleum by-products or any fraction thereof and asbestos.

Indebtedness. The word "Indebtedness" means the indebtedness evidenced by the Note or Related Documents, including all principal and interest together with all other indebtedness and costs and expenses for which Grantor is responsible under this Agreement or under any of the Related Documents.

Lender. The word "Lender" means Commerce Bank of Arizona, its successors and assigns.

Note. The word "Note" means the Note executed by Las Quintas Serenas Water CO. in the principal amount of

**COMMERCIAL SECURITY AGREEMENT
(Continued)**

Loan No: 100007-100

Page 7

\$1,650,000.00 dated October 26, 2005, together with all renewals of, extensions of, modifications of, refinancings of, consolidations of, and substitutions for the note or credit agreement.

Property. The word "Property" means all of Grantor's right, title and interest in and to all the Property as described in the "Collateral Description" section of this Agreement.

Related Documents. The words "Related Documents" mean all promissory notes, credit agreements, loan agreements, environmental agreements, guaranties, security agreements, mortgages, deeds of trust, security deeds, collateral mortgages, and all other instruments, agreements and documents, whether now or hereafter existing, executed in connection with the Indebtedness.

GRANTOR HAS READ AND UNDERSTOOD ALL THE PROVISIONS OF THIS COMMERCIAL SECURITY AGREEMENT AND AGREES TO ITS TERMS. THIS AGREEMENT IS DATED OCTOBER 26, 2005.

GRANTOR:

LAS QUINTAS SERENAS WATER CO.

By: _____
**John S. Gay, President of Las Quintas
Serenas Water CO.**

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and

W-01583A-05-0340

**Applicant's
Exhibit A-7**

BUSINESS LOAN AGREEMENT

Principal	Loan Date	Maturity	Loan No	Call / Coll	Account	Officer	Initials
\$1,650,000.00	10-26-2005	04-26-2016	100007-100	04AD / BL		05	
References in the shaded area are for Lender's use only and do not limit the applicability of this document to any particular loan or item. Any item above containing "****" has been omitted due to text length limitations.							

Borrower: Las Quintas Serenas Water CO.
16961 S. Camino De Las Quintas
Sahuarita, AZ 85629

Lender: Commerce Bank of Arizona
Main Office
3805 E. Broadway Blvd.
Tucson, AZ 85716
(520) 325-5200

THIS BUSINESS LOAN AGREEMENT dated October 26, 2005, is made and executed between Las Quintas Serenas Water CO. ("Borrower") and Commerce Bank of Arizona ("Lender") on the following terms and conditions. Borrower has received prior commercial loans from Lender or has applied to Lender for a commercial loan or loans or other financial accommodations, including those which may be described on any exhibit or schedule attached to this Agreement ("Loan"). Borrower understands and agrees that: (A) in granting, renewing, or extending any Loan, Lender is relying upon Borrower's representations, warranties, and agreements as set forth in this Agreement; (B) the granting, renewing, or extending of any Loan by Lender at all times shall be subject to Lender's sole judgment and discretion; and (C) all such Loans shall be and remain subject to the terms and conditions of this Agreement.

TERM. This Agreement shall be effective as of October 26, 2005, and shall continue in full force and effect until such time as all of Borrower's Loans in favor of Lender have been paid in full, including principal, interest, costs, expenses, attorneys' fees, and other fees and charges, or until April 26, 2016.

CONDITIONS PRECEDENT TO EACH ADVANCE. Lender's obligation to make the initial Advance and each subsequent Advance under this Agreement shall be subject to the fulfillment to Lender's satisfaction of all of the conditions set forth in this Agreement and in the Related Documents.

Loan Documents. Borrower shall provide to Lender the following documents for the Loan: (1) the Note; (2) Security Agreements granting to Lender security interests in the Collateral; (3) financing statements and all other documents perfecting Lender's Security Interests; (4) evidence of insurance as required below; (5) together with all such Related Documents as Lender may require for the Loan; all in form and substance satisfactory to Lender and Lender's counsel.

Borrower's Authorization. Borrower shall have provided in form and substance satisfactory to Lender properly certified resolutions, duly authorizing the execution and delivery of this Agreement, the Note and the Related Documents. In addition, Borrower shall have provided such other resolutions, authorizations, documents and instruments as Lender or its counsel, may require.

Payment of Fees and Expenses. Borrower shall have paid to Lender all fees, charges, and other expenses which are then due and payable as specified in this Agreement or any Related Document.

Representations and Warranties. The representations and warranties set forth in this Agreement, in the Related Documents, and in any document or certificate delivered to Lender under this Agreement are true and correct.

No Event of Default. There shall not exist at the time of any Advance a condition which would constitute an Event of Default under this Agreement or under any Related Document.

REPRESENTATIONS AND WARRANTIES. Borrower represents and warrants to Lender, as of the date of this Agreement, as of the date of each disbursement of loan proceeds, as of the date of any renewal, extension or modification of any Loan, and at all times any Indebtedness exists:

Organization. Borrower is a corporation for profit which is, and at all times shall be, duly organized, validly existing, and in good standing under and by virtue of the laws of the State of Arizona. Borrower is duly authorized to transact business in all other states in which Borrower is doing business, having obtained all necessary filings, governmental licenses and approvals for each state in which Borrower is doing business. Specifically, Borrower is, and at all times shall be, duly qualified as a foreign corporation in all states in which the failure to so qualify would have a material adverse effect on its business or financial condition. Borrower has the full power and authority to own its properties and to transact the business in which it is presently engaged or presently proposes to engage. Borrower maintains an office at 16961 S. Camino De Las Quintas, Sahuarita, AZ 85629. Unless Borrower has designated otherwise in writing, the principal office is the office at which Borrower keeps its books and records including its records concerning the Collateral. Borrower will notify Lender prior to any change in the location of Borrower's state of organization or any change in Borrower's name. Borrower shall do all things necessary to preserve and to keep in full force and effect its existence, rights and privileges, and shall comply with all regulations, rules, ordinances, statutes, orders and decrees of any governmental or quasi-governmental authority or court applicable to Borrower and Borrower's business activities.

Assumed Business Names. Borrower has filed or recorded all documents or filings required by law relating to all assumed business names used by Borrower. Excluding the name of Borrower, the following is a complete list of all assumed business names under which Borrower does business: **None.**

Authorization. Borrower's execution, delivery, and performance of this Agreement and all the Related Documents have been duly authorized by all necessary action by Borrower and do not conflict with, result in a violation of, or constitute a default under (1) any provision of (a) Borrower's articles of incorporation or organization, or bylaws, or (b) any agreement or other instrument binding upon Borrower or (2) any law, governmental regulation, court decree, or order applicable to Borrower or to Borrower's properties.

Financial Information. Each of Borrower's financial statements supplied to Lender truly and completely disclosed Borrower's financial condition as of the date of the statement, and there has been no material adverse change in Borrower's financial condition subsequent to the date of the most recent financial statement supplied to Lender. Borrower has no material contingent obligations except as disclosed in such financial statements.

Legal Effect. This Agreement constitutes, and any instrument or agreement Borrower is required to give under this Agreement when delivered will constitute legal, valid, and binding obligations of Borrower enforceable against Borrower in accordance with their respective terms.

Properties. Except as contemplated by this Agreement or as previously disclosed in Borrower's financial statements or in writing to Lender and as accepted by Lender, and except for property tax liens for taxes not presently due and payable, Borrower owns and has good title to all of Borrower's properties free and clear of all Security Interests, and has not executed any security documents or financing statements relating to such properties. All of Borrower's properties are titled in Borrower's legal name, and Borrower has not used or filed a financing statement under any other name for at least the last five (5) years.

Hazardous Substances. Except as disclosed to and acknowledged by Lender in writing, Borrower represents and warrants that: (1) During the period of Borrower's ownership of the Collateral, there has been no use, generation, manufacture, storage, treatment, disposal, release or threatened release of any Hazardous Substance by any person on, under, about or from any of the Collateral. (2) Borrower has no knowledge of, or reason to believe that there has been (a) any breach or violation of any Environmental Laws; (b) any use, generation, manufacture, storage, treatment, disposal, release or threatened release of any Hazardous Substance on, under, about or from the Collateral by any prior owners or occupants of any of the Collateral; or (c) any actual or threatened litigation or claims of any kind by any person relating to such matters. (3) Neither Borrower nor any tenant, contractor, agent or other authorized user of any of the Collateral shall use, generate, manufacture, store, treat, dispose of or release any Hazardous Substance on, under, about or from any of the Collateral; and any such activity shall be conducted in compliance with all applicable federal, state, and local laws, regulations, and ordinances, including without limitation all Environmental Laws. Borrower authorizes Lender and its agents to enter upon the Collateral to make such inspections and tests as Lender may deem appropriate to determine compliance of the Collateral with this section of the Agreement. Any inspections or tests made by Lender shall be at Borrower's expense and for Lender's purposes only and shall not be construed to create any responsibility or liability on the part of Lender to Borrower or to any other person. The representations and warranties contained herein are based on Borrower's due diligence in investigating the Collateral for hazardous waste and Hazardous Substances. Borrower hereby (1) releases and waives any future claims against Lender for indemnity or contribution in the event Borrower becomes liable for cleanup or other costs under any such laws, and (2) agrees to indemnify and hold harmless Lender against any and all claims, losses, liabilities, damages, penalties, and expenses which Lender may directly or indirectly sustain or suffer resulting from a breach of this section of the Agreement or as a consequence of any use, generation, manufacture, storage, disposal, release or threatened release of a hazardous waste or substance on the Collateral. The provisions of this section of the Agreement, including the obligation to indemnify, shall survive the payment of the Indebtedness and the termination, expiration or satisfaction of this Agreement and shall not be affected by Lender's acquisition of any interest in any of the Collateral, whether by foreclosure or otherwise.

Litigation and Claims. No litigation, claim, investigation, administrative proceeding or similar action (including those for unpaid taxes) against Borrower is pending or threatened, and no other event has occurred which may materially adversely affect Borrower's financial

condition or properties, other than litigation, claims, or other events, if any, that have been disclosed to and acknowledged by Lender in writing.

Taxes. To the best of Borrower's knowledge, all of Borrower's tax returns and reports that are or were required to be filed, have been filed, and all taxes, assessments and other governmental charges have been paid in full, except those presently being or to be contested by Borrower in good faith in the ordinary course of business and for which adequate reserves have been provided.

Lien Priority. Unless otherwise previously disclosed to Lender in writing, Borrower has not entered into or granted any Security Agreements, or permitted the filing or attachment of any Security Interests on or affecting any of the Collateral directly or indirectly securing repayment of Borrower's Loan and Note, that would be prior or that may in any way be superior to Lender's Security Interests and rights in and to such Collateral.

Binding Effect. This Agreement, the Note, all Security Agreements (if any), and all Related Documents are binding upon the signers thereof, as well as upon their successors, representatives and assigns, and are legally enforceable in accordance with their respective terms.

AFFIRMATIVE COVENANTS. Borrower covenants and agrees with Lender that, so long as this Agreement remains in effect, Borrower will:

Notices of Claims and Litigation. Promptly inform Lender in writing of (1) all material adverse changes in Borrower's financial condition, and (2) all existing and all threatened litigation, claims, investigations, administrative or similar actions affecting Borrower or any Guarantor which could materially affect the financial condition of Borrower or the financial condition of any Guarantor.

Financial Records. Maintain its books and records in accordance with GAAP, applied on a consistent basis, and permit Lender to examine and audit Borrower's books and records at all reasonable times.

Financial Statements. Furnish Lender with the following:

Annual Statements. As soon as available, but in no event later than sixty (60) days after the end of each fiscal year, Borrower's balance sheet and income statement for the year ended, prepared by Borrower.

Tax Returns. As soon as available, but in no event later than thirty (30) days after the applicable filing date for the tax reporting period ended, Federal and other governmental tax returns, prepared by Borrower.

All financial reports required to be provided under this Agreement shall be prepared in accordance with GAAP, applied on a consistent basis, and certified by Borrower as being true and correct.

Additional Information. Furnish such additional information and statements, as Lender may request from time to time.

Insurance. Maintain fire and other risk insurance, public liability insurance, and such other insurance as Lender may require with respect to Borrower's properties and operations, in form, amounts, coverages and with insurance companies acceptable to Lender. Borrower, upon request of Lender, will deliver to Lender from time to time the policies or certificates of insurance in form satisfactory to Lender, including stipulations that coverages will not be cancelled or diminished without at least fifteen (15) days prior written notice to Lender. Each insurance policy also shall include an endorsement providing that coverage in favor of Lender will not be impaired in any way by any act, omission or default of Borrower or any other person. In connection with all policies covering assets in which Lender holds or is offered a security interest for the Loans, Borrower will provide Lender with such lender's loss payable or other endorsements as Lender may require.

Insurance Reports. Furnish to Lender, upon request of Lender, reports on each existing insurance policy showing such information as Lender may reasonably request, including without limitation the following: (1) the name of the insurer; (2) the risks insured; (3) the amount of the policy; (4) the properties insured; (5) the then current property values on the basis of which insurance has been obtained, and the manner of determining those values; and (6) the expiration date of the policy. In addition, upon request of Lender (however not more often than annually), Borrower will have an independent appraiser satisfactory to Lender determine, as applicable, the actual cash value or replacement cost of any Collateral. The cost of such appraisal shall be paid by Borrower.

Other Agreements. Comply with all terms and conditions of all other agreements, whether now or hereafter existing, between Borrower and any other party and notify Lender immediately in writing of any default in connection with any other such agreements.

Loan Proceeds. Use all Loan proceeds solely for Borrower's business operations, unless specifically consented to the contrary by Lender in writing.

Taxes, Charges and Liens. Pay and discharge when due all of its indebtedness and obligations, including without limitation all assessments, taxes, governmental charges, levies and liens, of every kind and nature, imposed upon Borrower or its properties, income, or profits, prior to the date on which penalties would attach, and all lawful claims that, if unpaid, might become a lien or charge upon any of Borrower's properties, income, or profits.

Performance. Perform and comply, in a timely manner, with all terms, conditions, and provisions set forth in this Agreement, in the Related Documents, and in all other instruments and agreements between Borrower and Lender. Borrower shall notify Lender immediately in writing of any default in connection with any agreement.

Operations. Maintain executive and management personnel with substantially the same qualifications and experience as the present executive and management personnel; provide written notice to Lender of any change in executive and management personnel; conduct its business affairs in a reasonable and prudent manner.

Environmental Studies. Promptly conduct and complete, at Borrower's expense, all such investigations, studies, samplings and testings as may be requested by Lender or any governmental authority relative to any substance, or any waste or by-product of any substance defined as toxic or a hazardous substance under applicable federal, state, or local law, rule, regulation, order or directive, at or affecting any property or any facility owned, leased or used by Borrower.

Compliance with Governmental Requirements. Comply with all laws, ordinances, and regulations, now or hereafter in effect, of all governmental authorities applicable to the conduct of Borrower's properties, businesses and operations, and to the use or occupancy of the Collateral, including without limitation, the Americans With Disabilities Act. Borrower may contest in good faith any such law, ordinance, or regulation and withhold compliance during any proceeding, including appropriate appeals, so long as Borrower has notified Lender in writing prior to doing so and so long as, in Lender's sole opinion, Lender's interests in the Collateral are not jeopardized. Lender may require Borrower to post adequate security or a surety bond, reasonably satisfactory to Lender, to protect Lender's interest.

Inspection. Permit employees or agents of Lender at any reasonable time to inspect any and all Collateral for the Loan or Loans and Borrower's other properties and to examine or audit Borrower's books, accounts, and records and to make copies and memoranda of Borrower's books, accounts, and records. If Borrower now or at any time hereafter maintains any records (including without limitation computer generated records and computer software programs for the generation of such records) in the possession of a third party, Borrower, upon request of Lender, shall notify such party to permit Lender free access to such records at all reasonable times and to provide Lender with copies of any records it may request, all at Borrower's expense.

Compliance Certificates. Unless waived in writing by Lender, provide Lender at least annually, with a certificate executed by Borrower's chief financial officer, or other officer or person acceptable to Lender, certifying that the representations and warranties set forth in this Agreement are true and correct as of the date of the certificate and further certifying that, as of the date of the certificate, no Event of Default exists under this Agreement.

Environmental Compliance and Reports. Borrower shall comply in all respects with any and all Environmental Laws; not cause or permit to exist, as a result of an intentional or unintentional action or omission on Borrower's part or on the part of any third party, on property owned and/or occupied by Borrower, any environmental activity where damage may result to the environment, unless such environmental activity is pursuant to and in compliance with the conditions of a permit issued by the appropriate federal, state or local governmental authorities; shall furnish to Lender promptly and in any event within thirty (30) days after receipt thereof a copy of any notice, summons, lien, citation, directive, letter or other communication from any governmental agency or instrumentally concerning any intentional or unintentional action or omission on Borrower's part in connection with any environmental activity whether or not there is damage to the environment and/or other natural resources.

Additional Assurances. Make, execute and deliver to Lender such promissory notes, mortgages, deeds of trust, security agreements, assignments, financing statements, instruments, documents and other agreements as Lender or its attorneys may reasonably request to evidence and secure the Loans and to perfect all Security Interests.

LENDERS' EXPENDITURES. If any action or proceeding is commenced that would materially affect Lender's interest in the Collateral or if Borrower fails to comply with any provision of this Agreement or any Related Documents, including but not limited to Borrower's failure to discharge or pay when due any amounts Borrower is required to discharge or pay under this Agreement or any Related Documents, Lender on Borrower's behalf may (but shall not be obligated to) take any action that Lender deems appropriate, to the extent permitted by applicable law, including but not limited to discharging or paying all taxes, liens, security interests, encumbrances and other claims, at any time levied or placed on any Collateral and paying all costs for insuring, maintaining and preserving any Collateral. All such expenditures incurred or paid by Lender

for such purposes will then bear interest at the rate charged under the Note from the date incurred or paid by Lender to the date of repayment by Borrower. All such expenses will become a part of the Indebtedness and, at Lender's option, will (A) be payable on demand; (B) be added to the balance of the Note and be apportioned among and be payable with any installment payments to become due during either (1) the term of any applicable insurance policy; or (2) the remaining term of the Note; or (C) be treated as a balloon payment which will be due and payable at the Note's maturity.

NEGATIVE COVENANTS. Borrower covenants and agrees with Lender that while this Agreement is in effect, Borrower shall not, without the prior written consent of Lender:

Indebtedness and Liens. (1) Except for trade debt incurred in the normal course of business and indebtedness to Lender contemplated by this Agreement, create, incur or assume indebtedness for borrowed money, including capital leases, (2) sell, transfer, mortgage, assign, pledge, lease, grant a security interest in, or encumber any of Borrower's assets (except as allowed as Permitted Liens), or (3) sell with recourse any of Borrower's accounts, except to Lender.

Continuity of Operations. (1) Engage in any business activities substantially different than those in which Borrower is presently engaged, (2) cease operations, liquidate, merge, transfer, acquire or consolidate with any other entity, change its name, dissolve or transfer or sell Collateral out of the ordinary course of business, or (3) pay any dividends on Borrower's stock (other than dividends payable in its stock), provided, however that notwithstanding the foregoing, but only so long as no Event of Default has occurred and is continuing or would result from the payment of dividends, if Borrower is a "Subchapter S Corporation" (as defined in the Internal Revenue Code of 1986, as amended), Borrower may pay cash dividends on its stock to its shareholders from time to time in amounts necessary to enable the shareholders to pay income taxes and make estimated income tax payments to satisfy their liabilities under federal and state law which arise solely from their status as Shareholders of a Subchapter S Corporation because of their ownership of shares of Borrower's stock, or purchase or retire any of Borrower's outstanding shares or alter or amend Borrower's capital structure.

Loans, Acquisitions and Guaranties. (1) Loan, invest in or advance money or assets to any other person, enterprise or entity, (2) purchase, create or acquire any interest in any other enterprise or entity, or (3) incur any obligation as surety or guarantor other than in the ordinary course of business.

Agreements. Borrower will not enter into any agreement containing any provisions which would be violated or breached by the performance of Borrower's obligations under this Agreement or in connection herewith.

CESSATION OF ADVANCES. If Lender has made any commitment to make any Loan to Borrower, whether under this Agreement or under any other agreement, Lender shall have no obligation to make Loan Advances or to disburse Loan proceeds if: (A) Borrower or any Guarantor is in default under the terms of this Agreement or any of the Related Documents or any other agreement that Borrower or any Guarantor has with Lender; (B) Borrower or any Guarantor dies, becomes incompetent or becomes insolvent, files a petition in bankruptcy or similar proceedings, or is adjudged a bankrupt; (C) there occurs a material adverse change in Borrower's financial condition, in the financial condition of any Guarantor, or in the value of any Collateral securing any Loan; or (D) any Guarantor seeks, claims or otherwise attempts to limit, modify or revoke such Guarantor's guaranty of the Loan or any other loan with Lender; or (E) Lender in good faith deems itself insecure, even though no Event of Default shall have occurred.

RIGHT OF SETOFF. To the extent permitted by applicable law, Lender reserves a right of setoff in all Borrower's accounts with Lender (whether checking, savings, or some other account). This includes all accounts Borrower holds jointly with someone else and all accounts Borrower may open in the future. However, this does not include any IRA or Keogh accounts, or any trust accounts for which setoff would be prohibited by law. Borrower authorizes Lender, to the extent permitted by applicable law, to charge or setoff all sums owing on the Indebtedness against any and all such accounts, and, at Lender's option, to administratively freeze all such accounts to allow Lender to protect Lender's charge and setoff rights provided in this paragraph.

DEFAULT. Each of the following shall constitute an Event of Default under this Agreement:

Payment Default. Borrower fails to make any payment when due under the Loan.

Other Defaults. Borrower fails to comply with or to perform any other term, obligation, covenant or condition contained in this Agreement or in any of the Related Documents or to comply with or to perform any term, obligation, covenant or condition contained in any other agreement between Lender and Borrower.

False Statements. Any warranty, representation or statement made or furnished to Lender by Borrower or on Borrower's behalf under this Agreement or the Related Documents is false or misleading in any material respect, either now or at the time made or furnished or becomes false or misleading at any time thereafter.

Insolvency. The dissolution or termination of Borrower's existence as a going business, the insolvency of Borrower, the appointment of a receiver for any part of Borrower's property, any assignment for the benefit of creditors, any type of creditor workout, or the commencement of any proceeding under any bankruptcy or insolvency laws by or against Borrower.

Defective Collateralization. This Agreement or any of the Related Documents ceases to be in full force and effect (including failure of any collateral document to create a valid and perfected security interest or lien) at any time and for any reason.

Creditor or Forfeiture Proceedings. Commencement of foreclosure or forfeiture proceedings, whether by judicial proceeding, self-help, repossession or any other method, by any creditor of Borrower or by any governmental agency against any collateral securing the Loan. This includes a garnishment of any of Borrower's accounts, including deposit accounts, with Lender. However, this Event of Default shall not apply if there is a good faith dispute by Borrower as to the validity or reasonableness of the claim which is the basis of the creditor or forfeiture proceeding and if Borrower gives Lender written notice of the creditor or forfeiture proceeding and deposits with Lender monies or a surety bond for the creditor or forfeiture proceeding, in an amount determined by Lender, in its sole discretion, as being an adequate reserve or bond for the dispute.

Events Affecting Guarantor. Any of the preceding events occurs with respect to any Guarantor of any of the Indebtedness or any Guarantor dies or becomes incompetent, or revokes or disputes the validity of, or liability under, any Guaranty of the Indebtedness.

Change in Ownership. Any change in ownership of twenty-five percent (25%) or more of the common stock of Borrower.

Adverse Change. A material adverse change occurs in Borrower's financial condition, or Lender believes the prospect of payment or performance of the Loan is impaired.

Insecurity. Lender in good faith believes itself insecure.

EFFECT OF AN EVENT OF DEFAULT. If any Event of Default shall occur, except where otherwise provided in this Agreement or the Related Documents, all commitments and obligations of Lender under this Agreement or the Related Documents or any other agreement immediately will terminate (including any obligation to make further Loan Advances or disbursements), and, at Lender's option, all Indebtedness immediately will become due and payable, all without notice of any kind to Borrower, except that in the case of an Event of Default of the type described in the "Insolvency" subsection above, such acceleration shall be automatic and not optional. In addition, Lender shall have all the rights and remedies provided in the Related Documents or available at law, in equity, or otherwise. Except as may be prohibited by applicable law, all of Lender's rights and remedies shall be cumulative and may be exercised singularly or concurrently. Election by Lender to pursue any remedy shall not exclude pursuit of any other remedy, and an election to make expenditures or to take action to perform an obligation of Borrower or of any Grantor shall not affect Lender's right to declare a default and to exercise its rights and remedies.

MISCELLANEOUS PROVISIONS. The following miscellaneous provisions are a part of this Agreement:

Amendments. This Agreement, together with any Related Documents, constitutes the entire understanding and agreement of the parties as to the matters set forth in this Agreement. No alteration of or amendment to this Agreement shall be effective unless given in writing and signed by the party or parties sought to be charged or bound by the alteration or amendment.

Attorneys' Fees; Expenses. Borrower agrees to pay upon demand all of Lender's costs and expenses, including Lender's attorneys' fees and Lender's legal expenses, incurred in connection with the enforcement of this Agreement. Lender may hire or pay someone else to help enforce this Agreement, and Borrower shall pay the costs and expenses of such enforcement. Costs and expenses include Lender's attorneys' fees and legal expenses whether or not there is a lawsuit, including attorneys' fees and legal expenses for bankruptcy proceedings (including efforts to modify or vacate any automatic stay or injunction), appeals, and any anticipated post-judgment collection services. However, Borrower will only pay attorneys' fees of an attorney not Lender's salaried employee, to whom the matter is referred after Borrower's default. Borrower also shall pay all court costs and such additional fees as may be directed by the court.

Caption Headings. Caption headings in this Agreement are for convenience purposes only and are not to be used to interpret or define the provisions of this Agreement.

Consent to Loan Participation. Borrower agrees and consents to Lender's sale or transfer, whether now or later, of one or more participation interests in the Loan to one or more purchasers, whether related or unrelated to Lender. Lender may provide, without any limitation whatsoever, to any one or more purchasers, or potential purchasers, any information or knowledge Lender may have about

Borrower or about any other matter relating to the Loan, and Borrower hereby waives any rights to privacy. Borrower may have with respect to such matters. Borrower additionally waives any and all notices of sale of participation interests, as well as all notices of any repurchase of such participation interests. Borrower also agrees that the purchasers of any such participation interests will be considered as the absolute owners of such interests in the Loan and will have all the rights granted under the participation agreement or agreements governing the sale of such participation interests. Borrower further waives all rights of offset or counterclaim that it may have now or later against Lender or against any purchaser of such a participation interest and unconditionally agrees that either Lender or such purchaser may enforce Borrower's obligation under the Loan irrespective of the failure or insolvency of any holder of any interest in the Loan. Borrower further agrees that the purchaser of any such participation interest may enforce its interests irrespective of any personal claims or defenses that Borrower may have against Lender.

Governing Law. This Agreement will be governed by federal law applicable to Lender and, to the extent not preempted by federal law, the laws of the State of Arizona without regard to its conflicts of law provisions. This Agreement has been accepted by Lender in the State of Arizona.

No Waiver by Lender. Lender shall not be deemed to have waived any rights under this Agreement unless such waiver is given in writing and signed by Lender. No delay or omission on the part of Lender in exercising any right shall operate as a waiver of such right or any other right. A waiver by Lender of a provision of this Agreement shall not prejudice or constitute a waiver of Lender's right otherwise to demand strict compliance with that provision or any other provision of this Agreement. No prior waiver by Lender, nor any course of dealing between Lender and Borrower, or between Lender and any Grantor, shall constitute a waiver of any of Lender's rights or of any of Borrower's or any Grantor's obligations as to any future transactions. Whenever the consent of Lender is required under this Agreement, the granting of such consent by Lender in any instance shall not constitute continuing consent to subsequent instances where such consent is required and in all cases such consent may be granted or withheld in the sole discretion of Lender.

Notices. Any notice required to be given under this Agreement shall be given in writing, and shall be effective when actually delivered, when actually received by telefacsimile (unless otherwise required by law), when deposited with a nationally recognized overnight courier, or, if mailed, when deposited in the United States mail, as first class, certified or registered mail postage prepaid, directed to the addresses shown near the beginning of this Agreement. Any party may change its address for notices under this Agreement by giving formal written notice to the other parties, specifying that the purpose is to change the party's address. For notice purposes, Borrower agrees to keep Lender informed at all times of Borrower's current address. Unless otherwise provided or required by law, if there is more than one Borrower, any notice given by Lender to any Borrower is deemed to be notice given to all Borrowers.

Severability. If a court of competent jurisdiction finds any provision of this Agreement to be illegal, invalid, or unenforceable as to any circumstance, that finding shall not make the offending provision illegal, invalid, or unenforceable as to any other circumstance, if feasible, the offending provision shall be considered modified so that it becomes otherwise legal, valid and enforceable. If the offending provision cannot be so modified, it shall be considered deleted from this Agreement. Unless otherwise required by law, the illegality, invalidity, or unenforceability of any provision of this Agreement shall not affect the legality, validity or enforceability of any other provision of this Agreement.

Subsidiaries and Affiliates of Borrower. To the extent the context of any provisions of this Agreement makes it appropriate, including without limitation any representation, warranty or covenant, the word "Borrower" as used in this Agreement shall include all of Borrower's subsidiaries and affiliates. Notwithstanding the foregoing however, under no circumstances shall this Agreement be construed to require Lender to make any loan or other financial accommodation to any of Borrower's subsidiaries or affiliates.

Successors and Assigns. All covenants and agreements by or on behalf of Borrower contained in this Agreement or any Related Documents shall bind Borrower's successors and assigns and shall inure to the benefit of Lender and its successors and assigns. Borrower shall not, however, have the right to assign Borrower's rights under this Agreement or any interest therein, without the prior written consent of Lender.

Survival of Representations and Warranties. Borrower understands and agrees that in making the Loan, Lender is relying on all representations, warranties, and covenants made by Borrower in this Agreement or in any certificate or other instrument delivered by Borrower to Lender under this Agreement or the Related Documents. Borrower further agrees that regardless of any investigation made by Lender, all such representations, warranties and covenants will survive the making of the Loan and delivery to Lender of the Related Documents, shall be continuing in nature, and shall remain in full force and effect until such time as Borrower's indebtedness shall be paid in full, or until this Agreement shall be terminated in the manner provided above, whichever is the last to occur.

Time is of the Essence. Time is of the essence in the performance of this Agreement.

Waive Jury. All parties to this Agreement hereby waive the right to any jury trial in any action, proceeding, or counterclaim brought by any party against any other party.

DEFINITIONS. The following capitalized words and terms shall have the following meanings when used in this Agreement. Unless specifically stated to the contrary, all references to dollar amounts shall mean amounts in lawful money of the United States of America. Words and terms used in the singular shall include the plural, and the plural shall include the singular, as the context may require. Words and terms not otherwise defined in this Agreement shall have the meanings assigned to them in accordance with generally accepted accounting principles as in effect on the date of this Agreement:

Advance. The word "Advance" means a disbursement of loan funds made, or to be made, to Borrower or on Borrower's behalf on a line of credit or multiple advance basis under the terms and conditions of this Agreement.

Agreement. The word "Agreement" means this Business Loan Agreement, as this Business Loan Agreement may be amended or modified from time to time, together with all exhibits and schedules attached to this Business Loan Agreement from time to time.

Borrower. The word "Borrower" means Las Quintas Serenas Water CO, and includes all co-signers and co-makers signing the Note and all their successors and assigns.

Collateral. The word "Collateral" means all property and assets granted as collateral security for a Loan, whether real or personal property, whether granted directly or indirectly, and whether granted now or in the future, and whether granted in the form of a security interest, mortgage, collateral mortgage, deed of trust, assignment, pledge, crop pledge, chattel mortgage, collateral chattel mortgage, chattel trust, factor's lien, equipment trust, conditional sale, trust receipt, lien, charge, lien or title retention contract, lease or consignment intended as a security device, or any other security or lien interest whatsoever, whether created by law, contract, or otherwise.

Environmental Laws. The words "Environmental Laws" mean any and all state, federal and local statutes, regulations and ordinances relating to the protection of human health or the environment, including without limitation the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. Section 9601, et seq. ("CERCLA"), the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499 ("SARA"), the Hazardous Materials Transportation Act, 49 U.S.C. Section 1801, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq., or other applicable state or federal laws, rules, or regulations adopted pursuant thereto.

Event of Default. The words "Event of Default" mean any of the events of default set forth in this Agreement in the default section of this Agreement.

GAAP. The word "GAAP" means generally accepted accounting principles.

Grantor. The word "Grantor" means each and all of the persons or entities granting a Security Interest in any Collateral for the Loan, including without limitation all Borrowers granting such a Security Interest.

Guarantor. The word "Guarantor" means any guarantor, surety, or accommodation party of any or all of the Loan.

Guaranty. The word "Guaranty" means the guaranty from Guarantor to Lender, including without limitation a guaranty of all or part of the Note.

Hazardous Substances. The words "Hazardous Substances" mean materials that, because of their quantity, concentration or physical, chemical or infectious characteristics, may cause or pose a present or potential hazard to human health or the environment when improperly used, treated, stored, disposed of, generated, manufactured, transported or otherwise handled. The words "Hazardous Substances" are used in their very broadest sense and include without limitation any and all hazardous or toxic substances, materials or waste as defined by or listed under the Environmental Laws. The term "Hazardous Substances" also includes, without limitation, petroleum and petroleum by-products or any fraction thereof and asbestos.

Indebtedness. The word "Indebtedness" means the indebtedness evidenced by the Note or Related Documents, including all principal and interest together with all other indebtedness and costs and expenses for which Borrower is responsible under this Agreement or under any of the Related Documents.

Lender. The word "Lender" means Commerce Bank of Arizona, its successors and assigns.

**BUSINESS LOAN AGREEMENT
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Loan. The word "Loan" means any and all loans and financial accommodations from Lender to Borrower whether now or hereafter existing, and however evidenced, including without limitation those loans and financial accommodations described herein or described on any exhibit or schedule attached to this Agreement from time to time.

Note. The word "Note" means the Note executed by Las Quintas Serenas Water CO. in the principal amount of \$1,650,000.00 dated October 26, 2005, together with all renewals of, extensions of, modifications of, refinancings of, consolidations of, and substitutions for the note or credit agreement.

Permitted Liens. The words "Permitted Liens" mean (1) liens and security interests securing Indebtedness owed by Borrower to Lender; (2) liens for taxes, assessments, or similar charges either not yet due or being contested in good faith; (3) liens of materialmen, mechanics, warehousemen, or carriers, or other like liens arising in the ordinary course of business and securing obligations which are not yet delinquent; (4) purchase money liens or purchase money security interests upon or in any property acquired or held by Borrower in the ordinary course of business to secure indebtedness outstanding on the date of this Agreement or permitted to be incurred under the paragraph of this Agreement titled "Indebtedness and Liens"; (5) liens and security interests which, as of the date of this Agreement, have been disclosed to and approved by the Lender in writing; and (6) those liens and security interests which in the aggregate constitute an immaterial and insignificant monetary amount with respect to the net value of Borrower's assets.

Related Documents. The words "Related Documents" mean all promissory notes, credit agreements, loan agreements, environmental agreements, guaranties, security agreements, mortgages, deeds of trust, security deeds, collateral mortgages, and all other instruments, agreements and documents, whether now or hereafter existing, executed in connection with the Loan.

Security Agreement. The words "Security Agreement" mean and include without limitation any agreements, promises, covenants, arrangements, understandings or other agreements, whether created by law, contract, or otherwise, evidencing, governing, representing, or creating a Security Interest.

Security Interest. The words "Security Interest" mean, without limitation, any and all types of collateral security, present and future, whether in the form of a lien, charge, encumbrance, mortgage, deed of trust, security deed, assignment, pledge, crop pledge, chattel mortgage, collateral chattel mortgage, chattel trust, factor's lien, equipment trust, conditional sale, trust receipt, lien or title retention contract, lease or consignment intended as a security device, or any other security or lien interest whatsoever whether created by law, contract, or otherwise.

BORROWER ACKNOWLEDGES HAVING READ ALL THE PROVISIONS OF THIS BUSINESS LOAN AGREEMENT AND BORROWER AGREES TO ITS TERMS. THIS BUSINESS LOAN AGREEMENT IS DATED OCTOBER 26, 2005.

BORROWER:

LAS QUINTAS SERENAS WATER CO.

By: _____
John S. Gay, President of Las Quintas Serenas
Water CO.

LENDER:

COMMERCE BANK OF ARIZONA

By: _____
Authorized Signer

Las Quintas Serenas Water Company

Docket Nos. W-01583A-04-0178, W-01583A-05-0326 and

W-01583A-05-0340

**Applicant's
Exhibit A-13**

DESIGN REPORT

**LAS QUINTAS SERENAS
WATER COMPANY
ARSENIC TREATMENT**

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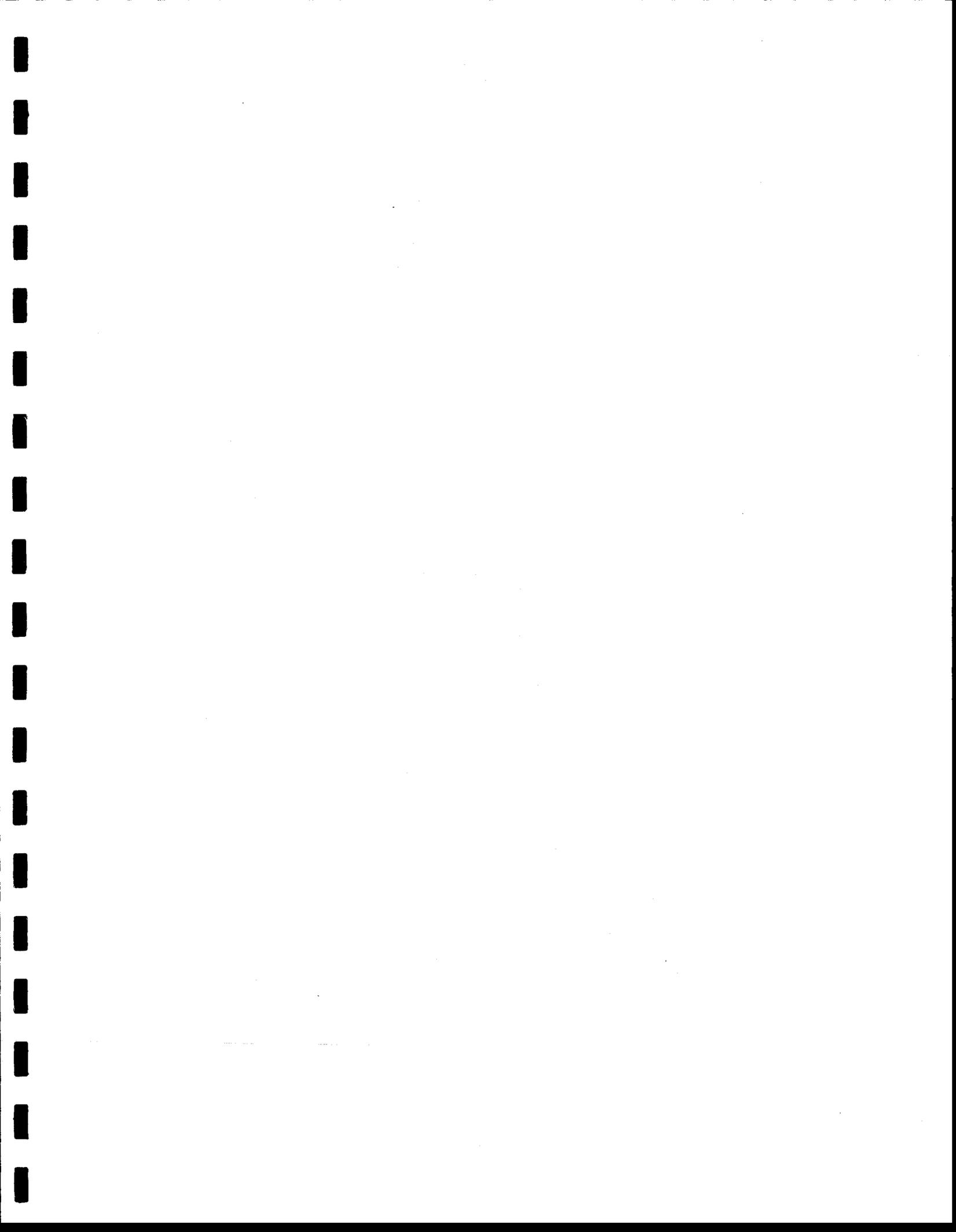


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INTRODUCTION

This report describes the design criteria for arsenic treatment for the Las Quintas Serenas Water Company Well Nos. 5, 6, and 7. Arsenic treatment will consist of a 1,220-gallon-per-minute (gpm) iron-media (Bayoxide® E33) adsorption arsenic treatment system, a 400,000-gallon storage tank, and a 1,000-gpm transfer booster station at the existing Well No. 6 site. A new 12-inch dedicated transmission watermain approximately 2,500 feet long will connect Well No. 7 to the Well No. 6 site. Raw water from either or both wells will be treated through the arsenic system at the Well No. 6 site. The treated water meeting the new arsenic standard will fill the new 400,000-gallon tank. A transfer booster station with a combined capacity of 1,000 gpm will then pump treated water from the new 400,000-gallon storage tank into the distribution system. Well No. 5 will be equipped with a pre-packaged, skid-mounted 210-gpm arsenic treatment facility designed to treat Well No. 5, and deliver directly into the water system and controlled by the existing reservoir system. There will be two Points of Entry (POEs) following implementation of the new arsenic systems, Well No 5 and the reservoir/booster station at the Well No. 6 site.

ARSENIC TREATMENT CRITERIA

In January 2001, the Environmental Protection Agency (EPA) modified 40 Code of Federal Regulations (CFR) Parts 9, 141, and 142, to adopt a new arsenic Maximum Contaminant Level (MCL) for drinking water. The rule modification lowered the MCL for arsenic from 50 parts per billion (ppb) to 10 ppb. This rule applies to all community water systems and non-transient, non-community water systems, including the Las Quintas Serenas Water system. January 23, 2006 is the date established for compliance with this ruling. Compliance must be obtained at all POEs within the system, meaning that all water sources that serve directly into the system must be providing an arsenic level of 10 ppb or less by January 23, 2006. The proposed arsenic treatment facilities will be designed to treat arsenic to 7 ppb, which will meet the new EPA requirements.

SOURCE CAPACITY

The Las Quintas Serenas Water Company currently operates three wells, Well Nos. 5, 6, and 7. All three wells pump directly into the water system to fill the existing 30,000- and 60,000-gallon storage tanks on the Animax mine tailings. The high water level of the tanks is approximately 3,057 feet. Well No. 7 is located near the southern end of the water company's Certificate of Convenience and Necessity (CC&N) and provides between 600 to 850 gpm. This well has a variable frequency drive (VFD) that changes the operational speed of the well based on pressure in the water system at the well site. Well No. 6 is located near the southwest corner of the CC&N. Both an electric motor and a natural gas engine operate Well No. 6. The electric motor provides 350 gpm, while the natural gas engine provides 425 gpm. Las

Quintas Serenas Water Company utilizes this type of operation because of their interruptible power agreement with Trico Electric Cooperative. During interruptible power outages, Well No. 6 and the existing storage are the only available water sources. Well Nos. 6 and 7 cannot operate together due to excessive pressures caused by both wells pumping at the same time. The layout of the Las Quintas Serenas Water system is provided in Appendix A.

WATER QUALITY

Water quality results provided by the owner for all three wells were compared to the National Primary Drinking Water Regulations (NPDWR). NPDWRs are legally enforceable standards to protect public health. All three wells were found to be compliant with the current primary standards, with the exception of the new arsenic standard.

ARSENIC LEVELS

All wells will require arsenic treatment. A typical design criterion for arsenic treatment systems is to treat the 90th percentile arsenic level. A percentile is a value on a scale of 100 that indicates the percent of a distribution that is equal to or below it. For example, an individual water quality sample for a POE with an arsenic level at the 90th percentile is equal to or greater than 90 percent of all the water quality samples containing arsenic for that POE. This statistical method eliminates outlying data points which may result in over-design of the treatment system. The well capacities and design arsenic levels are shown in Table 1. The future anticipated well capacities differ from existing well capacities as the pumping heads will be altered due to the pressure changes related to the arsenic system implementation. The required re-equipping of the wells is included later in this report. Most arsenic treatment systems, including the facilities selected for Las Quintas Serenas, are flexible enough to adjust the amount of treated water should arsenic levels suddenly increase or decrease after initial set up and installation. This is important because a flow bypass will be used at each facility to blend raw and treated well water in order to provide flexibility and extend the bed life of the media. The flow bypass regime will be explained later in this report.

Table 1. Well Summary

Facility	Existing Well Capacity (gpm)	Anticipated Well Capacity (gpm)	90 th percentile Arsenic Levels (ppb)
Well No. 5	230	200	11
Well No. 6	350-425	400	15
Well No. 7	600-850	790	13

ARSENIC LEVEL DEVELOPMENT AND TREATMENT GOALS

The owner provided results of arsenic levels for all three wells from March 1990 to February 2005. The 90th percentile arsenic level for each well has been calculated as the basis for design of the treatment system. This arsenic level affects the initial bypass flow control settings, as the bed life of the media and operation & maintenance (O&M) costs. Should arsenic levels in the raw water ever increase or decrease, field adjustments to the flow control bypass may be made to treat various combinations of flow. If the arsenic standard is ever changed, the system can be adjusted, and with minor amendments, can be altered to meet the new standard. The actual size of the treatment vessels is primarily based on gpm flow, rather than raw water arsenic levels.

ARSENIC TREATMENT FACILITY SITING ANALYSIS

Combined arsenic treatment at one facility is often more cost effective and less maintenance than individual treatment systems, as was shown to be the case for Well Nos. 6 and 7 in the Las Quintas Serenas Water System and Arsenic Master Plan, 2005. It was not deemed cost effective to build a dedicated watermain from Well No. 5 to the combined treatment plant at Well No. 6 due to the small size of Well No. 5, the long distance between well sites, and the age and condition of this well. The individual arsenic treatment unit at Well No. 5 will be skid-mounted and transportable to a future well site if Well No. 5 is ever abandoned or a new source well requiring arsenic treatment is developed. It is also recommended that all arsenic treatment sites contain facilities from the same manufacturer and, if possible, the same arsenic treatment process. This will assist water company personnel with operation and familiarity with equipment, and minimize service agreement and O&M contracts with different suppliers.

TREATMENT ALTERNATIVES CONSIDERED

AVAILABLE TREATMENT TECHNOLOGIES

A number of treatment processes can be used to remove arsenic from water. These processes include ion exchange, adsorption, membrane processes, and precipitation processes. Each of these processes is briefly discussed below.

Ion Exchange

Ion exchange is a remediation process that removes dissolved ions from liquids. The ion-exchange process involves passing the contaminated water through a packed media. This media is designed to exchange a solid ion with the liquid phase ion of choice, in this case arsenic. This process occurs until all exchange sites on the media have been exhausted. The media can be regenerated by using a concentrated solution of the ions originally used on the media. Regeneration creates an arsenic-rich waste stream that must then be dealt with by one of the other treatment techniques. Generally, the waste stream is treated using a coagulation-flocculation process, which leaves a liquid waste stream low in arsenic and a solid waste stream high in arsenic. The benefits to this treatment technique are lower capital costs and relatively low volumes of waste when compared with precipitation and membrane processes. Lower capital costs are attained because the water system can lease this type of treatment technology from a vendor, rather than purchasing the equipment outright. This system, however, can suffer greatly if other competing ions are in the liquid stream, as this causes higher waste volumes due to the need to regenerate the media more often. This also results in high maintenance costs. Monitoring of the effluent stream during startup may be needed to properly determine the volumetric setpoint and avoid possible breakthrough conditions. Operator skill for this treatment is categorized as high. One drawback of this treatment technology is that the high arsenic waste streams can be considered a hazardous waste that must be disposed of in an appropriate manner.

Adsorption

The adsorption process involves passing the contaminated water over a packed media in which the arsenic physically and chemically bonds to the media. The packed media is contained within pressurized vessels operating either in parallel or in series. This removal process occurs until all of the available sites within the media are exhausted. It is typically not cost effective to regenerate adsorption media and it must be replaced when it becomes saturated. Generally, the packed media will last anywhere from one to five years before replacement is required. In most cases, the exhausted media can be discarded in landfills and classified as non-hazardous waste. The adsorption life of the media relies on raw water pH, arsenic concentration levels, and operating cycles per day.

Periodic backwashing or “fluffing” is typically performed because adsorption media in pressurized systems can compact and develop preferential channels that can cause short-circuiting and incomplete adsorption over time. Additionally, sand and other sediment from wells, oxidized iron precipitate (depending on media type), or other suspended material may be captured in the adsorption media bed. To prevent excessive pressure drop and channeling, backwashing to “fluff” the adsorption bed is typically performed. The backwashing does not regenerate the media, it merely removes solid particulates from the system and “fluffs” the media. Backwash vessels with recycle pumps may be required depending on owners’ preferences and available options for discharging of waste stream.

The backwash stream is generally much smaller for the adsorption process than the ion exchange stream and only requires separation of the particulates in backwash vessels via sedimentation or through bag filters before the water can either be sent back to the head of the treatment plant, discharged to a sewer or septic system, or hauled from the site and disposed in a sewer or treatment plant. It is possible that the backwash water could be discharged to local waters via a National Pollutant Discharge Elimination System (NPDES) De Minimus permit. The benefits to this system are relatively simple operations and no hazardous materials disposal. Operator skill for this treatment is categorized as low and Operator Level I is typically required to run this type of facility.

Membrane Processes

Membrane processes involve passing the contaminated feed water through a semi-permeable membrane. These membranes are designed to allow certain constituents through while blocking the contaminants of choice. These processes proceed due to a driving force, which can include pressure, chemical potential, or electrical potential. Pressure is most typically used to drive the membrane process. The membrane process can also remove several other constituents from water such as organic carbon, salts, dissolved minerals, and color. Membrane cleaning is important to removal efficiency, and is costly and difficult. This system has several disadvantages including membrane clogging and chemical cleaning requirements, power consumption costs, membrane replacement, and high waste stream volumes. Operator skill for this treatment is categorized as medium.

Precipitation Processes

Precipitation processes involve the addition of a coagulate feed stream to bind with the arsenic and create a solid. For arsenic, an iron or alumina coagulant is generally used. This coagulant binds with the arsenic and is removed from the stream either by natural settling or direct filtration. The benefits of this system are that the coagulants are inexpensive and readily available. However, the system generates a large volume of waste, requires significant feed chemicals, and requires almost continuous monitoring to control feed chemical influent rates. Some feed chemicals must be stored in double-walled containers. The arsenic concentration in the waste is generally lower due to the larger volume of waste that may allow for easier disposal. Operator skill for this treatment is categorized as low.

EVALUATION OF ALTERNATIVES CONSIDERED

The adsorption arsenic treatment process is the preferred alternative for arsenic treatment. The primary reasons for selecting adsorption are: adsorption is the one of the simplest forms of arsenic treatment, adsorption media is specifically designed to select for and remove arsenic, facilities produce low backwash volumes and no hazardous waste generation, facilities require low maintenance, O&M

contracts are readily available with numerous established media suppliers, and this process has been successfully employed in both the United State (including Arizona) and Great Britain. Three adsorption arsenic treatment providers were evaluated. All three treatment providers supply both the treatment facility and media.

McPhee Environmental Supply specializes in nano-particle selective resin known as As:X^{np}. As X^{np} contains iron oxide bound to spherical resin beads that are uniform in size. This uniform spherical shape allows a homogeneous flow that prevents the media from channeling. The spherical beads are termed "macro porous" and have large surface areas containing iron oxide. As:X^{np} is typically regenerated unlike most other iron-based medias. All As:X^{np} is currently regenerated in Tennessee, although McPhee is in the process of permitting a new regeneration facility in Tempe, Arizona. The disadvantage of regeneration of the media is that the media loses adsorption capacity with each regeneration. Free arsenic is also created during the regeneration process that must be properly disposed of. The major advantage of this media is that backwash is infrequent and backwash vessels are not required to settle out the fines associated with other granular iron oxide medias. The backwash water is typically clear and may be pumped directly into the system during the backwash cycle. These units are also typically the least capital cost, although the As:X^{np} is significantly more expensive than other medias considered. It is our understanding that McPhee facilities are designed specifically for As:X^{np} and cannot accept other types of media. McPhee provides media removal and regeneration services, and requires a three-year O&M contract for these services. McPhee is a relatively new arsenic treatment manufacturer and, at the time of this report, did not have any existing facilities operating in Arizona.

US Filter was evaluated as a candidate for providing arsenic treatment to Las Quintas Serenas. US Filter uses Granular Ferric Hydroxide (GFH) ferric-based media. Once the media has exhausted its adsorption capacity, it is removed from the vessel and replaced with new media. US Filter service crews are available to remove the exhausted media and safely dispose of it, and fill the vessel with new media. The simplicity of this process with single-use media is very attractive for small installations and wellhead applications where no treatment currently exists. A backwash process flow rate of 10 to 12 gpm/square foot is typically required to prevent compaction of the bed and remove captured particulates. The backwash process typically requires backwash vessels sized to contain the full backwash volume. The backwash is then decanted in the backwash vessels to allow the captured particulates to settle out. One drawback to the GFH media is that it is shipped wet and requires special storage to prevent biologic growth on the wet media. Water content also increases the media's weight and associated shipping cost. US Filter's facilities are not restricted to the use of a single media and are adaptable should a future media become the preferred alternative.

Severn Trent was the third arsenic treatment supplier evaluated for arsenic treatment. Severn Trent's arsenic removal facilities are similar to those of US Filter. Severn Trent uses a "second-generation" ferric-based media called Bayoxide® E33. Bayoxide® E33 has a larger particle size than GFH, which may reduce backwash frequency, media compaction, and the amount of media particulate contained in the backwash stream. Severn Trent also claims Bayoxide® E33 is also more robust to common water constituents such as silica, vanadium, and variances in pH. Bayoxide® E33 is shipped dry, which makes onsite storage a viable option and makes changing the media simpler. Backwashing is typically performed at a rate of 7 to 9 gpm/square foot. Severn Trent also provides media removal and refill services. Severn Trent's facilities are adaptable to other types of media as more efficient and lower cost media are developed in the future.

Severn Trent was selected to provide both the arsenic treatment facilities and Bayoxide® E33 adsorption media. Major reasons for the selection of Severn Trent were based on initial bids received by Las Quintas Serenas Water Company, anticipated O&M cost provided by Severn Trent, removal efficiency and ease of storage and handling of Bayoxide® E33 media, the ability to use other media types in Severn Trent facilities in the future, and the positive reputation and history of Severn Trent in the environmental services industry.

RESERVOIR DESIGN

A new storage reservoir will be required at the Well No. 6 site to provide equalization between well and booster station pumping cycles for the new arsenic treatment system.

The following equation was used to size the new forbay reservoir capacity based on limiting the largest well, Well No. 7, to five-hour pumping cycles, which is the minimum desired pumping cycle for wells of this size. Ideally, the well would cycle only once or twice a day. Well "pump on" set points are typically set to turn the well on when the reservoir level drops to approximately half full. The main reason to keep the reservoir approximately half full is to maintain net positive suction head (NPSH) on the booster pumps to inhibit cavitation and vortex formation and keep the pumps primed. In addition to maintaining NPSH, the bottom two feet and top one foot of storage are typically considered unusable or "dead" storage. It is assumed that one of the booster pumps (310 gpm with one pump on) is in operation during the time Well No. 7 (790 gpm) is in operation, which results in a net inflow into the reservoir of 480 gpm (790 gpm - 310 gpm):

$$480 \text{ gallons/minute} \times 5 \text{ hours} \times 60 \text{ minutes/hour} = 144,000 \text{ gallons}$$

Assuming 144,000 gallons is about half the capacity of the new reservoir, the minimum storage tank size required by the arsenic treatment system will be approximately 250,000 gallons. 144,000 gallons is about 60 percent of 250,000 gallons. The remaining storage maintains adequate NPSH on the pumps and also accounts for unusable or "dead" storage.

Las Quintas Serenas Water Company has chosen to oversize the reservoir by 150,000 gallons, which will increase the reservoir size to 400,000 gallons. This oversizing of the reservoir is not required for arsenic treatment and will be paid for by the Las Quintas Serenas Water Company.

The new reservoir will be a 400,000-gallon welded steel tank, constructed according to AWWA D-100. The reservoir will be approximately 57 feet in diameter and 24 feet high, with the bottom two feet and top one foot considered "dead" storage. The blended treated water will fill the reservoir through a 12-inch top-feed inlet on the new reservoir. A 12-inch outlet connects to the suction manifold of the new pump station. The reservoir will be provided with a concrete ring wall, a 16-inch overflow line, a 6-inch drain, and a 24-inch screened roof vent.

BOOSTER STATION CAPACITY AND PUMP SIZING

The proposed booster station capacity of 1,000 gpm is based on delivering the maximum capacity that will not over pressurize the water system. A system curve was developed using a hydraulic model to determine the specifications and operating points of the new booster station. The system curve was developed assuming that a new 8-inch water main will connect from Well No. 6 site into the new water distribution network in Santa Cruz Meadows Lots 1-239, north of the site. This 8-inch watermain connection will be required prior to the installation of the proposed booster station. If this 8-inch connection is not available, the booster station design point will change slightly. The system curve is included in Appendix B. A reservoir was used in the model to simulate the effects of a new booster station supplying capacity and pressure at this location. The hydraulic grade (elevation) of the reservoir was set to the desired discharge hydraulic grade of the pump. The hydraulic grade of the reservoir in the hydraulic model was gradually increased from static pressure of approximately 85 pounds per square inch (psi)/196 feet to 100 psi/230 feet. The upper extent 100 psi/230 feet of the analysis is the maximum discharge pressure of existing Well No. 6. It is not desirable to increase the pressure beyond the existing system pressure as increasing the pressure above 100 psi may damage the existing water system or the customers' existing plumbing. The system curve was generated by subtracting 20 feet from the reservoir hydraulic grade to take into account suction pressure that would affect a booster station drawing suction from a 24-foot-tall reservoir, assuming it was four feet low. A hydraulic grade vs. flow curve (system curve) was developed for a pump operating during the average day demand (ADD) and peak day demand (PDD) scenarios. The system curve was used to size booster pumps capable of operating at the desired points along the system curve.

A packaged booster pumping system consisting of four, 20-horsepower constant speed vertical multi-stage pumps will be added at the existing Well No. 6 site. These pumps will feed the existing remote reservoir that provides storage and regulates pressure in the water distribution system. The pump curve for the four pumps operating in parallel for both level and pressure control are included in Appendix B. Reservoir level pump settings are proved in the following table:

Table 2. Elevation Pump Controls

Pump Number	Design Flow (gpm)	Combined Design Flow (gpm)	Horsepower	Upper Reservoir Elevation On (feet)	Upper Reservoir Elevation Off (feet)	Average Pump Head (feet)	Emergency Shut-off Head (feet)
Pump 1	310	310	20	3,053 (4' low)	3,057 (0'low)	180	220
Pump 2	300	600	20	3,051 (6' low)	3,056.5 (.5'low)	185	220
Pump 3	285	850	20	3,050 (8' low)	3,056 (1'low)	195	220
Pump 4	250	1,000	20	3,047 (10'low)	3,055.5 (1.5'low)	205	220

The pump station will also be equipped to provide some pressure control. Pressure control will allow the booster station to provide capacity during sudden pressure drops typically associated with high demand scenarios. The booster station will include a pressure sensing instrument on the discharge side of the unit set and will be programmed turn booster pumps on as pressure decreases below predetermined set points. The booster pumps will turn off as the pressure in the water system rises above a predetermined set point. The following table describes the pressure control of the booster station:

Table 3. Pressure Pump Controls

Pump Number	Design Flow (gpm)	Combined Design Flow (gpm)	Horsepower	Pump On Site Pressure Setting (feet/psi)	Pump Off Site Pressure Setting (feet/psi)	Average Pump Head ^{*1} (feet)	Emergency Shut-off Pump Head (feet)
Pump 1	320	320	20	173/75	215/93	174	220
Pump 2	350	700	20	168/73	212/92	170	220
Pump 3	345	1,035	20	164/71	210/91	167	220
Pump 4	360	1,440	20	159/69	207/90	163	220

*1 Avg. Pump Head is the Avg. Pump On/Off Pressure Settings – Suction Highwater (Assume Tank 4 feet low.).

ELECTRICAL AND CONTROLS

The existing well pump for Well No. 6 is presently served by a 75-horsepower electric motor and a natural gas-powered engine via a combination gear drive that allows either drive to operate the pump. This configuration allows the well pump to be operated during a utility power failure.

Electric power to the site is 200 amperes, 480 volt, three-phase service by Trico Electric Cooperative from pole-mounted transformers. The capacity of the existing electrical service will have to be increased from 200 amperes to 400 amperes to serve the added booster pumps.

An electric generator is required at Well No. 6 as this site will have the proposed 400,000-gallon reservoir, which will contain the majority of available treated water. In the event of a power outage, Well No. 6 will be able to supply treated water to the reservoir because it is also equipped with an emergency power supply via the existing natural gas engine. In order to pump treated water from the onsite reservoir into the water distribution system, an electric generator will be required to supply the booster station with emergency power.

A dedicated 130kW (162 KVA) diesel-powered engine generator is proposed to serve only the new booster pumps. The new pumps will be fed electric power via an automatic transfer switch that will automatically control the generator to provide power to the booster pumps upon loss of the normal utility power source. The transfer switch will also provide an automatic exercise program that can be set to run the engine at regular intervals, such as 20 minutes once a week, to minimize problems arising from extended idle periods. The generator will have a sound-attenuated, weatherproof enclosure and a double-walled, base-mounted fuel tank with capacity for at least 24 hours of full load operation.

The new booster pumps will be provided with weatherproof full-voltage combination starters mounted on an electrical equipment rack. The rack will be designed to provide shade for the equipment and also support the required new service equipment and automatic transfer switch.

The new booster pumps will typically be controlled by level in the remote upper reservoir via the existing radio-telemetry equipment serving the sites. The pumps can be set to start sequentially on falling level in the reservoir, and stop sequentially on rising level using the existing reservoir level signal. Provisions to remove one or more pumps from the pumping regime for maintenance can also be programmed into the telemetry system. Minimal additional telemetry hardware will be required to incorporate the new pumps into this control scheme. Most of the telemetry system work required will be in the form of programming the existing processors at the reservoir and Well No. 6 sites, and at the central telemetry system computer at the water company's office to allow the operator to monitor the new functions.

OTHER DESIGN CRITERIA

The pump station will include 12-inch suction and discharge manifolds as part of the pre packaged booster station and flow meter. A new onsite 12-inch watermain will connect the booster station to the existing 12-inch watermain in Calle Santiago. A portion of the onsite 6-inch watermain will be replaced by a new 8-inch water main as part of the proposed connection to Santa Cruz Meadows north of the well site. It is anticipated that the existing 5,000 gallon 150 psi hydropneumatic tank at Well Site 6 will be relocated to the discharge side of the new booster station. Chlorination facilities will also be provided for each well feed to properly oxidize and disinfect prior to the arsenic treatment system. The Well No. 6 site layout is included in Appendix C.

WELL PUMP MODIFICATIONS

The iron adsorption arsenic treatment facilities typically require 5 to 10 psi for normal operation and 15 psi for backwashing procedures. Two pressure instruments located on the intake and discharge side of the facility measure pressure differential across the arsenic facilities. As the pressure differential across the treatment facility increases above the desired amount, the facility is backwashed or "fluffed" which decreases the pressure differential across the facility. A typical design criterion is to backwash or fluff the media beds when the pressure differential buildup across the facility goes over 10 psi of the initial pressure reading at start up. In order to fill the new onsite 24-foot-tall reservoir, an additional 24-foot/11 psi will be required for these facilities. The wells will be required to deliver a minimum normal operation pressure of 10 psi plus 11 psi to fill the onsite reservoir for a total of 21 psi.

The new pumping water level for Well Nos. 6 and 7 will be the elevation of the Well No. 6 site plus the 21 psi/48 feet. The existing Well No. 6 site elevation of 2,855 feet + 48 feet = 2,903 feet. The well modifications also provide for extra headloss associated with backwash procedures and fluctuation in the pressure differential across the facilities between backwash cycles.

Wells Nos. 6 and 7 currently pump to the existing storage tanks with a highwater elevation of 3,057 feet. Because the wells will now be pumping to a reservoir much lower than the existing storage tank highwater levels, the pumps will be modified to pump to this lower elevation.

The following sections describe the criteria and specifications for well modifications. A summary of the design calculations for Well Nos. 6 and 7, including pump curves and a summary for all three wells, are included in Appendix D.

WELL NO. 7

The existing well will be equipped to pump into a new 2,500 lineal foot (lf) 12-inch dedicated watermain for delivery to the new arsenic treatment facility. An 8-inch watermain would have a headloss of approximately 30 feet and a velocity of 5 feet/second, which is less economical in long-term power consumption than a new 12-inch water main at 4 feet of headloss and a velocity of 2 feet/second. The existing well is currently equipped to pump to the existing storage tanks that are at a higher elevation than the new arsenic treatment facility. Three stages will be removed from the existing 10-stage assembly. System design criteria are shown in the following table.

Table 4. Well 7 (790 gpm) Design Criteria

Pump Head at Treatment Plant Site (feet elevation)	2,903
Well Pad Elevation (feet elevation)	2,880
Static Water Level (feet bls)	363
Estimated Drawdown @ 820 gpm (feet) ^{*1}	8
8-inch Column Head Loss (feet)	13
2,500 lf 12-inch transmission main losses: Hazen Williams C =130 (feet)	4
Manifold Losses (feet)	5
Sand Separator Losses	16
Total Dynamic Head (TDH, feet)	431

^{*1} Las Quintas Serenas Water Co. provided the drawdown for Well 7 and a step test was not available.

The manufacturer's pump curve showing the new design point for seven stages is included in Appendix D.

Well No. 7 will be fitted with a new sand separator at Well No. 7 site. The sand separator will add approximately 7 psi /16 feet of headloss at 790 gpm. Manufacturer's cut sheets for the sand separator can be seen in Appendix E.

Well No. 7 site piping will be disconnected from the existing hydrotank and routed to the new transmission main. The existing Variable Frequency Drive on Well 7 will be used to gradually ramp up Well 7 to maximum capacity and provide some surge protection. The existing hydrotank will remain at the Well No. 7 site to provide surge protection.

WELL NO. 6

Well No. 6 will have four bowl stages removed from its existing 13-stage pump assembly. Additionally, Well No. 6 has shown signs of sanding and will require an external sand separator which will account for a 6 psi/14 feet of headloss at 400 gpm per the manufacturers specifications. Manufacturer's cut sheets for the sand separator can be seen in Appendix E.

A new 3,000 gallon hydropneumatic tank will be required for Well No. 6 to provide surge protection for the arsenic treatment facilities as this well is not equipped with variable frequency drive.

Table 5. Well 6 (400 gpm) Design Criteria

Pump Head at Treatment Plant Site (feet elevation)	2,903
Well Pad Elevation (feet elevation)	2,855
Static Water Level (feet bls)	337
Estimated Drawdown at 400 gpm (feet)	9
6-inch Column Friction Head Loss (460 feet bowl setting) (feet)	11
Manifold Losses (feet)	5
Sand Separator Losses (feet)	14
Total Dynamic Head (TDH, feet)	424

WELL NO. 5

Well No. 5 will not require any modifications, as it will continue to pump directly into the distribution system. The capacity of Well No. 5 will likely decrease to 200 gpm due to the headloss associated with the new treatment facility (approximately 5 psi during normal operation and an additional 10 psi during backwash). The pump curve for Well No. 5 is included in Appendix D. Additionally, Well No. 5 has shown signs of sanding and will require an external sand separator, which will create an 8 psi/18 feet headloss at 200 gpm per the manufacturer's specifications. Manufacturers cut sheets for the sand separator can be seen in Appendix E.

Table 6. Well 5 Design Criteria

	Existing (230 gpm)	Future (200 gpm)
Highwater Elevation (feet elevation)	3057	3057
Well Pad Elevation (feet elevation)	2910	2910
Static Water Level (feet bls)	401	401
Estimated Drawdown at 200 gpm (feet)	7	4
4-inch Column Friction Head Loss (460 feet bowl setting) (feet)	16	12
Manifold Losses (feet)	5	5
Sand Separator Losses (feet)	0	18
Arsenic Facility Losses (feet)	0	23
Total Dynamic Head (TDH, feet)	576	610

ARSENIC TREATMENT FACILITIES

Wells No. 6 and 7 will both be treated for arsenic at the Well No. 6 site via iron media adsorption with a flow bypass. Water from both wells will be blended and treated through the single adsorption media arsenic treatment facility at the Well No. 6 site. Well No. 5 will include an individual arsenic treatment facility. Arsenic facilities at the Well No. 6 site and Well No. 5 will be provided by Severn Trent Water Purification, Inc. (STWP). Both facilities will be delivered with support gravel to support the media and cover the effluent collectors to prevent media plugging, and Bayoxide® E33™ Media.

WELL NO. 6 SITE ARSENIC TREATMENT FACILITIES

The Well No. 6 site will include two, 10-foot-diameter, 75 psi ASME-rated, carbon steel vessels. Vessels will include NFP 61 interior coatings and two access ports, one 24-inch-diameter on the side wall with hinge and one 14-inch x 18-inch on the top head. Each adsorber will include a ladder and platform for access. Additional equipment provided by Severn Trent will include flow meters, control valves, and differential pressure switches.

A 13,400-gallon nominal capacity bolted steel tank with nozzles for fill, withdraws, drain, vent, level switches, and overflow will be provided for backwashing procedures. A side access hatch will be provided on the bolted steel tank. Erection of the bolted steel tank will be provided by Severn Trent on a slab foundation designed and supplied by the site contractor. An access ladder and perimeter handrail is included. Additional items provided by Severn Trent will include a multi-stage backwash transfer pump, a backwash transfer pump pressure gauge, and backwash tank level switches.

Severn Trent will provide a NEMA 4X control panel. The panel will control the start/stop of the backwash return pump. The PLC will be an Allen-Bradley Micrologix 1200 and the HMI will be an Allen-Bradley 600 with sunshield. Power to the panel is to be 120V, 1 ph, 60 hz.

WELL NO. 5 SITE ARSENIC TREATMENT FACILITIES

Well No. 5 will consist of two, 48-inch diameter, 150-psi ASME-rated Fiberglass Reinforced Plastic (FRP) adsorber vessels, and one skid that includes piping, wiring, valves, instruments and controls. The FRP vessels include external paint for protection from UV radiation.

The backwash tank will have a capacity of 3,000 gallons and include nozzles for fill, withdraws, drain, vent, level switches and overflow. A side access hatch will be provided on the backwash tank. Additional items provided by Severn Trent will include a multi-stage backwash transfer pump, a backwash transfer pump pressure gauge, and backwash tank level switches.

Severn Trent will include a NEMA 4X control panel for the Well No. 5 arsenic treatment facilities. Flow and pressure differential indicators are on the front face. A PLC will control the backwash sequence on an operator-settable time schedule. Power to the panel is to be 120V, 1 ph, 60 hz. The PLC will be an Allen-Bradley Micrologix 1200 and the HMI will be an Allen-Bradley 600 with sunshield.

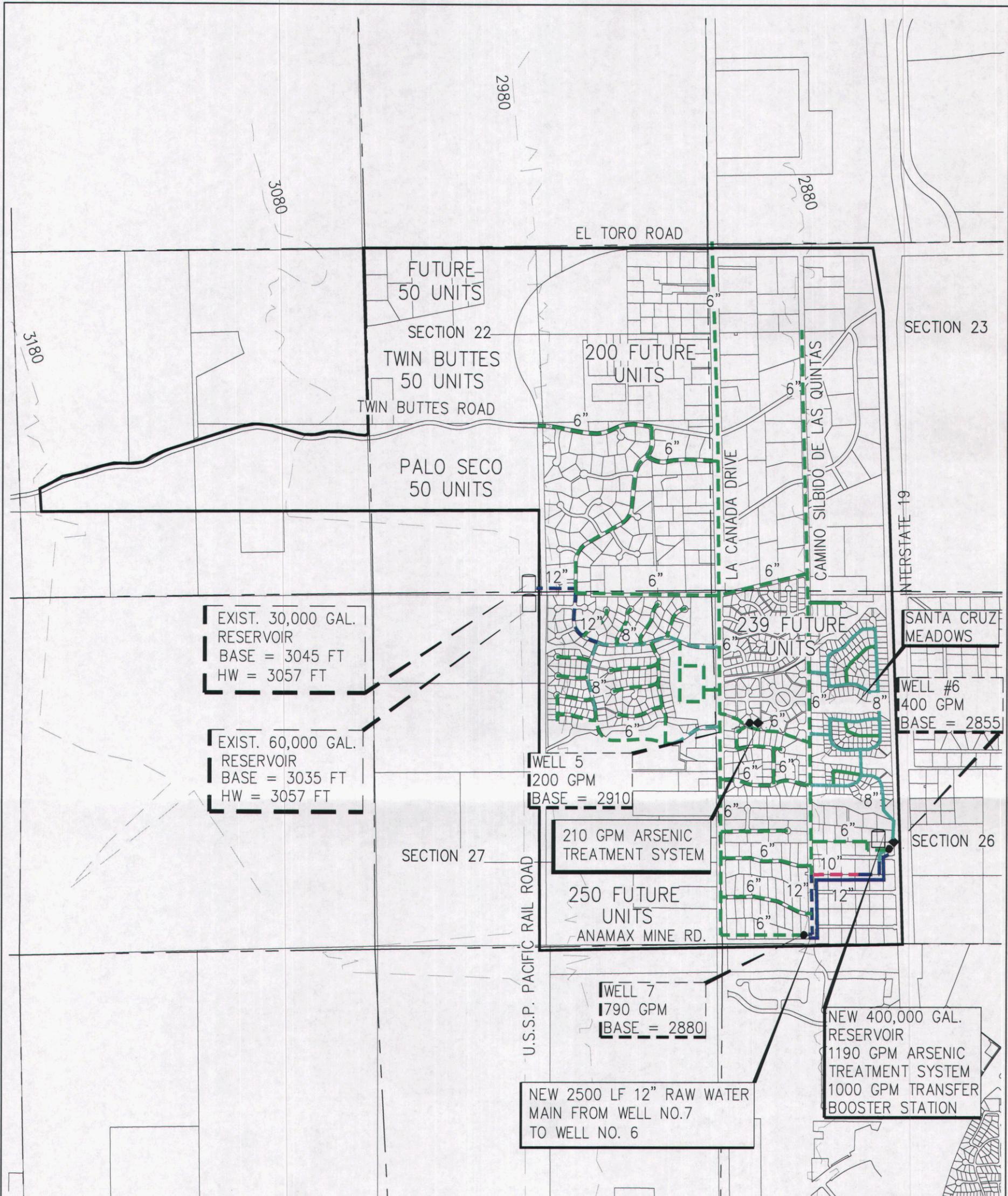
The submittal for the Severn Trent treatment systems is included in Appendix F.

BYPASS FLOW CONTROL TREATMENT METHOD

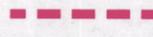
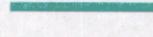
The Severn Trent adsorption facilities are anticipated to treat processed water to undetectable arsenic levels. In order to meet the treatment design goal of 7 ppb, only a portion of the raw water must be treated to non-detect (0 ppb). Raw water will be blended with treated water to the desired treatment level of 7 ppb. The flow control valves will be set to allow a certain percentage of raw water to either be treated or bypassed as required. Flow control and bypass settings are included in Appendix G.

APPENDIX A

**LAS
QUINTAS
WATER
SYSTEM
LAYOUT**



LEGEND

-  EXISTING 6 INCH TRANSMISSION MAIN
-  EXISTING 8 INCH TRANSMISSION MAIN
-  EXISTING 10 INCH TRANSMISSION MAIN
-  EXISTING 12 INCH TRANSMISSION MAIN
-  C C & N BOUNDARY
-  NEW 2500 LF 12 INCH TRANSMISSION MAIN
-  NEW 8 INCH TRANSMISSION MAIN
-  NEW 6 INCH TRANSMISSION MAIN
-  WELL
-  ARSENIC TREATMENT SYSTEM
-  RESERVOIR

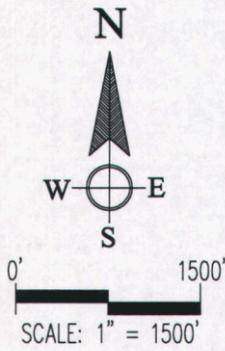


Exhibit 1
LAS QUINTAS SERENAS WATER COMPANY
 Water System Infrastructure
 SYSTEM LAYOUT AND PROPOSED UPGRADES

M:\projects\1148.02\ARSENIC DESIGN.dwg Dec 05, 2005 - 2:18pm rudyg

APPENDIX B

**SYSTEM
CURVE AND
HYDRAULIC
MODELING
RESULTS**

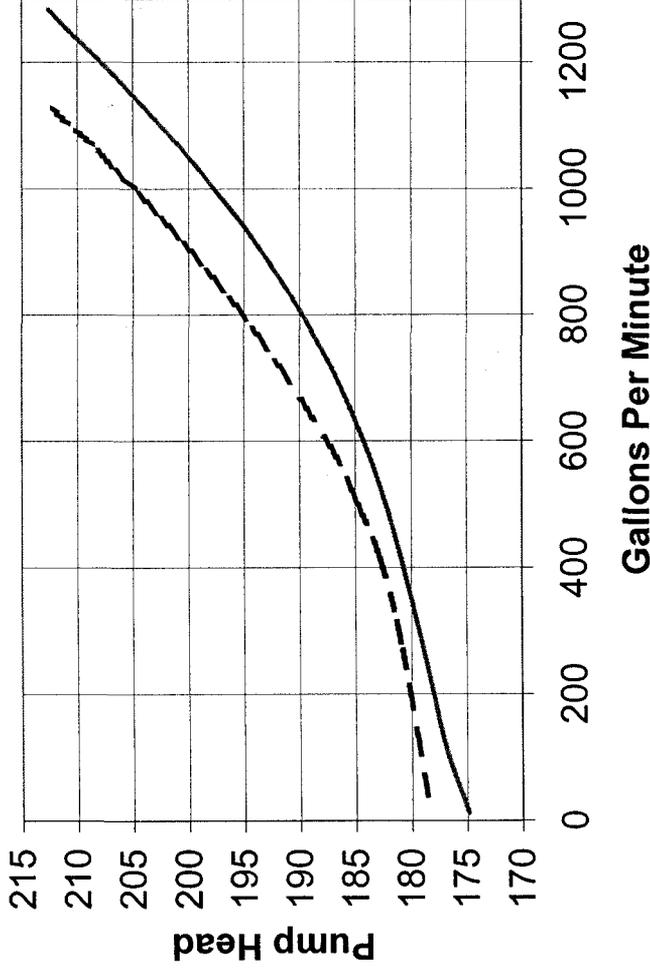
Average Day Demand (ADD)

Hydraulic Grade of Pump	Pressure psi	Pressure ft	Subtract Suction HW (20ft)	Discharge
3054	86.0	199	179	40
3056	87.0	201	181	282
3058	87.8	203	183	414
3060	88.7	205	185	503
3062	89.5	207	187	575
3064	90.4	209	189	638
3066	91.3	211	191	694
3068	92.2	213	193	746
3070	93.0	215	195	794
3072	93.9	217	197	839
3074	94.7	219	199	882
3076	95.6	221	201	923
3078	96.5	223	203	962
3080	97.3	225	205	1000
3082	98.2	227	207	1035
3084	99.0	229	209	1070
3086	99.9	231	211	1103
3088	100.8	233	213	1136

Peak Daily Demand (PDD)

Hydraulic Grade of Pump	Pressure psi	Pressure ft	Subtract Suction HW (20ft)	Discharge
3050	84	195	175	12
3052	85	197	177	112
3054	86	199	179	248
3056	87	201	181	411
3058	87.83	203	183	532
3060	88.69	205	185	627
3062	89.55	207	187	706
3064	90.42	209	189	773
3066	91.28	211	191	832
3068	92.15	213	193	886
3070	93	215	195	936
3072	93.88	217	197	982
3074	94.74	219	199	1026
3076	95.6	221	201	1068
3078	96.47	223	203	1107
3080	97.33	225	205	1145
3082	98.2	227	207	1182
3084	99.06	229	209	1217
3086	99.93	231	211	1251
3088	100.7	233	213	1284

LQS Well Site 6 System Curve



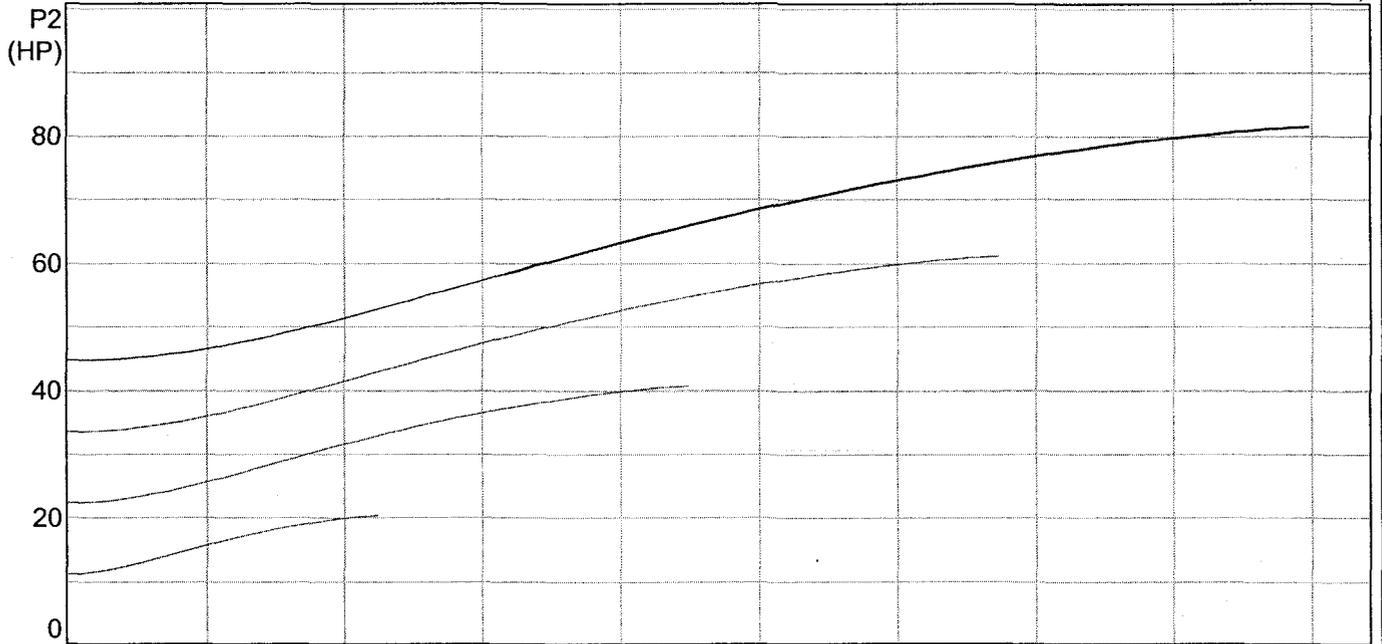
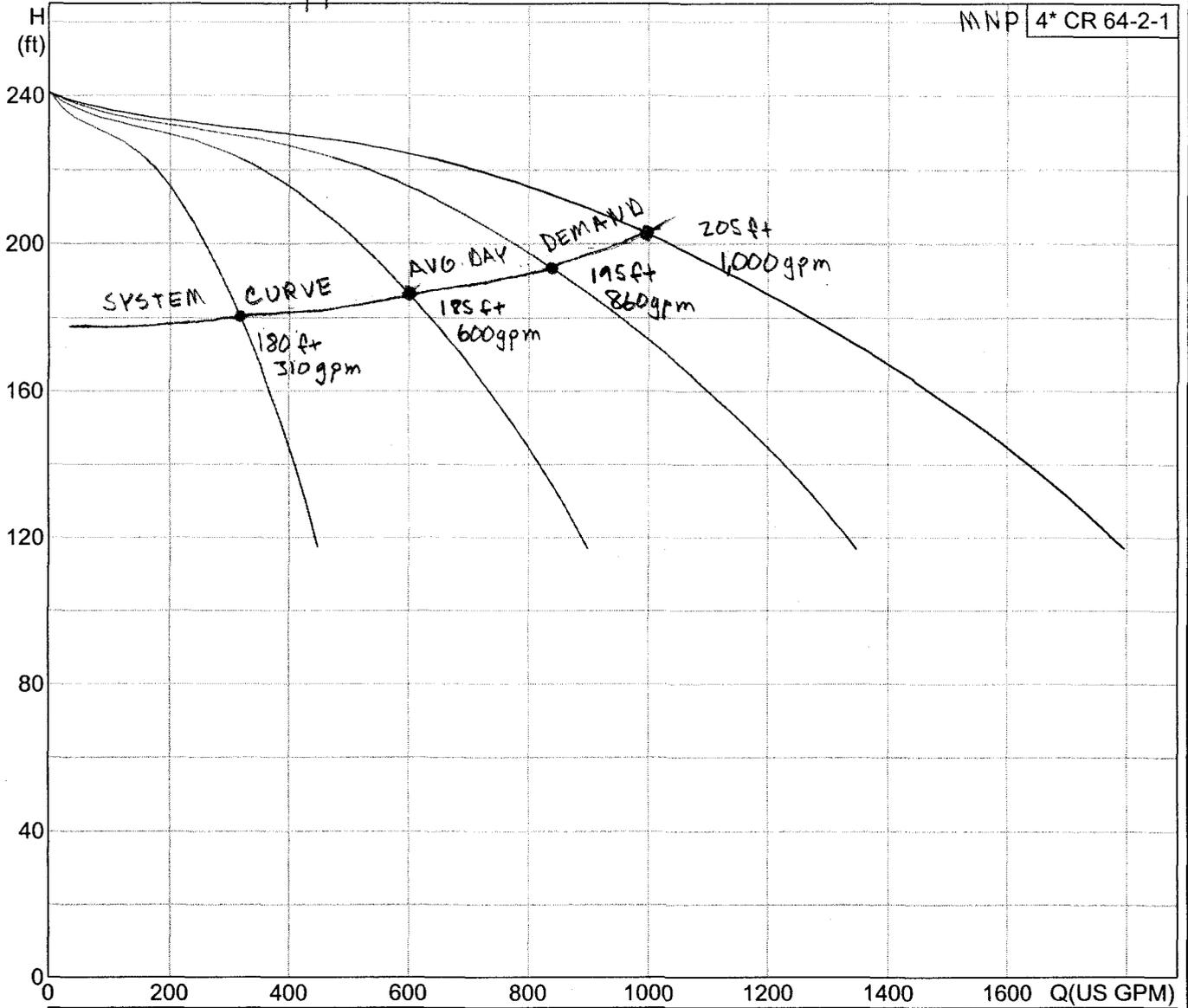
Existing Tanks set to 3055 ft (2ft Low)
Assume 24 ft tall Tank at Well Site No. 6 is four feet low (20 ft suction pressure)

Four Pumps 80 hp (Combined)

MNP CR 64-2-1

Upper Reservoir Level Control

MNP 4* CR 64-2-1

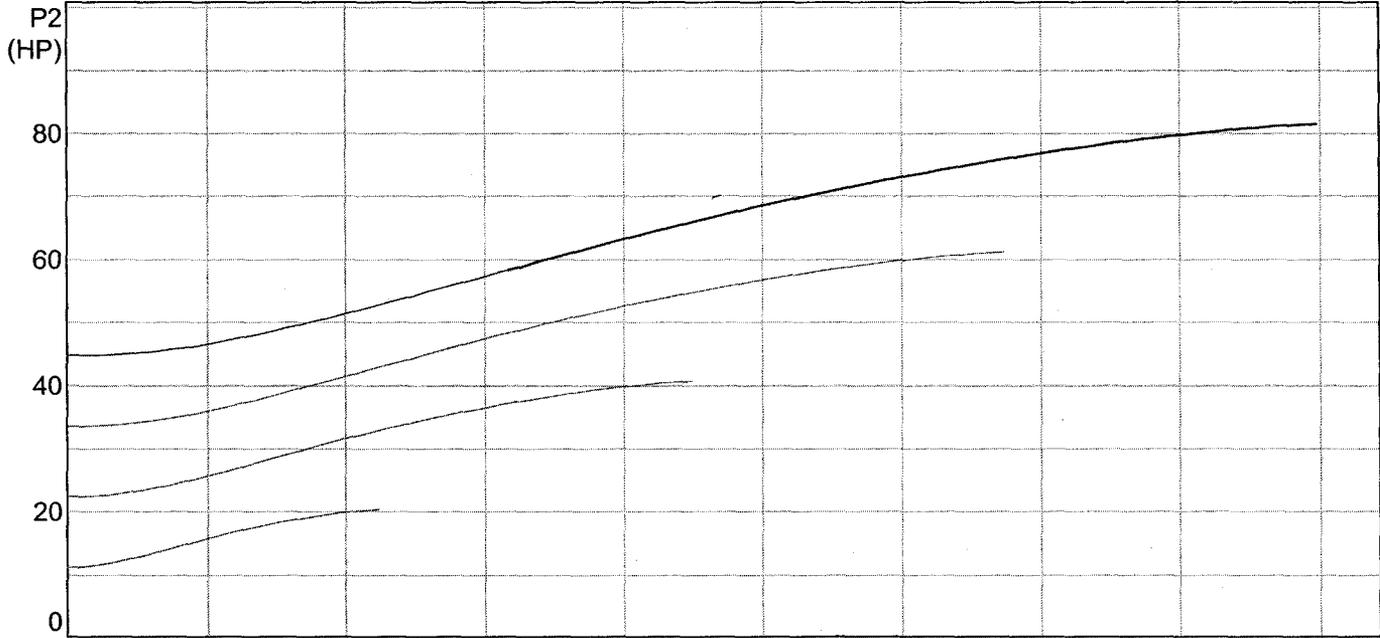
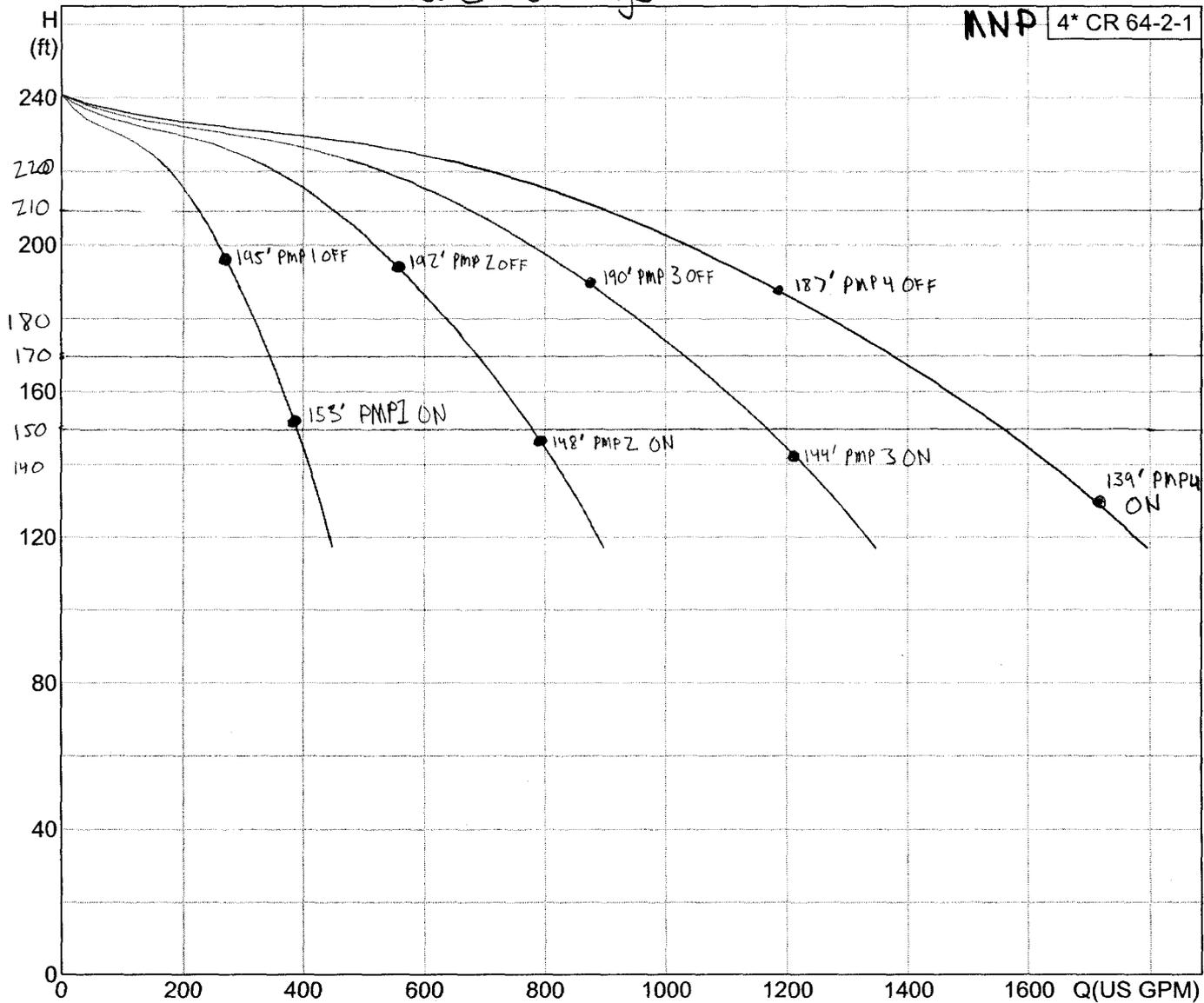


Four Pumps 80hp (Combined)

MNPCR 64-2-1

Pressure Settings

MNP 4* CR 64-2-1



Scenario: ADD

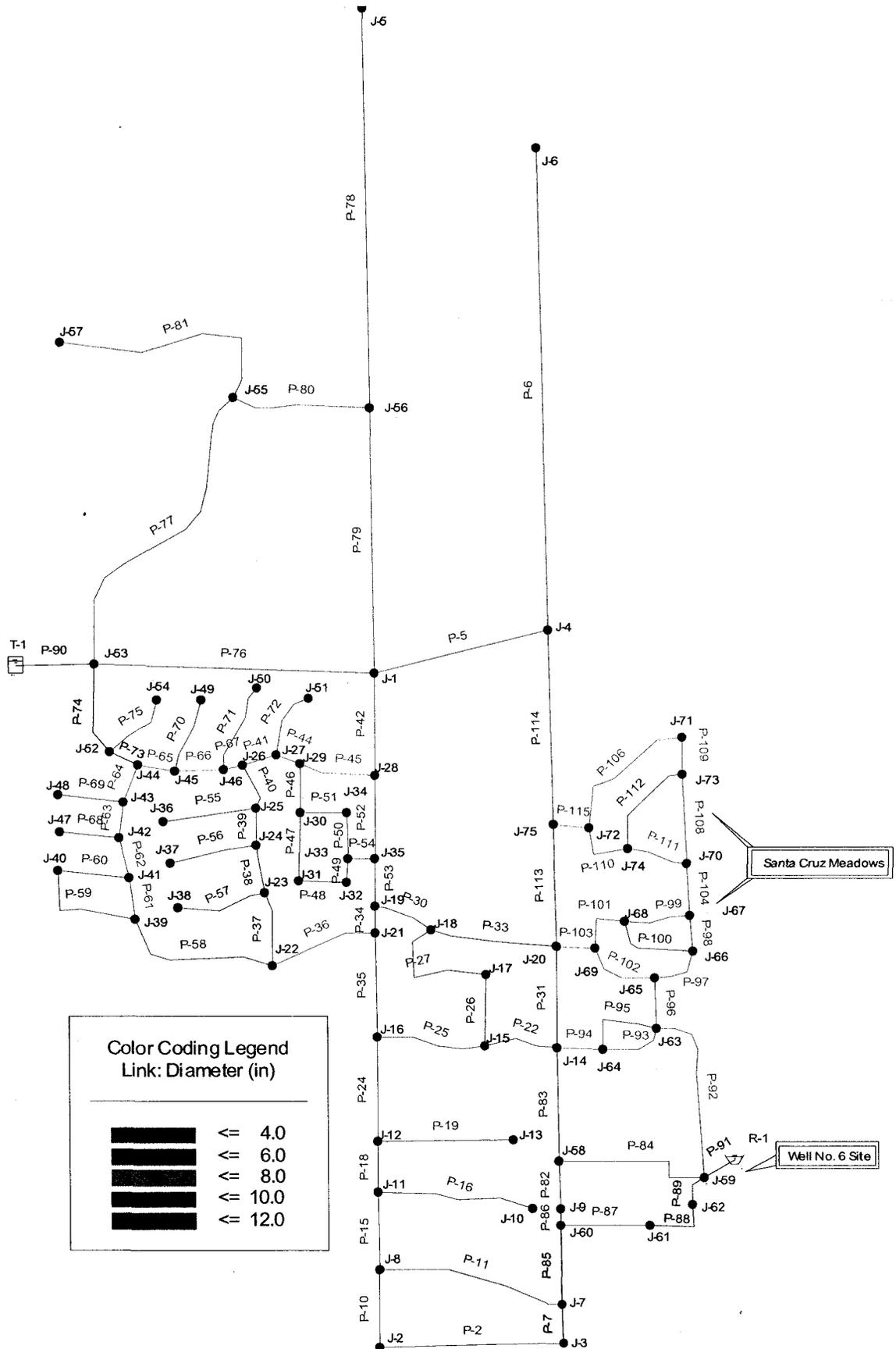


Table 1. Average Day Demand Junction Report

	Elevation (ft)	Zone	Base Flow (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-48	2,975.00	Zone	4.54	3,056.48	35.25
J-47	2,975.00	Zone	4.54	3,056.65	35.33
J-40	2,975.00	Zone	4.54	3,056.93	35.45
J-57	2,975.00	Zone	4.54	3,056.93	35.45
J-53	2,970.00	Zone	4.54	3,055.70	37.08
J-52	2,970.00	Zone	4.54	3,056.15	37.27
J-43	2,970.00	Zone	4.54	3,056.48	37.42
J-42	2,970.00	Zone	4.54	3,056.65	37.49
J-41	2,965.00	Zone	4.54	3,056.87	39.75
J-39	2,965.00	Zone	4.54	3,057.04	39.82
J-44	2,960.00	Zone	4.54	3,056.31	41.67
J-36	2,960.00	Zone	4.54	3,058.82	42.75
J-54	2,955.00	Zone	4.54	3,056.15	43.76
J-37	2,958.00	Zone	4.54	3,059.27	43.81
J-45	2,955.00	Zone	4.54	3,056.99	44.13
J-38	2,955.00	Zone	4.54	3,059.94	45.4
J-49	2,950.00	Zone	4.54	3,056.99	46.29
J-46	2,945.00	Zone	4.54	3,057.93	48.86
J-50	2,940.00	Zone	4.54	3,057.93	51.02
J-26	2,940.00	Zone	4.54	3,058.33	51.19
J-25	2,940.00	Zone	4.54	3,058.82	51.41
J-55	2,938.00	Zone	4.54	3,056.94	51.46
J-24	2,940.00	Zone	4.54	3,059.27	51.6
J-23	2,940.00	Zone	4.54	3,059.94	51.89
J-22	2,940.00	Zone	4.54	3,061.07	52.38
J-27	2,935.00	Zone	4.54	3,058.66	53.5
J-29	2,930.00	Zone	4.54	3,058.93	55.78
J-30	2,930.00	Zone	4.54	3,059.51	56.03
J-31	2,930.00	Zone	4.54	3,059.70	56.12
J-51	2,925.00	Zone	4.54	3,058.66	57.83
J-34	2,925.00	Zone	4.54	3,059.72	58.29
J-32	2,925.00	Zone	4.54	3,059.86	58.35
J-33	2,925.00	Zone	4.54	3,059.94	58.38
J-5	2,920.00	Zone	4.54	3,057.59	59.53
J-28	2,920.00	Zone	4.54	3,059.16	60.21
J-35	2,920.00	Zone	4.54	3,060.39	60.74

Table 1. Average Day Demand Junction Report

	Elevation (ft)	Zone	Base Flow (gpm)	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-21	2,920.00	Zone	4.54	3,063.06	61.9
J-19	2,920.00	Zone	4.54	3,063.10	61.91
J-1	2,915.00	Zone	4.54	3,059.16	62.37
J-56	2,910.00	Zone	4.54	3,057.60	63.86
J-16	2,920.00	Zone	4.54	3,069.34	64.61
J-12	2,920.00	Zone	4.54	3,072.36	65.92
J-11	2,920.00	Zone	4.54	3,073.97	66.62
J-8	2,920.00	Zone	4.54	3,076.58	67.74
J-2	2,920.00	Zone	4.54	3,077.20	68.01
J-18	2,910.00	Zone	4.54	3,067.71	68.23
J-17	2,900.00	Zone	4.54	3,069.33	73.26
J-15	2,900.00	Zone	4.54	3,070.26	73.66
J-13	2,890.00	Zone	4.54	3,072.35	78.9
J-75	2,888.00	Zone	4.54	3,071.30	79.3
J-4	2,880.00	Zone	4.54	3,064.79	79.95
J-72	2,885.00	Zone	4.54	3,071.45	80.67
J-20	2,885.00	Zone	4.54	3,071.82	80.83
J-14	2,885.00	Zone	4.54	3,073.17	81.41
J-10	2,885.00	Zone	4.54	3,073.97	81.76
J-6	2,875.00	Zone	4.54	3,064.77	82.11
J-69	2,880.00	Zone	4.54	3,071.99	83.07
J-64	2,878.00	Zone	4.54	3,073.30	84.5
J-74	2,875.00	Zone	4.54	3,071.57	85.05
J-68	2,875.00	Zone	4.54	3,071.99	85.23
J-58	2,880.00	Zone	4.54	3,078.06	85.69
J-9	2,880.00	Zone	4.54	3,078.69	85.96
J-3	2,880.00	Zone	4.54	3,078.81	86.02
J-7	2,880.00	Zone	4.54	3,078.82	86.02
J-60	2,880.00	Zone	4.54	3,078.93	86.07
J-65	2,868.00	Zone	4.54	3,072.40	88.43
J-63	2,868.00	Zone	4.54	3,073.41	88.87
J-71	2,865.00	Zone	4.54	3,071.55	89.36
J-73	2,865.00	Zone	4.54	3,071.58	89.38
J-70	2,865.00	Zone	4.54	3,071.68	89.42
J-67	2,865.00	Zone	4.54	3,071.97	89.54
J-66	2,862.00	Zone	4.54	3,072.09	90.89
J-61	2,865.00	Zone	4.54	3,079.62	92.86
J-62	2,855.00	Zone	4.54	3,079.84	97.28
J-59	2,855.00	Zone	4.54	3,079.95	97.32

Table 2. Average Day Demand Pipe Report

	Length (ft)	Diameter (in)	Hazen-Williams C	Discharge (gpm)	Velocity (ft/s)
P-30	474	6	130	333.92	3.79
P-35	795	6	130	-298.37	3.39
P-53	361	6	130	-290.61	3.3
P-92	1,369.00	8	130	484.59	3.09
P-83	858	6	130	250.13	2.84
P-91	20	12	130	999.53	2.84
P-22	566	6	130	236.91	2.69
P-15	583	6	130	-219.42	2.49
P-114	1,482.00	6	130	217.43	2.47
P-33	977	6	130	-212.28	2.41
P-18	391	6	130	-210.34	2.39
P-5	1,386.00	6	130	-208.35	2.36
P-24	792	6	130	-201.26	2.28
P-96	385	8	130	352.08	2.25
P-67	151	8	130	-349.2	2.23
P-66	382	8	130	-340.12	2.17
P-36	836	8	130	332.59	2.12
P-65	289	8	130	-331.04	2.11
P-58	1,236.00	6	130	185.07	2.1
P-90	601	12	130	659.03	1.87
P-54	205	6	130	-147.68	1.68
P-37	562	6	130	142.98	1.62
P-44	196	8	130	-247.07	1.58
P-52	642	6	130	-138.39	1.57
P-87	681	10	130	-378.11	1.54
P-86	129	6	130	135.99	1.54
P-38	372	6	130	133.9	1.52
P-41	263	8	130	-237.99	1.52
P-31	775	6	130	132.11	1.5
P-82	365	6	130	131.45	1.49
P-26	542	6	130	130.72	1.48
P-76	2,143.00	6	130	-126.48	1.44
P-27	1,008.00	6	130	126.18	1.43
P-46	366	6	130	-124.98	1.42
P-39	288	6	130	124.82	1.42
P-11	1,456.00	6	130	123.46	1.4
P-84	1,231.00	6	130	-123.22	1.4
P-73	237	12	130	479.79	1.36
P-74	714	12	130	470.71	1.34
P-40	360	6	130	115.74	1.31
P-2	1,412.00	6	130	-105.04	1.19
P-25	851	6	130	101.65	1.15
P-10	587	6	130	-100.5	1.14
P-97	425	8	130	175.16	1.12
P-104	403	8	130	173.33	1.11
P-102	571	8	130	-172.38	1.1
P-89	249	12	130	-387.19	1.1

Table 2. Average Day Demand Pipe Report

	Length (ft)	Diameter (in)	Hazen-Williams C	Discharge (gpm)	Velocity (ft/s)
P-62	318	8	130	171.45	1.09
P-88	512	12	130	-382.65	1.09
P-63	273	8	130	162.37	1.04
P-103	299	8	130	-156.05	1
P-64	306	8	130	153.29	0.98
P-115	277	8	130	150.63	0.96
P-79	2,032.00	6	130	-84.55	0.96
P-61	324	8	130	-147.76	0.94
P-50	351	6	130	77.22	0.88
P-98	268	8	130	136.06	0.87
P-80	1,071.00	6	130	75.47	0.86
P-51	361	6	130	72.68	0.82
P-113	932	6	130	71.34	0.81
P-45	579	8	130	-126.63	0.81
P-94	350	8	130	123.43	0.79
P-77	2,533.00	6	130	-66.39	0.75
P-49	182	6	130	-65.92	0.75
P-48	366	6	130	-61.38	0.7
P-85	600	12	130	-237.58	0.67
P-47	527	6	130	-56.84	0.64
P-110	473	8	130	-98.83	0.63
P-111	473	8	130	-94.66	0.6
P-93	505	8	130	90.66	0.58
P-108	682	8	130	74.13	0.47
P-34	205	6	130	38.76	0.44
P-95	644	6	130	37.31	0.42
P-100	659	6	130	-34.55	0.39
P-109	279	8	130	60.88	0.39
P-59	884	6	130	32.77	0.37
P-106	1,120.00	8	130	56.34	0.36
P-60	546	6	130	28.23	0.32
P-7	295	12	130	-109.58	0.31
P-99	504	8	130	-41.81	0.27
P-112	802	6	130	8.71	0.1
P-42	781	6	130	-7.22	0.08
P-101	445	8	130	-11.79	0.08
P-56	674	6	130	4.54	0.05
P-57	700	6	130	4.54	0.05
P-68	459	6	130	4.54	0.05
P-55	724	6	130	4.54	0.05
P-6	3,692.00	6	130	4.54	0.05
P-16	1,213.00	6	130	-4.54	0.05
P-19	1,040.00	6	130	4.54	0.05
P-75	576	6	130	4.54	0.05
P-78	3,173.00	6	130	-4.54	0.05
P-81	1,893.00	6	130	4.54	0.05
P-72	548	6	130	4.54	0.05
P-69	502	6	130	4.54	0.05
P-70	592	6	130	4.54	0.05

Table 3. Average Day Demand Reservoir Report

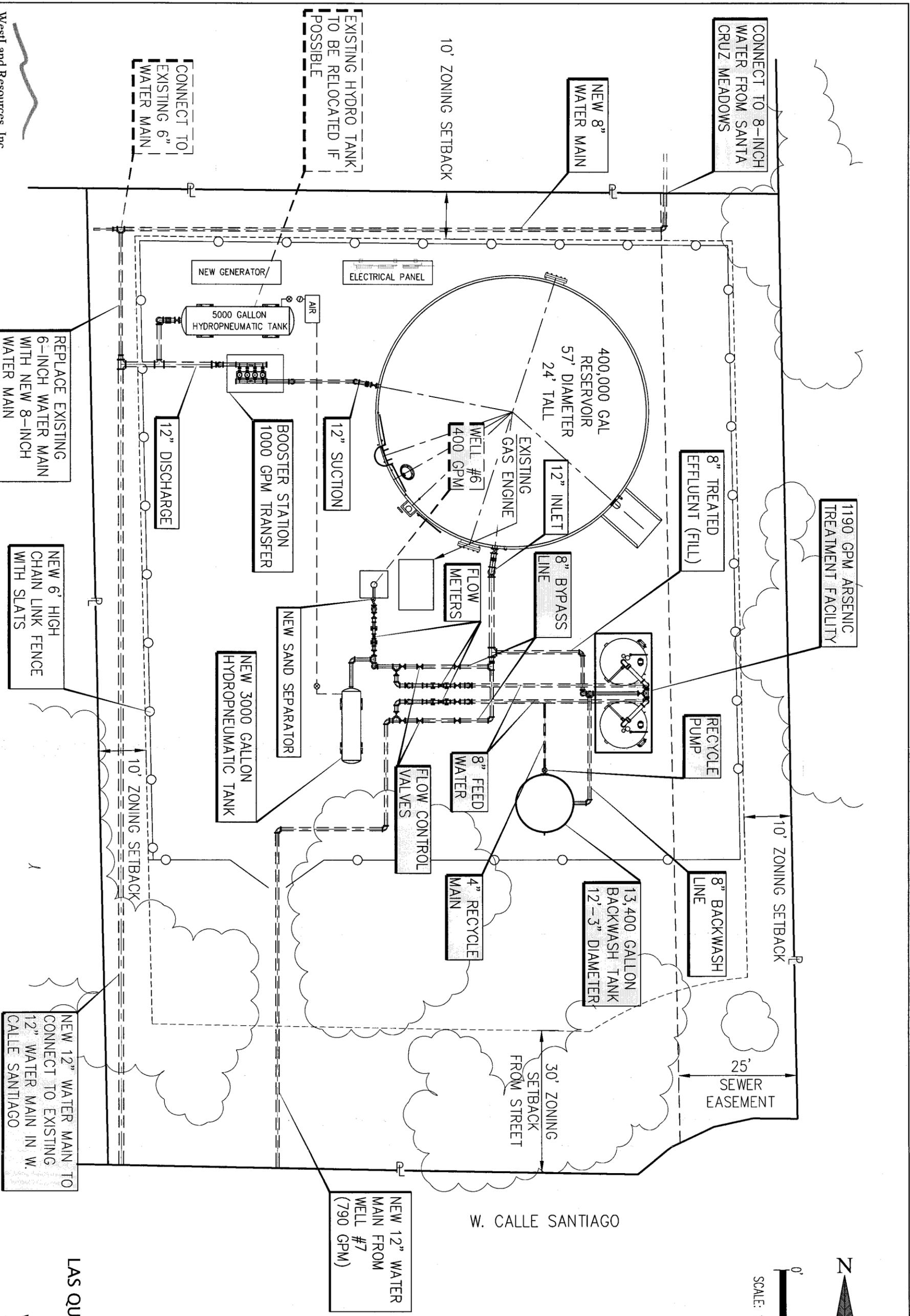
	Elevation (ft)	Zone	Outflow (gpm)	Calculated Hydraulic Grade (ft)
R-1	3,080.00	Zone	999.53	3,080.00

Table 4. Average Day Demand Tank Report

	Zone	Base Elevation (ft)	Minimum Elevation (ft)	Maximum Elevation (ft)	Initial HGL (ft)	Inflow (gpm)	Calculated Hydraulic Grade (ft)
T-1	Zone	3,030.00	3,031.00	3,057.00	3,055.00	659.03	3,055.00

APPENDIX C

**WELL NO. 6
SITE
LAYOUT**



SCALE: 1" = 20'

W. CALLE SANTIAGO

LAS QUINTAS SERENAS WATER COMPANY

Well No. 6 Site Layout

PROPOSED UPGRADES
DECEMBER 05, 2005

Westland Resources Inc.
Engineering and Environmental Consultants
2343 E. Broadway Blvd., Suite 202
Tucson, AZ 85719 (520) 208-9585

CONNECT TO 8-INCH WATER FROM SANTA CRUZ MEADOWS

NEW 8" WATER MAIN

10' ZONING SETBACK

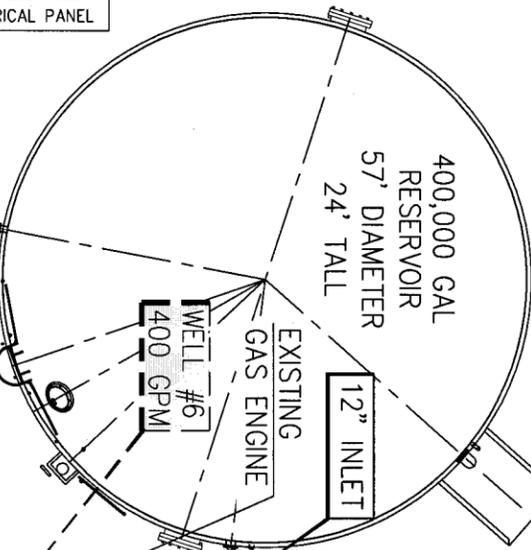
EXISTING HYDRO TANK TO BE RELOCATED IF POSSIBLE

CONNECT TO EXISTING 6" WATER MAIN

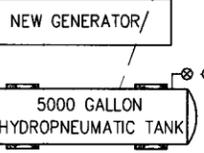
1190 GPM ARSENIC TREATMENT FACILITY

8" TREATED EFFLUENT (FILL)

12" INLET



12" SUCTION



BOOSTER STATION 1000 GPM TRANSFER

12" DISCHARGE

REPLACE EXISTING 6-INCH WATER MAIN WITH NEW 8-INCH WATER MAIN

NEW 6' HIGH CHAIN LINK FENCE WITH SLATS

RECYCLE PUMP

8" BYPASS LINE

FLOW METERS

NEW SAND SEPARATOR

NEW 3000 GALLON HYDROPNEUMATIC TANK

FLOW CONTROL VALVES

8" FEED WATER

8" BACKWASH LINE

13,400 GALLON BACKWASH TANK 12"-3" DIAMETER

4" RECYCLE MAIN

25' SEWER EASEMENT

30' ZONING SETBACK FROM STREET

10' ZONING SETBACK

NEW 12" WATER MAIN TO CONNECT TO EXISTING 12" WATER MAIN IN W. CALLE SANTIAGO

NEW 12" WATER MAIN FROM WELL #7 (790 GPM)

APPENDIX D

**WELL AND
WELL PUMP
INFORMATION**

Existing Well Summary

	Well No. 5	Well No. 6	Well No. 7
ADWR Registration No.	55-608531	55-608530	55-566940
Date Drilled	1968	1971	1998
Well Depth (ft)	805'	837'	922'
Pump Setting Depth (ft)	460'	420'	460'
Casing Diameter (in)	10.75" to 535' and 8.5" to 805'	12.75"	12.25"
Pump Manufacture	Grundfos (Model 230S)	American Turbine (1760 rpm)	Goulds Pump (Model 11CMC 1770 RPM)
Pump Impeller Trim	230S400-14 (40HP)	10-L-30 (Trim A 7.70")	Curve No. E3143-1 (8.13")
Number of Stages	Summersable Pump	13	10
Pump Column Diameter (in)	4"	6"	8"
Pump Tube Diameter (in)	Summersable Pump	2"	2.5"
Pump Shaft Diameter (in)	Summersable Pump	1.25"	1.5"
Perforations (ft)	357' - 805'	440' - 820'	541' - 902'
Static Water Level (ft) / Date	401' / Oct. 2004	337' / May 2005	363
Discharge Pressure (psi / ft)	75 psi / 173'	95 psi / 219'	85 psi / 196'
Drawdown (ft)	200 gpm / 7 ft	56gpm/ft @ 394 gpm = 7' 54gpm/ft @ 483 gpm = 9' 52gpm/ft @ 586 gpm = 11'	850 gpm / 6.5'

LQS Well No. 6

Manifold and Pipeline Losses

Design Flow (gpm)	400
-------------------	-----

Pumping Water Level ft bls	346	337static + 9 ft drawdown @ 400 gpm
Pump Head at Treatment Plant Site (ft)	2903	2855 ft (Well No. 6 Site Elevation) + 21 psi / 48 ft (Facility Head)
Site Elevation, Ft	2855	
Sand Separator Losses	14	6psi / 14 ft
Hydraulic Grade Difference ft	62	

Pipeline and Manifold	Column Tube and Shatt	Including Oil Tube Adjustments
DIA, in	8	Column Diameter (in)
"C"	130	
Calculated equiv. Length, ft	50	Pump Setting depth (ft)
		420

1.5 inch oil tube

Pipeline and Manifold	Pipe Column	
Velocity fps	Hf ft/1000 ft	Calculated Velocity Hf ft/100 ft
2.6	3.4	4.8
		2.7
Add Manifold Losses	5.0	
	5.2	
		11.3

From Simflow 502-1 for 6" x 1.5" x 1" per 100ft @ 400 gpm

Try to keep velocity above 4ft/s to pick up sediment
Try to keep head loss less than 5ft/100ft

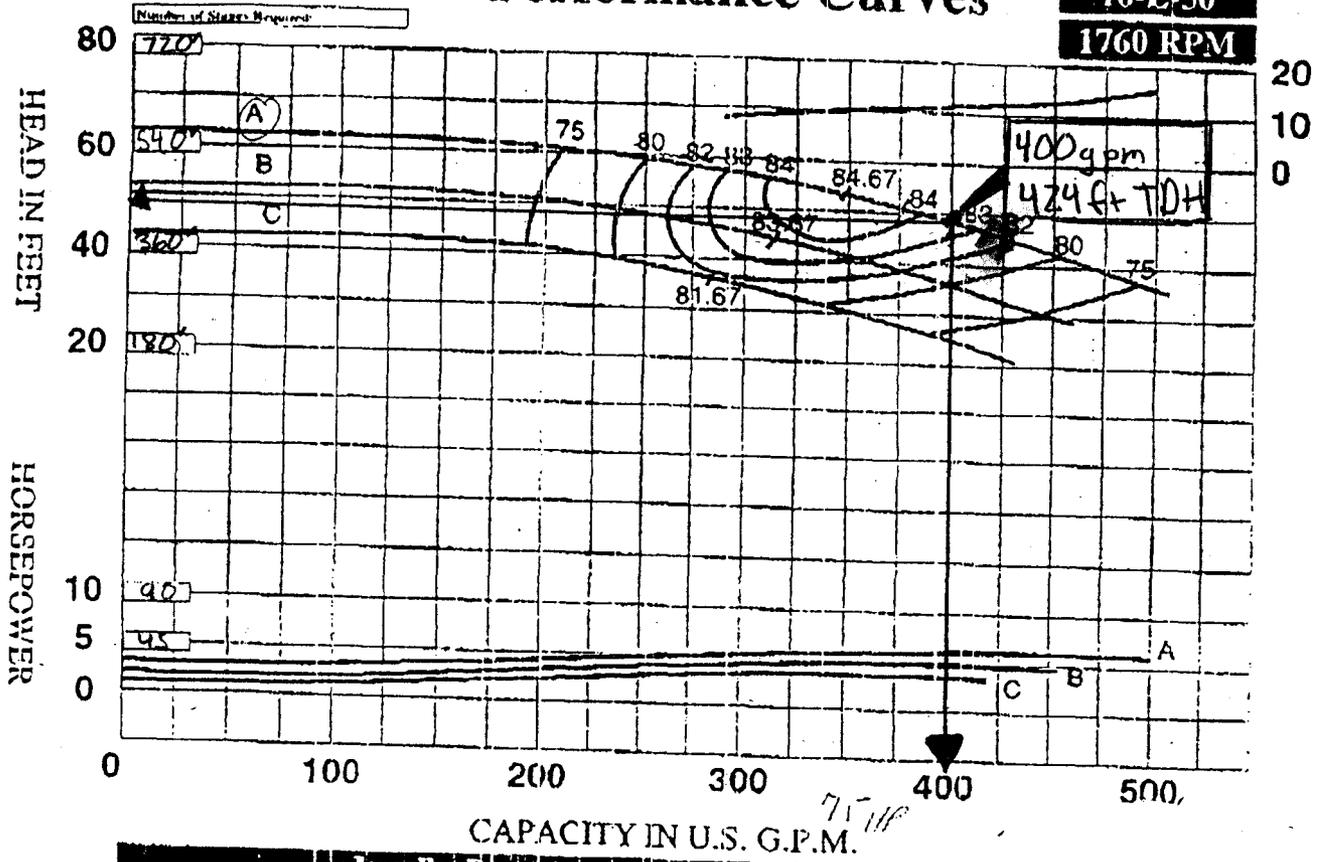
SYSTEM TDH	ft	424.5
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Static Head	ft	408
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Performance Curves

10-L-30
1760 RPM



9 bowls

HORSEPOWER

CAPACITY IN U.S. G.P.M.

N.P.S.H.

Impeller Data	
Impeller Number	10-L-30
Type	Enclosed
Diameter: A=	7.700"
B=	7.200"
C=	6.700"
Thrust Constant (K)	4.0 pounds/foot of head
Impeller Weight	9.8 #
Number of Vanes	8
Specific Speed (Ns)	1629
Effective Eye Area	7.24 square inches
W(r sq.)	.325 lbs.-ft. sq.
Eye Fluid Velocity	0.04 (ft/sec./g.p.m.)
Peripheral Velocity	7.68 ft./sec./inch of impeller diameter

Bowl Data	
Bowl Number	10-L
Connection Type	Bolted
Outside Diameter: nominal	9.750"
minimum	9.500"
Column Pipe Size: standard	4"
maximum	8"
Suction Pipe Size: standard	6"
maximum	6"
Shaft Size: standard	1.500"
maximum	1.750"
Lateral: standard	.375"
maximum	.500"
Shaft Bearing Clearance	.010"
Impeller Skirt Clearance	.015"
Maximum Sphere Size	.550"
Maximum No. Stages (std. const.)	39
Maximum Head (with full nominal bowl diameter) (1.0 S.G.)	613 ft.

Efficiency Correction for	1	2	3	4	5
Number of Stages	1	2	3	4	5
Deduct No. Points	4	3	2	1	0

Lengths	
Column Adapter	1.500"
Discharge Case	4.000"
Bowl	7.250"
Suction Case	8.750"
Suction Bell	6.300"
Submersible Motor Adapter	12.875"

Approximate Shipping Weights	
First Stage	156 #
Additional Stage	58 #

Miscellaneous	
Hub Projection on Bell Suction	2.250"
Cable Guard Height	.500"
Distance From Impeller Eye to Bottom of Bell Suction	6.688"

General Data	
Operational	CONSULT FACTORY
Minimum Required Submergence	Standard Construction Materials
Bowl	A48-30 c. i. (porcelain)
Impeller	C83800 br.
Bowl Shaft	416 stainless steel
Shaft Coupling	C1215 steel
Lock Collar	C1215 steel
Cap Screw	grade 5
Bowl Bearing	C84400 br./Duna-N A40
Suction/Submersible Motor Adapter Bearing	C84400 br.
Throttle Bearing	C84400 br.
Sand Collar	polyethylene
Column Adapter/Discharge Case/Suction Case	A48-30 c. i.
Submersible Motor Adapter	A48-30 c. i.
Tube Adapter	cl. 65-45-12 ductile iron

1996
6 well
Existing 13 bowls

12" ... 0" ...

LQS Well No. 7

Manifold and Pipeline Losses

Design Flow (gpm)
790

Pumping Water Level ft bls	371	363 static + 8 ft drawdown @ 790 gpm
Pump Head at Treatment Plant Site (ft)	2903	2855 ft (Well No. 6 Site Elevation) + 21 psi / 48 ft (Facility Head)
Site El. (ft)	2880	
Sand Separator Losses	16	7 psi / 16 ft
Hydraulic Grade Difference (ft)	39	

Pipeline and Manifold	Column Tube and Shaft	Including Oil Tube Adjustments
DIA. in	12	Column Diameter (in)
"C"	130	
Calculated equiv. Length, ft	2500	Pump Setting depth (ft)
		460

2.5 inch oil tube

Pipeline and Manifold	Pipe Column
Velocity fps	Calculated Velocity ft/1000 ft
2.2	1.6
Add Manifold Losses	5.0
	9.1
	2.70
	12.4
	TOTALS

From Simflow 502-1 for 8" x 2.5" x 1.5" per 100ft @ 790 gpm

Try to keep velocity above 4ft/s to pick up sediment
Try to keep head loss less than 5ft/100ft

SYSTEM TDH
ft
431.5

Static Head
ft
410

MODEL 230S

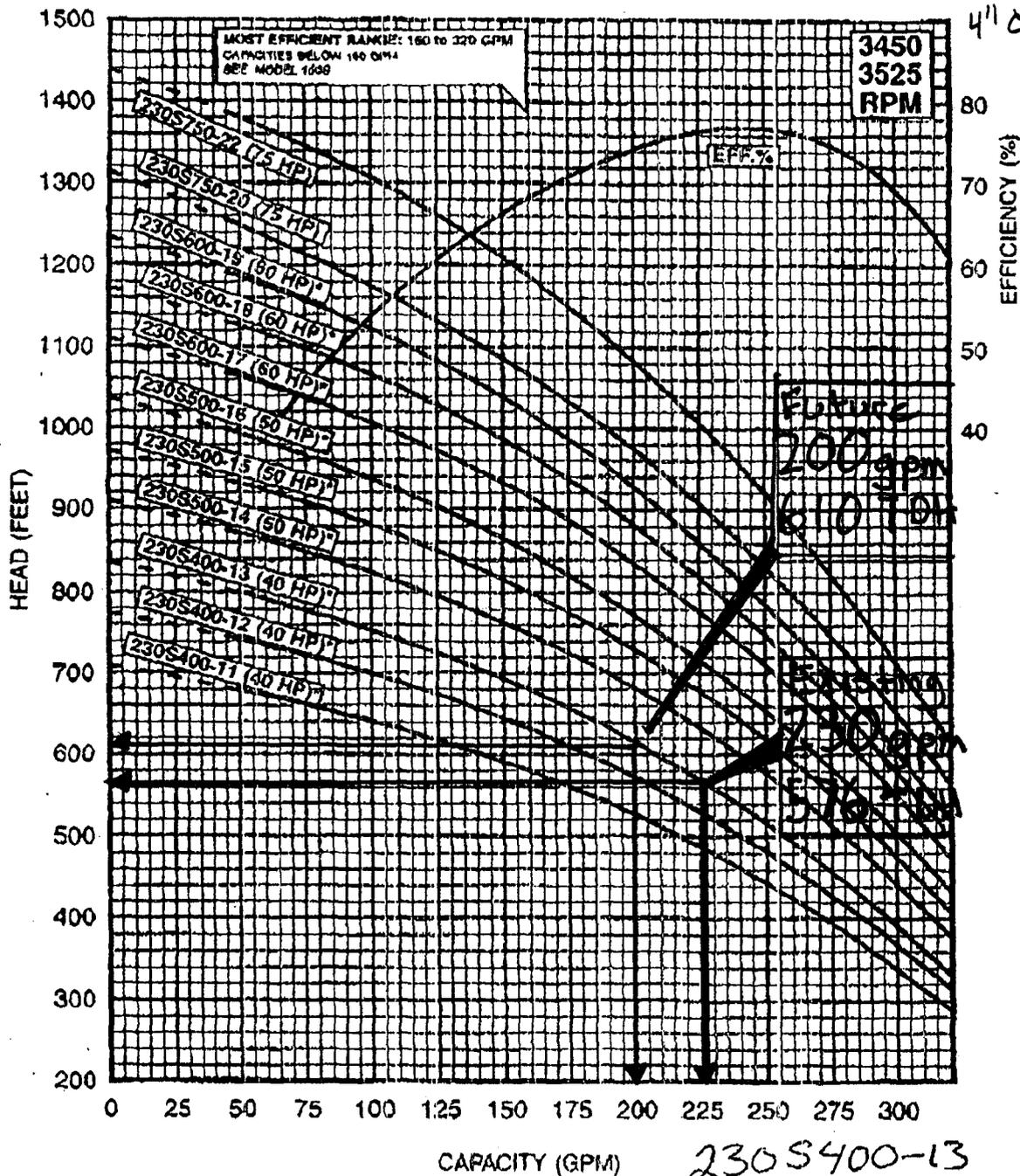
230 GPM

PERFORMANCE CURVES

FLOW RANGE: 160 -320 GPM

CUTLET SIZE: 3" NPT

NOMINAL DIA. 6"



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

- 4" MOTOR STANDARD, 7.5 HP/3450 RPM
- 6" MOTOR STANDARD, 10-60 HP/3450 RPM.
- 8" MOTOR STANDARD, 75 HP/3525 RPM.

* Alternate motor sizes available.

*Well #5
2004*

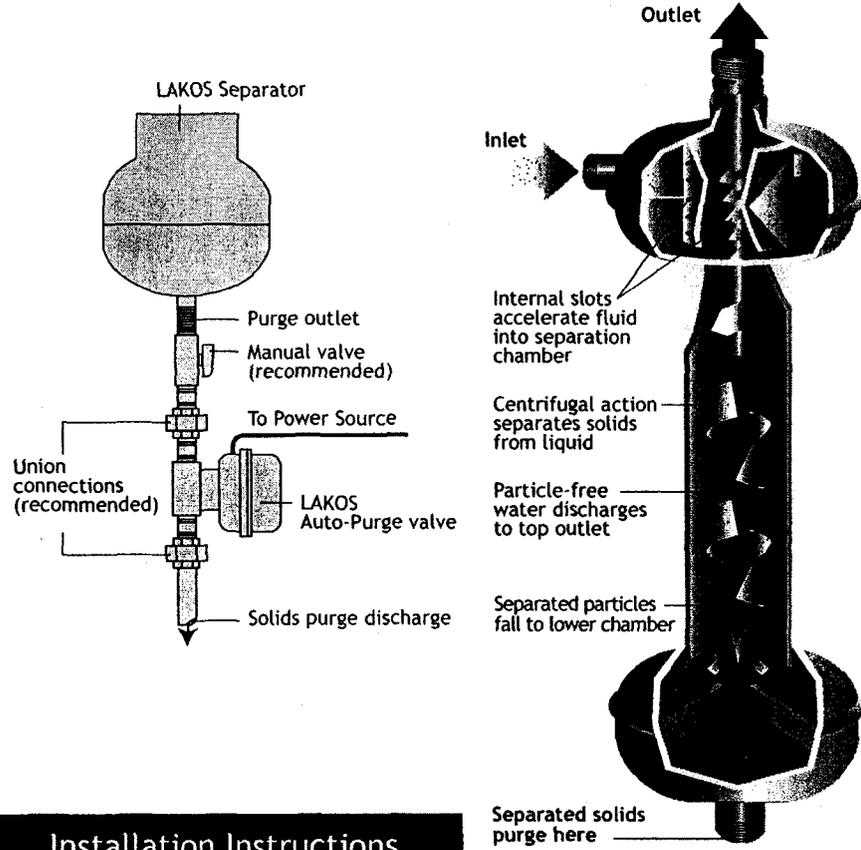
Perfo marca conforms to ISO 9908 Annex A @ 8 ft. min. submergence.

APPENDIX E

**SAND
SEPARATOR
SPECS.**

How It Works

Maintenance/Purging

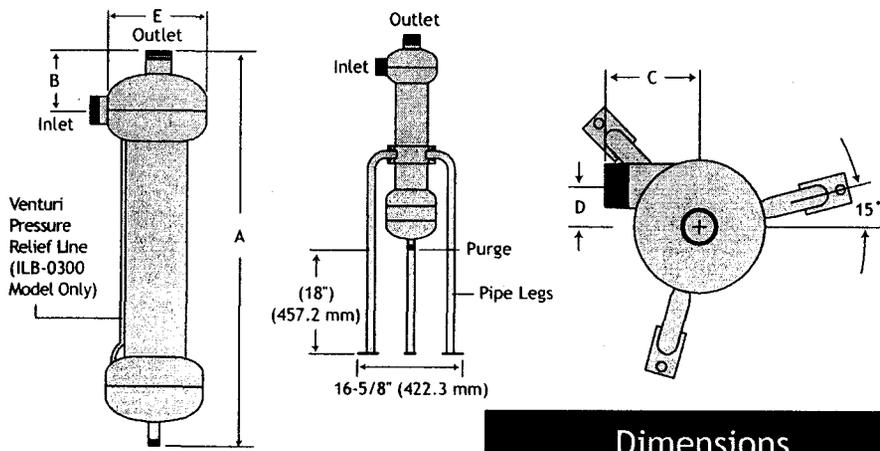


Installation Instructions

- 1 LAKOS ILB Separators are shipped in heavy-duty cartons with plastic caps over the inlet and outlet to protect their male pipe threads. Option: Flush unit before operation.
- 2 Prior to installation, the inlet, outlet and purge of each unit should be inspected for the presence of any foreign objects which may have entered the unit during shipping or storage.
- 3 Install piping to inlet and outlet as shown by diagram on page 3. Note data, page 3, for pipe sizes per model.
- 4 For effective solids removal, LAKOS Separators must be operated within the recommended flow range for each model as specified on page 3. *Pipe size is not a factor in model selection.* Minimum inlet pressure should be at least 15 psi (1.0 bar) or equal to the pressure loss anticipated through the separator (see graph, page 3) plus the system's downstream pressure requirement.
- 5 LAKOS ILB Separators should be installed in the near upright vertical position on the discharge side of the pumping system. (Refer to factory for suction side installation.) Suitable means for supporting the separator's weight independently from the inlet/outlet piping is necessary. A LAKOS Mounting Kit is recommended, but may be substituted with similar hardware, such as U-bolts fastened snugly around the separator's inner barrel.
- 6 If subject to idle periods, LAKOS ILB Separators installed in sub-freezing locations must be drained of liquid or protected from freezing to avoid damage from ice expansion. NOTE: All LAKOS automatic purging hardware provide a manual override to allow for easy draining via the purge opening.
- 7 In a pressurized system (vs. open discharge), pressure gauges are recommended at both inlet and outlet to monitor pressure loss and proper system flow (see graph, page 3). If the separator is operated at open discharge, a valve is recommended at the outlet, set to create a back pressure of 5 psi (0.3 bar).

LAKOS products are manufactured and sold under one or more of the following U.S. patents: 3,289,608; 3,312,651; 3,668,837; 3,701,425; 3,947,364; 3,969,073; 4,027,481; 4,120,795; 4,123,800; 4,140,638; 4,147,630; 4,148,735; 4,305,825; 4,553,333; 5,320,747; 5,338,341; 5,368,735; 5,425,876; 5,571,416; 5,578,203; 5,622,545; 5,653,874; 5,894,995; 6,090,276; 6,143,175; 6,167,960; 6,202,543; Des. 327,693; and corresponding foreign patents. Other U.S. and foreign patents pending.

ILB



Dimensions

Model	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
ILB-0037	16-1/2	419	3	76	3-5/8	86	1-5/8	41	4	102
ILB-0050	20	508	4	102	4	102	2-1/4	57	6	152
ILB-0075	20	508	4	102	4	102	2-1/8	54	6	152
ILB-0100	30	762	4-3/8	111	4	102	2	51	6	152
ILB-0125	30	762	4-3/8	111	4	102	1-7/8	48	6	152
ILB-0150	30	762	4-3/8	111	4-3/4	121	1-3/4	44	6	152
ILB-0200	33-5/8	854	5	127	5-1/2	140	2-5/8	67	8-5/8	219
ILB-0250	37	940	5-1/2	140	6-1/4	159	2-5/8	67	8-5/8	219
ILB-0300	42	1067	7	178	8-1/4	209	3-1/4	83	10-3/4	273

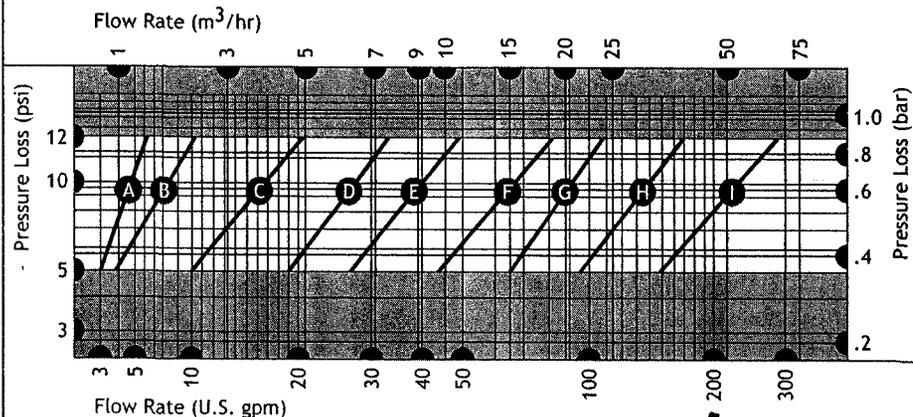
Dimensions for reference only. Consult factory when pre-plumbing.

Specifications

Model	Flow Range		Inlet/Outlet Size male N.P.T.*	Weight		Weight with Water	
	U.S. gpm	m ³ /hr		lbs.	kg	lbs.	kg
ILB-0037	3-6	7-15	3/8"	9	4.1	19	8.6
ILB-0050	4-10	1.0-2.5	1/2"	14	6.3	20	9.1
ILB-0075	10-20	2.5-4.5	3/4"	16	6.8	25	11.3
ILB-0100	19-32	4.5-7.5	1"	27	12.2	38	17.2
ILB-0125	28-48	6.5-11.0	1-1/4"	27	12.2	38	17.2
ILB-0150	45-70	10.0-16.0	1-1/2"	27	12.2	40	18.1
ILB-0200	65-108	14.5-24.5	2"	57	23.6	98	44.4
ILB-0250	95-155	21.5-35.0	2-1/2"	60	27.2	109	49.4
ILB-0300	148-290	33.5-66.0	3"	101	45.8	177	80.0

*Also available in BSP or JIS threads. Consult factory for details.

Flow vs. Pressure Loss



- A ILB-0037
- B ILB-0050
- C ILB-0075
- D ILB-0100
- E ILB-0125
- F ILB-0150
- G ILB-0200
- H ILB-0250
- I ILB-0300

Well #6 and #7

Centrifugal-Action Sand Separators

IHB



How-it-Works Illustration

Installation & Operating Instructions

Maintenance & Purging

Model Specifications

Engineering Specifications

Flow range:
285 - 4,350 U.S. gpm
(65 - 988 m³/hr) per unit

Maximum standard
pressure rating:
150 psi (10.3 bar)

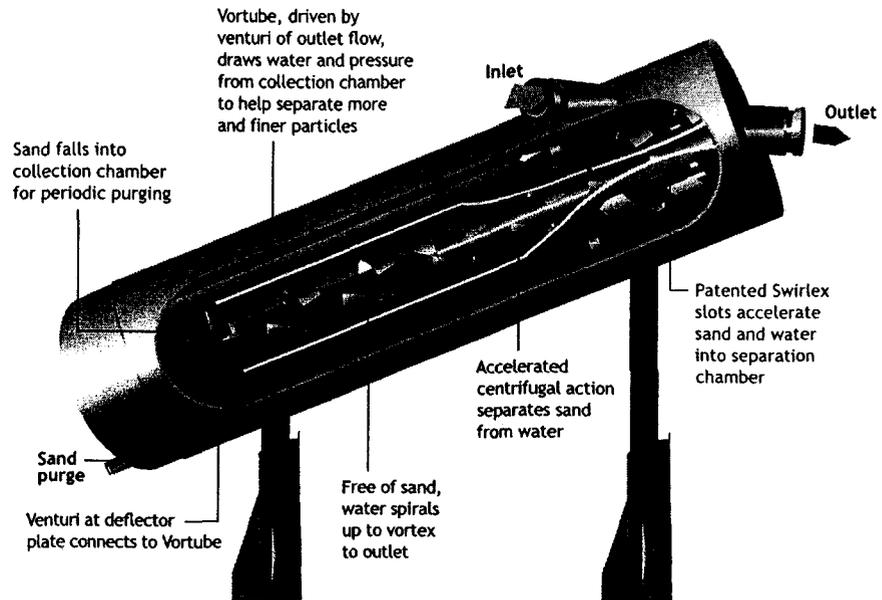
ASME Code option available

LAKOS

Sand Separation Systems

Maintenance/Purging

How It Works

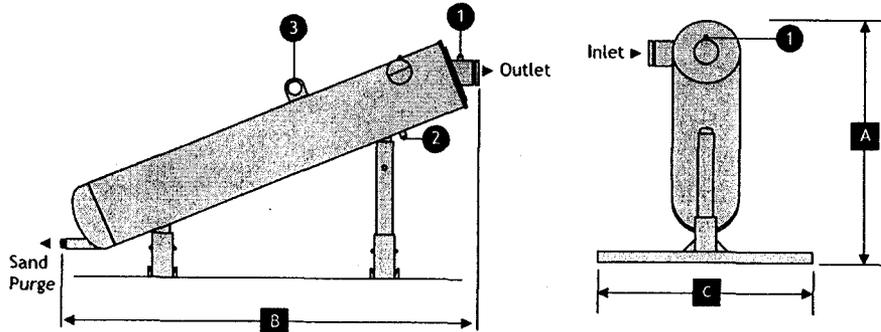


Installation Instructions

- 1 LAKOS IHB Separators are shipped on a wooden skid with the two support legs detached. A large ring, located on the unit's side, is provided for hoisting as necessary.
- 2 A suitable foundation is necessary to accommodate the separator's weight including water (see chart, page 3). Tie-down bolts are recommended in the base of the legs. Prior to installation, inspect the inlet, outlet and purge of each unit for foreign objects that may have entered the unit during shipping or storage.
- 3 Proper purge hardware is required to flush separated sand from the separator. This equipment should be installed before start-up.
- 4 Pipe connections to the inlet and outlet of LAKOS IHB Separator should be a straight run of at least five pipe diameters to minimize turbulence and optimize performance. *Pipe size is not a factor in selecting the proper model of a LAKOS Separator.* Rather, all LAKOS Separators operate within a prescribed flow range.
- 5 Use appropriate hardware to match inlet and outlet size. Grooved couplings are not included with the separator. Inlet pressure to the LAKOS Separator must be at least equal to or greater than the anticipated pressure loss through the separator, plus 15 psi (1.0 bar), plus the required downstream pressure.
- 6 LAKOS IHB Separators are typically installed on the discharge of a pumping system. Consult your LAKOS representative for suction side installation. No other pressure or power is required to operate a LAKOS Separator.
- 7 In a pressurized system (vs. open discharge), pressure gauges are recommended at both inlet and outlet to monitor pressure loss and proper system flow. If the separator is operated at open discharge, a valve is recommended at the outlet, set to create a backpressure of 5 psi (0.3 bar).
- 8 Winterizing is important if the separator is to remain idle in freezing temperatures. Drain water as necessary to avoid bursting due to water-ice expansion.

LAKOS products are manufactured and sold in one or more of the following U.S. patents: 5,055,608; 5,512,651; 5,568,837; 5,701,425; 5,747,364; 5,963,073; 4,027,481; 4,120,725; 4,123,800; 4,140,638; 4,147,630; 4,148,735; 4,395,325; 4,555,333; 5,320,747; 5,338,343; 5,368,735; 5,425,876; 5,571,416; 5,578,203; 5,622,545; 5,653,874; 5,894,925; 6,090,276; 6,143,175; 6,167,960; 6,202,543; Des. 327,693 and corresponding foreign patents. Other U.S. and foreign patents pending.

IHB



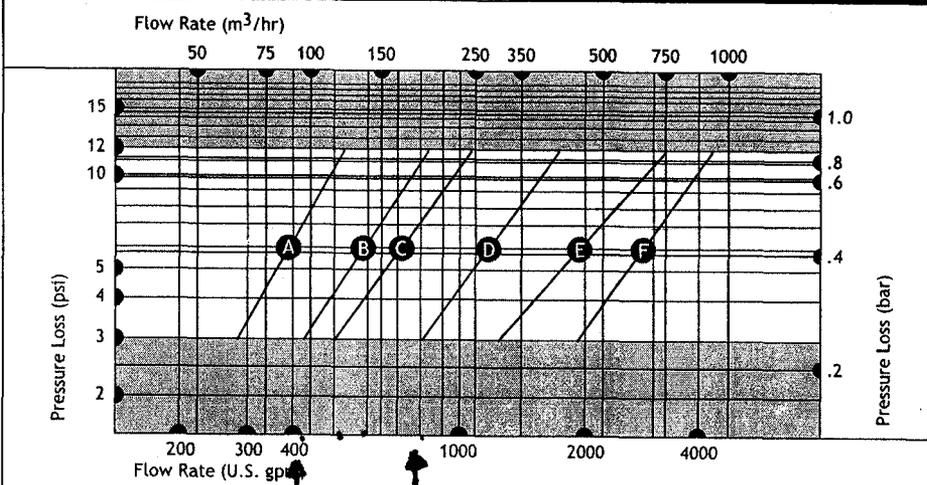
Dimensions

Model	A		B		C	
	in	mm	in	mm	in	mm
IHB-0285	45	1143	78-1/4	1994	40	1016
IHB-0450	52-1/2	1333	96-1/4	2445	40	1016
IHB-0500	52-1/2	1333	96-1/4	2445	40	1016
IHB-0810	61	1549	108	2743	40	1016
IHB-1275	72-1/2	1841	130	3302	40	1016
IHB-1950	79-1/4	2013	142	3607	40	1016

Specifications

Model	Flow Range		Inlet/Outlet Grooved Coupling	Purge Size male N.P.T.	Collection Chamber Capacity		Weight		Weight with Water	
	U.S. gpm	m ³ /hr			gal	liters	lbs.	kg	lbs.	kg
IHB-0285	285-525	65-120	4"	1-1/2"	2.1	7.9	76	34	786	357
IHB-0450	450-825	102-187	6"	1-1/2"	2.8	10.6	699	318	1163	529
IHB-0500	500-1100	118-250	6"	1-1/2"	2.8	10.6	703	320	1167	531
IHB-0810	810-1670	184-379	8"	1-1/2"	6.2	23.5	966	439	1856	844
IHB-1275	1275-3100	290-704	10"	2"	11.5	43.5	1344	611	2960	1346
IHB-1950	1950-4350	443-988	12"	2"	15	56.8	1795	816	3933	1788

Flow vs. Pressure Loss



APPENDIX F

**SEVERN
TRENT
FACILITY
SPECS.**

SEVERN

TRENT

SERVICES

*Filtration
Products*

LAS QUINTAS SERENAS WATER COMPANY

GREEN VALLEY, ARIZONA

PROPOSAL FOR

**SORB 33™ Adsorber Arsenic Removal Systems
For Wells #5, #6 and #7**

This proposal contains proprietary or confidential information of Severn Trent Water Purification, Inc. (STWP) regarding patent protected proprietary technologies and their implementation in the field, recommended uses and costs. Any such proprietary or confidential information disclosed herein is provided at buyer's request and solely for the purpose of enabling buyer to evaluate this proposal.

In receiving and reading this proposal, buyer agrees that it will not reveal or otherwise distribute its contents to any third party without STWP's prior written consent. The foregoing limitation shall not preclude buyer from disclosing the contents of this proposal to its employees, on a need to know basis, who have the responsibility to evaluate and/or implement the program set forth in this proposal. This proposal shall at all times remain the exclusive property of STWP until accepted by the party to which it was tendered.

**STWP Proposal 33841, Rev 2
September 7, 2005**

TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 EAS Equipment Description
- 3.0 APU Equipment Description
- 4.0 Assembly Requirements
- 5.0 Field Services
- 6.0 Qualifications
- 7.0 Price and Payment Schedule
- 8.0 Production Schedule
- 9.0 Acceptance of Proposal

Attachments

Standard Terms and Conditions of Sale

Drawings:

D01	P&I Diagram – APU-160
G01	General Arrangement – APU-160
D1054	P&I Diagram – 10'-0" Adsorbers
G1054	General Arrangement – 10'-0" Adsorbers

1.0 INTRODUCTION

Severn Trent Water Purification, Inc. (STWP) is pleased to offer this proposal for the supply of equipment, materials, and services for SORB 33™ Adsorber Systems at the sites listed below located near Green Valley, AZ. This proposal is in accordance with the specifications of STWP.

The table below lists the specific site and the quantity, size or model of adsorber system.

Well Site	# & Size of Vessels or Model No.	Piping Type	Process Piping Size
Wells #6 & #7	(2) 10' Dia EAS Units	DI	8"
Well #5	(1) APU-160	PVC	3"

The following sections provide descriptions of the EAS Units and the APU Unit.

2.0 EAS EQUIPMENT DESCRIPTION

2.1 Adsorber Internals

2 lots Support Gravel

To support the media and cover the effluent collectors to prevent media plugging, shipped in 50# bags.

2 lots Bayoxide® E33™ Media

Shipped in 38 ft³ super sacks.

2.2 Process Vessels

2 Adsorber Vessels

75 psig vertical pressure vessel, 10'-0" diameter with 5'-3" straight side wall. Design features as follows:

- SA516-70 carbon steel plate.
- Designed and stamped to ASME Section VIII, Division 1 Code in effect at time of contract award.
- Legs for support of the vessels from the floor.
- Interior blast cleaned, SP-10, and coated with NSF 61 certified epoxy.
- Exterior blast cleaned, SP-6, and coated with two coats of self priming epoxy.
- Nozzles to have flanged ends.
- Two access ports, one 24" diameter on the side wall with hinge and one 14" x 18" on the top head.
- 304 stainless steel inlet distributor/backwash collection pipe.
- 304 stainless steel effluent header with 304 stainless steel screened laterals.

1 lots Adsorber Piping

The attached drawings indicate how the vessels will be piped together.

- Cement lined ductile iron process piping
- PP lined carbon steel media removal piping
- Carbon steel rupture disc and vent piping
- Copper instrument tubing for DP cells

2 lots Platforms and Ladders

Each platform and ladder will service one adsorber.

2.3 Valves & Accessories

The enclosed PIDs indicate the type, quantity and size of valves and accessories for the vessels. Accessories will include expansion joints, rupture discs, quick connect adaptors and air release valves. Butterfly valves will have lugged cast iron bodies and stainless steel discs. Control valve operators will be electric actuation type (Triac, or equal) powered by 120V, 60 Hz, 1 phase and with manual handwheel override. Manual butterfly valves have handwheel operators.

2.4 Instrumentation

2 Influent Flow Meters

Magmeters, sizes are indicated on the PIDs.

2 Differential Pressure Switches

2.5 Auxiliary Equipment – Bypass Control

1 Bypass Flow Meter

Magmeter, size per the PID, with the same features as those for the Adsorber Influent Flow Meters.

1 Bypass Flow Control Valve

Electric actuated, modulating butterfly valve, same specification as the automatic valves on the Adsorbers.

2.6 Auxiliary Equipment – Backwash Recovery System

1 Backwash/Rinse Wastewater Holding Tank

Bolted steel tank, 13,400 gallon nominal capacity, with nozzles for fill, withdraw, drain, vent, level switches and overflow. A side access hatch will be provided. Erection of the bolted steel tank will be provided by STWP on a slab foundation designed and supplied by others. An access ladder and perimeter handrail is included.

- 1 Backwash Transfer Pump
Multi-stage centrifugal pump with a capacity of 50 gpm at 50 psi. Final pressure rating will be based on the actual line pressure of the system, which must still be confirmed.
- 1 Backwash Transfer Pump Pressure Gage
- 2 Backwash/Rinse Tank Level Switches

2.8 Controls

- 1 Local Control Panel
NEMA 4X control panel. Panel will control the start/stop of the backwash return pump. The PLC will be an Allen-Bradley Micrologix 1200 and the HMI will be an Allen-Bradley 600 with sunshield. Power to the panel is to be 120V, 1 ph, 60 hz.

3.0 APU EQUIPMENT DESCRIPTION

3.1 Adsorber Internals

- 1 lot Support Gravel
Three grades to support the media and cover the effluent collectors to prevent media plugging, shipped in 50# bags.
- 1 lot Bayoxide® E33 Media
Shipped in 38 ft³ bags.

3.2 APU-160

The APU is an assembly shipped in three segments consisting of two adsorber vessels, and one skid that includes piping, wiring, valves, instruments and controls. Once the three segments are assembled it is completely ready for operation once the support gravel and media are installed. Backwashing of the unit is automatically controlled. The components of the assembly are described below.

- 2 Adsorber Vessels
Vessels will be 48" diameter with the following features:
 - Maximum 150 psig rating
 - FRP construction.
 - Tripod base for support of the vessels from the frame.
 - PVC or stainless steel Inlet distributor/backwash collector.
 - PVC screened effluent laterals.
 - Externally painted for protection from UV radiation (not required if located indoors)

- 1 Adsorber Mounting Frame
Painted carbon steel and 304 stainless steel construction.
- 1 lot Adsorber Piping
Process piping will be schedule 80 PVC. Instrument air pipe, tubing and fittings will be copper or PVC. There will be three piping connections for the contractor to make on each skid: a) process influent, b) process effluent, c) backwash effluent.
- Bypass piping is included on the skid.
- Piping will be painted for protection from UV radiation.
- 1 lot Valves
Process valves will be Butterfly type valves constructed of PVC. The manual valves will have lever handles. The control valves will have electric actuators rated for 120V, 1ph, 60 hz power. Ball valves for sample, vent and drain are included.
- 1 lot Instruments
- Each vessel will have a flow meter on the influent.
 - Each vessel will have a differential pressure indicating switch.
 - Pressure gages are included on the skid influent and effluent.
- 1 Control Panel
NEMA 4X control panel. Flow and pressure differential indicators are on the front face. A PLC will control the backwash sequence on operator settable time schedule. Power to the panel is to be 120V, 1 ph, 60 hz. The PLC will be an Allen-Bradley Micrologix 1200 and the HMI will be an Allen-Bradley 600 with sunshield.

3.3 Auxiliary Equipment – Backwash Recovery System

- 1 Backwash/Rinse Wastewater Holding Tank
PE tank for capacity of 3,000 gallons (minimum). Has nozzles for fill, withdraw, drain, vent, level switches and overflow. An access ladder will be provided.
- 1 Backwash Transfer Pump
Multi-stage centrifugal pump with a capacity of 10 gpm at 50 psi. Final pressure rating will be based on the actual line pressure of the system, which must still be confirmed.
- 1 Backwash Transfer Pump Pressure Gage

2 Backwash/Rinse Tank Level Switches

4.0 **ASSEMBLY REQUIREMENTS**

The following are the items that will be shipped individually that must be assembled in the field.

EAS Systems

- Gravel
- Bayoxide® E33 media
- Adsorbers: All the internal collectors and distributors will be installed at the shop. The carbon steel piping and media withdraw piping will be attached at the shop.
- Platforms
- Ladders
- Process Piping: Each pair of adsorbers will have a central piping "tree" with valves attached. This "tree" will be shipped as a unit. Individual piping spools that connect the "tree" with the adsorbers will be shipped loose for connection in the field. These loose pipe spools will include the expansion joints.
- Influent flow meters for adsorbers.
- All auxiliary equipment
- Control panel

APU-160

- Gravel
- Bayoxide® E33 media
- Adsorber Vessels.
- Piping Skid
- Interconnecting pipe between piping skid and Adsorber Vessels.
- All auxiliary equipment

5.0 **FIELD SERVICES**

STWP will furnish the services of a qualified field representative to instruct operation personnel and advise on equipment and media installation. The time for each site will be as follows:

Well Site	Equip Installation	Start-up
Wells #6 & #7	3 days in 1 trip	3 days in 1 trip
Well #5	2 days in 1 trip	1 day

Additional services can be purchased, if desired, at the rate of \$1,000 per day (8 hr/day max.) plus travel and living expenses at cost.

When the STWP field representative arrives on-site at the time requested by the contractor/purchaser all equipment must be ready for work to begin. If equipment is not ready then our standard per diem rate, plus travel and living

expenses, will apply.

6.0 **QUALIFICATIONS**

The following items are not included in the STWP package:

- Receiving, unloading, storing and installation of STWP supplied equipment.
- Concrete foundations for vessels, building/architectural work and engineering thereof.
- Anchor bolts for adsorber vessel or mechanical equipment.
- Access ladders & platforms for APU Adsorbers. These FRP tanks cannot have ladders attached.
- Interconnecting piping or piping supports including flanges, bolts, nuts and gaskets, and engineering thereof, outside the boundary of the piping on the adsorber vessels.
- Electrical starters, circuit breakers, motor control center, and engineering thereof, and power supply.
- Conduit and power wire and all signal wiring for instruments.
- Heat trace and insulation of pipe or instruments for freeze protection
- Water supply/disposal for flushing of adsorber internals
- Performance testing; collection of samples and lab analysis.
- Spare parts.

STWP will provide 3 operation and maintenance manuals in final form.

7.0 **PRICE AND PAYMENT SCHEDULE**

STWP will deliver the equipment, materials and service described herein for a lump sum of \$ _____ including freight, but no taxes.

Pricing is valid for thirty (30) days.

Payment is net 30 days after invoice. All invoices to be submitted by the 25th day of the month or sooner. Interest to be billed at 1-1/2% per month on invoices unpaid after 30 days or the maximum allowable by law, whichever is less.

Payment shall be made as follows:

- 10% upon initial submittal of drawings for approval;
- 30% upon delivery of raw materials to fabricator and media to distribution site;
- 50% upon delivery of equipment to the site;
- 10% upon completion of start-up.

8.0 **PRODUCTION SCHEDULE**

- Submittal of drawings 4 to 6 weeks after purchase order.
- Delivery of equipment and media 12 to 14 weeks after drawing approval.

9.0 ACCEPTANCE OF PROPOSAL

The referenced documents and attached Standard Terms and Conditions of Sale are incorporated herein and are agreed to be a material part of this Agreement.

AGREED BY:
Severn Trent Water Purification, Inc.

AGREED BY:

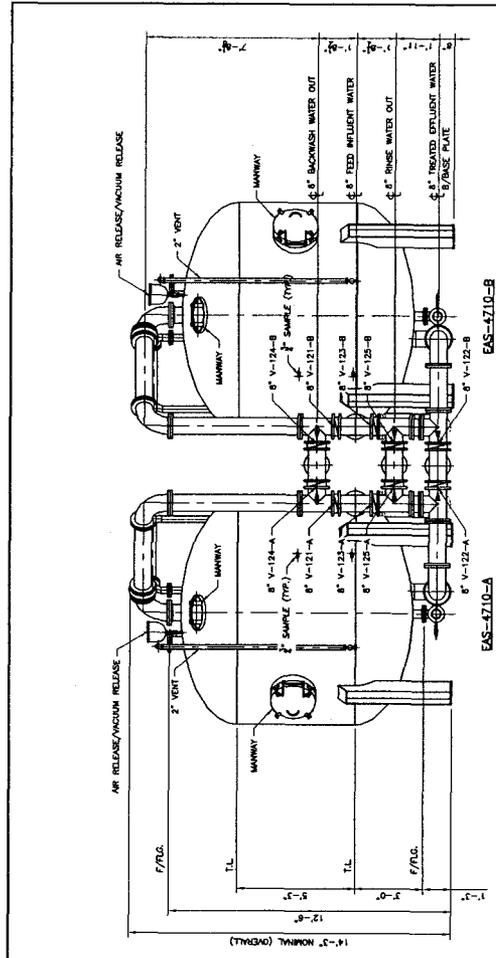
(Name)

(Name)

(Title)

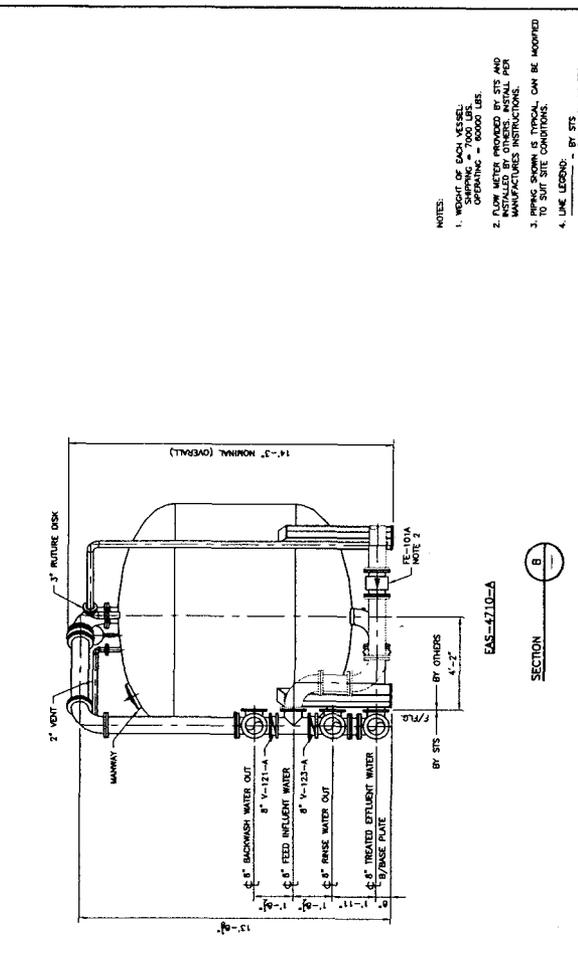
(Title)

(Client's Purchase Order Number)



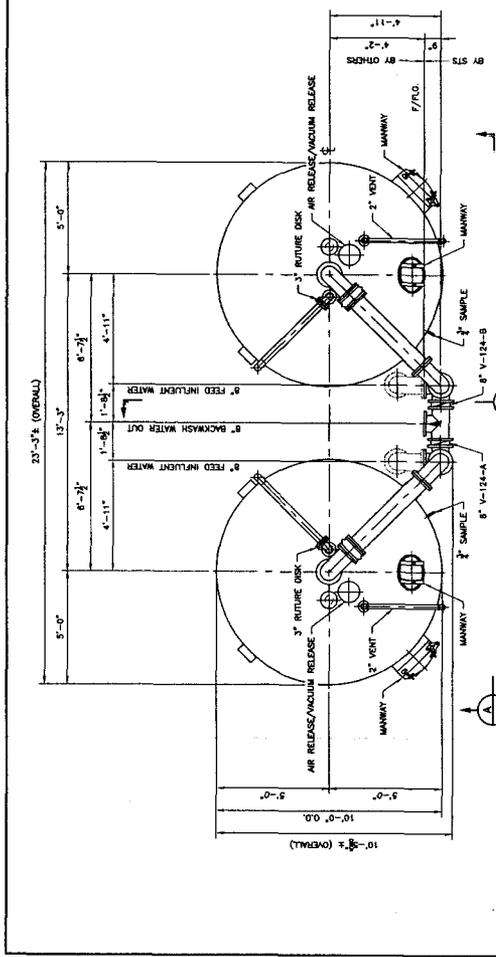
ELEVATION
A

EAS-4710-A
EAS-4710-B



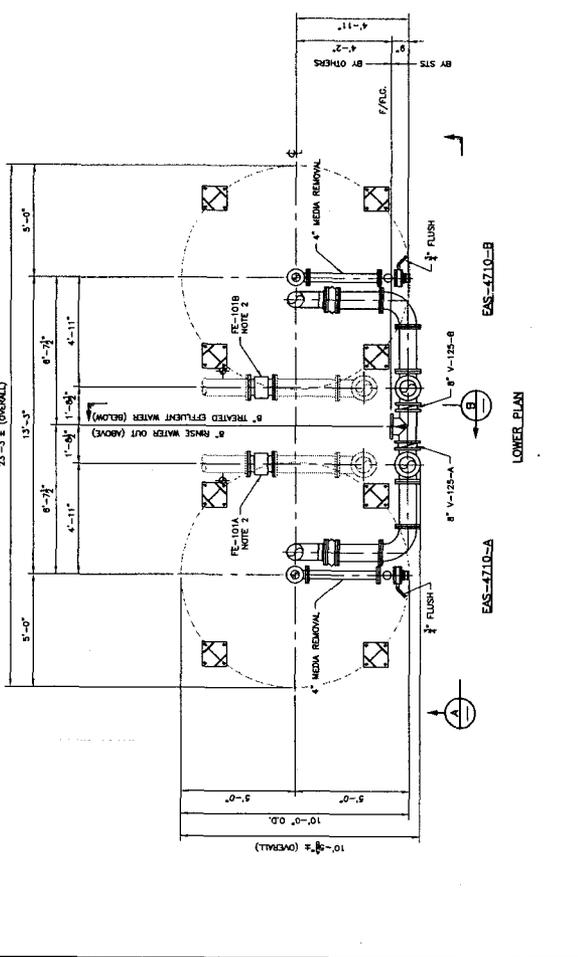
SECTION
B

EAS-4710-A
EAS-4710-B



UPPER PLAN
A

EAS-4710-A
EAS-4710-B

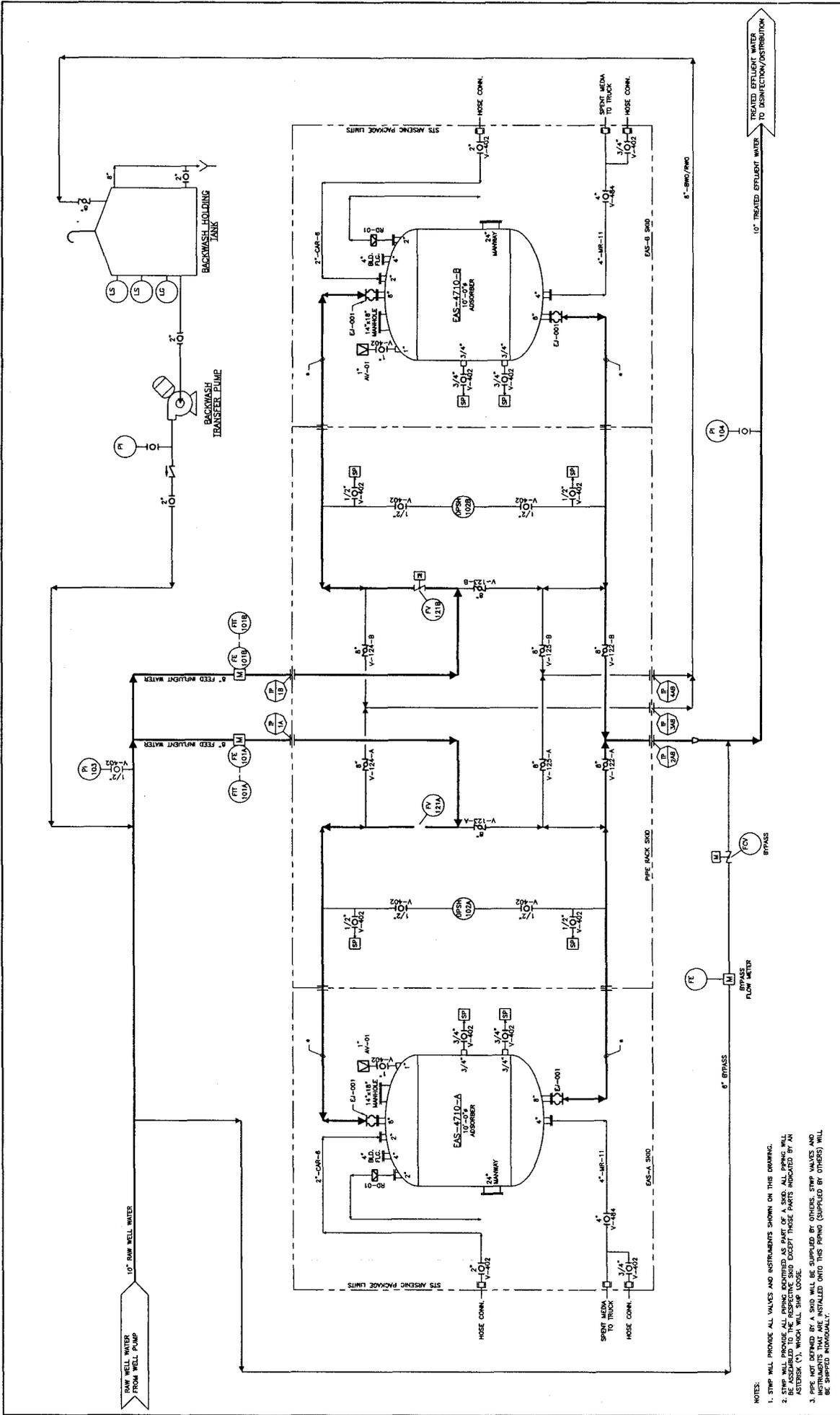


LOWER PLAN
B

EAS-4710-A
EAS-4710-B

NOTE:
1. WEIGHT OF EACH VESSEL
OPERATING AT 100 PSI
OPERATING = 80000 LBS.
2. FLOW METER PROVIDED BY STS AND
OPERATING INSTRUCTIONS PER
MANUFACTURER'S INSTRUCTIONS.
3. WIRING SHOWN IS TYPICAL, CAN BE MODIFIED
TO SUIT SITE CONDITIONS.
4. LINE LEGEND:
BY STS - PROVIDED BY OTHERS

NO. A	REVISIONS	BY	DATE	APPD	NO.	REVISIONS	BY	DATE	APPD	SCALE	3/8" = 1'-0"	DESIGNED CHECKED	FOR PROPOSAL ONLY	LAS QUINTAS SERENAS WATER CO. GREEN VALLEY, AZ (2) 10'-0" DIA EAS ADSORBER SYSTEM GENERAL ARRANGEMENT PLAN AND SECTIONS	SEVERN TREN SERVICES	FILTRATION PRODUCTS	CONTRACT NO.	DRAWING NO.	REV. A
	ISSUE FOR PROPOSAL	NSB	9/2/05	NPK															



NOTES:

1. SWP WILL PROVIDE ALL VALVES AND INSTRUMENTS SHOWN ON THIS DRAWING.
2. SWP WILL PROVIDE ALL PIPING REQUIRED AS PART OF A S&P. ALL PIPING WILL BE 80% COMPLETE. SWP WILL PROVIDE ALL INSTRUMENTS AND VALVES INDICATED BY AN ASTERISK (*), WHICH WILL SHIP LOOSE.
3. PIPE NOT DEFINED BY A S&P WILL BE SUPPLIED BY OTHERS. SWP VALVES AND INSTRUMENTS THAT ARE INSTALLED ONTO THIS PIPING (SUPPLIED BY OTHERS) WILL BE SHIPPED INDIVIDUALLY.

REVISIONS FOR PROPOSAL		REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS	
NO.	ISSUED FOR PROPOSAL	BY	DATE	APP'D	NO.	DATE	APP'D	NO.	DATE	APP'D	SCALE
A		KXB	9/20/05	RPK							SCALE NONE
											APP'D
											DATE
											DESIGNED
											DRAFTED
											CHECKED

FOR PROPOSAL ONLY

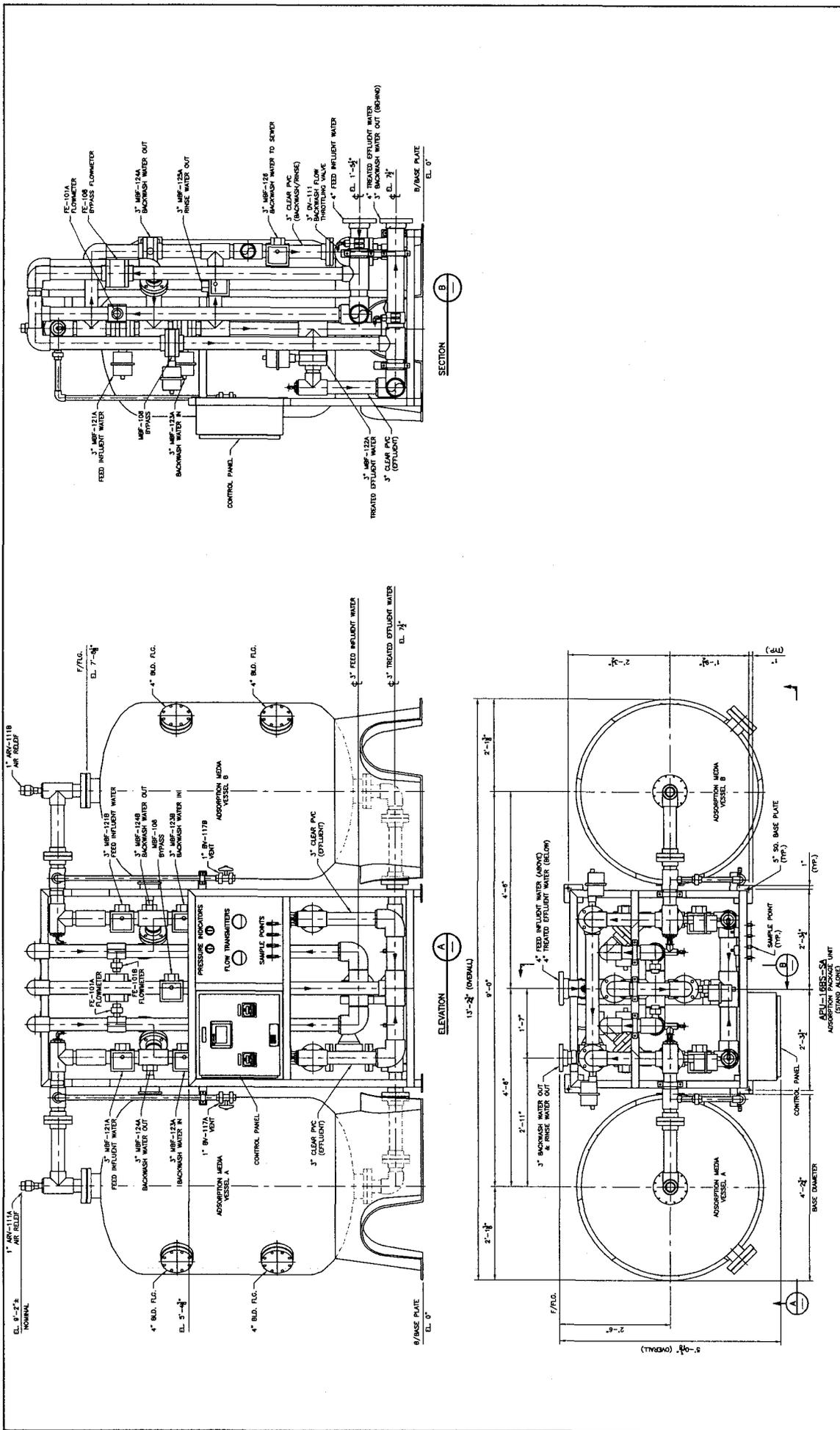
LAS QUINTAS SERENAS WATER CO.
GREEN VALLEY, AZ
(2) 10" DIA. EAS ADSORBERS
P & I DIAGRAM

SEVERN
TRENT
SERVICES

CONTRACT NO. **E33841 - D1055**

DWG. NO. **A**

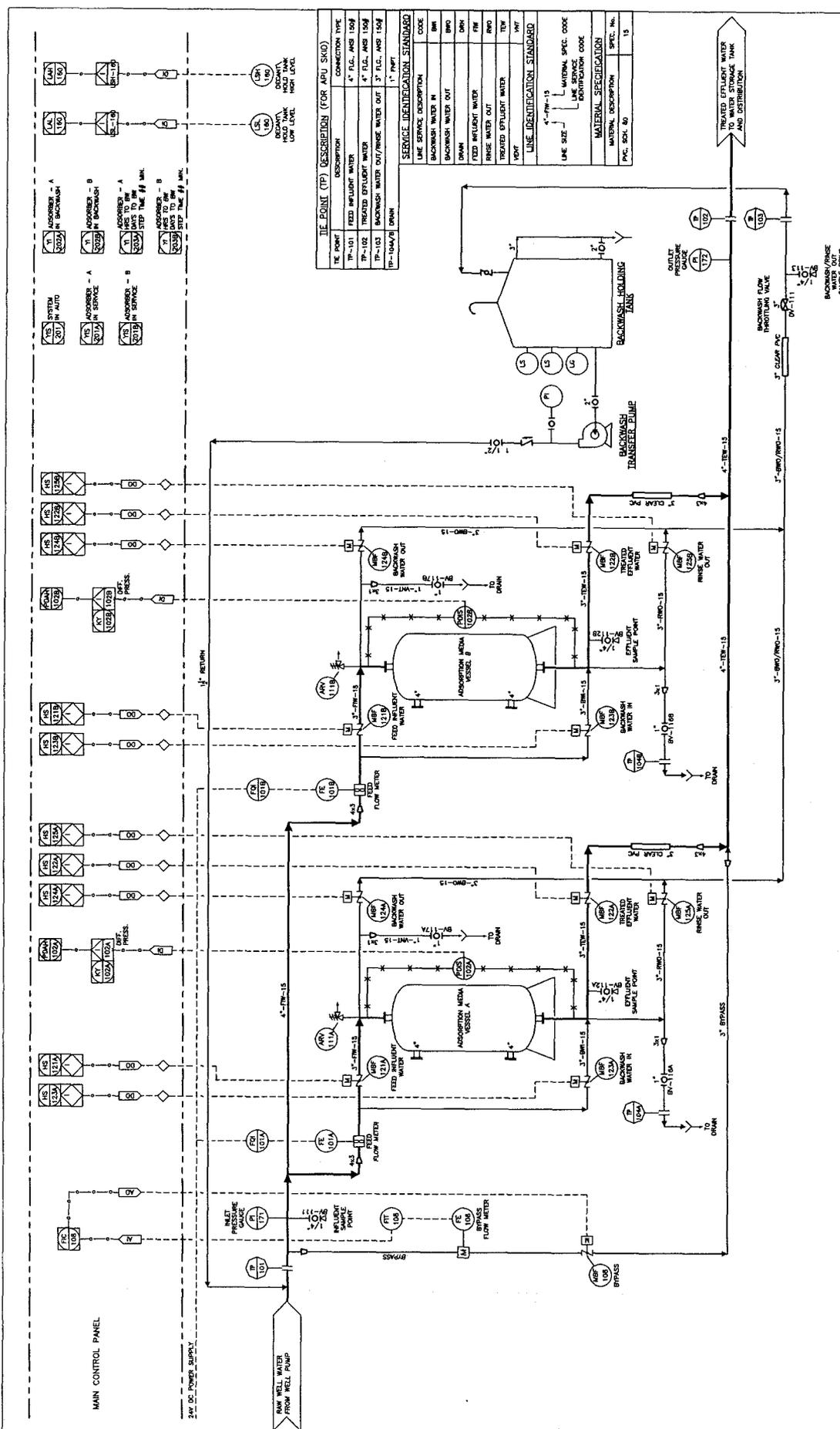
09/20/05 1:45PM 33841D.055



NO.		REVISIONS		BY		DATE		APPROVED		SCALE		FOR PROPOSAL ONLY	
A	ISSUED FOR PROPOSAL	KCB	9/20/05	NPK						1:1 (SCALE)	DATE	DESIGNED	DRAFTED
													CHECKED

SEVERN		FILTRATION PRODUCTS	
T R E N T		CONTRACT NO.	DWG. NO.
SERVICES		E33841 - 16B-G01 A	

LAS QUIMAS SERENAS WATER CO.		GREEN VALLEY, AZ	
SORB 330 ARSENIC PACKAGE UNIT - APU-16B-SA		GENERAL ARRANGEMENT	
PLAN, ELEVATION, SECTION & DETAIL		05/05/05 10:44AM 33841-16B-G01	



TIE POINT (TP) DESCRIPTION (FOR APU SKID)	
TP-101	FEED INFLUENT WATER 4" FLG. AHS 150#
TP-102	TREATED EFFLUENT WATER 3" FLG. AHS 150#
TP-103	BACKWASH WATER OUT/RINSE WATER OUT 3" FLG. AHS 150#
TP-104A/B	DNH

SERVICE IDENTIFICATION STANDARD	
CODE	LINE SERVICE DESCRIPTION
BN	BACKWASH WATER IN
BO	BACKWASH WATER OUT
DNH	DNH
FIW	FEED INFLUENT WATER
FW	FEED EFFLUENT WATER
RWO	RINSE WATER OUT
TEW	TREATED EFFLUENT WATER
WWT	WWT

LINE IDENTIFICATION STANDARD	
4"-TPW-15	MATERIAL SPEC. CODE
3"-RWD/RPO-15	LINE SERVICE IDENTIFICATION CODE
3"-RWD/RPO-15	MATERIAL SPECIFICATION
3"-RWD/RPO-15	MATERIAL DESCRIPTION
3"-RWD/RPO-15	SPEC. NO.
3"-RWD/RPO-15	PIC. SCH. NO.
3"-RWD/RPO-15	15

SEVERN FILTRATION PRODUCTS	
CONTRACT NO.	E33841-168-001
REV.	A

LAS CUNAS SERENAS WATER CO.	
GREEN VALLEY, AZ	
SORB 330 ARBENIC PACKAGE UNIT	
P & I DIAGRAM	
APU-168-SA PARALLEL FLOW WITH BYPASS	

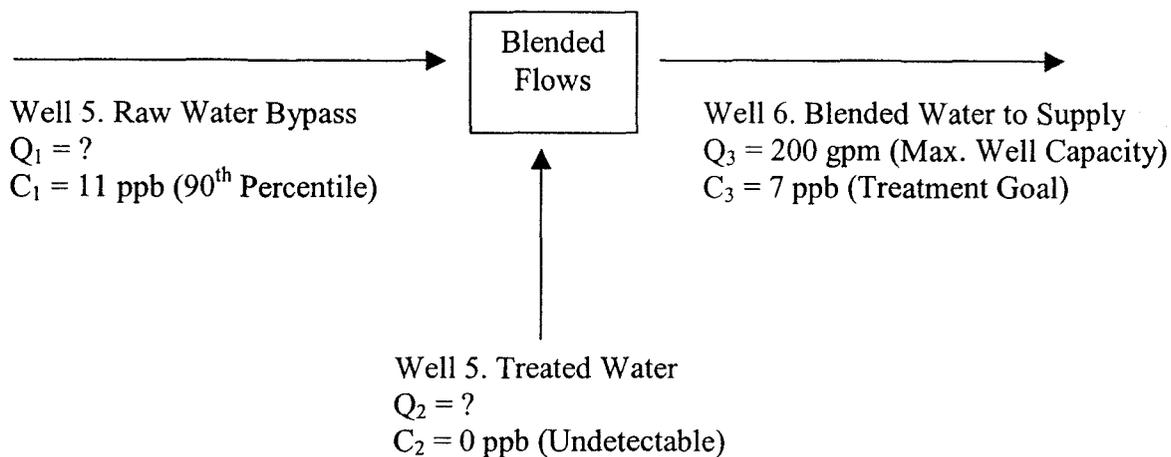
FOR PROPOSAL ONLY								
NO.	REVISIONS							
A	ISSUED FOR PROPOSAL							
BY	DATE	APPD	NO.	BY	DATE	APPD	NO.	REVISIONS
KRS	9/2/05	NPK						
SCALE	AS SHOWN	DATE		DESIGNED		DRAFTED		CHECKED

09/06/05 10:46AM E33841-168-001

APPENDIX G

**INITIAL
FLOW
CONTROL
BYPASS
SETTINGS**

Initial Flow Control Bypass Settings for Well No. 5



General Equation for Steady State Mass Balance :

$$\Sigma \text{Mass in by flow} = \Sigma \text{Mass out by flow}$$

$$(Q_1)(C_1) + (Q_2)(C_2) = (Q_3)(C_3)$$

or

$$(Q_1)(C_1) + (Q_2)(C_2) - (Q_3)(C_3) = 0$$

Step 1. $(Q_1)(11 \text{ ppb}) + (Q_2)(0 \text{ ppb}) - (200 \text{ gpm})(7 \text{ ppb}) = 0$

Step 2. $(Q_1)(11 \text{ ppb}) = (200 \text{ gpm})(7 \text{ ppb})$

Step 3. $Q_1 = [(200 \text{ gpm})(7 \text{ ppb})] / (11 \text{ ppb})$

Step 4. $Q_1 = 127.27 \text{ gpm}$, use 128 gpm (Raw Water bypassed around (As) Treatment Facility)

Step 5. $Q_2 = Q_3 - Q_1$

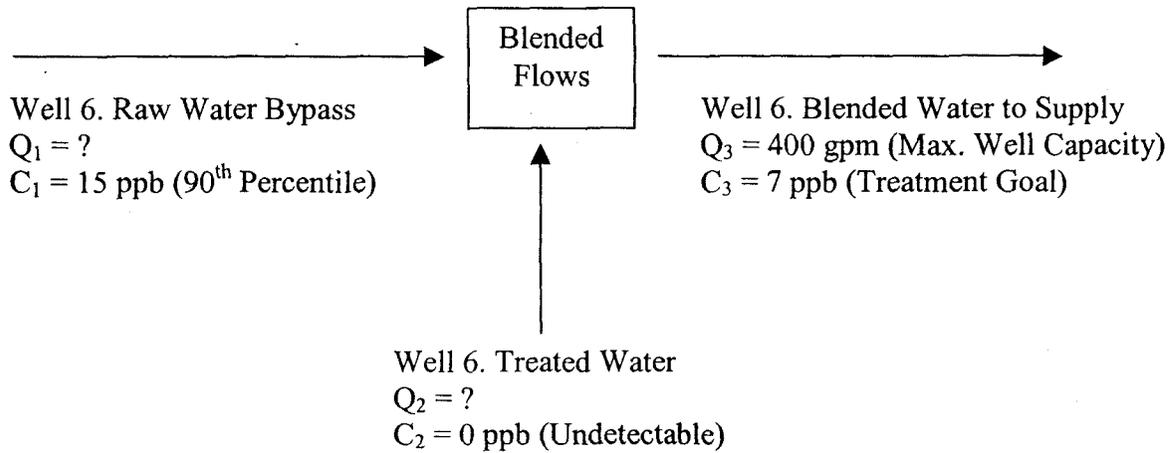
Step 6. $Q_2 = 200 \text{ gpm} - 128 \text{ gpm}$

Step 7. $Q_2 = 72 \text{ gpm}$ (Raw Water Treated to Undetectable As Levels through (As) Treatment Facility)

Note: $(\text{Treated Water in gpm}) / (\text{Well Capacity in gpm}) = (72 \text{ gpm}) / (200 \text{ gpm}) = 36\%$

In order to obtain 7 ppb from 11 ppb, facility must treat 36% of total flow for any well capacity

Initial Flow Control Bypass Settings for Well No. 6



General Equation for Steady State Mass Balance :

$$\Sigma \text{Mass in by flow} = \Sigma \text{Mass out by flow}$$

$$(Q_1)(C_1) + (Q_2)(C_2) = (Q_3)(C_3)$$

or

$$(Q_1)(C_1) + (Q_2)(C_2) - (Q_3)(C_3) = 0$$

Step 1. $(Q_1)(15 \text{ ppb}) + (Q_2)(0 \text{ ppb}) - (400 \text{ gpm})(7 \text{ ppb}) = 0$

Step 2. $(Q_1)(15 \text{ ppb}) = (400 \text{ gpm})(7 \text{ ppb})$

Step 3. $Q_1 = [(400 \text{ gpm})(7 \text{ ppb})] / (15 \text{ ppb})$

Step 4. $Q_1 = 186 \text{ gpm (Raw Water bypassed around (As) Treatment Facility)}$

Step 5. $Q_2 = Q_3 - Q_1$

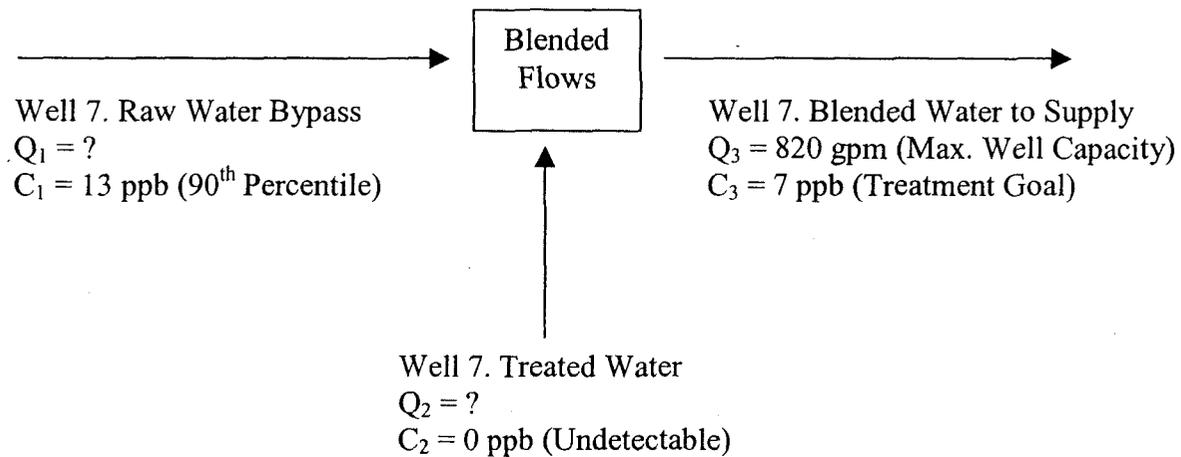
Step 6. $Q_2 = 400 \text{ gpm} - 186 \text{ gpm}$

Step 7. $Q_2 = 214 \text{ gpm (Raw Water Treated to Undetectable As Levels through (As) Treatment Facility)}$

Note: $(\text{Treated Water in gpm}) / (\text{Well Capacity in gpm}) = (214 \text{ gpm}) / (400 \text{ gpm}) = 53\%$

In order to obtain 7 ppb from 15 ppb, facility must treat 53% of total flow for any well capacity

Initial Flow Control Bypass Settings for Well No. 7



General Equation for Steady State Mass Balance :

$$\Sigma \text{Mass in by flow} = \Sigma \text{Mass out by flow}$$

$$(Q_1)(C_1) + (Q_2)(C_2) = (Q_3)(C_3)$$

or

$$(Q_1)(C_1) + (Q_2)(C_2) - (Q_3)(C_3) = 0$$

Step 1. $(Q_1)(13 \text{ ppb}) + (Q_2)(0 \text{ ppb}) - (820 \text{ gpm})(7 \text{ ppb}) = 0$

Step 2. $(Q_1)(13 \text{ ppb}) = (820 \text{ gpm})(7 \text{ ppb})$

Step 3. $Q_1 = [(820 \text{ gpm})(7 \text{ ppb})] / (13 \text{ ppb})$

Step 4. $Q_1 = 441 \text{ gpm (Raw Water bypassed around (As) Treatment Facility)}$

Step 5. $Q_2 = Q_3 - Q_1$

Step 6. $Q_2 = 820 \text{ gpm} - 441 \text{ gpm}$

Step 7. $Q_2 = 379 \text{ gpm (Raw Water Treated to Undetectable As Levels through (As) Treatment Facility)}$

Note: $(\text{Treated Water in gpm}) / (\text{Well Capacity in gpm}) = (379 \text{ gpm}) / (820 \text{ gpm}) = 46\%$

In order to obtain 7 ppb from 13 ppb, facility must treat 46% of total flow for any well capacity