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Arizona Corporation Commission
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28DR

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, TO EXTEND ITS EXISTING CERTIFICATES OF CONVENIENCE AND NECESSITY AT CASA GRANDE AND COOLIDGE, PINAL COUNTY, ARIZONA	DOCKET NO. W-01445A-04-0755
IN THE MATTER OF THE APPLICATION OF WOODRUFF WATER COMPANY, INC. FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY TO PROVIDE WATER SERVICE IN PINAL COUNTY, ARIZONA	DOCKET NO. W-04264A-04-0438
IN THE MATTER OF WOODRUFF UTILITY COMPANY, INC. FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY TO PROVIDE SEWER SERVICE IN PINAL COUNTY, ARIZONA	DOCKET NO. SW-04265A-04-0439
	RESPONSE TO INSUFFICIENCY LETTER

On or about November 15, 2004 ARIZONA WATER COMPANY, an Arizona corporation, (the "Company") received an Insufficiency Letter in Docket No. W-01445A-04-0755 from the Commission's Staff.

Now, at the request of the Staff, the Company is docketing its response to the Insufficiency Letter, and serving a copy on all parties of record to this matter.

U:\CC&N\CASA GRANDE\WOODRUFF\RESPONSE TO INSUF LTR_010405.DOC
RWG:JC | 13:24 1/4/05

RESPECTFULLY SUBMITTED this 4th day of January, 2005.

ARIZONA WATER COMPANY

By: Robert W. Geake

Robert W. Geake
Vice President and General Counsel
ARIZONA WATER COMPANY
Post Office Box 29006
Phoenix, Arizona 85038-9006

and

Steven A. Hirsch
Bryan Cave LLP
Two North Central Avenue
Suite 2200
Phoenix, AZ 85004

Attorneys for
Arizona Water Company

Original and seventeen (17) copies of the foregoing filed the 4th day of January, 2005 with:

Docket Control Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

A copy of the foregoing was mailed this 4th day of January, 2005 to:

Marc E. Stern, Esq.
Administrative Law Judge
Hearing Division
Arizona Corporation Commission
1200 West Washington
Phoenix, AZ 85007

Timothy J. Sabo
Assistant Counsel
Legal Division
Arizona Corporation Commission
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Ernest G. Johnson
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

By: Robert W. Geake

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

December 30, 2004

Mr. Jim Fisher
Executive Consultant Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, AZ 85007

Re: Arizona Water Company – Application for an Extension of its Certificate of Convenience and Necessity (CC&N) Docket W-01445A-04-0755
INSUFFICIENCY LETTER

Dear Mr. Fisher:

In reference to Arizona Corporation Commission's INSUFFICIENCY LETTER, dated November 12, 2004, this letter is in response to you requests.

1. Please provide a request for service each of the affected property owners.
   See Exhibit "2" in the original application

2. Please provide a map of the requested service territory with an identification of the respective property owners requesting service.
   See Exhibit "3" in the original application

3. Please provide a drinking water design report which clarifies how water will be provided to the proposed CC&N.

   The report should identify existing and future sources, the capacities of existing sources, the estimated capacities of future sources and any existing demand on the present water sources.
   See Design Report Attachments - Well and Tank Analysis
   - A-6 Sandia
   - B-7 Sandia Phase 1
   - C-8 Martin Ranch
   - D-7 Sandia and Martin Ranch

   The report should include the estimated water demand from a typical dwelling unit, the estimated demand from the proposed CC&N.
   See Design Report Attachments – Demand Estimates

FILE COPY

E-MAIL: mail@azwater.com

- A-3 Sandia
- B-2 Sandia Phase 1
- C-3 Martin Ranch
- D-1 Sandia and Martin Ranch

The report should identify the location of future and existing transmission mains and include the timing or construction phasing of facilities.
See Design Report Figures – Subdivision Layout

- A Sandia
- B Sandia Phase 1
- C Martin Ranch
- D Sandia and Martin Ranch

Also see Design Report Attachments – Construction Schedule and Cost Estimate

- A-2 Sandia
- B-1 Sandia
- C-2 Martin Ranch

The design report should describe water quality and address any water quality problems with the existing and future sources of water (as an example, will extra treatment costs arise in order to meet existing or future maximum contaminant levels for arsenic, nitrates, or fluorides in the drinking water?).
See Design Report – Water Treatment Section

4. Please provide a copy of the Arizona Department of Water resources Analysis of Adequate Water Supply for the proposed service territory.
   See Design Report Attachment A-1 Sandia and C-1 Martin Ranch - Physical Availability Demonstration

5. Please provide any other information which will allow the Commission to analyze and conclude that the company has sufficient water production capacity, or can develop enough drinking water capacity to service the existing and future demands from the proposed CC&N.
   See Design Report

6. Please provide a set of design plans for the proposed water facilities.
   See Design Report Figure E

7. Please provide an estimate of the water facilities costs necessary to serve the proposed CC&N. The cost should include a description of the major components with the cost of the component (i.e., wells, number and size of storage tanks, etc.). The method of financing for the major components should be described specifically.
   See Design Report Attachments – Construction Schedule and Cost Estimate
   - A-2 Sandia

- B-1 Sandia Phase 1
- C-2 Martin Ranch

8. Please provide a copy of the Pinal County Franchise for the requested area. See Exhibit " 8" in the original application

Very truly yours,

Mike Loggins
Engineer
engineering@azwater.com

kd

Enclosures

Water Plan for Sandia & Martin Ranch

Prepared by:

Arizona Water Company
PO Box 29006
Phoenix, AZ 85038-9006

December 17, 2004

Introduction

The Sandia and Martin Ranch projects are residential subdivisions located between Arizona Water Company's (the "Company") Casa Grande and Coolidge Certificates of Convenience and Necessity (CC&N). The Company's current application to extend its Casa Grande and Coolidge CC&Ns filed with the Arizona Corporation Commission ("Commission"), if approved by the Commission, would integrate the two CC&N's into one single CC&N. Water system planning for this integrated Casa Grande/Coolidge CC&N is accomplished through the Company's Pinal Valley Master Water Plan.

The Sandia project consists of approximately 9,000 or more residential housing units (approximately 3,200 acres) located West of Coolidge, Arizona, in Pinal County bordered on the East by Macrae Road, on the West by Signal Peak Road, on the North by London Road and on the South by Woodruff Road. It is more accurately described as a portion of Sections 13, 14, 23, 24, and 25 Township 5 South, Range 7 East of the Gila and Salt River Base and Meridian Pinal County, Arizona.

The Martin Ranch project consists of approximately 2,100 or more residential housing units (approximately 565.5 acres) located East of Casa Grande, Arizona, in Pinal County adjacent to the Sandia Development bordered on the East by Curry Road, on the West by Signal Peak Road, on the South by Woodruff Road, and a quarter mile North of Val Vista Road. It is more accurately described as a portion of Sections 23, 25, and 26 Township 5 South, Range 7 East of the Gila and Salt River Base and Meridian Pinal County, Arizona.

Water Supply

Sandia

The Company proposes to supply water to the Sandia project from six 750 gpm wells that will be drilled within the boundaries of the project and from existing water supplies within the Company's Coolidge water system to be distributed by a 16-inch water main tied into the Coolidge System. Treated Central Arizona Project ("CAP") water will also be available for potable use within the Sandia project upon completion of the Company's CAP water treatment plant. Attachment A-1 is a copy of the Physical Availability Demonstration ("PAD") approval on file with the Arizona Department of Water Resources ("ADWR"). This approval indicates that there is approximately 13,510 acre feet per year of groundwater available in the Coolidge service area, although more physical groundwater supplies can be demonstrated through an updated PAD the Company intends to submit to ADWR in the future.

The Company has adequate production and storage capacity within its Coolidge water system to serve the first phase of the Sandia project. The Company proposes to serve the first phase of this project by interconnecting this development to the Company's Coolidge water system, which will require the installation of 18,500 linear feet of 12-inch Ductile Iron Pipe. After the first five hundred residential housing units within the Sandia project are developed, the developer will be required to advance funds to the Company to drill the first 750 gpm well, build a one million gallon water storage tank, and a booster pump station. See Attachment B-1 for the construction schedule of Sandia Phase 1. The Company will invest its own capital to increase the size of the interconnection main from 12-inch to 16-inch in accordance with the Company's Pinal Valley Master Water Plan Design. The Company will refund to the developer the cost of production wells, 12-inch and larger water mains, water storage tank and booster pump station on a per lot basis.

Martin Ranch

The Martin Ranch project will advance funds to the Company for it to construct one 750 gpm water production well and to install 18,500 linear feet of 16-inch water main from the Company's existing Casa Grande water system. Attachment C-1 is a copy of the Physical Availability Demonstration approval on file with the Arizona Department of Water Resources. This approval indicates that there is approximately 57,507 acre feet per year of groundwater physically available for the Company's Casa Grande service area and any extensions there from.

The Martin Ranch project's water storage will be met from the existing 15 million gallons of water storage located within the Casa Grande water system. As with the Sandia project, the Company will refund to the developer the cot of the production well and 12-inch and larger water mains on a per lot basis.

Sandia and Martin Ranch

The water distribution system design for these two developments will result in the interconnection of the Company's Casa Grande and Coolidge water distribution systems, allowing the Company to provide greater water system reliability and better access to physical supplies of groundwater and CAP water. When combined to form the Master Planned Pinal Valley Service Area, the Company will have approximately 75,000 acre feet per year of ground water and 11,000 acre feet per year of Central Arizona Project Water available to serve this entire area.

When the Sandia project reaches 1,500 residential units, the developer will be required to advance funds to the Company to drill a second 750 gpm well, and this process will be repeated for every 1,500 residential housing units added thereafter until this project reaches full build out. During the course of developing the distribution system to serve the Sandia and Martin Ranch projects, the Company's Casa Grande and Coolidge water systems will be fully integrated, allowing the

Sandia project to also benefit from the existing 15 million gallons of water storage within the Casa Grande system. The area covering the Sandia project, as well as the Martin Ranch project will be served from the same pressure zone as the central portion of the Company's Casa Grande water system. The proposed construction schedule for Sandia is shown in Attachment A-2. The Company has sufficient tank site property to add an additional 15 million gallons of water storage, doubling the existing water storage capacity. Although this water storage would be adequate for the Company to serve significant additions to its Casa Grande/Coolidge water systems, the Company is also planning to acquire additional property suitable to build two additional five million gallon storage tanks in the future when additional water storage is warranted. This additional property will be located in close proximity to the Sandia and Martin Ranch projects.

The Martin Ranch project will not be required to advance funds to provide water storage because existing water storage (15 million gallons) is adequate to serve this project. The construction schedule for Martin Ranch is shown in Attachment C-2

Water Treatment

The Company is in compliance with all of Arizona Department of Environmental Quality drinking water standards. The current maximum contaminant level (MCL) for Arsenic is 50 parts per billion (PPB). A new arsenic MCL of 10 PPB becomes effective on January 23, 2006. The Company has already begun the process of bidding, designing, and building Arsenic treatment plants in the Casa Grande and Coolidge System and plans on meeting new arsenic MCL standard before the January 23, 2006 deadline. If water treatment is needed for the proposed wells, funds will be advanced by the developer, which is also subject to the same method of refund as described above.

Distribution System Model

The distribution system analysis for the developments was performed using PIPE2000 developed by the University of Kentucky Civil Engineering Software Center. It is a Windows version of the original KY-Pipe developed by the University which used Fortran Code. The model uses the Hazen-Williams formula for system analysis. The modeling software allows the distribution system to be developed with consideration for different flow conditions.

Analysis

Sandia Phase 1

The estimated Average Day Peak Month (ADPM) demand was calculated and is shown in Attachment B-2. This ADPM demand was multiplied by a factor of 1.2 to estimate the Peak Day Demand. A summary of the demand estimate calculations is shown in Table 1. See Figure A. for a layout of the KY Pipe Model. The estimated peak day demand was then distributed throughout the model for analysis. Four different scenarios were used for Sandia's Phase 1 analysis:

- peak day demand no new well, tank, or booster pump.
- peak day demand with Sandia well #1, one million gallon water storage tank, and booster pumps on.
- peak day demand with fire flow no new well, tank, or booster pump.
- peak day demand with fire flow and Sandia well #1, one million gallon water storage tank, and booster pumps on.

Sandia

The estimated Average Day Peak Month (ADPM) demand was calculated in Attachment A-3. This ADPM demand was multiplied by a factor of 1.2 to estimate the Peak Day Demand. A summary of the demand estimate calculations is shown in Table 1. See Figure B. Sandia Phase 1

for a layout of the KY Pipe Model. The estimated peak day demand was then distributed throughout the model for analysis. Two different scenarios were used for Sandia's analysis:

- peak day demand with all six Sandia wells running, one million gallon water storage tank, and booster pumps on.
- peak day demand with fire flow and all six Sandia wells running, one million gallon water storage tank, and booster pumps on.

Martin Ranch

The estimated Average Day Peak Month (ADPM) demand was calculated in Attachment C-3. This demand was multiplied by a factor of 1.5 to estimate the Peak Day Demand. A summary of the demand estimate calculations is shown in Table 1. See Figure C. Martin Ranch for a layout of the KY Pipe Model. The estimated peak day demand was then distributed throughout the model for analysis. Four different scenarios were used for analysis:

- peak day demand with no new well.
- peak day demand with Martin Ranch well #1 running.
- peak day demand with fire flow with no new well.
- peak day demand with fire flow with Martin ranch well #1 running.

Sandia and Martin Ranch

The estimated Average Day Peak Month (ADPM) demand was calculated in Attachment D-1. This demand was calculated by adding together Sandia's ADPM and Martin Ranch's ADPM to estimate the Peak Day Demand. A summary of the demand estimate calculations is shown in Table 1. See Figure D Sandia and Martin Ranch for a layout of the KY Pipe Model. The estimated peak day demand was then distributed throughout the model for analysis. Five different scenarios were used for analysis:

- peak day demand with no new wells, tank, or booster pump station.
- peak day demand with one well running, one million gallon water storage tank, and booster pumps on.

- peak day demand with 7 new wells running, one million gallon water storage tank, and booster pumps on.

- peak day demand with fire flow with one well running, one million gallon water storage tank, and booster pumps on.

- peak day demand with fire flow with 7 new wells running, one million gallon water storage tank, and booster pumps on.

Table 1 – Demand Estimates

Development	Lots/ DUs	Density people/DU	Demand GPCD	ADPM	Peak Day Demand
				gpm	Gpm
Sandia Phase 1	1,500	2.85	143	425	637
Sandia	9,000	2.85	143	2,547	3,821
Martin Ranch	2,100	2.85	143	589	707
Sandia and Martin Ranch	11,100	2.85	143	3136	4528

The conditions used in development of the analysis are presented as follows:

- *Fire flow condition*: 1000 gallons per minute (gpm) at 20 pounds per square inch gauge (psig) pressure per ADEQ requirements.

- *Pipe considerations*: Ductile iron pipe (DIP) with a friction factor of C = 140 in the model.

- *Valving considerations*: Valves and other minor losses are assumed to be negligible and were not included in the model of the system. The hydrant testing was performed under assumed peak conditions and reflected all valve and fitting losses.

- *Hydrant considerations*: The most hydraulically remote locations within the development were determined, then the fire flow demand was placed at these locations.

- *Average Day Peak Month Demand (ADPM)*: The average day peak month demand for Sandia and Martin Ranch are based on 143 gallons per capita per day (GPCD) based on Arizona Water Company's criteria. The density for this community will be approximately 2.85 people per dwelling unit (DU).

- *Peak Day Demand*: Is determined by multiplying the ADPM by a peaking factor of 1.2 for Casa Grande and 1.5 for Coolidge.

Peak Day Demand. The model was analyzed using the peak day demand distributed throughout the development. Each attachment contains the full design report for the peak day conditions with all pumps off (gravity flow only).

Attachment B-3 Sandia Phase 1

Attachment C-4 Martin Ranch

Attachment D-2 Sandia and Martin Ranch

The design report in each attachment below uses the same demand conditions but predict pressures within the distribution system resulting from one new well providing service to the development simulated in an operating condition.

Attachment B-4 Sandia Phase 1

Attachment C-5 Martin Ranch

Attachment D-3 Sandia and Martin Ranch

A summary of the results are shown in Table 2.

The design report in each attachment below uses the same demand conditions but predict pressures within the distribution system resulting from all new wells and booster pumps on providing service to the development simulated in an operating condition.

Attachment A-4 Sandia

Attachment D-4 Sandia and Martin Ranch

Peak Day Demand with Fire Flow. The model was next analyzed using the peak day demand and fire flow demand distributed throughout the development. Each attachment below contains the full design report for these demand conditions with all wells off, simulating results from a " worst case" scenario.

Attachment B-5 Sandia Phase 1

Attachment C-6 Martin Ranch

The design report in each attachment below uses the same "worst case" demand conditions but with one new well providing service to the development simulated in an operating condition.

Attachment B-6 Sandia Phase 1

Attachment C-7 Martin Ranch

Attachment D-5 Sandia and Martin Ranch

The design report in each attachment below uses the same "worst case" demand conditions but with all wells providing service to the development simulated in an operating condition.

Attachment A-5 Sandia

Attachment D-6 Sandia and Martin Ranch

Table 2
Modeled System Conditions

Peak Day Demand Conditions (All Pumps Off)		
Sandia Phase 1 Lowest Pressure	J-5	57.95 psig
Martin Ranch Lowest Pressure	J-27	57.98 psig
Sandia and Martin Ranch	J-5	29.48 psig
Peak Day Demand Conditions (One Well On)		
Sandia Phase 1 Lowest Pressure	(Sandia Tie in Point)	65.64 psig
Martin Ranch Lowest Pressure	J-27	61.07 psig
Sandia and Martin Ranch	J-27	43.25 psig
Peak Day Demand Conditions (All Wells On)		
Sandia	(Sandia Tie in Point)	71.64 psig
Sandia and Martin Ranch	J-27	61.58 psig
Peak Day Demand with 1000gpm Fire Flow (All Pumps Off)		
Sandia Phase 1	J-10	21.02 psig
Martin Ranch	J-27	38.71 psig
Peak Day Demand with 1000gpm Fire Flow (One Well On)		
Sandia Phase 1	J-10	53.98 psig
Martin Ranch	J-27	49.86 psig
Sandia and Martin Ranch	J-5	33.13 psig
Peak Day Demand with 1000gpm Fire Flow (All Wells On)		
Sandia	J-4	64.34 psig
Martin Ranch	J-27	60.54 psig

Well and Storage Analysis

Attachments below represents the results of an engineering analysis of water source and water storage adequacy for various scenarios for the Company's existing and future consolidated water systems with demands from both developments included in these scenarios. The engineering analysis indicates that the existing and proposed storage exceed the minimum requirements for fire protection and the production capacity exceeds the needs of the current and proposed customers even with two wells out of service.

Attachment A-6 Sandia

Attachment B-7 Sandia Phase 1

Attachment C-8 Martin Ranch

Attachment D-7 Sandia and Martin Ranch

SANDIA

Attachment A-1

Physical Availability Demonstration

ARIZONA DEPARTMENT OF WATER RESOURCES
Hydrology Division
500 North Third Street, Phoenix, Arizona 85004
Telephone 602 417-2448
Fax 602 417-2425

JANE DEE HULL
Governor

JOSEPH C. SMITH
Director

April 24, 2002

RECEIVED
APR 26 2002
ARIZONA WATER COMPANY
PHOENIX - EXECUTIVE

Mr. William Garfield
Arizona Water Company
3805 North Black Canyon Highway
Phoenix, Arizona 85015

RE: Arizona Water Company
Application for Physical Availability Demonstration #20-400600

Dear Mr. Garfield:

The Department has completed review of the report entitled ***Hydrology Study Report, Pinal AMA, Casa Grande Groundwater Flow Model,*** prepared by Clear Creek Associates, August 31, 2001. The area of review has been limited to the Casa Grande (including Arizona City), Coolidge, and Tierra Grande service areas of Arizona Water Company's Pinal County CC&Ns. The model study area is located primarily in the Maricopa-Stanfield and Eloy sub-basins of the Pinal Active Management Area.

In accordance with A.A.C. R-12-15-702(C), it was determined that approximately 57,507 acre-feet per year of groundwater is available for the Casa Grande service area; 13,510 acre-feet per year is available for the Coolidge service area; and 4,786 acre-feet per year is available for the Tierra Grande service area. These quantities represent the amount of groundwater available for new demands within the service area of each system. The groundwater is projected to be physically available for 100 years under A.A.C. R-12-15-703(B) for assured water supply purposes in the respective areas. Currently, the water supply systems are in compliance with water quality standards for the purposes of A.A.C. R-12-15-704. It is the Department's conclusion that, pumping the projected demands for 100 years, will take the depth-to-static water level to approximately the maximum depth allowed by A.A.C. R-12-15-703(B).

The results of the Department's hydrologic review fulfill the requirements of A.A.C. R12-15-702 (C) and can be cited in applications for a Certificates of Assured Water Supply or for Designation of Assured Water Supply. These applications have certain additional requirements based on the assured water supply criteria referenced in A.R.S. §45-576 and A.A.C. R-12-15-701 *et. seq.* For further information on these requirements, please contact the Office of Assured and Adequate Water Supply Certification at (602)417-2465. **If the Department finds that the groundwater supply is not available because the assumptions and information used in determining the physical availability under the current criteria prove incorrect, the Department will modify the availability of groundwater accordingly.**

The Department's determination is an appealable agency action. In order to appeal this decision, you must request an appeal within thirty (30) days from receipt of this letter. I have enclosed a summary of the appeals process and an appeal form should you wish to pursue this option.

If you have any questions regarding the physical availability review, please contact me at (602) 417-2448.

Sincerely,

Greg Wallace
Chief Hydrologist

GW/KM/rd
202245

cc: Steve Corell, Clear Creek Associates
Doug Dunham, ADWR
Dennis Kimberlin, ADWR, Pinal AMA

SANDIA

Attachment A-2

Construction Schedule and Cost Estimate

Arizona Water Company

Sandia, Pinal County, Arizona

Summary of the Backbone Water System Required to provide Water Service to Sandia

Phase 1

Units	* Wells	** Arsenic Treatment	Hydro System	*** 1,000,000 GAL Tank	Backbone Infrastructure	Total Cost
0-500	$0	$0	$0	$0	$600,000	$600,000
501-1500	$950,000	$0	$220,000	$400,000	$0	$1,570,000
1501-3000	$950,000	$0	$0	$0	$0	$950,000
						$3,120,000

Total Project

Units	* Wells	** Arsenic Treatment	Hydro System	*** 1,000,000 GAL Tank	Backbone Infrastructure	Total Cost
0-500	$0	$0	$0	$0	$600,000	$600,000
501-1500	$950,000	$0	$220,000	$400,000	$0	$1,570,000
1501-3000	$950,000	$0	$0	$0	$0	$950,000
3001-4500	$950,000	$0	$0	$0		$950,000
4501-6000	$950,000	$0	$0	$0		$950,000
6501-7500	$950,000	$0	$0	$0		$950,000
7501-9000	$950,000	$0	$0	$0		$950,000
Totals						$6,920,000

Total cost of 1 Well, Tank, and Hydro System	$1,570,000
Total cost of Wells, Tanks, and Hydro Systems	$6,920,000

* Assume new wells will be capable of 750 gallons per minute
** Any wells that require Arsenic Treatment add $600,000
*** Any additional storage required will be served from Coolidge's existing system

SANDIA

Attachment A-3

Demand Estimate
Average Day Peak Month

ARIZONA WATER COMPANY

Sandia
COOLIDGE, PINAL COUNTY, ARIZONA

Calculation to determine Average Day Peak Month (ADPM)

Assume:

1.	GPCD	143
2.	Per Capita Occupancy	2.85
3.	Dwelling Units	9000
4.	Average Days per Month	30.42

Peak Month (gallons/month) = (143)(9000)(30.42)(2.85)
Peak Month (gallons/month) = 111,579,039
Average Day Peak Month (gallons/day) = 111,579,039/30.42
ADPM (gallons/day) = 3,667,950

Average GPM= 2,547
Peak Day GPM= 3,821

SANDIA

Attachment A-4

Peak Day Demand Conditions
(All Wells On)

```
* * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                      *
*   University of Kentucky Network Modeling Software   *
*                                                      *
*              Copyrighted by KPFS 1998                *
*             Version 1.200 - 01/26/2000               *
*                                                      *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 15:40:49 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia.RS2

****
S U M M A R Y O F O R I G I N A L D A T A
****

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	l Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD FLOWRATE EFFICIENCY

(ft)	(gpm)	(%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-31		0.00	1385.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 S		-750.00	1385.00	
Well #2 S		-750.00	1380.00	
Well #3 S		-750.00	1380.00	
Well #4 S		-750.00	1385.00	
Well #5 S		-750.00	1385.00	
Well #6 S		-750.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 23
NUMBER OF END NODES .....(j) = 20
NUMBER OF PRIMARY LOOPS .....(l) = 2
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00012

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-01	Sandia tie	Coolidge S	672.17	15.32	0.00	1.88	1.02
P-02	J-03	Sandia tie	672.17	1.79	0.00	1.00	0.22
P-03	J-04	J-03	672.17	0.19	0.00	1.00	0.22
P-04	J-05	J-04	43.72	0.00	0.00	0.07	0.00
P-05	J-06	J-05	-406.28	0.37	0.00	0.61	0.09
P-06	J-07	J-06	412.71	0.13	0.00	0.62	0.09
P-07	J-08	J-07	-337.29	0.05	0.00	0.50	0.06
P-08	J-09	J-08	-1059.47	1.23	0.00	1.58	0.52
P-09	J-10	J-09	-359.47	1.10	0.00	1.00	0.32
P-10	J-10	J-11	-340.53	2.10	0.00	0.95	0.29
P-11	J-11	J-12	-921.54	3.22	0.00	2.58	1.83
P-12	J-12	J-13	-171.54	0.26	0.00	0.48	0.08
P-13	J-13	J-04	628.46	2.97	0.00	1.76	0.90
P-14	J-11	J-06	-118.99	0.15	0.00	0.33	0.04
P-15	J-08	Pump Stati	-722.17	0.00	0.00	1.08	0.25
P-16	Pump Stati	1 Mil. Tan	-722.17	0.00	0.00	1.08	0.25
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27
P-18	J-07	Well #2 S	-750.00	2.87	0.00	2.10	1.25
P-19	J-12	Well #3 S	-750.00	4.91	0.00	2.10	1.25
P-20	J-13	Well #4 S	-750.00	0.43	0.00	2.10	1.25
P-21	J-13	Well #5 S	-750.00	0.43	0.00	2.10	1.25
P-22	J-05	Well #6 S	-750.00	5.68	0.00	2.10	1.25
P-23	J-09	J-31	0.00	0.00	0.00	0.00	0.00

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)
Pump Stati	722.17	0.00	177.02	177.0	----	-----	---	----

END NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1562.11	1395.00	167.11	72.41
J-04		0.00	1562.30	1395.00	167.30	72.50
J-05		300.00	1562.30	1395.00	167.30	72.50
J-06		700.00	1561.93	1385.00	176.93	76.67
J-07		0.00	1562.07	1385.00	177.07	76.73
J-08		0.00	1562.01	1385.00	177.01	76.71
J-09		700.00	1560.78	1385.00	175.78	76.17
J-10		700.00	1559.68	1380.00	179.68	77.86
J-11		700.00	1561.78	1380.00	181.78	78.77
J-12		0.00	1565.01	1380.00	185.01	80.17
J-13		700.00	1565.27	1385.00	180.27	78.12
J-31		0.00	1560.78	1385.00	175.78	76.17
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1560.32	1395.00	165.32	71.64
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Well #2 S		-750.00	1564.94	1380.00	184.94	80.14
Well #3 S		-750.00	1569.92	1380.00	189.92	82.30
Well #4 S		-750.00	1565.70	1385.00	180.70	78.30
Well #5 S		-750.00	1565.70	1385.00	180.70	78.30
Well #6 S		-750.00	1567.99	1395.00	172.99	74.96
Pump Stati		0.00	1562.02	1385.00	177.02	76.71

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	-27.83	
Coolidge Sy	-672.17	

NET SYSTEM INFLOW = 0.00
NET SYSTEM OUTFLOW = -700.00
NET SYSTEM DEMAND = -700.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA

Attachment A-5

Peak Day Demand Conditions with Fire Flow (All Pumps On)

```
* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                        *
*    University of Kentucky Network Modeling Software    *
*                                                        *
*              Copyrighted by KPFS 1998                  *
*             Version 1.200 - 01/26/2000                 *
*                                                        *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 15:39:55 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia.RS2

****
S U M M A R Y O F O R I G I N A L D A T A
****

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD FLOWRATE EFFICIENCY

(ft)	(gpm)	(%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		1700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-31		0.00	1385.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 S		-750.00	1385.00	
Well #2 S		-750.00	1380.00	
Well #3 S		-750.00	1380.00	
Well #4 S		-750.00	1385.00	
Well #5 S		-750.00	1385.00	
Well #6 S		-750.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 23
NUMBER OF END NODES .....(j) = 20
NUMBER OF PRIMARY LOOPS .....(l) = 2
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00111

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-01	Sandia tie	Coolidge S	-181.06	1.35	0.00	0.51	0.09
P-02	J-03	Sandia tie	-181.06	0.16	0.00	0.27	0.02
P-03	J-04	J-03	-181.06	0.02	0.00	0.27	0.02
P-04	J-05	J-04	-627.46	0.64	0.00	0.94	0.20
P-05	J-06	J-05	-1077.46	2.25	0.00	1.61	0.53
P-06	J-07	J-06	-41.09	0.00	0.00	0.06	0.00
P-07	J-08	J-07	-791.09	0.26	0.00	1.18	0.30
P-08	J-09	J-08	-1660.03	2.84	0.00	2.48	1.19
P-09	J-10	J-09	-960.03	6.79	0.00	2.68	1.98
P-10	J-10	J-11	-739.97	8.86	0.00	2.07	1.22
P-11	J-11	J-12	-1103.60	4.50	0.00	3.08	2.56
P-12	J-12	J-13	-353.60	0.99	0.00	0.99	0.31
P-13	J-13	J-04	446.40	1.58	0.00	1.25	0.48
P-14	J-11	J-06	-336.37	1.03	0.00	0.94	0.28
P-15	J-08	Pump Stati	-868.93	0.00	0.00	1.30	0.36
P-16	Pump Stati	1 Mil. Tan	-868.93	0.00	0.00	1.30	0.36
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27
P-18	J-07	Well #2 S	-750.00	2.87	0.00	2.10	1.25
P-19	J-12	Well #3 S	-750.00	4.91	0.00	2.10	1.25
P-20	J-13	Well #4 S	-750.00	0.43	0.00	2.10	1.25
P-21	J-13	Well #5 S	-750.00	0.43	0.00	2.10	1.25
P-22	J-05	Well #6 S	-750.00	5.68	0.00	2.10	1.25
P-23	J-09	J-31	0.00	0.00	0.00	0.00	0.00

PUMP/LOSS ELEMENT RESULTS

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)
Pump Stati	868.93	0.00	155.33	155.3	----	-----	---	----

END NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1543.49	1395.00	148.49	64.35
J-04		0.00	1543.48	1395.00	148.48	64.34
J-05		300.00	1542.84	1395.00	147.84	64.06
J-06		700.00	1540.59	1385.00	155.59	67.42
J-07		0.00	1540.58	1385.00	155.58	67.42
J-08		0.00	1540.32	1385.00	155.32	67.31
J-09		700.00	1537.49	1385.00	152.49	66.08
J-10		1700.00	1530.70	1380.00	150.70	65.30
J-11		700.00	1539.56	1380.00	159.56	69.14
J-12		0.00	1544.06	1380.00	164.06	71.09
J-13		700.00	1545.05	1385.00	160.05	69.36
J-31		0.00	1537.49	1385.00	152.49	66.08
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1543.65	1395.00	148.65	64.42
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Well #2 S		-750.00	1543.46	1380.00	163.46	70.83
Well #3 S		-750.00	1548.97	1380.00	168.97	73.22
Well #4 S		-750.00	1545.48	1385.00	160.48	69.54
Well #5 S		-750.00	1545.48	1385.00	160.48	69.54
Well #6 S		-750.00	1548.52	1395.00	153.52	66.52
Pump Stati		0.00	1540.33	1385.00	155.33	67.31

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	118.93	
Coolidge Sy	181.06	

NET SYSTEM INFLOW = 300.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 300.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA

Attachment A-6

Well and Tank Analysis

ARIZONA WATER COMPANY

System: COOLIDGE AND SANDIA

SYSTEM	MONTH 2004	AVERAGE DAY PEAK MONTH (gpd)	PEAK DAY PEAK MONTH (gpd)	MAXIMUM PRODUCTION (gpd) LESS LARGEST PRODUCER	STORAGE AVAILABLE FOR USE (gpd)	NET GAIN or (LOSS) (gpm)
CL	June	5,783,717	8,675,575	10,440,000	461,083	1,545

No Additional production required

Well Number and Name	Production (gpm)	Tank Name	Storage (gal)
#1 - Sandia	750	Sandia Tank #1	1,000,000
#2 - Sandia	750	Warehouse Tank #1	100,000
#3 - Sandia	750	Warehouse Tank #2	500,000
#4 - Sandia	750	Warehouse Tank #3	1,000,000
#5 - Sandia	750	North Tank #1	35,500
#6 -Sandia	750	North Tank #2	116,000
#7 - Coolidge	1140	Valley Farms Tank	15,000
#9 - Coolidge	1350		
#10 - Coolidge	1500		
#2 - Valley Farms	260		
TOTAL PRODUCTION:	8,750	TOTAL STORAGE:	2,766,500

Largest producer out-of-service.

Design Statement for Well Production:

The water distribution system must have sufficient well capacity to meet the peak day demand for three consecutive days with the largest producing well out-of-service. One-half of the available storage can be used to meet the peak day demand over the same period of time with the remaining storage held in reserve for fire protection.

Design Criteria:

Peak Day Peak Month = 1.5 x Average Day Peak Month

All other wells run 24 hours per day

ARIZONA WATER COMPANY

DAY ONE
STORAGE CALCULATIONS
SYSTEM - COOLIDGE

* PRODUCTION (Gallons) =	10,440,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	435,000
AVERAGE DAY PEAK MONTH (Gallons) =	5,783,717
PEAK DAY PEAK MONTH (Gal/day) =	8,675,575
AVERAGE HOURLY DEMAND (Peak Day)=	361,482

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	488.43	435	-53.43	-53.43
7-8 AM	0.0779	675.83	435	-240.83	-294.26
8-9 AM	0.0824	714.87	435	-279.87	-574.13
9-10 AM	0.0769	667.15	435	-232.15	-806.28
10-11 AM	0.0657	569.99	435	-134.99	-941.27
11-12 PM	0.0569	493.64	435	-58.64	-999.91
12-1 PM	0.0496	430.31	435	4.69	-995.22
1-2 PM	0.0458	397.34	435	37.66	-957.56
2-3 PM	0.0423	366.98	435	68.02	-889.53
3-4 PM	0.0402	348.76	435	86.24	-803.29
4-5 PM	0.0451	391.27	435	43.73	-759.56
5-6 PM	0.0442	383.46	435	51.54	-708.02
6-7 PM	0.0461	399.94	435	35.06	-672.96
7-8 PM	0.0417	361.77	435	73.23	-599.74
8-9 PM	0.038	329.67	435	105.33	-494.41
9-10 PM	0.0387	335.74	435	99.26	-395.15
10-11 PM	0.033	286.29	435	148.71	-246.45
11-12 AM	0.0246	213.42	435	221.58	-24.87
12-1 AM	0.016	138.81	435	296.19	271.33
1-2 AM	0.0102	88.49	435	346.51	617.83
2-3 AM	0.0102	88.49	435	346.51	964.34
3-4 AM	0.0139	120.59	435	314.41	1278.75
4-5 AM	0.016	138.81	435	296.19	1574.94
5-6 AM	0.0283	245.52	435	189.48	1764.43
TOTAL	1	8,675.5750			

Minimum Storage Requirements	999,907	Gallons
*** Fire Flow Requirements	240,000	Gallons
TOTAL STORAGE REQUIRED	1,239,907	Gallons
TOTAL STORAGE AVAILABLE	2,766,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service.
***Fire Flows - 1,000 gpm @ 4 hours = 240,000 gallons.

ARIZONA WATER COMPANY

DAY TWO
STORAGE CALCULATIONS
SYSTEM - COOLIDGE

* PRODUCTION (Gallons) =	10,440,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	435,000
AVERAGE DAY PEAK MONTH (Gallons) =	5,783,717
PEAK DAY PEAK MONTH (Gal/day) =	8,675,575
AVERAGE HOURLY DEMAND (Peak Day)=	361,482

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	488.43	435	-53.43	1710.99
7-8 AM	0.0779	675.83	435	-240.83	1470.16
8-9 AM	0.0824	714.87	435	-279.87	1190.30
9-10 AM	0.0769	667.15	435	-232.15	958.14
10-11 AM	0.0657	569.99	435	-134.99	823.16
11-12 PM	0.0569	493.64	435	-58.64	764.52
12-1 PM	0.0496	430.31	435	4.69	769.21
1-2 PM	0.0458	397.34	435	37.66	806.87
2-3 PM	0.0423	366.98	435	68.02	874.89
3-4 PM	0.0402	348.76	435	86.24	961.13
4-5 PM	0.0451	391.27	435	43.73	1004.87
5-6 PM	0.0442	383.46	435	51.54	1056.40
6-7 PM	0.0461	399.94	435	35.06	1091.46
7-8 PM	0.0417	361.77	435	73.23	1164.69
8-9 PM	0.038	329.67	435	105.33	1270.02
9-10 PM	0.0387	335.74	435	99.26	1369.27
10-11 PM	0.033	286.29	435	148.71	1517.98
11-12 AM	0.0246	213.42	435	221.58	1739.56
12-1 AM	0.016	138.81	435	296.19	2035.75
1-2 AM	0.0102	88.49	435	346.51	2382.26
2-3 AM	0.0102	88.49	435	346.51	2728.77
3-4 AM	0.0139	120.59	435	314.41	2766.50
4-5 AM	0.016	138.81	435	296.19	2766.50
5-6 AM	0.0283	245.52	435	189.48	2766.50
TOTAL	1	8,675.575			

Minimum Storage Requirements	0	Gallons
*** Fire Flow Requirements	240,000	Gallons
TOTAL STORAGE REQUIRED	240,000	Gallons
TOTAL STORAGE AVAILABLE	2,766,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service.
***Fire Flows - 1,000 gpm @ 4 hours = 240,000 gallons.

ARIZONA WATER COMPANY

DAY THREE
STORAGE CALCULATIONS
SYSTEM - COOLIDGE

* PRODUCTION (Gallons) =	10,440,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	435,000
AVERAGE DAY PEAK MONTH (Gallons) =	5,783,717
PEAK DAY PEAK MONTH (Gal/day) =	8,675,575
AVERAGE HOURLY DEMAND (Peak Day)=	361,482

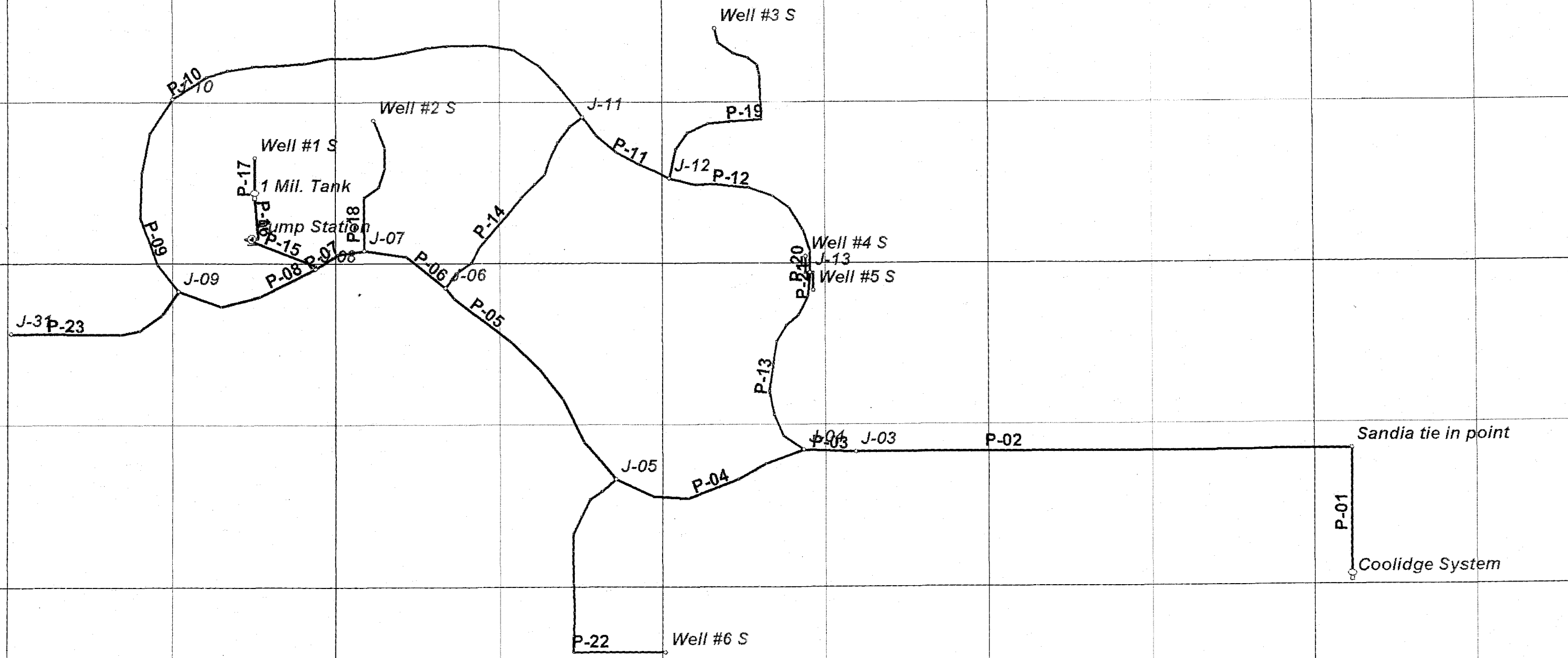
TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	488.43	435	-53.43	2713.07
7-8 AM	0.0779	675.83	435	-240.83	2472.24
8-9 AM	0.0824	714.87	435	-279.87	2192.37
9-10 AM	0.0769	667.15	435	-232.15	1960.22
10-11 AM	0.0657	569.99	435	-134.99	1825.23
11-12 PM	0.0569	493.64	435	-58.64	1766.59
12-1 PM	0.0496	430.31	435	4.69	1771.28
1-2 PM	0.0458	397.34	435	37.66	1808.94
2-3 PM	0.0423	366.98	435	68.02	1876.97
3-4 PM	0.0402	348.76	435	86.24	1963.21
4-5 PM	0.0451	391.27	435	43.73	2006.94
5-6 PM	0.0442	383.46	435	51.54	2058.48
6-7 PM	0.0461	399.94	435	35.06	2093.54
7-8 PM	0.0417	361.77	435	73.23	2166.76
8-9 PM	0.038	329.67	435	105.33	2272.09
9-10 PM	0.0387	335.74	435	99.26	2371.35
10-11 PM	0.033	286.29	435	148.71	2520.05
11-12 AM	0.0246	213.42	435	221.58	2741.63
12-1 AM	0.016	138.81	435	296.19	2766.50
1-2 AM	0.0102	88.49	435	346.51	2766.50
2-3 AM	0.0102	88.49	435	346.51	2766.50
3-4 AM	0.0139	120.59	435	314.41	2766.50
4-5 AM	0.016	138.81	435	296.19	2766.50
5-6 AM	0.0283	245.52	435	189.48	2766.50
TOTAL	1	8,675.575			

Minimum Storage Requirements	0	Gallons
*** Fire Flow Requirements	240,000	Gallons
TOTAL STORAGE REQUIRED	240,000	Gallons
TOTAL STORAGE AVAILABLE	2,766,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service.
***Fire Flows - 1,000 gpm @ 4 hours = 240,000 gallons.

FIGURE A

Sandia Subdivision Layout


Well #3 S
P-10
Well #2 S
J-11
P-19
Well #1 S
P-11
J-12
P-12
P-17
1 Mil. Tank
P-18
Pump Station
J-07
P-14
Well #4 S
P-09
P-15
P-07
P-06
J-13
P-20
J-09
P-08
J-06
Well #5 S
P-05
J-31
P-23
P-13
J-03
P-02
Sandia tie in point
J-05
P-04
P-01
Coolidge System
P-22
Well #6 S
Pipe Diameter
<= 8
<= 12
<= 16
> 16

SANDIA Phase 1

Attachment B-1

Construction Schedule and Cost Estimate

Arizona Water Company

Sandia, Pinal County, Arizona

Summary of the Backbone Water System Required to provide Water Service to Sandia

Phase 1

Units	* Wells	** Arsenic Treatment	Hydro System	*** 1,000,000 GAL Tank	Backbone Infrastructure	Total Cost
0-500	$0	$0	$0	$0	$600,000	$600,000
501-1500	$950,000	$0	$220,000	$400,000	$0	$1,570,000
1501-3000	$950,000	$0	$0	$0	$0	$950,000
						$3,120,000

Total Project

Units	* Wells	** Arsenic Treatment	Hydro System	*** 1,000,000 GAL Tank	Backbone Infrastructure	Total Cost
0-500	$0	$0	$0	$0	$600,000	$600,000
501-1500	$950,000	$0	$220,000	$400,000	$0	$1,570,000
1501-3000	$950,000	$0	$0	$0	$0	$950,000
3001-4500	$950,000	$0	$0	$0		$950,000
4501-6000	$950,000	$0	$0	$0		$950,000
6501-7500	$950,000	$0	$0	$0		$950,000
7501-9000	$950,000	$0	$0	$0		$950,000
Totals						$6,920,000

Total cost of 1 Well, Tank, and Hydro System	$1,570,000
Total cost of Wells, Tanks, and Hydro Systems	$6,920,000

* Assume new wells will be capable of 750 gallons per minute
** Any wells that require Arsenic Treatment add $600,000
*** Any additional storage required will be served from Coolidge's existing system

SANDIA Phase 1

Attachment B-2

Typical Dwelling Unit
Average Day Peak Month

ARIZONA WATER COMPANY

Sandia Phase 1
COOLIDGE, PINAL COUNTY, ARIZONA

Calculation to determine Average Day Peak Month (ADPM)

Assume:

1.	GPCD	143
2.	Per Capita Occupancy	2.85
3.	Dwelling Units	1500
4.	Average Days per Month	30.42

Peak Month (gallons/month) = (143)(1500)(30.42)(2.85)
Peak Month (gallons/month) = 18,596,507
Average Day Peak Month (gallons/day) = 18,596,507/30.42
ADPM (gallons/day) = 611,325

Average GPM= 425
Peak Day GPM= 637

SANDIA Phase 1

Attachment B-3

Peak Day Demand Conditions
(All Wells Off)

```
* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                        *
*    University of Kentucky Network Modeling Software    *
*                                                        *
*              Copyrighted by KPFS 1998                  *
*             Version 1.200 - 01/26/2000                 *
*                                                        *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 16:39:01 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia_P.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia_P.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia_P.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-15	J-08@~Pump Sta		10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE	NODE	EXTERNAL	JUNCTION	EXTERNAL

NAME	TITLE	DEMAND (gpm)	ELEVATION (ft)	GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		0.00	1395.00	
J-06		0.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		300.00	1385.00	
J-10		336.00	1380.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 S		0.00	1385.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 12
NUMBER OF END NODES .....(j) = 11
NUMBER OF PRIMARY LOOPS .....(l) = 0
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-01	Sandia tie	Coolidge S	-636.00	13.83	0.00	1.78	0.92
P-02	J-03	Sandia tie	-636.00	1.61	0.00	0.95	0.20
P-03	J-04	J-03	-636.00	0.17	0.00	0.95	0.20
P-04	J-05	J-04	-636.00	0.66	0.00	0.95	0.20
P-05	J-06	J-05	-636.00	0.85	0.00	0.95	0.20
P-06	J-07	J-06	-636.00	0.30	0.00	0.95	0.20
P-07	J-08	J-07	-636.00	0.17	0.00	0.95	0.20
P-08	J-09	J-08	-636.00	0.48	0.00	0.95	0.20
P-09	J-10	J-09	-336.00	0.97	0.00	0.94	0.28
P-15	J-08	Pump Stati	0.00	0.00	0.00	0.00	0.00
P-16	Pump Stati	1 Mil. Tan	0.00	0.00	0.00	0.00	0.00
P-17	1 Mil. Tan	Well #1 S	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

Device "Pump Statio" is closed

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1529.56	1395.00	134.56	58.31
J-04		0.00	1529.39	1395.00	134.39	58.23
J-05		0.00	1528.73	1395.00	133.73	57.95
J-06		0.00	1527.88	1385.00	142.88	61.92
J-07		0.00	1527.58	1385.00	142.58	61.79
J-08		0.00	1527.41	1385.00	142.41	61.71
J-09		300.00	1526.93	1385.00	141.93	61.50
J-10		336.00	1525.96	1380.00	145.96	63.25
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1531.17	1395.00	136.17	59.01
Well #1 S		0.00	1385.00	1385.00	0.00	0.00
Pump Stati		0.00	1527.41	1385.00	142.41	61.71

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	0.00	
Coolidge Sy	636.00	

NET SYSTEM INFLOW = 636.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 636.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA Phase 1

Attachment B-4

Peak Day Demand Conditions
(One Well On)

```
* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                        *
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*                                                        *
*              Copyrighted by KPFS 1998                  *
*             Version 1.200 - 01/26/2000                 *
*                                                        *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 16:06:20 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia_P.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia_P.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia_P.RS2

****
S U M M A R Y O F O R I G I N A L D A T A
****

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE	NODE	EXTERNAL	JUNCTION	EXTERNAL

NAME	TITLE	DEMAND (gpm)	ELEVATION (ft)	GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		0.00	1395.00	
J-06		0.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		0.00	1385.00	
J-10		636.00	1380.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 S		-750.00	1385.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 12
NUMBER OF END NODES .....(j) = 11
NUMBER OF PRIMARY LOOPS .....(l) = 0
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.00089

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-01	Sandia tie	Coolidge S	190.11	1.48	0.00	0.53	0.10
P-02	J-03	Sandia tie	190.11	0.17	0.00	0.28	0.02
P-03	J-04	J-03	190.11	0.02	0.00	0.28	0.02
P-04	J-05	J-04	190.11	0.07	0.00	0.28	0.02
P-05	J-06	J-05	190.11	0.09	0.00	0.28	0.02
P-06	J-07	J-06	190.11	0.03	0.00	0.28	0.02
P-07	J-08	J-07	190.11	0.02	0.00	0.28	0.02
P-08	J-09	J-08	-636.00	0.48	0.00	0.95	0.20
P-09	J-10	J-09	-636.00	3.17	0.00	1.78	0.92
P-15	J-08	Pump Stati	-826.11	0.00	0.00	1.23	0.33
P-16	Pump Stati	1 Mil. Tan	-826.11	0.00	0.00	1.23	0.33
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)
Pump Stati	826.11	0.00	161.88	161.9	----	-----	---	----

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1546.65	1395.00	151.65	65.71
J-04		0.00	1546.67	1395.00	151.67	65.72
J-05		0.00	1546.74	1395.00	151.74	65.75
J-06		0.00	1546.83	1385.00	161.83	70.13
J-07		0.00	1546.86	1385.00	161.86	70.14
J-08		0.00	1546.88	1385.00	161.88	70.15
J-09		0.00	1546.40	1385.00	161.40	69.94
J-10		636.00	1543.23	1380.00	163.23	70.73
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1546.48	1395.00	151.48	65.64
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Pump Stati		0.00	1546.88	1385.00	161.88	70.15

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	76.11	
Coolidge Sy	-190.11	

NET SYSTEM INFLOW = 76.11
NET SYSTEM OUTFLOW = -190.11
NET SYSTEM DEMAND = -114.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA Phase 1

Attachment B-5

Peak Day Demand Conditions with Fire Flow
(All Wells Off)

```
* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                        *
*   University of Kentucky Network Modeling Software     *
*                                                        *
*              Copyrighted by KPFS 1998                  *
*             Version 1.200 - 01/26/2000                 *
*                                                        *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Wed Dec 29 16:39:43 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia_P.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia_P.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia_P.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE	NODE	EXTERNAL	JUNCTION	EXTERNAL

NAME	TITLE	DEMAND (gpm)	ELEVATION (ft)	GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		0.00	1395.00	
J-06		0.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		300.00	1385.00	
J-10		1336.00	1380.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 S		0.00	1385.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 12
NUMBER OF END NODES .....(j) = 11
NUMBER OF PRIMARY LOOPS .....(l) = 0
NUMBER OF SUPPLY NODES .....(f) = 2
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-01	Sandia tie	Coolidge S	-1636.00	79.57	0.00	4.57	5.30
P-02	J-03	Sandia tie	-1636.00	9.28	0.00	2.45	1.16
P-03	J-04	J-03	-1636.00	0.98	0.00	2.45	1.16
P-04	J-05	J-04	-1636.00	3.78	0.00	2.45	1.16
P-05	J-06	J-05	-1636.00	4.88	0.00	2.45	1.16
P-06	J-07	J-06	-1636.00	1.72	0.00	2.45	1.16
P-07	J-08	J-07	-1636.00	1.00	0.00	2.45	1.16
P-08	J-09	J-08	-1636.00	2.76	0.00	2.45	1.16
P-09	J-10	J-09	-1336.00	12.52	0.00	3.73	3.65
P-15	J-08	Pump Stati	0.00	0.00	0.00	0.00	0.00
P-16	Pump Stati	1 Mil. Tan	0.00	0.00	0.00	0.00	0.00
P-17	1 Mil. Tan	Well #1 S	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

Device "Pump Statio" is closed

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1456.15	1395.00	61.15	26.50
J-04		0.00	1455.17	1395.00	60.17	26.07
J-05		0.00	1451.39	1395.00	56.39	24.44
J-06		0.00	1446.52	1385.00	61.52	26.66
J-07		0.00	1444.79	1385.00	59.79	25.91
J-08		0.00	1443.79	1385.00	58.79	25.48
J-09		300.00	1441.03	1385.00	56.03	24.28
J-10		1336.00	1428.52	1380.00	48.52	21.02
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1465.43	1395.00	70.43	30.52
Well #1 S		0.00	1385.00	1385.00	0.00	0.00
Pump Stati		0.00	1443.79	1385.00	58.79	25.48

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	0.00	
Coolidge Sy	1636.00	

NET SYSTEM INFLOW = 1636.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1636.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA Phase 1

Attachment B-6

Peak Day Demand Conditions with Fire Flow (One Well On)

```
* * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                      *
*   University of Kentucky Network Modeling Software   *
*                                                      *
*              Copyrighted by KPFS 1998                *
*             Version 1.200 - 01/26/2000               *
*                                                      *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 16:07:00 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia_P.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia_P.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia_P.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-15	J-08@~	Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE	NODE	EXTERNAL	JUNCTION	EXTERNAL

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC-ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)
Pump Stati	962.22	0.00	140.43	140.4	----	-----	---	----

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1527.82	1395.00	132.82	57.55
J-04		0.00	1527.63	1395.00	132.63	57.47
J-05		0.00	1526.89	1395.00	131.89	57.15
J-06		0.00	1525.95	1385.00	140.95	61.08
J-07		0.00	1525.62	1385.00	140.62	60.93
J-08		0.00	1525.43	1385.00	140.43	60.85
J-09		0.00	1522.67	1385.00	137.67	59.66
J-10		1636.00	1504.45	1380.00	124.45	53.93
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1529.61	1395.00	134.61	58.33
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Pump Stati		0.00	1525.43	1385.00	140.43	60.85

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	212.22	
Coolidge Sy	673.78	

NET SYSTEM INFLOW = 886.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 886.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA Phase 1

Attachment B-7

Well and Tank Analysis

ARIZONA WATER COMPANY

System: COOLIDGE AND SANDIA PHASE 1

SYSTEM	MONTH 2004	AVERAGE DAY PEAK MONTH (gpd)	PEAK DAY PEAK MONTH (gpd)	MAXIMUM PRODUCTION (gpd) LESS LARGEST PRODUCER	STORAGE AVAILABLE FOR USE (gpd)	NET GAIN or (LOSS) (gpm)
CL	June	2,727,092	4,090,638	5,040,000	461,083	979

No Additional production required

Well Number and Name	Production (gpm)	Tank Name	Storage (gal)
#1 - Sandia	750	Sandia Tank #1	1,000,000
#7 - Coolidge	1140	Warehouse Tank #1	100,000
#9 - Coolidge	1350	Warehouse Tank #2	500,000
#10 - Coolidge	1500	Warehouse Tank #3	1,000,000
#2 - Valley Farms	260	North Tank #1	35,500
		North Tank #2	116,000
		Valley Farms Tank	15,000
TOTAL PRODUCTION:	5,000	TOTAL STORAGE:	2,766,500

Largest producer out-of-service.

Design Statement for Well Production:

The water distribution system must have sufficient well capacity to meet the peak day demand for three consecutive days with the largest producing well out-of-service. One-half of the available storage can be used to meet the peak day demand over the same period of time with the remaining storage held in reserve for fire protection.

Design Criteria:

Peak Day Peak Month = 1.5 x Average Day Peak Month

All other wells run 24 hours per day

ARIZONA WATER COMPANY

DAY ONE
STORAGE CALCULATIONS
SYSTEM - COOLIDGE

* PRODUCTION (Gallons) =	5,040,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	210,000
AVERAGE DAY PEAK MONTH (Gallons) =	2,727,092
PEAK DAY PEAK MONTH (Gal/day) =	4,090,638
AVERAGE HOURLY DEMAND (Peak Day)=	170,443

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	230.30	210	-20.30	-20.30
7-8 AM	0.0779	318.66	210	-108.66	-128.96
8-9 AM	0.0824	337.07	210	-127.07	-256.03
9-10 AM	0.0769	314.57	210	-104.57	-360.60
10-11 AM	0.0657	268.75	210	-58.75	-419.36
11-12 PM	0.0569	232.76	210	-22.76	-442.11
12-1 PM	0.0496	202.90	210	7.10	-435.01
1-2 PM	0.0458	187.35	210	22.65	-412.36
2-3 PM	0.0423	173.03	210	36.97	-375.40
3-4 PM	0.0402	164.44	210	45.56	-329.84
4-5 PM	0.0451	184.49	210	25.51	-304.33
5-6 PM	0.0442	180.81	210	29.19	-275.13
6-7 PM	0.0461	188.58	210	21.42	-253.71
7-8 PM	0.0417	170.58	210	39.42	-214.29
8-9 PM	0.038	155.44	210	54.56	-159.73
9-10 PM	0.0387	158.31	210	51.69	-108.04
10-11 PM	0.033	134.99	210	75.01	-33.03
11-12 AM	0.0246	100.63	210	109.37	76.34
12-1 AM	0.016	65.45	210	144.55	220.89
1-2 AM	0.0102	41.72	210	168.28	389.16
2-3 AM	0.0102	41.72	210	168.28	557.44
3-4 AM	0.0139	56.86	210	153.14	710.58
4-5 AM	0.016	65.45	210	144.55	855.13
5-6 AM	0.0283	115.77	210	94.23	949.36
TOTAL	1	4,090.6375			

Minimum Storage Requirements	442,114	Gallons
*** Fire Flow Requirements	240,000	Gallons
TOTAL STORAGE REQUIRED	682,114	Gallons
TOTAL STORAGE AVAILABLE	2,766,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service.
***Fire Flows - 1,000 gpm @ 4 hours = 240,000 gallons.

ARIZONA WATER COMPANY

DAY TWO
STORAGE CALCULATIONS
SYSTEM - COOLIDGE

* PRODUCTION (Gallons) =	5,040,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	210,000
AVERAGE DAY PEAK MONTH (Gallons) =	2,727,092
PEAK DAY PEAK MONTH (Gal/day) =	4,090,638
AVERAGE HOURLY DEMAND (Peak Day)=	170,443

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	230.30	210	-20.30	929.06
7-8 AM	0.0779	318.66	210	-108.66	820.40
8-9 AM	0.0824	337.07	210	-127.07	693.33
9-10 AM	0.0769	314.57	210	-104.57	588.76
10-11 AM	0.0657	268.75	210	-58.75	530.01
11-12 PM	0.0569	232.76	210	-22.76	507.25
12-1 PM	0.0496	202.90	210	7.10	514.35
1-2 PM	0.0458	187.35	210	22.65	537.00
2-3 PM	0.0423	173.03	210	36.97	573.97
3-4 PM	0.0402	164.44	210	45.56	619.52
4-5 PM	0.0451	184.49	210	25.51	645.04
5-6 PM	0.0442	180.81	210	29.19	674.23
6-7 PM	0.0461	188.58	210	21.42	695.65
7-8 PM	0.0417	170.58	210	39.42	735.07
8-9 PM	0.038	155.44	210	54.56	789.63
9-10 PM	0.0387	158.31	210	51.69	841.32
10-11 PM	0.033	134.99	210	75.01	916.33
11-12 AM	0.0246	100.63	210	109.37	1025.70
12-1 AM	0.016	65.45	210	144.55	1170.25
1-2 AM	0.0102	41.72	210	168.28	1338.52
2-3 AM	0.0102	41.72	210	168.28	1506.80
3-4 AM	0.0139	56.86	210	153.14	1659.94
4-5 AM	0.016	65.45	210	144.55	1804.49
5-6 AM	0.0283	115.77	210	94.23	1898.73
TOTAL	1	4,090.638			

Minimum Storage Requirements	0	Gallons
*** Fire Flow Requirements	240,000	Gallons
TOTAL STORAGE REQUIRED	240,000	Gallons
TOTAL STORAGE AVAILABLE	2,766,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service.
***Fire Flows - 1,000 gpm @ 4 hours = 240,000 gallons.

ARIZONA WATER COMPANY

DAY THREE
STORAGE CALCULATIONS
SYSTEM - COOLIDGE

* PRODUCTION (Gallons) =	5,040,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	210,000
AVERAGE DAY PEAK MONTH (Gallons) =	2,727,092
PEAK DAY PEAK MONTH (Gal/day) =	4,090,638
AVERAGE HOURLY DEMAND (Peak Day)=	170,443

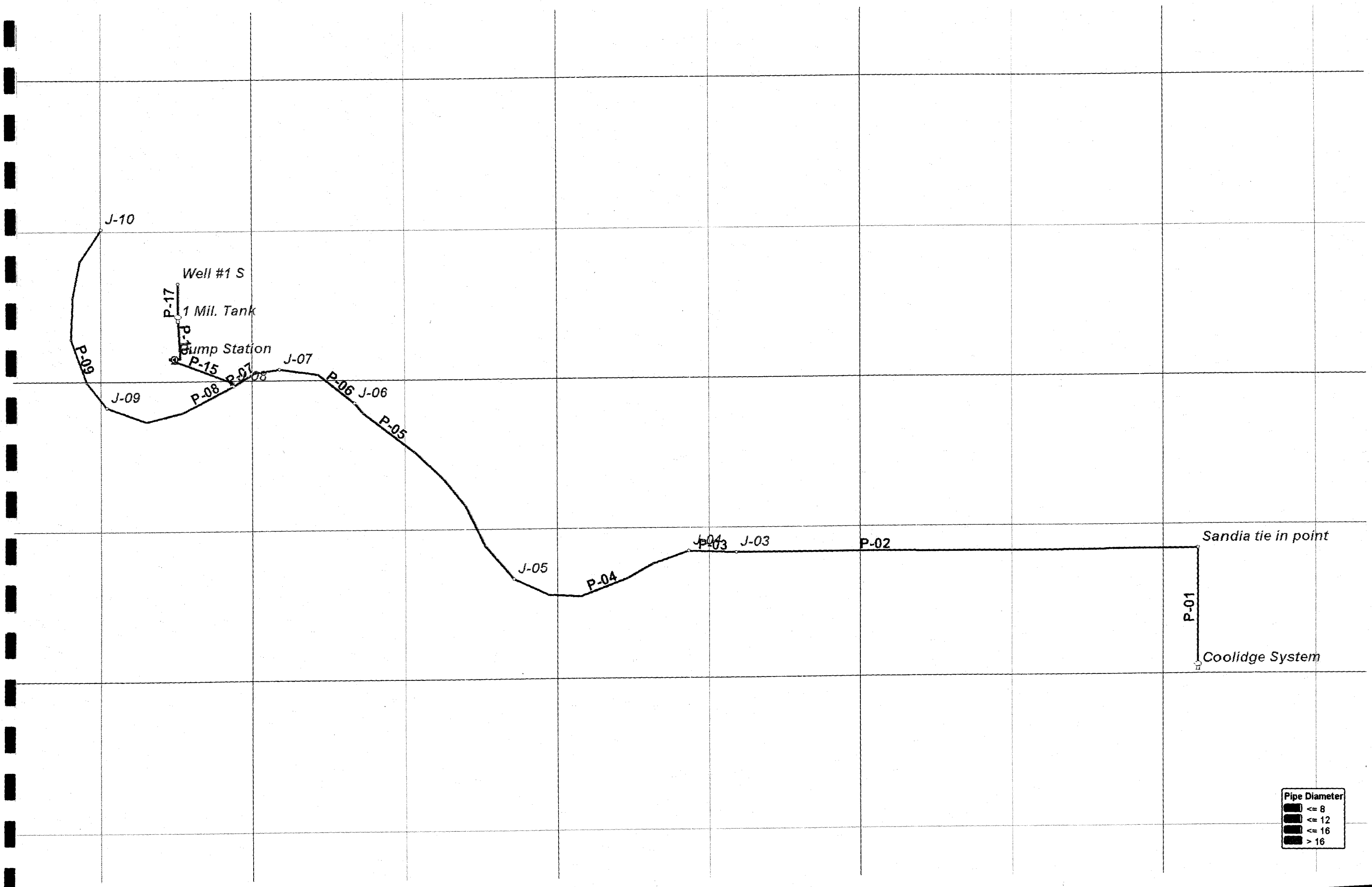
TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	230.30	210	-20.30	1878.42
7-8 AM	0.0779	318.66	210	-108.66	1769.76
8-9 AM	0.0824	337.07	210	-127.07	1642.69
9-10 AM	0.0769	314.57	210	-104.57	1538.12
10-11 AM	0.0657	268.75	210	-58.75	1479.37
11-12 PM	0.0569	232.76	210	-22.76	1456.61
12-1 PM	0.0496	202.90	210	7.10	1463.72
1-2 PM	0.0458	187.35	210	22.65	1486.36
2-3 PM	0.0423	173.03	210	36.97	1523.33
3-4 PM	0.0402	164.44	210	45.56	1568.89
4-5 PM	0.0451	184.49	210	25.51	1594.40
5-6 PM	0.0442	180.81	210	29.19	1623.59
6-7 PM	0.0461	188.58	210	21.42	1645.01
7-8 PM	0.0417	170.58	210	39.42	1684.43
8-9 PM	0.038	155.44	210	54.56	1738.99
9-10 PM	0.0387	158.31	210	51.69	1790.68
10-11 PM	0.033	134.99	210	75.01	1865.69
11-12 AM	0.0246	100.63	210	109.37	1975.06
12-1 AM	0.016	65.45	210	144.55	2119.61
1-2 AM	0.0102	41.72	210	168.28	2287.89
2-3 AM	0.0102	41.72	210	168.28	2456.16
3-4 AM	0.0139	56.86	210	153.14	2609.30
4-5 AM	0.016	65.45	210	144.55	2753.85
5-6 AM	0.0283	115.77	210	94.23	2766.50
TOTAL	1	4,090.638			

Minimum Storage Requirements	0	Gallons
*** Fire Flow Requirements	240,000	Gallons
TOTAL STORAGE REQUIRED	240,000	Gallons
TOTAL STORAGE AVAILABLE	2,766,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* *Largest Producer out-of-service.*
***Fire Flows - 1,000 gpm @ 4 hours = 240,000 gallons.

FIGURE B

Sandia Phase 1 Subdivision Layout


J-10
Well #1 S
P-17
1 Mil. Tank
P-16
Pump Station
P-15
P-07
J-08
J-07
P-06
J-06
P-05
P-09
J-09
P-08
J-05
P-04
J-04
P-03
J-03
P-02
Sandia tie in point
P-01
Coolidge System
Pipe Diameter
<= 8
<= 12
<= 16
> 16

MARTIN RANCH

Attachment C-1

Physical Availability Demonstration

ARIZONA DEPARTMENT OF WATER RESOURCES
Hydrology Division
500 North Third Street, Phoenix, Arizona 85004
Telephone 602 417-2448
Fax 602 417-2425

JANE DEE HI
Governor

JOSEPH C. SM
Director

April 24, 2002

RECEIVED
APR 26 2002
ARIZONA WATER COMPANY
PHOENIX - EXECUTIVE

Mr. William Garfield
Arizona Water Company
3805 North Black Canyon Highway
Phoenix, Arizona 85015

RE: Arizona Water Company
Application for Physical Availability Demonstration #20-400600

Dear Mr. Garfield:

The Department has completed review of the report entitled ***Hydrology Study Report, Pinal AMA, Casa Grande Groundwater Flow Model,*** prepared by Clear Creek Associates, August 31, 2001. The area of review has been limited to the Casa Grande (including Arizona City), Coolidge, and Tierra Grande service areas of Arizona Water Company's Pinal County CC&Ns. The model study area is located primarily in the Maricopa-Stanfield and Eloy sub-basins of the Pinal Active Management Area.

In accordance with A.A.C. R-12-15-702(C), it was determined that approximately 57,507 acre-feet per year of groundwater is available for the Casa Grande service area; 13,510 acre-feet per year is available for the Coolidge service area; and 4,786 acre-feet per year is available for the Tierra Grande service area. These quantities represent the amount of groundwater available for new demands within the service area of each system. The groundwater is projected to be physically available for 100 years under A.A.C. R-12-15-703(B) for assured water supply purposes in the respective areas. Currently, the water supply systems are in compliance with water quality standards for the purposes of A.A.C. R-12-15-704. It is the Department's conclusion that, pumping the projected demands for 100 years, will take the depth-to-static water level to approximately the maximum depth allowed by A.A.C. R-12-15-703(B).

The results of the Department's hydrologic review fulfill the requirements of A.A.C. R12-15-702 (C) and can be cited in applications for a Certificates of Assured Water Supply or for Designation of Assured Water Supply. These applications have certain additional requirements based on the assured water supply criteria referenced in A.R.S. §45-576 and A.A.C. R-12-15-701 *et. seq.* For further information on these requirements, please contact the Office of Assured and Adequate Water Supply Certification at (602)417-2465. **If the Department finds that the groundwater supply is not available because the assumptions and information used in determining the physical availability under the current criteria prove incorrect, the Department will modify the availability of groundwater accordingly.**

The Department's determination is an appealable agency action. In order to appeal this decision, you must request an appeal within thirty (30) days from receipt of this letter. I have enclosed a summary of the appeals process and an appeal form should you wish to pursue this option.

If you have any questions regarding the physical availability review, please contact me at (602) 417-2448.

Sincerely,

Greg Wallace
Chief Hydrologist

GW/KM/rd
202245

cc: Steve Corell, Clear Creek Associates
Doug Dunham, ADWR
Dennis Kimberlin, ADWR, Pinal AMA

MARTIN RANCH

Attachment C-2

Construction Schedule and Cost Estimate

Arizona Water Company

Martin Ranch, Pinal County, Arizona

Summary of the Backbone Water System Required to provide Water Service to Martin Ranch

Phase 1

Units	* Wells	** Arsenic Treatment	Hydro System	*** 1,000,000 GAL Tank	Backbone Infrastructure	Total Cost
0-500	$0	$0	$0	$0	$600,000	$600,000
501-1500	$950,000	$0	$0	$0	$0	$950,000
						$1,550,000

Total cost of Wells, Tanks, and Hydro Systems $1,550,000

* Assume new wells will be capable of 750 gallons per minute
** Any wells that require Arsenic Treatment add $600,000
*** Any additional storage required will be served from Casa Grande's existing system

MARTIN RANCH

Attachment C-3

Demand Estimate
Average Day Peak Month

ARIZONA WATER COMPANY

Martin Ranch
CASA GRANDE, PINAL COUNTY, ARIZONA

Calculation to determine Average Day Peak Month (ADPM)

Assume:

1.	GPCD	143
2.	Per Capita Occupancy	2.85
3.	Dwelling Units	2082
4.	Average Days per Month	30.42

Peak Month (gallons/month) = (143)(2082)(30.42)(2.85)
Peak Month (gallons/month) = 25,811,951
Average Day Peak Month (gallons/day) = 25,811,951/30.42
ADPM (gallons/day) = 848,519

Average GPM= 589
Peak Day GPM= 707

MARTIN RANCH

Attachment C-4

Peak Day Demand Conditions
(All Wells Off)

```
* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                        *
*    University of Kentucky Network Modeling Software    *
*                                                        *
*              Copyrighted by KPFS 1998                  *
*             Version 1.200 - 01/26/2000                 *
*                                                        *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 13:58:53 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Martin_R.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Martin_R.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Martin_R.RS2

****
S U M M A R Y O F O R I G I N A L D A T A
****

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-24	Casa Grand	Martin Ran	1126.86	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16101.26	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00
P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
Casa Grand		----	1545.00	1545.00
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
Martin Ran		0.00	1403.00	
Well #1 MR		0.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 11
NUMBER OF END NODES .....(j) = 9
NUMBER OF PRIMARY LOOPS .....(l) = 2
NUMBER OF SUPPLY NODES .....(f) = 1
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 6 TRIALS: ACCURACY = 0.00200

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-24	Casa Grand	Martin Ran	700.00	0.27	0.00	1.05	0.24
P-25	Martin Ran	J-20	700.00	3.86	0.00	1.05	0.24
P-26	J-20	J-22	454.69	0.28	0.00	0.68	0.11
P-27	J-22	J-23	354.69	0.86	0.00	0.99	0.31
P-28	J-23	J-24	227.61	0.37	0.00	0.64	0.14
P-29	J-24	J-25	127.61	0.05	0.00	0.36	0.05
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	-72.39	0.38	0.00	0.45	0.12
P-32	J-26	J-23	-27.08	0.04	0.00	0.17	0.02
P-33	J-26	J-20	-145.31	1.18	0.00	0.91	0.43
P-34	J-25	Well #1 MR	0.00	0.00	0.00	0.00	0.00

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
Casa Grand		----	1545.00	1545.00	0.00	0.00
J-20		100.00	1540.86	1392.00	148.86	64.51
J-22		100.00	1540.59	1389.00	151.59	65.69
J-23		100.00	1539.72	1390.00	149.72	64.88
J-24		100.00	1539.35	1390.00	149.35	64.72
J-25		0.00	1539.30	1395.00	144.30	62.53
J-26		100.00	1539.69	1395.00	144.69	62.70
J-27		200.00	1538.80	1405.00	133.80	57.98
Martin Ran		0.00	1544.73	1403.00	141.73	61.42
Well #1 MR		0.00	1539.30	1395.00	144.30	62.53

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
Casa Grande	700.00	

NET SYSTEM INFLOW = 700.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 700.00

***** HYDRAULIC ANALYSIS COMPLETED *****

MARTIN RANCH

Attachment C-5

Peak Day Demand Conditions
(One Well On)

```
* * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                       *
*   University of Kentucky Network Modeling Software    *
*                                                       *
*              Copyrighted by KPFS 1998                 *
*             Version 1.200 - 01/26/2000                *
*                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 14:11:22 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Martin_R.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Martin_R.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Martin_R.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-24	Casa Grand	Martin Ran	1152.84	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16100.97	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00
P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
Casa Grand		----	1545.00	1545.00
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
Martin Ran		0.00	1403.00	
Well #1 MR		-750.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 11
NUMBER OF END NODES .....(j) = 9
NUMBER OF PRIMARY LOOPS .....(l) = 2
NUMBER OF SUPPLY NODES .....(f) = 1
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 6 TRIALS: ACCURACY = 0.00006

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-24	Casa Grand	Martin Ran	-50.00	0.00	0.00	0.07	0.00
P-25	Martin Ran	J-20	-50.00	0.03	0.00	0.07	0.00
P-26	J-20	J-22	-88.44	0.01	0.00	0.13	0.01
P-27	J-22	J-23	-188.44	0.27	0.00	0.53	0.10
P-28	J-23	J-24	-317.62	0.68	0.00	0.89	0.25
P-29	J-24	J-25	-417.62	0.44	0.00	1.17	0.42
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	132.38	1.17	0.00	0.83	0.36
P-32	J-26	J-23	-29.18	0.04	0.00	0.18	0.02
P-33	J-26	J-20	61.56	0.24	0.00	0.39	0.09
P-34	J-25	Well #1 MR	-750.00	0.25	0.00	1.12	0.27

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
Casa Grand		----	1545.00	1545.00	0.00	0.00
J-20		100.00	1545.03	1392.00	153.03	66.31
J-22		100.00	1545.04	1389.00	156.04	67.62
J-23		100.00	1545.31	1390.00	155.31	67.30
J-24		100.00	1545.99	1390.00	155.99	67.60
J-25		0.00	1546.44	1395.00	151.44	65.62
J-26		100.00	1545.27	1395.00	150.27	65.12
J-27		200.00	1545.93	1405.00	140.93	61.07
Martin Ran		0.00	1545.00	1403.00	142.00	61.53
Well #1 MR		-750.00	1546.69	1395.00	151.69	65.73

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
Casa Grande	-50.00	

NET SYSTEM INFLOW = 0.00
NET SYSTEM OUTFLOW = -50.00
NET SYSTEM DEMAND = -50.00

***** HYDRAULIC ANALYSIS COMPLETED *****

MARTIN RANCH

Attachment C-6

Peak Day Demand Conditions with Fire Flow
(All Wells Off)

```
* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                         *
*    University of Kentucky Network Modeling Software     *
*                                                         *
*              Copyrighted by KPFS 1998                   *
*             Version 1.200 - 01/26/2000                  *
*                                                         *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 14:00:32 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Martin_R.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Martin_R.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Martin_R.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-24	Casa Grand	Martin Ran	1152.84	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16100.97	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00
P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
Casa Grand		----	1545.00	1545.00
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		1200.00	1405.00	
Martin Ran		0.00	1403.00	
Well #1 MR		0.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 11
NUMBER OF END NODES .....(j) = 9
NUMBER OF PRIMARY LOOPS .....(l) = 2
NUMBER OF SUPPLY NODES .....(f) = 1
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00011

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-24	Casa Grand	Martin Ran	1700.00	1.43	0.00	2.54	1.24
P-25	Martin Ran	J-20	1700.00	19.99	0.00	2.54	1.24
P-26	J-20	J-22	1179.25	1.63	0.00	1.76	0.63
P-27	J-22	J-23	1079.25	6.79	0.00	3.02	2.46
P-28	J-23	J-24	954.91	5.23	0.00	2.67	1.96
P-29	J-24	J-25	854.91	1.67	0.00	2.39	1.59
P-30	J-25	J-27	1200.00	13.93	0.00	3.35	2.99
P-31	J-25	J-26	-345.09	6.87	0.00	2.16	2.13
P-32	J-26	J-23	-24.33	0.03	0.00	0.15	0.02
P-33	J-26	J-20	-420.75	8.44	0.00	2.64	3.07
P-34	J-25	Well #1 MR	0.00	0.00	0.00	0.00	0.00

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
Casa Grand		----	1545.00	1545.00	0.00	0.00
J-20		100.00	1523.58	1392.00	131.58	57.02
J-22		100.00	1521.95	1389.00	132.95	57.61
J-23		100.00	1515.17	1390.00	125.17	54.24
J-24		100.00	1509.93	1390.00	119.93	51.97
J-25		0.00	1508.26	1395.00	113.26	49.08
J-26		100.00	1515.14	1395.00	120.14	52.06
J-27		1200.00	1494.34	1405.00	89.34	38.71
Martin Ran		0.00	1543.57	1403.00	140.57	60.91
Well #1 MR		0.00	1508.26	1395.00	113.26	49.08

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
Casa Grande	1700.00	

NET SYSTEM INFLOW = 1700.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 1700.00

***** HYDRAULIC ANALYSIS COMPLETED *****

MARTIN RANCH

Attachment C-7

Peak Day Demand Conditions with Fire Flow
(One Well On)

```
* * * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                         *
*    University of Kentucky Network Modeling Software     *
*                                                         *
*              Copyrighted by KPFS 1998                   *
*             Version 1.200 - 01/26/2000                  *
*                                                         *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 14:09:48 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Martin_R.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Martin_R.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Martin_R.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-24	Casa Grand	Martin Ran	1152.84	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16100.97	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00
P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
Casa Grand		----	1545.00	1545.00
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		1200.00	1405.00	
Martin Ran		0.00	1403.00	
Well #1 MR		-750.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 11
NUMBER OF END NODES .....(j) = 9
NUMBER OF PRIMARY LOOPS .....(l) = 2
NUMBER OF SUPPLY NODES .....(f) = 1
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00161

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
P-24	Casa Grand	Martin Ran	950.00	0.49	0.00	1.42	0.42
P-25	Martin Ran	J-20	950.00	6.80	0.00	1.42	0.42
P-26	J-20	J-22	636.11	0.52	0.00	0.95	0.20
P-27	J-22	J-23	536.11	1.86	0.00	1.50	0.67
P-28	J-23	J-24	409.14	1.09	0.00	1.14	0.41
P-29	J-24	J-25	309.14	0.25	0.00	0.86	0.24
P-30	J-25	J-27	1200.00	13.93	0.00	3.35	2.99
P-31	J-25	J-26	-140.86	1.31	0.00	0.88	0.40
P-32	J-26	J-23	-26.97	0.04	0.00	0.17	0.02
P-33	J-26	J-20	-213.89	2.41	0.00	1.34	0.88
P-34	J-25	Well #1 MR	-750.00	0.25	0.00	1.12	0.27

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
Casa Grand		----	1545.00	1545.00	0.00	0.00
J-20		100.00	1537.71	1392.00	145.71	63.14
J-22		100.00	1537.19	1389.00	148.19	64.22
J-23		100.00	1535.33	1390.00	145.33	62.98
J-24		100.00	1534.24	1390.00	144.24	62.51
J-25		0.00	1533.99	1395.00	138.99	60.23
J-26		100.00	1535.30	1395.00	140.30	60.80
J-27		1200.00	1520.06	1405.00	115.06	49.86
Martin Ran		0.00	1544.51	1403.00	141.51	61.32
Well #1 MR		-750.00	1534.24	1395.00	139.24	60.34

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
Casa Grande	950.00	

NET SYSTEM INFLOW = 950.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 950.00

***** HYDRAULIC ANALYSIS COMPLETED *****

MARTIN RANCH

Attachment C-8

Well and Tank Analysis

ARIZONA WATER COMPANY

System: Casa Grande and Martin Ranch

SYSTEM	MONTH 2004	AVERAGE DAY PEAK MONTH (gpd)	PEAK DAY PEAK MONTH (gpd)	MAXIMUM PRODUCTION (gpd) LESS LARGEST PRODUCER	STORAGE AVAILABLE FOR USE (gpd)	NET GAIN or (LOSS) (gpm)
CG	June	16,211,252	19,453,503	19,224,000	2,478,333	1,562

No Additional production required

Well Number and Name	Production (gpm)	Tank Name	Storage (gal)
#1 - Martin Ranch	750	Martin Ranch	1,000,000
#10 - Casa Grande	900	Indian Hills	100,000
#14 - Cottonwood Ln.	150	Cottonwood	1,000,000
#17 - Casa Grande	800	Burgess Peak	2,000,000
#19 - Poonian	1620	Casa Grande Mtn	5,000,000
#20 - Casa Grande	1200	Scott Drive #1	110,000
#21 - Casa Grande	720	Scott Drive #2	5,000,000
#22 - Singh/Quaid	1100	North Park	625,000
#23 - Casa Grande	1600	North Park	35,000
#24 - Casa Grande	1000		
#25 - Casa Grande	1300		
#26 - Casa Grande	1460		
#27 - Lake in the Desert	470		
#28 - Az City	1500		
#29 - Mission Royale	1500		
TOTAL PRODUCTION:	16,070	TOTAL STORAGE:	14,870,000

Largest producer out-of-service taking the Blend Plan with it.

Design Statement for Well Production:

The water distribution system must have sufficient well capacity to meet the peak day demand for

Design Criteria:

Peak Day Peak Month = 1.2 x Average Day Peak Month

All other wells run 24 hours per day

ARIZONA WATER COMPANY

DAY ONE
STORAGE CALCULATIONS
SYSTEM - CASA GRANDE

* PRODUCTION (Gallons) =	19,224,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	801,000
AVERAGE DAY PEAK MONTH (Gallons) =	16,211,252
PEAK DAY PEAK MONTH (Gal/day) =	19,453,503
AVERAGE HOURLY DEMAND (Peak Day)=	810,563

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	1095.23	801	-294.23	-294.23
7-8 AM	0.0779	1515.43	801	-714.43	-1008.66
8-9 AM	0.0824	1602.97	801	-801.97	-1810.63
9-10 AM	0.0769	1495.97	801	-694.97	-2505.60
10-11 AM	0.0657	1278.10	801	-477.10	-2982.70
11-12 PM	0.0569	1106.90	801	-305.90	-3288.60
12-1 PM	0.0496	964.89	801	-163.89	-3452.50
1-2 PM	0.0458	890.97	801	-89.97	-3542.47
2-3 PM	0.0423	822.88	801	-21.88	-3564.35
3-4 PM	0.0402	782.03	801	18.97	-3545.38
4-5 PM	0.0451	877.35	801	-76.35	-3621.73
5-6 PM	0.0442	859.84	801	-58.84	-3680.58
6-7 PM	0.0461	896.81	801	-95.81	-3776.38
7-8 PM	0.0417	811.21	801	-10.21	-3786.60
8-9 PM	0.038	739.23	801	61.77	-3724.83
9-10 PM	0.0387	752.85	801	48.15	-3676.68
10-11 PM	0.033	641.97	801	159.03	-3517.65
11-12 AM	0.0246	478.56	801	322.44	-3195.20
12-1 AM	0.016	311.26	801	489.74	-2705.46
1-2 AM	0.0102	198.43	801	602.57	-2102.88
2-3 AM	0.0102	198.43	801	602.57	-1500.31
3-4 AM	0.0139	270.40	801	530.60	-969.71
4-5 AM	0.016	311.26	801	489.74	-479.97
5-6 AM	0.0283	550.53	801	250.47	-229.50
TOTAL	1	19,453.5028			

Minimum Storage Requirements	3,786,596	Gallons
*** Fire Flow Requirements	480,000	Gallons
TOTAL STORAGE REQUIRED	4,266,596	Gallons
TOTAL STORAGE AVAILABLE	14,870,000	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service taking Blen Plan with it.
***Fire Flows - 2,000 gpm @ 4 hours = 480,000 gallons.

ARIZONA WATER COMPANY

DAY TWO
STORAGE CALCULATIONS
SYSTEM - CASA GRANDE

* PRODUCTION (Gallons) =	19,224,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	801,000
AVERAGE DAY PEAK MONTH (Gallons) =	16,211,252
PEAK DAY PEAK MONTH (Gal/day) =	19,453,503
AVERAGE HOURLY DEMAND (Peak Day)=	810,563

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	1095.23	801	-294.23	-523.74
7-8 AM	0.0779	1515.43	801	-714.43	-1238.16
8-9 AM	0.0824	1602.97	801	-801.97	-2040.13
9-10 AM	0.0769	1495.97	801	-694.97	-2735.11
10-11 AM	0.0657	1278.10	801	-477.10	-3212.20
11-12 PM	0.0569	1106.90	801	-305.90	-3518.11
12-1 PM	0.0496	964.89	801	-163.89	-3682.00
1-2 PM	0.0458	890.97	801	-89.97	-3771.97
2-3 PM	0.0423	822.88	801	-21.88	-3793.85
3-4 PM	0.0402	782.03	801	18.97	-3774.88
4-5 PM	0.0451	877.35	801	-76.35	-3851.24
5-6 PM	0.0442	859.84	801	-58.84	-3910.08
6-7 PM	0.0461	896.81	801	-95.81	-4005.89
7-8 PM	0.0417	811.21	801	-10.21	-4016.10
8-9 PM	0.038	739.23	801	61.77	-3954.33
9-10 PM	0.0387	752.85	801	48.15	-3906.18
10-11 PM	0.033	641.97	801	159.03	-3747.15
11-12 AM	0.0246	478.56	801	322.44	-3424.70
12-1 AM	0.016	311.26	801	489.74	-2934.96
1-2 AM	0.0102	198.43	801	602.57	-2332.39
2-3 AM	0.0102	198.43	801	602.57	-1729.81
3-4 AM	0.0139	270.40	801	530.60	-1199.22
4-5 AM	0.016	311.26	801	489.74	-709.47
5-6 AM	0.0283	550.53	801	250.47	-459.01
TOTAL	1	19,453.503			

Minimum Storage Requirements	4,016,099	Gallons
*** Fire Flow Requirements	480,000	Gallons
TOTAL STORAGE REQUIRED	4,496,099	Gallons
TOTAL STORAGE AVAILABLE	14,870,000	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service taking Blen Plan with it.
***Fire Flows - 2,000 gpm @ 4 hours = 480,000 gallons.

ARIZONA WATER COMPANY

DAY THREE
STORAGE CALCULATIONS
SYSTEM - CASA GRANDE

* PRODUCTION (Gallons) =	19,224,000
HOURLY SOURCE OF SUPPLY (Gal/day)=	801,000
AVERAGE DAY PEAK MONTH (Gallons) =	16,211,252
PEAK DAY PEAK MONTH (Gal/day) =	19,453,503
AVERAGE HOURLY DEMAND (Peak Day)=	810,563

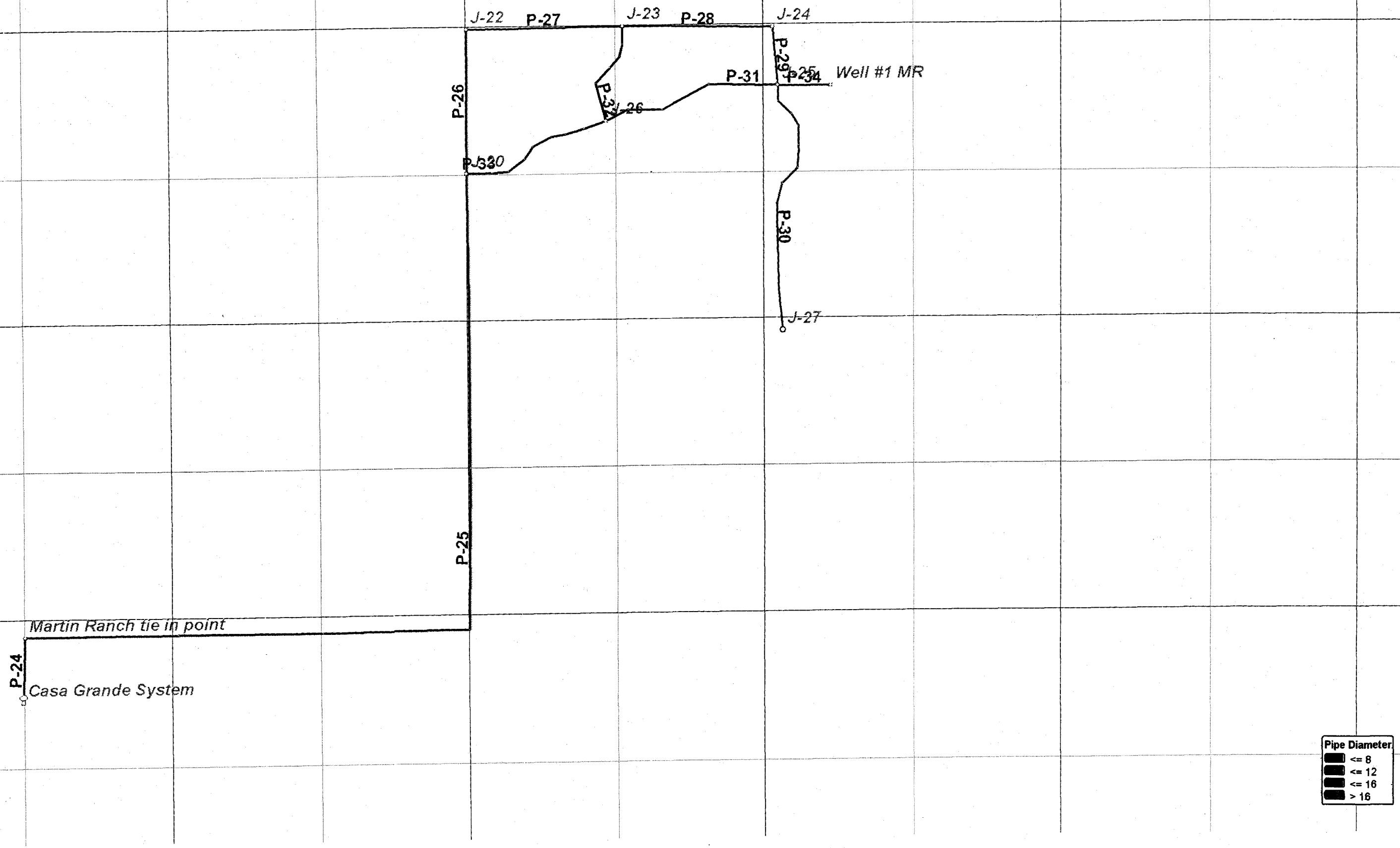
TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	1095.23	801	-294.23	-753.24
7-8 AM	0.0779	1515.43	801	-714.43	-1467.67
8-9 AM	0.0824	1602.97	801	-801.97	-2269.63
9-10 AM	0.0769	1495.97	801	-694.97	-2964.61
10-11 AM	0.0657	1278.10	801	-477.10	-3441.70
11-12 PM	0.0569	1106.90	801	-305.90	-3747.61
12-1 PM	0.0496	964.89	801	-163.89	-3911.50
1-2 PM	0.0458	890.97	801	-89.97	-4001.47
2-3 PM	0.0423	822.88	801	-21.88	-4023.36
3-4 PM	0.0402	782.03	801	18.97	-4004.39
4-5 PM	0.0451	877.35	801	-76.35	-4080.74
5-6 PM	0.0442	859.84	801	-58.84	-4139.58
6-7 PM	0.0461	896.81	801	-95.81	-4235.39
7-8 PM	0.0417	811.21	801	-10.21	-4245.60
8-9 PM	0.038	739.23	801	61.77	-4183.83
9-10 PM	0.0387	752.85	801	48.15	-4135.69
10-11 PM	0.033	641.97	801	159.03	-3976.65
11-12 AM	0.0246	478.56	801	322.44	-3654.21
12-1 AM	0.016	311.26	801	489.74	-3164.46
1-2 AM	0.0102	198.43	801	602.57	-2561.89
2-3 AM	0.0102	198.43	801	602.57	-1959.31
3-4 AM	0.0139	270.40	801	530.60	-1428.72
4-5 AM	0.016	311.26	801	489.74	-938.97
5-6 AM	0.0283	550.53	801	250.47	-688.51
TOTAL	1	19,453.503			

Minimum Storage Requirements	4,245,602	Gallons
*** Fire Flow Requirements	480,000	Gallons
TOTAL STORAGE REQUIRED	4,725,602	Gallons
TOTAL STORAGE AVAILABLE	14,870,000	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

*Largest Producer out-of-service taking Blen Plan with it.
***Fire Flows - 2,000 gpm @ 4 hours = 480,000 gallons.

FIGURE C

Martin Ranch Subdivision Layout


J-22
P-27
J-23
P-28
J-24
P-29
P-25
P-34
Well #1 MR
P-31
P-26
P-32
J-26
P-33
P-30
J-27
P-25
Martin Ranch tie in point
P-24
Casa Grande System
Pipe Diameter
<= 8
<= 12
<= 16
> 16

SANDIA and MARTIN RANCH

Attachment D-1

Demand Estimate
Average Day Peak Month

SANDIA and MARTIN RANCH

Attachment D-2

Peak Day Demand Conditions
(All Wells Off)

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* * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                       *
*   University of Kentucky Network Modeling Software    *
*                                                       *
*              Copyrighted by KPFS 1998                 *
*             Version 1.200 - 01/26/2000                *
*                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Date & Time: Wed Dec 29 13:34:15 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia-M.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia-M.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia-M.RS2

SUMMARY OF ORIGINAL DATA

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
Interconne	J-31	J-22	4174.93	16.53	140.0000	0.00
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00
P-24	Casa Grand	Martin Ran	1127.63	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16101.26	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00

P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25Well #1 MR		931.47	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A PUMP AT NODE Pump Stati; USEFUL POWER = 0.00 (Efficiency = 1.00%)

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Casa Grand		----	1545.00	1545.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
J-31		0.00	1385.00	
Martin Ran		0.00	1403.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 MR		0.00	1395.00	
Well #1 S		0.00	1385.00	
Well #2 S		0.00	1380.00	
Well #3 S		0.00	1380.00	
Well #4 S		0.00	1385.00	
Well #5 S		0.00	1385.00	
Well #6 S		0.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 35
NUMBER OF END NODES .....(j) = 29
NUMBER OF PRIMARY LOOPS .....(l) = 4
NUMBER OF SUPPLY NODES .....(f) = 3
NUMBER OF SUPPLY ZONES .....(z) = 1

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00045

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
Interconne	J-31	J-22	-2252.91	8.73	0.00	3.37	2.09
P-01	Sandia tie	Coolidge S	-1547.10	71.75	0.00	4.32	4.78
P-02	J-03	Sandia tie	-1547.10	8.37	0.00	2.31	1.04
P-03	J-04	J-03	-1547.10	0.88	0.00	2.31	1.04
P-04	J-05	J-04	-781.83	0.96	0.00	1.17	0.29
P-05	J-06	J-05	-481.83	0.51	0.00	0.72	0.12
P-06	J-07	J-06	803.92	0.46	0.00	1.20	0.31
P-07	J-08	J-07	803.92	0.27	0.00	1.20	0.31
P-08	J-09	J-08	803.92	0.74	0.00	1.20	0.31
P-09	J-10	J-09	-748.98	4.29	0.00	2.09	1.25
P-10	J-10	J-11	48.98	0.06	0.00	0.14	0.01
P-11	J-11	J-12	-65.27	0.02	0.00	0.18	0.01
P-12	J-12	J-13	-65.27	0.04	0.00	0.18	0.01
P-13	J-13	J-04	-765.27	4.28	0.00	2.14	1.30
P-14	J-11	J-06	-585.75	2.87	0.00	1.64	0.79
P-15	J-08	Pump Stati	0.00	0.00	0.00	0.00	0.00
P-16	Pump Statil	Mil. Tan	0.00	0.00	0.00	0.00	0.00
P-17	1 Mil. Tan	Well #1 S	0.00	0.00	0.00	0.00	0.00
P-18	J-07	Well #2 S	0.00	0.00	0.00	0.00	0.00
P-19	J-12	Well #3 S	0.00	0.00	0.00	0.00	0.00
P-20	J-13	Well #4 S	0.00	0.00	0.00	0.00	0.00
P-21	J-13	Well #5 S	0.00	0.00	0.00	0.00	0.00
P-22	J-05	Well #6 S	0.00	0.00	0.00	0.00	0.00
P-23	J-09	J-31	-2252.91	6.24	0.00	3.37	2.09
P-24	Casa Grand	Martin Ran	2952.91	3.89	0.00	4.41	3.45
P-25	Martin Ran	J-20	2952.91	55.58	0.00	4.41	3.45
P-26	J-20	J-22	2501.72	6.55	0.00	3.74	2.54
P-27	J-22	J-23	148.81	0.17	0.00	0.42	0.06
P-28	J-23	J-24	181.73	0.24	0.00	0.51	0.09
P-29	J-24	J-25	81.73	0.02	0.00	0.23	0.02
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	-118.27	0.95	0.00	0.74	0.29
P-32	J-26	J-23	132.92	0.68	0.00	0.83	0.36
P-33	J-26	J-20	-351.19	6.04	0.00	2.20	2.20
P-34	J-25	Well #1 MR	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

Device "Pump Statio" is closed

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Casa Grand		----	1545.00	1545.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1464.89	1395.00	69.89	30.28
J-04		0.00	1464.00	1395.00	69.00	29.90
J-05		300.00	1463.04	1395.00	68.04	29.48
J-06		700.00	1462.53	1385.00	77.53	33.60
J-07		0.00	1463.00	1385.00	78.00	33.80
J-08		0.00	1463.26	1385.00	78.26	33.91
J-09		700.00	1464.00	1385.00	79.00	34.24
J-10		700.00	1459.72	1380.00	79.72	34.54
J-11		700.00	1459.66	1380.00	79.66	34.52
J-12		0.00	1459.68	1380.00	79.68	34.53
J-13		700.00	1459.73	1385.00	74.73	32.38
J-20		100.00	1485.53	1392.00	93.53	40.53
J-22		100.00	1478.98	1389.00	89.98	38.99
J-23		100.00	1478.81	1390.00	88.81	38.48
J-24		100.00	1478.56	1390.00	88.56	38.38
J-25		0.00	1478.54	1395.00	83.54	36.20
J-26		100.00	1479.49	1395.00	84.49	36.61
J-27		200.00	1478.04	1405.00	73.04	31.65
J-31		0.00	1470.25	1385.00	85.25	36.94
Martin Ran		0.00	1541.11	1403.00	138.11	59.85
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1473.25	1395.00	78.25	33.91
Well #1 MR		0.00	1478.54	1395.00	83.54	36.20
Well #1 S		0.00	1385.00	1385.00	0.00	0.00
Well #2 S		0.00	1463.00	1380.00	83.00	35.96
Well #3 S		0.00	1459.68	1380.00	79.68	34.53
Well #4 S		0.00	1459.73	1385.00	74.73	32.38
Well #5 S		0.00	1459.73	1385.00	74.73	32.38
Well #6 S		0.00	1463.04	1395.00	68.04	29.48
Pump Stati		0.00	1463.26	1385.00	78.26	33.91

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	0.00	
Casa Grande	2952.91	
Coolidge Sy	1547.10	

NET SYSTEM INFLOW = 4500.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4500.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA and MARTIN RANCH

Attachment D-3

Peak Day Demand Conditions
(One Well On)

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* * * * * * * * * *   K Y P I P E 4   * * * * * * * * * *
*                                                        *
*    University of Kentucky Network Modeling Software    *
*                                                        *
*              Copyrighted by KPFS 1998                  *
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*                                                        *
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Date & Time: Wed Dec 29 13:49:20 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia-M.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia-M.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia-M.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
Interconne	J-31	J-22	4174.93	16.53	140.0000	0.00
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00
P-24	Casa Grand	Martin Ran	1127.63	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16101.26	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00

P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Casa Grand		----	1545.00	1545.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
J-31		0.00	1385.00	
Martin Ran		0.00	1403.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 MR		0.00	1395.00	
Well #1 S		-750.00	1385.00	
Well #2 S		0.00	1380.00	
Well #3 S		0.00	1380.00	
Well #4 S		0.00	1385.00	
Well #5 S		0.00	1385.00	
Well #6 S		0.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 35
NUMBER OF END NODES .....(j) = 29

NUMBER OF PRIMARY LOOPS .....(l) = 4
NUMBER OF SUPPLY NODES .....(f) = 3
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00147

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
Interconne	J-31	J-22	-1525.24	4.24	0.00	2.28	1.02
P-01	Sandia tie	Coolidge S	-1156.89	41.88	0.00	3.23	2.79
P-02	J-03	Sandia tie	-1156.89	4.88	0.00	1.73	0.61
P-03	J-04	J-03	-1156.89	0.52	0.00	1.73	0.61
P-04	J-05	J-04	-455.16	0.35	0.00	0.68	0.11
P-05	J-06	J-05	-155.16	0.06	0.00	0.23	0.01
P-06	J-07	J-06	1168.36	0.92	0.00	1.75	0.62
P-07	J-08	J-07	1168.36	0.54	0.00	1.75	0.62
P-08	J-09	J-08	50.49	0.00	0.00	0.08	0.00
P-09	J-10	J-09	-774.75	4.56	0.00	2.17	1.33
P-10	J-10	J-11	74.75	0.13	0.00	0.21	0.02
P-11	J-11	J-12	-1.72	0.00	0.00	0.00	0.00
P-12	J-12	J-13	-1.72	0.00	0.00	0.00	0.00
P-13	J-13	J-04	-701.72	3.64	0.00	1.96	1.11
P-14	J-11	J-06	-623.53	3.23	0.00	1.74	0.89
P-15	J-08	Pump Stati	-1117.87	0.01	0.00	1.67	0.57
P-16	Pump Stati	1 Mil. Tan	-1117.87	0.01	0.00	1.67	0.57
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27
P-18	J-07	Well #2 S	0.00	0.00	0.00	0.00	0.00
P-19	J-12	Well #3 S	0.00	0.00	0.00	0.00	0.00
P-20	J-13	Well #4 S	0.00	0.00	0.00	0.00	0.00
P-21	J-13	Well #5 S	0.00	0.00	0.00	0.00	0.00
P-22	J-05	Well #6 S	0.00	0.00	0.00	0.00	0.00
P-23	J-09	J-31	-1525.24	3.03	0.00	2.28	1.02
P-24	Casa Grand	Martin Ran	2225.24	2.30	0.00	3.33	2.04
P-25	Martin Ran	J-20	2225.24	32.91	0.00	3.33	2.04
P-26	J-20	J-22	1850.11	3.75	0.00	2.77	1.45
P-27	J-22	J-23	224.86	0.37	0.00	0.63	0.13
P-28	J-23	J-24	206.10	0.31	0.00	0.58	0.11
P-29	J-24	J-25	106.10	0.04	0.00	0.30	0.03
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	-93.90	0.62	0.00	0.59	0.19
P-32	J-26	J-23	81.23	0.27	0.00	0.51	0.15
P-33	J-26	J-20	-275.14	3.84	0.00	1.73	1.40
P-34	J-25	Well #1 MR	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

Pump Stati	1117.87	-0.01	113.77	113.8	----	-----	---	----

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Casa Grand		----	1545.00	1545.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1498.23	1395.00	103.23	44.73
J-04		0.00	1497.72	1395.00	102.72	44.51
J-05		300.00	1497.36	1395.00	102.36	44.36
J-06		700.00	1497.30	1385.00	112.30	48.66
J-07		0.00	1498.23	1385.00	113.23	49.06
J-08		0.00	1498.76	1385.00	113.76	49.30
J-09		700.00	1498.77	1385.00	113.77	49.30
J-10		700.00	1494.20	1380.00	114.20	49.49
J-11		700.00	1494.08	1380.00	114.08	49.43
J-12		0.00	1494.08	1380.00	114.08	49.43
J-13		700.00	1494.08	1385.00	109.08	47.27
J-20		100.00	1509.78	1392.00	117.78	51.04
J-22		100.00	1506.04	1389.00	117.04	50.72
J-23		100.00	1505.67	1390.00	115.67	50.12
J-24		100.00	1505.36	1390.00	115.36	49.99
J-25		0.00	1505.32	1395.00	110.32	47.81
J-26		100.00	1505.94	1395.00	110.94	48.07
J-27		200.00	1504.82	1405.00	99.82	43.25
J-31		0.00	1501.80	1385.00	116.80	50.61
Martin Ran		0.00	1542.70	1403.00	139.70	60.53
Pump Stati		0.00	1384.99	1385.00	-0.01	0.00
Sandia tie		0.00	1503.12	1395.00	108.12	46.85
Well #1 MR		0.00	1505.32	1395.00	110.32	47.81
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Well #2 S		0.00	1498.23	1380.00	118.23	51.23
Well #3 S		0.00	1494.08	1380.00	114.08	49.43
Well #4 S		0.00	1494.08	1385.00	109.08	47.27
Well #5 S		0.00	1494.08	1385.00	109.08	47.27
Well #6 S		0.00	1497.36	1395.00	102.36	44.36
Pump Stati		0.00	1498.77	1385.00	113.77	49.30

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	367.87	
Casa Grande	2225.24	
Coolidge Sy	1156.89	

NET SYSTEM INFLOW = 3750.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3750.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA and MARTIN RANCH

Attachment D-4

Peak Day Demand Conditions
(All Wells On)

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* * * * * * * * * * *  K Y P I P E 4  * * * * * * * * * * *
*                                                          *
*    University of Kentucky Network Modeling Software      *
*                                                          *
*              Copyrighted by KPFS 1998                    *
*             Version 1.200 - 01/26/2000                   *
*                                                          *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Wed Dec 29 13:46:51 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia-M.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia-M.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia-M.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
Interconne	J-31	J-22	4174.93	16.53	140.0000	0.00
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00
P-24	Casa Grand	Martin Ran	1127.63	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16101.26	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00

P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Casa Grand		----	1545.00	1545.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
J-31		0.00	1385.00	
Martin Ran		0.00	1403.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 MR		-750.00	1395.00	
Well #1 S		-750.00	1385.00	
Well #2 S		-750.00	1380.00	
Well #3 S		-750.00	1380.00	
Well #4 S		-750.00	1385.00	
Well #5 S		-750.00	1385.00	
Well #6 S		-750.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 35
NUMBER OF END NODES .....(j) = 29

NUMBER OF PRIMARY LOOPS .....(l) = 4
NUMBER OF SUPPLY NODES .....(f) = 3
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00037

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
Interconne	J-31	J-22	386.54	0.33	0.00	0.58	0.08
P-01	Sandia tie	Coolidge S	371.30	5.10	0.00	1.04	0.34
P-02	J-03	Sandia tie	371.30	0.60	0.00	0.56	0.07
P-03	J-04	J-03	371.30	0.06	0.00	0.56	0.07
P-04	J-05	J-04	-218.77	0.09	0.00	0.33	0.03
P-05	J-06	J-05	-668.77	0.93	0.00	1.00	0.22
P-06	J-07	J-06	167.18	0.03	0.00	0.25	0.02
P-07	J-08	J-07	-582.82	0.15	0.00	0.87	0.17
P-08	J-09	J-08	-1390.67	2.04	0.00	2.08	0.86
P-09	J-10	J-09	-304.13	0.81	0.00	0.85	0.24
P-10	J-10	J-11	-395.87	2.78	0.00	1.11	0.38
P-11	J-11	J-12	-959.93	3.48	0.00	2.68	1.98
P-12	J-12	J-13	-209.93	0.38	0.00	0.59	0.12
P-13	J-13	J-04	590.07	2.64	0.00	1.65	0.80
P-14	J-11	J-06	-135.94	0.19	0.00	0.38	0.05
P-15	J-08	Pump Stati	-807.85	0.00	0.00	1.21	0.31
P-16	Pump Stati	1 Mil. Tan	-807.85	0.00	0.00	1.21	0.31
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27
P-18	J-07	Well #2 S	-750.00	2.87	0.00	2.10	1.25
P-19	J-12	Well #3 S	-750.00	4.91	0.00	2.10	1.25
P-20	J-13	Well #4 S	-750.00	0.43	0.00	2.10	1.25
P-21	J-13	Well #5 S	-750.00	0.43	0.00	2.10	1.25
P-22	J-05	Well #6 S	-750.00	5.68	0.00	2.10	1.25
P-23	J-09	J-31	386.54	0.24	0.00	0.58	0.08
P-24	Casa Grand	Martin Ran	-436.54	0.11	0.00	0.65	0.10
P-25	Martin Ran	J-20	-436.54	1.61	0.00	0.65	0.10
P-26	J-20	J-22	-455.35	0.28	0.00	0.68	0.11
P-27	J-22	J-23	-168.81	0.22	0.00	0.47	0.08
P-28	J-23	J-24	-315.13	0.67	0.00	0.88	0.25
P-29	J-24	J-25	-415.13	0.44	0.00	1.16	0.42
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	134.87	1.21	0.00	0.85	0.37
P-32	J-26	J-23	-46.32	0.10	0.00	0.29	0.05
P-33	J-26	J-20	81.19	0.40	0.00	0.51	0.15
P-34	J-25	Well #1 MR	-750.00	0.25	0.00	1.12	0.27

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

Pump Stati	807.85	0.00	164.62	164.6	----	-----	---	----

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Casa Grand		----	1545.00	1545.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1550.70	1395.00	155.70	67.47
J-04		0.00	1550.76	1395.00	155.76	67.50
J-05		300.00	1550.67	1395.00	155.67	67.46
J-06		700.00	1549.74	1385.00	164.74	71.39
J-07		0.00	1549.77	1385.00	164.77	71.40
J-08		0.00	1549.62	1385.00	164.62	71.33
J-09		700.00	1547.58	1385.00	162.58	70.45
J-10		700.00	1546.77	1380.00	166.77	72.27
J-11		700.00	1549.55	1380.00	169.55	73.47
J-12		0.00	1553.03	1380.00	173.03	74.98
J-13		700.00	1553.40	1385.00	168.40	72.98
J-20		100.00	1546.72	1392.00	154.72	67.05
J-22		100.00	1547.00	1389.00	158.00	68.47
J-23		100.00	1547.22	1390.00	157.22	68.13
J-24		100.00	1547.89	1390.00	157.89	68.42
J-25		0.00	1548.33	1395.00	153.33	66.44
J-26		100.00	1547.13	1395.00	152.13	65.92
J-27		200.00	1547.83	1405.00	142.83	61.89
J-31		0.00	1547.34	1385.00	162.34	70.35
Martin Ran		0.00	1545.11	1403.00	142.11	61.58
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1550.10	1395.00	155.10	67.21
Well #1 MR		-750.00	1548.59	1395.00	153.59	66.55
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Well #2 S		-750.00	1552.64	1380.00	172.64	74.81
Well #3 S		-750.00	1557.94	1380.00	177.94	77.11
Well #4 S		-750.00	1553.84	1385.00	168.84	73.16
Well #5 S		-750.00	1553.83	1385.00	168.83	73.16
Well #6 S		-750.00	1556.35	1395.00	161.35	69.92
Pump Stati		0.00	1549.62	1385.00	164.62	71.34

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	57.85	
Casa Grande	-436.54	
Coolidge Sy	-371.30	

NET SYSTEM INFLOW = 57.85
NET SYSTEM OUTFLOW = -807.84
NET SYSTEM DEMAND = -750.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA and MARTIN RANCH

Attachment D-2

Peak Day Demand Conditions with Fire Flows (One Well On)

```
* * * * * * * * * * *  K Y P I P E 4  * * * * * * * * * * *
*                                                          *
*    University of Kentucky Network Modeling Software      *
*                                                          *
*              Copyrighted by KPFS 1998                    *
*             Version 1.200 - 01/26/2000                   *
*                                                          *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Wed Dec 29 13:50:48 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia-M.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia-M.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia-M.RS2

S U M M A R Y O F O R I G I N A L D A T A

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
Interconne	J-31	J-22	4174.93	16.53	140.0000	0.00
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00
P-24	Casa Grand	Martin Ran	1127.63	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16101.26	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00

P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25Well #1 MR		931.47	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Casa Grand		----	1545.00	1545.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		1700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
J-31		0.00	1385.00	
Martin Ran		0.00	1403.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 MR		0.00	1395.00	
Well #1 S		-750.00	1385.00	
Well #2 S		0.00	1380.00	
Well #3 S		0.00	1380.00	
Well #4 S		0.00	1385.00	
Well #5 S		0.00	1385.00	
Well #6 S		0.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 35
NUMBER OF END NODES .....(j) = 29

NUMBER OF PRIMARY LOOPS .....(l) = 4
NUMBER OF SUPPLY NODES .....(f) = 3
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00062

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
Interconne	J-31	J-22	-2076.07	7.50	0.00	3.10	1.80
P-01	Sandia tie	Coolidge S	-1463.53	64.73	0.00	4.09	4.32
P-02	J-03	Sandia tie	-1463.53	7.55	0.00	2.19	0.94
P-03	J-04	J-03	-1463.53	0.80	0.00	2.19	0.94
P-04	J-05	J-04	-530.41	0.47	0.00	0.79	0.14
P-05	J-06	J-05	-230.41	0.13	0.00	0.34	0.03
P-06	J-07	J-06	1363.52	1.23	0.00	2.04	0.83
P-07	J-08	J-07	1363.52	0.71	0.00	2.04	0.83
P-08	J-09	J-08	103.11	0.02	0.00	0.15	0.01
P-09	J-10	J-09	-1272.95	11.45	0.00	3.56	3.33
P-10	J-10	J-11	-427.05	3.20	0.00	1.19	0.44
P-11	J-11	J-12	-233.11	0.25	0.00	0.65	0.14
P-12	J-12	J-13	-233.11	0.46	0.00	0.65	0.14
P-13	J-13	J-04	-933.11	6.17	0.00	2.61	1.88
P-14	J-11	J-06	-893.93	6.29	0.00	2.50	1.73
P-15	J-08	Pump Stati	-1260.41	0.01	0.00	1.88	0.71
P-16	Pump Stati	1 Mil. Tan	-1260.41	0.01	0.00	1.88	0.71
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27
P-18	J-07	Well #2 S	0.00	0.00	0.00	0.00	0.00
P-19	J-12	Well #3 S	0.00	0.00	0.00	0.00	0.00
P-20	J-13	Well #4 S	0.00	0.00	0.00	0.00	0.00
P-21	J-13	Well #5 S	0.00	0.00	0.00	0.00	0.00
P-22	J-05	Well #6 S	0.00	0.00	0.00	0.00	0.00
P-23	J-09	J-31	-2076.07	5.37	0.00	3.10	1.80
P-24	Casa Grand	Martin Ran	2776.07	3.47	0.00	4.15	3.08
P-25	Martin Ran	J-20	2776.07	49.57	0.00	4.15	3.08
P-26	J-20	J-22	2343.79	5.81	0.00	3.50	2.25
P-27	J-22	J-23	167.72	0.22	0.00	0.47	0.08
P-28	J-23	J-24	188.20	0.26	0.00	0.53	0.10
P-29	J-24	J-25	88.20	0.02	0.00	0.25	0.02
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	-111.80	0.85	0.00	0.70	0.26
P-32	J-26	J-23	120.48	0.57	0.00	0.76	0.30
P-33	J-26	J-20	-332.28	5.45	0.00	2.08	1.98
P-34	J-25	Well #1 MR	0.00	0.00	0.00	0.00	0.00

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

PUMP Pump Statio IS OPERATING OUT OF RANGE ....

Pump Stati	1260.41	-0.01	88.27	88.3	----	-----	---	----

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Casa Grand		----	1545.00	1545.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1472.72	1395.00	77.72	33.68
J-04		0.00	1471.92	1395.00	76.92	33.33
J-05		300.00	1471.45	1395.00	76.45	33.13
J-06		700.00	1471.32	1385.00	86.32	37.41
J-07		0.00	1472.55	1385.00	87.55	37.94
J-08		0.00	1473.26	1385.00	88.26	38.25
J-09		700.00	1473.28	1385.00	88.28	38.25
J-10		1700.00	1461.83	1380.00	81.83	35.46
J-11		700.00	1465.03	1380.00	85.03	36.85
J-12		0.00	1465.29	1380.00	85.29	36.96
J-13		700.00	1465.75	1385.00	80.75	34.99
J-20		100.00	1491.96	1392.00	99.96	43.31
J-22		100.00	1486.15	1389.00	97.15	42.10
J-23		100.00	1485.93	1390.00	95.93	41.57
J-24		100.00	1485.68	1390.00	95.68	41.46
J-25		0.00	1485.65	1395.00	90.65	39.28
J-26		100.00	1486.50	1395.00	91.50	39.65
J-27		200.00	1485.15	1405.00	80.15	34.73
J-31		0.00	1478.65	1385.00	93.65	40.58
Martin Ran		0.00	1541.53	1403.00	138.53	60.03
Pump Stati		0.00	1384.99	1385.00	-0.01	0.00
Sandia tie		0.00	1480.27	1395.00	85.27	36.95
Well #1 MR		0.00	1485.65	1395.00	90.65	39.28
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Well #2 S		0.00	1472.55	1380.00	92.55	40.11
Well #3 S		0.00	1465.29	1380.00	85.29	36.96
Well #4 S		0.00	1465.75	1385.00	80.75	34.99
Well #5 S		0.00	1465.75	1385.00	80.75	34.99
Well #6 S		0.00	1471.45	1395.00	76.45	33.13
Pump Stati		0.00	1473.27	1385.00	88.27	38.25

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	510.41	
Casa Grande	2776.07	
Coolidge Sy	1463.53	

NET SYSTEM INFLOW = 4750.00
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4750.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA and MARTIN RANCH

Attachment D-6

Peak Day Demand Conditions with Fire Flows
(All Wells On)

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* * * * * * * * * *  K Y P I P E 4  * * * * * * * * * *
*                                                       *
*    University of Kentucky Network Modeling Software   *
*                                                       *
*              Copyrighted by KPFS 1998                 *
*             Version 1.200 - 01/26/2000                *
*                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Wed Dec 29 13:43:44 2004

INPUT DATA FILENAME ---------- C:\PROGRA~1\PIPE20~1\Sandia-M.DT2
TABULATED OUTPUT FILENAME -------- C:\PROGRA~1\PIPE20~1\Sandia-M.OT2
POSTPROCESSOR RESULTS FILENAME --- C:\PROGRA~1\PIPE20~1\Sandia-M.RS2

****
S U M M A R Y O F O R I G I N A L D A T A
****

U N I T S S P E C I F I E D

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
Interconne	J-31	J-22	4174.93	16.53	140.0000	0.00
P-01	Sandia tie	Coolidge S	15000.00	12.09	140.0000	0.00
P-02	J-03	Sandia tie	8024.93	16.53	140.0000	0.00
P-03	J-04	J-03	847.64	16.53	140.0000	0.00
P-04	J-05	J-04	3269.72	16.53	140.0000	0.00
P-05	J-06	J-05	4216.77	16.53	140.0000	0.00
P-06	J-07	J-06	1489.94	16.53	140.0000	0.00
P-07	J-08	J-07	864.64	16.53	140.0000	0.00
P-08	J-09	J-08	2386.62	16.53	140.0000	0.00
P-09	J-10	J-09	3434.04	12.09	140.0000	0.00
P-10	J-10	J-11	7256.85	12.09	140.0000	0.00
P-11	J-11	J-12	1759.49	12.09	140.0000	0.00
P-12	J-12	J-13	3194.65	12.09	140.0000	0.00
P-13	J-13	J-04	3292.21	12.09	140.0000	0.00
P-14	J-11	J-06	3629.72	12.09	140.0000	0.00
P-15	J-08	@~Pump Sta	10.00	16.53	140.0000	0.00
P-16	Pump Stati	1 Mil. Tan	10.00	16.53	140.0000	0.00
P-17	1 Mil. Tan	Well #1 S	10.00	16.53	140.0000	0.00
P-18	J-07	Well #2 S	2296.76	12.09	140.0000	0.00
P-19	J-12	Well #3 S	3923.69	12.09	140.0000	0.00
P-20	J-13	Well #4 S	345.97	12.09	140.0000	0.00
P-21	J-13	Well #5 S	342.69	12.09	140.0000	0.00
P-22	J-05	Well #6 S	4542.25	12.09	140.0000	0.00
P-23	J-09	J-31	2985.25	16.53	140.0000	0.00
P-24	Casa Grand	Martin Ran	1127.63	16.53	140.0000	0.00
P-25	Martin Ran	J-20	16101.26	16.53	140.0000	0.00
P-26	J-20	J-22	2579.79	16.53	140.0000	0.00
P-27	J-22	J-23	2764.72	12.09	140.0000	0.00
P-28	J-23	J-24	2673.53	12.09	140.0000	0.00
P-29	J-24	J-25	1046.85	12.09	140.0000	0.00
P-30	J-25	J-27	4661.57	12.09	140.0000	0.00

P-31	J-25	J-26	3231.86	8.07	140.0000	0.00
P-32	J-26	J-23	1876.41	8.07	140.0000	0.00
P-33	J-26	J-20	2750.65	8.07	140.0000	0.00
P-34	J-25	Well #1 MR	931.47	16.53	140.0000	0.00

P U M P/L O S S E L E M E N T D A T A

THERE IS A DEVICE AT NODE Pump Stati DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
242.31	0.00	1.00
173.08	750.00	1.00
112.50	1125.00	1.00

E N D N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
1 Mil. Tan		----	1385.00	1385.00
Casa Grand		----	1545.00	1545.00
Coolidge S		----	1545.00	1545.00
J-03		0.00	1395.00	
J-04		0.00	1395.00	
J-05		300.00	1395.00	
J-06		700.00	1385.00	
J-07		0.00	1385.00	
J-08		0.00	1385.00	
J-09		700.00	1385.00	
J-10		1700.00	1380.00	
J-11		700.00	1380.00	
J-12		0.00	1380.00	
J-13		700.00	1385.00	
J-20		100.00	1392.00	
J-22		100.00	1389.00	
J-23		100.00	1390.00	
J-24		100.00	1390.00	
J-25		0.00	1395.00	
J-26		100.00	1395.00	
J-27		200.00	1405.00	
J-31		0.00	1385.00	
Martin Ran		0.00	1403.00	
Pump Stati		0.00	1385.00	
Sandia tie		0.00	1395.00	
Well #1 MR		-750.00	1395.00	
Well #1 S		-750.00	1385.00	
Well #2 S		-750.00	1380.00	
Well #3 S		-750.00	1380.00	
Well #4 S		-750.00	1385.00	
Well #5 S		-750.00	1385.00	
Well #6 S		-750.00	1395.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(p) = 35
NUMBER OF END NODES .....(j) = 29

NUMBER OF PRIMARY LOOPS .....(l) = 4
NUMBER OF SUPPLY NODES .....(f) = 3
NUMBER OF SUPPLY ZONES .....(z) = 1

==========

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.00206

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE (gpm)	HEAD LOSS (ft)	MINOR LOSS (ft)	LINE VELO. (ft/s)	HL/ 1000 (ft/ft)
Interconne	J-31	J-22	-391.44	0.34	0.00	0.59	0.08
P-01	Sandia tie	Coolidge S	179.80	1.33	0.00	0.50	0.09
P-02	J-03	Sandia tie	179.80	0.16	0.00	0.27	0.02
P-03	J-04	J-03	179.80	0.02	0.00	0.27	0.02
P-04	J-05	J-04	-333.85	0.20	0.00	0.50	0.06
P-05	J-06	J-05	-783.85	1.25	0.00	1.17	0.30
P-06	J-07	J-06	279.79	0.07	0.00	0.42	0.04
P-07	J-08	J-07	-470.21	0.10	0.00	0.70	0.11
P-08	J-09	J-08	-1308.56	1.82	0.00	1.96	0.76
P-09	J-10	J-09	-1000.00	7.32	0.00	2.79	2.13
P-10	J-10	J-11	-700.00	7.99	0.00	1.96	1.10
P-11	J-11	J-12	-1036.36	4.01	0.00	2.90	2.28
P-12	J-12	J-13	-286.36	0.67	0.00	0.80	0.21
P-13	J-13	J-04	513.64	2.04	0.00	1.44	0.62
P-14	J-11	J-06	-363.64	1.19	0.00	1.02	0.33
P-15	J-08	Pump Stati	-838.35	0.00	0.00	1.25	0.34
P-16	Pump Stati	1 Mil. Tan	-838.35	0.00	0.00	1.25	0.34
P-17	1 Mil. Tan	Well #1 S	-750.00	0.00	0.00	1.12	0.27
P-18	J-07	Well #2 S	-750.00	2.87	0.00	2.10	1.25
P-19	J-12	Well #3 S	-750.00	4.91	0.00	2.10	1.25
P-20	J-13	Well #4 S	-750.00	0.43	0.00	2.10	1.25
P-21	J-13	Well #5 S	-750.00	0.43	0.00	2.10	1.25
P-22	J-05	Well #6 S	-750.00	5.68	0.00	2.10	1.25
P-23	J-09	J-31	-391.44	0.24	0.00	0.59	0.08
P-24	Casa Grand	Martin Ran	341.44	0.07	0.00	0.51	0.06
P-25	Martin Ran	J-20	341.44	1.02	0.00	0.51	0.06
P-26	J-20	J-22	291.06	0.12	0.00	0.44	0.05
P-27	J-22	J-23	-200.38	0.30	0.00	0.56	0.11
P-28	J-23	J-24	-318.69	0.69	0.00	0.89	0.26
P-29	J-24	J-25	-418.69	0.44	0.00	1.17	0.43
P-30	J-25	J-27	200.00	0.50	0.00	0.56	0.11
P-31	J-25	J-26	131.31	1.15	0.00	0.82	0.36
P-32	J-26	J-23	-18.31	0.02	0.00	0.11	0.01
P-33	J-26	J-20	49.62	0.16	0.00	0.31	0.06
P-34	J-25	Well #1 MR	-750.00	0.25	0.00	1.12	0.27

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE (gpm)	INLET HEAD (ft)	OUTLET HEAD (ft)	HEAD CHANGE (ft)	EFFIC- ENCY (%)	USEFUL POWER (Hp)	INCREMTL COST ($)	TOTAL COST ($)

Pump Stati	838.35	0.00	160.03	160.0	----	-----	---	----

E N D N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	HYDRAULIC GRADE (ft)	NODE ELEVATION (ft)	PRESSURE HEAD (ft)	NODE PRESSURE (psi)
1 Mil. Tan		----	1385.00	1385.00	0.00	0.00
Casa Grand		----	1545.00	1545.00	0.00	0.00
Coolidge S		----	1545.00	1545.00	0.00	0.00
J-03		0.00	1546.49	1395.00	151.49	65.64
J-04		0.00	1546.50	1395.00	151.50	65.65
J-05		300.00	1546.31	1395.00	151.31	65.57
J-06		700.00	1545.06	1385.00	160.06	69.36
J-07		0.00	1545.12	1385.00	160.12	69.39
J-08		0.00	1545.02	1385.00	160.02	69.34
J-09		700.00	1543.20	1385.00	158.20	68.55
J-10		1700.00	1535.88	1380.00	155.88	67.55
J-11		700.00	1543.87	1380.00	163.87	71.01
J-12		0.00	1547.88	1380.00	167.88	72.75
J-13		700.00	1548.55	1385.00	163.55	70.87
J-20		100.00	1543.91	1392.00	151.91	65.83
J-22		100.00	1543.78	1389.00	154.78	67.07
J-23		100.00	1544.08	1390.00	154.08	66.77
J-24		100.00	1544.77	1390.00	154.77	67.07
J-25		0.00	1545.21	1395.00	150.21	65.09
J-26		100.00	1544.07	1395.00	149.07	64.60
J-27		200.00	1544.71	1405.00	139.71	60.54
J-31		0.00	1543.44	1385.00	158.44	68.66
Martin Ran		0.00	1544.93	1403.00	141.93	61.50
Pump Stati		0.00	1385.00	1385.00	0.00	0.00
Sandia tie		0.00	1546.33	1395.00	151.33	65.58
Well #1 MR		-750.00	1545.47	1395.00	150.47	65.20
Well #1 S		-750.00	1385.00	1385.00	0.00	0.00
Well #2 S		-750.00	1548.00	1380.00	168.00	72.80
Well #3 S		-750.00	1552.79	1380.00	172.79	74.87
Well #4 S		-750.00	1548.98	1385.00	163.98	71.06
Well #5 S		-750.00	1548.98	1385.00	163.98	71.06
Well #6 S		-750.00	1551.99	1395.00	156.99	68.03
Pump Stati		0.00	1545.03	1385.00	160.03	69.34

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE (gpm)	NODE TITLE
1 Mil. Tank	88.35	
Casa Grande	341.44	
Coolidge Sy	-179.80	

NET SYSTEM INFLOW = 429.80
NET SYSTEM OUTFLOW = -179.80
NET SYSTEM DEMAND = 250.00

***** HYDRAULIC ANALYSIS COMPLETED *****

SANDIA and MARTIN RANCH

Attachment D-7

Well and Tank Analysis

ARIZONA WATER COMPANY

System: Casa Grande, Coolidge, Martin Ranch, and Sandia

SYSTEM	MONTH 2004	AVERAGE DAY PEAK MONTH (gpd)	PEAK DAY PEAK MONTH (gpd)	MAXIMUM PRODUCTION (gpd) LESS LARGEST PRODUCER	STORAGE AVAILABLE FOR USE (gpd)	NET GAIN or (LOSS) (gpm)
CG, CL	June	21,994,969	26,393,963	31,727,520	2,917,583	5,730

No Additional production required

Well Number and Name	Production (gpm)	Tank Name	Storage (gal)
#1 - Martin Ranch	750	Martin Ranch	1,000,000
#10 - Casa Grande	900	Indian Hills	100,000
#14 - Cottonwood Ln.	150	Cottonwood	1,000,000
#17 - Casa Grande	800	Burgess Peak	2,000,000
#19 - Poonian	1620	Casa Grande Mtn	5,000,000
#20 - Casa Grande	1200	Scott Drive #1	110,000
#21 - Casa Grande	720	Scott Drive #2	5,000,000
#22 - Singh/Quaid	1100	North Park	625,000
#23 - Casa Grande	1600	North Park	35,000
#24 - Casa Grande	1000	Sandia Tank #1	1,000,000
#25 - Casa Grande	1300	Warehouse Tank #1	100,000
#26 - Casa Grande	1460	Warehouse Tank #2	500,000
#27 - Lake in the Desert	470	Warehouse Tank #3	1,000,000
#28 - Az City	1500	North Tank #1	35,500
#29 - Mission Royale	1500	North Tank #2	116,000
#1 - Sandia	750	Valley Farms Tank	15,000
#2 - Sandia	750		
#3 - Sandia	750		
#4 - Sandia	750		
#5 - Sandia	750		
#6 -Sandia	750		
#7 - Coolidge	1140		
#9 - Coolidge	1350		
#10 - Coolidge	1500		
#2 - Valley Farms	260		
TOTAL PRODUCTION:	24,820	TOTAL STORAGE:	17,505,500

Largest producer out-of-service in Casa Grande taking the Blend Plan with it.

Largest producer out-of-service in Coolidge

Design Statement for Well Production:

The water distribution system must have sufficient well capacity to meet the peak day demand for three consecutive days with the largest producing well out-of-service. One-half of the available storage can be used to meet the peak day demand over the same period of time with the remaining storage held in reserve for fire protection.

Design Criteria:

Peak Day Peak Month = 1.2 x Average Day Peak Month

All other wells run 24 hours per day

ARIZONA WATER COMPANY

DAY ONE
STORAGE CALCULATIONS
SYSTEM - CASA GRANDE, COOLIDGE, MARTIN RANCH, AND SANDIA

* PRODUCTION (Gallons) =	31,727,520
HOURLY SOURCE OF SUPPLY (Gal/day)=	1,321,980
AVERAGE DAY PEAK MONTH (Gallons) =	21,994,969
PEAK DAY PEAK MONTH (Gal/day) =	26,393,963
AVERAGE HOURLY DEMAND (Peak Day)=	1,099,748

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	1485.98	1321.98	-164.00	-164.00
7-8 AM	0.0779	2056.09	1321.98	-734.11	-898.11
8-9 AM	0.0824	2174.86	1321.98	-852.88	-1750.99
9-10 AM	0.0769	2029.70	1321.98	-707.72	-2458.71
10-11 AM	0.0657	1734.08	1321.98	-412.10	-2870.81
11-12 PM	0.0569	1501.82	1321.98	-179.84	-3050.65
12-1 PM	0.0496	1309.14	1321.98	12.84	-3037.81
1-2 PM	0.0458	1208.84	1321.98	113.14	-2924.67
2-3 PM	0.0423	1116.46	1321.98	205.52	-2719.16
3-4 PM	0.0402	1061.04	1321.98	260.94	-2458.21
4-5 PM	0.0451	1190.37	1321.98	131.61	-2326.60
5-6 PM	0.0442	1166.61	1321.98	155.37	-2171.23
6-7 PM	0.0461	1216.76	1321.98	105.22	-2066.02
7-8 PM	0.0417	1100.63	1321.98	221.35	-1844.66
8-9 PM	0.038	1002.97	1321.98	319.01	-1525.66
9-10 PM	0.0387	1021.45	1321.98	300.53	-1225.12
10-11 PM	0.033	871.00	1321.98	450.98	-774.14
11-12 AM	0.0246	649.29	1321.98	672.69	-101.45
12-1 AM	0.016	422.30	1321.98	899.68	798.22
1-2 AM	0.0102	269.22	1321.98	1052.76	1850.98
2-3 AM	0.0102	269.22	1321.98	1052.76	2903.75
3-4 AM	0.0139	366.88	1321.98	955.10	3858.85
4-5 AM	0.016	422.30	1321.98	899.68	4758.53
5-6 AM	0.0283	746.95	1321.98	575.03	5333.56
TOTAL	1	26,393.9628			

Minimum Storage Requirements	3,050,648	Gallons
*** Fire Flow Requirements	480,000	Gallons
TOTAL STORAGE REQUIRED	3,530,648	Gallons
TOTAL STORAGE AVAILABLE	17,505,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service taking Blen Plan with it.
***Fire Flows - 2,000 gpm @ 4 hours = 480,000 gallons.

ARIZONA WATER COMPANY

DAY TWO
STORAGE CALCULATIONS
SYSTEM - CASA GRANDE, COOLIDGE, MARTIN RANCH, AND SANDIA

* PRODUCTION (Gallons) =	31,727,520
HOURLY SOURCE OF SUPPLY (Gal/day)=	1,321,980
AVERAGE DAY PEAK MONTH (Gallons) =	21,994,969
PEAK DAY PEAK MONTH (Gal/day) =	26,393,963
AVERAGE HOURLY DEMAND (Peak Day)=	1,099,748

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	1485.98	1321.98	-164.00	5169.56
7-8 AM	0.0779	2056.09	1321.98	-734.11	4435.45
8-9 AM	0.0824	2174.86	1321.98	-852.88	3582.56
9-10 AM	0.0769	2029.70	1321.98	-707.72	2874.85
10-11 AM	0.0657	1734.08	1321.98	-412.10	2462.75
11-12 PM	0.0569	1501.82	1321.98	-179.84	2282.91
12-1 PM	0.0496	1309.14	1321.98	12.84	2295.75
1-2 PM	0.0458	1208.84	1321.98	113.14	2408.89
2-3 PM	0.0423	1116.46	1321.98	205.52	2614.40
3-4 PM	0.0402	1061.04	1321.98	260.94	2875.34
4-5 PM	0.0451	1190.37	1321.98	131.61	3006.96
5-6 PM	0.0442	1166.61	1321.98	155.37	3162.32
6-7 PM	0.0461	1216.76	1321.98	105.22	3267.54
7-8 PM	0.0417	1100.63	1321.98	221.35	3488.89
8-9 PM	0.038	1002.97	1321.98	319.01	3807.90
9-10 PM	0.0387	1021.45	1321.98	300.53	4108.44
10-11 PM	0.033	871.00	1321.98	450.98	4559.41
11-12 AM	0.0246	649.29	1321.98	672.69	5232.10
12-1 AM	0.016	422.30	1321.98	899.68	6131.78
1-2 AM	0.0102	269.22	1321.98	1052.76	7184.54
2-3 AM	0.0102	269.22	1321.98	1052.76	8237.30
3-4 AM	0.0139	366.88	1321.98	955.10	9192.41
4-5 AM	0.016	422.30	1321.98	899.68	10092.08
5-6 AM	0.0283	746.95	1321.98	575.03	10667.11
TOTAL	1	26,393.963			

Minimum Storage Requirements	0	Gallons
*** Fire Flow Requirements	480,000	Gallons
TOTAL STORAGE REQUIRED	480,000	Gallons
TOTAL STORAGE AVAILABLE	17,505,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service taking Blen Plan with it.
***Fire Flows - 2,000 gpm @ 4 hours = 480,000 gallons.

ARIZONA WATER COMPANY

DAY THREE
STORAGE CALCULATIONS
SYSTEM - CASA GRANDE, COOLIDGE, MARTIN RANCH, AND SANDIA

* PRODUCTION (Gallons) =	31,727,520
HOURLY SOURCE OF SUPPLY (Gal/day)=	1,321,980
AVERAGE DAY PEAK MONTH (Gallons) =	21,994,969
PEAK DAY PEAK MONTH (Gal/day) =	26,393,963
AVERAGE HOURLY DEMAND (Peak Day)=	1,099,748

TIME	% OF AVERAGE DAY	THOUSAND GALLONS PER HOUR			STORAGE IN 1,000 GALLONS
		USE	FROM SOURCE	TO STORAGE	
6-7 AM	0.0563	1485.98	1321.98	-164.00	10503.11
7-8 AM	0.0779	2056.09	1321.98	-734.11	9769.00
8-9 AM	0.0824	2174.86	1321.98	-852.88	8916.12
9-10 AM	0.0769	2029.70	1321.98	-707.72	8208.41
10-11 AM	0.0657	1734.08	1321.98	-412.10	7796.30
11-12 PM	0.0569	1501.82	1321.98	-179.84	7616.47
12-1 PM	0.0496	1309.14	1321.98	12.84	7629.31
1-2 PM	0.0458	1208.84	1321.98	113.14	7742.44
2-3 PM	0.0423	1116.46	1321.98	205.52	7947.96
3-4 PM	0.0402	1061.04	1321.98	260.94	8208.90
4-5 PM	0.0451	1190.37	1321.98	131.61	8340.51
5-6 PM	0.0442	1166.61	1321.98	155.37	8495.88
6-7 PM	0.0461	1216.76	1321.98	105.22	8601.10
7-8 PM	0.0417	1100.63	1321.98	221.35	8822.45
8-9 PM	0.038	1002.97	1321.98	319.01	9141.46
9-10 PM	0.0387	1021.45	1321.98	300.53	9441.99
10-11 PM	0.033	871.00	1321.98	450.98	9892.97
11-12 AM	0.0246	649.29	1321.98	672.69	10565.66
12-1 AM	0.016	422.30	1321.98	899.68	11465.34
1-2 AM	0.0102	269.22	1321.98	1052.76	12518.10
2-3 AM	0.0102	269.22	1321.98	1052.76	13570.86
3-4 AM	0.0139	366.88	1321.98	955.10	14525.96
4-5 AM	0.016	422.30	1321.98	899.68	15425.64
5-6 AM	0.0283	746.95	1321.98	575.03	16000.67
TOTAL	1	26,393.963			

Minimum Storage Requirements	0	Gallons
*** Fire Flow Requirements	480,000	Gallons
TOTAL STORAGE REQUIRED	480,000	Gallons
TOTAL STORAGE AVAILABLE	17,505,500	Gallons
ADDITIONAL STORAGE REQUIRED	0	Gallons

* Largest Producer out-of-service taking Blen Plan with it.
***Fire Flows - 2,000 gpm @ 4 hours = 480,000 gallons.

FIGURE D

Sandia and Martin Ranch Subdivision Layout

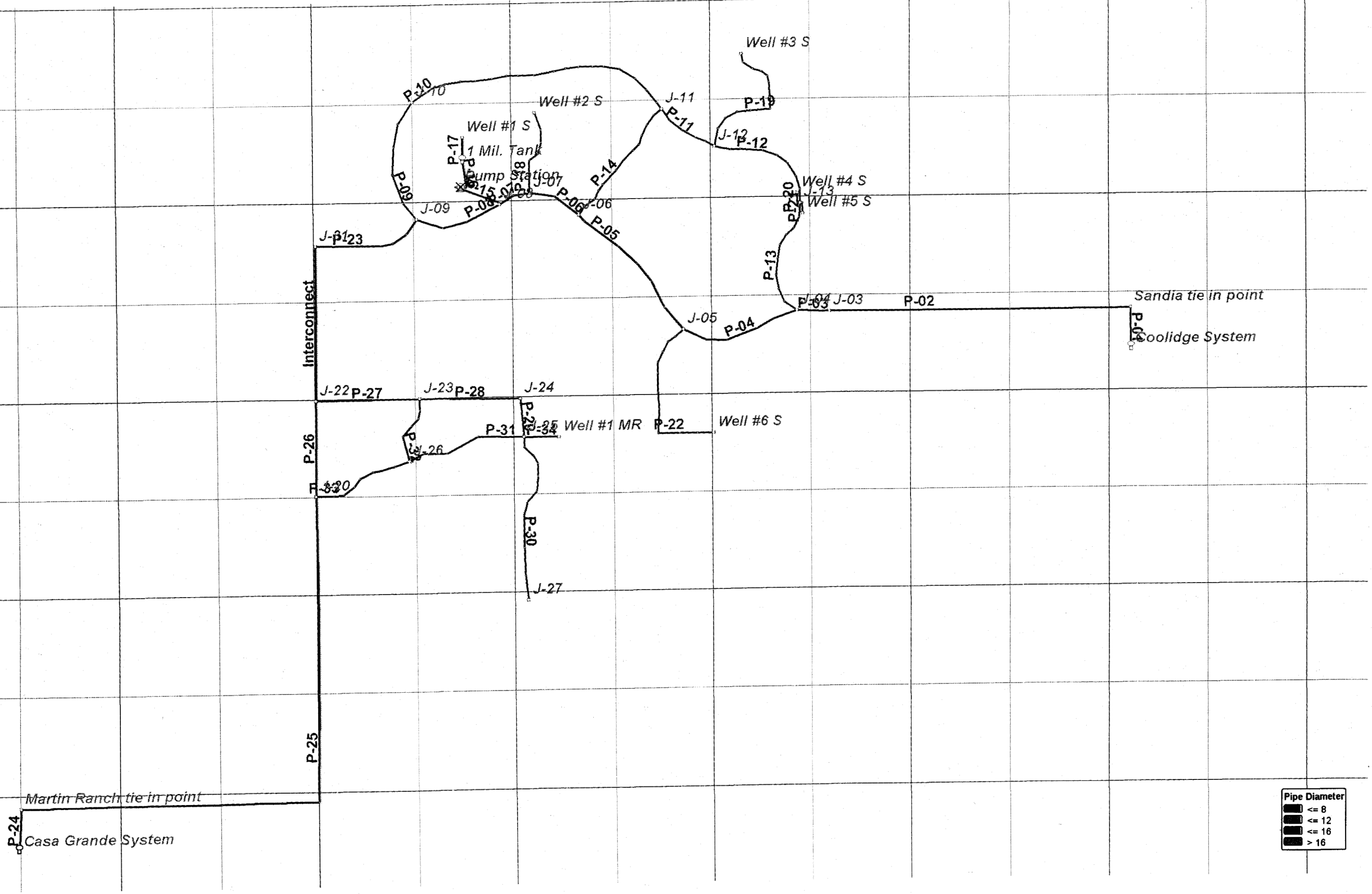
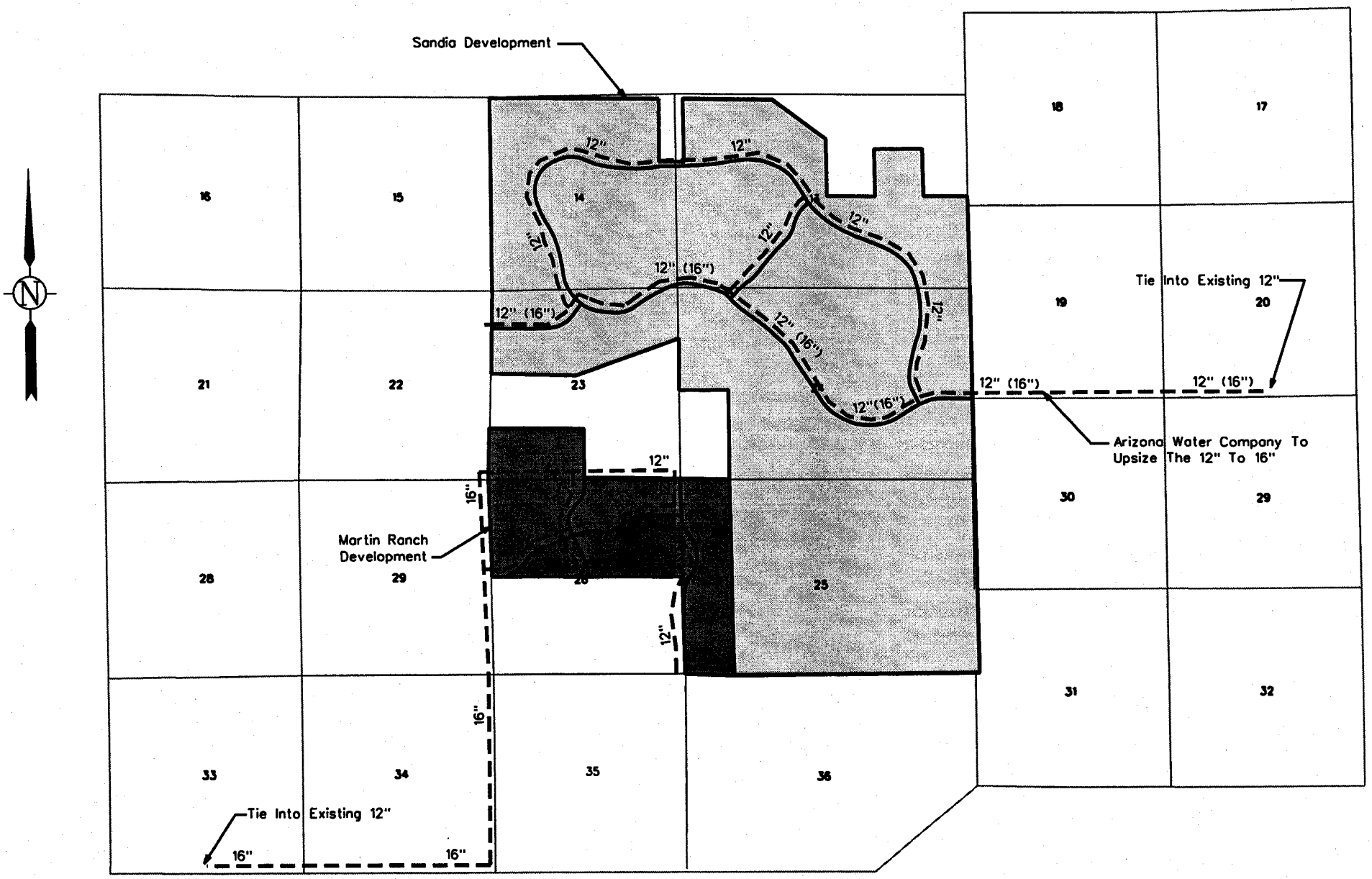

Well #3 S
P-10
Well #2 S
J-11
P-19
Well #1 S
P-11
J-12
P-12
1 Mil. Tank
P-17
P-18
Pump Station
P-14
J-07
Well #4 S
J-13
Well #5 S
P-20
P-09
J-09
P-08
P-06
J-06
P-05
J-01
P-23
P-13
Interconnect
J-04
J-03
P-03
P-02
Sandia tie in point
P-01
Coolidge System
J-05
P-04
J-22
P-27
J-23
P-28
J-24
P-21
J-25
Well #1 MR
P-22
Well #6 S
P-31
J-34
P-26
J-26
P-32
P-30
J-27
P-25
Martin Ranch tie in point
P-24
Casa Grande System
Pipe Diameter
<= 8
<= 12
<= 16
> 16

FIGURE E

Design Layout


Sandia Development
Martin Ranch Development
Tie Into Existing 12"
Tie Into Existing 12"
Arizona Water Company To Upsize The 12" To 16"
12"
12" (16")
16"
N
16
15
14
18
17
19
20
21
22
23
28
29
26
25
30
29
31
32
33
34
35
36