APPLICATION
WS-01303A-14-0010

PART 2 OF 5
BARCODE # 0000152664

To review Part 1 please see:
BARCODE #0000152663

To review Part 3 please see:
BARCODE # 0000152665

To review Part 4 please see:
BARCODE # 0000152666

To review Part 5 please see:
BARCODE #0000152667

Arizona Corporation Commission
DOCKETED
MAR 10 2014
DOCKETED BY
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2018

Sun City – P[illegible]D No. 07-099

SIB PLANT TABLE I, 1-3

2018 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-36	333	service lines	11	5-1.5" 5-2" 1-3"	Copper	1.5"-$3,947 2"-$4,013 3"-$4,145	Thunderbird Blvd	12/2018	n/a	$43,943	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (11 total on 105th Ave and Thunderbird Blvd between Del Webb Blvd and 103rd Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-36 in Exhibit CC-1-B for more detail.
S-37	333	service lines	9	7-1.5" 2-2"	Copper	1.5"-$3,947 2"-$4,013	Royal Oak Rd South	12/2018	n/a	$31,640	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (9 total on 103rd Ave, 99th Ave and Santa Fe Dr between 103rd Ave and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-37 in Exhibit CC-1-B for more detail.

S-38	333	service lines	39	2-1.5" 37-2"	Copper	1.5"-$3,947 2"-$4,013	Royal Oak Rd North	12/2018	n/a	$156,367	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (39 total on 100th Ave, 100th Dr, 99th Dr, Cedar Dr, Forrester Dr, Royal Oak Rd and Thunderbird Blvd between Thunderbird Bld and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-38 in Exhibit CC-1-B for more detail.
S-39	333	service lines	22	3-1.5" 19-2"	Copper	1.5"-$3,947 2"-$4,013	Hawthorn Dr	12/2018	n/a	$88,084	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on 100th Ave, Emberwood Dr, Hawthorn Dr and Thunderbird Blvd between Forrester Dr and Lancaster Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-39 in Exhibit CC-1-B for more detail.
S-40	333	service lines	14	1.5"	Copper	$3,947	Candlewood Dr	12/2018	n/a	$55,255	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on Royal Oak Rd and Candlewood Dr between 103rd Ave and Thunderbird Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-40 in Exhibit CC-1-B for more detail.
S-41	333	service lines	5	1.5"	Copper	$3,9477	Bolivar Dr	12/2018	n/a	$19,734	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (5 total on Bolivar Dr and Crown Pt between 103rd Ave and Teakwood Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-41 in Exhibit CC-1-B for more detail.

S-42	333	service lines	17	1.5"	Copper	$3,947	Tumble-brook Way	12/2018	n/a	$67,096	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (17 total on 99th Dr, Bolivar Dr, Thunderbird Blvd and Tumblebrook Way between LancasterDr and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-42 in Exhibit CC-1-B for more detail.
S-43	333	service lines	1	1.5"	Copper	$3,947	Thunderbird Ave	12/2018	n/a	$3,947	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (1 total on Thunderbird Rd between Sahara Dr and 93rd Ave.) This service is a priority because it was installed 40 to 50 years ago. Replacing the service will help reduce system water loss and improve customer pressure and flow. The service line replacement is for existing customers and not related to new growth. See Section 1 narrative and Map No. S-43 in Exhibit CC-1-B for more detail.
S-44	333	service lines	18	1-1.5" 17-2"	Copper	1.5"-$3,947 2"-$4,013	Newcastle Dr	12/2018	n/a	$72,164	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (18 total on Cameo Dr, Desert Butte Dr, Newcastle Dr, PalmRidge Dr and Thunderbird Blvd between Cameo Dr and Emerald Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-44 in Exhibit CC-1-B for more detail.
S-45	333	service lines	24	8-1.5" 16-2"	Copper	1.5"-$3,947 2"-$4,013	Palm Ridge Dr	12/2018	n/a	$95,779	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (24 total on 111th Ave, Cameo Dr and Palm Ridge Dr between Thunderbird Blvd and 111th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-45 in Exhibit CC-1-B for more detail.

S-46	333	service lines	20	6-1.5" 14-2"	Copper	1.5"-$3,947 2"-$4,013	Topaz Dr	12/2018	n/a	$79,860	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (20 total on 109th Ave, 110th Ave, Cameo Dr and Topaz Dr between 111th Ave and 109th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-46 in Exhibit CC-1-B for more detail.
S-47	333	service lines	33	8-1.5" 25-2"	Copper	1.5"-$3,947 2"-$4,013	108th Dr	12/2018	n/a	$131,894	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (33 total on 107th Dr, 108th Dr, Buccaneer Dr, Cameo Dr and Emerald Dr between 109th Ave and 107th Ln.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-47 in Exhibit CC-1-B for more detail.
S-48	333	service lines	8	7-1.5" 1-2"	Copper	1.5"-$3,947 2"-$4,013	Buccaneer Dr	12/2018	n/a	$31,640	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on Bayside Rd, Buccaneer Way and Del Webb Blvd between Cameo Dr and Buccaneer Way.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-48 in Exhibit CC-1-B for more detail.
S-49	333	service lines	32	1.5"	Copper	$3,947	Tropicana Cir South	12/2018	n/a	$126,298	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (32 total on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-49 in Exhibit CC-1-B for more detail.

S-50	333	service lines	22	1.5"	Copper	$3,947	Tropicana Cir North	12/2018	n/a	$86,830	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-50 in Exhibit CC-1-B for more detail.
S-51	333	service lines	41	1.5"	Copper	$3,947	El Capitan Cir	12/2018	n/a	$161,819	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (41 total on Camelot Cir, Del Webb Blvd, El Capitan Cir and Roundelay Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-51 in Exhibit CC-1-B for more detail.
Total			**316**							**$1,256,363**	

2018

Project No: N/A
PWSID: 0407099

Sun City Water

Project Area:

Sun City 2018 Project Areas

Project Description:

Replace 266 residential, 25 irrigation and 25 commercial services.

Legend

Services

Services

- COPPER
- COMMERCIAL
- IRRIGATION
- RESIDENTIAL

Project Parcels

- Parcels with service previously replaced
- Parcels with service to be replaced

N

410 205 0 410 820 1,230 1,640
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

2018

Project No: S-36
PWSID: 0407099

Sun City Water

Project Area:

Thunderbird Blvd

Project Description:

Replace 5 commercial and 6 irrigation services on 105th Ave and Thunderbird Blvd between Del Webb Blvd and 103rd Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

90 45 0 90 180 270 360 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2018 S-36**	Thunderbird Blvd

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (11 total on 105th Ave and Thunderbird Blvd between Del Webb Blvd and 103rd Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
5	1.5" service	3560	Contractor material and labor to replace services	$ 17,800
5	2" service	3620	Contractor material and labor to replace services	$ 18,100
1	3" service	3740	Contractor material and labor to replace services	$ 3,740
11	hours	28	Company labor for field oversight and construction project management	$ 308
Subtotal				$ 39,948
General Overhead Rate on Labor and Capital (10%)				$ 3,995
Total Estimated Cost				**$ 43,943**

2018

Project No: S-37
PWSID: 0407099

Sun City Water

Project Area:

Royal Oak Rd South

Project Description:

Replace 1 residential, 7 commercial and 1 irrigation services on 103rd Ave, 99th Ave and Santa Fe Dr between 103rd Ave and 99th Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

130 65 0 130 260 390 520 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-37**	Project Location: Royal Oak Rd South

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on 103rd Ave, 99th Ave and Santa Fe Dr between 103rd Ave and 99th Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
7	1.5" service	3560	Contractor material and labor to replace services	$ 24,920
2	2" service	3620	Contractor material and labor to replace services	$ 7,240
9	hours	28	Company labor for field oversight and construction project management	$ 252
Subtotal				$ 32,412
General Overhead Rate on Labor and Capital (10%)				$ 3,241
Total Estimated Cost				**$ 35,653**

2018

Project No: S-38
PWSID: 0407099

Sun City Water

Project Area:

Royal Oak Rd North

Project Description:

Replace 25 residential, 11 commercial and 3 irrigation services on 100th Ave, 100th Dr, 99th Dr, Cedar Dr, Forrester Dr, Royal Oak Rd and Thunderbird Blvd between Thunderbird Blvd and 99th Ave.

Legend

Project Services

- Service previously replaced
- Service to be Replaced

Project Parcels

- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

130 65 0 130 260 390 520 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2018 S-38**	Royal Oak Rd North

Project Description:
Replace aging services with copper service lines to reduce water leaks and emergency repairs. (39 total on 100th Ave, 100th Dr, 99th Dr, Cedar Dr, Forrester Dr, Royal Oak Rd and Thunderbird Blvd between Thunderbird Bld and 99th Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
2	1.5" service	3560	Contractor material and labor to replace services	$ 7,120
37	2" service	3620	Contractor material and labor to replace services	$ 133,940
39	hours	28	Company labor for field oversight and construction project management	$ 1,092
Subtotal				$ 142,152
General Overhead Rate on Labor and Capital (10%)				$ 14,215
Total Estimated Cost				**$ 156,367**

2018

Project No: S-39
PWSID: 0407099

Sun City Water

Project Area:

Hawthorn Dr

Project Description:

Replace 19 residential and 3 irrigation services on 100th Ave, Emberwood Dr, Hawthorn Dr and Thunderbird Blvd between Forrester Dr and Lancaster Dr.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

80 40 0 80 160 240 320 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

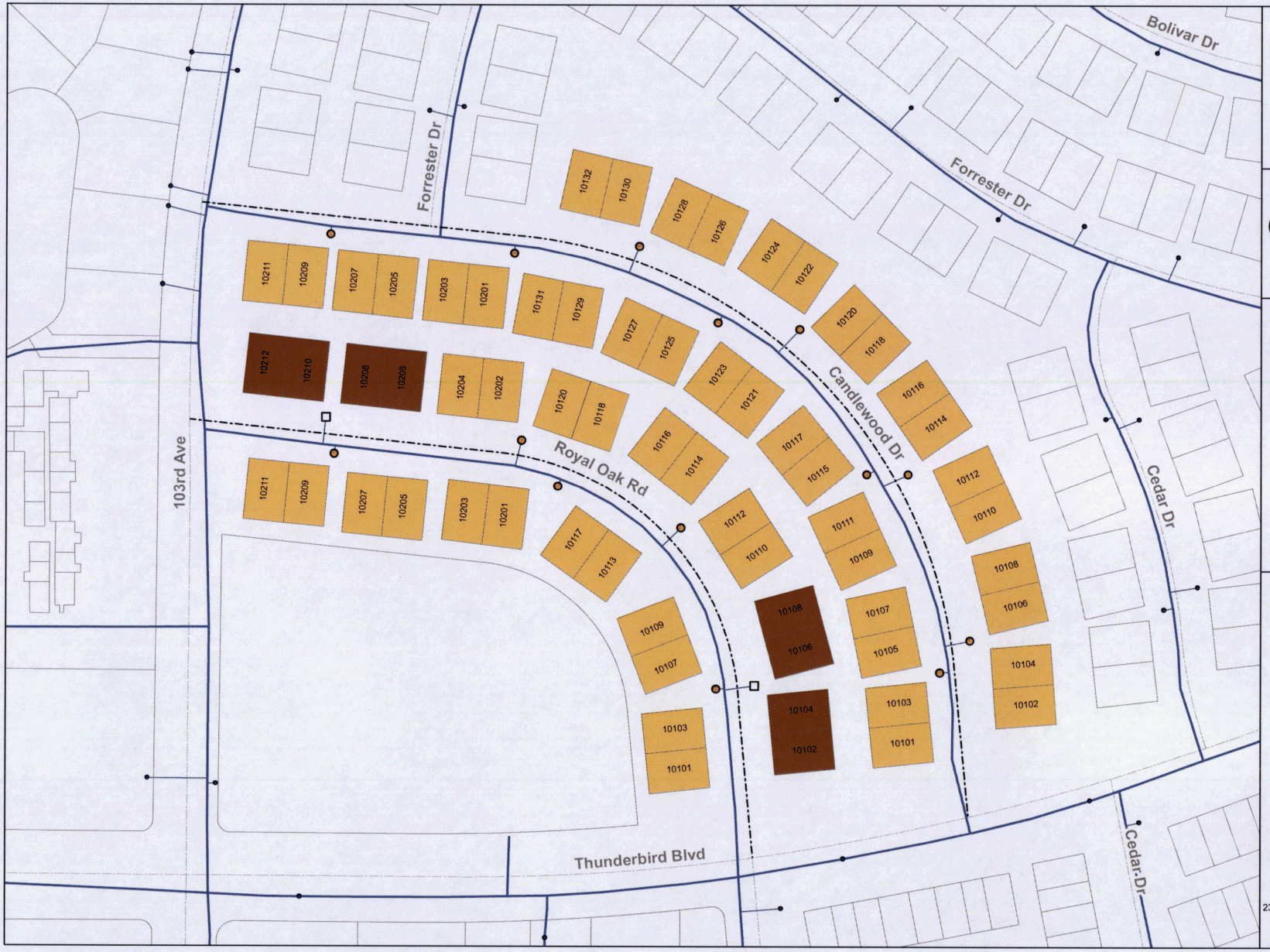
Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2018 S-39**	Hawthorn Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on 100th Ave, Emberwood Dr, Hawthorn Dr and Thunderbird Blvd between Forrester Dr and Lancaster Dr.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
3	1.5" service	3560	Contractor material and labor to replace services	$ 10,680
19	2" service	3620	Contractor material and labor to replace services	$ 68,780
22	hours	28	Company labor for field oversight and construction project management	$ 616
Subtotal				$ 80,076
General Overhead Rate on Labor and Capital (10%)				$ 8,008
Total Estimated Cost				**$ 88,084**



2018

Project No: S-40
PWSID: 0407099

Sun City Water

Project Area:

Candlewood Dr

Project Description:

Replace 14 residential services on Royal Oak Rd and Candlewood Dr between 103rd Ave and Thunderbird Blvd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

40 20 0 40 80 120 160
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-40**	Project Location: Candlewood Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on Royal Oak Rd and Candlewood Dr between 103rd Ave and Thunderbird Blvd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
14	1.5" service	3560	Contractor material and labor to replace services	$ 49,840
14	hours	28	Company labor for field oversight and construction project management	$ 392
Subtotal				$ 50,232
General Overhead Rate on Labor and Capital (10%)				$ 5,023
Total Estimated Cost				**$ 55,255**

2018

Project No: S-41
PWSID: 0407099

Sun City Water

Project Area:

Bolivar Dr

Project Description:

Replace 5 residential services on Bolivar Dr and Crown Pt between 103rd Ave and Teakwood Dr.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

75 37.5 0 75 150 225 300 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-41**	Project Location: Bolivar Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (5 total on Bolivar Dr and Crown Pt between 103rd Ave and Teakwood Dr.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
5	1.5" service	3560	Contractor material and labor to replace services	$ 17,800
5	hours	28	Company labor for field oversight and construction project management	$ 140
Subtotal				$ 17,940
General Overhead Rate on Labor and Capital (10%)				$ 1,794
Total Estimated Cost				**$ 19,734**

2018

Project No: S-42
PWSID: 0407099

Sun City Water

Project Area:

Tumblebrook Way

Project Description:

Replace 14 residential, 1 commercial and 2 irrigation services on 99th Dr, Bolivar Dr, Thunderbird Blvd and Tumblebrook Way between Lancaster Dr and 99th Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

75 37.5 0 75 150 225 300 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

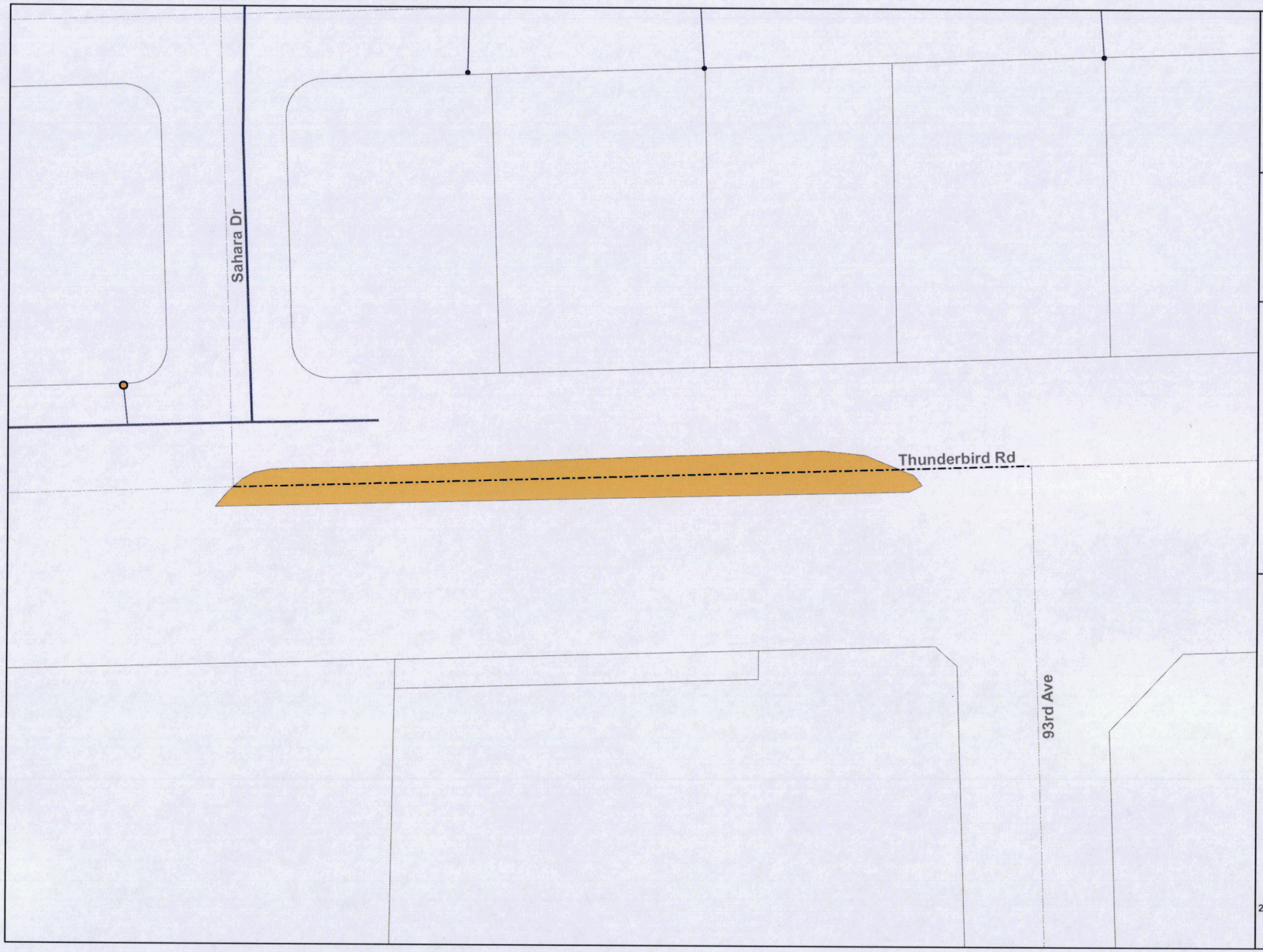
Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2018 S-42**	Tumblebrook Way

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (17 total on 99th Dr, Bolivar Dr, Thunderbird Blvd and Tumblebrook Way between LancasterDr and 99th Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
17	1.5" service	3560	Contractor material and labor to replace services	$ 60,520
17	hours	28	Company labor for field oversight and construction project management	$ 476
Subtotal				$ 60,996
General Overhead Rate on Labor and Capital (10%)				$ 6,100
Total Estimated Cost				**$ 67,096**



2018

Project No: S-43
PWSID: 0407099

Sun City Water

Project Area:

Thunderbird Rd

Project Description:

Replace 1 irrigation service on Thunderbird Rd between Sahara Dr and 93rd Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

10 5 0 10 20 30 40 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ▪

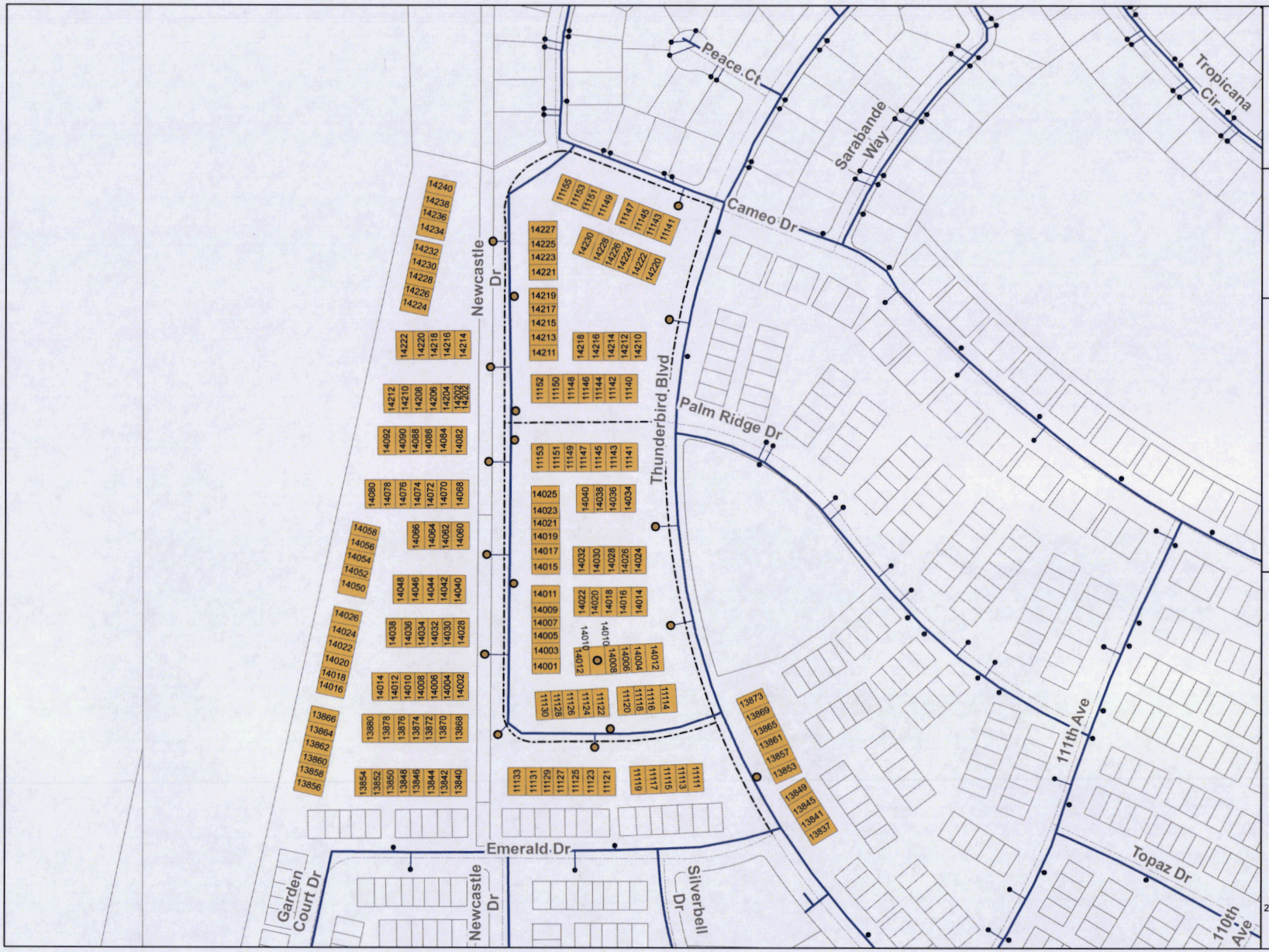
EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-43**	Project Location: Thunderbird Rd

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (1 total on Thunderbird Rd between Sahara Dr and 93rd Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1	1.5" service	3560	Contractor material and labor to replace services	$ 3,560
1	hours	28	Company labor for field oversight and construction project management	$ 28
Subtotal				$ 3,588
General Overhead Rate on Labor and Capital (10%)				$ 359
Total Estimated Cost				**$ 3,947**



2018

Project No: S-44
PWSID: 0407099

Sun City Water

Project Area:

Newcastle Dr

Project Description:

Replace 18 residential services on Cameo Dr, Desert Butte Dr, Newcastle Dr, Palm Ridge Dr and Thunderbird Blvd between Cameo Dr and Emerald Dr.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

80 40 0 80 160 240 320 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

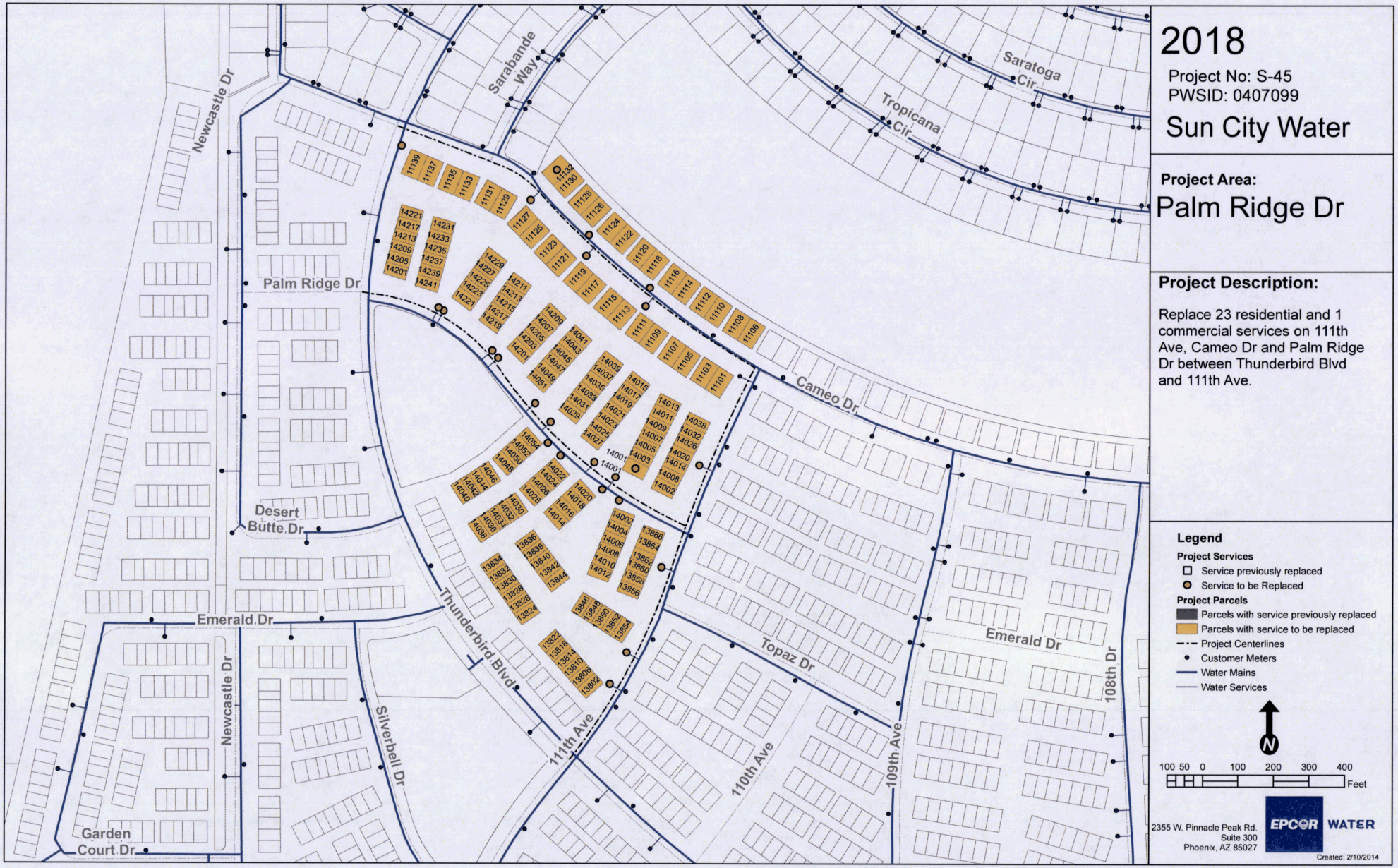
EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-44**	Project Location: Newcastle Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (18 total on Cameo Dr, Desert Butte Dr, Newcastle Dr, PalmRidge Dr and Thunderbird Blvd between Cameo Dr and Emerald Dr.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1	1.5" service	3560	Contractor material and labor to replace services	$ 3,560
17	2" service	3620	Contractor material and labor to replace services	$ 61,540
18	hours	28	Company labor for field oversight and construction project management	$ 504
Subtotal				$ 65,604
General Overhead Rate on Labor and Capital (10%)				$ 6,560
Total Estimated Cost				**$ 72,164**



2018

Project No: S-45
PWSID: 0407099

Sun City Water

Project Area:

Palm Ridge Dr

Project Description:

Replace 23 residential and 1 commercial services on 111th Ave, Cameo Dr and Palm Ridge Dr between Thunderbird Blvd and 111th Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-45**	Project Location: Palm Ridge Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (24 total on 111th Ave, Cameo Dr and Palm Ridge Dr between Thunderbird Blvd and 111th Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
8	1.5" service	3560	Contractor material and labor to replace services	$ 28,480
16	2" service	3620	Contractor material and labor to replace services	$ 57,920
24	hours	28	Company labor for field oversight and construction project management	$ 672
Subtotal				$ 87,072
General Overhead Rate on Labor and Capital (10%)				$ 8,707
Total Estimated Cost				**$ 95,779**

2018

Project No: S-46
PWSID: 0407099

Sun City Water

Project Area:

Topaz Dr

Project Description:

Replace 20 residential services on 109th Ave, 110th Ave, Cameo Dr and Topaz Dr between 111th Ave and 109th Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-46**	Project Location: Topaz Dr	

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (20 total on 109th Ave, 110th Ave, Cameo Dr and Topaz Dr between 111th Ave and 109th Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
6	1.5" service	3560	Contractor material and labor to replace services	$ 21,360
14	2" service	3620	Contractor material and labor to replace services	$ 50,680
20	hours	28	Company labor for field oversight and construction project management	$ 560
Subtotal				$ 72,600
General Overhead Rate on Labor and Capital (10%)				$ 7,260
Total Estimated Cost				**$ 79,860**

2018

Project No: S-47
PWSID: 0407099

Sun City Water

Project Area:

108th Dr

Project Description:

Replace 33 residential services on 107th Dr, 108th Dr, Buccaneer Dr, Cameo Dr and Emerald Dr between 109th Ave and 107th Ln.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

110 55 0 110 220 330 440 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ▪

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-47**	Project Location: 108th Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (33 total on 107th Dr, 108th Dr, Buccaneer Dr, Cameo Dr and Emerald Dr between 109th Ave and 107th Ln.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
8	1.5" service	3560	Contractor material and labor to replace services	$ 28,480
25	2" service	3620	Contractor material and labor to replace services	$ 90,500
33	hours	28	Company labor for field oversight and construction project management	$ 924
Subtotal				$ 119,904
General Overhead Rate on Labor and Capital (10%)				$ 11,990
Total Estimated Cost				**$ 131,894**

2018

Project No: S-48
PWSID: 0407099

Sun City Water

Project Area:

Buccaneer Way

Project Description:

Replace 5 residential and 3 irrigation services on Bayside Rd, Buccaneer Way and Del Webb Blvd between Cameo Dr and Buccaneer Way

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

90 45 0 90 180 270 360 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

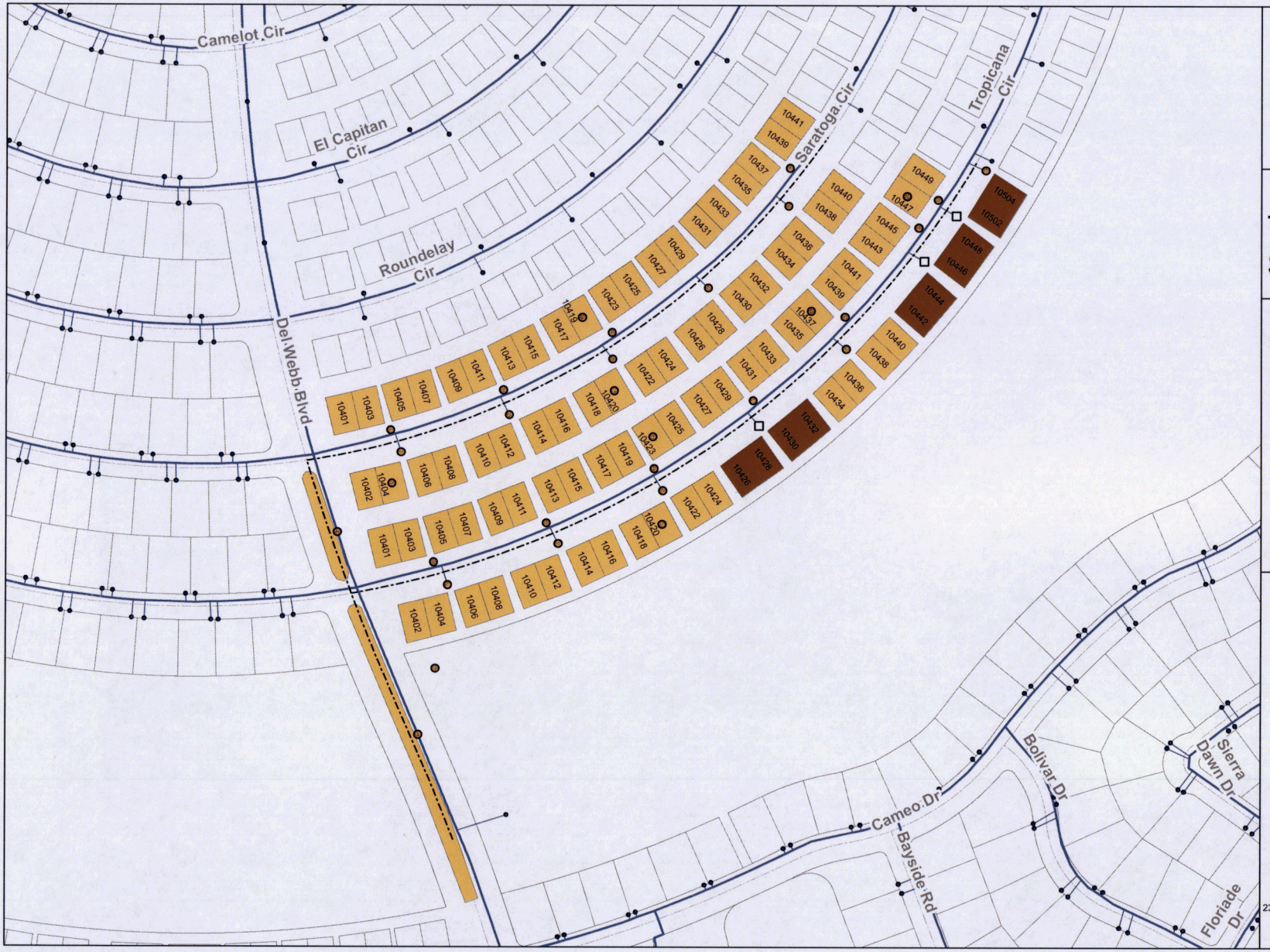
EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-48**	Project Location: Buccaneer Way

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on Bayside Rd, Buccaneer Way and Del Webb Blvd between Cameo Dr and Buccaneer Way.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
7	1.5" service	3560	Contractor material and labor to replace services	$ 24,920
1	2" service	3620	Contractor material and labor to replace services	$ 3,620
8	hours	28	Company labor for field oversight and construction project management	$ 224
Subtotal				$ 28,764
General Overhead Rate on Labor and Capital (10%)				$ 2,876
Total Estimated Cost				**$ 31,640**



2018

Project No: S-49
PWSID: 0407099

Sun City Water

Project Area:

Tropicana Cir South

Project Description:

Replace 29 residential and 3 irrigation services on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

75 37.5 0 75 150 225 300 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

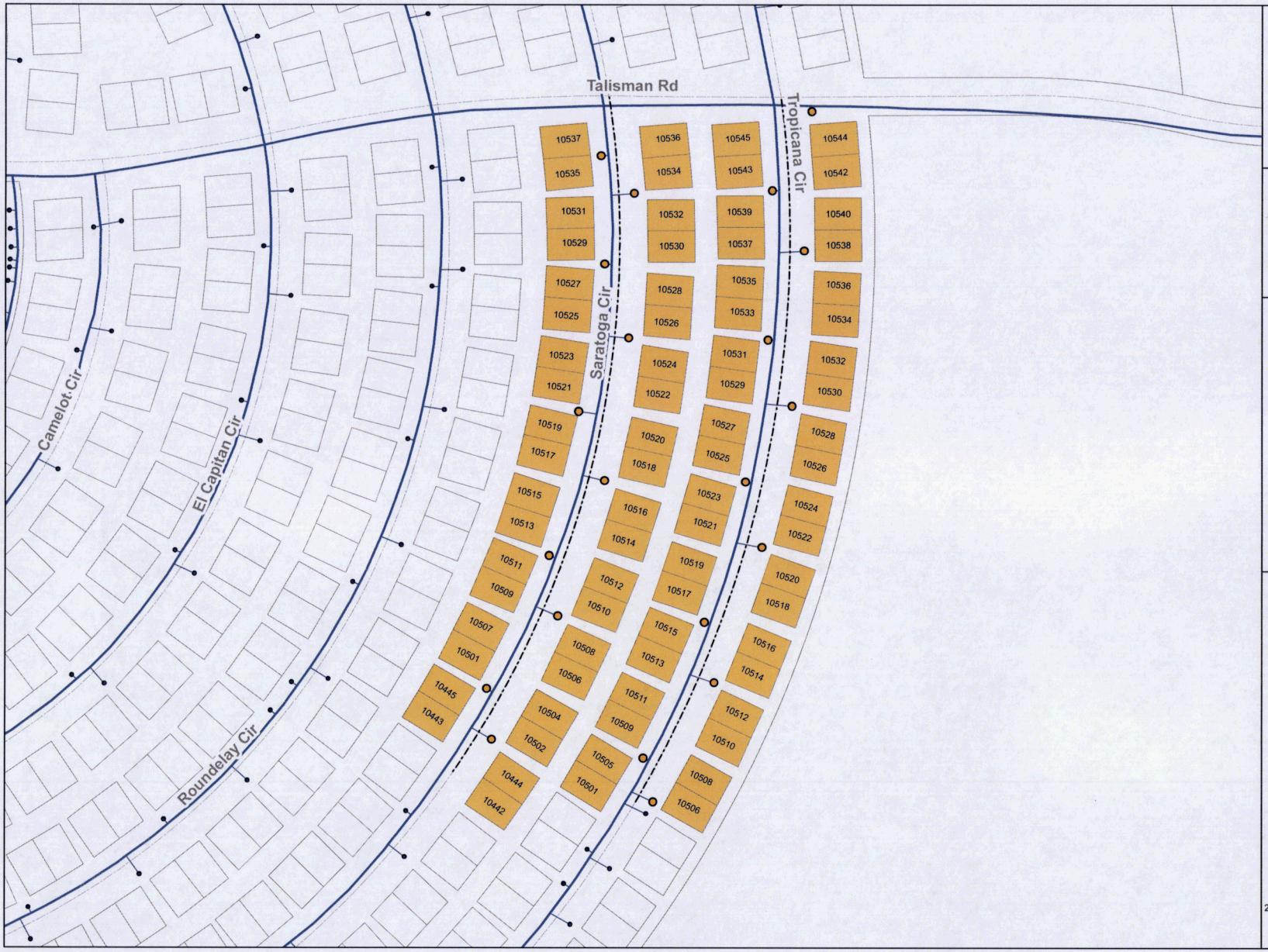
Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2018 S-49**	Tropicana Cir South

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (32 total on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
32	1.5" service	3560	Contractor material and labor to replace services	$ 113,920
32	hours	28	Company labor for field oversight and construction project management	$ 896
Subtotal				$ 114,816
General Overhead Rate on Labor and Capital (10%)				$ 11,482
Total Estimated Cost				**$ 126,298**



2018

Project No: S-50
PWSID: 0407099

Sun City Water

Project Area:

Tropicana Cir North

Project Description:

Replace 22 residential services on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

60 30 0 60 120 180 240 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

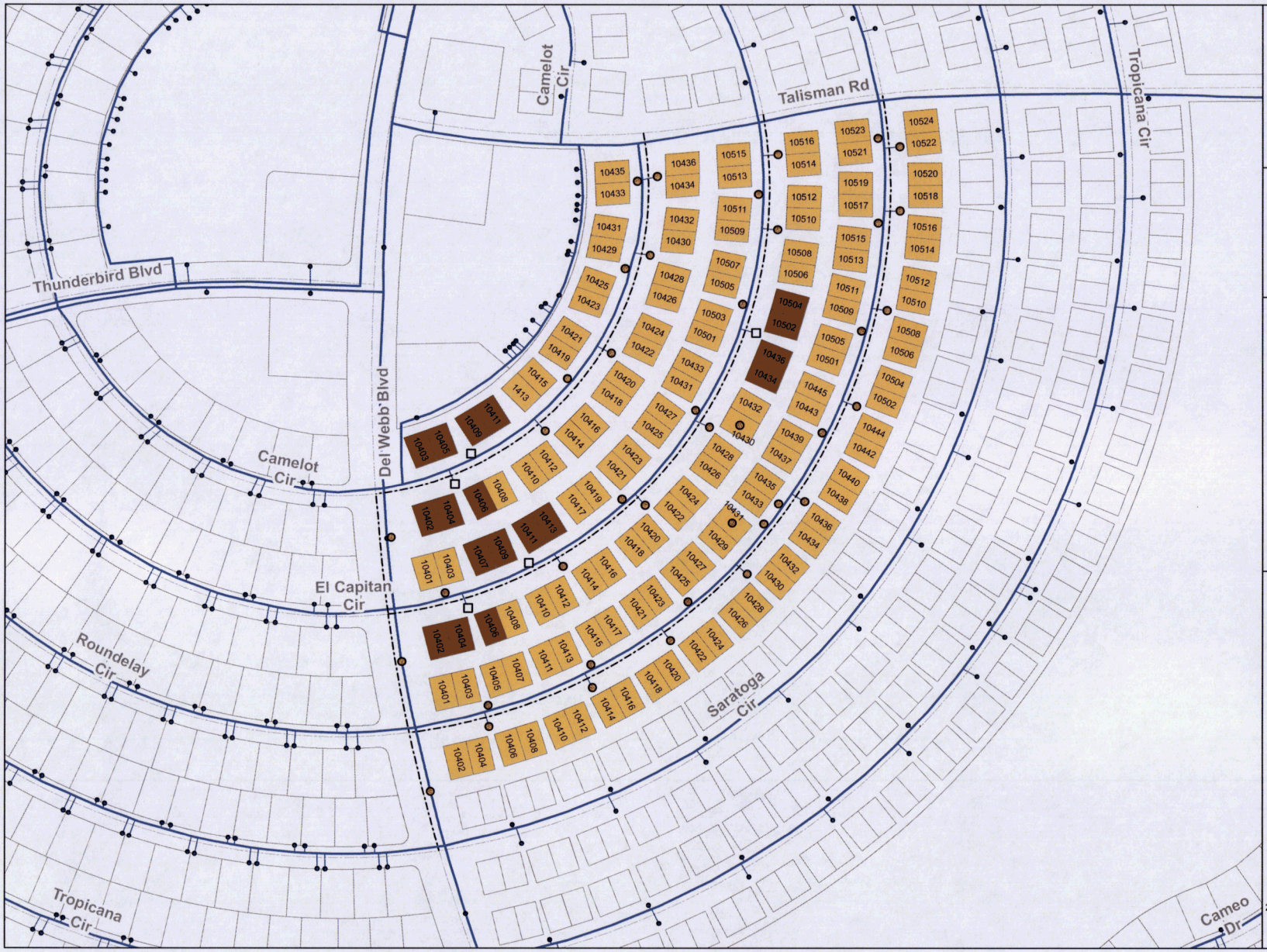
Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2018 S-50**	Tropicana Cir North

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
22	1.5" service	3560	Contractor material and labor to replace services	$ 78,320
22	hours	28	Company labor for field oversight and construction project management	$ 616
Subtotal				$ 78,936
General Overhead Rate on Labor and Capital (10%)				$ 7,894
Total Estimated Cost				**$ 86,830**



2018

Project No: S-51
PWSID: 0407099

Sun City Water

Project Area:

El Capitan Cir

Project Description:

Replace 38 residential and 3 irrigation services on Camelot Cir, Del Webb Blvd, El Capitan Cir and Roundelay Cir between Del Webb Blvd and Talisman Rd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

80 40 0 80 160 240 320 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2018 S-51**	Project Location: El Capitan Cir

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (41 total on Camelot Cir, Del Webb Blvd, El Capitan Cir and Roundelay Cir between Del Webb Blvd and Talisman Rd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
41	1.5" service	3560	Contractor material and labor to replace services	$ 145,960
41	hours	28	Company labor for field oversight and construction project management	$ 1,148
Subtotal				$ 147,108
General Overhead Rate on Labor and Capital (10%)				$ 14,711
Total Estimated Cost				**$ 161,819**

2019

Sun City – PV[redacted]D No. 07-099

SIB PLANT TABLE I, 1-4

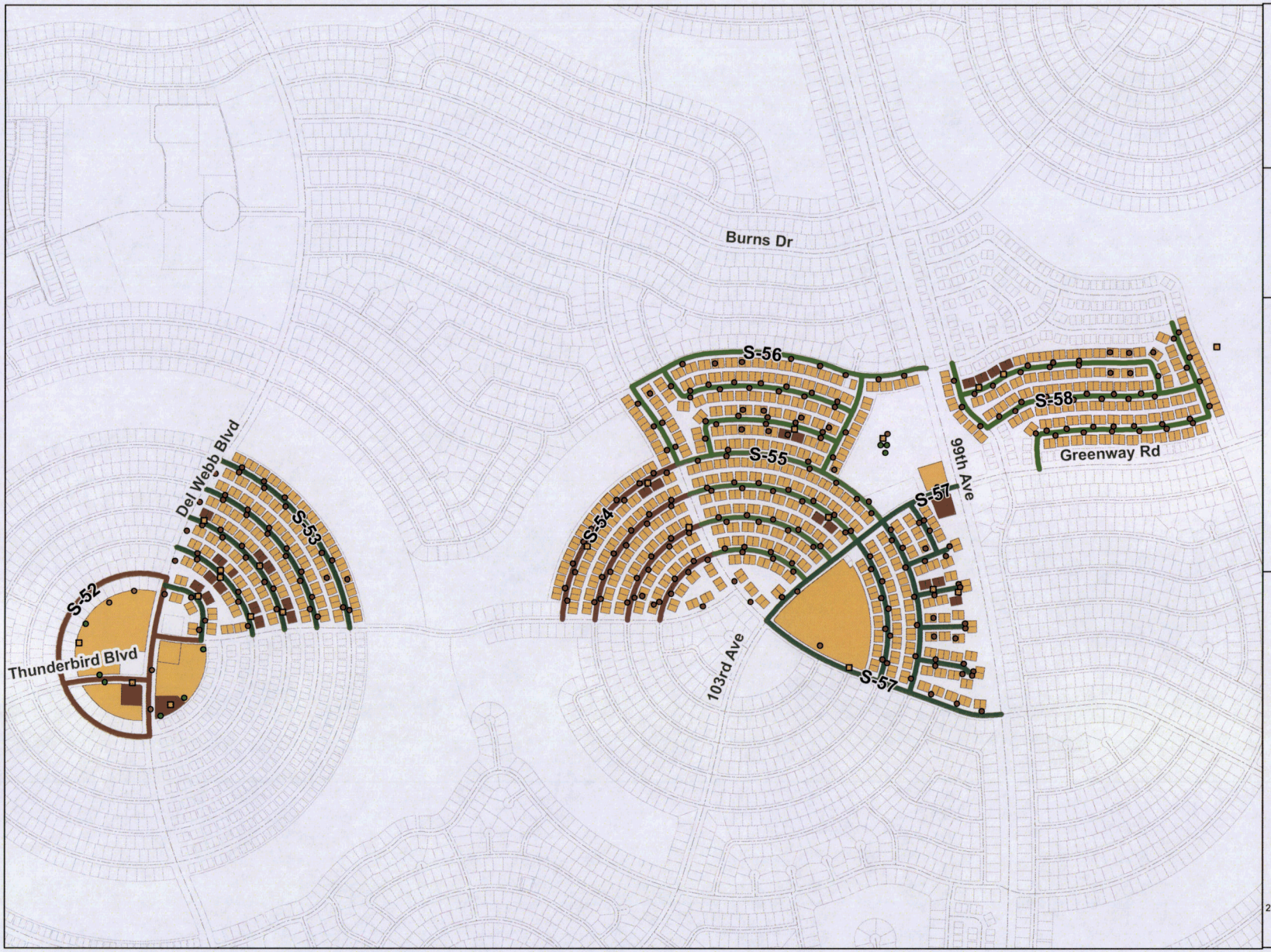
2019 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-52	333	service lines	10	5-1.5" 5-2"	Copper	1.5"-$3,947 2"-$4,013	Del Webb Blvd	12/2019	n/a	$39,798	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total at the intersection of Del Webb Blvd, Thunderbird Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-52 in Exhibit CC-1-B for more detail.
S-53	333	service lines	49	1.5"	Copper	1.5"-$3,947	Saratoga Circle	12/2019	n/a	$193,393	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (49 total on Camelot Cir, El Capitan Cir, Roundelay Cir, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-53 in Exhibit CC-1-B for more detail.

S-54	333	service lines	41	1.5"	Copper	1.5"-$3,947	Kingswood Cir West	12/2019	n/a	$161,819	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (41 total on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Talisman Rd and Boswell Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-54 in Exhibit CC-1-B for more detail.
S-55	333	service lines	43	42-1.5" 1-2"	Copper	1.5"-$3,947 2"-$4,013	Kingswood Cir East	12/2019	n/a	$169,778	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (43 total on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Boswell Blvd and 103rd Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-55 in Exhibit CC-1-B for more detail.
S-56	333	service lines	53	49-1.5" 4-2"	Copper	1.5"-$3,947 2"-$4,013	Shasta Dr	12/2019	n/a	$209,444	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (53 total on Boswell Blvd, Desert Rose Dr, Pleasant Valley Rd, Sandstone Dr and Shasta Dr between Boswell Blvd and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-56 in Exhibit CC-1-B for more detail.
S-57	333	service lines	44	42-1.5" 2-2"	Copper	1.5"-$3,947 2"-$4,013	Prairie Hills Cir	12/2019	n/a	$173,791	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (44 total on 103rd Ave, Boswell Blvd, Kingswood Cir, Newport Dr, Pineridge Dr, Prairie Hills Cir, Raintree Dr and Spruce Dr between 103rd Ave and Boswell Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-57 in Exhibit CC-1-B for more detail.

S-58	333	service lines	50	49-1.5" 1-2"	Copper	1.5"-$3,947 2"-$4,013	Sandstone Dr	12/2019	n/a	$197,406	Replace aging services with copper ser[illegible]es to reduce water leaks and emergency repairs. (50 to[illegible]on Cameo Dr, Lakeforest Dr, Long Hills Dr, Sandstone Dr and Shasta Dr between 99th Ave and Cameo Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-58 in Exhibit CC-1-B for more detail.
Total			**290**							**$1,145,430**	



2019

Project No: N/A
PWSID: 0407099

Sun City Water

Project Area:

Sun City 2019 Project Areas

Project Description:

Replace 277 residential, 8 irrigation and 9 commercial services.

Legend

Services

Services

- COPPER
- COMMERCIAL
- IRRIGATION
- RESIDENTIAL

Project Parcels

- Parcels with service previously replaced
- Parcels with service to be replaced

N

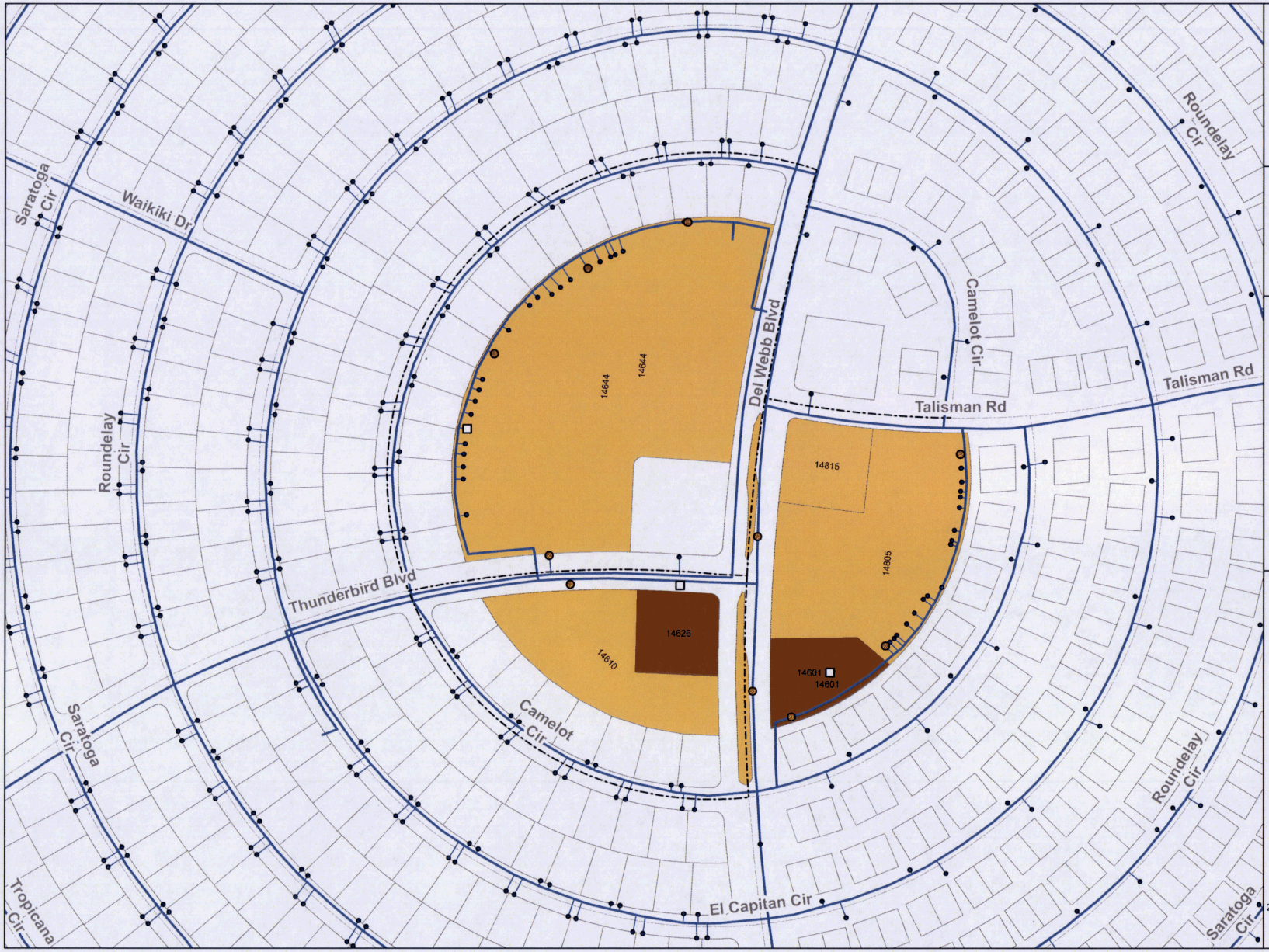
330 165 0 330 660 990 1,320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •



2019

Project No: S-52
PWSID: 0407099

Sun City Water

Project Area:

Del Webb Blvd

Project Description:

Replace 6 commercial and 4 irrigation services at the intersection of Del Webb Blvd, Thunderbird Blvd and Talisman Rd

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

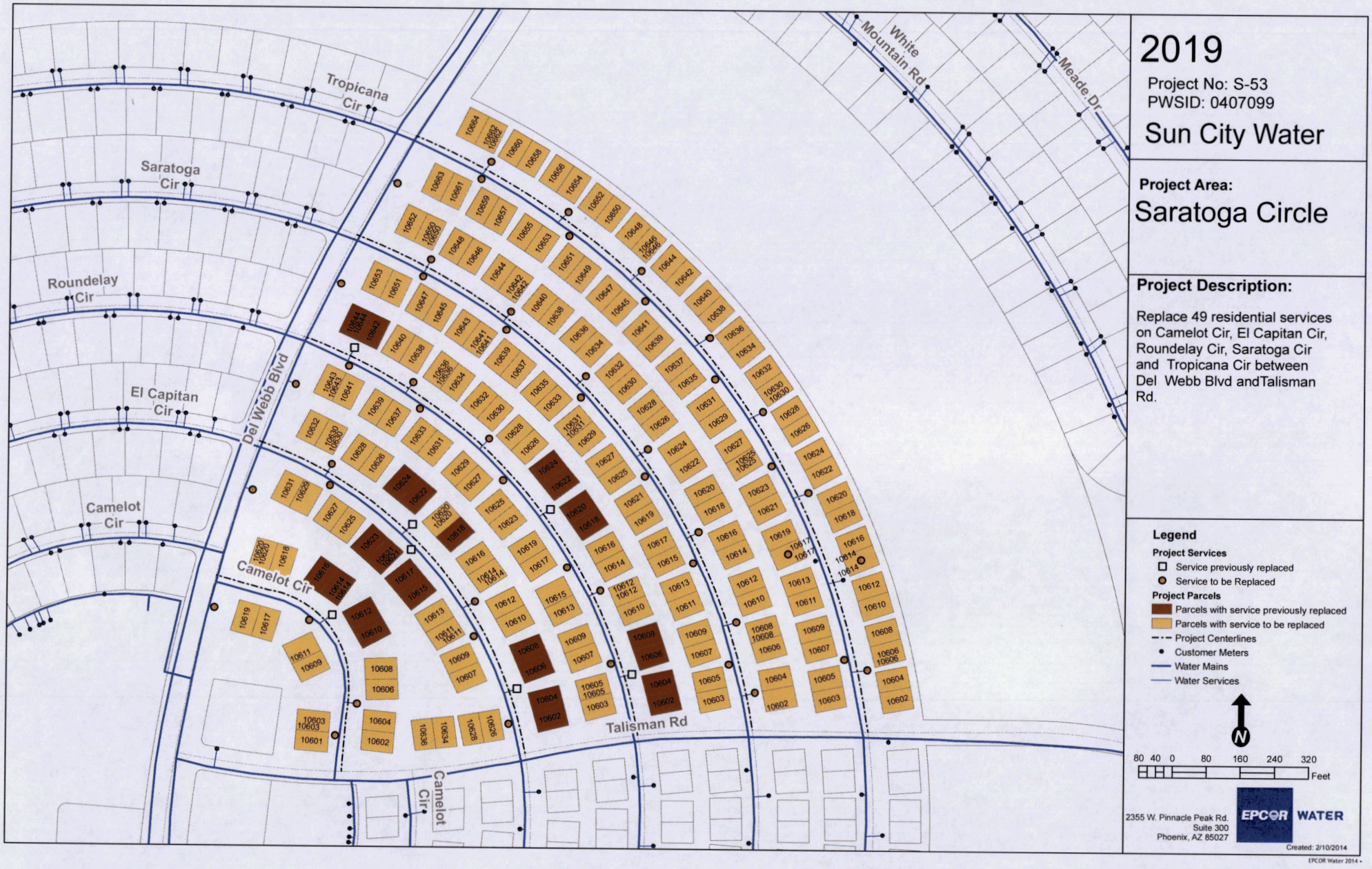
Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2019 S-52**	Del Webb Blvd

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total at the intersection of Del Webb Blvd, Thunderbird Blvd and Talisman Rd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
5	1.5" service	3560	Contractor material and labor to replace services	$ 17,800
5	2" service	3620	Contractor material and labor to replace services	$ 18,100
10	hours	28	Company labor for field oversight and construction project management	$ 280
Subtotal				$ 36,180
General Overhead Rate on Labor and Capital (10%)				$ 3,618
Total Estimated Cost				**$ 39,798**



2019

Project No: S-53
PWSID: 0407099

Sun City Water

Project Area:

Saratoga Circle

Project Description:

Replace 49 residential services on Camelot Cir, El Capitan Cir, Roundelay Cir, Saratoga Cir and Tropicana Cir between Del Webb Blvd andTalisman Rd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

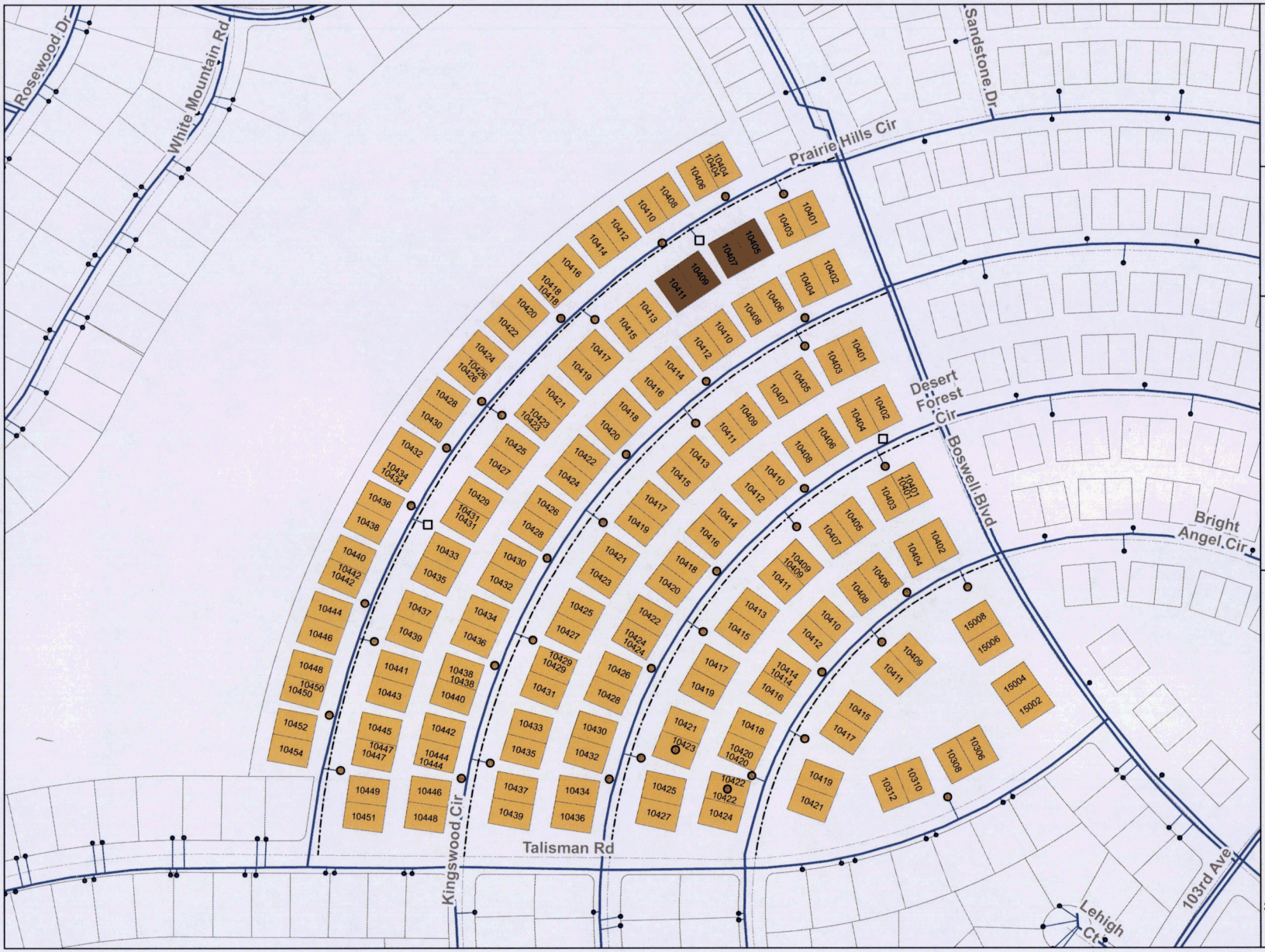
EPCOR Water 2014 -

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2019 S-53**	Project Location: Saratoga Circle

Project Description:
Replace aging services with copper service lines to reduce water leaks and emergency repairs. (49 total on Camelot Cir, El Capitan Cir, Roundelay Cir, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
49	1.5" service	3560	Contractor material and labor to replace services	$ 174,440
49	hours	28	Company labor for field oversight and construction project management	$ 1,372
Subtotal				$ 175,812
General Overhead Rate on Labor and Capital (10%)				$ 17,581
Total Estimated Cost				**$ 193,393**



2019

Project No: S-54
PWSID: 0407099

Sun City Water

Project Area:

Kingswood Cir West

Project Description:

Replace 41 residential services on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Talisman Rd and Boswell Blvd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

70 35 0 70 140 210 280 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

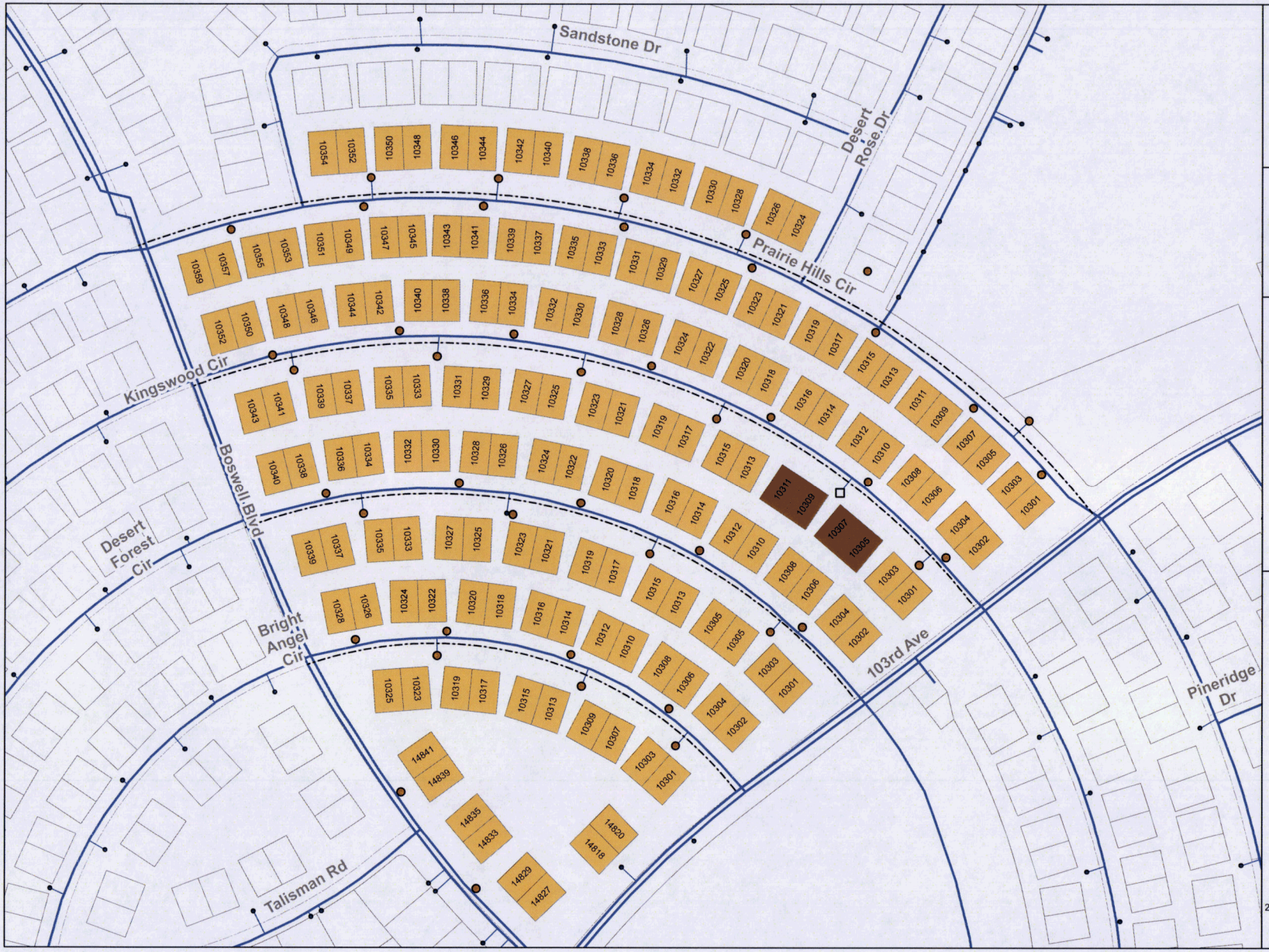
EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2019 S-54**	Project Location: Kingswood Cir West	

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (41 total on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Talisman Rd and Boswell Blvd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
41	1.5" service	3560	Contractor material and labor to replace services	$ 145,960
41	hours	28	Company labor for field oversight and construction project management	$ 1,148
Subtotal				$ 147,108
General Overhead Rate on Labor and Capital (10%)				$ 14,711
Total Estimated Cost				**$ 161,819**



2019

Project No: S-55
PWSID: 0407099

Sun City Water

Project Area:

Kingswood Cir East

Project Description:

Replace 42 residential and 1 irrigation services on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Boswell Blvd and 103rd Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

70 35 0 70 140 210 280 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/7/2014

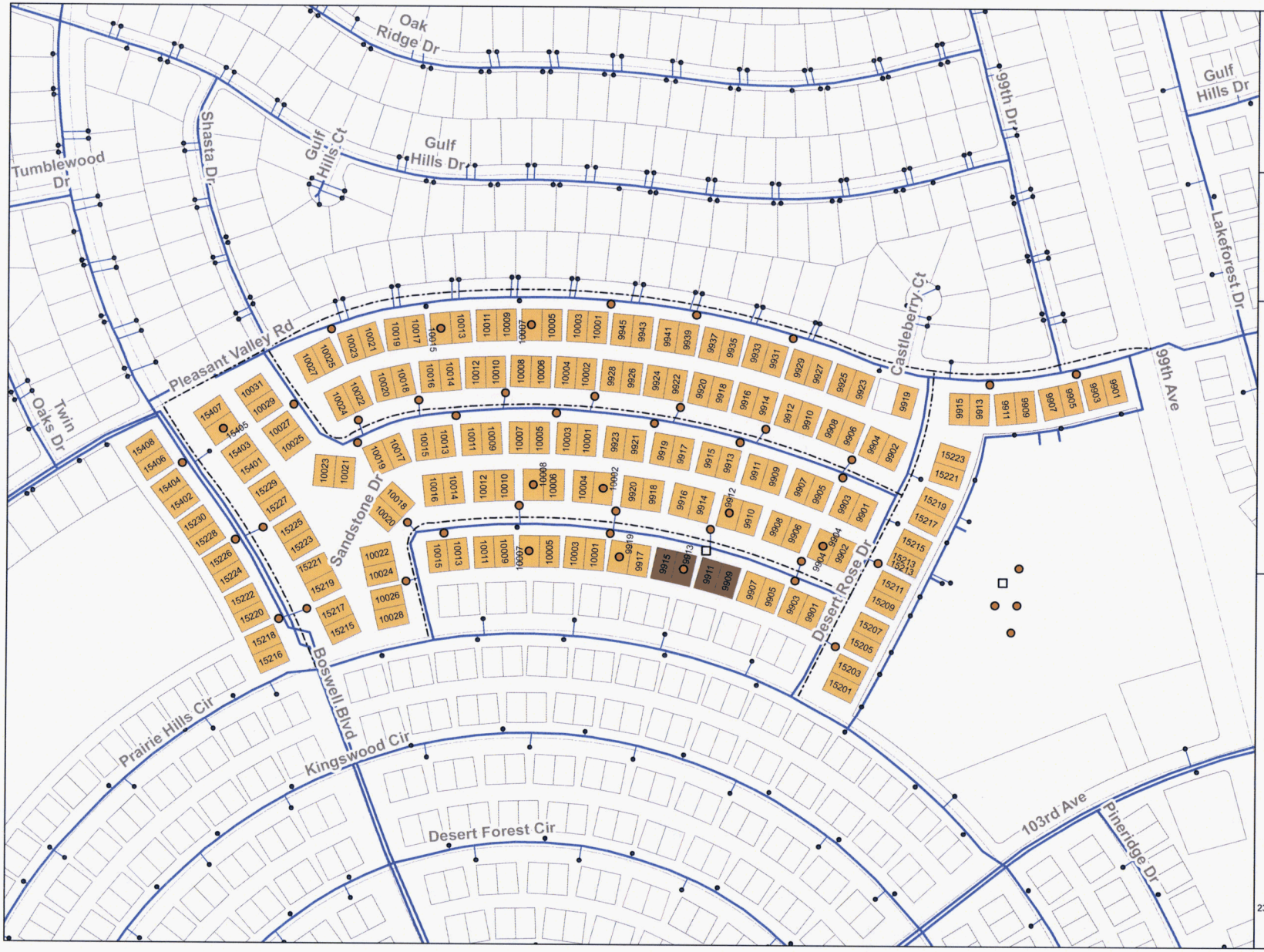
Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, PE	Sun City	**2019 S-55**	Kingswood Cir East

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (43 total on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Boswell Blvd and 103rd Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
42	1.5" service	3560	Contractor material and labor to replace services	$ 149,520
1	2" service	3620	Contractor material and labor to replace services	$ 3,620
43	hours	28	Company labor for field oversight and construction project management	$ 1,204
Subtotal				$ 154,344
General Overhead Rate on Labor and Capital (10%)				$ 15,434
Total Estimated Cost				**$ 169,778**



2019

Project No: S-56
PWSID: 0407099

Sun City Water

Project Area:

Shasta Dr

Project Description:

Replace 49 residential, 3 commercial and 1 irrigation services on Boswell Blvd, Desert Rose Dr, Pleasant Valley Rd, Sandstone Dr and Shasta Dr between Boswell Blvd and 99th Ave.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

90 45 0 90 180 270 360 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

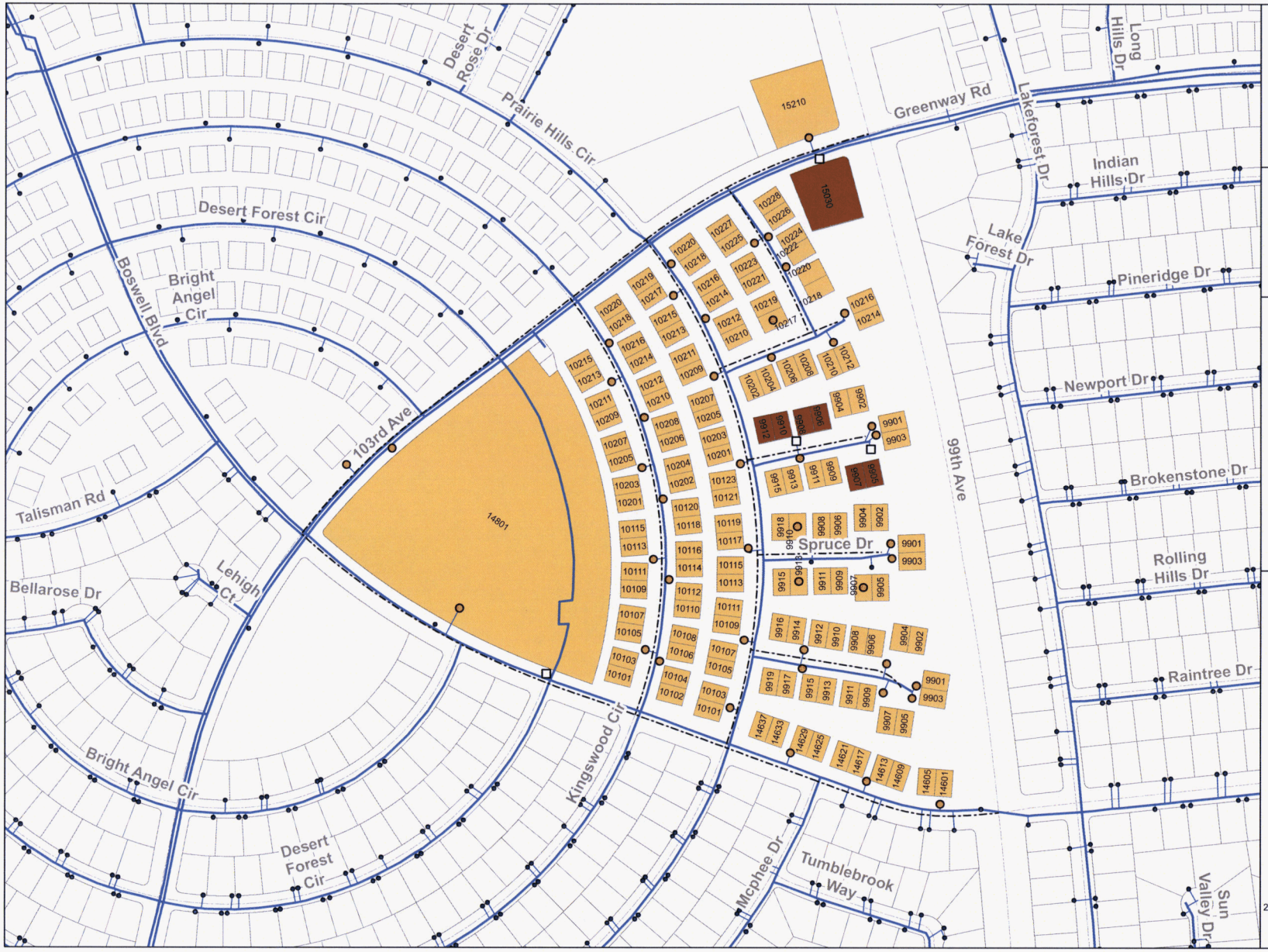
EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2019 S-56**	Project Location: Shasta Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (53 total on Boswell Blvd, Desert Rose Dr, Pleasant Valley Rd, Sandstone Dr and Shasta Dr between Boswell Blvd and 99th Ave.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
49	1.5" service	3560	Contractor material and labor to replace services	$ 174,440
4	2" service	3620	Contractor material and labor to replace services	$ 14,480
53	hours	28	Company labor for field oversight and construction project management	$ 1,484
Subtotal				$ 190,404
General Overhead Rate on Labor and Capital (10%)				$ 19,040
Total Estimated Cost				**$ 209,444**



2019

Project No: S-57
PWSID: 0407099

Sun City Water

Project Area:

Prairie Hills Cir

Project Description:

Replace 42 residential and 2 irrigation services on 103rd Ave, Boswell Blvd, Kingswood Cir, Newport Dr, Pineridge Dr, Prairie Hills Cir, Raintree Dr and Spruce Dr between 103rd Ave and Boswell Blvd.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

110 55 0 110 220 330 440 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2019 S-57**	Project Location: Prairie Hills Cir

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (44 total on 103rd Ave, Boswell Blvd, Kingswood Cir, Newport Dr, Pineridge Dr, Prairie Hills Cir, Raintree Dr and Spruce Dr between 103rd Ave and Boswell Blvd.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
42	1.5" service	3560	Contractor material and labor to replace services	$ 149,520
2	2" service	3620	Contractor material and labor to replace services	$ 7,240
44	hours	28	Company labor for field oversight and construction project management	$ 1,232
Subtotal				$ 157,992
General Overhead Rate on Labor and Capital (10%)				$ 15,799
Total Estimated Cost				**$ 173,791**

2019

Project No: S-58
PWSID: 0407099

Sun City Water

Project Area:

Sandstone Dr

Project Description:

Replace 50 residential services on Cameo Dr, Lakeforest Dr, Long Hills Dr, Sandstone Dr and Shasta Dr between 99th Ave and Cameo Dr.

Legend

Project Services
- Service previously replaced
- Service to be Replaced

Project Parcels
- Parcels with service previously replaced
- Parcels with service to be replaced
- Project Centerlines
- Customer Meters
- Water Mains
- Water Services

N

90 45 0 90 180 270 360 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 ©

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/7/2014
Prepared By: Marc Allen, PE	Water System: Sun City	Project Year and Number: **2019 S-58**	Project Location: Sandstone Dr

Project Description:

Replace aging services with copper service lines to reduce water leaks and emergency repairs. (50 total on Cameo Dr, Lakeforest Dr, Long Hills Dr, Sandstone Dr and Shasta Dr between 99th Ave and Cameo Dr.)

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
49	1.5" service	3560	Contractor material and labor to replace services	$ 174,440
1	2" service	3620	Contractor material and labor to replace services	$ 3,620
50	hours	28	Company labor for field oversight and construction project management	$ 1,400
Subtotal				$ 179,460
General Overhead Rate on Labor and Capital (10%)				$ 17,946
Total Estimated Cost				**$ 197,406**

Section 2 - Valves

SECTION 2 – VALVES

2.1 Overview

The Sun City water system contains about 3,870 distribution system valves. Over 42% of the valves in the system are over 40 years old, and as valves age, they are prone to deterioration and the parts begin to fail. Common failures include stripped, broken, or bent stems, leaking O-rings or packing, corrosion or cracking of the valve body, corrosion of the connecting bolts, and wear on the valve disk and seat.

2.2 Nessie Curve

As described in Section 1, a "Nessie Curve" is a graphical representation of the annual replacement needs for buried infrastructure. Because it is not economical or feasible to inspect all buried infrastructure, the curve uses historical replacement data and statistical analysis to determine when an asset has reached the end of its useful life and is likely to need replacement. The end of an asset's useful life is when it is considered economically efficient to replace it, or when replacement becomes less expensive than the cost of replacement or repairs in the future. Failure to replace assets when it is economical to do so can be disastrous in the future, when demographic and economic conditions may have changed. As an example, if the population of an area were to decrease in the future, the financial burden of asset replacements on the remaining population would become increasingly difficult, especially if prudent replacements have not been completed in the past.

According to the American Water Works Association (AWWA) "there will be a three-fold increase in the repair costs by the year 2030 despite a concurrent increase of three and a half times in annual investments to replace pipes." [1] The AWWA estimates that buried drinking water infrastructure will need investments totaling more than $1 trillion nationwide in the next 25 years.[2] Given these daunting predictions, it is especially important for water utility providers to implement asset replacement programs now in order to properly manage the investments that will be needed in the future.

---

[1] Reinvesting in Drinking Water Infrastructure, AWWA, May 2001

[2] Buried No Longer: Confronting America's Water Infrastructure Challenge, AWWA, 2012

Exhibit 2-1 is the Nessie curve which was developed specifically for the valves in EPCOR's Sun City district. Exhibit 2-2 shows the same data in tabular format. The curve shows that most of the system valves will need to be replaced by 2030. It also shows that in the next six years, from 2015 through 2020, approximately $7.2 million should be spent on valve replacements, or about $1.2 million per year. This equates to about 241 valve replacements per year.

Exhibit 2-1 – Valve Nessie Curve

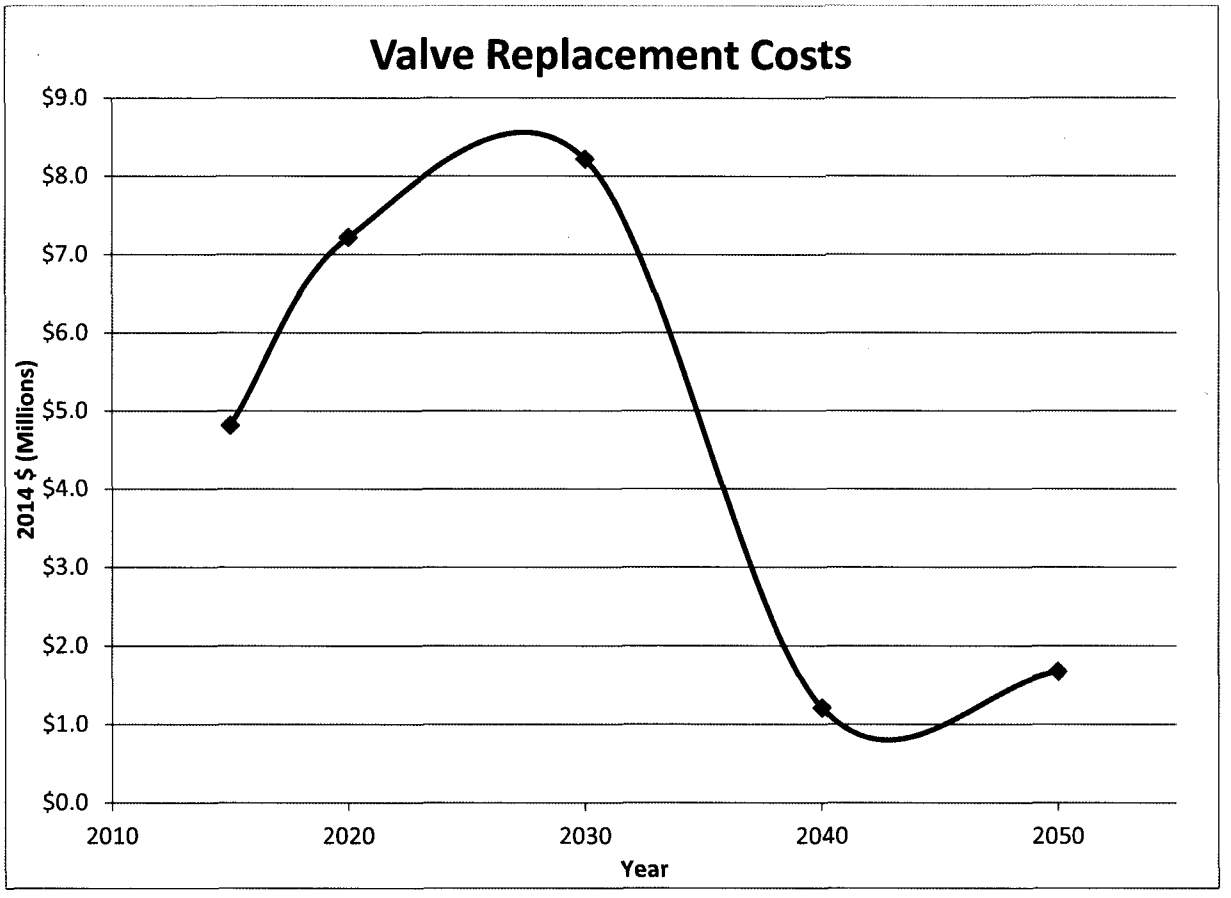


Exhibit 2-6 - Nessie Curve Table

Time Frame	Number of Valves to be Replaced	Cost to Replace Valves	Number of Valve Replacements per Year	Cost per Year
today-2020	1445	$ 7,216,696	241	$ 1,202,783
2020-2030	1644	$ 8,212,399	164	$ 821,240
2030-2040	242	$ 1,208,278	24	$ 120,828
2040-2050	335	$ 1,671,174	33	$ 167,117

2.3 Valve Replacements

Until the last few years, the valves were tested and replaced if found broken during main break repairs or during fire hydrant maintenance. A valve maintenance and exercise program has been followed during recent years, which has greatly increased the reliability of the valves in the system. Although some replacements will still be needed, it is not expected that nearly as many will need to be replaced as is predicted by the Nessie Curve. In the last year, 16 valves out of 772 tested (approximately 2%) were found to be inoperable or broken. EPCOR plans to continue to systematically test and replace valves according to the valve maintenance schedule. Based on historical data from 2013, it is anticipated that approximately 16 valves will need replacement per year. The investment over five years for valve replacements is estimated at $400,000.

Valve replacement projects are described in the following tabs labeled **2015, 2016, 2017, 2018,** and **2019.** SIB Plant Table I, 2-1 through SIB Plant Table I, 2-5 provide a detailed description of each valve replacement project. The tables are broken down by year, so there is a separate table for each year from 2015 (Table I, 2-1) through 2019 (Table I, 2-5). Each project addresses a set of valve replacements that will occur within a defined area. Each project can also be tied to a map showing the proposed valve replacements as well as any valves in the vicinity that have been replaced since 2008 (note that valve replacements that occurred prior to 2008 are not shown on these maps). A detailed cost estimate for each project is also provided.

2015

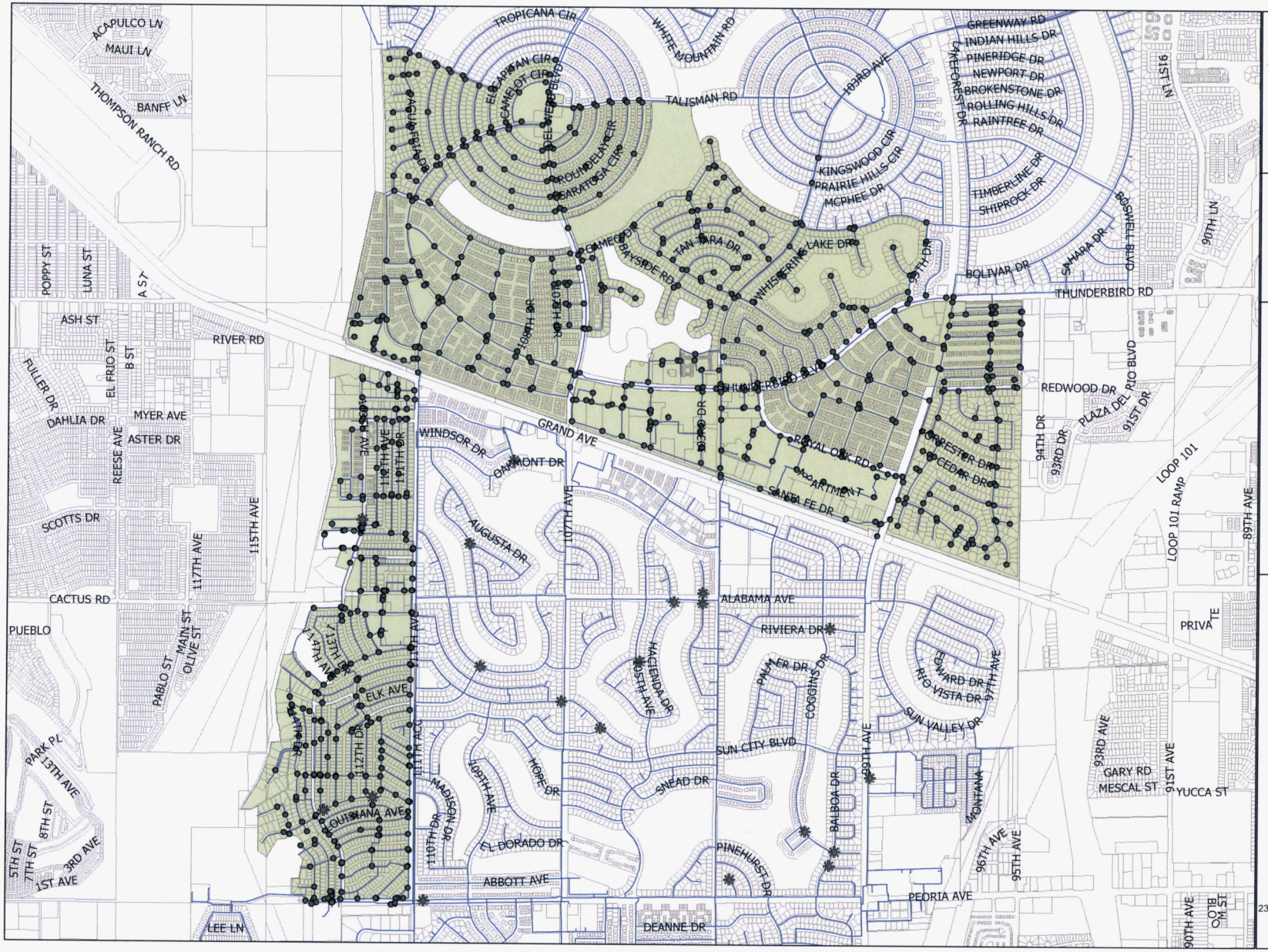
Sun City – PW[illegible]D No. 07-099

SIB PLANT TABLE I, 2-1

2015 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-1	331	gate valves	16	3-4" 10-6" 2-8" 1-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Youngtown and area north of Grand Ave between 95th Ave and 115th Ave (see map V-1 for detail)	12/2015	n/a	$76,375	Replace 3-4", 10-6", 2-8", and 1-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. See Section 2 narrative and Map V-1 in Exhibit CC-1-B for more detail.
Total			**16**							**$76,375**	



2015

Project No: V-1
PWSID: 0407099

Sun City Water

Project Area:

Valve Maintenance Area V-1

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-1: 854

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

1,000 500 0 1,000 2,000 3,000 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2015 V-1**	Youngtown and area north of Grand Ave between 95th Ave and 115th Ave

Project Description:

Replace old distribution system valves that are not operable due to age and natural build-up of minerals on internal components with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
3	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-1.	$ 12,000
10	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-1.	$ 42,000
2	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-1.	$ 9,400
1	12" Valve	5500	Contractor material and labor to replace 10" valves in Area V-1.	$ 5,500
3	hour	28	Company labor for field oversight and construction management	$ 84
10	hour	28	Company labor for field oversight and construction management	$ 280
2	hour	28	Company labor for field oversight and construction management	$ 56
4	hour	28	Company labor for field oversight and construction management	$ 112
Subtotal				$ 69,432
General Overhead Rate on Labor and Capital (10%)				$ 6,943
Total Estimated Cost				**$ 76,375**

*Company labor includes the salary for one employee at a rate of $28/hour for one hour with the exception of valves 12" or larger, which require one employee for four hours.

2016

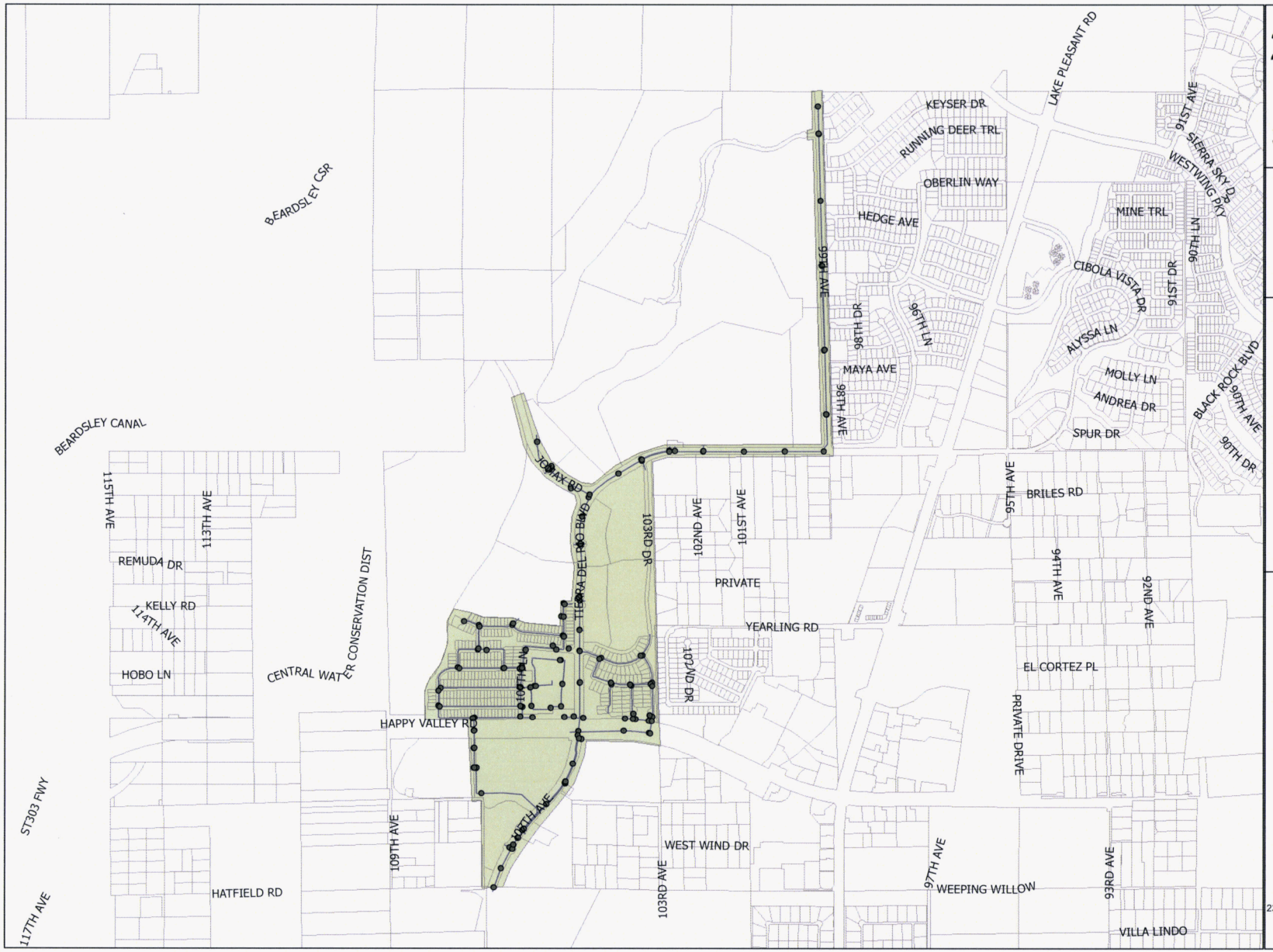
Sun City – PV[redacted]D No. 07-099

SIB PLANT TABLE I, 2-2

2016 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-2	331	gate valves	16	1-4" 8-6" 5-8" 1-12" 1-16"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 16"-$7,603	Tierra Del Rio, Agua Fria Ranch, and the area south of Bell Rd between 99th Ave and 111th Ave (see map V-2 for detail)	12/2016	n/a	$81,418	Replace 1-4", 8-6", 5-8", 1-12", and 1-16" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-2 in Exhibit CC-1-B for more detail.
Total			**16**							**$81,418**	



2016

Project No: V-2
PWSID: 0407532

Sun City Water

Project Area:

Valve Maintenance Area V-2
(Terra Del Rio)

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V2: 737

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

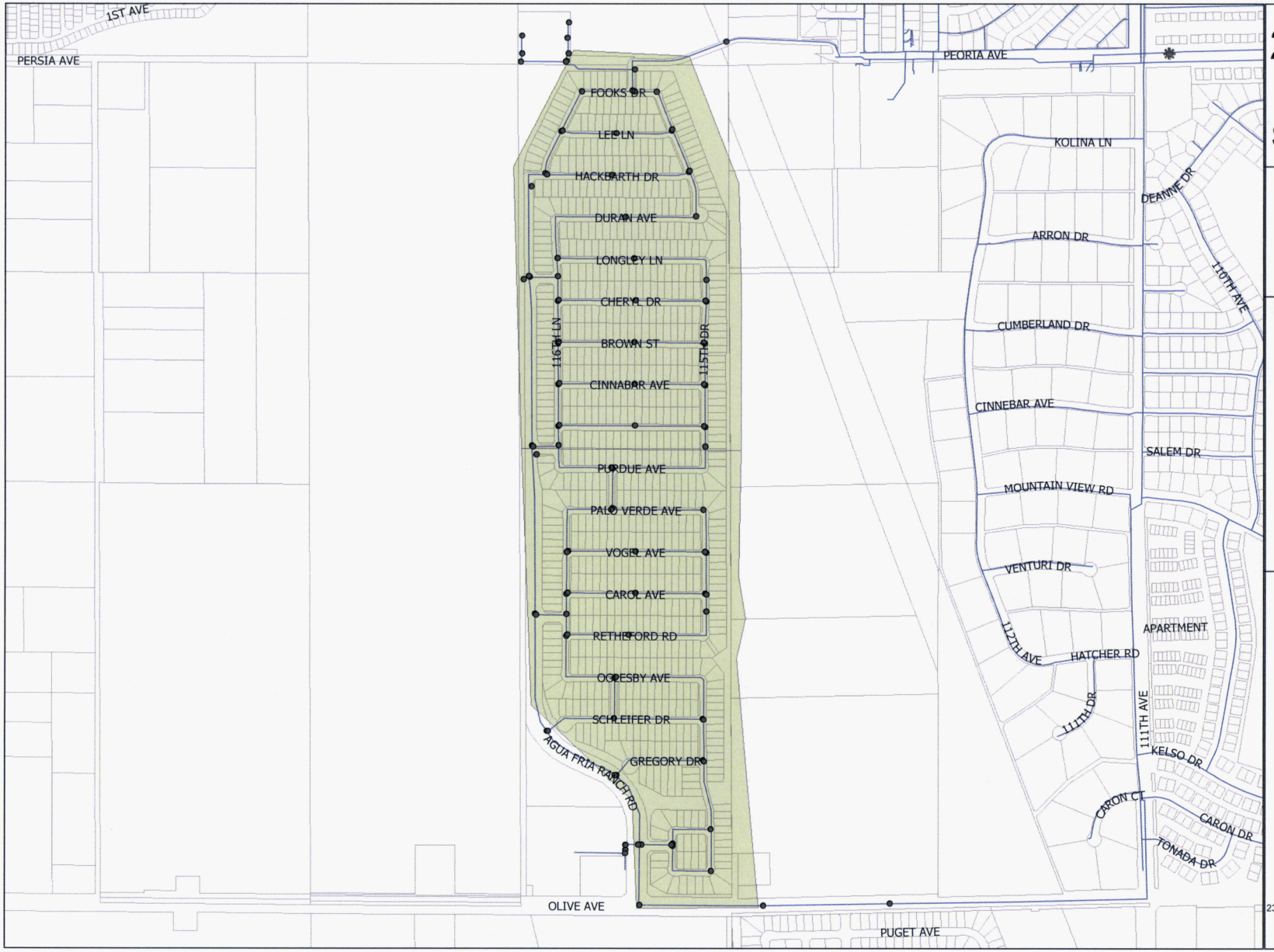
890 445 0 890 1,780 2,670
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 •



2016

Project No: V-2
PWSID: 0407099

Sun City Water

Project Area:

Valve Maintenance Area V-2
(Agua Fria Ranch)

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V2: 737

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

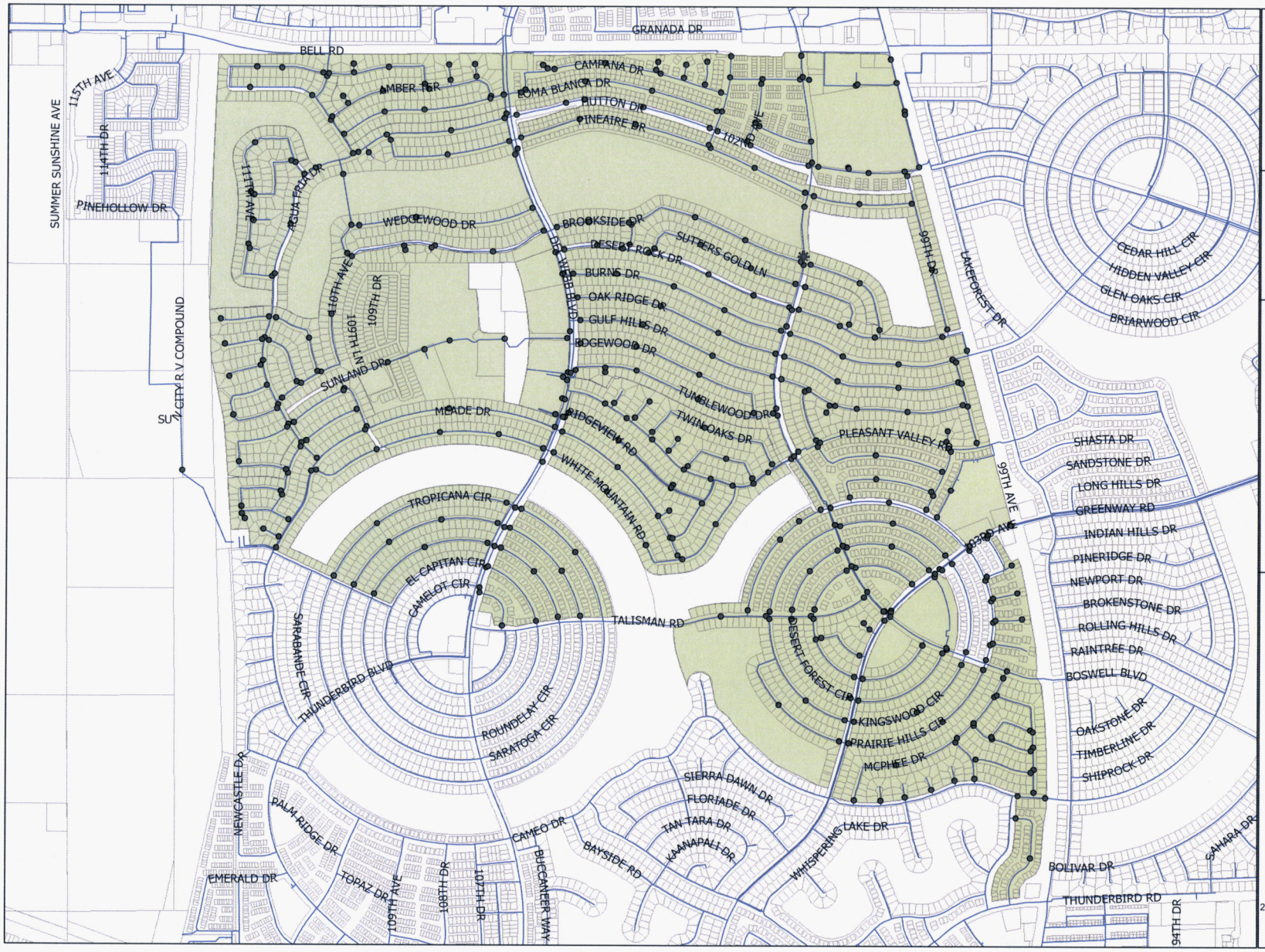
375 187.5 0 375 750 1,125 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 ▪



2016

Project No: V-2
PWSID: 0407099

Sun City Water

Project Area:

Valve Maintenance Area V-2
(SWC 99th Ave. & Bell Rd.)

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V2: 737

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

730 365 0 730 1,460 2,190 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2016 V-2**	Tierra Del Rio, Agua Fria Ranch, and area south of Bell Rd btwn 99th and 111th Ave

Project Description:

Replace old distribution system valves that are not operable due to age and natural build-up of minerals on internal components with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-2.	$ 4,000
8	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-2.	$ 33,600
5	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-2.	$ 23,500
1	12" Valve	5500	Contractor material and labor to replace 10" valves in Area V-2.	$ 5,500
1	16" Valve	6800	Contractor material and labor to replace 12" valves in Area V-2.	$ 6,800
1	hour	28	Company labor for field oversight and construction management	$ 28
8	hour	28	Company labor for field oversight and construction management	$ 224
5	hour	28	Company labor for field oversight and construction management	$ 140
4	hour	28	Company labor for field oversight and construction management	$ 112
4	hour	28	Company labor for field oversight and construction management	$ 112
Subtotal				$ 74,016
General Overhead Rate on Labor and Capital (10%)				$ 7,402
Total Estimated Cost				**$ 81,418**

2017

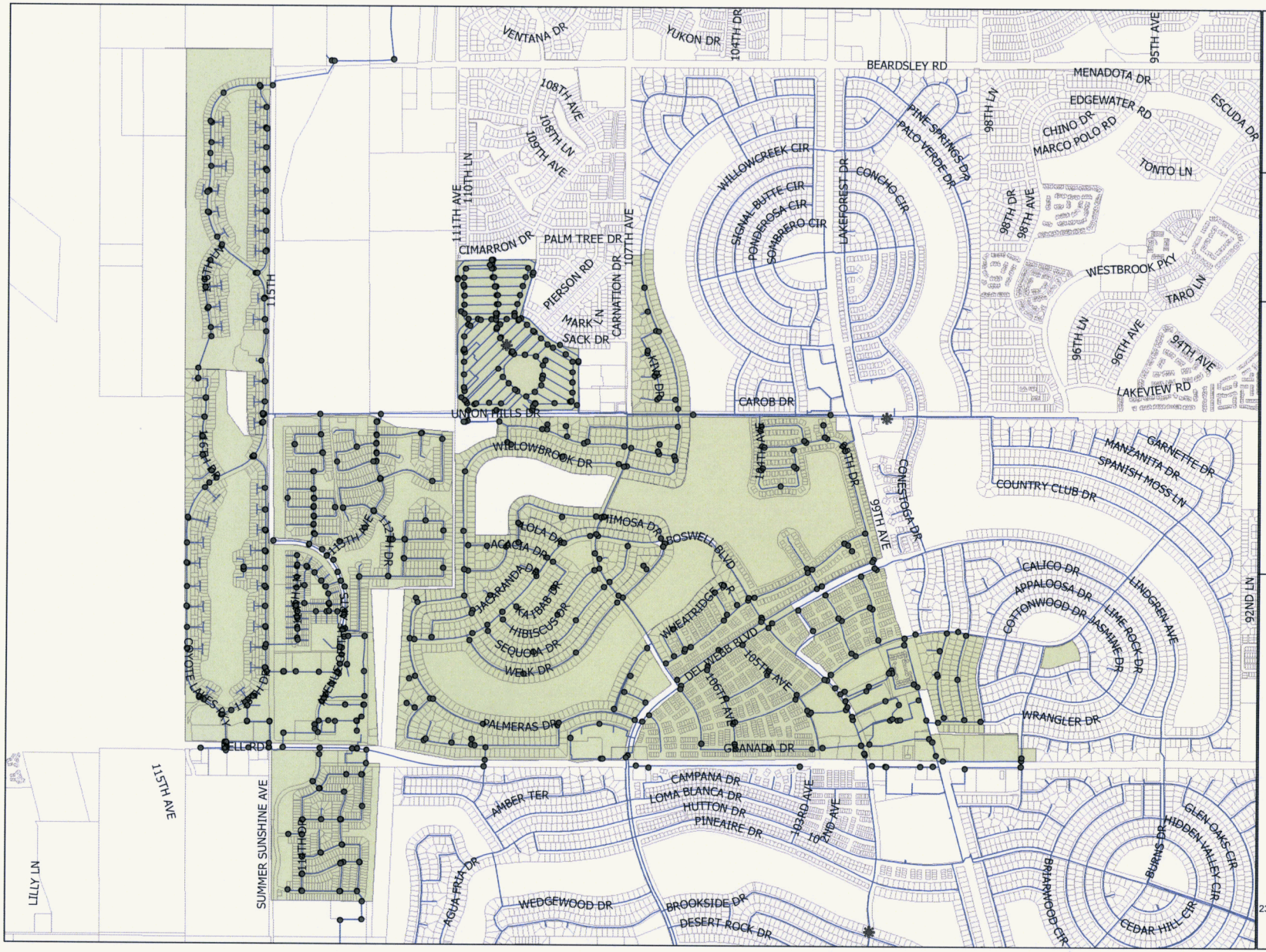
Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 2-3

2017 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-3	331	gate valves	16	1-4" 8-6" 5-10" 2-12"	cast iron with rubberized epoxy coating	4"-$4,431 8"-$5,201 12"-$6,173	Coyote Lakes, Citrus Point, and area west of 99th Ave between Union Hills and Bell Rd (see map V-3 for detail)	12/2017	n/a	$82,188	Replace 1-4", 8-6", 5-10", and 2-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-3 in Exhibit CC-1-B for more detail.
Total			**16**							**$82,188**	



2017

Project No: V-3
PWSID: 0407099

Sun City Water

Project Area:

Valve Maintenance Area V-3

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-3: 731

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

900 450 0 900 1,800 2,700 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2017 V-3**	Coyote Lakes, Citrus Point, area west of 99th Ave between Union Hills and Bell

Project Description:

Replace old distribution system valves that are not operable due to age and natural build-up of minerals on internal components with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-3.	$ 4,000
8	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-3.	$ 33,600
5	10" Valve	5100	Contractor material and labor to replace 10" valves in Area V-3.	$ 25,500
2	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-3.	$ 11,000
				$ -
1	hour	28	Company labor for field oversight and construction management	$ 28
8	hour	28	Company labor for field oversight and construction management	$ 224
5	hour	28	Company labor for field oversight and construction management	$ 140
8	hour	28	Company labor for field oversight and construction management	$ 224
				$ -
Subtotal				$ 74,716
General Overhead Rate on Labor and Capital (10%)				$ 7,472
Total Estimated Cost				**$ 82,188**

2018

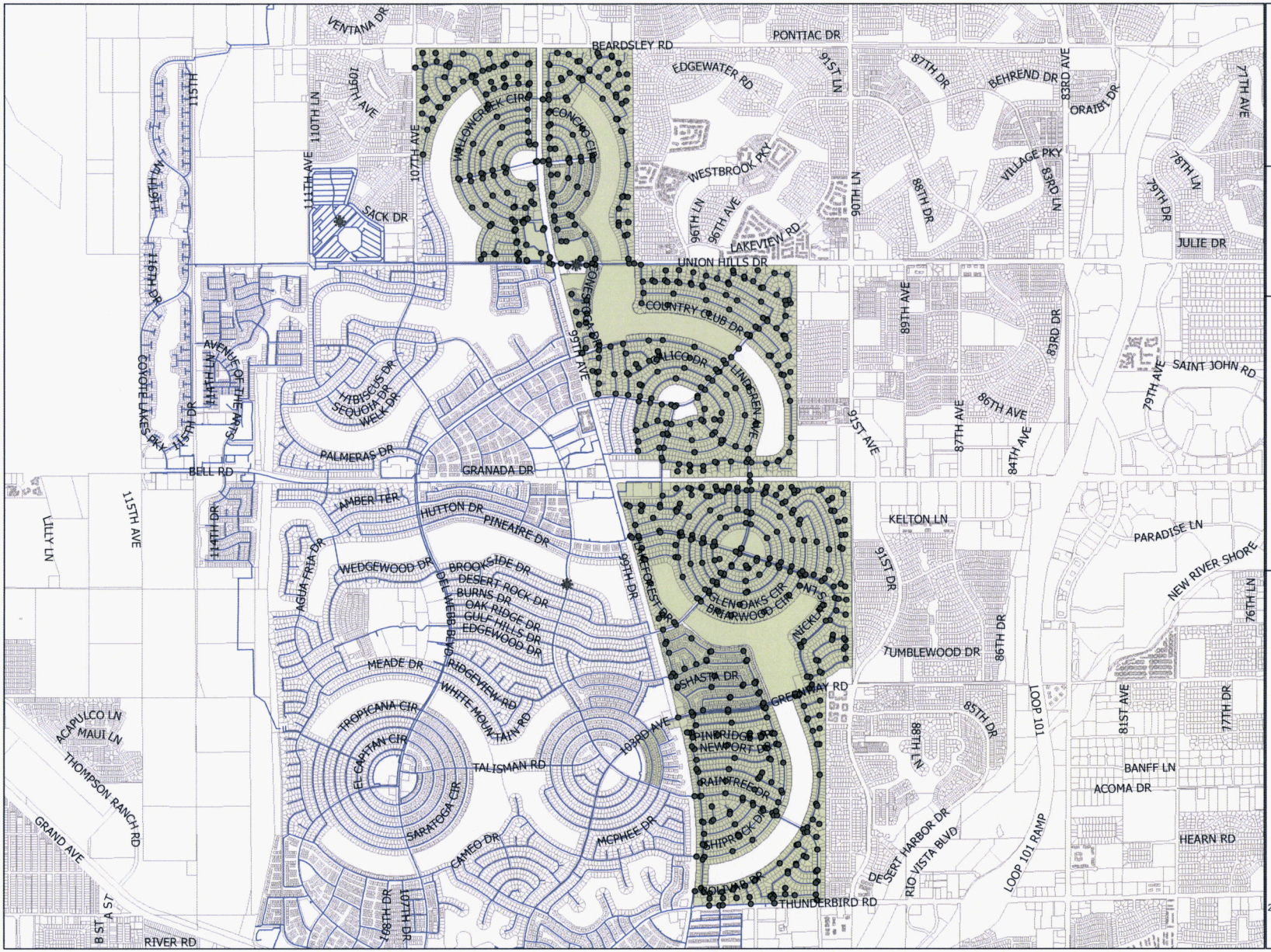
Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 2-4

2018 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-4	331	gate valves	16	2-4" 12-6" 2-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 12"-$6,173	Area east of 99th Ave between Thunderbird and Union Beardsley and east of 99th Ave north of Beardsley (see map V-4 for detail)	12/2018	n/a	$77,018	Replace 2-4", 12-6", and 2-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-4 in Exhibit CC-1-B for more detail.
Total			**16**							**$77,018**	



2018

Project No: V-4
PWSID: 0407099

Sun City Water

Project Area:

Valve Maintenance Area V-4

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-4: 768

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

1,400 700 0 1,400 2,800 4,200 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2018 V-4**	Area east of 99th Ave btwn Thunderbird and Union Beardsley and east of 99th Ave north of Beardsley

Project Description:

Replace old distribution system valves that are not operable due to age and natural build-up of minerals on internal components with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
2	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-4.	$ 8,000
12	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-4.	$ 50,400
2	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-4.	$ 11,000
				$ -
				$ -
2	hour	28	Company labor for field oversight and construction management	$ 56
12	hour	28	Company labor for field oversight and construction management	$ 336
8	hour	28	Company labor for field oversight and construction management	$ 224
				$ -
				$ -
Subtotal				$ 70,016
General Overhead Rate on Labor and Capital (10%)				$ 7,002
Total Estimated Cost				**$ 77,018**

2019

Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 2-5

2019 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-5	331	gate valves	16	1-4" 5-6" 7-8" 3-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Area between Grand Ave and Olive Ave and between 111th Ave/127th Ave and the Agua Fria Wash (see map V-5 for detail)	12/2019	n/a	$82,610	Replace 1-4", 5-6", 7-8", and 3-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-5 in Exhibit CC-1-B for more detail.
Total			**16**							**$82,610**	

2019

Project No: V-5
PWSID: 0407099

Sun City Water

Project Area:

Valve Maintenance Area V-5

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-5: 803

Legend

- Previous Valve Replacements
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

990 495 0 990 1,980 2,970 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2019 V-5**	Area between Grand Ave, Olive Ave, 111th Ave/127th Ave and the Agua Fria Wash

Project Description:

Replace old distribution system valves that are not operable due to age and natural build-up of minerals on internal components with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-5.	$ 4,000
5	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-5.	$ 21,000
7	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-5.	$ 32,900
3	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-5.	$ 16,500
				$ -
1	hour	28	Company labor for field oversight and construction management	$ 28
5	hour	28	Company labor for field oversight and construction management	$ 140
7	hour	28	Company labor for field oversight and construction management	$ 196
12	hour	28	Company labor for field oversight and construction management	$ 336
				$ -
Subtotal				$ 75,100
General Overhead Rate on Labor and Capital (10%)				$ 7,510
Total Estimated Cost				**$ 82,610**

Section 3 - Mains

SECTION 3 – MAINS

3.1 Overview

EPCOR's Sun City district includes about 309 miles of water mains. Most of this pipe was installed beginning in 1959 and through the 1960's and 1970's. Replacement of mains is a priority primarily due to the pipe age and material as well as the pipe bedding. Many breaks have been occurring in recent years in two main areas: the Coyote Lakes residential subdivision at the north end of the district and the oldest area of the system, south of Grand Avenue.

3.2 Nessie Curve

As explained in the previous two sections, a "Nessie Curve" is a graphical representation of the annual replacement needs for buried infrastructure. Because it is not economical or feasible to inspect all buried infrastructure, the curve uses historical replacement data and statistical analysis to determine when an asset has reached the end of its useful life and is likely to need replacement. The end of an asset's useful life is when it is considered economically efficient to replace it; this is to say when replacement becomes less expensive than the cost of replacement or repairs in the future. Failure to replace assets when it is economical to do so can be disastrous in the future, when demographic and economic conditions may have changed. As an example, if the population of an area were to decrease in the future, the financial burden of asset replacements on the remaining population would become increasingly difficult, especially if prudent replacements have not been completed in the past.

According to the American Water Works Association (AWWA) "there will be a three-fold increase in the repair costs by the year 2030 despite a concurrent increase of three and a half times in annual investments to replace pipes." [1] The AWWA estimates that buried drinking water infrastructure will need investments totaling more than $1 trillion nationwide in the next 25 years.[2] Given these daunting predictions, it is especially important for water utility providers to implement asset replacement programs now in order to properly manage the investments that will be needed in the future.

[1] Reinvesting in Drinking Water Infrastructure, AWWA, May 2001

[2] Buried No Longer: Confronting America's Water Infrastructure Challenge, AWWA, 2012

Exhibit 3-1 is the Nessie curve which was developed specifically for the water mains in EPCOR's Sun City district. Exhibit 3-2 shows the same data in tabular format. The curve shows that in the next six years, from 2015 through 2020, approximately $13 million should be spent on main replacements, or about $2.2 million per year. This equates to about 15,600 linear feet of main replacements per year.

Exhibit 3-1 – Main Lines Nessie Curve

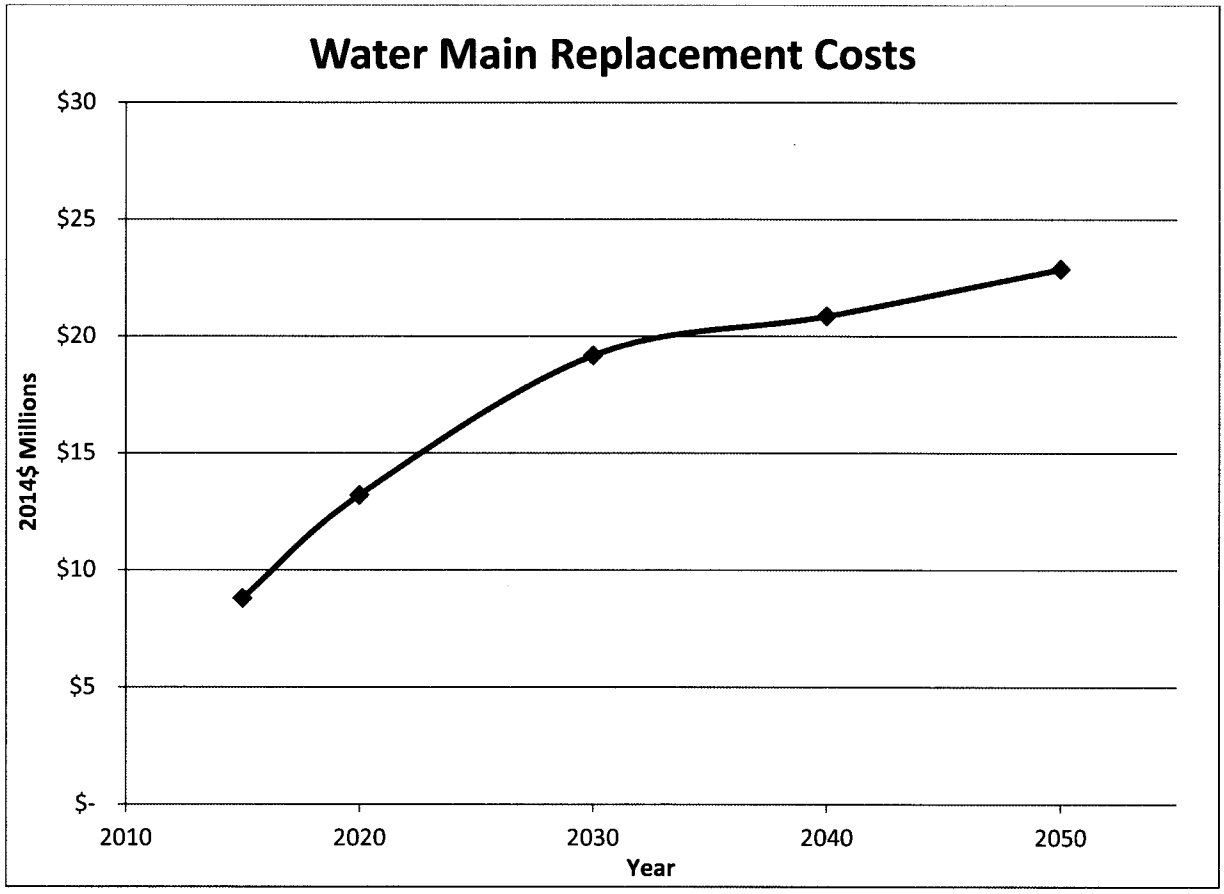


Exhibit 3-2 Nessie Curve Table

Time Frame	Linear Feet of Main to be Replaced	Cost to Replace Mains	Linear Feet of Main to be Replaced per Year	Cost per Year
today-2020	93,565	$13,192,676	15,594	$2,198,779
2020-2030	135,957	$19,169,876	13,596	$1,916,988
2030-2040	147,959	$20,862,163	14,796	$2,086,216
2040-2050	162,192	$22,869,040	16,219	$2,286,904

3.3 Main Material

The material that was used when the majority of the main lines were installed in Sun City was asbestos cement pipe (ACP), also known as "transite" pipe. During the 1940s through the 1960s, ACP was a very common choice for water pipe and other uses. The design life is considered to be 50 to 70 years. According to Williams and Von Aspern, AC pipe failure increases dramatically with age. Failure rates are about one per year per mile of pipe.[3] Therefore, a significant quantity of pipe in Sun City has reached the end of its design life, which is evident by the high number of breaks in the system. New mains will be constructed using ductile iron pipe or AWWA C-900 PVC.

3.4 Main Replacements

Over the past 5.5 years, about 200 main breaks have occurred in the Sun City system. This equates to an average of approximately 36 main line failures per year. Note that this doesn't include service lines which are leaking unbeknownst to EPCOR Water employees. Although the Nessie curve suggests that about 15,600 feet of pipe should be replaced per year, this would require a significant labor and capital investment that would not be feasible by the company and would put significant financial burden on the customers. Additionally, service line replacements are a high priority due to the high rate of failures (see Section 1 for more information). Therefore, EPCOR proposes to spend an average of about $816,000 per year in

[3] "Asbestos Cement Pipe: What If It Needs To Be Replaced?", Williams, G. Eric and Von Aspern, Kent. Retrieved from http://www.mtpinnacle.com/pdfs/CD_M.pm_02.30_Williams.pdf on February 7, 2014.

main replacements for the next five years. This equates to a total of about 29,000 feet of main at a cost of $4.1 million.

Main replacement projects are described in the following tabs labeled **2015, 2016, 2017, 2018, and 2019**. SIB Plant Table I, 3-1 through SIB Plant Table I, 3-5 provide a detailed description of each main replacement project. The tables are broken down by year, so there is a separate table for each year from 2015 (Table I, 3-1) through 2019 (Table I, 3-5). Each project addresses a set of main replacements that will occur within a defined area. Each project can also be tied to a map showing the main replacement as well as historical replacements in the area. (Historical data include only main replacements between 2008 and 2013; replacements prior to 2008 are not included.) A detailed cost estimate for each project is also provided.

2015

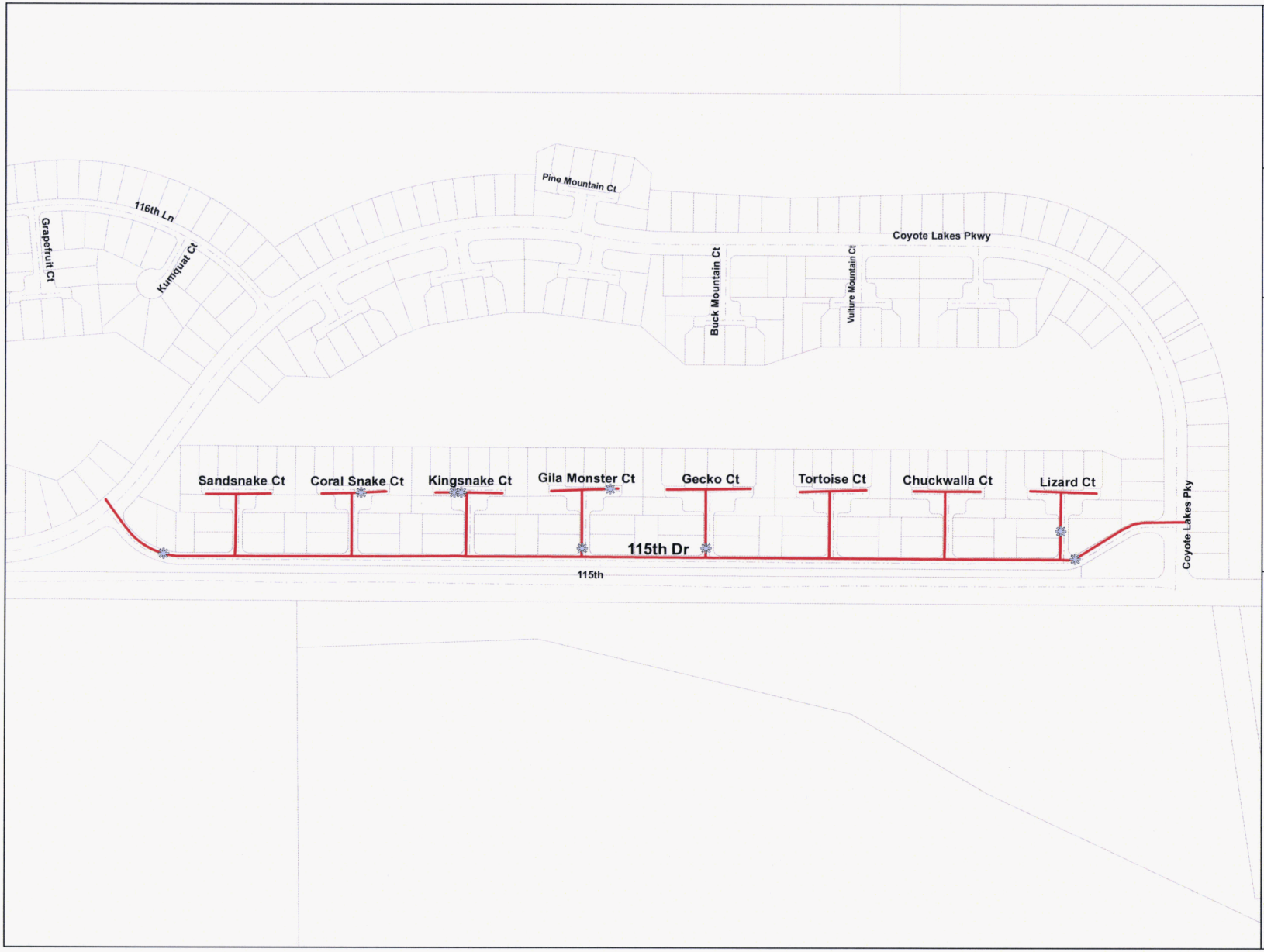
Sun City – PW[illegible]D No. 07-099

SIB PLANT TABLE I, 3-1

2015 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-1	331	Mains	5,786 LF	2,842 LF-4" 2,944 LF-8"	PVC	$174	115th Dr, in north 1/3 of Coyote Lakes	12/2015	n/a	$1,005,087	Replace existing mains with 2,842 LF of 4" main and 2,944 LF of 8" main in 115th Dr and adjacent cul-de-sacs in the northern 1/3 of the Coyote Lakes development. The mains were installed in native soil which has resulted in several leaks due to rocks puncturing and cracking the pipe. Due to the high flows and pressures in this area, main breaks result in large amounts of lost water. Replacing the mains will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-1 in Exhibit CC-1-B for more detail.
Total			**5,786 LF**							**$1,005,087**	



2015

Project No: WM-1 •
PWSID: 0407099

Sun City District

Project Area:

Coyote Lakes 115th Dr

Project Description:

Replace existing main with
2,842 LF of 4" main
and 2,944 LF of 8" main
in 115th Dr and in each cul-de-sac
along 115th Dr east of Coyote Lakes Pkwy.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

10050 0 100 200 300 400
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/11/2014
Prepared By: Marc Allen, P.E.	Water System: Sun City	Project Year and Number: **2015 WM-1**	Project Location: Coyote Lakes--115th Dr

Project Description:
Replace existing main with 2,842 LF of 4" 2,944 LF of 8" main in 115th Dr and adjacent cul-de-sacs in the north 1/3 of the Coyote Lakes development.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
5,786	linear feet	135	Contractor material and labor to replace existing mains	$ 781,110
1	lump sum	100,000	Consultant engineering design	$ 100,000
263	hours	35	Company labor for field oversight and inspections	$ 9,205
520	hours	45	Company labor for project management	$ 23,400
Subtotal				$ 913,715
General Overhead Rate on Labor and Capital (10%)				$ 91,372
Total Estimated Cost				**$ 1,005,087**

2016

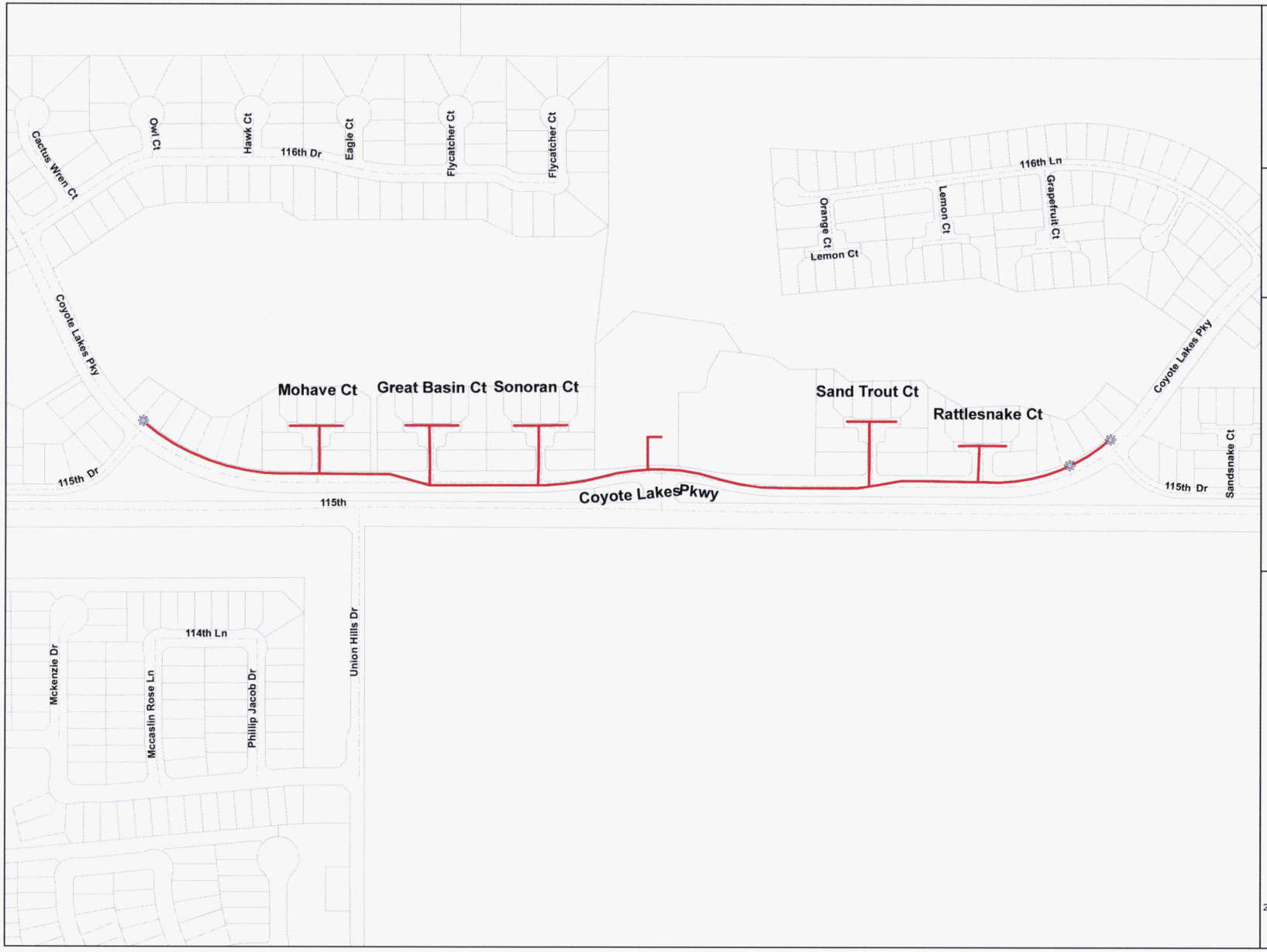
Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 3-2

2016 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-2	331	Mains	12,869 LF	4,871 LF-4" 832 LF-6" 6,004 LF-8" 1,170 LF-12"	PVC	$131	115th Dr, Coyote Lakes Pkwy, in south 2/3 of Coyote Lakes	12/2016	n/a	$1,680,440	Replace existing mains with 4,871 LF of 4", 832 LF of 6", 6,004 LF of 8", and 1,170 LF of 12" main in 115th Dr, in Coyote Lakes Pkwy, and in adjacent cul-de-sacs in the southern 2/3 of the Coyote Lakes development The mains were installed in native soil which has resulted in several leaks due to rocks puncturing and cracking the pipe. Due to the high flows and pressures in this area, main breaks result in large amounts of lost water. Replacing the mains will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-2 in Exhibit CC-1-B for more detail.
Total			**12,869 LF**							**$1,680,440**	



2016

Project No: WM-2 (Part 1) •
PWSID: 0407099

Sun City District

Project Area:

Coyote Lakes
Coyote Lakes Pkwy

Project Description:

Replace existing main with
1,423 LF of 4" main
203 LF of 6" main, 1,678 LF of 8" main,
and 1,170 LF of 12" main
in Coyote Lakes Pky and in each
cul-de-sac along Coyote Lakes Pkwy.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

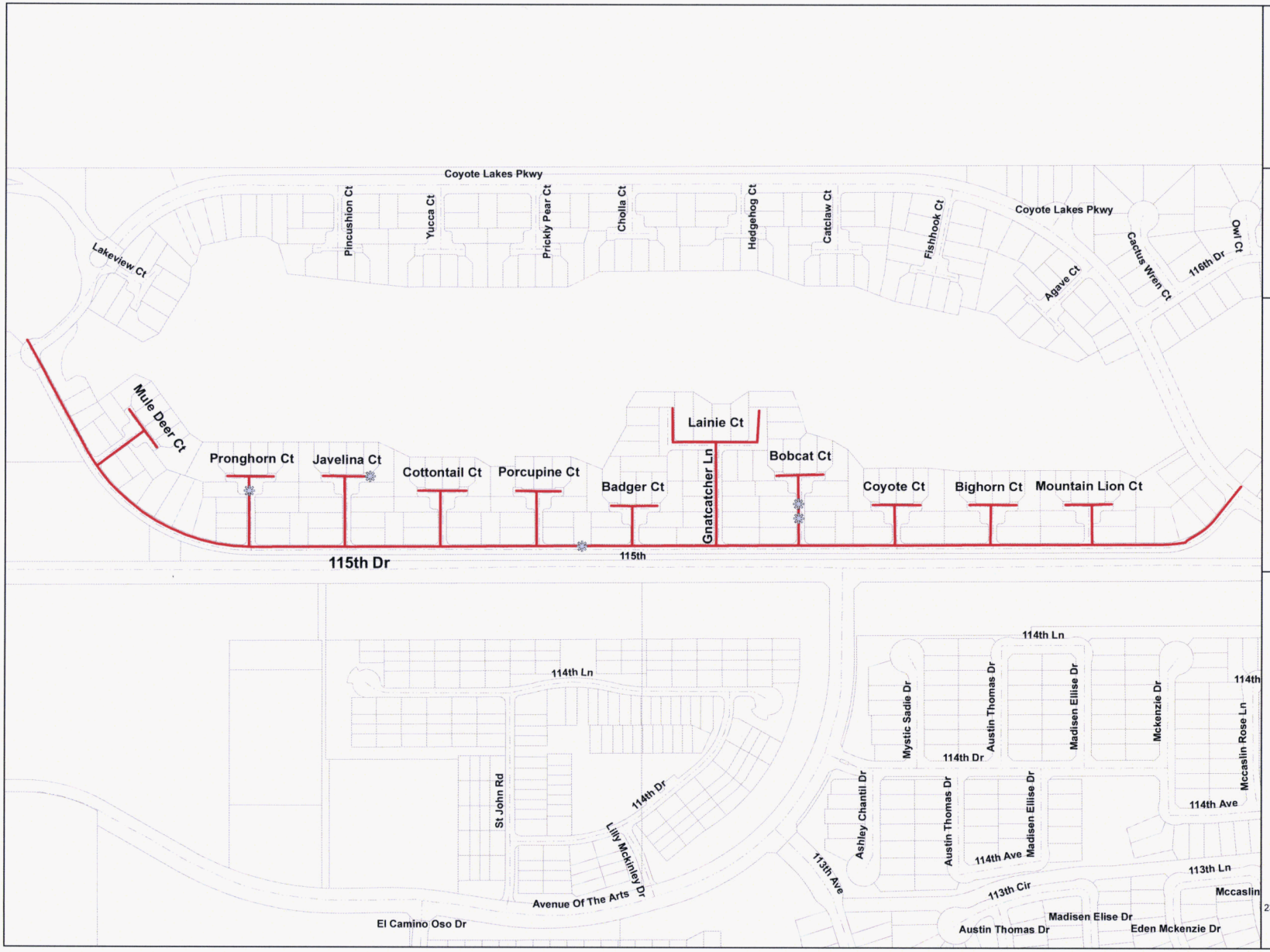
110 55 0 110 220 330 440
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •



2016

Project No: WM-2 (Part 2)•
PWSID: 0407099

Sun City District

Project Area:

Coyote Lakes 115th Dr

Project Description:

Replace existing main with
3,448 LF of 4" main,
629 LF of 6" main,
and 4,326 LF of 8" main
in 115th Dr and in each cul-de-sac
along 115th Dr east of Coyote Lakes Pkwy.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

130 65 0 130 260 390 520 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/11/2014
Prepared By: Marc Allen, P.E.	Water System: Sun City	Project Year and Number: **2016 WM-2**	Project Location: Coyote Lakes--Coyote Lakes Pkwy/115th Dr

Project Description:

Replace existing main with with 4,871 LF of 4", 832 LF of 6", 6,004 LF of 8", and 1,170 LF of 12" main in 115th Dr and in Coyote Lakes Pkwy (and adjacent cul-de-sacs) in the south 2/3 of the Coyote Lakes development (east side).

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
12,869	linear feet	117	Contractor material and labor to replace existing mains with PVC	$ 1,505,673
1	lump sum	0	Consultant engineering design (complete as part of project WM-1)	$ -
500	hours	35	Company labor for field oversight and inspections	$ 17,500
100	hours	45	Company labor for project management	$ 4,500
Subtotal				$ 1,527,673
General Overhead Rate on Labor and Capital (10%)				$ 152,767
Total Estimated Cost				**$ 1,680,440**

2017

Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 3-3

2017 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-3	331	Mains	3,854 LF	6"	PVC	$122	Cherry Hills Dr/Hillcrest Dr	12/2017	n/a	$471,483	Replace existing main with 3,854 LF of 6"main in Cherry Hills Dr and Hillcrest Dr south of Alabama Ave. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. The existing main is 4" in diameter which cannot support the flows necessary for fire protection. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-3 in Exhibit CC-1-B for more detail.
Total			**3,854 LF**							**$471,483**	

2017

Project No: WM-3 •
PWSID: 0407099

Sun City District

Project Area:

Cherry Hills Dr
Hillcrest Dr

Project Description:

Replace existing main with
3,854 LF of 6" main
on Cherry Hills Dr and Hillcrest Dr
south of Alabama Ave.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2017 WM-3**	Cherry Hills Dr/Hillcrest Dr

Project Description:

Replace existing main with 6" main in Cherry Hills Dr and Hillcrest Dr south of Alabama Ave.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
3854	linear feet	99	Contractor material and labor to replace existing mains	$ 381,546
1	lump sum	24,000	Consultant engineering design	$ 24,000
325	hours	35	Company labor for field oversight and inspections	$ 11,375
260	hours	45	Company labor for project management	$ 11,700
Subtotal				$ 428,621
General Overhead Rate on Labor and Capital (10%)				$ 42,862
Total Estimated Cost				**$ 471,483**

2018

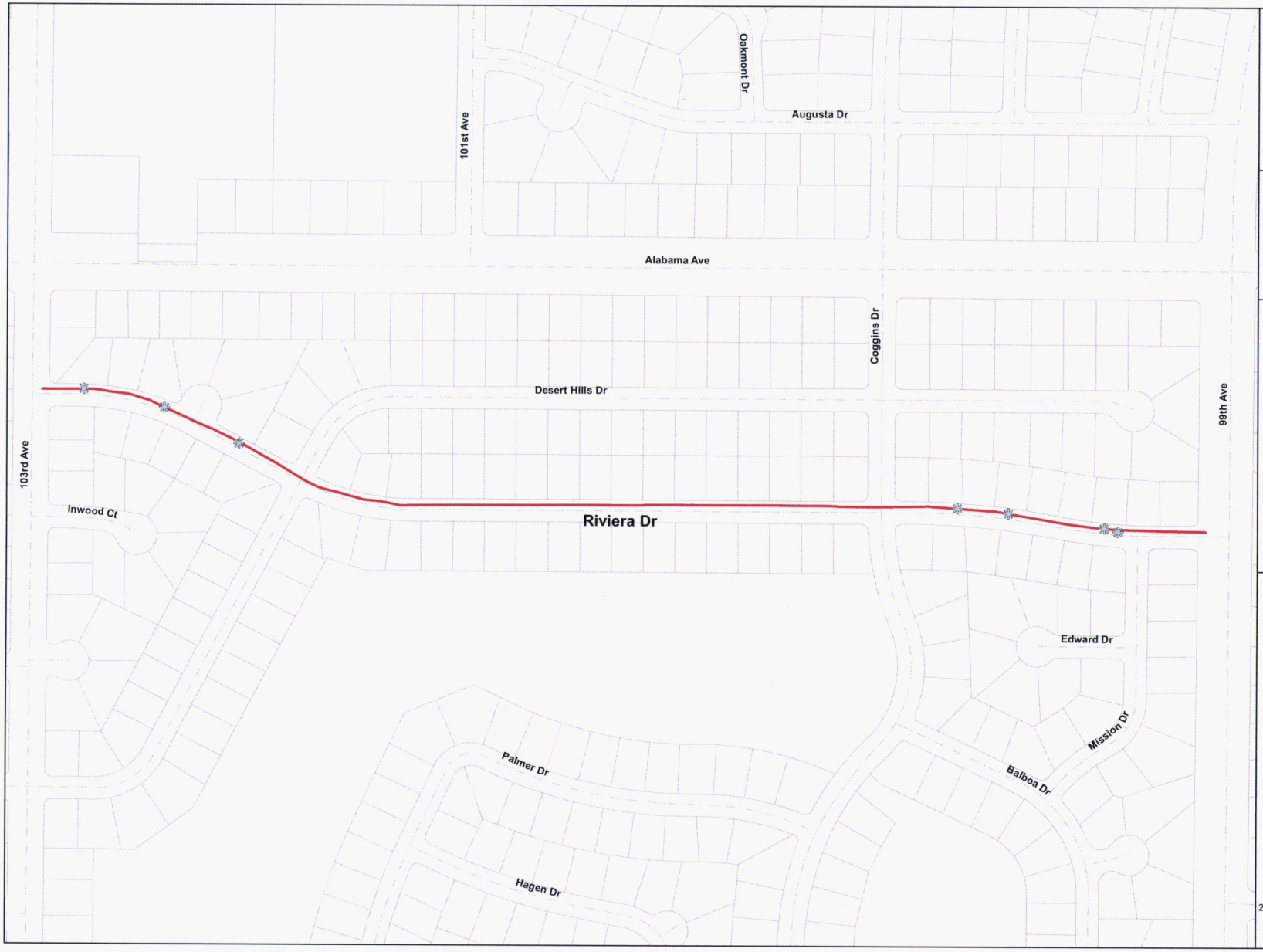
Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 3-4

2018 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-4	331	Mains	2,633 LF	6"	PVC	$133	Riviera Dr	12/2018	n/a	$349,698	Replace existing main with 2,633 LF of 6"main in Riviera Dr between 103rd Ave and 99th Ave. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. The existing main is 4" in diameter which cannot support the flows necessary for fire protection. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-4 in Exhibit CC-1-B for more detail.
Total			**2,633 LF**							**$349,698**	



2018

Project No: WM-4 •
PWSID: 0407099

Sun City District

Project Area:

Riviera Dr

Project Description:

Replace existing main with
2,633 LF 6" main
on Riviera Dr between
103rd Ave and 99th Ave.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

90 45 0 90 180 270 360
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Marc Allen, P.E.	Sun City	**2018 WM-4**	Riviera Dr

Project Description:

Replace existing main with 6" main in Riviera Dr between 103rd Ave and 99th Ave.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
2633	linear feet	104	Contractor material and labor to replace existing mains	$ 273,832
1	lump sum	21,000	Consultant engineering design	$ 21,000
325	hours	35	Company labor for field oversight and inspections	$ 11,375
260	hours	45	Company labor for project management	$ 11,700
Subtotal				$ 317,907
General Overhead Rate on Labor and Capital (10%)				$ 31,791
Total Estimated Cost				**$ 349,698**

2019

Sun City – P[redacted]D No. 07-099

SIB PLANT TABLE I, 3-5

2019 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-5	331	Mains	2,148 LF	6"	PVC	$144	105th Ave	12/2019	n/a	$308,391	Replace existing main with 2,148 LF of 6"main in 105th Ave between Alabama Ave and Desert Hills Dr. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-5 in Exhibit CC-1-B for more detail.
WM-6	331	Mains	1,676 LF	8"	PVC	$159	Oakmont Dr	12/2019	n/a	$266,771	Replace existing main with 1,676 LF of 8"main in Oakmont Dr between 107th Ave and 105th Ave. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-6 in Exhibit CC-1-B for more detail.
Total			**3,824 LF**							**$575,162**	

2019

Project No: WM-5 •
PWSID: 0407099

Sun City District

Project Area:

105th Avenue

Project Description:

Replace existing main with
2,148 LF of 6" main
on 105th Ave between
Alabama Ave and Desert Hills Dr.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

90 45 0 90 180 270 360
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Marc Allen, P.E.	Water System: Sun City	Project Year and Number: **2019 WM-5**	Project Location: 105th Ave	
Project Description: Replace existing main with 6" main in 105th Ave between Alabama Ave and Desert Hills Dr.				

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
2148	linear feet	110	Contractor material and labor to replace existing mains	$ 236,280
1	lump sum	21,000	Consultant engineering design	$ 21,000
325	hours	35	Company labor for field oversight and inspections	$ 11,375
260	hours	45	Company labor for project management	$ 11,700
Subtotal				$ 280,355
General Overhead Rate on Labor and Capital (10%)				$ 28,036
Total Estimated Cost				**$ 308,391**

2019

Project No: WM-6 •
PWSID: 0407099

Sun City District

Project Area:

Oakmont Dr

Project Description:

Replace existing main with
1,676 LF of 8" main
on Oakmont Dr
between 107th Ave and 105th Ave.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

50 25 0 50 100 150 200
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/11/2014
Prepared By: Marc Allen, P.E.	Water System: Sun City	Project Year and Number: **2019 WM-6**	Project Location: Oakmont Dr

Project Description:

Replace existing main with 8" main in Oakmont Dr between 107th Ave and 105th Ave.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1676	linear feet	119	Contractor material and labor to replace existing mains	$ 199,444
1	lump sum	20,000	Consultant engineering design	$ 20,000
325	hours	35	Company labor for field oversight and inspections	$ 11,375
260	hours	45	Company labor for project management	$ 11,700
Subtotal				$ 242,519
General Overhead Rate on Labor and Capital (10%)				$ 24,252
Total Estimated Cost				**$ 266,771**

Section 4 - Meters

SECTION 4 - METERS

4.1 Overview

The Sun City system has approximately 23,000 residential and commercial customer accounts. Many meter routes in the system contain meters that are over 12 years old or will be within the next five years. In the past two years, EPCOR has replaced an estimated 2,553 meters per year, on average. In order to ensure meter reading accuracy throughout the system, EPCOR plans to continue replacing inaccurate meters at a comparable pace.

4.2 Best Management Practices

The Arizona Department of Water Resources' (ADWR) Modified Non-Per Capita Conservation Program (MNPCCP) is one of the regulatory programs for large municipal water providers in Active Management Areas. It is a performance-based program (Best Management Practice or BMP) that participating water providers use to implement water conservation measures that result in water use efficiency in their service areas. ADWR's BMP for meter replacement and testing requires 2" and smaller meters be replaced at a minimum of every 15 years. EPCOR has adopted the following BMP for its Sun City district:

Meter Repair and/or Replacement Tariff – BMP 4.2

PURPOSE

A program for the Company to systematically assess all in-service water meters (including Company production meters) in its water service area to identify under-registering meters and to repair or replace them (Modified Non-Per Capita Conservation Program Best Management Practice Category 4: Physical System Evaluation and Improvement 4.2 Meter Repair and/or Replacement Program).

REQUIREMENTS

The requirements of this tariff are governed by Rules of the Arizona Corporation Commission and were adapted from the Arizona Department of Water Resources' Required Public Education Program and Best Management Practices in the Modified Non-Per Capita Conservation Program.

1. On a systematic basis, the Company will replace all 2-inch and smaller in-service water meters at least once every fifteen years.
2. The Company will test all meters that have caused a meter reading complaint to be filed with the Arizona Corporation Commission.
3. Meters larger than 2-inch shall be tested for one of the following reasons:
   a. A meter reading complaint is filed with the Company by a customer or Arizona Corporation Commission Staff,
   b. A meter has been in service for five years.
4. The test will be accomplished by one of the following:
   a. Having the meter pulled and having a Company Technician physically inspect each meter and its fittings for leaks, registers which may have become loose or are not properly attached to the meter and could be under-registering or other broken parts which need repair.
   b. Utilizing equipment to verify that all electronic components are within manufacturer specifications and are operating properly.
5. In addition, meters shall be randomly selected for flow testing utilizing a flow through detector testing meter.
6. All replacement water meters shall register in gallons in increments equal to or less than as follows:
   a. All new 1-inch and smaller meters that are installed will register usage in 1 gallon increments,
   b. All new 1-1/2-inch through 4-inch meters that are installed will register in 10 gallon increments, and
   c. All new 6-inch and larger meters that are installed will register in 100 gallon increments.
7. The Company shall keep records on the number of meters that were replaced and make this information available to the Commission upon request.

4.3 Industry Standards

EPCOR contacted other water utilities around the country to find out what their standard for meter replacement has been. Most of these utilities believe that replacing meters every 10 to 15 years is appropriate. Different studies around the country determined that a 10 to 20 year range

is acceptable; however, there is no exact age that determines the time when a meter should be replaced. A meter's accuracy is dependent on many factors including water quality, water temperature, the flow rate passing through the meter, and the quantity of water that passes through the meter.

4.4 Meter Replacements

EPCOR plans to continue with the annual meter replacement program at a slightly slower pace than that of the last two years. The program will target meter routes with the oldest meters first, as well as meters in critical areas where there have been instances of zero read meters. Prior to replacing the meters in a specific route, 10% of the meters will be tested for accuracy. If these meters do not meet the accuracy requirements described in our meter testing program, all of the meters in the route will be replaced; otherwise another meter route will be considered and tested for replacement need. A copy of the Company's meter testing and replacement guidelines is included in the following tab, **Meter Testing**.

Note that the timing of meter replacements will not necessarily coincide with the timing of service line replacements. Meters located in service line replacement areas may not be ready for replacement at the time of the service line replacements, and vice versa. Meters are being replaced according to meter route, and service lines are being replaced by street. However, when service lines are replaced, the meters on that street will be tested according to EPCOR's meter testing program, and if they are found to meet the requirements for replacement, they will be replaced at the time of the service line replacements; these meters will then *not* be replaced again under the meter replacement schedule.

EPCOR plans to replace an average of 2,320 meters per year over the next five years and continue at this pace until the all meters in the system are replaced. Meter replacement projects for the next five years are described in the following tabs labeled **2015, 2016, 2017, 2018, and 2019**. SIB Plant Table I, 4-1 through SIB Plant Table I, 4-5 provide a detailed description of each meter replacement project. The tables are broken down by year, so there is a separate table for each year from 2015 (Table I, 4-1) through 2019 (Table I, 4-5). Each project addresses a set of meter replacements that will occur within a defined meter route. Each project can also be tied to a map showing the proposed meter replacements. A detailed cost estimate for each project is also provided.

Meter Testing

FIELD OPERATIONS STANDARD OPERATING PRACTICES	Effective Date:	10-8-07
	Revised Date:	9-10-12

SOP NAME: **SMALL METER TESTING**	SOP #: **CFO-312**

TYPE: Preventative Maintenance	**DIVISION:** Field Operations	**Activity Definitions:**

OBJECTIVE

The objective of document is to provide consistent procedures for conducting preventative maintenance by testing water meters for accurate measurement of water consumption.

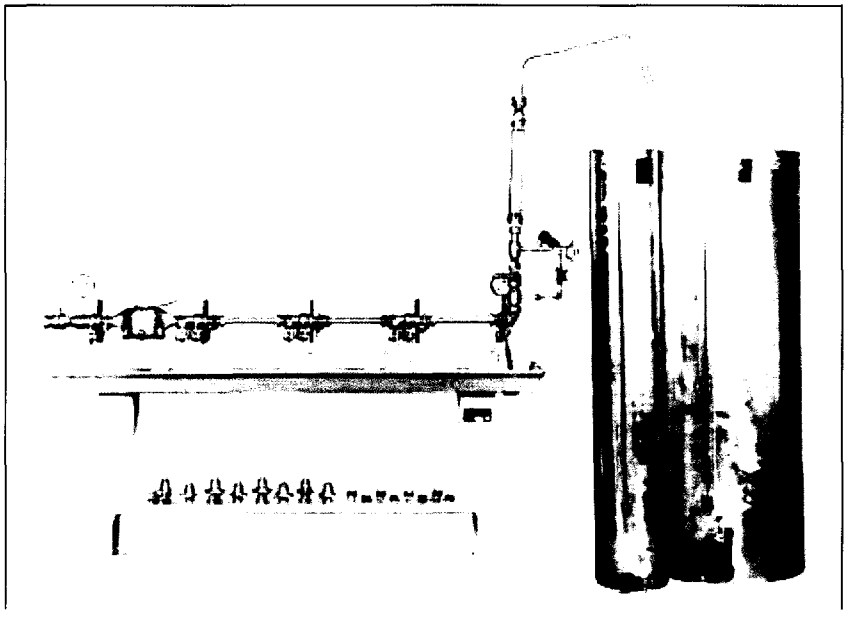
GOAL

The goal is for all personnel to consistently perform water meter testing using the same steps.

SCOPE

The practices and procedures in this program apply to all Field Operations employees, and contractors working on behalf of EPCOR Water, performing water meter testing.

ILLUSTRATION



PRECAUTIONS

1. Water lines are under constant pressure.
2. Pinch hazards.
3. Ford Meter Test Bench (pictured above)

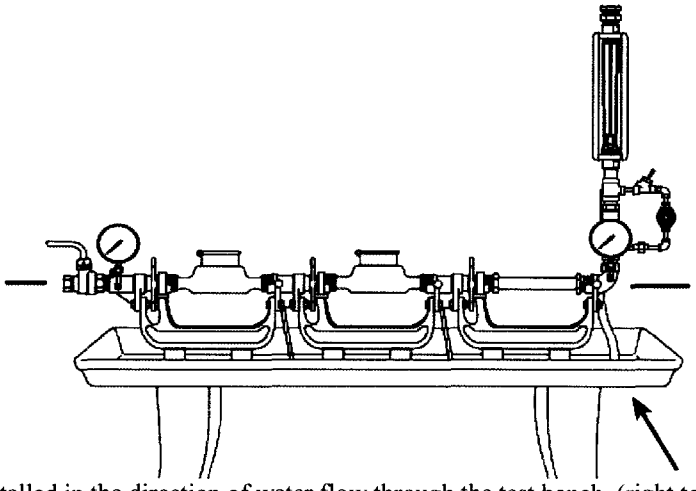
PROCEDURE

The Ford Indianapolis Test Bench will be used to test water meters in sizes 5/8" through 3/4" short; and the Ford Akron Test Bench will be used to test meters in sizes 3/4" long through 3". Always test meters of the same size at the same time. Both test benches have a water supply valve to supply water pressure to operate the hydraulic clamping cylinders. This valve should remain open at all times.

We will first go through the procedures for the Indianapolis Test Bench.

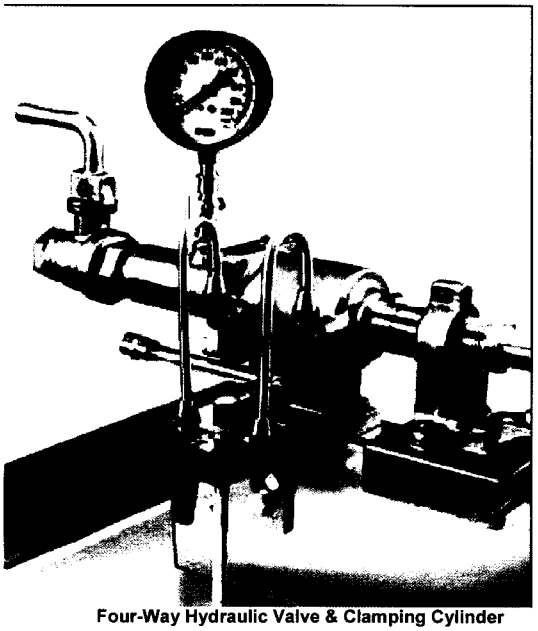
1. Check to see that all gaskets are in-place for each meter saddle.

2. If all meter saddles (9) will not be used, install a ⅝" or ¾" idler bar in each unused meter saddle. (See example below)



3. Make sure meters are installed in the direction of water flow through the test bench, (right to left).

4. Clamp the meters into position by turning the lever handle on the four hydraulic valve to the straight up position. Turning the valve ¼ turn counter-clockwise will release the meters from the clamped position. (See the picture below)



Four-Way Hydraulic Valve & Clamping Cylinder

5. Once all meters and/or idler bars are securely clamped in-place, open the blow-off valve and close the outlet valve going to the Testerate Indicator (rate of flow gauge). Slowly open the inlet valve to purge all the air from the meters. Once the air is purged, close the blow-off valve and slowly open the outlet valve to slowly purge all air from the entire test bench system. Once the purging is complete, close the outlet valve. Verify that there are no leaks from any gaskets, valves, or fittings before proceeding with the testing. Repair all leaks as needed.

6. With the outlet valve closed and the inlet valve open, adjust the meters to an easily recordable start point (dial hand on a whole number or zero) by using the bleeder valves. By opening the bleeder valve for each meter, this allows water to flow through the meter to position the dial hand to a start point. Adjust the outlet/last meter first (far left position), then move to the next (upstream) meter with each successive adjustment. You must use the blow-off valve to adjust the meter in the last position. Eventually all meters will be adjusted to a start point and ready for testing. Document the start point and the meter reading for each meter prior to testing.

7. Make sure the appropriate calibrated tank is empty and the tank drain valve is closed. The 10-gallon tank is used for low or intermediate flow tests and the 100 gallon tank is used for high flow tests. Rotate the calibration tank fill tube over the appropriate tank. Now you are ready to begin testing the meters.

8. The following chart indicates the American Water Works Association (AWWA) test requirements for new, rebuilt and repaired cold water meters:

Maximum Rate (All Meters)					Intermediate Rate (All Meters)				Minimum Rate (New and Rebuilt)				
Size In.	Rate† of Flow gpm	Test Quantity†† Gal.	Test Quantity†† Cu. Ft.	Accuracy Limits Percent	Rate of Flow gpm	Test Quantity†† Gal.	Test Quantity†† Cu. Ft.	Accuracy Limits Percent	Rate of Flow gpm	Test Quantity†† Gal.	Test Quantity†† Cu. Ft.	Accuracy Limits Percent New & Rebuilt Meters	Accuracy Limits Percent Repaired Meters
DISPLACEMENT METERS (AWWA C700 AND C710)													
5/8	15	100	10	98.5-101.5	2	10	1	98.5-101.5	1/4	10	1	95-101	90
5/8x3/4	15	100	10	98.5-101.5	2	10	1	98.5-101.5	1/4	10	1	95-101	90
3/4	25	100	10	98.5-101.5	3	10	1	98.5-101.5	1/2	10	1	95-101	90
1	40	100	10	98.5-101.5	4	10	1	98.5-101.5	3/4	10	1	95-101	90
1-1/2	50	100	10	98.5-101.5	8	100	10	98.5-101.5	1-1/2	100	10	95-101	90
2	100	100	10	98.5-101.5	15	100	10	98.5-101.5	2	100	10	95-101	90
3	150	500	50	98.5-101.5	20	100	10	98.5-101.5	4	100	10	95-101	90
4	200	500	50	98.5-101.5	40	100	10	98.5-101.5	7	100	10	95-101	90
6	500	1,000	100	98.5-101.5	60	100	10	98.5-101.5	12	100	10	95-101	90

We will start with the Low Flow Test. Switch the flow mode to Low on the electric flow control system panel. Turn the power switch to the on position. Quickly adjust the flow rate to ¼ gpm (5/8" meter) on the Testerate Indicator Gauge. The rate-of-flow is measured even with the flat top of the rotor body. Considering this is not a time measured test, it's not too critical for the flow rate to be precisely ¼ gpm throughout the length of the test. However, make every effort to keep the flow rate at ¼ gpm. The flow rate may fluctuate during the test, if the system pressure changes. *If the electric flow control system is not available or required, perform the test manually by slowly opening the outlet valve and quickly adjusting the flow rate to 1/4 gpm.*

9. Once the water level reaches the specified quantity level in the calibrated tank (see chart above), the flow valve should close automatically. If not, manually close the outlet valve. Record the meter reading and calculate the meter accuracy using the following equation:

   Final Meter Reading - Initial Meter Reading = Measured Flow Registered

   5/8" meter minimum flow rate 10 gallon test
   Example #1 0654090.9 - 0654082.8 = 8.1 = Meter running slow
   Example #2 1054230.5 - 1054220.4 = 10.1 = Meter running fast

   In Example #1, this meter test result is outside our tariff of >3% (9.7 gallons) and would need to be replaced.
   In Example #2, this meter test result is within our tariff of >3% (10.3 gallons) and would not require replacement. This meter should be reinstalled at its original service location. Repeat this calculation for each meter tested. A meter running slow, more than 3% accuracy, would require replacement. A meter running fast, more than 3% accuracy, would require replacement and a credit to the customer.

   All customer meters must meet the Arizona Corporation Commission (ACC) accuracy of 3%.

10. Repeat steps 6 – 9 to run the Intermediate and/or Maximum Rate Flow Test. Reference the appropriate column in the chart above for the test rate-of-flow gpm.

11. Once all tests are complete, remove all meters tested, and attach Meter Test Result Tag. Record all meter test results in the Meter Test Data Base.

We will now go through the procedures for the Akron Test Bench.

1. Check to see that all gaskets are in-place for each meter saddle.

2. If all meter saddles (3) will not be used, install the 2" idler bar in each unused meter saddle. Install the correct meter adapter (located on back row of test bench) for each size meter as follows:

¾" Long	HT-16&HT-12A
1"	HT-14
1½"	HT-15
2"	Not Required
3"	Not Required

3. Make sure meters are installed in the direction of water flow through the test bench, (left to right).

4. Clamp the meters into position by turning the lever handle on the four hydraulic valve to the right (On). Turning the valve to the left (Off) will release the meters from the clamped position. The center position is a neutral position. (See the picture below)

5. Once all meters and/or idler bars are securely clamped in-place, open the blow-off valve and close the outlet valve going to the Testerate Indicator (rate of flow gauge). Slowly open the inlet valve to purge all the air from the meters. Once the air is purged, close the blow-off valve and slowly open the outlet valve to slowly purge all air from the entire test bench system. Once the purging is complete, close the outlet valve. At this point, determine the maximum rate of flow expected for your meter test. All rate of flows less than 36 gpm should be performed with the Testerate By-pass Valve in the close position. All rates of flows over 36 gpm up to 170 gpm should be performed with the Testerate By-pass Valve in the close position and are read from the auxiliary scale mounted along side the tube. The rate of flow is measured even with the flat top of the rotor body. Verify that there are no leaks from any gaskets, valves, or fittings before proceeding with the testing. Repair all leaks as needed.

6. With the outlet valve closed and the inlet valve open, adjust the meters to an easily recordable start point (dial hand on a whole number or zero) by using the bleeder valves. By opening the bleeder valve for each meter, this allows water to flow through the meter to position the dial hand to a start point. Adjust the outlet/last meter first (far left position), then move to the next (upstream) meter with each successive adjustment. You must use the blow-off valve to adjust the meter in the last position. Eventually all meters will be adjusted to a start point and ready for testing. Document the start point and the meter reading for each meter prior to testing.

7. Make sure the appropriate calibrated tank is empty and the tank drain valve is closed. The 10-gallon tank is used for low or intermediate flow tests and the 100 gallon tank is used for high flow tests. Rotate the calibration tank fill tube over the appropriate tank. Now you are ready to begin testing the meters.

8. We will start with the Low Flow Test. Slowly open the outlet valve and quickly adjust the flow rate to ¾ gpm on the Testerate Indicator Gauge. The rate-of-flow is measured even with the flat top of the rotor body. Considering this is not a time measured test, it's not too critical for the flow rate to be precisely ¾ gpm throughout the length of the test. However, make every effort to keep the flow rate at ¾ gpm. The flow rate may fluctuate during the test, if the system pressure changes.

   All 3" hydrant meters will be tested at the following flow rates and quantities:

Intermediate	20 gpm	100 gallons
Minimum	8 gpm	100 gallons

9. Once the water level reaches the specified quantity level in the calibrated tank (see chart above), the flow valve should close automatically. If not, manually close the outlet valve. Record the meter reading and calculate the meter accuracy using the following equation:

Final Meter Reading - Initial Meter Reading = Measured Flow Registered

3" meter maximum flow rate, 100 gallon test
Example #1 01654178 - 01654082 = 96 = Meter running slow
Example #2 01054322 – 01054220 = 102 = Meter running fast

In Example #1, this meter test result is outside our tariff of >3% (96 gallons) and would need to be replaced.
In Example #2, this meter test result is within our tariff of >3% (102 gallons) and would not require replacement. This meter should be reinstalled at its original service location. Repeat this calculation for each meter tested. A meter running slow, more than 3% accuracy, would require replacement. A meter running fast, more than 3% accuracy, would require replacement and a credit to the customer.

All customer meters must meet the Arizona Corporation Commission (ACC) accuracy of 3%.

10. Repeat steps 6 – 9 to run the Intermediate and/or Maximum Rate Flow Test. Reference the appropriate column in the chart above for the test rate-of-flow gpm.

11. Once all tests are complete, remove all meters tested, and attach Meter Test Result Tag. Record all meter test results in the Meter Test Data Base.

MEL HUNTSPON **September 10, 2012**
Manager, Field Operations

2015

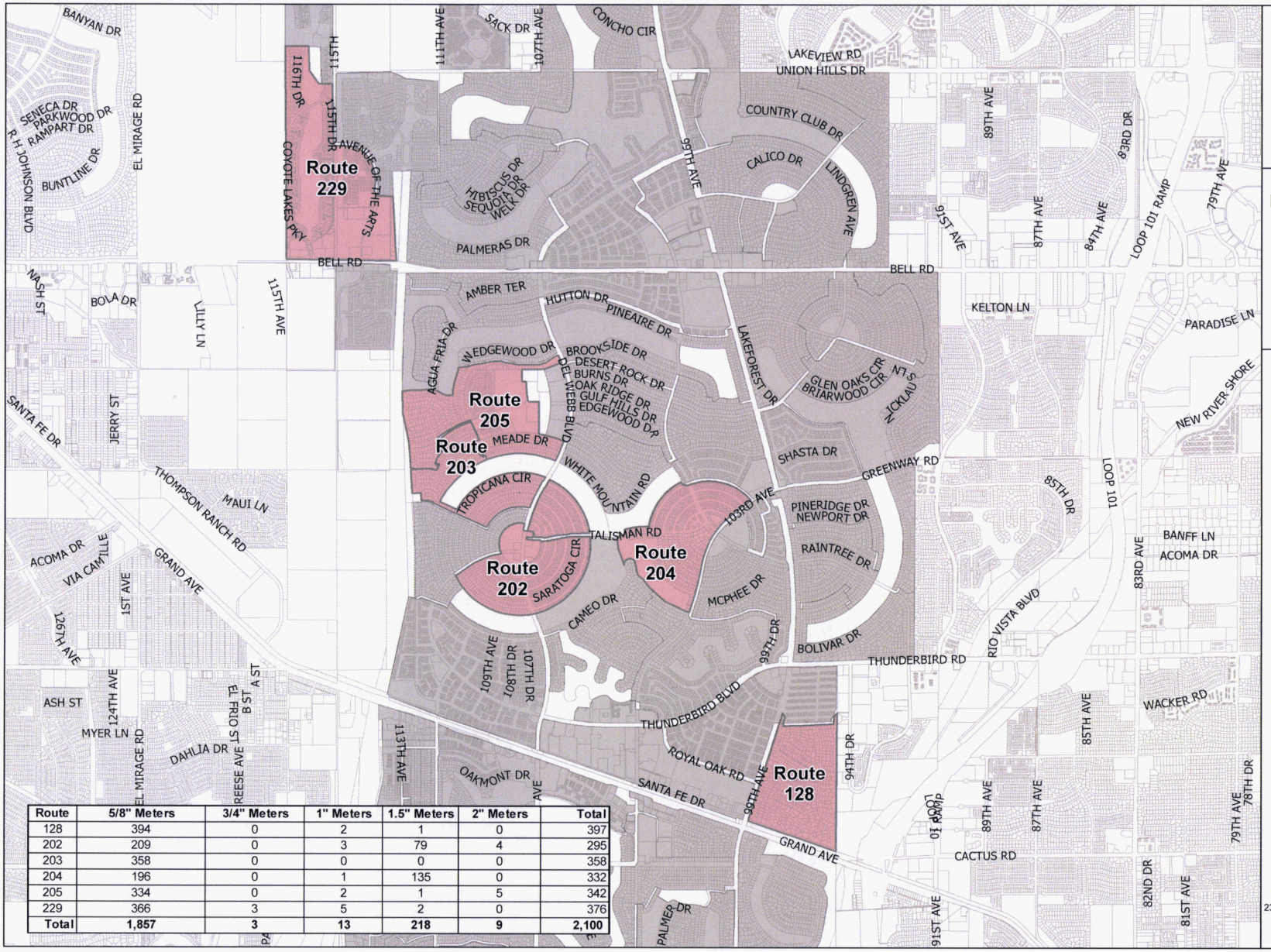
Sun City water distr[illegible] PWS ID No. 07-099

SIB PLANT TABLE I, 4-1

2015 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-1	334	meters	2,100	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter Routes 128, 202, 203, 204, 205, and 229 (see map M-1 for detail)	12/2015	n/a	$409,508	Replace 1,857 - 5/8", 3 - 3/4", 13 – 1", 218 – 1.5", and 9 – 2" (2,100 total) meters in SC district Meter Routes 128, 202, 203, 204, 205, and 229. The existing meters in these routes will be at least 16 years old when replaced. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 of the SIB Report (Exhibit CC-1) for more explanation. See map M-1 in Exhibit CC-1 for the location of the meter routes.
Total			**2,100**							**$409,508**	



Route	5/8" Meters	3/4" Meters	1" Meters	1.5" Meters	2" Meters	Total
128	394	0	2	1	0	397
202	209	0	3	79	4	295
203	358	0	0	0	0	358
204	196	0	1	135	0	332
205	334	0	2	1	5	342
229	366	3	5	2	0	376
Total	**1,857**	**3**	**13**	**218**	**9**	**2,100**

2015

Project No: M-1
PWSID: 0407099

Sun City Water

Project Description:

2,100 Meters total to be replaced in Routes 128, 202, 203, 204, 205 and 229

Legend

- Other Routes
- Target Routes

N

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/7/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Number:	Project Location:
Marc Allen, P.E.	Sun City	M-1	Meter Routes 128, 202, 203, 204, 205, and 229

Project Description:

Replace 1,857 - 5/8", 3 - 3/4", 13 – 1", 218 – 1.5", and 9 – 2" (2,100 total) meters.

Materials & Labor

Quantity	Unit	$/Unit	Description	Estimated Item Cost
1857	5/8" Meter	139	New Meter	$ 257,714
3	3/4" Meter	159	New Meter	$ 476
13	1" Meter	194	New Meter	$ 2,521
218	1.5" Meter	292	New Meter	$ 63,621
9	2" Meter	350	New Meter	$ 3,149
1244	hours	28	Labor to install new 5/8" meters*	$ 34,837
2	hours	28	Labor to install new 3/4" meters*	$ 56
9	hours	28	Labor to install new 1" meters*	$ 244
327	hours	28	Labor to install new 1.5" meters*	$ 9,156
18	hours	28	Labor to install new 2" meters*	$ 504
Subtotal				$ 372,280
General Overhead Rate on Labor and Capital (10%)				$ 37,228
Total Estimated Cost				**$ 409,508**

*Company labor includes the salary for two employees at a rate of $28/hour for 20 minutes each for 3/4" and 1" meters, 45 minutes each for 1 1/2" meters, 1 hour each for 2" meters, and 2 hours each for meters larger than 2".

2016

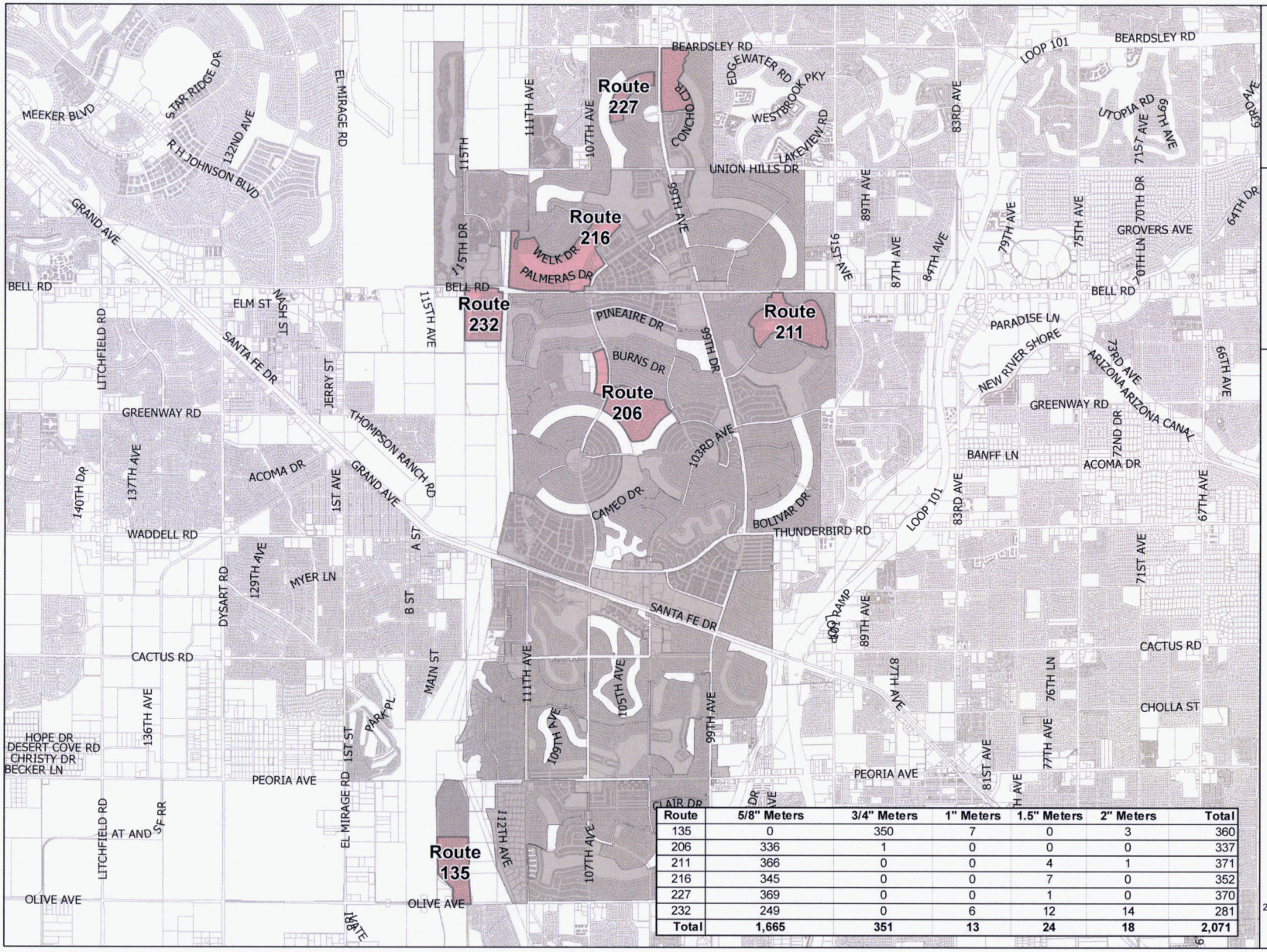
Sun City water distri[illegible] PWS ID No. 07-099

SIB PLANT TABLE I, 4-2

2016 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-2	334	meters	2,071	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter Routes 135, 206, 211, 216, 227, and 232 (see map M-2 for detail)	12/2016	n/a	$376,982	Replace 1,665 - 5/8", 351 – 3/4", 13 - 1", 24 – 1.5", and 18 – 2" (2,071 total) in SC district meter routes 135, 206, 211, 216, 227, and 232. The existing meters in these routes will be over 12 years old at replacement; meters in routes 227 and 232 will be 17 and 16 years old, respectively. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 of the SIB Report (Exhibit CC-1) for more explanation. See map M-2 in Exhibit CC-1 for the location of the meter routes.
Total			**2,071**							**$376,982**	



Route	5/8" Meters	3/4" Meters	1" Meters	1.5" Meters	2" Meters	Total
135	0	350	7	0	3	360
206	336	1	0	0	0	337
211	366	0	0	4	1	371
216	345	0	0	7	0	352
227	369	0	0	1	0	370
232	249	0	6	12	14	281
Total	**1,665**	**351**	**13**	**24**	**18**	**2,071**

2016

Project No: M-2
PWSID: 0407099

Sun City Water

Project Description:

2,071 Meters total to be replaced in Routes 135, 206, 211, 216, 227 and 232

Legend

- Other Routes
- Target Routes

N

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/7/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Number:	Project Location:
Marc Allen, P.E.	Sun City	M-2	Meter Routes 135, 206, 211, 216, 227, and 232

Project Description:

Replace 1,665 - 5/8", 351 – 3/4", 13 - 1", 24 – 1.5", and 18 – 2" (2,071 total) meters.

Materials & Labor

Quantity	Unit	$/Unit	Description	Estimated Item Cost
1665	5/8" Meter	139	New Meter	$ 231,069
351	3/4" Meter	159	New Meter	$ 55,739
13	1" Meter	194	New Meter	$ 2,521
24	1.5" Meter	292	New Meter	$ 7,004
18	2" Meter	350	New Meter	$ 6,298
1116	hours	28	Labor to install new 5/8" meters	$ 31,235
235	hours	28	Labor to install new 3/4" meters	$ 6,585
9	hours	28	Labor to install new 1" meters	$ 244
36	hours	28	Labor to install new 1.5" meters	$ 1,008
36	hours	28	Labor to install new 2" meters	$ 1,008
Subtotal				$ 342,711
General Overhead Rate on Labor and Capital (10%)				$ 34,271
Total Estimated Cost				**$ 376,982**

2017

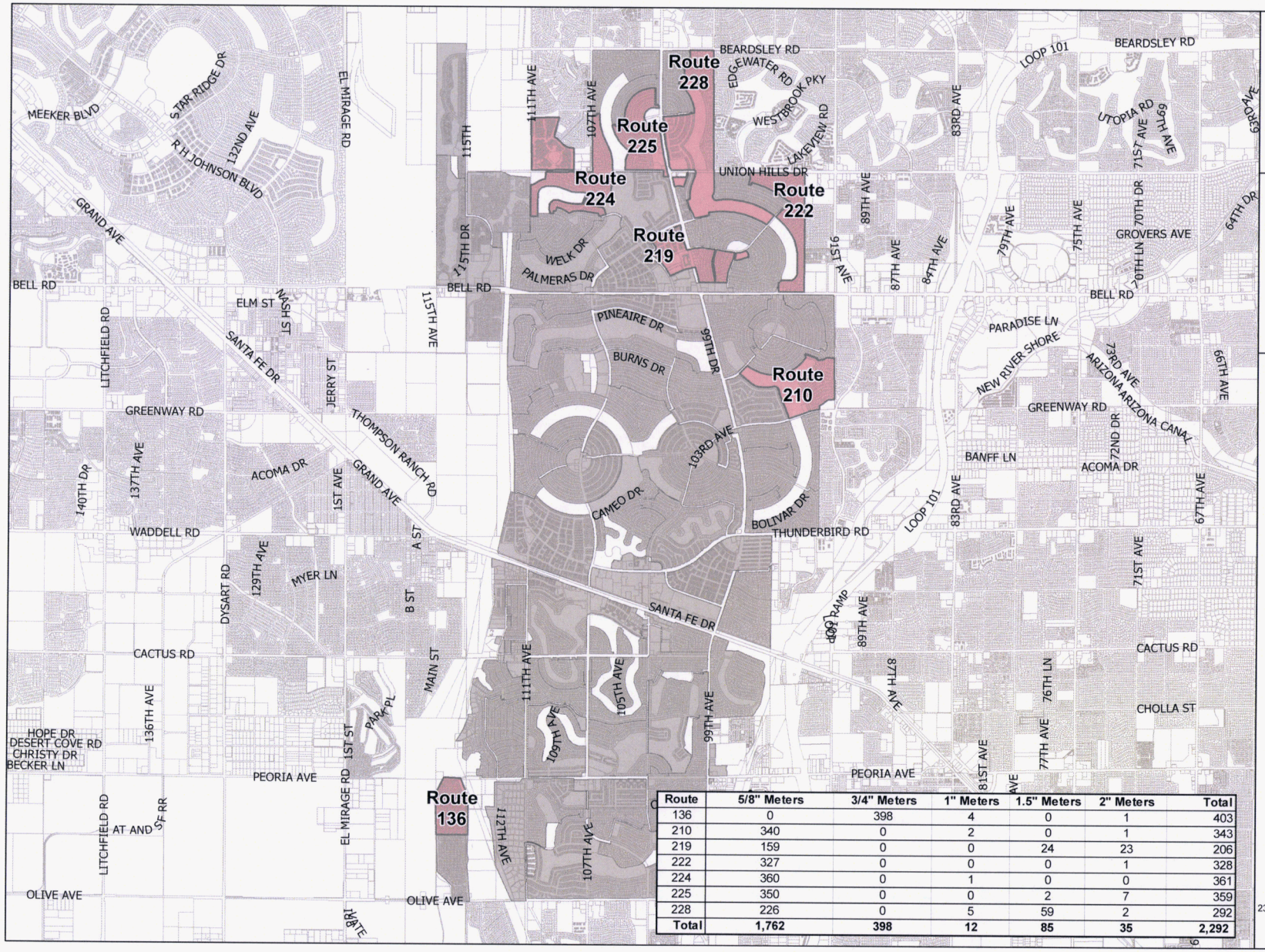
Sun City water distr[illegible] PWS ID No. 07-099

SIB PLANT TABLE I, 4-3

2017 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-3	334	meters	2,292	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter routes 136, 210, 219, 222, 224, 225, and 228 (see map M-3 for detail)	12/2017	n/a	$432,728	Replace 1,762 - 5/8", 398 - 3/4", 12 – 1", 85 – 1.5", and 35 – 2" (2,292 total) meters in SC district meter routes 136, 210, 219, 222, 224, 225, and 228. The existing meters in these routes will be between 12 and 13 years when replaced. The meters are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 of the SIB Report (Exhibit CC-1) for more explanation. See map M-3 in Exhibit CC-1 for the location of the meter routes.
Total			**2,292**							**$432,728**	



Route	5/8" Meters	3/4" Meters	1" Meters	1.5" Meters	2" Meters	Total
136	0	398	4	0	1	403
210	340	0	2	0	1	343
219	159	0	0	24	23	206
222	327	0	0	0	1	328
224	360	0	1	0	0	361
225	350	0	0	2	7	359
228	226	0	5	59	2	292
Total	1,762	398	12	85	35	2,292

2017

Project No: M-3
PWSID: 0407099

Sun City Water

Project Description:

2,292 Meters total to be replaced in Routes 136, 210, 219, 222, 224. 225 and 228

Legend

- Other Routes
- Target Routes

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/7/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Number:	Project Location:
Marc Allen, P.E.	Sun City	M-3	Meter Routes 136, 210, 219, 222, 224, 225, and 228

Project Description:

Replace 1,762 - 5/8",398 - 3/4", 12 – 1", 85 – 1.5", and 35 – 2" (2,292 total) meters.

Materials & Labor

Quantity	Unit	$/Unit	Description	Estimated Item Cost
1762	5/8" Meter	139	New Meter	$ 244,530
398	3/4" Meter	159	New Meter	$ 63,202
12	1" Meter	194	New Meter	$ 2,328
85	1.5" Meter	292	New Meter	$ 24,806
35	2" Meter	350	New Meter	$ 12,245
1181	hours	28	Labor to install new 5/8" meters	$ 33,055
267	hours	28	Labor to install new 3/4" meters	$ 7,466
8	hours	28	Labor to install new 1" meters	$ 225
128	hours	28	Labor to install new 1.5" meters	$ 3,570
70	hours	28	Labor to install new 2" meters	$ 1,960
Subtotal				$ 393,389
General Overhead Rate on Labor and Capital (10%)				$ 39,339
Total Estimated Cost				**$ 432,728**

2018

Sun City water distr[illegible] PWS ID No. 07-099

SIB PLANT TABLE I, 4-4

2018 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-4	334	meters	2,784	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter routes 131, 133, 212, 217, 218, 220, 221, and 231 (see map M-4 for detail)	12/2018	n/a	$534,279	Replace 2,380 - 5/8", 1 - 3/4", 215 – 1", 159 – 1.5", and 29 – 2" (2,784 total) meters in SC district meter routes 131, 133, 212, 217, 218, 220, 221, and 231. The existing meters in these routes will be between 12 and 17 years old when replaced. The meters are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 of the SIB Report (Exhibit CC-1) for more explanation. See map M-4 in Exhibit CC-1 for the location of the meter routes.
Total			**2,784**							**$534,279**	

Route	5/8" Meters	3/4" Meters	1" Meters	1.5" Meters	2" Meters	Total
131	473	0	0	0	0	473
133	194	0	2	0	0	196
212	383	0	0	3	2	388
217	340	0	0	1	0	341
218	22	0	9	144	24	199
220	362	0	0	0	0	362
221	310	0	0	2	0	312
231	296	1	204	9	3	513
Total	**2,380**	**1**	**215**	**159**	**29**	**2,784**

2018

Project No: M-4
PWSID: 0407099

Sun City Water

Project Description:

2,784 Meters total to be replaced in Routes 131, 133, 212, 217, 218, 220, 221 and 231

Legend

- Other Routes
- Target Routes

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/7/2014

EPCOR Water 2014 ©

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/11/2014
Prepared By: Marc Allen, P.E.	Water System: Sun City	Project Number: M-4	Project Location: Meter Routes 131, 133, 212, 217, 218, 220, 221, and 231

Project Description:

Replace 2,380 - 5/8", 1 - 3/4", 215 – 1", 159 – 1.5", and 29 – 2" (2,784 total) meters.

Materials & Labor

Quantity	Unit	$/Unit	Description	Estimated Item Cost
2380	5/8" Meter	139	New Meter	$ 330,296
1	3/4" Meter	159	New Meter	$ 159
215	1" Meter	194	New Meter	$ 41,701
159	1.5" Meter	292	New Meter	$ 46,403
29	2" Meter	350	New Meter	$ 10,146
1595	hours	28	Labor to install new 5/8" meters	$ 44,649
1	hours	28	Labor to install new 3/4" meters	$ 19
144	hours	28	Labor to install new 1" meters	$ 4,033
239	hours	28	Labor to install new 1.5" meters	$ 6,678
58	hours	28	Labor to install new 2" meters	$ 1,624
Subtotal				$ 485,708
General Overhead Rate on Labor and Capital (10%)				$ 48,571
Total Estimated Cost				**$ 534,279**

2019

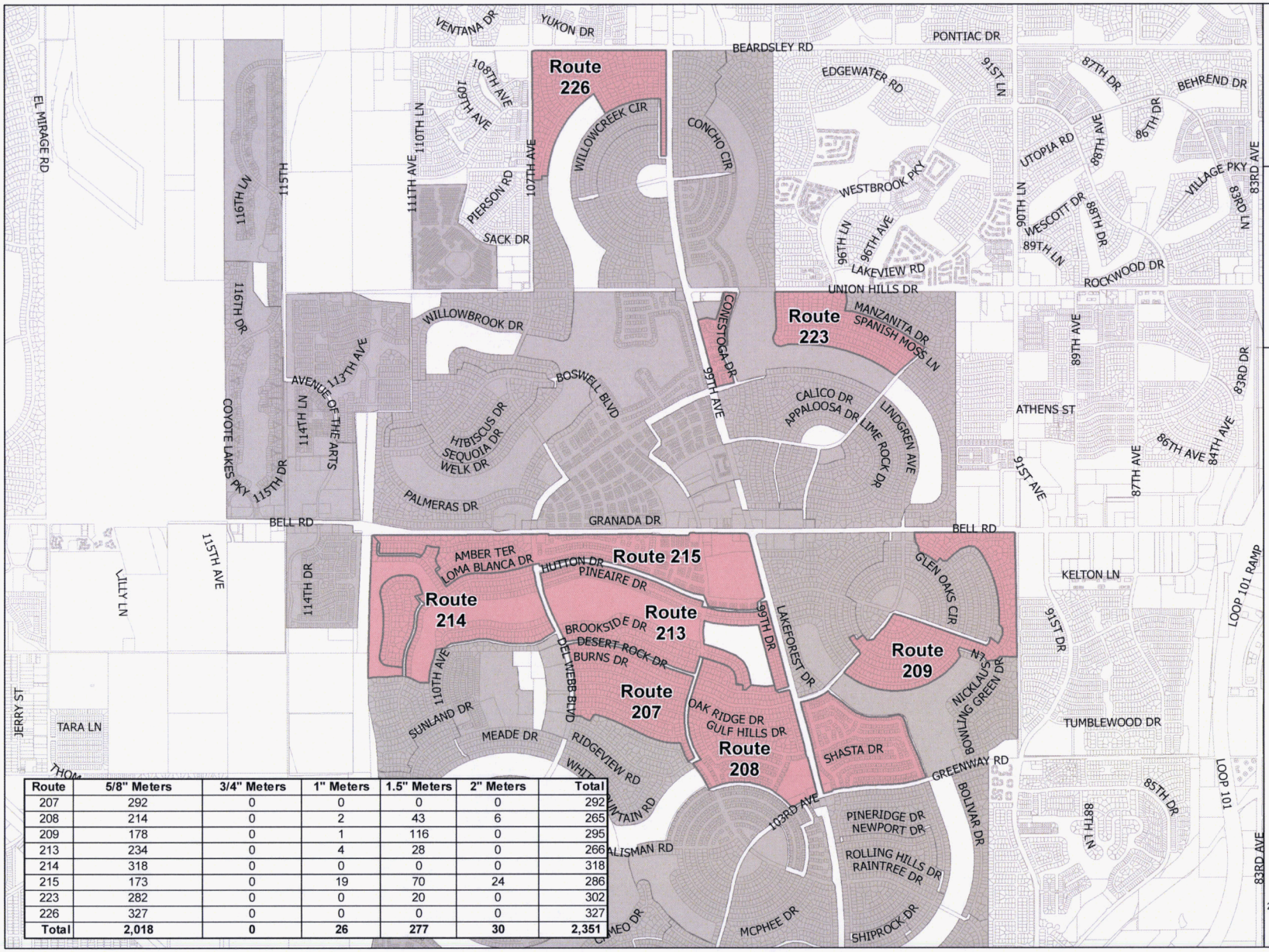
Sun City water distr[redacted] PWS ID No. 07-099

SIB PLANT TABLE I, 4-5

2019 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-5	334	meters	2,351	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter routes 207, 208, 209, 213, 214, 215, 223, and 226 (see map M-5 for detail)	12/2019	n/a	$470,906	Replace 2,018 - 5/8", 26 – 1", 277 – 1.5", and 30 – 2" (2,351 total) meters in SC district meter routes 207, 208, 209, 213, 214, 215, 223, and 226. The existing meters in these routes will be 14 years old when replaced. The meters are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 of the SIB Report (Exhibit CC-1) for more explanation. See map M-5 in Exhibit CC-1 for the location of the meter routes.
Total			**2,351**							**$470,906**	



Route	5/8" Meters	3/4" Meters	1" Meters	1.5" Meters	2" Meters	Total
207	292	0	0	0	0	292
208	214	0	2	43	6	265
209	178	0	1	116	0	295
213	234	0	4	28	0	266
214	318	0	0	0	0	318
215	173	0	19	70	24	286
223	282	0	0	20	0	302
226	327	0	0	0	0	327
Total	**2,018**	**0**	**26**	**277**	**30**	**2,351**

2019

Project No: M-5
PWSID: 0407099

Sun City Water

Project Description:

2,351 Meters total to be replaced in Routes 207, 208, 209, 213, 214, 215, 223 and 226

Legend

- Other Routes
- Target Routes

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/7/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Marc Allen, P.E.	Water System: Sun City	Project Number: M-5	Project Location: Meter Routes 207, 208, 209, 213, 214, 215, 223, and 226	
Project Description: Replace 2,018 - 5/8", 26 – 1", 277 – 1.5", and 30 – 2" (2,351 total) meters.				

Materials & Labor

Quantity	Unit	$/Unit	Description	Estimated Item Cost
2018	5/8" Meter	139	New Meter	$ 280,058
0	3/4" Meter	159	New Meter	$ -
26	1" Meter	194	New Meter	$ 5,043
277	1.5" Meter	292	New Meter	$ 80,840
30	2" Meter	350	New Meter	$ 10,496
1352	hours	28	Labor to install new 5/8" meters	$ 37,858
0	hours	28	Labor to install new 3/4" meters	$ -
17	hours	28	Labor to install new 1" meters	$ 488
416	hours	28	Labor to install new 1.5" meters	$ 11,634
60	hours	28	Labor to install new 2" meters	$ 1,680
Subtotal				$ 428,096
General Overhead Rate on Labor and Capital (10%)				$ 42,810
Total Estimated Cost				**$ 470,906**

SIB ENGINEERING REPORT

(Exhibit CC-1-C)

EPCOR Water (USA) Inc.

Paradise Valley Water District

PWS ID No. 0407056

February 28, 2014

Introduction

EPCOR Water is submitting this report as **Exhibit CC-1-C** for the direct testimony of Candace Coleman. The intent of this report is to support EPCOR's System Improvement Benefit (SIB) application for its Paradise Valley district. Included in this report are a brief system introduction followed by detailed project justifications for asset replacement projects. Each project is accompanied by the corresponding **SIB Plant Table I.**

EPCOR Water supplies water to approximately 5,000 customers in the Paradise Valley Water District. The distribution system is comprised of about 130 miles of pipe and 1,500 distribution system valves. During the last two years, approximately $1.0 million was spent replacing services, valves, and mains. This is only a small portion of the total items that need to be replaced, and only addressed the egregious and visible infrastructure failures. The budget for replacement of critical assets in this system needs to be increased to ensure the reliability of the system and to decrease system water loss.

In the past, assets were replaced when there was a noticeable failure such as water surfacing. This type of reactive approach is typically more expensive as replacements usually occur in an emergency situation, sometimes requiring an unnecessary interruption in water service. It may also result in water losses, overtime pay, and paying a premium for parts. Another concern, related to reactive maintenance, is public health and safety. Emergency repairs may require unanticipated shutdowns of the distribution system, leaving homes and possibly fire hydrants without water. Saturated soils, resulting from leaking pipes, may undermine roads, utilities, and other structures.

EPCOR has developed a planned replacement approach to asset management for the future. For service lateral, valve, and water main replacements, EPCOR is using an industry standard Nessie Curve that relies on infrastructure age and historical data to help predict the rate of failure that will occur in the future. Results of the Nessie Curve are used as a baseline to assist in determining which asset types are the most critical for replacement.

The remainder of this report will give a detailed explanation of the replacements planned for the next five years and an overview of the condition of the Paradise Valley Water system infrastructure. Service line, valve, and water main replacement projects are broken down and

described by year in the SIB Plant Table I; a map and cost estimate are provided for each project. The information is organized as follows:

- Section 1 – Services
- Section 2 – Valves
- Section 3 – Water Mains

The following table summarizes the recommended estimated project quantities and spending per category by year for the next five years. It is estimated that a total of about $7.0 million will be spent over the next five years, with an average spend of $1.4 million per year. These costs are expected to vary slightly by year depending on field conditions, business requirements, and staff availability.

Asset Replacements - Paradise Valley Water District, 2015-2019

Asset Type	2015		2016		2017		2018		2019		Total	
	units	$	units	$	units	$	units	$	units	$	units	$
Mains	2,088	$ 454,179	1,982	$ 346,614	1,700	$ 291,500	2,030	$ 362,142	1,426	$ 224,369	9,226	$ 1,678,804
Services	209	$ 813,727	212	$ 824,710	239	$ 930,283	232	$ 904,042	196	$ 761,957	1,088	$ 4,234,719
Valves	40	$ 203,628	40	$ 225,795	40	$ 242,691	40	$ 204,380	40	$ 229,975	200	$ 1,106,469
Total		**$ 1,471,534**		**$ 1,397,119**		**$ 1,464,474**		**$ 1,470,564**		**$ 1,216,301**		**$ 7,019,992**

Section 1 - Services

SECTION 1 – SERVICES

1.1 Overview

Based on the current customer count in EPCOR's Paradise Valley Water district, there are about 5,000 active service laterals. Most of these services were installed between 1950 and 1980. Replacement of service lines is a priority for a number of reasons, including the age of the service lines and the material of the pipe.

1.2 Nessie Curve

A "Nessie Curve" is a graphical representation of the annual replacement needs for buried infrastructure. Because it is not economical or feasible to inspect all buried infrastructure, the curve uses historical replacement data and statistical analysis to determine when an asset has reached the end of its useful life and is likely to need replacement. The end of an asset's useful life is when it is considered economically efficient to replace it; this is to say when replacement becomes less expensive than the cost of replacement or repairs in the future. Failure to replace assets when it is economical to do so can be disastrous in the future, when demographic and economic conditions may have changed. As an example, if the population of an area were to decrease in the future, the financial burden of asset replacements on the remaining population would become increasingly difficult, especially if prudent replacements have not been completed in the past.

According to the American Water Works Association (AWWA) "there will be a three-fold increase in the repair costs by the year 2030 despite a concurrent increase of three and a half times in annual investments to replace pipes." [1] The AWWA estimates that buried drinking water infrastructure will need investments totaling more than $1 trillion nationwide in the next 25 years.[2] Given these daunting predictions, it is especially important for water utility providers to implement asset replacement programs now in order to properly manage the investments that will be needed in the future.

Exhibit 1-1 is the Nessie curve which was developed specifically for the service lines in EPCOR's Paradise Valley district. Exhibit 1-2 shows this same data in tabular format. The

[1] Reinvesting in Drinking Water Infrastructure, AWWA, May 2001

[2] Buried No Longer: Confronting America's Water Infrastructure Challenge, AWWA, 2012

curve shows that indeed the cost of replacement will be the highest between now and 2030, as predicted by AWWA. It shows that in the next six years, from 2015 through 2020, approximately $5.3 million should be invested in service line replacements in order to offset the rate at which the services are failing. This equates to about 226 service replacements per year, or an investment of about $881,000 per year in service line replacements.

Exhibit 1-1 – Service Line Nessie Curve

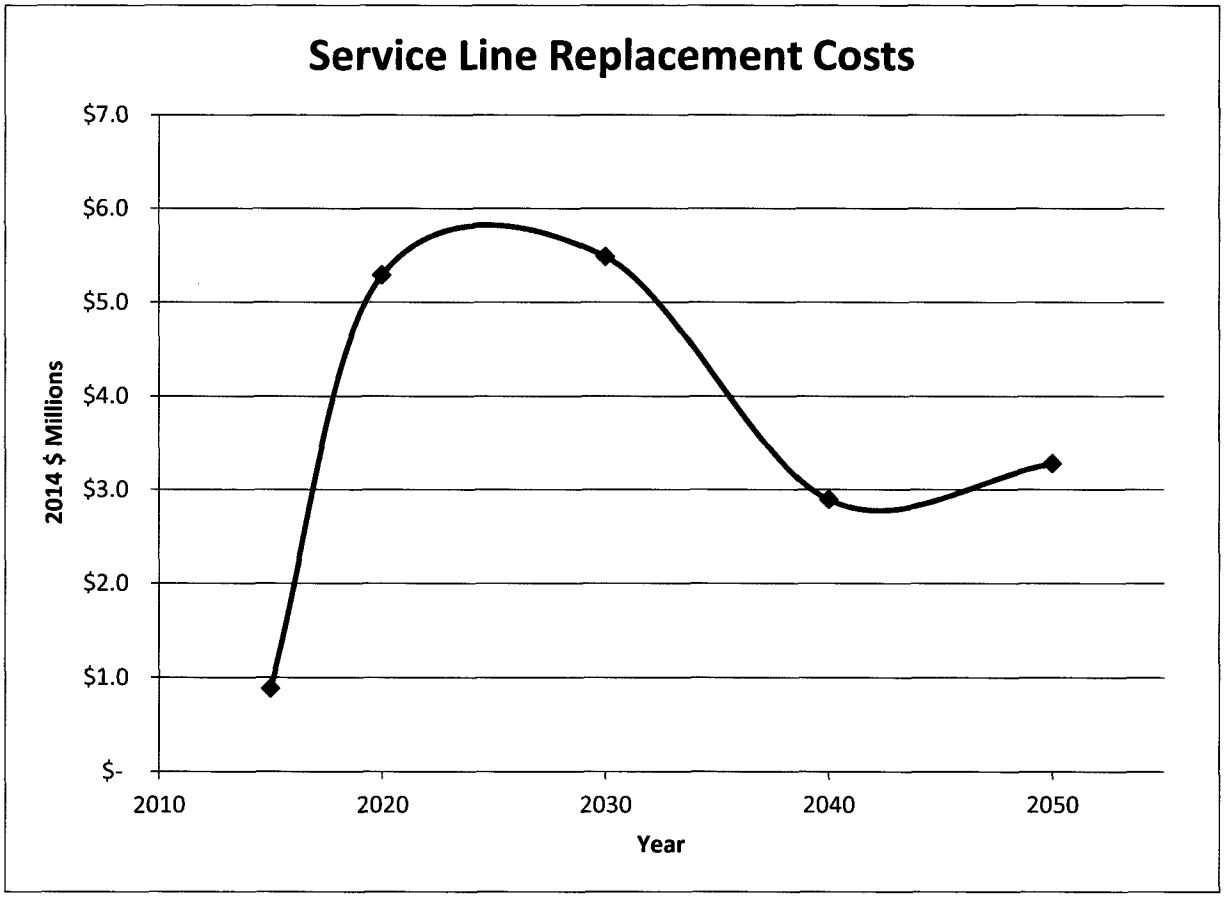


Exhibit 1-2 Nessie Curve Table

Time Frame	Number of Services to be Installed	Cost to Replace Services	Number of Service Replacements per Year	Cost per Year
today-2020	1357	$ 5,286,525	226	$ 881,087
2020-2030	1407	$ 5,484,261	141	$ 548,426
2030-2040	742	$ 2,890,941	74	$ 289,094
2040-2050	841	$ 3,275,952	84	$ 327,595

1.3 Service Line Material

The services to be replaced in Paradise Valley are galvanized steel pipe. Galvanized pipe is known to have a short lifetime, usually 25 to 40 years, according to the AWWA. Considering galvanized pipe was discontinued in use for water pipes in the 1970s, almost all galvanized pipe has reached the end of its useful life. As these pipes age, the zinc coating erodes from the pipe, leading to corrosion of other metals beneath the coating. Corrosion can build up on the inside walls of the pipes which can interfere with pressure and flow. Galvanized pipe also tends to corrode on the outside of the pipe in certain soil types. Exhibits 1-3, 1-4, and 1-5 are pictures of galvanized service lines found and replaced in the Paradise Valley district. A large number of service line failures and leaks contribute to unnecessary water loss and service disruptions. Oftentimes, the water from many service line leaks never surfaces because of the porous soil and leaks can go undetected until the line is uncovered much later.

1.4 Service Line Replacements

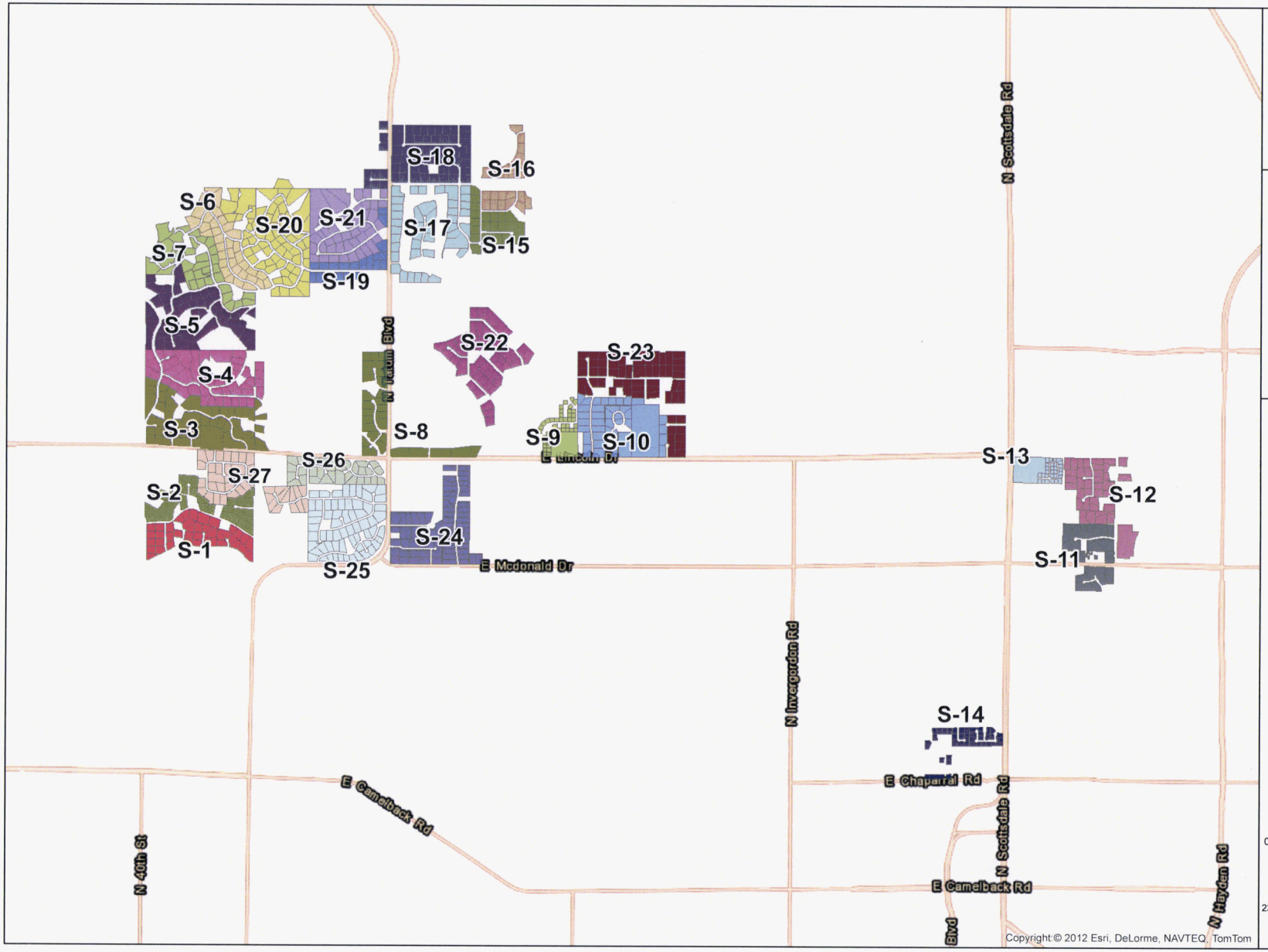
In 2012 and 2013, approximately 300 galvanized services were replaced in Paradise Valley. Between 2015 and 2019, EPCOR's plan is to replace approximately 218 services per year at an average estimated cost per year of $850,000.

Exhibit 1-3

Exhibit 1-4

Exhibit 1-5

The following map shows the locations of all the service line replacement projects. These projects are described in the following tabs labeled **2015, 2016, 2017, 2018, and 2019**. SIB Plant Table I, 1-1 through SIB Plant Table I, 1-5 provide detailed descriptions of each service line replacement project. The tables are broken down by year, so there is a separate table for each year from 2015 (Table I, 1-1) through 2019 (Table I, 1-5). Each project addresses a set of service line replacements that will occur within a defined area. Each project can also be tied to a map showing the parcels where the proposed service lines will be replaced. A cost estimate for each project is also provided.



Paradise Valley District

Project Area:

Paradise Valley Service Replacement Projects 2015-2019

Legend

S-1 Project Area

N

0.2 0.1 0 0.2 0.4 0.6 0.8 Miles

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/12/2014

EPCOR Water 2014

2015

Paradise Vall[illegible] PWS ID No. 0407056

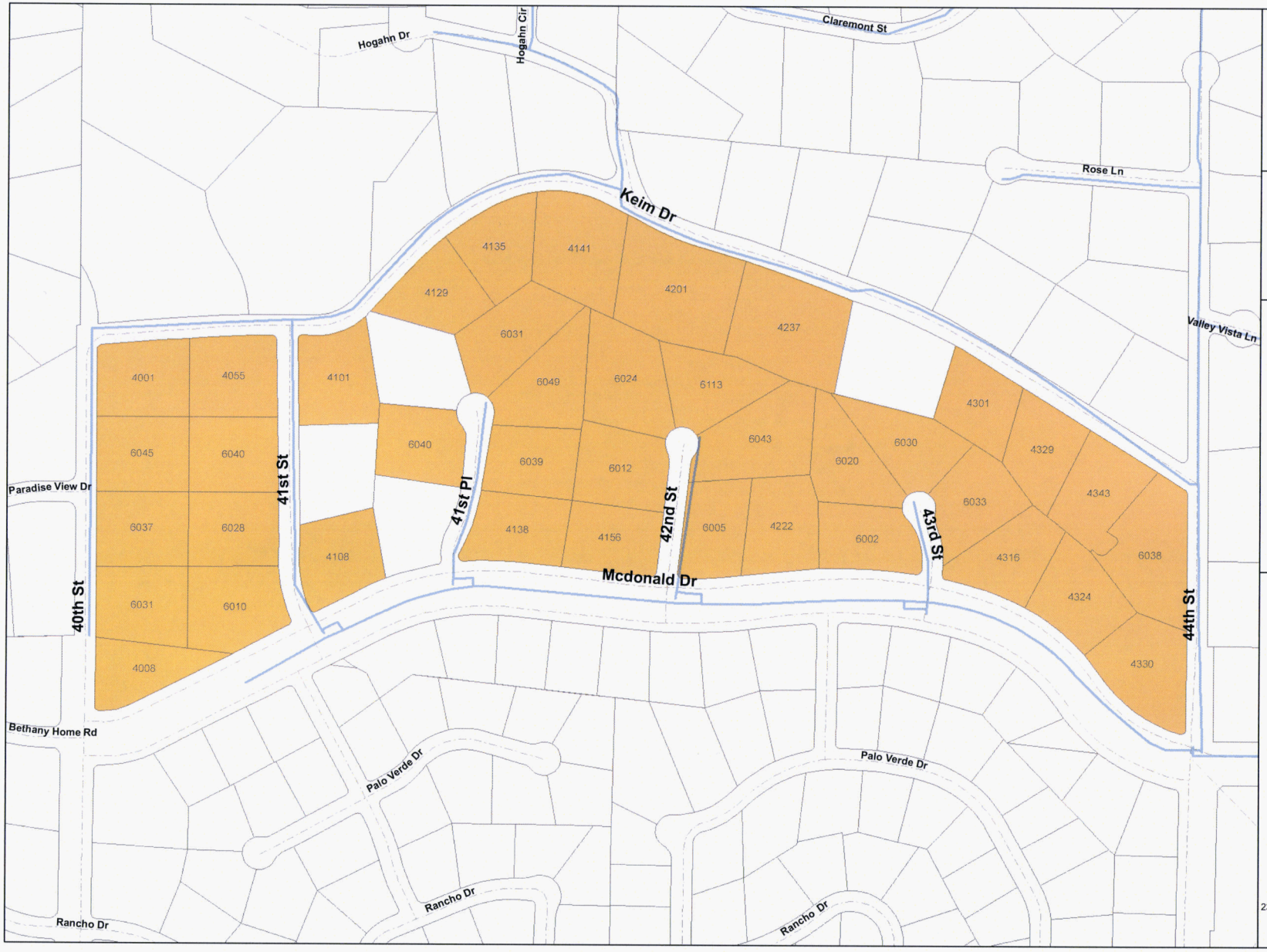
SIB PLANT TABLE I, 1-1

2015 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-1	333	service lines	39	33-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Keim Dr	12/2015	n/a	$151,879	Replace 33-1", 4-1.5", and 2-2" (39 total) residential services between McDonald Dr, Keim Dr, 40th St, and 44th St. These services are a priority for replacement because they are galvanized steel pipe and will be about 58 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-1 in Exhibit CC-1-C for more detail.
S-2	333	service lines	23	18-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Hoghan Dr	12/2015	n/a	$89,720	Replace 18-1", 3-1.5", and 2-2" (23 total) residential services north of Keim Dr between 44th St and 40th St. These services are a priority for replacement because they are galvanized steel pipe and will be about 58 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth See Section 1 narrative and Map No. S-2 in Exhibit CC-1-C for more detail.

S-3	333	service lines	55	52-1" 3-1.5"	Copper	1"-$3,881 1.5"-$3,947	Lincoln Dr	12/2015	n/a	$213,642	Replace 52-1" and 3-1.5" (55 total) residential services north of Lincoln Dr between 40th St and Hillside Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth See Section 1 narrative and Map No. S-3 in Exhibit CC-1-C for more detail.
S-4	333	service lines	45	37-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Highlands Dr	12/2015	n/a	$175,362	Replace 37-1", 5-1.5", and 3-2" (45 total) residential services on Highlands Dr and Lamar Rd between 40th St and Hillside Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-4 in Exhibit CC-1-C for more detail.
S-5	333	service lines	47	39-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Upper Ridge Way	12/2015	n/a	$183,124	Replace 39-1", 5-1.5", and 3-2" (47 total) residential services on Lakeside Ln and Sandy Mountain Rd between 40th St and Upper Ridge Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-5 in Exhibit CC-1-C for more detail.
Total			**209**							**$813,727**	



2015

Project No: S-1 •
PWSID: 0407056

Paradise Valley District

Project Area:

Keim Dr

Project Description:

Replace the following services:
4 residential services on Mcdonald Dr
2 residential services on 44th St
4 residential services on 43rd St
5 residential services on 42nd St
5 residential services on 41st Pl
4 residential services on 41st St
4 residential services on 40th St
11 residential services on Keim Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

90 45 0 90 180 270 360 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

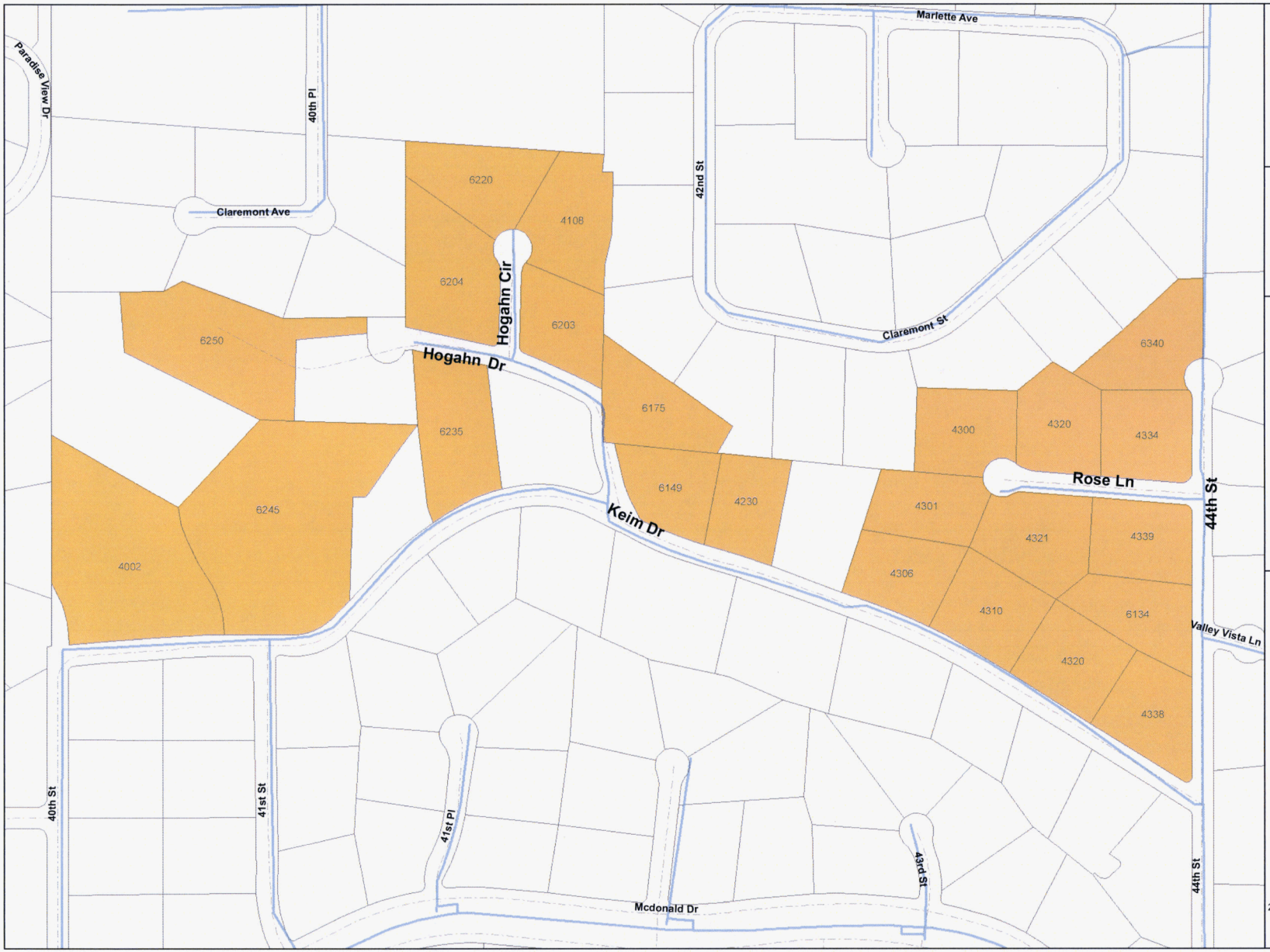
EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2015 S-1**	Project Location: Keim Dr, McDonald Dr, 44th St, 43rd St, 42nd St, 41st, Pl, 41st St, 40th St	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
33	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 115,500
4	1.5" service	3,560	Contractor material and labor to replace 1.5" residential services	$ 14,240
2	2" service	3,620	Contractor material and labor to replace 2" residential services	$ 7,240
39	hour	28	Company labor for field oversight and construction management	$ 1,092
Subtotal				$ 138,072
General Overhead Rate on Labor and Capital (10%)				$ 13,807
Total Estimated Cost				**$ 151,879**



2015

Project No: S-2 •
PWSID: 0407056

Paradise Valley District

Project Area:

Hogahn Dr

Project Description:

Replace the following services:
4 residential services on Hogahn Dr
4 residential services on Hogahn Cir
7 residential services on Keim Dr
2 residential services on 44th St
6 residential services on Rose Ln

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

90 45 0 90 180 270 360 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/4/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

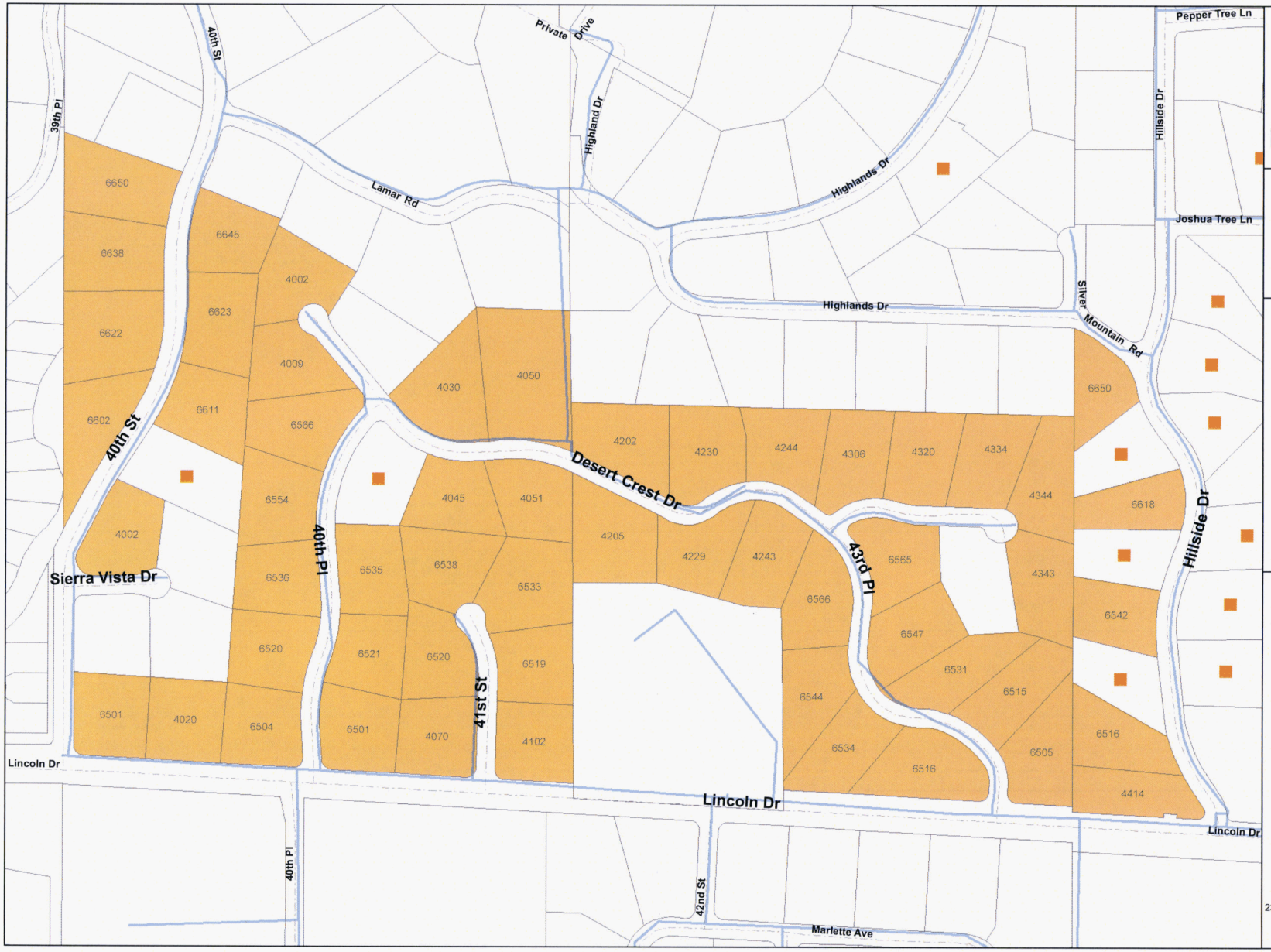
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2015 S-2**	Hoghan Dr, Hoghan Cir, Keim Dr, 44th St, Rose Ln

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
18	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 63,000
3	1.5" service	3,560	Contractor material and labor to replace 1.5" residential services	$ 10,680
2	2" service	3,620	Contractor material and labor to replace 2" residential services	$ 7,240
23	hour	28	Company labor for field oversight and construction management	$ 644
Subtotal				$ 81,564
General Overhead Rate on Labor and Capital (10%)				$ 8,156
Total Estimated Cost				**$ 89,720**



2015

Project No: S-3 •
PWSID: 0407056

Paradise Valley District

Project Area:

Desert Crest Dr

Project Description:

Replace the following services:
4 residential services on Lincoln Dr
9 residential services on 40th St
8 residential services on 40th Pl
4 residential services on 41st St
8 residential services on 43rd Pl
18 residential services on Desert Crest Dr
4 residential services on Hillside Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/12/2014

EPCOR Water 2014 •

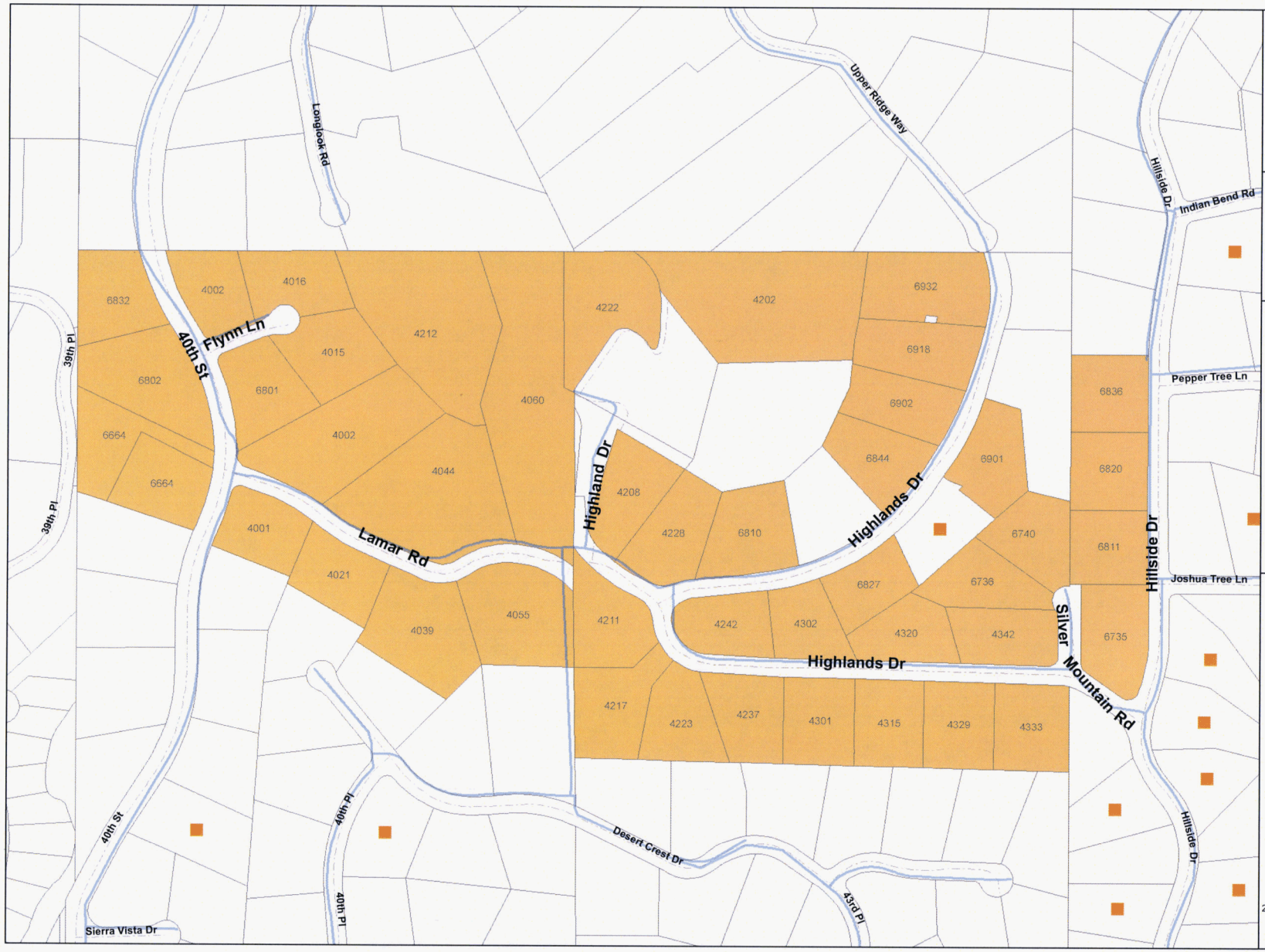
EPCOR Water **Preliminary Cost Estimate**				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2015 S-3**	Project Location: Lincoln Dr, 40th St, 40th Pl, 41st St, 43rd Pl, Desert Crest Dr, Hillside Dr	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
52	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 182,000
3	1.5" service	3,560	Contractor material and labor to replace 1.5" residential services	$ 10,680
55	hour	28	Company labor for field oversight and construction management	$ 1,540
Subtotal				$ 194,220
General Overhead Rate on Labor and Capital (10%)				$ 19,422
Total Estimated Cost				**$ 213,642**



2015

Project No: S-4 •
PWSID: 0407056

Paradise Valley District

Project Area:

Highlands Dr

Project Description:

Replace the following services:
5 residential services on 40th St
3 residential services on Flynn Ln
11 residential services on Lamar Rd
20 residential services on Highlands Dr
3 residential services on Silver Mountain Dr
3 residential services on Hillside Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

100 50 0 100 200 300 400
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/4/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

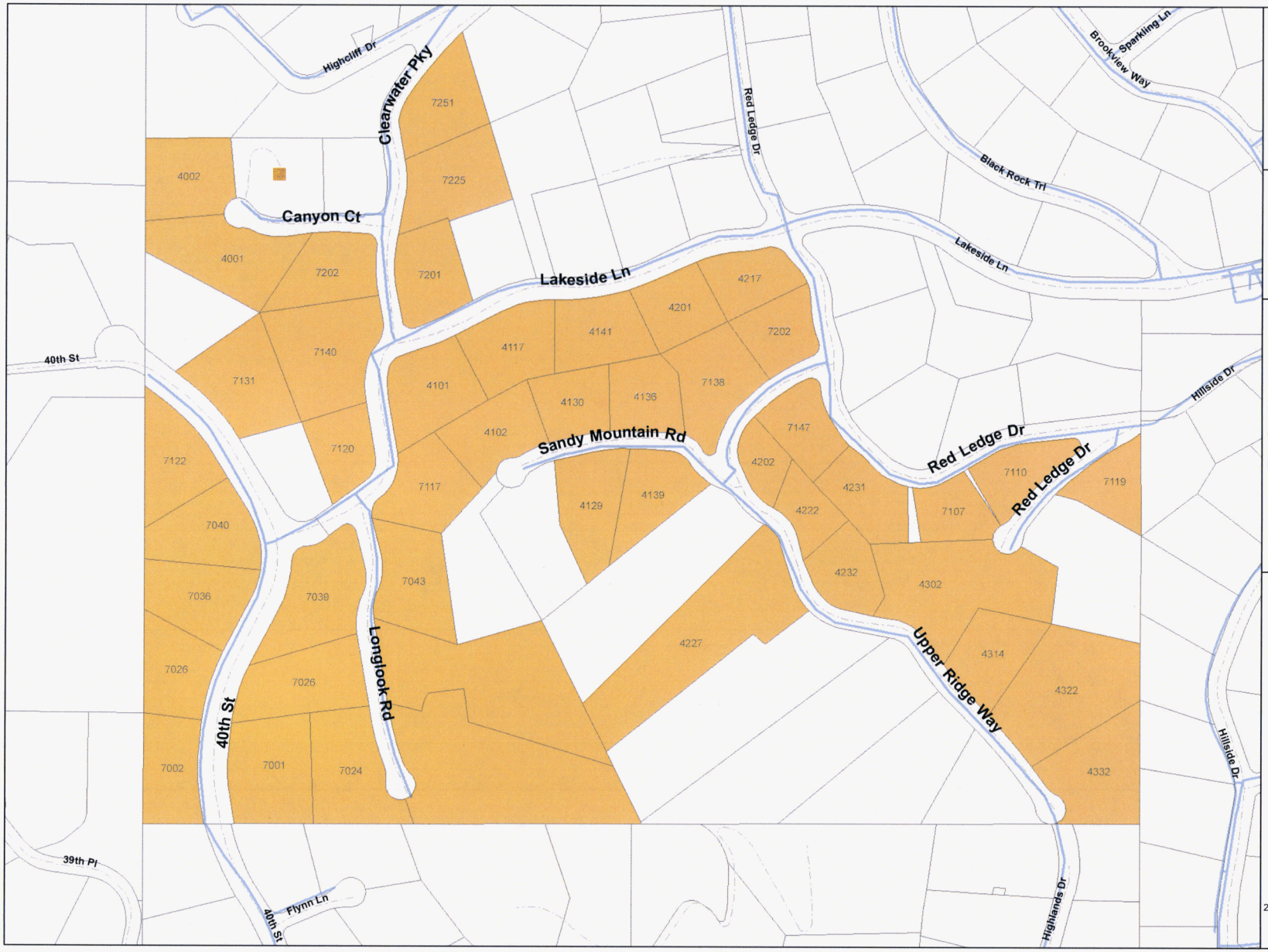
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2015 S-4**	Highlands Dr, 40th St, Flynn Ln, Lamar Rd, Silver Mountain Dr, Hillside Dr

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
37	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 129,500
5	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 17,800
3	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 10,860
45	hour	28	Company labor for field oversight and construction management	$ 1,260
Subtotal				$ 159,420
General Overhead Rate on Labor and Capital (10%)				$ 15,942
Total Estimated Cost				**$ 175,362**



2015

Project No: S-5 •
PWSID: 0407056

Paradise Valley District

Project Area:

Upper Ridge Way

Project Description:

Replace the following services:
8 residential services on 40th St
5 residential services on Longlook Rd
7 residential services on Clearwater Pkwy
2 residential services on Canyon Ct
5 residential services on Lakeside Ln
6 residential services on Red Ledge Dr
8 residential services on Upper Ridge Way
6 residential services on Sandy Mountain Rd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/4/2014

EPCOR Water 2014 •

EPCOR Water **Preliminary Cost Estimate**				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2015 S-5**	Project Location: Upper Ridge Wy, 40th St, Longlook Rd, Clearwater Pkwy, Canyon Ct, Lakeside Ln, Red Ledge Dr, Upper Ridge Wy, Sandy Mtn Rd	
Project Description: Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.				

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
39	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 136,500
5	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 17,800
3	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 10,860
47	hour	28	Company labor for field oversight and construction management	$ 1,316
Subtotal				$ 166,476
General Overhead Rate on Labor and Capital (10%)				$ 16,648
Total Estimated Cost				**$ 183,124**

2016

Paradise Valley – [redacted] ID No. 0407056

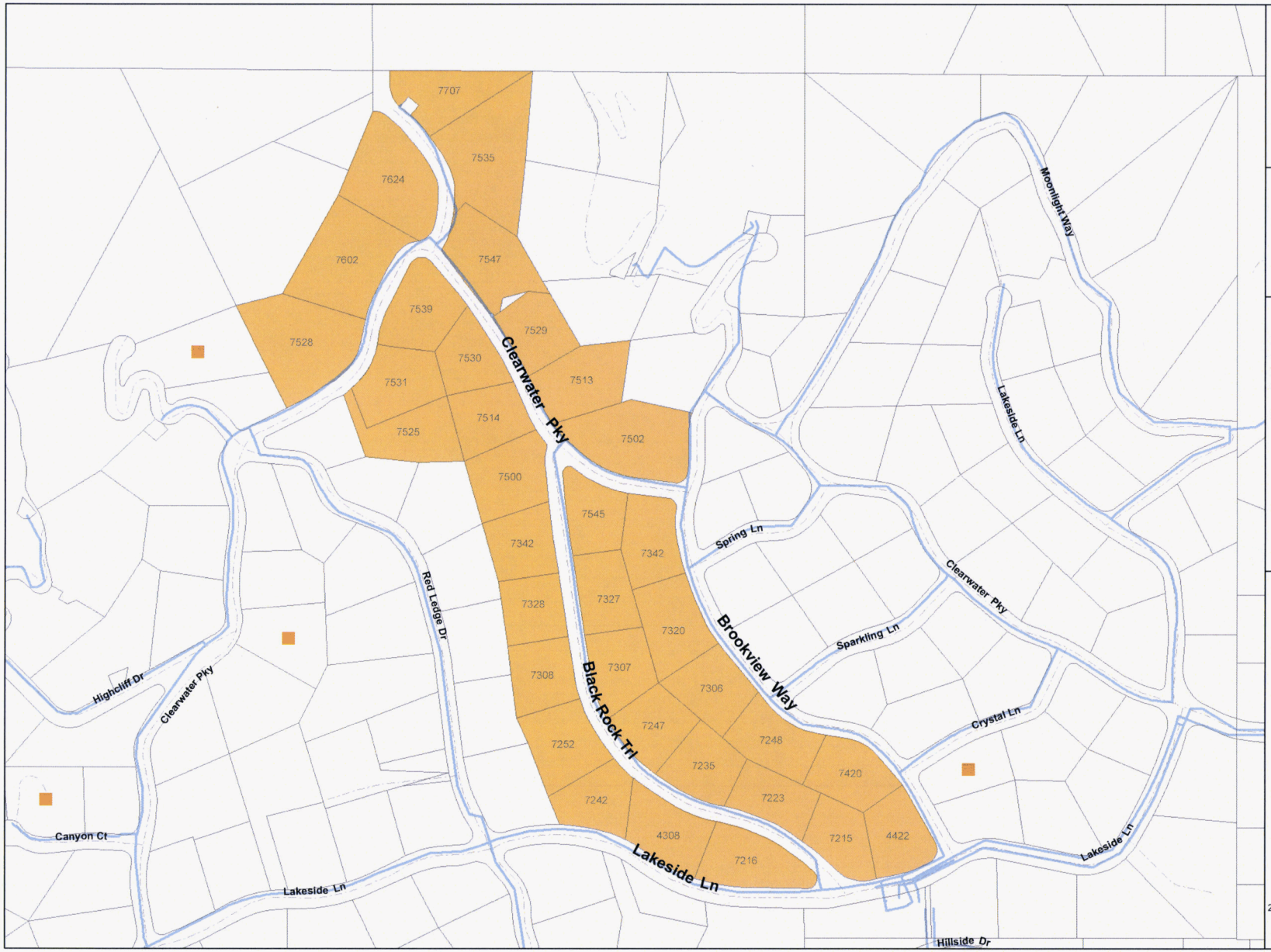
SIB PLANT TABLE I, 1-2

2016 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-6	333	service lines	35	29-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Black Rock Trl	12/2016	n/a	$136,356	Replace 29-1", 4-1.5", and 2-2" (35 total) residential services along Black Rock Trl and Clearwater Pkwy north of Lakeside Ln. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-6 in Exhibit CC-1-C for more detail.
S-7	333	service lines	31	25-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Red Ledge Dr	12/2016	n/a	$120,833	Replace 25-1", 4-1.5", and 2-2" (31 total) residential services along Red Ledge Dr, Clearwater Pkwy, and Highcliff Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 56 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-7 in Exhibit CC-1-C for more detail.

S-8	333	service lines	36	30-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Praying Monk Rd	12/2016	n/a	$140,237	Replace 30-1", 4-1.5", and 2-2" (36 tot[redacted]idential and commercial services along Praying mon[redacted] Joshua Tree Ln, and Lincoln Dr between Tatum and Desert Fairways. These services are a priority for replacement because they are galvanized steel pipe and will be about 62 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-8 in Exhibit CC-1-C for more detail.
S-9	333	service lines	43	42-1" 1-2"	Copper	1"-$3,881 2"-$4,013	Camelback Inn	12/2016	n/a	$166,940	Replace 42-1" and 1-2" (43 total) residential and commercial services in the Camelback Inn north of Lincoln. These services are a priority for replacement because they are galvanized steel pipe and will be about 50 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-9 in Exhibit CC-1-C for more detail.
S-10	333	service lines	40	38-1" 2-2"	Copper	1"-$3,881 2"-$4,013	Lost Dutchman Dr	12/2016	n/a	$155,364	Replace 38-1" and 2-2" (40 total) residential and commercial services along Lost Dutchman Dr, Smoke Tree Ln, Cactus Wren Rd, and 59th St. These services are a priority for replacement because they are galvanized steel pipe and will be about 52 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-10 in Exhibit CC-1-C for more detail.
S-11	333	service lines	27	24-1" 3-2"	Copper	1"-$3,881 2"-$4,013	Berridge Ln	12/2016	n/a	$104,980	Replace 24-1" and 3-2" (27 total) residential and commercial services along Berridge ln and Sundown Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 58 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-11 in Exhibit CC-1-C for more detail.
Total			**212**							**$824,710**	



2016

Project No: S-6 •
PWSID: 0407056

Paradise Valley District

Project Area:

Black Rock Trl

Project Description:

Replace the following services:
14 residential services on Black Rock Trl
2 residential services on Lakeside Ln
5 residential services on Brookview Way
12 residential services on Clearwater Pkwy
2 residential services on Mountain View Pass

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

120 60 0 120 240 360 480
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2016 S-6**	Black Rock Trl, Lakeside Ln, Brookview Way, Clearwater Pkwy, Mountain View Pass

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
29	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 101,500
4	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 14,240
2	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 7,240
35	hour	28	Company labor for field oversight and construction management	$ 980
Subtotal				$ 123,960
General Overhead Rate on Labor and Capital (10%)				$ 12,396
Total Estimated Cost				**$ 136,356**

2016

Project No: S-7 •
PWSID: 0407056

Paradise Valley District

Project Area:

Red Ledge Dr

Project Description:

Replace the following services:
18 residential services on Red Ledge Dr
5 residential services on Lakeside Ln
4 residential services on Clearwater Pkwy
4 residential services on High Cliff Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

120 60 0 120 240 360 480 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

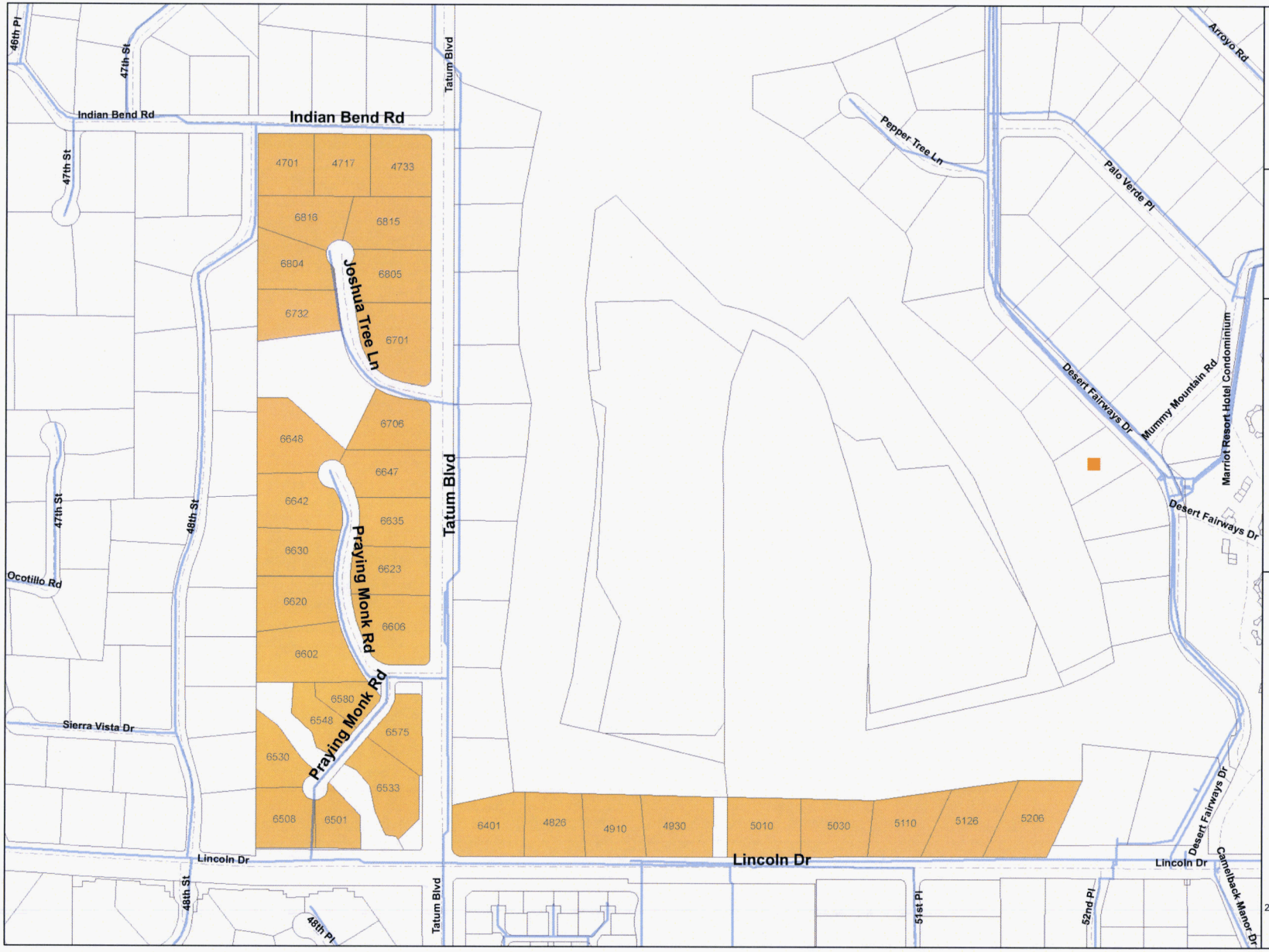
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2016 S-7**	Red Ledge Dr, Lakeside Ln, Clearwater Pkwy, High Cliff Dr

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
25	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 87,500
4	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 14,240
2	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 7,240
31	hour	28	Company labor for field oversight and construction management	$ 868
Subtotal				$ 109,848
General Overhead Rate on Labor and Capital (10%)				$ 10,985
Total Estimated Cost				**$ 120,833**



2016

Project No: S-8 •
PWSID: 0407056

Paradise Valley District

Project Area:

Praying Monk Rd

Project Description:

Replace the following services:
16 residential services on Praying Monk Rd
7 residential services on Joshua Tree Ln
3 residential services on Indian Bend Rd
9 residential services on Lincoln Dr
1 commercial service on Tatum Blvd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

140 70 0 140 280 420 560 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

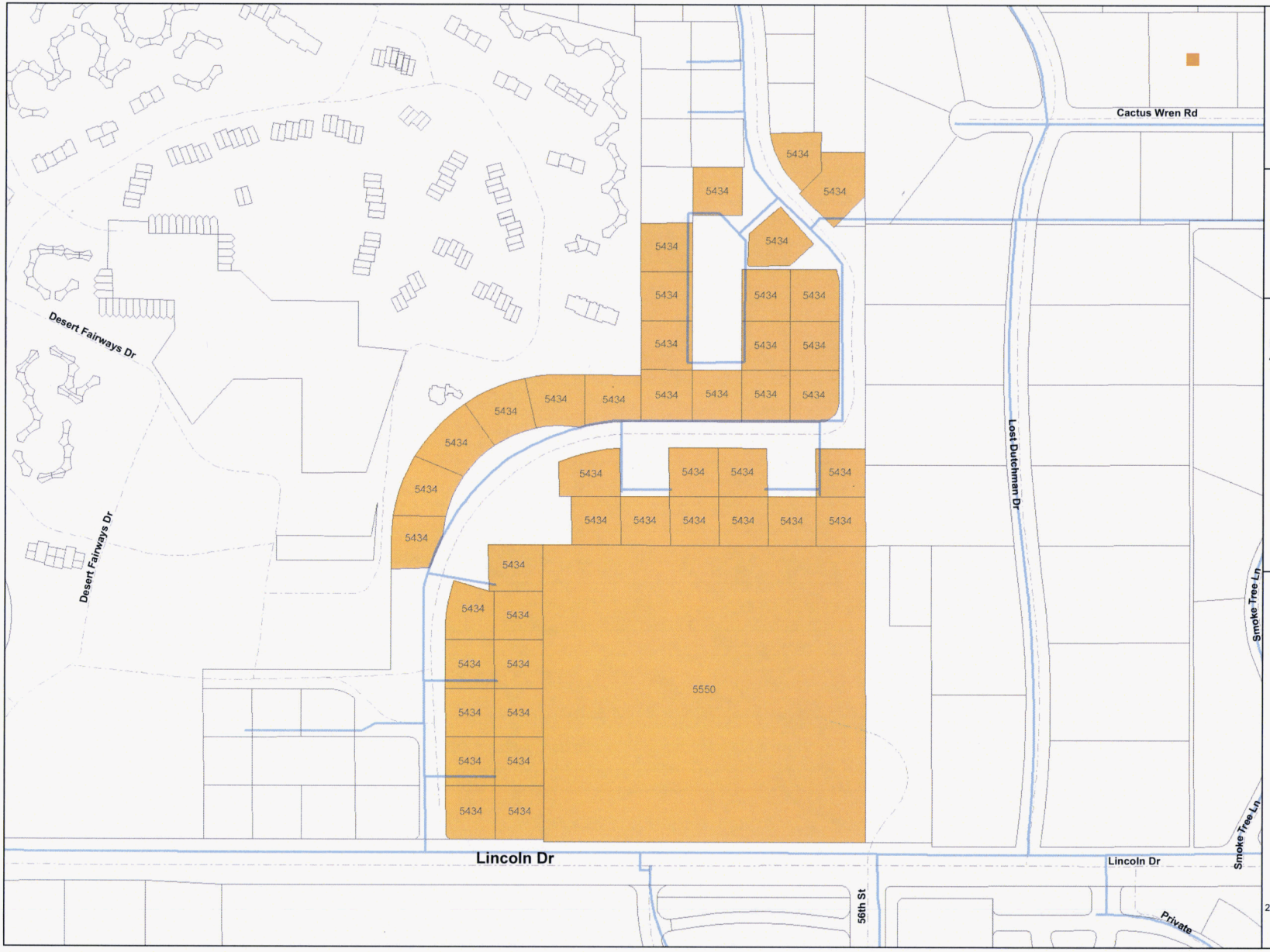
EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2016 S-8**	Project Location: Praying Monk Rd, Joshua Tree Ln, Indian Bend Rd, Lincoln Dr, Tatum Blvd

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
30	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 105,000
4	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 14,240
2	2" service	3620	Contractor materials and labor to replace 2" residential and commercial services	$ 7,240
36	hour	28	Company labor for field oversight and construction management	$ 1,008
Subtotal				$ 127,488
General Overhead Rate on Labor and Capital (10%)				$ 12,749
Total Estimated Cost				**$ 140,237**



2016

Project No: S-9 •
PWSID: 0407056

Paradise Valley District

Project Area:

Camelback Inn Condos

Project Description:

Replace the following services:
42 residential services at the Camelback Inn
1 commercial service on Lincoln Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

80 40 0 80 160 240 320 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/5/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

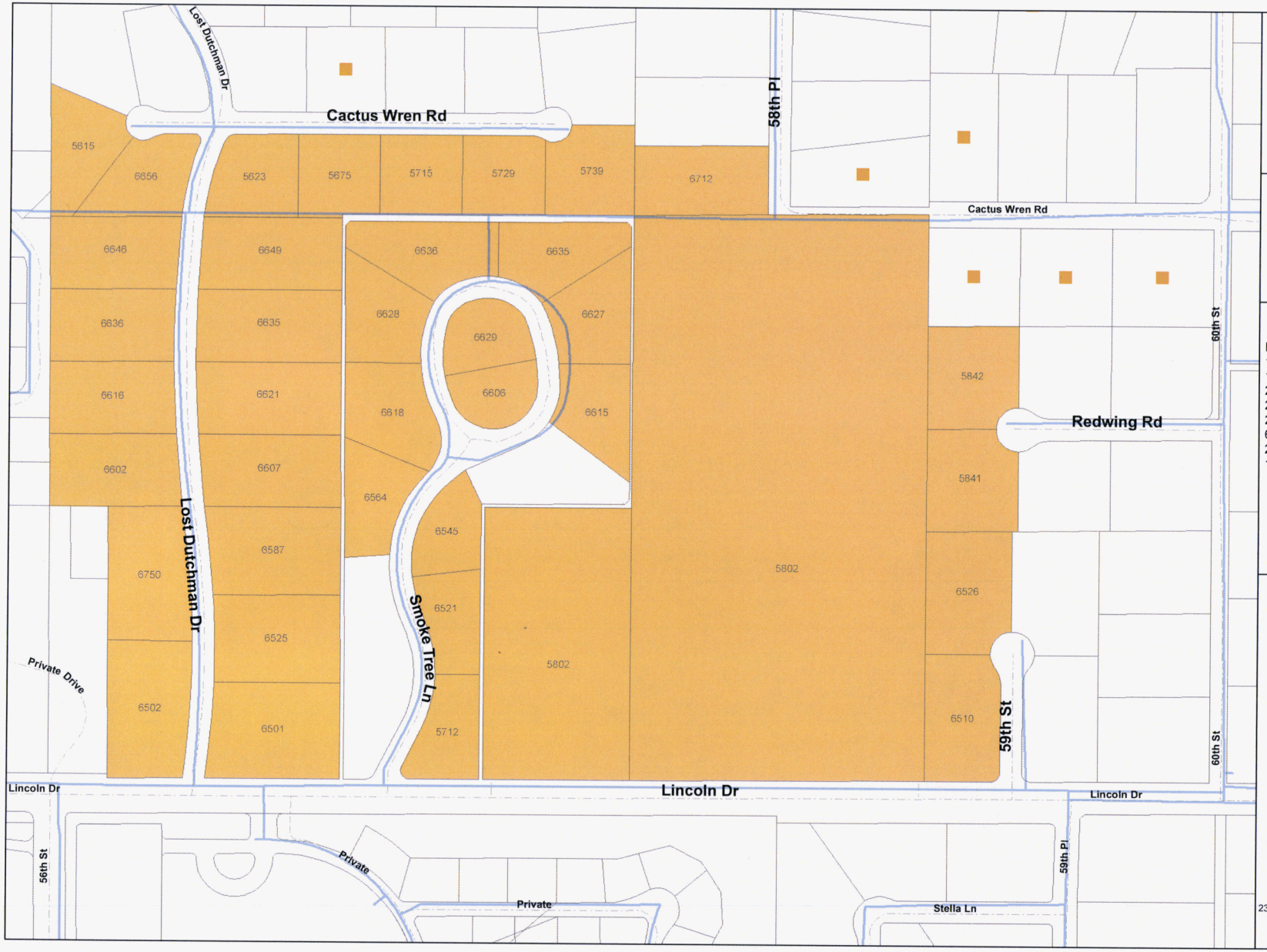
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2016 S-9**	Camelback Inn Condominiums

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
42	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 147,000
1	2" service	3,560	Contractor materials and labor to replace 2" commercial service	$ 3,560
43	hour	28	Company labor for field oversight and construction management	$ 1,204
Subtotal				$ 151,764
General Overhead Rate on Labor and Capital (10%)				$ 15,176
Total Estimated Cost				**$ 166,940**



2016

Project No: S-10 •
PWSID: 0407056

Paradise Valley District

Project Area:

Lost Dutchman Dr

Project Description:

Replace the following services:
14 residential services on Lost Dutchman Dr
11 residential services on Smoke Tree Ln
2 residential services on 59th St
2 residential services on 58th Pl
2 residential services on Redwing Rd
6 residential services on Cactus Wren Rd
2 commercial service on Lincoln Dr
1 residential service on Lincoln Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2016 S-10**	Project Location: Lost Dutchman Dr, Smoke Tree Ln, 59th St, 58th Pl, Redwing Rd, Cactus Wren Rd, Lincoln Dr	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
38	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 133,000
2	2" service	3,560	Contractor materials and labor to replace 2" commercial services	$ 7,120
40	hour	28	Company labor for field oversight and construction management	$ 1,120
Subtotal				$ 141,240
General Overhead Rate on Labor and Capital (10%)				$ 14,124
Total Estimated Cost				**$ 155,364**

2016

Project No: S-11 •
PWSID: 0407056

Paradise Valley District

Project Area:

Berridge Ln

Project Description:

Replace the following services:
12 residential services on Berridge Ln
1 residential service on Cattle Track Rd
2 residential services on Sundown Dr
4 residential services on Sundown Cir
8 commercial services on Mcdonald Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

75 37.5 0 75 150 225 300 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2016 S-11**	Project Location: Berridge Ln, Cattle Track Rd, Sundown Dr, Sundown Cir, McDonald Dr

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
24	1" service	3,500	Contractor material and labor to replace 1" residential and commerical services	$ 84,000
3	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential and commercial services	$ 10,680
27	hour	28	Company labor for field oversight and construction management	$ 756
Subtotal				$ 95,436
General Overhead Rate on Labor and Capital (10%)				$ 9,544
Total Estimated Cost				**$ 104,980**

2017

Paradise Valley – [redacted]S ID No. 0407056

SIB PLANT TABLE I, 1-3

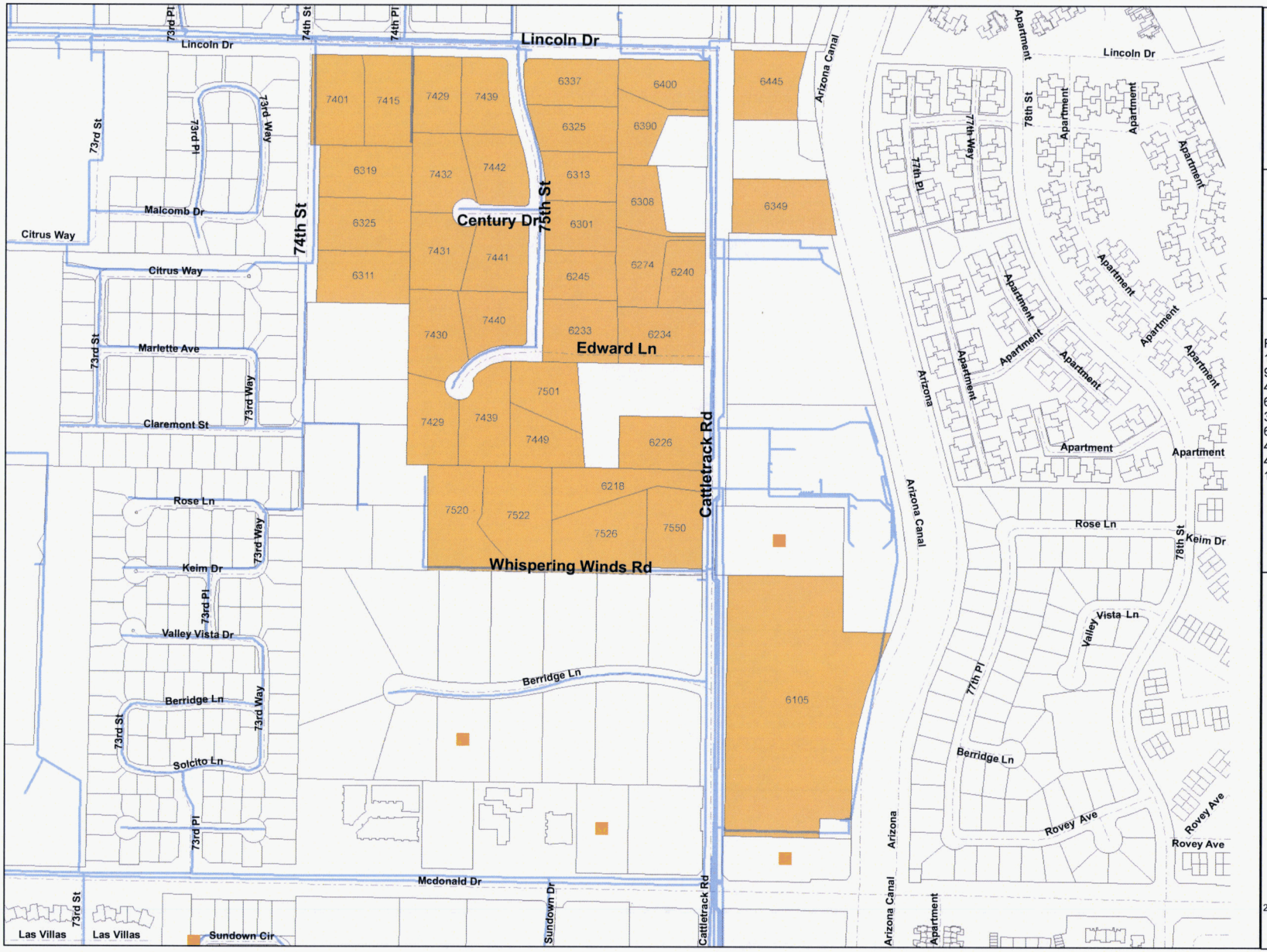
2017 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-12	333	service lines	38	34-1" 4-1.5"	Copper	1"-$3,881 1.5"-$3,947	Cattletrack Rd	12/2017	n/a	$147,734	Replace 34-1" and 4-1.5" (38 total) residential and commercial services between Cattletrack Rd, 74th St, Lincoln Dr, and Whispering Winds Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 40 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-12 in Exhibit CC-1-C for more detail.
S-13	333	service lines	33	29-1" 4-2"	Copper	1"-$3,881 2"-$4,013	73rd Way	12/2017	n/a	$128,330	Replace 29-1" and 4-2" (33 total) residential and commercial services between 73rd Way, Scottsdale Rd, Lincoln Dr, and Citrus Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 45 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-13 in Exhibit CC-1-C for more detail.

S-14	333	service lines	33	33-1"	Copper	1"-$3,881	Balfour Rd	12/2017	n/a	$128,066	Replace 40-1" residential services south[redacted]ta Dr between 68th St and Scottsdale Rd. These services are a priority for replacement because they are galvanized steel pipe will be about 59 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-14 in Exhibit CC-1-C for more detail.
S-15	333	service lines	21	16-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Paradise Canyon Rd	12/2017	n/a	$81,959	Replace 16-1", 3-1.5", and 2-2" (21 total) residential services along Las Brisas Ln and Paradise Canyon Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 46 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-15 in Exhibit CC-1-C for more detail.
S-16	333	service lines	22	17-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	54th St	12/2017	n/a	$85,840	Replace 17-1", 3-1.5", and 2-2" (22 total) residential services along 54th St, Desert Park Ln, Roadrunner Rd, and Desert Vista Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 43 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-16 in Exhibit CC-1-C for more detail.
S-17	333	service lines	32	26-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Shadow Mountain Rd	12/2017	n/a	$124,714	Replace 26-1", 4-1.5", and 2-2" (32 total) residential services between Shadow Mountain Rd, Tatum Blvd, Roadrunner Rd, and Prickly Pear Ln. These services are a priority for replacement because they are galvanized steel pipe and will be about 61 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-17 in Exhibit CC-1-C for more detail.

S-18	333	service lines	60	51-1" 6-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Crestview Dr	12/2017	n/a	$233,640	Replace 51-1", 6-1.5", and 3-2" (60 tot[redacted]ential services between Desert Jewel Dr, Road[redacted] Rd, Tatum Blvd, and Shadow Mountain Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 47 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-18 in Exhibit CC-1-C for more detail.
Total			**239**							**$930,283**	



2017

Project No: S-12 •
PWSID: 0407056

Paradise Valley District

Project Area:

Cattle Track Rd

Project Description:

Replace the following services:
1 commercial service on Cattle Track Rd
9 residential services on Cattle Track Rd
4 residential services on Whispering Winds Rd
6 residential services on Edward Ln
3 residential services on 74th St
6 residential services on 75th St
4 residential services on Lincoln Dr
4 residential services on Century Dr
1 residential service on Miller Rd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

12562.5 0 125 250 375 500 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

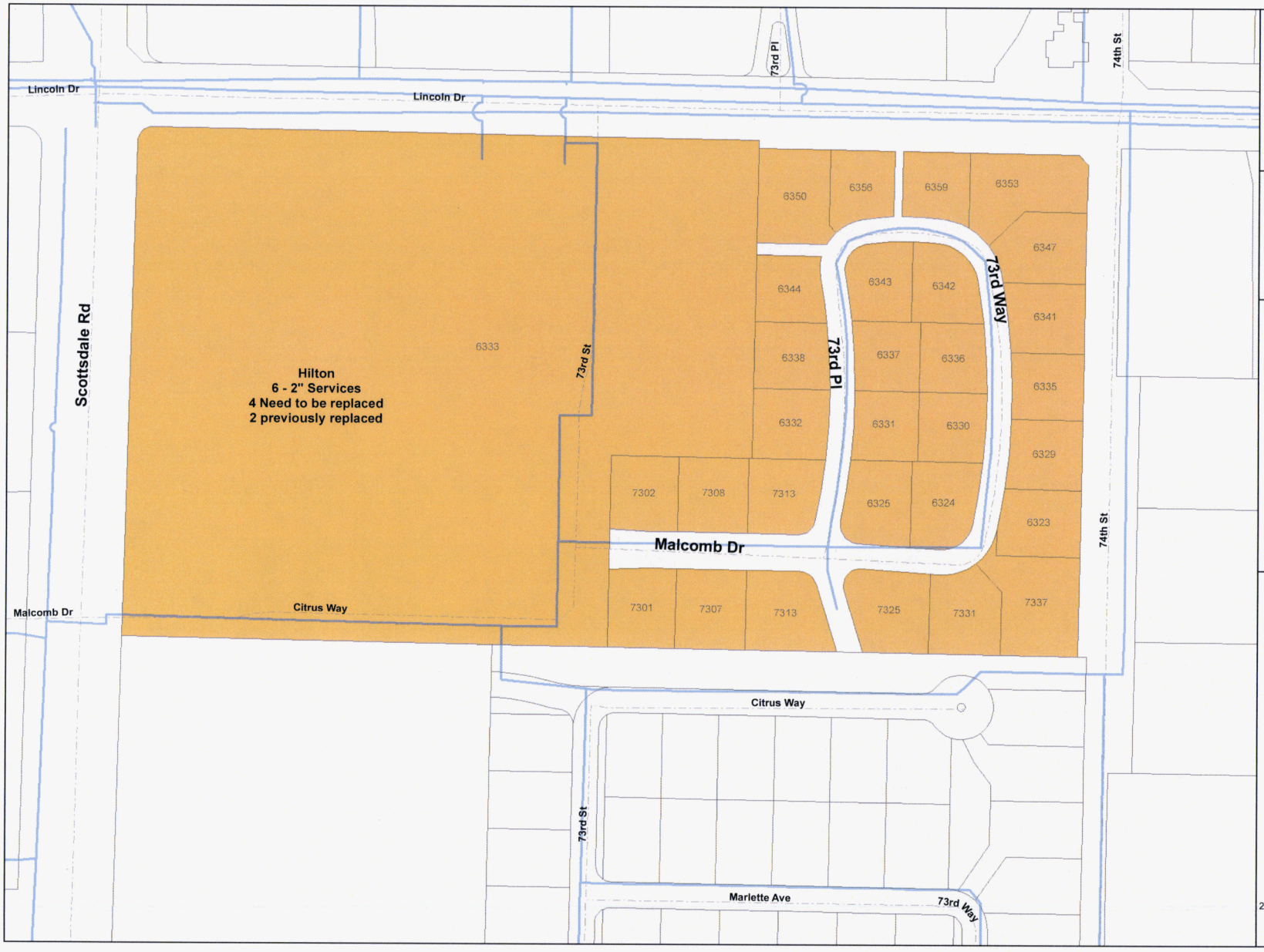
EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2017 S-12**	Project Location: Cattle Track Rd, Whipsering Winds Rd, Edward Ln, 74th St, 75th St, Lincoln Dr, Century Dr, Miller Rd

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
34	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 119,000
4	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential and commercial services	$ 14,240
38	hour	28	Company labor for field oversight and construction management	$ 1,064
Subtotal				$ 134,304
General Overhead Rate on Labor and Capital (10%)				$ 13,430
Total Estimated Cost				**$ 147,734**



2017

Project No: S-13 •
PWSID: 0407056

Paradise Valley District

Project Area:

73rd Way

Project Description:

Replace the following services:
4 commercial services on Scottsdale Rd
9 residential services on Malcomb Dr
11 residential services on 73rd Way
9 residential services on 73rd Pl

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

40 20 0 40 80 120 160
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/10/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2017 S-13**	Project Location: 73rd Way, Scottsdale Rd, Malcomb Dr, 73rd Pl	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
29	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 101,500
4	2" service	3,560	Contractor materials and labor to replace 2" commercial services	$ 14,240
33	hour	28	Company labor for field oversight and construction management	$ 924
Subtotal				$ 116,664
General Overhead Rate on Labor and Capital (10%)				$ 11,666
Total Estimated Cost				**$ 128,330**

2017

Project No: S-14 •
PWSID: 0407056

Paradise Valley District

Project Area:

Balfour Rd

Project Description:

Replace the following services:
12 residential services on Balfour Rd
1 residential service on 69th Pl
6 residential services on Vista Dr
1 residential service on 70th St
3 residential services on Chaparral Rd
2 residential services on 70st Pl
3 residential services on 71st St
2 residential services on 70th Way
3 residential services on 71st Way

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

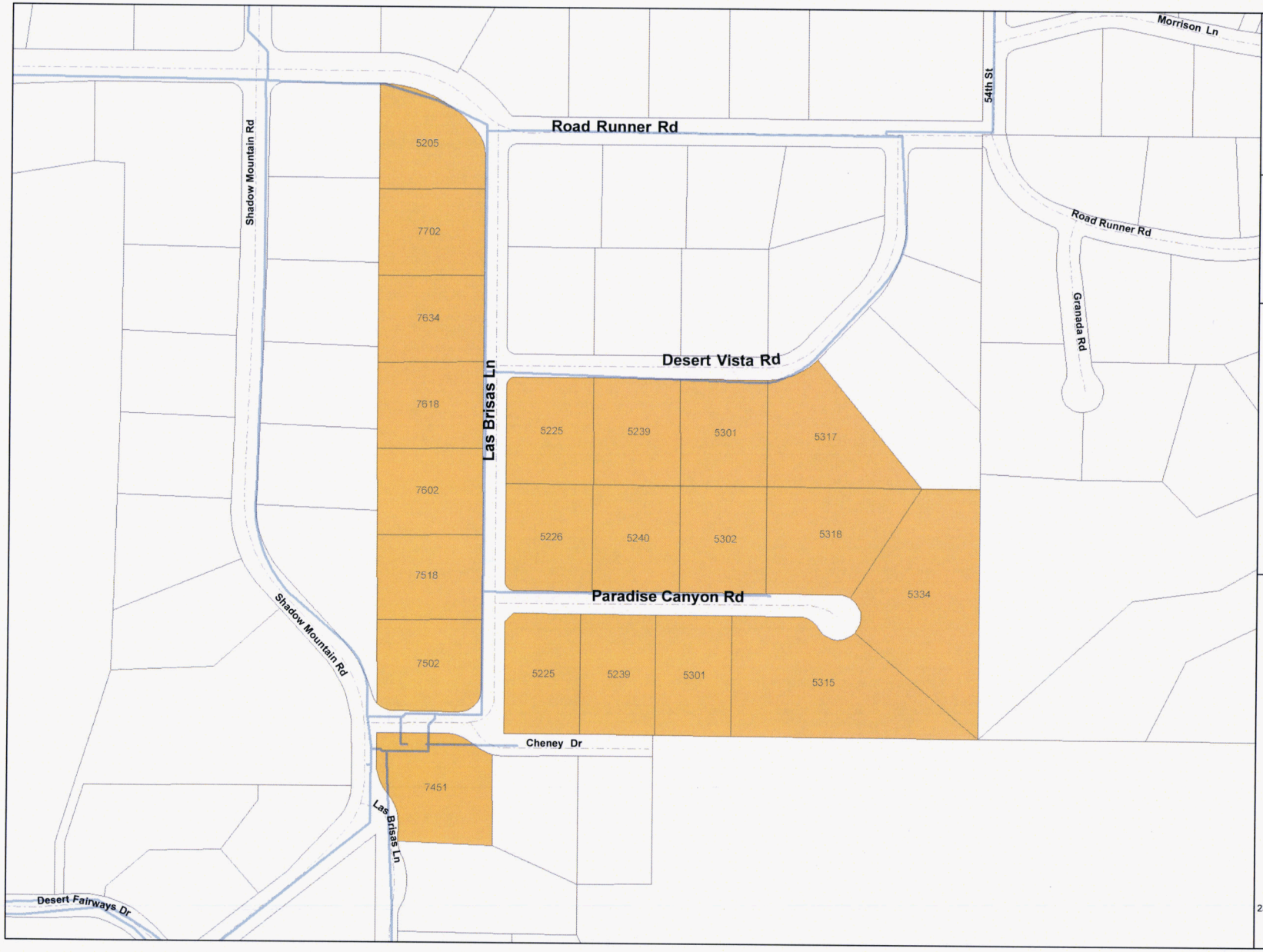
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2017 S-14**	Balfour Rd, 69th Pl, Vista Dr, 70th St, Chaparral Rd, 70th St, 71st St, 70th Way, 71st Way

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
33	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 115,500
33	hour	28	Company labor for field oversight and construction management	$ 924
Subtotal				$ 116,424
General Overhead Rate on Labor and Capital (10%)				$ 11,642
Total Estimated Cost				**$ 128,066**



2017

Project No: S-15 •
PWSID: 0407056

Paradise Valley District

Project Area:

Paradise Canyon Road

Project Description:

Replace the following services:
9 residential services on Paradise Canyon Rd
1 residential service on Roadrunner Rd
7 residential services on Las Brisas Ln
4 residential services on Desert Vista Rd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

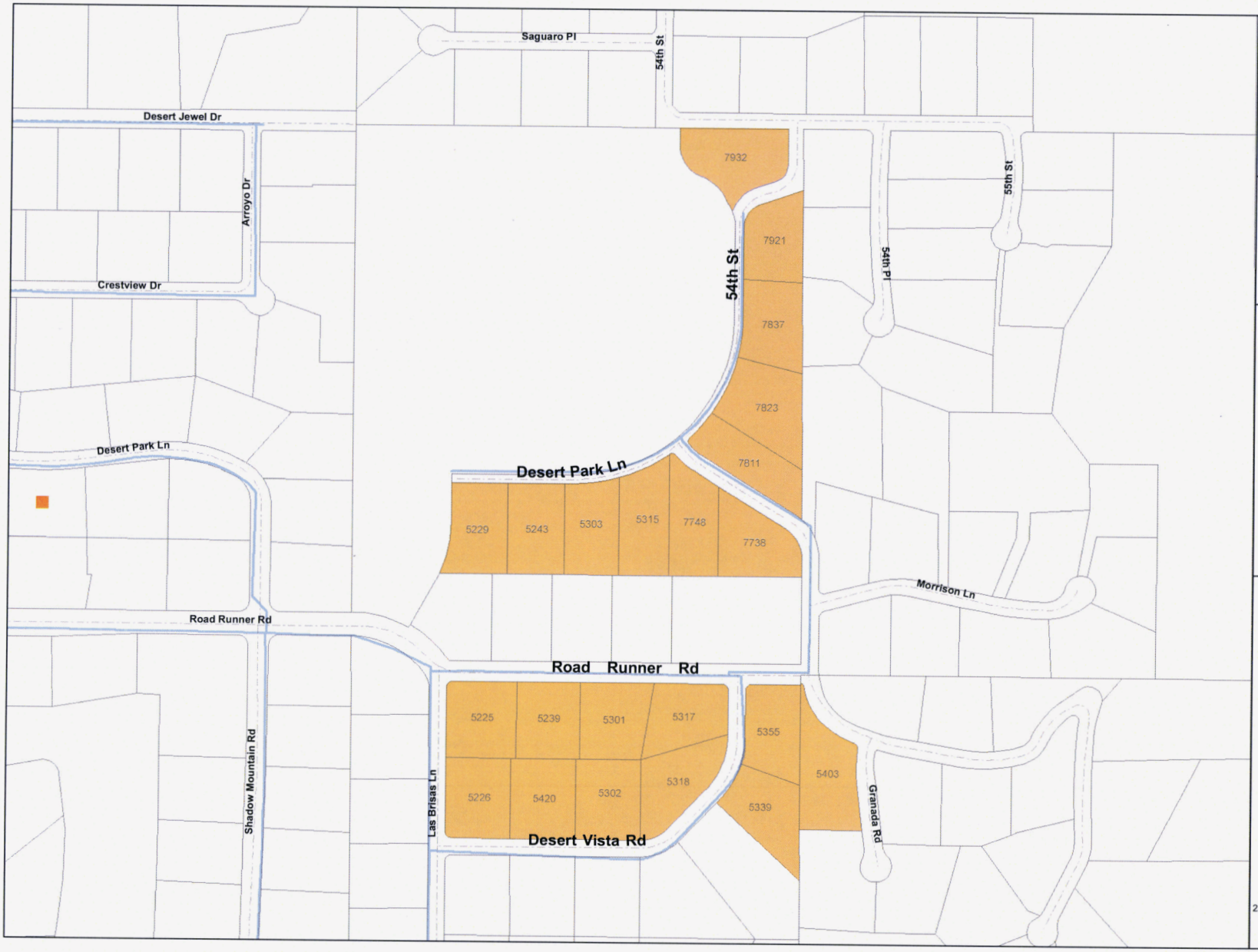
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2017 S-15**	Paradise Canyon Rd, Roadrunner Rd, Las Brisas Ln, Desert Vista Rd

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
16	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 56,000
3	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 10,680
2	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 7,240
21	hour	28	Company labor for field oversight and construction management	$ 588
Subtotal				$ 74,508
General Overhead Rate on Labor and Capital (10%)				$ 7,451
Total Estimated Cost				**$ 81,959**



2017

Project No: S-16 •
PWSID: 0407056

Paradise Valley District

Project Area:

54th Street

Project Description:

Replace the following services:
7 residential services on 54th St
5 residential services on Roadrunner Rd
4 residential services on Desert Park Ln
6 residential services on Desert Vista Rd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

110 55 0 110 220 330 440
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

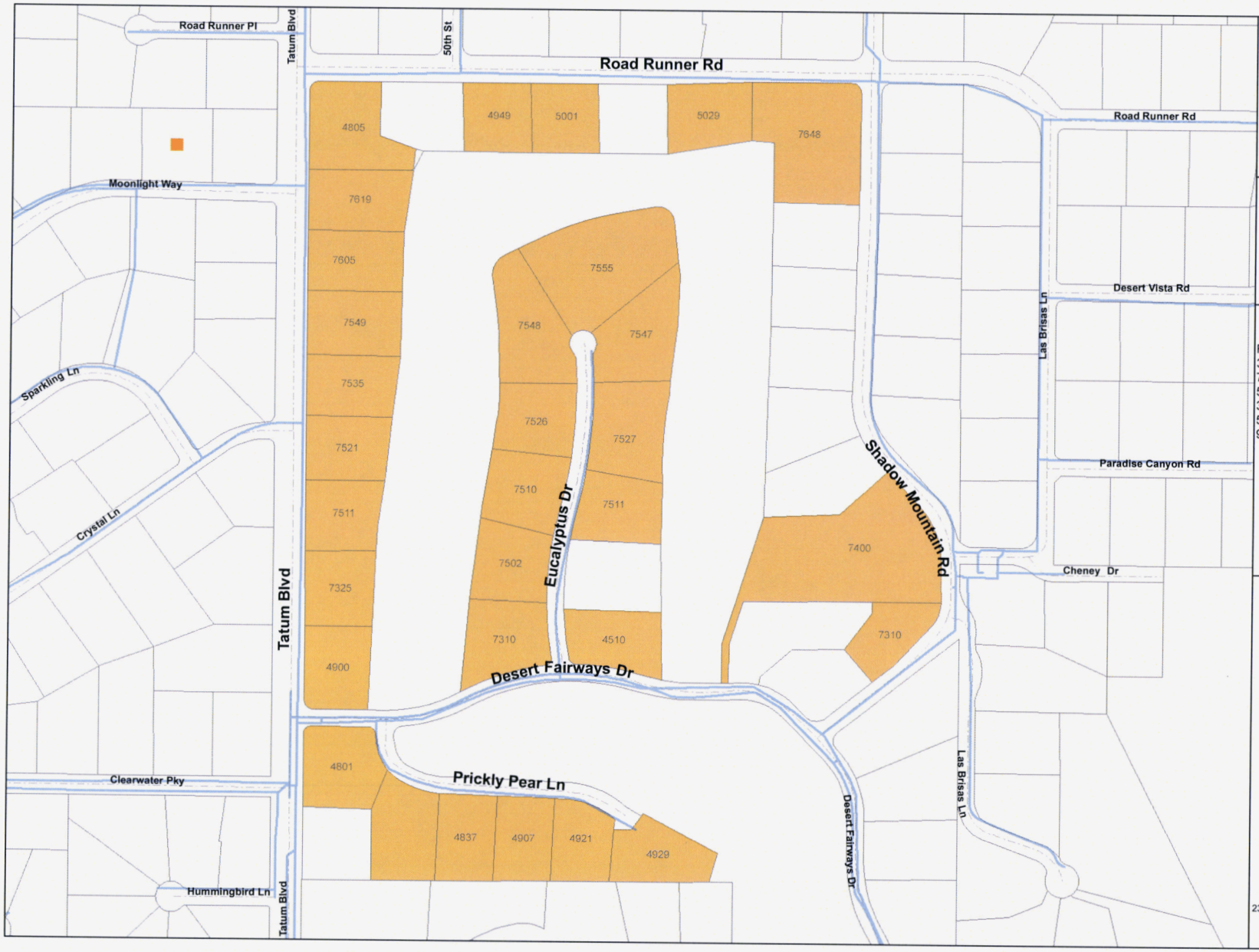
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2017 S-16**	54th St, Roadrunner Rd, Desert Park Ln, Desert Vista Rd

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
17	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 59,500
3	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 10,680
2	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 7,240
22	hour	28	Company labor for field oversight and construction management	$ 616
Subtotal				$ 78,036
General Overhead Rate on Labor and Capital (10%)				$ 7,804
Total Estimated Cost				**$ 85,840**



2017

Project No: S-17 •
PWSID: 0407056

Paradise Valley District

Project Area:

Eucalyptus Dr

Project Description:

Replace the following services:
3 residential services on Shadow Mountain Rd
7 residential services on Tatum Blvd
5 residential services on Roadrunner Rd
3 residential services on Desert Fairways Dr
5 residential services on Prickly Pear Ln
9 residential services on Eucalyptus Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

110 55 0 110 220 330 440
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

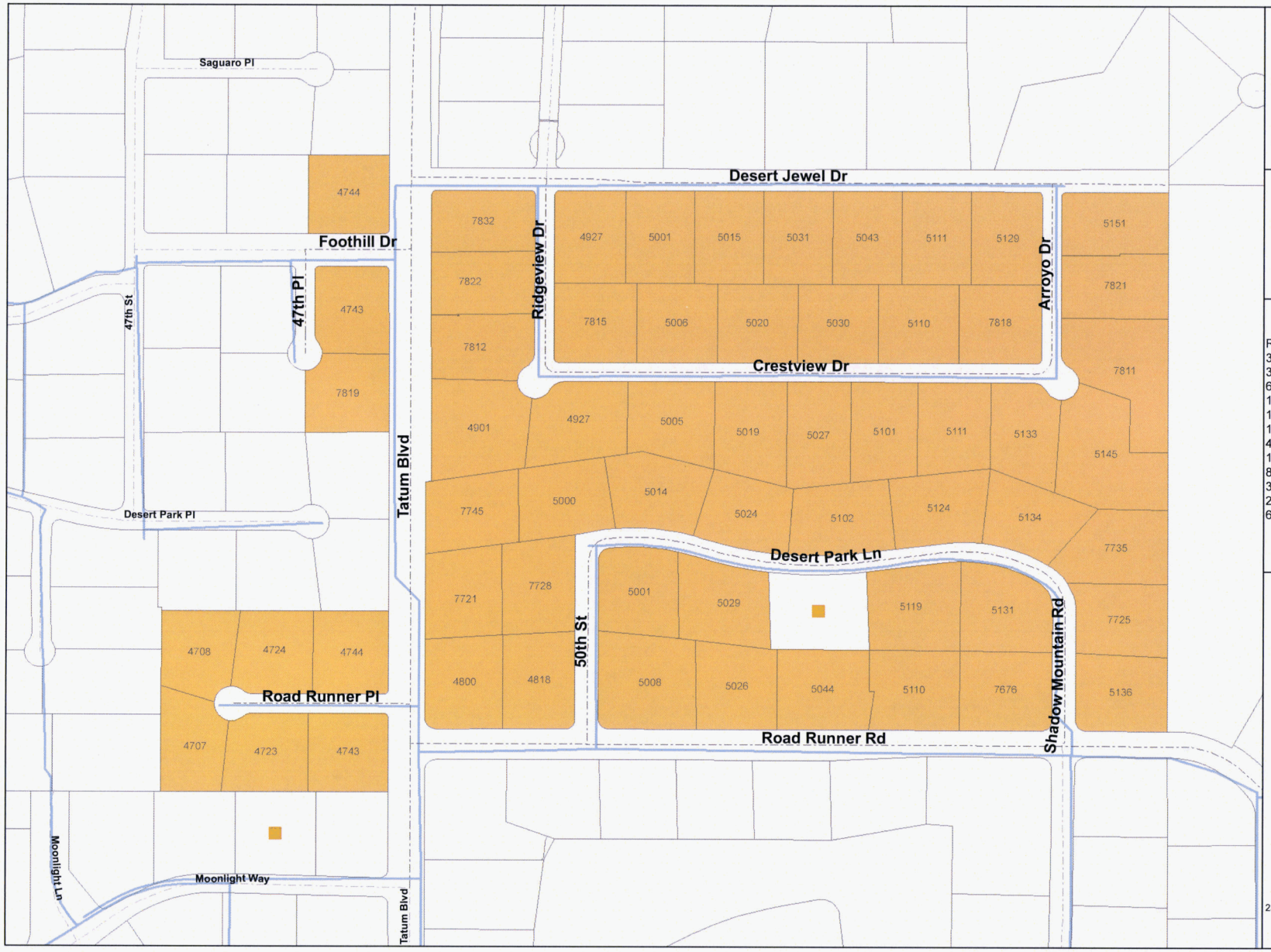
EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2017 S-17**	Project Location: Shadow Mountain Rd, Tatum Blvd, Roadrunner Rd, Desert Fairways Dr, Prickly Pear Ln, Eucalyptus Dr	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
26	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 91,000
4	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 14,240
2	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 7,240
32	hour	28	Company labor for field oversight and construction management	$ 896
Subtotal				$ 113,376
General Overhead Rate on Labor and Capital (10%)				$ 11,338
Total Estimated Cost				**$ 124,714**



2017

Project No: S-18 •
PWSID: 0407056

Paradise Valley District

Project Area:

Crestview Drive

Project Description:

Replace the following services:
3 residential services on Shadow Mountain Rd
3 residential services on Tatum Blvd
6 residential services on Roadrunner Rd
10 residential services on Desert Park Ln
1 residential service on 50th St
1 residential service on 47th Pl
4 residential services on Ridgeview Dr
13 residential services on Crestview Dr
8 residential services on Desert Jewel Dr
3 residential services on Arroyo Dr
2 residential services on Foothill Dr
6 residential services on Roadrunner Pl

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2017 S-18**	Project Location: Crestview Dr, Tatum Blvd, Roadrunner Rd & Pl, Desert Park Ln, 47th Pl, Crestview Dr, Desert Jewel Dr, Foothill Dr	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
51	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 178,500
6	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 21,360
3	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 10,860
60	hour	28	Company labor for field oversight and construction management	$ 1,680
Subtotal				$ 212,400
General Overhead Rate on Labor and Capital (10%)				$ 21,240
Total Estimated Cost				**$ 233,640**

2018

Paradise Valley – [redacted] ID No. 0407056

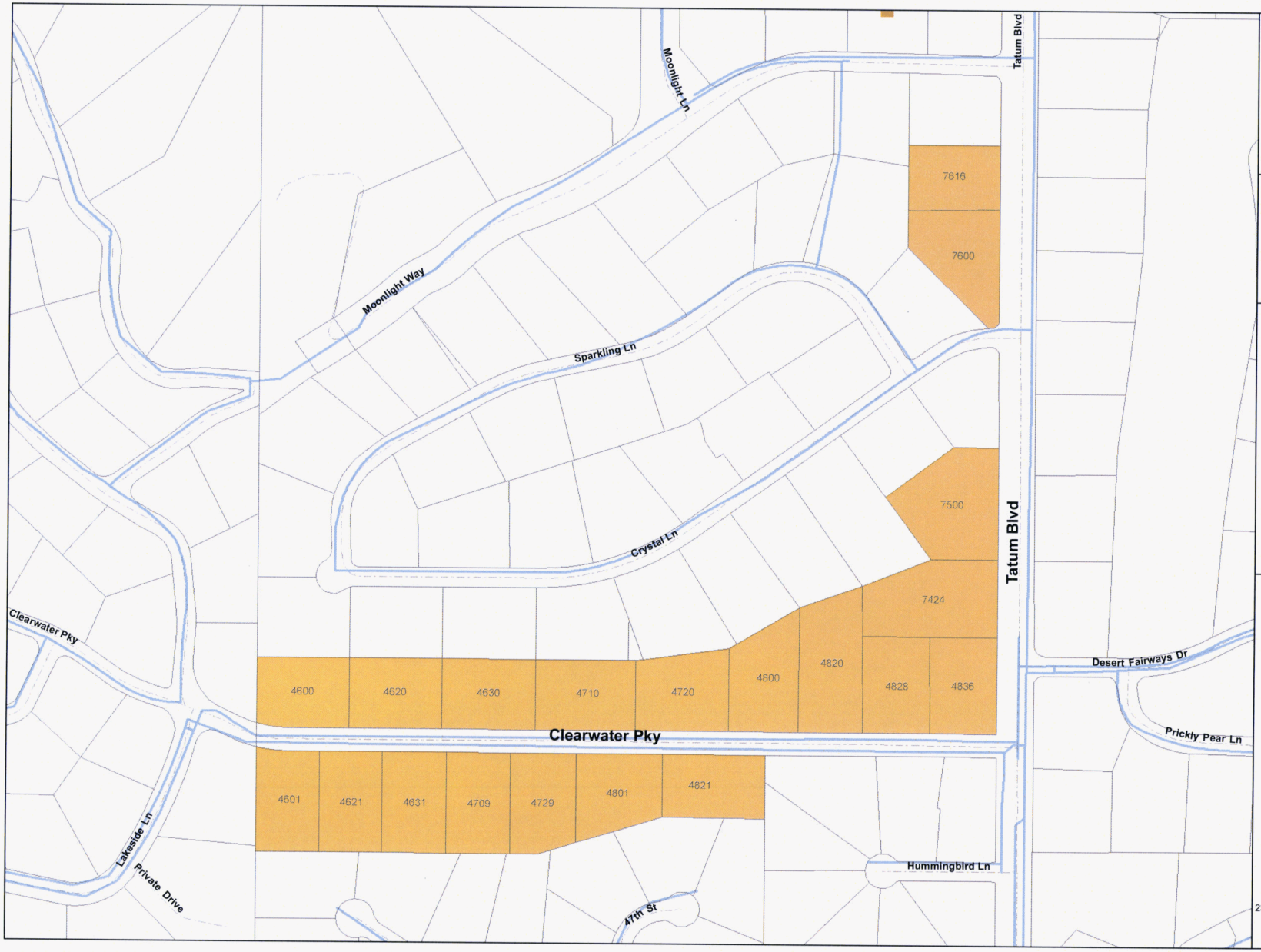
SIB PLANT TABLE I, 1-4

2018 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-19	333	service lines	21	16-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Clearwater Pkwy	12/2018	n/a	$81,959	Replace 16-1", 3-1.5", and 2-2" (21 total) residential services Clearwater Pkwy and Tatum Blvd. These services are a priority for replacement because they are galvanized steel pipe and will be about 63 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-19 in Exhibit CC-1-C for more detail.
S-20	333	service lines	65	54-1" 7-1.5" 4-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Lakeside Ln	12/2018	n/a	$253,242	Replace 54-1", 7-1.5", and 4-2" (65 total) residential services along Lakeside Ln, Moonlight Way, Clearwater Pkwy, and Brookview Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 62 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-20 in Exhibit CC-1-C for more detail.

S-21	333	service lines	43	35-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Crystal Ln	12/2018	n/a	$167,600	Replace 35-1", 5-1.5", and 3-2" (43 total) residential services along Crystal Ln, Sparkling Ln, and Moonlight Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-21 in Exhibit CC-1-C for more detail.
S-22	333	service lines	45	37-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Desert Fairways Dr	12/2018	n/a	$175,362	Replace 37-1", 5-1.5", and 3-2" (45 total) residential services along Desert Fairways Dr, Palo Verde Pl, Pepper Tree Ln, and Arroyo Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 65 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-22 in Exhibit CC-1-C for more detail.
S-23	333	service lines	58	49-1" 6-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Joshua Tree Ln	12/2018	n/a	$225,878	Replace 49-1", 6-1.5", and 3-2" (58 total) residential services between Indian Bend Rd, Lincoln Dr, 60th St, and Lost Dutchman Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 60 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-23 in Exhibit CC-1-C for more detail.
Total			**232**							**$904,042**	



2018

Project No: S-19 •
PWSID: 0407056

Paradise Valley District

Project Area:

Clearwater Pkwy

Project Description:

Replace the following services:
17 residential services on Clearwater Pkwy
4 residential services on Tatum Blvd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

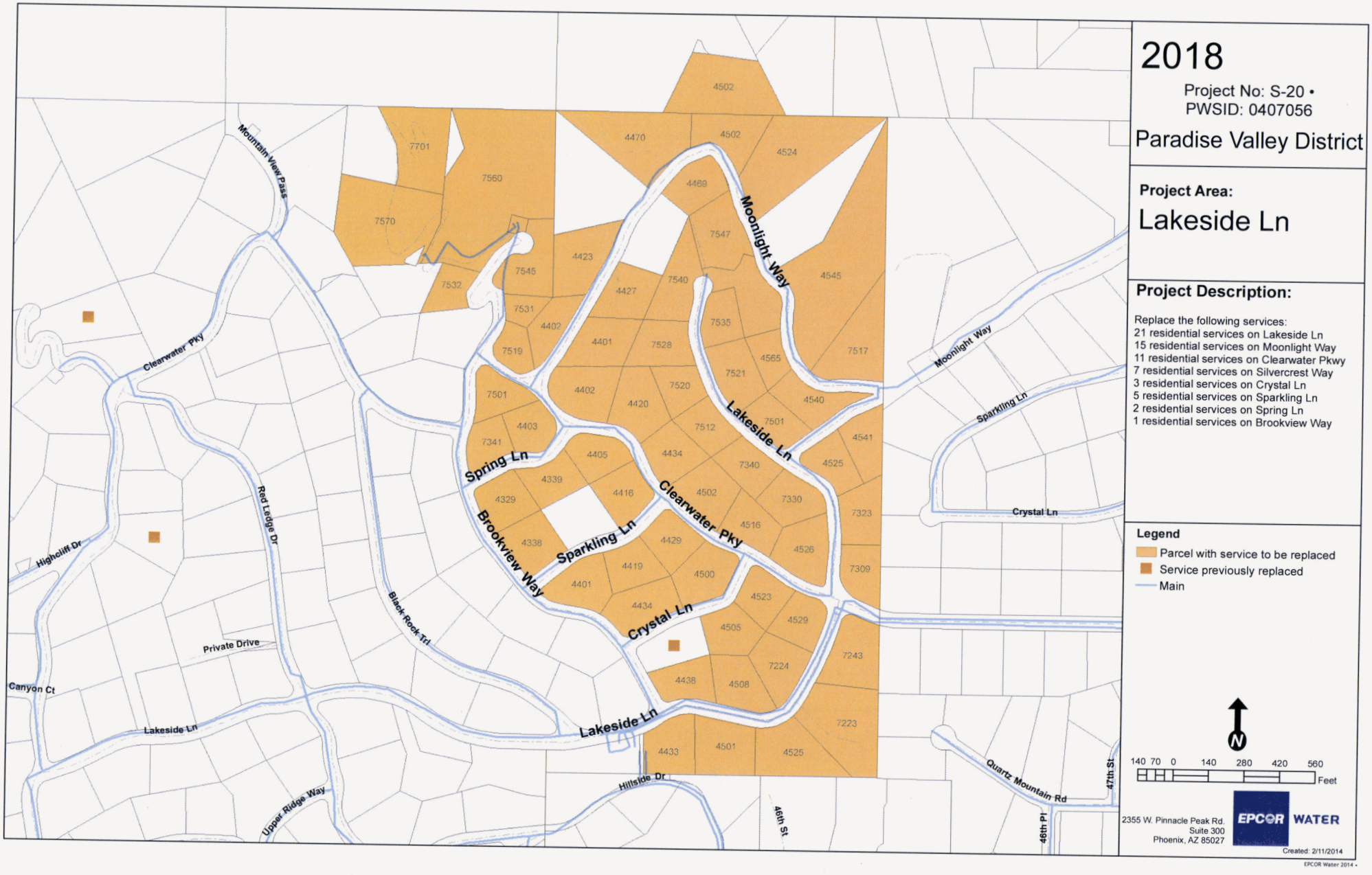
EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2018 S-19**	Project Location: Clearwater Pkwy, Tatum Blvd

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
16	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 56,000
3	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 10,680
2	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 7,240
21	hour	28	Company labor for field oversight and construction management	$ 588
Subtotal				$ 74,508
General Overhead Rate on Labor and Capital (10%)				$ 7,451
Total Estimated Cost				**$ 81,959**



2018

Project No: S-20 •
PWSID: 0407056

Paradise Valley District

Project Area:

Lakeside Ln

Project Description:

Replace the following services:
21 residential services on Lakeside Ln
15 residential services on Moonlight Way
11 residential services on Clearwater Pkwy
7 residential services on Silvercrest Way
3 residential services on Crystal Ln
5 residential services on Sparkling Ln
2 residential services on Spring Ln
1 residential services on Brookview Way

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

140 70 0 140 280 420 560
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 -

EPCOR Water

Preliminary Cost Estimate

Date Prepared: 2/11/2014

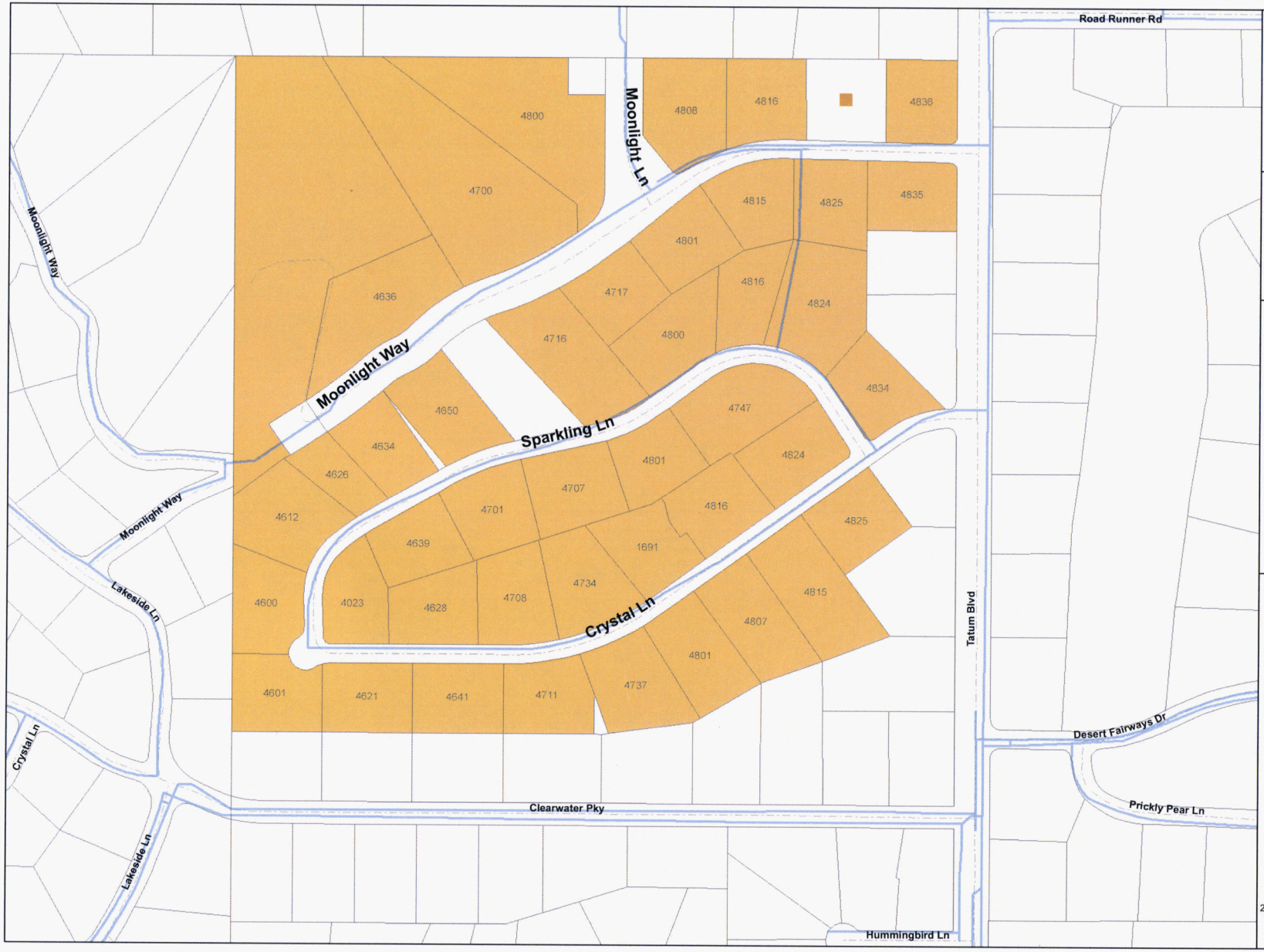
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2018 S-20**	Lakedside Ln, Moonlight Way, Clearwater Pkwy, Silvercrest Way, Crystal Ln, Sparkling Ln, Spring Ln, Brookview Way

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
54	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 189,000
7	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 24,920
4	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 14,480
65	hour	28	Company labor for field oversight and construction management	$ 1,820
Subtotal				$ 230,220
General Overhead Rate on Labor and Capital (10%)				$ 23,022
Total Estimated Cost				**$ 253,242**



2018

Project No: S-21 •
PWSID: 0407056

Paradise Valley District

Project Area:

Crystal Lane

Project Description:

Replace the following services:
12 residential services on Moonlight Way
16 residential services on Crystal Ln
15 residential services on Sparkling Ln

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

100 50 0 100 200 300 400 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

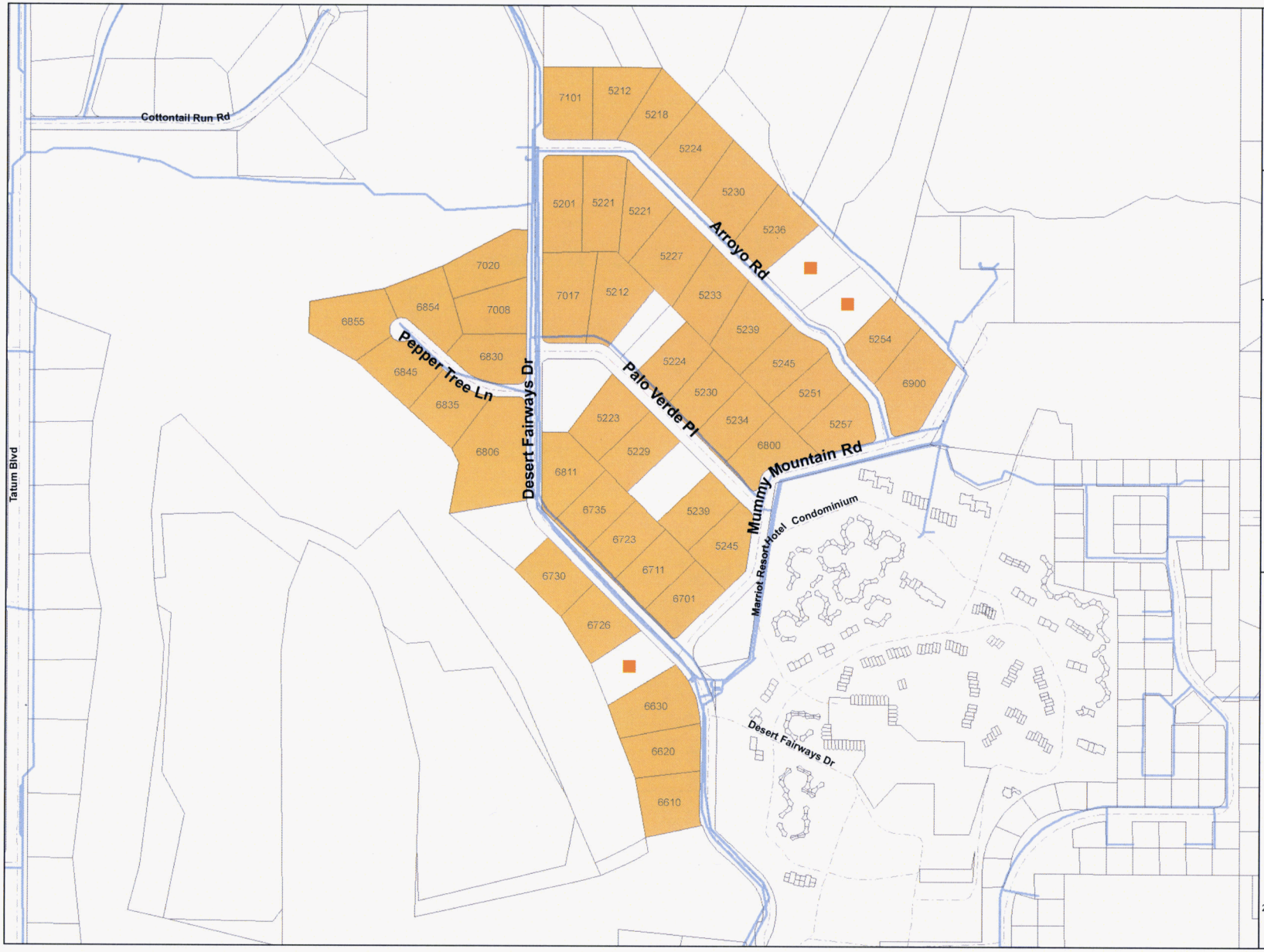
EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2018 S-21**	Project Location: Crystal Ln, Moonlight Way, Sparkling Way	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
35	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 122,500
5	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 17,800
3	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 10,860
43	hour	28	Company labor for field oversight and construction management	$ 1,204
Subtotal				$ 152,364
General Overhead Rate on Labor and Capital (10%)				$ 15,236
Total Estimated Cost				**$ 167,600**



2018

Project No: S-22 •
PWSID: 0407056

Paradise Valley District

Project Area:

Desert Fairways Drive

Project Description:

Replace the following services:
8 residential services on Palo Verde Pl
16 residential services on Desert Fairways Dr
15 residential services on Arroyo Rd
4 residential services on Pepper Tree Ln
2 residential services on Mummy Mountain Rd

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

150 75 0 150 300 450 600
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

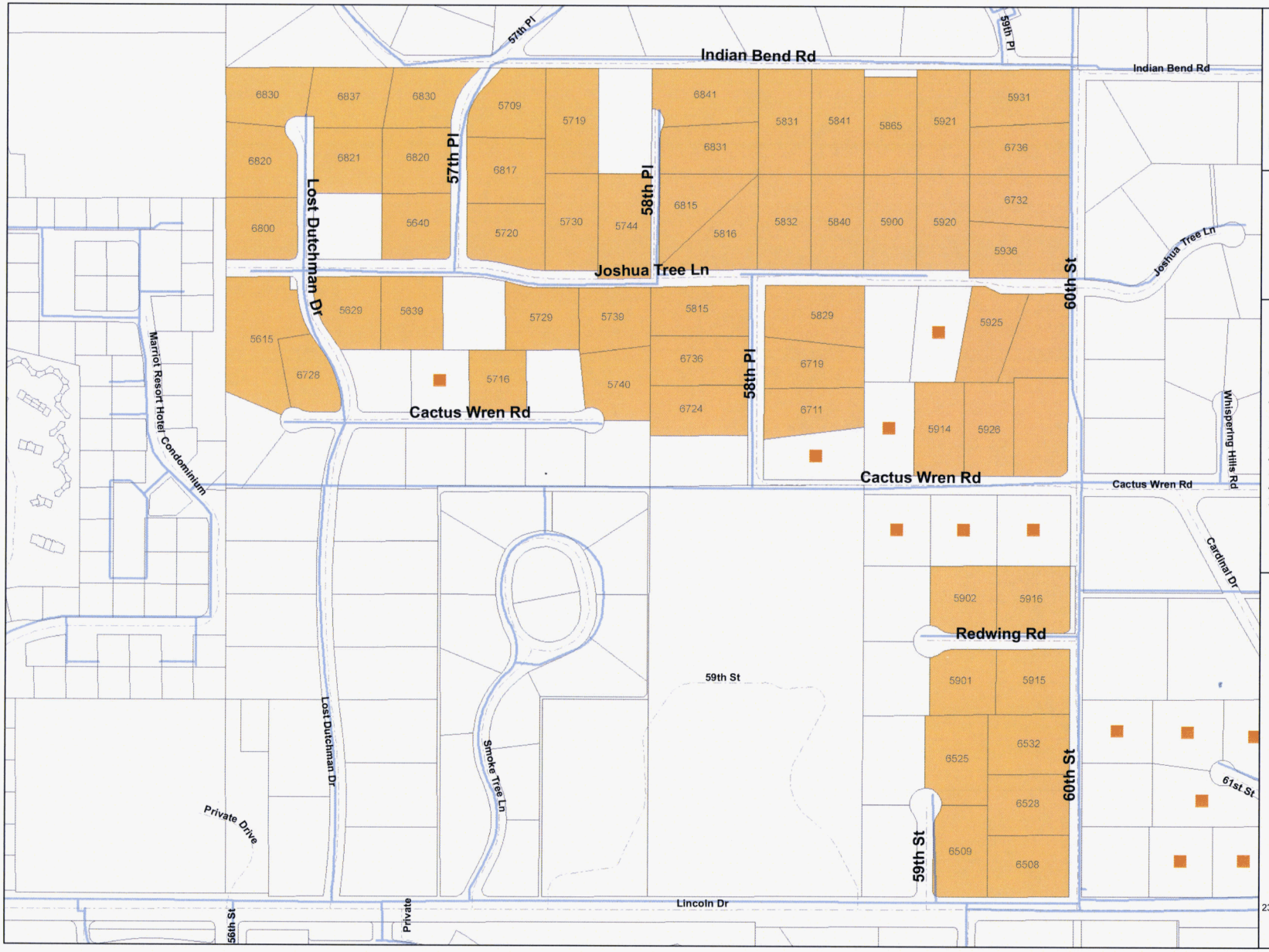
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2018 S-22**	Desert Fairways, Palo Verde Ln, Desert Fairways Dr, Arroyo Rd, Pepper Tree Ln, Mummy Mountain Rd

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
37	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 129,500
5	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 17,800
3	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 10,860
45	hour	28	Company labor for field oversight and construction management	$ 1,260
Subtotal				$ 159,420
General Overhead Rate on Labor and Capital (10%)				$ 15,942
Total Estimated Cost				**$ 175,362**



2018

Project No: S-23 •
PWSID: 0407056

Paradise Valley District

Project Area:

Joshua Tree Ln

Project Description:

Replace the following services:
17 residential services on Joshua Tree Ln
6 residential services on Lost Dutchman Dr
7 residential services on Indian Bend Rd
4 residential services on Cactus Wren Rd
3 residential services on 57th Pl
1 residential service on 58th St
2 residential services on 58th Dr
4 residential services on 58th Pl
8 residential services on 60th St
4 residential services on Redwing Rd
2 residential services on 59th St

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

120 60 0 120 240 360 480
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2018 S-23**	Project Location: Joshua Tree Ln, Lost Dutchman Dr, Indain Bend Rd, Cactus Wren Rd, 57th Pl, 58th St, 58th Pl, 60th St, Redwing Rd, 59th St	

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
49	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 171,500
6	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 21,360
3	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 10,860
58	hour	28	Company labor for field oversight and construction management	$ 1,624
Subtotal				$ 205,344
General Overhead Rate on Labor and Capital (10%)				$ 20,534
Total Estimated Cost				**$ 225,878**

2019

Paradise Valley – [redacted] ID No. 0407056

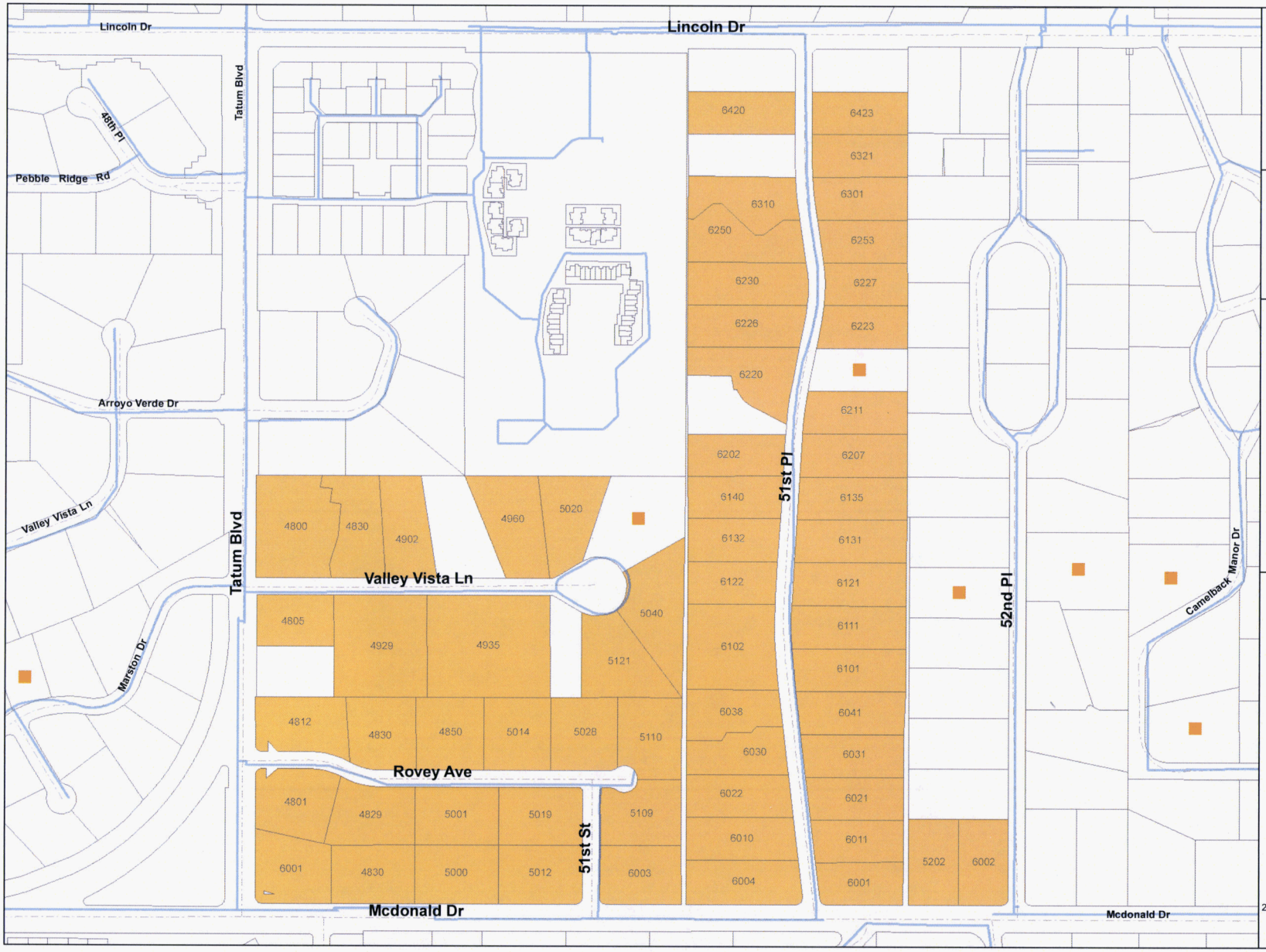
SIB PLANT TABLE I, 1-5

2019 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-24	333	service lines	62	51-1" 7-1.5" 4-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	51st Pl	12/2019	n/a	$241,600	Replace 51-1", 7-1.5", and 4-2" (62 total) residential services along 51st Pl, Valley Vista Ln, and Rovey Ave. These services are a priority for replacement because they are galvanized steel pipe and are will be about 66 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-24 in Exhibit CC-1-C for more detail.
S-25	333	service lines	63	63-1"	Copper	1"-$3,881	Marston Dr	12/2019	n/a	$244,490	Replace 63-1" residential and commercial services along Arroyo Verde Dr, Valley Vista Ln, and Marston Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 41 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-25 in Exhibit CC-1-C for more detail.

S-26	333	service lines	30	30-1"	Copper	1"-$3,881	Pebble Ridge Rd	12/2019	n/a	$116,424	Replace 30-1" residential services along [illegible]ble Ridge Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 45 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-26 in Exhibit CC-1-C for more detail.
S-27	333	service lines	41	36-1" 5-1.5"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Claremont Ave and Maderos Del Cuenta Dr	12/2019	n/a	$159,443	Replace 36-1" and 5-1.5" (41 total) residential services on Claremont Ave, 42nd St, Marlette Ave, and Maderos Del Cuenta Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 41 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-27 in Exhibit CC-1-C for more detail.
Total			**196**							**$761,957**	



2019

Project No: S-24 •
PWSID: 0407056

Paradise Valley District

Project Area:

51st Place

Project Description:

Replace the following services:
34 residential services on 51st Pl
10 residential services on Valley Vista Ln
1 residential service on 52nd Pl
1 residential service on Tatum Blvd
1 residential service on 51st St
11 residential services on Rovey Ave
4 residential services on Mcdonald Dr

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

110 55 0 110 220 330 440
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate				Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2019 S-24**	Project Location: 51st Pl, Valley Vista Ln, 52nd Pl, Tatum Blvd, 51st St, Rovey Ave, McDonald Dr	
Project Description: Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.				

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
51	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 178,500
7	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 24,920
4	2" service	3620	Contractor materials and labor to replace 2" residential services	$ 14,480
62	hour	28	Company labor for field oversight and construction management	$ 1,736
Subtotal				$ 219,636
General Overhead Rate on Labor and Capital (10%)				$ 21,964
Total Estimated Cost				**$ 241,600**

2019

Project No: S-25 •
PWSID: 0407056

Paradise Valley District

Project Area:

Marston Dr

Project Description:

Replace the following services:
24 residential services on Marston Dr
10 residential services on Valley Vista Ln
15 residential services on Arroyo Verde Dr
6 residential services on 47th St
3 residential services on 48th Pl
3 residential services on 47th Pl
1 residential service on 46th St
1 commercial service on Valley Vista Ln

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

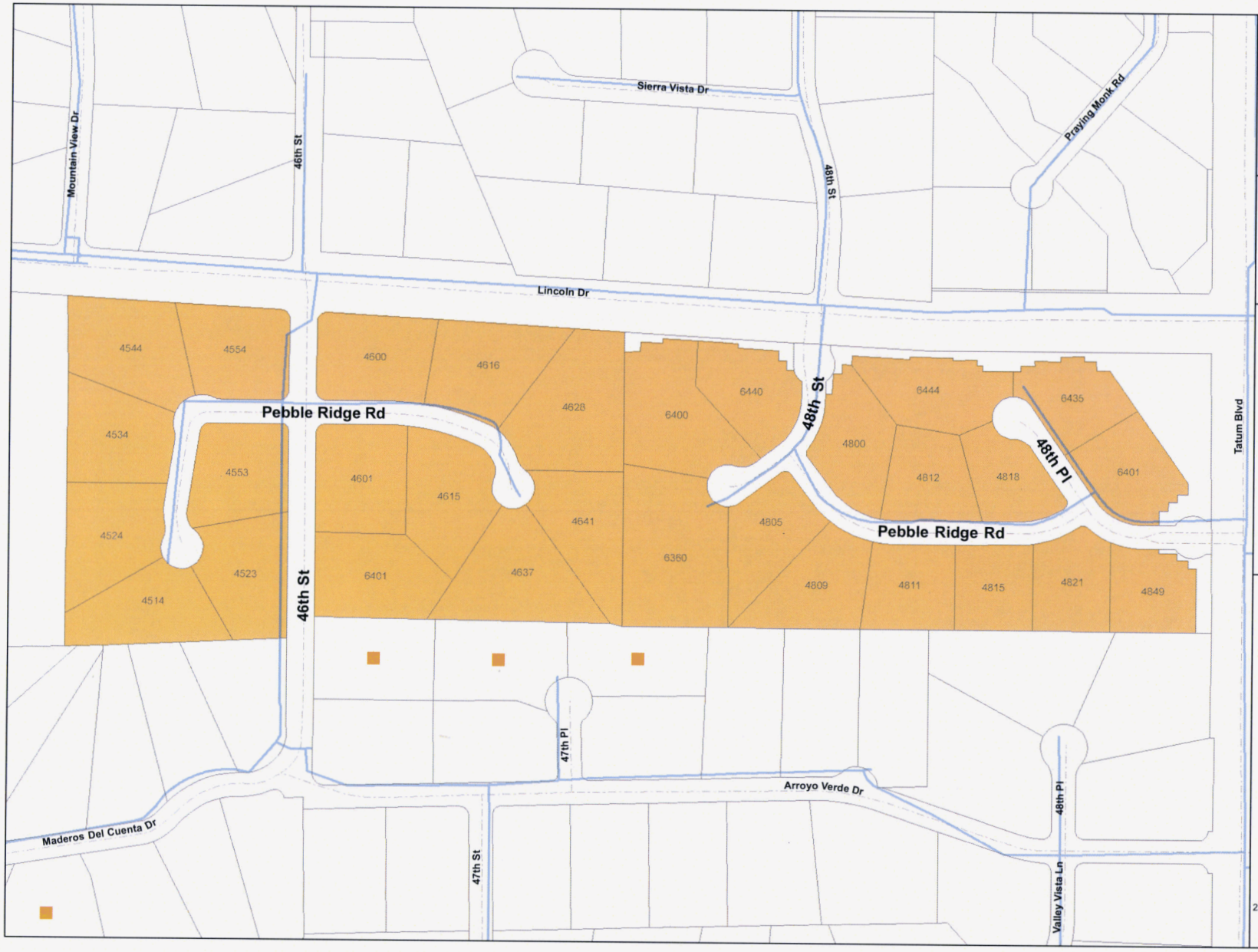
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2019 S-25**	Marston Dr, Valley Vista Ln, Arroyo Verde Dr, 47th St, 48th Pl, 47th Pl, 46th St

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
63	1" service	3,500	Contractor material and labor to replace 1" residential and commercial services	$ 220,500
63	hour	28	Company labor for field oversight and construction management	$ 1,764
Subtotal				$ 222,264
General Overhead Rate on Labor and Capital (10%)				$ 22,226
Total Estimated Cost				**$ 244,490**



2019

Project No: S-26 •
PWSID: 0407056

Paradise Valley District

Project Area:

Pebble Ridge Rd

Project Description:

Replace the following services:
23 residential services on Pebble Ridge Rd
3 residential services on 48th Pl
3 residential services on 48th St
1 residential service on 46th St

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2019 S-26**	Project Location: Pebble Ridge Rd, 48th St, 48th Pl, 46th St

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
30	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 105,000
30	hour	28	Company labor for field oversight and construction management	$ 840
Subtotal				$ 105,840
General Overhead Rate on Labor and Capital (10%)				$ 10,584
Total Estimated Cost				**$ 116,424**

2019

Project No: S-27 •
PWSID: 0407056

Paradise Valley District

Project Area:

Claremont Ave

Project Description:

Replace the following services:
13 residential services on
Maderos De Cuenta Dr
9 residential services on Marlette Ave
11 residential services on Claremont Ave
8 residential services on 42nd St

Legend

- Parcel with service to be replaced
- Service previously replaced
- Main

N

90 45 0 90 180 270 360
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/11/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2019 S-27**	Claremont Ave, 42nd St, Marlette Ave, Maderos Del Cuenta Dr

Project Description:

Replace galvanized service lines with copper service lines to reduce water leaks and emergency repairs.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
36	1" service	3,500	Contractor material and labor to replace 1" residential services	$ 126,000
5	1.5" service	3,560	Contractor materials and labor to replace 1.5" residential services	$ 17,800
41	hour	28	Company labor for field oversight and construction management	$ 1,148
Subtotal				$ 144,948
General Overhead Rate on Labor and Capital (10%)				$ 14,495
Total Estimated Cost				**$ 159,443**

Section 2 - Valves

SECTION 2 – VALVES

2.1 Overview

The Paradise Valley water system contains about 1,500 distribution system valves. Maintenance records have shown that many of these valves are leaking and/or inoperable. Parts of the system were installed in the 1940s and about a quarter of the distribution valves will be about 70 years old by the end of this decade. As valves age, they are prone to deterioration and the parts begin to fail. Common failures include stripped, broken, or bent stems, leaking O-rings or packing, corrosion or cracking of the valve body, corrosion of the connecting bolts, and wear on the valve disk and seat.

2.2 Nessie Curve

As described in Section 1, a "Nessie Curve" is a graphical representation of the annual replacement needs for buried infrastructure. It is not economical or feasible to inspect all buried infrastructure so the curve uses historical replacement data and statistical analysis to determine the end of an asset's useful lifetime. The end of an asset's useful life is when it is considered economically efficient to replace it, or when replacement becomes less expensive than the cost of replacement or repairs in the future. Failure to replace assets when it is economical to do so can be disastrous in the future, when demographic and economic conditions may have changed. As an example, if the population of an area were to decrease in the future, the financial burden of asset replacements on the remaining population would become increasingly difficult, especially if prudent replacements have not been completed in the past.

According to the American Water Works Association (AWWA) "there will be a three-fold increase in the repair costs by the year 2030 despite a concurrent increase of three and a half times in annual investments to replace pipes." [1] The AWWA estimates that buried drinking water infrastructure will need investments totaling more than $1 trillion nationwide in the next 25 years.[2] Given these daunting predictions, it is especially important for water utility providers to implement asset replacement programs now in order to properly manage the investments that will be needed in the future.

[1] Reinvesting in Drinking Water Infrastructure, AWWA, May 2001

[2] Buried No Longer: Confronting America's Water Infrastructure Challenge, AWWA, 2012

Exhibit 2-1 is the Nessie curve which was developed specifically for the valves in EPCOR's Paradise Valley water district. Exhibit 2-2 shows the same data in tabular format. The curve shows that a large investment in valve replacements should occur before 2030. In the next six years, from 2015 through 2020, approximately $1.3 million should be spent on valve replacements, or about $217,000 per year. This equates to about 40 valve replacements per year.

Exhibit 2-1 – Valve Nessie Curve

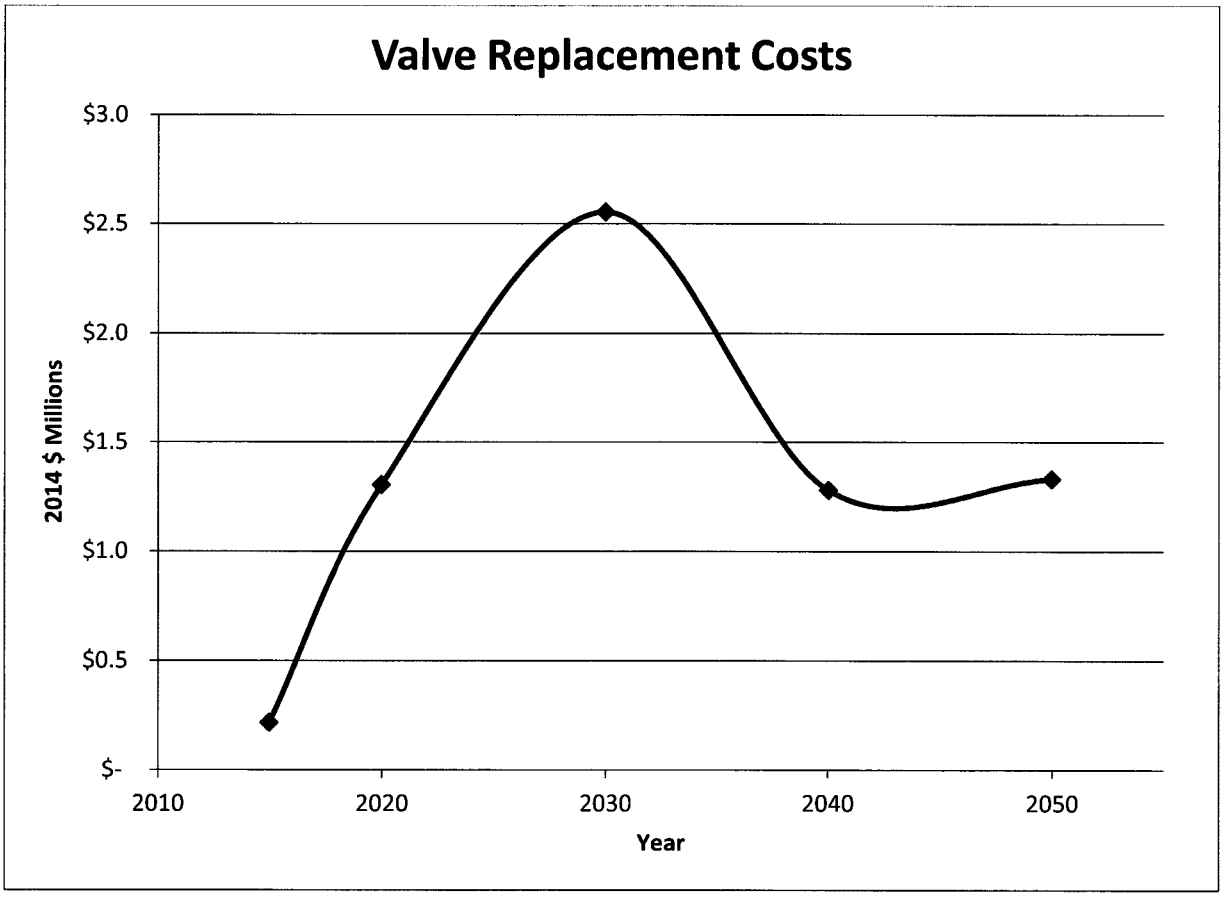


Exhibit 1-2 Nessie Curve Table

Time Frame	Number of Valves to be Installed	Cost to Replace Valves	Number of Valve Replacements per Year	Cost per Year
today-2020	238	$ 1,302,004	40	$ 217,001
2020-2030	467	$ 2,554,242	47	$ 255,424
2030-2040	234	$ 1,279,234	23	$ 127,923
2040-2050	243	$ 1,329,536	24	$ 132,954

2.3 Valve Replacements

Historically, valves in this district have been replaced if found broken during main break repairs, or other system maintenance. However, implementation of a more rigorous valve maintenance program will ensure that about 20% of the system valves are tested each year. As more valves are tested, it is expected that in the first few years more valves will be found in need of replacement. This number should decrease as all valves in the system are exercised and maintained regularly. This maintenance program will increase system reliability and reduce customer service disruptions.

The Nessie curve analysis suggests a replacement rate of 40 valves per year is needed. Therefore, EPCOR's goal is to replace close to 40 valves per year under this plan, although it is impossible to know how many valves will actually need to be replaced in each maintenance area. Additionally, it is assumed that the size of valves that will need replacement will be approximately proportional to the percentage of system valves of each size. The investment over five years for valve replacements is estimated to be $1.1 million.

Valve replacement projects are described in the following tabs labeled **2015, 2016, 2017, 2018,** and **2019.** SIB Plant Table I, 2-1 through SIB Plant Table I, 2-5 provide detailed descriptions of each valve replacement project. The tables are broken down by year, so there is a separate table for each year from 2015 (Table I, 2-1) through 2019 (Table I, 2-5). Each project addresses

a set of valve replacements that will occur within a defined area. Each project can also be tied to a map showing the proposed valve replacements as well as any valves in the vicinity that were found broken in the past three years (note that valve replacements that occurred prior to 2011 or were part of main replacement projects are not shown on these maps). A cost estimate for each project is also provided.

2015

Paradise Valley – [redacted]S ID No. 0407056

SIB PLAN TABLE I, 2-1

2015 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-1	331	gate valves	40	5-4" 28-6" 6-8" 1-16"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 16"-$20,046	Area north of Lincoln Dr between 40th St and 54th Pl (see map V-1 for detail)	12/2015	n/a	$203,628	Replace 5-4", 28-6", 6-8", and 1-16" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-1 in Exhibit CC-1-C for more detail.
Total			**40**							**$203,628**	

2015

Project No:
PWSID: 0407056

Paradise Valley Water

Project Area:

Valve Maintenance Area V-1

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-1: 272

Legend

- Previous Valve Replacements (2011-2013)
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

620 310 0 620 1,240 1,860 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/24/2014

EPCOR Water 2014 -

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2015 V-1**	Area north of Lincoln between 40th St and 54th Pl

Project Description:

Replace old distribution system valves that are inoperable with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
5	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-1.	$ 20,000
28	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-1.	$ 117,600
6	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-1.	$ 28,200
1	16" Valve	18000	Contractor material and labor to replace 16" valves in Area V-1.	$ 18,000
5	hour	28	Company labor for field oversight and construction management (4" valves)	$ 140
28	hour	28	Company labor for field oversight and construction management (6" valves)	$ 784
6	hour	28	Company labor for field oversight and construction management (8" valves)	$ 168
8	hour	28	Company labor for field oversight and construction management (16" valve)	$ 224
Subtotal				$ 185,116
General Overhead Rate on Labor and Capital (10%)				$ 18,512
Total Estimated Cost				**$ 203,628**

*Company labor includes the salary for one employee at a rate of $28/hour. Labor is estimated to be one hour for 4"-8" valves, four hours for 12" valves, and eight hours for 16" and 24" valves.

2016

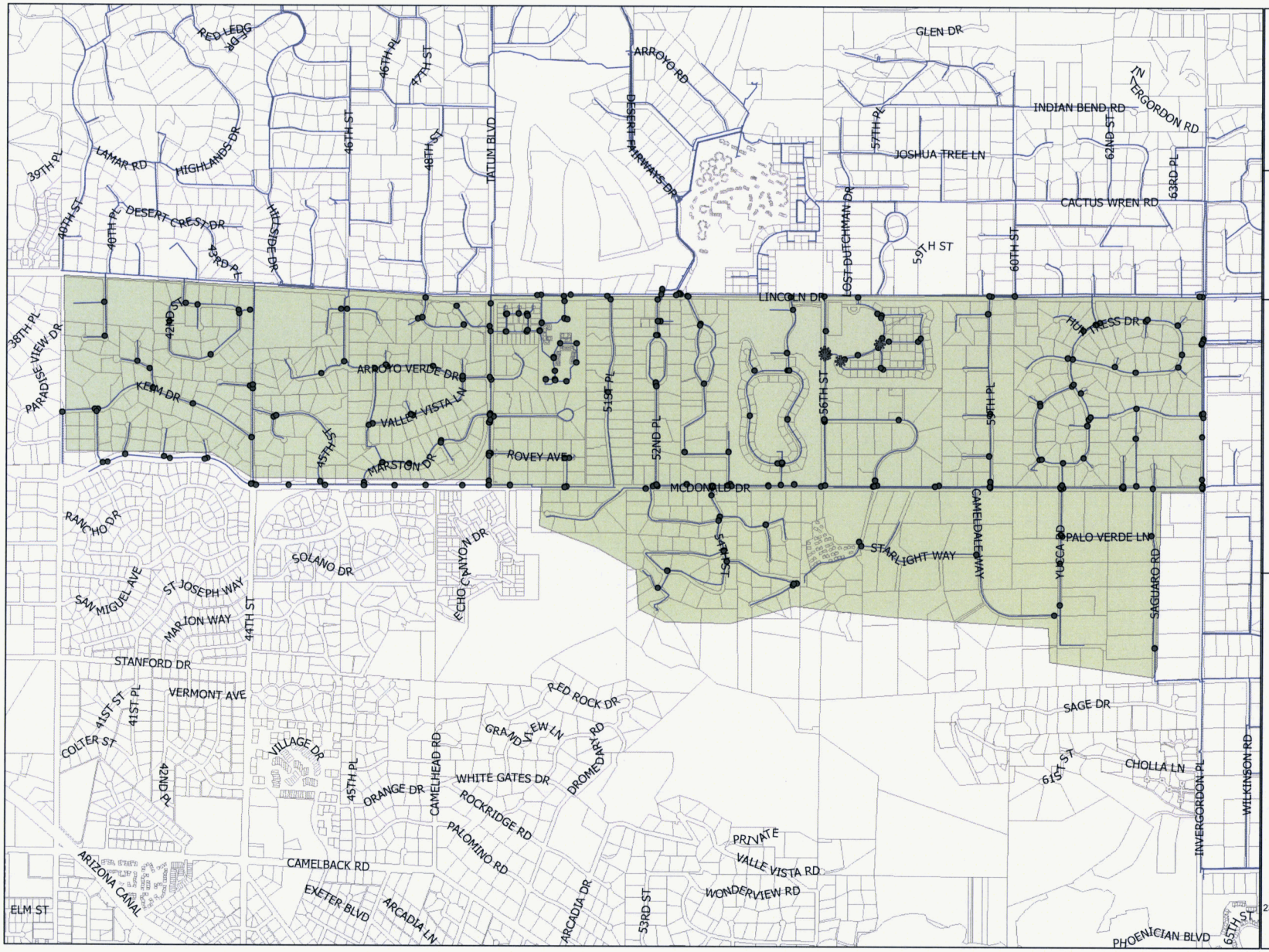
Paradise Valley - [redacted]S ID No. 0407056

SIB PLANT TABLE I, 2-2

2016 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-2	331	gate valves	40	5-4" 17-6" 14-8" 3-12" 1-24"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 24"-$33,246	Area south of Lincoln Dr between 40th St and Invergordon Dr (see map V-2 for detail)	12/2016	n/a	$225,795	Replace 5-4", 17-6", 14-8", 3-12", and 1-24" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-2 in Exhibit CC-1-C for more detail.
Total			**40**							**$225,795**	



2016

Project No:
PWSID: 0407056

Paradise Valley Water

Project Area:

Valve Maintenance Area V-2

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-2: 296

Legend

- Previous Valve Replacements (2011-2013)
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

825 412.5 0 825 1,650 2,475 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/24/2014

EPCOR Water 2014 •

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2016 V-2**	Project Location: Area south of Lincoln between 40th St and Invergordon

Project Description:

Replace old distribution system valves that are inoperable with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
5	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-2.	$ 20,000
17	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-2.	$ 71,400
14	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-2.	$ 65,800
3	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-2.	$ 16,500
1	24" Valve	30000	Contractor material and labor to replace 24" valves in Area V-2.	$ 30,000
5	hour	28	Company labor for field oversight and construction management (4" valves)	$ 140
17	hour	28	Company labor for field oversight and construction management (6" valves)	$ 476
14	hour	28	Company labor for field oversight and construction management (8" valves)	$ 392
12	hour	28	Company labor for field oversight and construction management (12" valve)	$ 336
8	hour	28	Company labor for field oversight and construction management (24" valve)	$ 224
Subtotal				$ 205,268
General Overhead Rate on Labor and Capital (10%)				$ 20,527
Total Estimated Cost				**$ 225,795**

2017

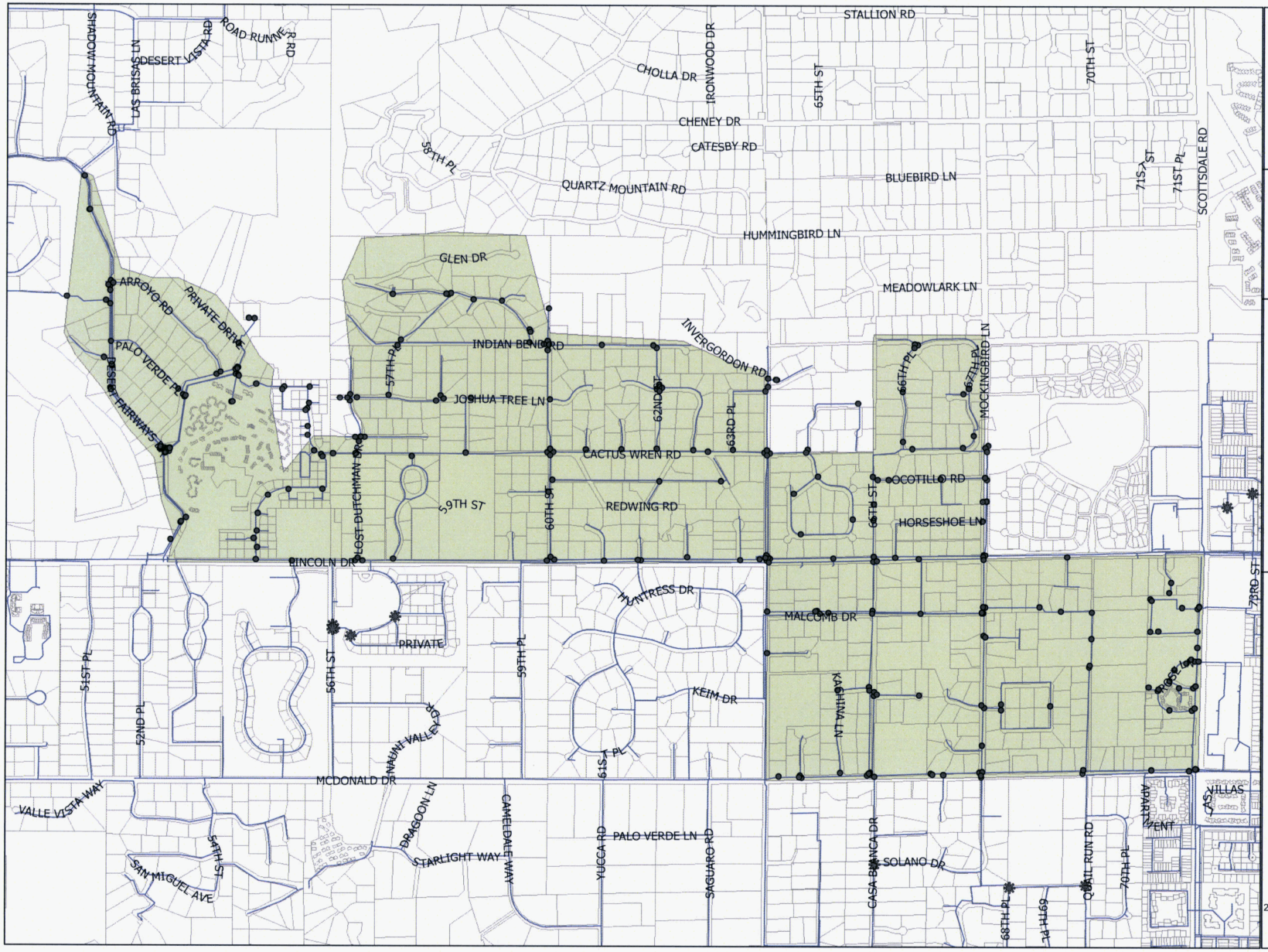
Paradise Valley - [redacted]S ID No. 0407056

SIB PLANT TABLE I, 2-3

2017 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-3	331	gate valves	40	7-4" 13-6" 12-8" 9-12" 1-24"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 24"-$33,246	Area between Desert Fairways and Mockingbird Ln north of Lincoln Dr and Invergordon Dr and Scottsdale Rd south of Lincoln Dr (see map V-3 for detail)	12/2017	n/a	$242,691	Replace 7-4", 13-6", 12-8", 9-12", and 1-24" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-3 in Exhibit CC-1-C for more detail.
Total			**40**							**$242,691**	



2017

Project No:
PWSID: 0407056

Paradise Valley Water

Project Area:

Valve Maintenance Area V-3

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-3: 304

Legend

- Previous Valve Replacements (2011-2013)
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

720 360 0 720 1,440 2,160 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/24/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2017 V-3**	Area between Desert Fairways and Mockingbird north of Lincoln and Invergordon and Scottsdale south of Lincoln

Project Description:

Replace old distribution system valves that are inoperable with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
7	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-3.	$ 28,000
13	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-3.	$ 54,600
12	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-3.	$ 56,400
9	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-3.	$ 49,500
1	24" Valve	30000	Contractor material and labor to replace 24" valves in Area V-3.	$ 30,000
7	hour	28	Company labor for field oversight and construction management (4" valves)	$ 196
13	hour	28	Company labor for field oversight and construction management (6" valves)	$ 364
12	hour	28	Company labor for field oversight and construction management (8" valves)	$ 336
36	hour	28	Company labor for field oversight and construction management (12" valve)	$ 1,008
8	hour	28	Company labor for field oversight and construction management (24" valve)	$ 224
Subtotal				$ 220,628
General Overhead Rate on Labor and Capital (10%)				$ 22,063
Total Estimated Cost				**$ 242,691**

2018

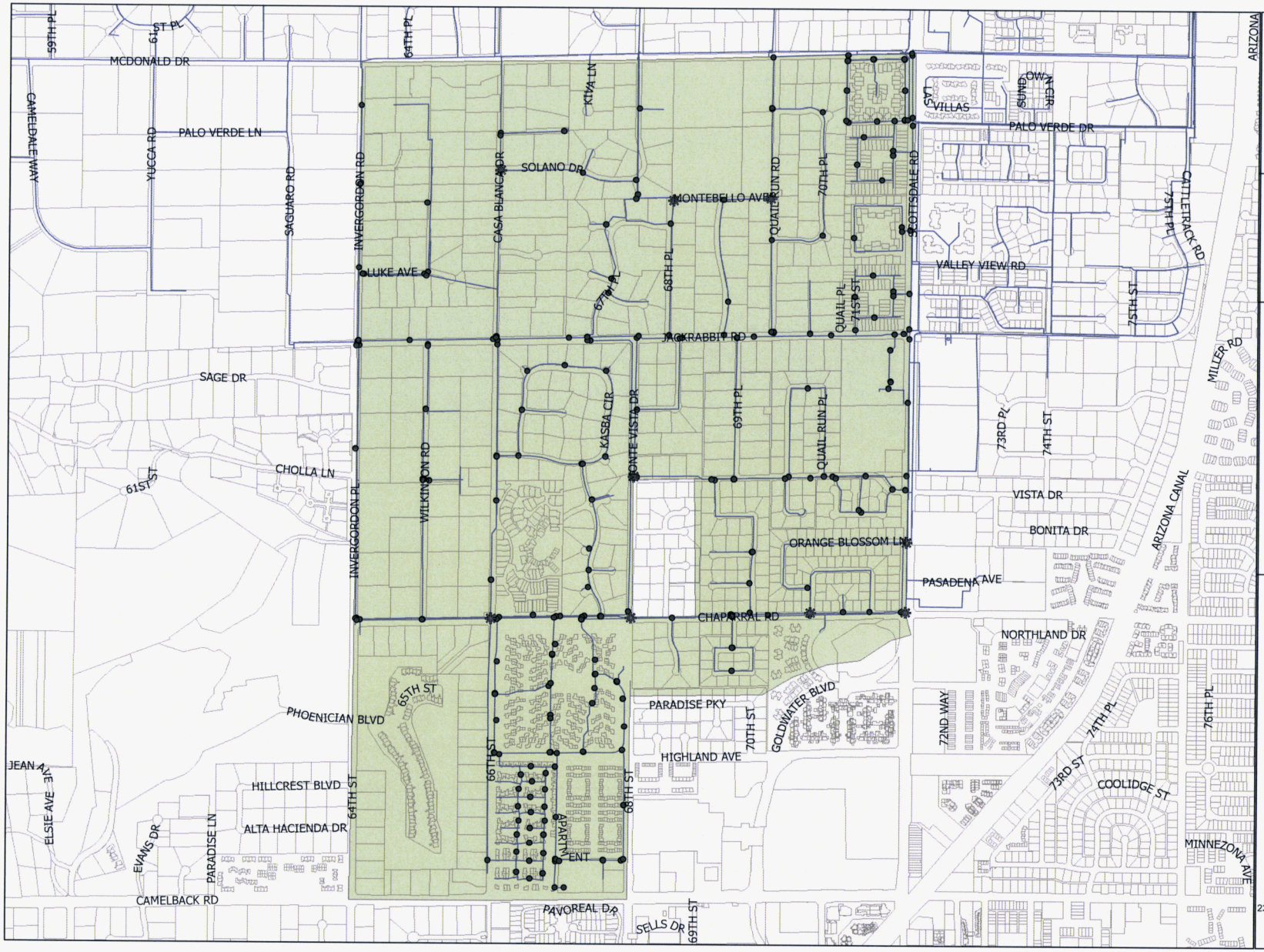
Paradise Valley – [redacted]S ID No. 0407056

SIB PLANT TABLE I, 2-4

2018 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-4	331	gate valves	40	11-4" 20-6" 7-8" 1-12" 1-16"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 16"-$20,046	Area south of McDonald Dr between Invergordon Dr and Scottsdale Rd (see map V-4 for detail)	12/2018	n/a	$204,380	Replace 11-4", 20-6", 7-8", 1-12", and 1-16" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-4 in Exhibit CC-1-C for more detail.
Total			**40**							**$204,380**	



2018

Project No:
PWSID: 0407056

Paradise Valley Water

Project Area:

Valve Maintenance Area V-4

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-4: 283

Legend

- Previous Valve Replacements (2011-2013)
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

560 280 0 560 1,120 1,680 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/24/2014

EPCOR Water 2014 ©

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2018 V-4**	Area south of McDonald between Invergordon and Scottsdale

Project Description:

Replace old distribution system valves that are inoperable with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
11	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-4.	$ 44,000
20	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-4.	$ 84,000
7	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-4.	$ 32,900
1	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-4.	$ 5,500
1	16" Valve	18000	Contractor material and labor to replace 16" valves in Area V-4.	$ 18,000
11	hour	28	Company labor for field oversight and construction management (4" valves)	$ 308
20	hour	28	Company labor for field oversight and construction management (6" valves)	$ 560
7	hour	28	Company labor for field oversight and construction management (8" valves)	$ 196
4	hour	28	Company labor for field oversight and construction management (12" valve)	$ 112
8	hour	28	Company labor for field oversight and construction management (16" valve)	$ 224
Subtotal				$ 185,800
General Overhead Rate on Labor and Capital (10%)				$ 18,580
Total Estimated Cost				**$ 204,380**

2019

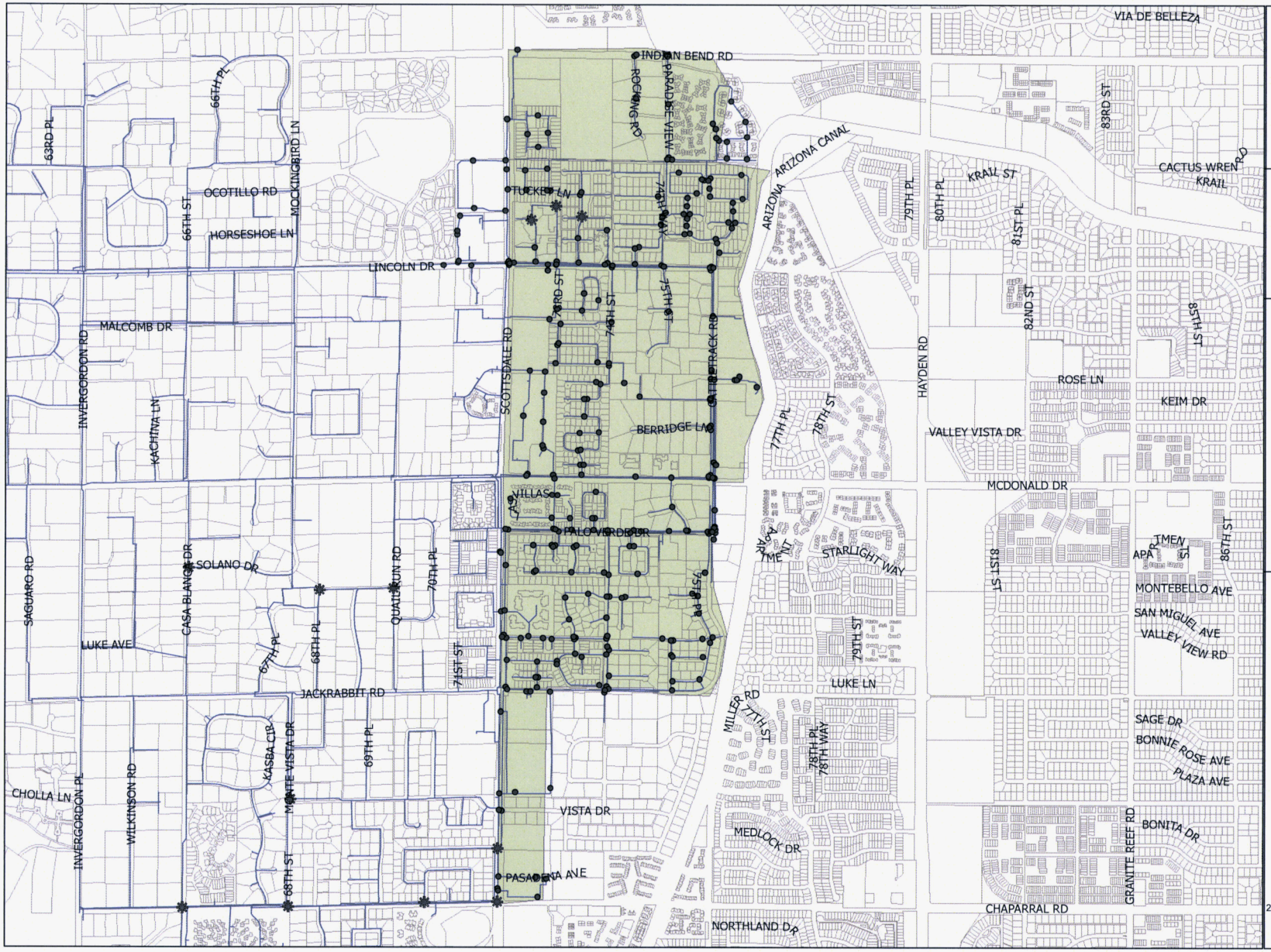
Paradise Valley – [redacted]S ID No. 0407056

SIB PLANT TABLE I, 2-5

2019 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-5	331	gate valves	40	1-4" 15-6" 20-8" 3-12" 1-24"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 24"-$33,246	Area east of Scottsdale Rd (see map V-5 for detail)	12/2019	n/a	$229,975	Replace 1-4", 15-6", 20-8", 3-12", and 1-24" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-5 in Exhibit CC-1-C for more detail.
Total			**40**							**$229,975**	



2019

Project No:
PWSID: 0407056

Paradise Valley Water

Project Area:

Valve Maintenance Area V-5

Project Description:

Approximately 20% of total distribution system valves will be tested annually. Valves found broken as part of the annual valve maintenance program will be replaced.

Total Valves in Area V-5: 307

Legend

- Previous Valve Replacements (2011-2013)
- Distribution System Valves

Water Main

- Distribution
- Maricopa County Parcels
- Valve Maintenance Area

N

750 375 0 750 1,500 2,250 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/24/2014

EPCOR Water 2014 -

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2019 V-5**	Area east of Scottsdale Rd

Project Description:

Replace old distribution system valves that are inoperable with new industry standard gate valves with epoxy and rubberized internal components to prevent build-up.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1	4" Valve	4000	Contractor material and labor to replace 4" valves in Area V-5.	$ 4,000
15	6" Valve	4200	Contractor material and labor to replace 6" valves in Area V-5.	$ 63,000
20	8" Valve	4700	Contractor material and labor to replace 8" valves in Area V-5.	$ 94,000
3	12" Valve	5500	Contractor material and labor to replace 12" valves in Area V-5.	$ 16,500
1	24" Valve	30000	Contractor material and labor to replace 24" valves in Area V-5.	$ 30,000
1	hour	28	Company labor for field oversight and construction management (4" valves)	$ 28
15	hour	28	Company labor for field oversight and construction management (6" valves)	$ 420
20	hour	28	Company labor for field oversight and construction management (8" valves)	$ 560
12	hour	28	Company labor for field oversight and construction management (12" valve)	$ 336
8	hour	28	Company labor for field oversight and construction management (24" valve)	$ 224
Subtotal				$ 209,068
General Overhead Rate on Labor and Capital (10%)				$ 20,907
Total Estimated Cost				**$ 229,975**

Section 3 - Mains

SECTION 3 – MAINS

3.1 Overview

EPCOR's Paradise Valley Water district includes about 130 miles of distribution main. About half of this pipe was installed before 1970, starting in 1946. Many mains have been breaking or leaking due to various reasons including inferior pipe material and deterioration from the aging process.

3.2 Nessie Curve

As explained in the previous two sections, a "Nessie Curve" is a graphical representation of the annual replacement needs for buried infrastructure. Because it is not economical or feasible to inspect all buried infrastructure, the curve uses historical replacement data and statistical analysis to determine when an asset has reached the end of its useful life and is likely to need replacement. The end of an asset's useful life is when it is considered economically efficient to replace it; this is to say when replacement becomes less expensive than the cost of replacement or repairs in the future. Failure to replace assets when it is economical to do so can be disastrous in the future, when demographic and economic conditions may have changed. As an example, if the population of an area were to decrease in the future, the financial burden of asset replacements on the remaining population would become increasingly difficult, especially if prudent replacements have not been completed in the past.

According to the American Water Works Association (AWWA) "there will be a three-fold increase in the repair costs by the year 2030 despite a concurrent increase of three and a half times in annual investments to replace pipes." [1] The AWWA estimates that buried drinking water infrastructure will need investments totaling more than $1 trillion nationwide in the next 25 years.[2] Given these daunting predictions, it is especially important for water utility providers to implement asset replacement programs now in order to properly manage the investments that will be needed in the future.

Exhibit 3-1 is the Nessie curve which was developed specifically for the water distribution mains in EPCOR's Paradise Valley district. Exhibit 3-2 shows the same data in tabular format. The

[1] Reinvesting in Drinking Water Infrastructure, AWWA, May 2001

[2] Buried No Longer: Confronting America's Water Infrastructure Challenge, AWWA, 2012

curve indicates that in the next six years, from 2015 through 2020, approximately $6 million should be spent on main replacements, or about $1 million per year. This equates to about 5,649 linear feet (LF) of main replacements per year.

Exhibit 3-2 – Main Line Nessie Curve

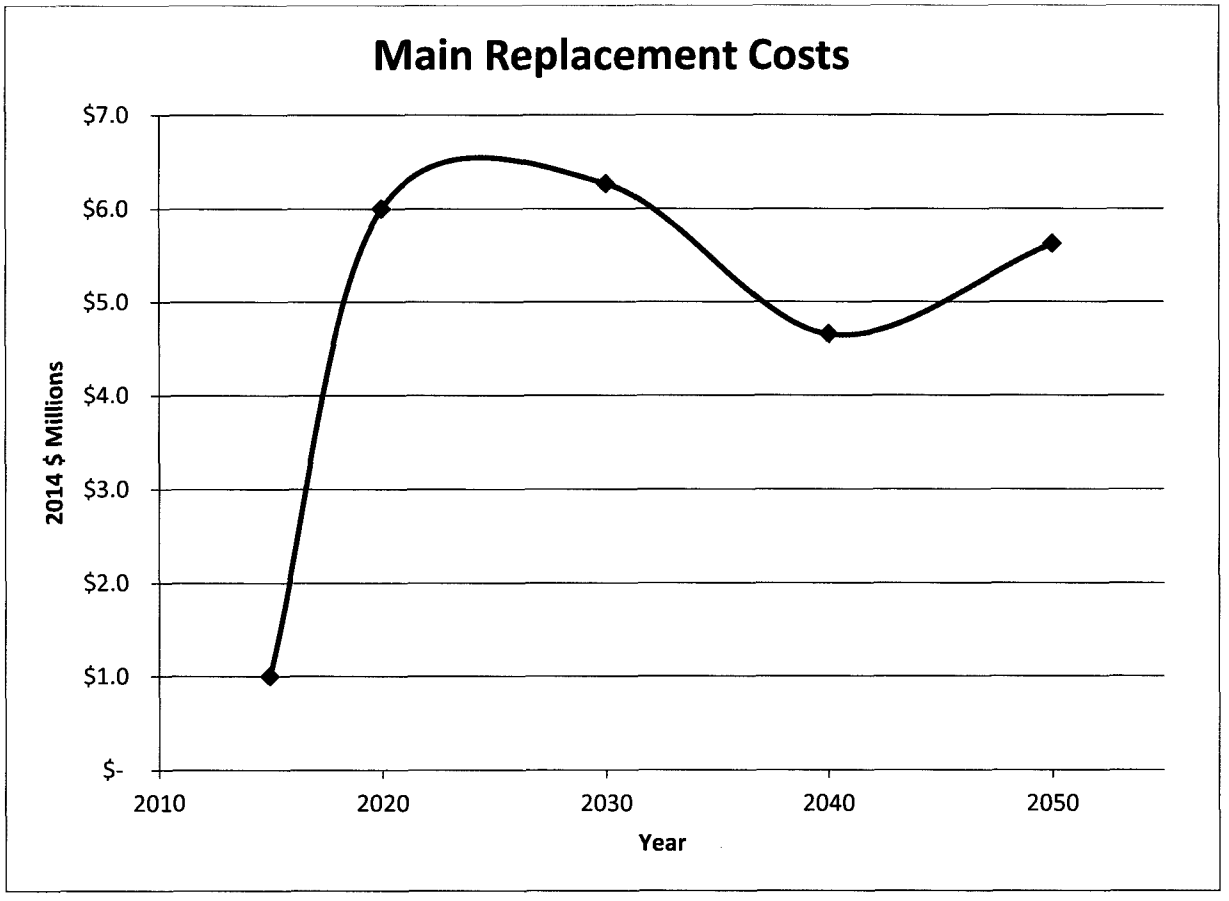


Exhibit 3-2 Nessie Curve Table

Time Frame	Linear Feet of Main to be Replaced	Cost to Replace Mains	Linear Feet of Main to be Replaced per Year	Cost per Year
today-2020	33891	$ 5,998,789	5649	$ 999,798
2020-2030	35409	$ 6,267,371	3541	$ 626,737
2030-2040	26301	$ 4,655,315	2630	$ 465,531
2040-2050	31774	$ 5,624,018	3177	$ 562,402

3.3 Main Age, Material, and Size

Water mains in the Paradise Valley district are currently as old as 68 years. Mains where the majority of the breaks are occurring were installed in the 1950s and are constructed of asbestos-cement (AC). This material is brittle and is no longer used in water systems. There is also some galvanized steel pipe, which, as explained in Section 1, is prone to corrosion. New mains will be polyvinyl chloride (PVC) which is proven to be more reliable. Many of the mains in which breaks occur are 4" mains in high pressure (>100 psi) areas. Newly installed mains must be designed to handle system pressures and flows, and in order to maintain the integrity of new mains, 6" mains will be installed instead of 4" mains where it is sensible to do so.

3.4 Main Replacements

In the past two years, there have been 31 main breaks in the Paradise Valley system, although this does not include mains which are leaking unbeknownst to EPCOR employees. Although the Nessie curve suggests that almost 6,000 feet of pipe should be replaced per year, the majority of breaks are occurring within a few specific areas. EPCOR has identified nine such areas and estimates that a total of only about 9,000 feet of pipe needs to be replaced due to frequent breaks. This would require replacing approximately 1,800 feet of main each year for the next five years. The estimated cost for these replacements totals about $1.7 million.

Main replacement projects are described in the following tabs labeled **2015, 2016, 2017, 2018, and 2019**. SIB Plant Tables I, 3-1 through SIB Plant Table I, 3-5 provide a detailed description of each main replacement project. The tables are broken down by year, so there is a separate table for each year from 2015 (Table I, 3-1) through 2019 (Table I, 3-5). Each project addresses a set of main replacements that will occur within a defined area. Each project can also be tied to a map showing the main replacement as well as historical replacements and repairs in the area. (Historical data include only main replacements and repairs between 2008 and 2013; replacements and repairs prior to 2008 are not included.) A detailed cost estimate for each project is also provided.

2015

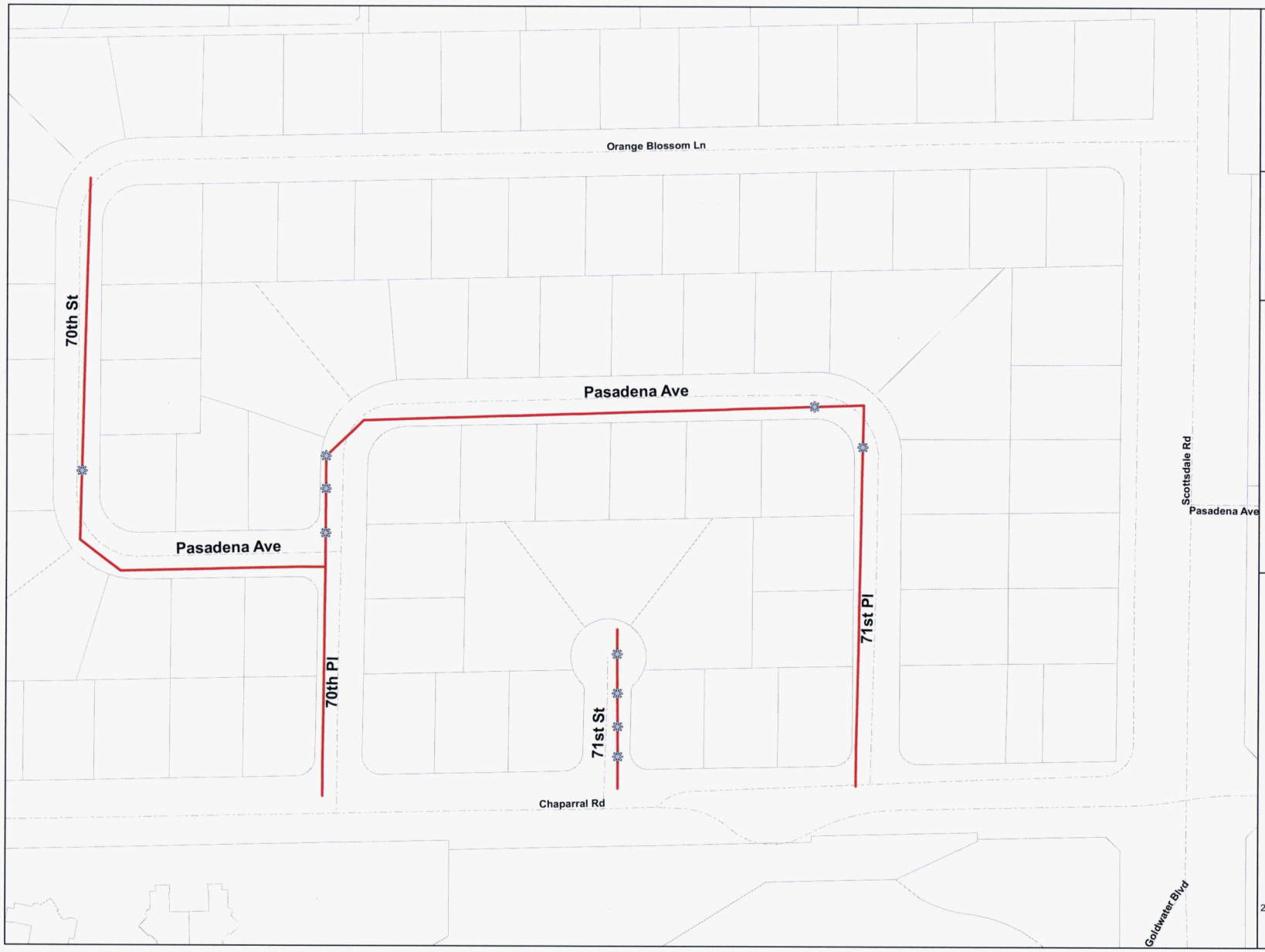
Paradise Valley – [redacted] ID No. 0407056

SIB PLANT TABLE I, 3-1

2015 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-1	331	Distribution Main	2,179 LF	6"	PVC	$208	Pasadena Loop	12/2015	n/a	$454,179	Replace 2,179 LF of existing main with 6" PVC in Pasadena Ave, 70th St, 70th Pl, 1st St, and 71st Pl. Ln. The main was installed in 1951 and the existing pipe material is a combination of asbestos-cement and galvanized steel which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-1 in Exhibit CC-1-C for more detail.
Total			**2,088 LF**							**$454,179**	



2015

Project No: WM-1 •
PWSID: 0407056

Paradise Valley

Project Area:

Pasadena Loop

Project Description:

Replace existing main in Pasadena Ave with 2,179 LF of 6" main.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

40 20 0 40 80 120 160
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/17/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2015 WM-1**	Pasadena Loop

Project Description:

Replace existing main on Pasadena Ave, Chaparral Rd, 70th Pl, 71st Pl, and 71st St with 2,088 feet of 6" main

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
2,088	linear feet	147	Contractor material and labor to install main and service connections	$ 306,936
1	lump sum	34,000	Consultant engineering design	$ 34,000
530	hours	35	Company labor for field oversight and inspections	$ 18,550
260	hours	45	Company labor for project management	$ 11,700
Subtotal				$ 371,186
General Overhead Rate on Labor and Capital (10%)				$ 37,119
Total Estimated Cost				**$ 408,305**

2016

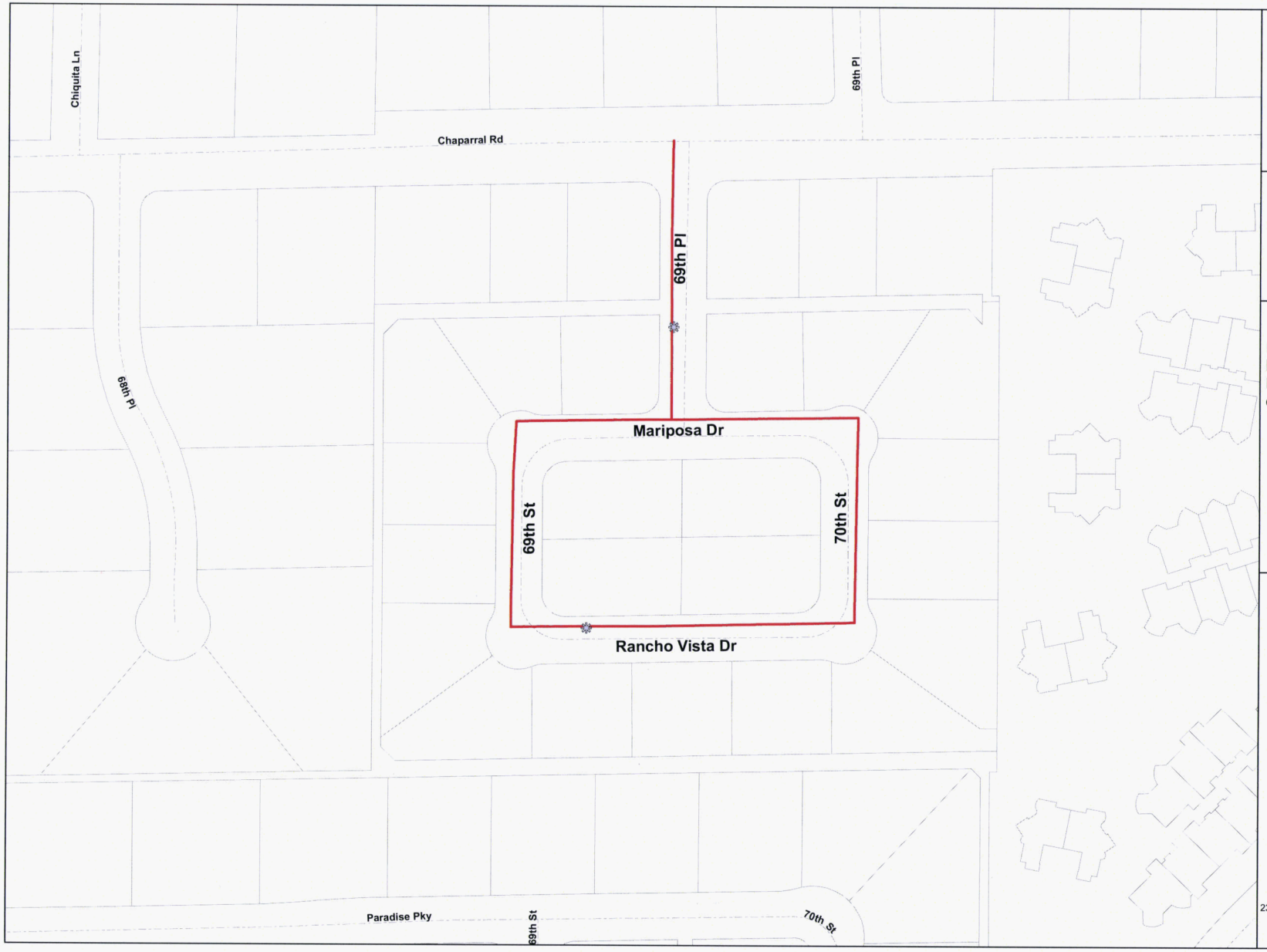
Paradise Valley – [redacted] ID No. 0407056

SIB PLANT TABLE I, 3-2

2016 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-2	331	Distribution Main	1,462 LF	6"	PVC	$192	Mariposa Dr	12/2016	n/a	$280,944	Replace existing main in 69th Pl, Mariposa Dr, 69th St, 70th St, and Rancho Vista Dr with 1,462 feet of 6" main. The main was installed in 1954 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-2 in Exhibit CC-1-C for more detail.
WM-3	331	Distribution Main	520 LF	4"	PVC	$126	Silvercrest Way	12/2016	n/a	$65,670	Replace existing main in Silvercrest Way between Clearwater Hills Tanks 1 and 3 with 520 feet of 4" main. The main was installed in 1953 and the existing pipe material is asbestos-cement. This main is currently known to be leaking, but requires Clearwater Hills Tanks 1 and 3 be temporarily shut down in order to be replaced. Replacing the main will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-3 in Exhibit CC-1-C for more detail.
Total			**1,982 LF**							**$346,614**	



2016

Project No: WM-2 •
PWSID: 0407056

Paradise Valley

Project Area:

Mariposa Dr

Project Description:

Replace existing main in 69th Pl, Mariposa Dr, 69th St, 70th St and Rancho Vista Dr with 1,462 LF of 6" main.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

40 20 0 40 80 120 160
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water Preliminary Cost Estimate			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2016 WM-2**	Project Location: Mariposa Dr

Project Description:

Replace existing main in 69th Pl, Mariposa Dr, 69th St, 70th St, and Rancho Vista Dr with 1,462 feet of 6" main.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1,462	linear feet	142	Contractor material and labor to install main and service connections	$ 207,604
1	lump sum	23,000	Consultant engineering design	$ 25,000
420	hours	35	Company labor for field oversight and inspections	$ 14,700
180	hours	45	Company labor for project management	$ 8,100
Subtotal				$ 255,404
General Overhead Rate on Labor and Capital (10%)				$ 25,540
Total Estimated Cost				**$ 280,944**

2016

Project No: WM-3 •
PWSID: 0407056

Paradise Valley

Project Area:

Silvercrest Way

Project Description:

Replace the existing main on Silvercrest Way with 520 LF of 4" main.

Legend

- Tank
- Main to be Replaced

N

10 5 0 10 20 30 40
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2016 WM-3**	Silvercrest Way

Project Description:

Replace existing main in Silvercrest Way with 520 feet of 4" main

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
520	linear feet	95	Contractor material and labor to install main	$ 49,400
1	lump sum	5,000	Consultant engineering design	$ 5,000
100	hours	35	Company labor for field oversight and inspections	$ 3,500
40	hours	45	Company labor for project management	$ 1,800
Subtotal				$ 59,700
General Overhead Rate on Labor and Capital (10%)				$ 5,970
Total Estimated Cost				**$ 65,670**

2017

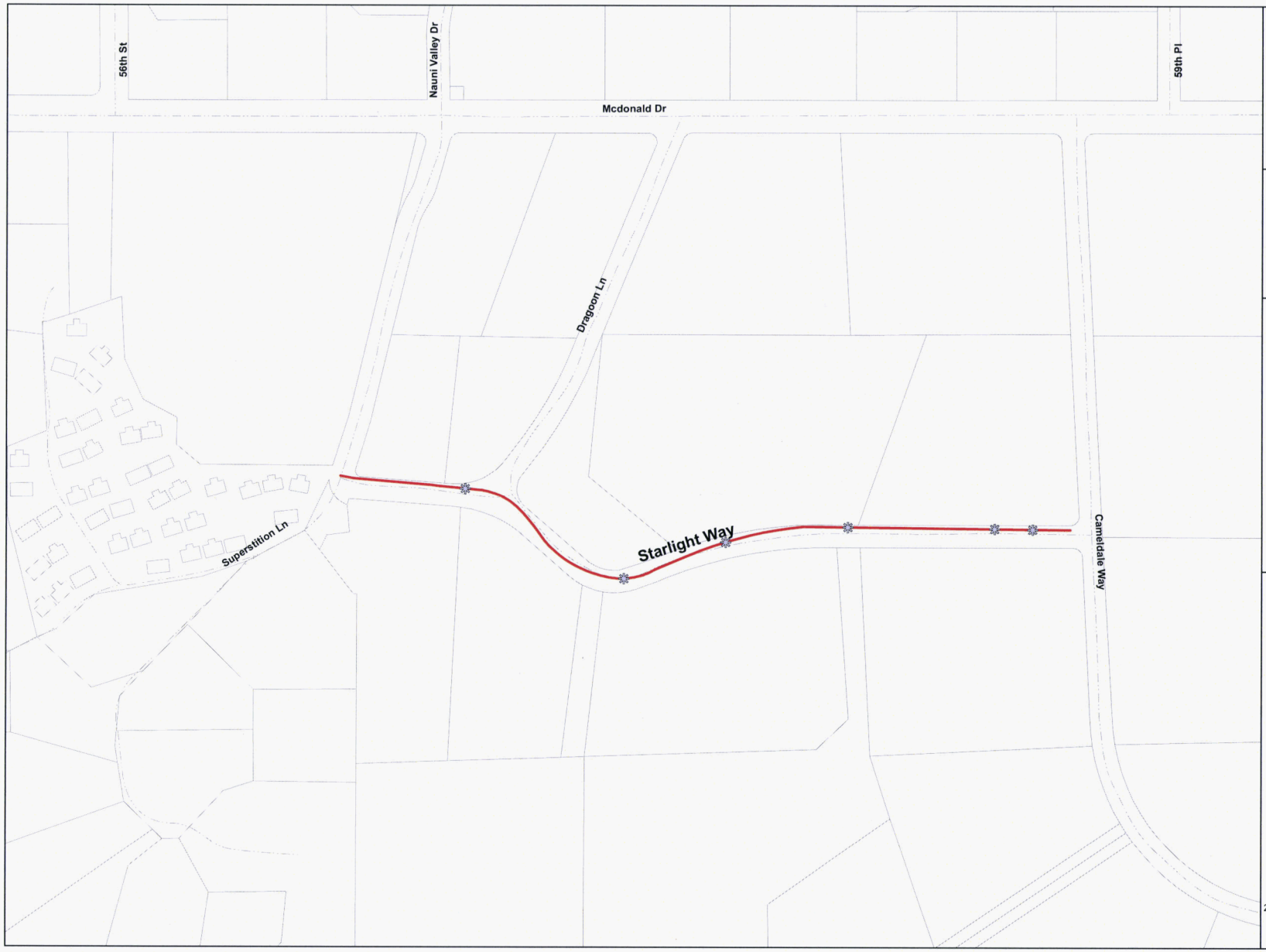
Paradise Valley – [redacted] ID No. 0407056

SIB PLANT TABLE I, 3-3

2017 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-4	331	Distribution Main	1,700 LF	6"	PVC	$171	Starlight Way	12/2017	n/a	$291,500	Replace existing main in Starlight Way between Cameldale Way and Superstition Ln with 1,700 feet of 6" main. Most of this main was installed in 1953 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-4 in Exhibit CC-1-C for more detail.
Total			**1,700 LF**							**$291,500**	



2017

Project No: WM-4 •
PWSID: 0407056

Paradise Valley

Project Area:

Starlight Way

Project Description:

Replace existing main on Starlight Way between Camdeldale Way and Superstition Ln with 1,700 feet of 6" Main

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

80 40 0 80 160 240 320
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water **Preliminary Cost Estimate**			Date Prepared: 2/11/2014
Prepared By: Candace Coleman, P.E.	Water System: Paradise Valley	Project Year and Number: **2017 WM-4**	Project Location: Starlight Way

Project Description:

Replace existing main on Starlight Way between Cameldale Way and Superstition Ln with 1,700 feet of 6" main

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1,700	linear feet	127	Contractor material and labor to install main and service connections	$ 215,900
1	lump sum	24,000	Consultant engineering design	$ 24,000
460	hours	35	Company labor for field oversight and inspections	$ 16,100
200	hours	45	Company labor for project management	$ 9,000
Subtotal				$ 265,000
General Overhead Rate on Labor and Capital (10%)				$ 26,500
Total Estimated Cost				**$ 291,500**

2018

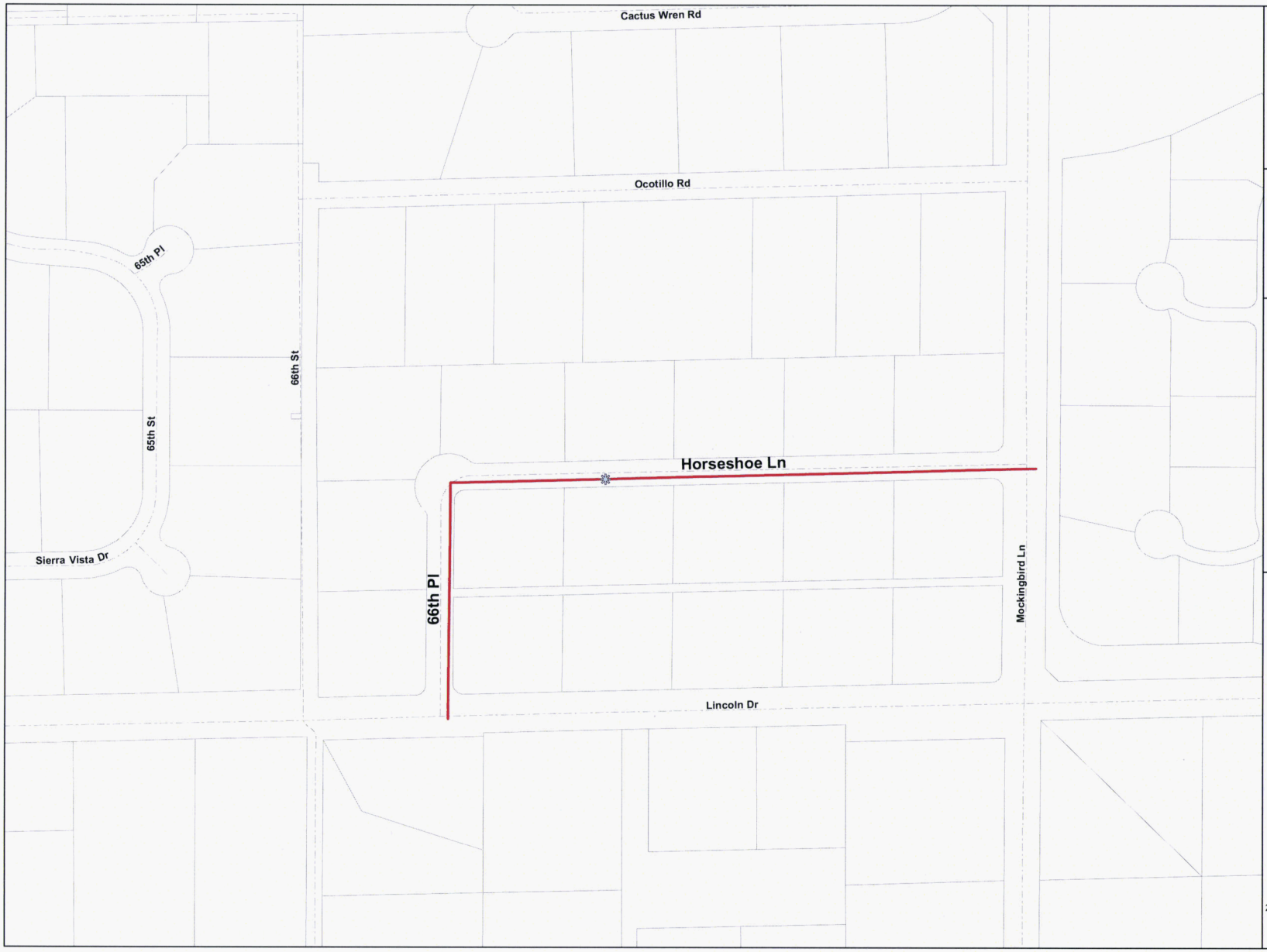
Paradise Vall[illegible] PWS ID No. 0407056

SIB PLANT [illegible]ABLE I, 3-4

2018 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-5	331	Distribution Main	1,530 LF	6"	PVC	$180	Horseshoe Ln	12/2018	n/a	$274,802	Replace existing main in Horseshoe Ln and 66th Ln with 1,530 feet of 6" main. The main was installed in 1953 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-5 in Exhibit CC-1-C for more detail.
WM-6	331	Distribution Main	500 LF	6"	PVC	$175	Quail Run	12/2018	n/a	$87,340	Replace existing main in the rear lot easement between Quail Run and Quail Pl with with 500 feet of 4" main in Quail Run. The main was installed in 1955 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and increase system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-6 in Exhibit CC-1-C for more detail.
Total			**2,030 LF**							**$362,142**	



2018

Project No: WM-5 •
PWSID: 0407056

Paradise Valley

Project Area:

Horseshoe Lane

Project Description:

Replace existing main on Horseshoe Ln and 66th Pl with 1,530 of 6" main.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

70 35 0 70 140 210 280 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

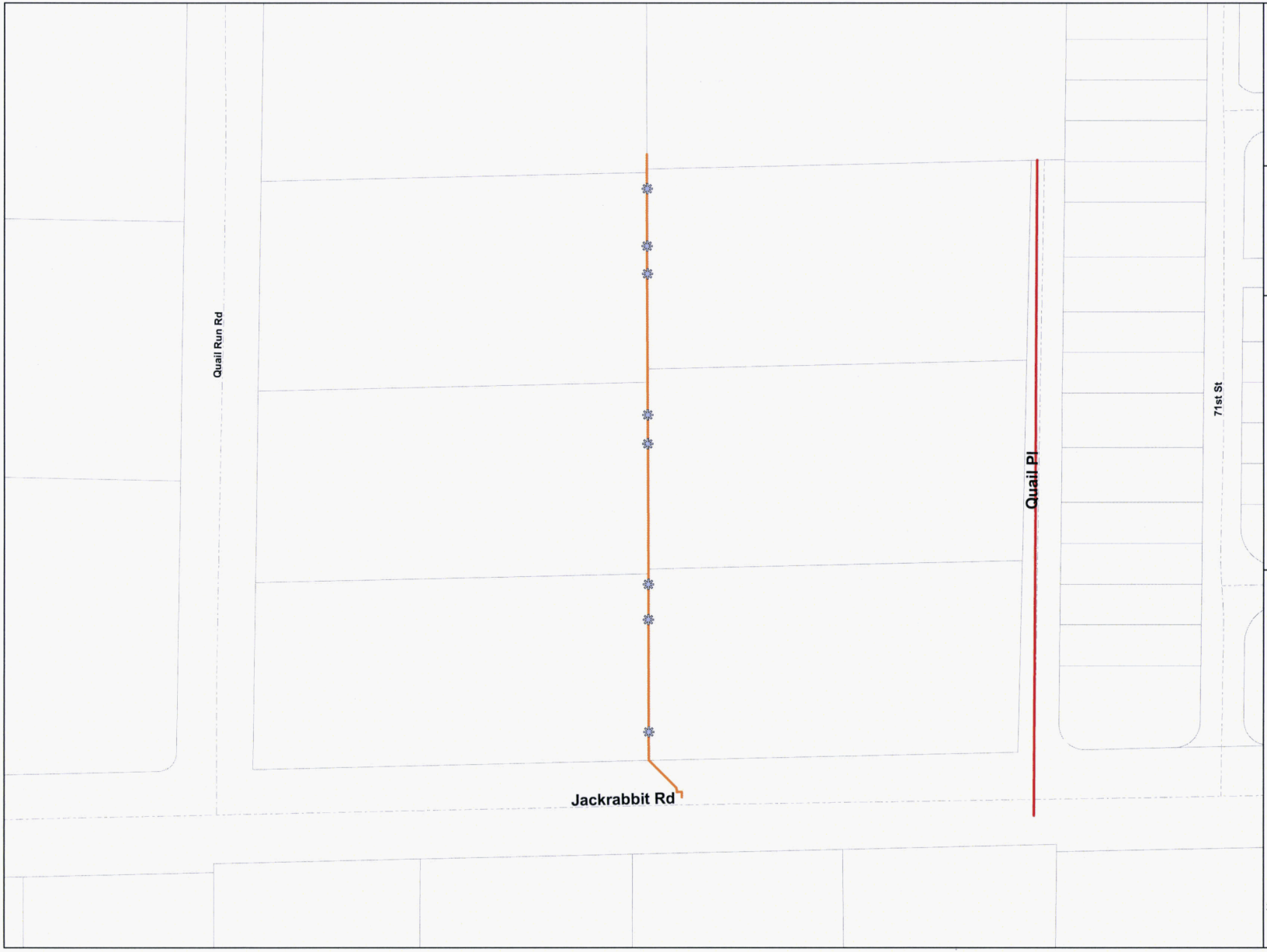
Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2018 WM-5**	Horseshoe Ln

Project Description:

Replace existing main on Horseshoe Ln and 66th Ln with 1,530 feet of 6" main

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
1,530	linear feet	134	Contractor material and labor to install main and service connections	$ 205,020
1	lump sum	22,000	Consultant engineering design	$ 22,000
420	hours	35	Company labor for field oversight and inspections	$ 14,700
180	hours	45	Company labor for project management	$ 8,100
Subtotal				$ 249,820
General Overhead Rate on Labor and Capital (10%)				$ 24,982
Total Estimated Cost				**$ 274,802**



2018

Project No: WM-6 •
PWSID: 0407056

Paradise Valley

Project Area:

Quail Run Rd

Project Description:

Replace the existing main in back lot easement between Quail Run Rd and Quail Pl with 500 LF of 6" main on Quail Pl.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Installed
- Existing Main

N

30 15 0 30 60 90 120 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2018 WM-6**	Quail Run

Project Description:
Replace existing main in the back lot easement between Quail Run Rd and Quail Run Pl with 500 feet of 6" main on Quail Run.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
500	linear feet	131	Contractor material and labor to install main and service connections	$ 65,500
1	lump sum	7000	Consultant engineering design	$ 7,000
120	hours	35	Company labor for field oversight and inspections	$ 4,200
60	hours	45	Company labor for project management	$ 2,700
Subtotal				$ 79,400
General Overhead Rate on Labor and Capital (10%)				$ 7,940
Total Estimated Cost				**$ 87,340**

2019

Paradise Valley – [redacted]S ID No. 0407056

SIB PLANT TABLE I, 3-5

2019 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-7	331	Distribution Main	525 LF	6"	PVC	$173	68 Pl and Chaparral	12/2019	n/a	$90,943	Replace existing main on Chaparral Rd and 68th Pl with 525 feet of 6" main. The main was installed in 1958 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-7 in Exhibit CC-1-C for more detail.
WM-8	331	Distribution Main	246 LF	4"	PVC	$165	Sierra Vista	12/2019	n/a	$40,493	Replace existing main in Sierra Vista with 246 feet of 4" main. The main was installed in 1960 and the existing pipe material is galvanized steel which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-8 in Exhibit CC-1-C for more detail.

WM-9	331	Distribution Main	655 LF	4"	PVC	$142	Tamanar Dr	12/2019	n/a	$92,934	Replace existing main in the four cul-de- on Tamanar Dr with 655 feet of 4" main. The main was installed in 1960 and the existing pipe material is galvanized steel which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-9 in Exhibit CC-1-C for more detail.
Total			**1,426 LF**							**$224,369**	

2019

Project No: WM-7 •
PWSID: 0407056

Paradise Valley

Project Area:

68th Place & Chaparral

Project Description:

Replace the existing main on 68th Pl with 525 LF of 6" main.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

40 20 0 40 80 120 160
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2019 WM-7**	68th Pl and Chaparral

Project Description:

Replace existing main on 68th Pl and Chaparral Rd with 525 feet of 6" main

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
525	linear feet	131	Contractor material and labor to install main and service connections	$ 68,775
1	lump sum	7,000	Consultant engineering design	$ 7,000
120	hours	35	Company labor for field oversight and inspections	$ 4,200
60	hours	45	Company labor for project management	$ 2,700
Subtotal				$ 82,675
General Overhead Rate on Labor and Capital (10%)				$ 8,268
Total Estimated Cost				**$ 90,943**

2019

Project No: WM-8 •
PWSID: 0407056

Paradise Valley

Project Area:

Sierra Vista Dr

Project Description:

Replace the existing main on Sierra Vista Dr with 246 LF of 4" main.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

20 10 0 20 40 60 80 Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2019 WM-8**	Sierra Vista

Project Description:

Replace existing main on Sierra Vista Dr with 246 feet of 4" main.

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
246	linear feet	122	Contractor material and labor to install main and service connections	$ 30,012
1	lump sum	3,000	Consultant engineering design	$ 3,000
70	hours	35	Company labor for field oversight and inspections	$ 2,450
30	hours	45	Company labor for project management	$ 1,350
Subtotal				$ 36,812
General Overhead Rate on Labor and Capital (10%)				$ 3,681
Total Estimated Cost				**$ 40,493**

2019

Project No: WM-9 •
PWSID: 0407056

Paradise Valley

Project Area:

Tamanar Dr

Project Description:

Replace the existing main in the cul-de-sacs onTamanar Dr with 655 LF of 4" main.

Legend

- Recorded Main Break/Leak (2008-2013)
- Main to be Replaced

N

70 35 0 70 140 210 280
Feet

2355 W. Pinnacle Peak Rd.
Suite 300
Phoenix, AZ 85027

EPCOR WATER

Created: 2/14/2014

EPCOR Water 2014 •

EPCOR Water
Preliminary Cost Estimate

Date Prepared: 2/11/2014

Prepared By:	Water System:	Project Year and Number:	Project Location:
Candace Coleman, P.E.	Paradise Valley	**2019 WM-9**	Tamanar Dr

Project Description:

Replace existing main in four cul-de-sacs on Tamanar Dr with 655 feet of 4" main

Materials & Labor

Quantity	Unit	Avg $/Unit	Description	Estimated Item Cost
655	linear feet	107	Contractor material and labor to install main and service connections	$ 70,085
1	lump sum	7,500	Consultant engineering design	$ 7,500
120	hours	35	Company labor for field oversight and inspections	$ 4,200
60	hours	45	Company labor for project management	$ 2,700
Subtotal				$ 84,485
General Overhead Rate on Labor and Capital (10%)				$ 8,449
Total Estimated Cost				**$ 92,934**

SIB Table I

(Exhibit CC-2-A)

EPCOR Water (USA) Inc.

Mohave Water District

PWS ID No. 08-032, 08-333, 08-068

February 28, 2014

Mohave – PWS ID No. 08-032

SIB PLANT TABLE I, 1-1

2015 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-1	333	service lines	36	¾" & 1"	Copper	$3,881	Calle de Mercado	12/2015	n/a	$139,709	Replace 34 residential and 2 commercial services on Silver Creek Rd, Calle de Mercado, and Mercado Ct between El Cazador and Rosewood Rd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-1 in Exhibit CC-1-A for more detail.
S-2	333	service lines	53	¾" & 1"	Copper	$3,881	Avenida Colibri	12/2015	n/a	$205,682	Replace 53 residential services on Avenida Colibri and Colibri Ct between Corona Vista and Rosewood Rd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-2 in Exhibit CC-1-A for more detail.

S-3	333	service lines	25	¾" & 1"	Copper	$3,881	Paloma Senda Dr	12/2015	n/a	$97,020	Replace 25 residential services on Paloma Senda Dr between Corona Vista and Rosewood Rd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-3 in Exhibit CC-1-A for more detail.
S-4	333	service lines	24	¾" & 1"	Copper	$3,881	Avenida Grande	12/2015	n/a	$93,139	Replace 24 residential services on Avenida Grande between Corona Vista and Avenida Ventura Dr. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth See Section 1 narrative and Map No. S-4 in Exhibit CC-1-A for more detail.
S-5	333	service lines	37	¾" & 1"	Copper	$3,881	El Cazador	12/2015	n/a	$143,590	Replace 37 residential services on Calle de Mercado, Valley Vista, El Cazador, Corona Vista, Avenida Grande, Corona Redonda, and Via Corona south of Silver Creek Rd Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-5 in Exhibit CC-1-A for more detail.
S-6	333	service lines	99	¾" & 1"	Copper	$3,881	Riverside Dr North	12/2015	n/a	$384,199	Replace 99 residential services on Riverside Dr between Orca Ln and Colorado Blvd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-6 in Exhibit CC-1-A for more detail.
Total			**274**							**$1,063,339**	

Mohave – PWS ID No. 08-032

SIB PLANT TABLE I, 1-2

2016 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-7	333	service lines	38	¾" & 1"	Copper	$3,881	Riverside Dr South	12/2016	n/a	$147,470	Replace 38 residential services on Riverside Dr between Orca Ln and Capistrano Ln. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-7 in Exhibit CC-1-A for more detail.
S-8	333	service lines	69	¾" & 1"	Copper	$3,881	Castle Rock	12/2016	n/a	$267,775	Replace 69 residential services on Castle Rock Cir and Capistrano Ln between Riverside Dr and Marina Blvd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-8 in Exhibit CC-1-A for more detail.

S-9	333	service lines	46	¾" & 1"	Copper	$3,881	*Capistrano* Ln	12/2016	n/a	$178,517	Replace 46 residential services on Castle Berry Ln and Capistrano Ln between Riverside Dr and Orca Ln. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-9 in Exhibit CC-1-A for more detail.
Total			**153**							**$593,762**	

Mohave – PWS ID No. 08-032

SIB PLANT TABLE I, 1-3

2017 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-10	333	service lines	40	¾" & 1"	Copper	$3,881	Orca Ln	12/2017	n/a	$155,232	Replace 40 residential services on Orca Ln between Riverside Dr and Colorado Blvd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-10 in Exhibit CC-1-A for more detail.
S-11	333	service lines	62	¾" & 1"	Copper	$3,881	Tanglewood Ln	12/2017	n/a	$240,610	Replace 62 residential services on Tanglewood Ln and Willowood Ln between Riverside Dr and Colorado Blvd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-11 in Exhibit CC-1-A for more detail.
Total			**102**							**$395,842**	

Mohave – PWS ID No. 08-032

SIB PLANT TABLE I, 1-4

2018 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-12	333	service lines	45	¾" & 1"	Copper	$3,881	Meander Ln	12/2018	n/a	$174,636	Replace 45 residential services on Meander Dr between Thunderbird Ln and Rio Grande Rd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-12 in Exhibit CC-1-A for more detail.
S-13	333	service lines	51	¾" & 1"	Copper	$3,881	Colorado Blvd South	12/2018	n/a	$197,921	Replace 51 residential services on Colorado Blvd between Marina Blvd and Riverwood Ln. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-13 in Exhibit CC-1-A for more detail.

S-14	333	service lines	49	¾" & 1"	Copper	$3,881	Forest Dr	12/2018	n/a	$190,159	Replace 49 residential services on Forest Dr between Riverwood Ln and Hancock Rd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-14 in Exhibit CC-1-A for more detail.
Total			**145**							**$562,716**	

Mohave – PWS ID No. 08-032

SIB PLANT TABLE I, 1-5

2019 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-15	333	service lines	40	¾" & 1"	Copper	$3,881	Cyprus Ln	12/2019	n/a	$155,232	Replace 40 residential services on Cyprus Ln between Colorado Blvd and Riverside Dr Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-15 in Exhibit CC-1-A for more detail.
S-16	333	service lines	16	¾" & 1"	Copper	$3,881	Riverwood Ln	12/2019	n/a	$62,093	Replace 16 residential services on Riverwood Ln between Colorado Blvd and Riverside Dr. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-16 in Exhibit CC-1-A for more detail.

S-17	333	service lines	47	¾" & 1"	Copper	$3,881	Colorado Blvd North	12/2019	n/a	$182,398	Replace 47 residential services on Colorado Blvd. between Riverwood Ln. and Hancock Rd. Many of the services are branched black poly lines (one service for two customers) that are failing at a high rate. These services are a priority for replacement because of the historical failure rate of the pipe material as well as the need to connect a single service to each customer. Replacing the services will help reduce system water loss and improve customer pressure and flow with a single service for each customer. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-17 in Exhibit CC-1-A for more detail.
Total			**103**							**$399,722**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 2-1

2015 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-1	331	gate valves	46	22-4" 19-6" 4-8" 1-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Area bounded by the Colorado River on the west, Hancock Rd on the north, and Lakeside Dr on the east	12/2015	n/a	$212,819	Replace 22-4", 19-6", 4-8", and 1-12" (estimated, 46 total) distribution system valves that are no longer functioning. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over one-third of the valves in the system are about 50 years old. In 2013, over 60 valves were found broken during normal operations activities. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-1 in Exhibit CC-1-A for more detail.
Total			**46**							**$212,819**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 2-2

2016 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	*Material*	*Installed* Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-2	331	gate valves	46	11-4" 26-6" 8-8" 1-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Area bounded by the Colorado River on the west, Hancock Rd on the south, and Hwy 95 and Fletcher Ln on the east	12/2016	n/a	$217,439	Replace 11-4", 26-6", 8-8", and 1-12" (estimated, 46 total) distribution system valves that are no longer functioning. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over one-third of the valves in the system are about 50 years old. In 2013, over 60 valves were found broken during normal operations activities. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-2 in Exhibit CC-1-A for more detail.
Total			**46**							**$217,439**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 2-3

2017 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-3	331	gate valves	46	8-4" 23-6" 10-8" 5-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Area bounded by Camino Del Rio and Lakeside Dr on the west, Hancock Rd on the north, Hwy 95 on the east, and Rainbow Dr on the south; also the area bounded by Hwy 95 on the west and north, Arcadia Blvd on the east, and Rio Vista Dr on the south	12/2017	n/a	$225,289	Replace 8-4", 23-6", 10-8", and 5-12" (estimated, 46 total) distribution system valves that are no longer functioning. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over one-third of the valves in the system are about 50 years old. In 2013, over 60 valves were found broken during normal operations activities. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-3 in Exhibit CC-1-A for more detail.
Total			**46**							**$225,289**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 2-4

2018 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-4	331	gate valves	45	1-4" 17-6" 20-8" 2-10" 5-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 10"-$5,641 12"-$6,173	Area east of Arcadia Blvd and Hwy 95 between the Pass Canyon Rd and Rainbow Dr	12/2018	n/a	$229,658	Replace 1-4", 17-6", 20-8", 2-10", and 5-12" (estimated, 45 total) distribution system valves that are no longer functioning. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over one-third of the valves in the system are about 50 years old. In 2013, over 60 valves were found broken during normal operations activities. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-4 in Exhibit CC-1-A for more detail.
Total			**45**							**$229,658**	

Mohave – PWS ID Nos. 08032, 08137, 08062, 08037, 08333, and 08163

SIB PLANT TABLE I, 2-5

2019 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-5	331	gate valves	45	8-4" 9-6" 23-8" 1-10" 4-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 10"-$5,641 12"-$6,173	Old Bullhead City, Desert Foothills, Lake Mohave Highlands, Camp Mohave, Rio Vista Ranches, and Gateway areas	12/2019	n/a	$226,763	Replace 8-4", 9-6", 23-8", 1-10", and 4-12" (estimated, 45 total) distribution system valves that are no longer functioning. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over one-third of the valves in the system are about 50 years old. In 2013, over 60 valves were found broken during normal operations activities. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-5 in Exhibit CC-1-A for more detail.
Total			**45**							**$226,763**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 3-1

2015 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-1	331	Distribution Main	485 LF	6"	PVC	$235	Juanita Ln	12/2015	n/a	$113,878	Replace 485 LF of existing ABS thin-wall main with 6" PVC in Juanita Ln. The main was installed in 1982 and the existing material is not of sufficient strength for use in a public water system which has resulted in several leaks. Replacing the main will help reduce system water loss and improve customer pressure and flow. The existing main is 3" in diameter, which is not sufficient for installing hydrants or supporting fire flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-1 in Exhibit CC-1-A for more detail.

WM-2	331	Distribution Main	1,677 LF	8"	PVC	$270	Safari Dr	12/2015	n/a	$452,216	Replace existing mains in rear-lot easements along Safari Dr between Riverview Way and Riverview Dr and along Riverview Cv north of Riverview Dr with 1,677 LF of 8" main in Safari Dr between Riverview Way and Riverview Dr and Riverview Cv north of Riverview Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-2 in Exhibit CC-1-A for more detail.
Total			**2,162 LF**							**$566,093**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 3-2

2016 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-3	331	Distribution Main	571 LF	8"	PVC	$207	Riverview Way	12/2016	n/a	$118,041	Replace existing mains in rear-lot easements along Riverview Way between Riverview Dr and Swan Dr with 571 LF of 8" main in Riverview Way between Riverview Dr and Swan Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-3 in Exhibit CC-1-A for more detail.

WM-4	331	Distribution Main	1,860 LF	8"	PVC	$231	Swan Dr	12/2016	n/a	$430,441	Replace existing mains in rear-lot easements along Swan Dr between Bermuda Dr and Newport Dr with 1,860 LF of 8" main in Swan Dr between Bermuda Dr and Newport Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-4 in Exhibit CC-1-A for more detail.
WM-5	331	Distribution Main	978 LF	8"	PVC	$216	Coronado Dr	12/2016	n/a	$211,229	Replace existing mains in rear-lot easements along Coronado Dr between Swan Dr and Bermuda Dr with 978 LF of 8" main in Coronado Dr between Swan Dr and Bermuda Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-5 in Exhibit CC-1-A for more detail.
WM-6	331	Distribution Main	411 LF	8"	PVC	$272	Swan Pl	12/2016	n/a	$111,612	Replace existing mains in rear-lot easements along Swan Pl between Bermuda Dr and Swan Dr with 411 LF of 8" main in Swan Pl between Bermuda Dr and Swan Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-6 in Exhibit CC-1-A for more detail.
Total			**3,820 LF**							**$872,322**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 3-3

2017 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-7	331	Distribution Main	1,155 LF	8"	PVC	$354	Morro Dr	12/2017	n/a	$408,980	Replace existing mains in rear-lot easements along along Morro Dr and Morro Cv between Bermuda Dr and Riverview Dr with 1,155 LF of 8" main in Morro Dr and Morro Cv between Bermuda Dr and Riverview Dr The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-7 in Exhibit CC-1-A for more detail.

WM-8	331	Distribution Main	353 LF	8"	PVC	$263	Coronado Dr	12/2017	n/a	$92,667	Replace existing mains in rear-lot easements along Coronado Dr between Riverview Dr and Malibu Dr with 353 LF of 8" main in Coronado Dr between Riverview Dr and Malibu Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-8 in Exhibit CC-1-A for more detail.
WM-9	331	Distribution Main	190 LF	8"	PVC	$356	Alpine Cv	12/2017	n/a	$67,733	Replace existing mains in rear-lot easements along Alpine Cv between Riverview Dr and Malibu Dr with 190 LF of 8" main in Alpine Cv between Riverview Dr and Malibu Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-9 in Exhibit CC-1-A for more detail.
WM-10	331	Distribution Main	548 LF	8"	PVC	$230	Ventura Dr	12/2017	n/a	$126,049	Replace existing mains in rear-lot easements along Ventura Dr between Riverview Dr and Malibu Dr with 548 LF of 8" main in Ventura Dr between Riverview Dr and Malibu Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-10 in Exhibit CC-1-A for more detail.

WM-11	331	Distribution Main	1,839 LF	8"	PVC	$235	Bermuda Dr	12/2017	n/a	$431,449	Replace existing mains in rear-lot easements along Bermuda Dr between Riverview Dr and Coronado Dr with 1,839 LF of 8" main in Bermuda Dr between Riverview Dr and Coronado Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-11 in Exhibit CC-1-A for more detail.
Total			**4,085 LF**							**$1,126,877**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 3-4

2018 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-12	331	Distribution Main	655 LF	8"	PVC	$232	Montecito Dr	12/2018	n/a	$151,762	Replace existing mains in rear-lot easements along Montecito Dr between Riverview Dr and Malibu Dr with 655 LF of 8" main in Montecito Dr between Riverview Dr and Malibu Dr The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-12 in Exhibit CC-1-A for more detail.

WM-13	331	Distribution Main	2,090 LF	8"	PVC	$258	Hermosa Dr	12/2018	n/a	$538,549	Replace existing mains in rear-lot easements along Hermosa Dr between Riverview Dr and Coronado Dr with 2,090 LF of 8" main in Hermosa Dr between Riverview Dr and Coronado Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-13 in Exhibit CC-1-A for more detail.
WM-14	331	Distribution Main	1,342 LF	8"	PVC	$254	Balboa Dr South	12/2018	n/a	$340,624	Replace existing mains in rear-lot easements along Balboa Dr between Riverview Dr and Swan Dr with 1,342 LF of 8" main in Balboa Dr between Riverview Dr and Swan Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-14 in Exhibit CC-1-A for more detail.
Total			**4,087 LF**							**$1,030,934**	

Mohave – PWS ID No. 08032

SIB PLANT TABLE I, 3-5

2019 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-15	331	Distribution Main	900 LF	8"	PVC	$281	Balboa Dr North	12/2019	n/a	$252,945	Replace existing mains in rear-lot easements along Del Rey Dr between Swan Dr and Coronado Dr with 900 LF of 8" main in Del Rey Dr between Swan Dr and Coronado Dr The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-15 in Exhibit CC-1-A for more detail.

WM-16	331	Distribution Main	2,603 LF	8"	PVC	$284	Del Rey Dr	12/2019	n/a	$739,306	Replace existing mains in rear-lot easements along Del Rey Dr between Riverview Dr and Coronado Dr with 2,603 LF of 8" main in Del Rey Dr between Riverview Dr and Coronado Dr. The existing mains in this area were installed in 1967. The existing pipe material does not meet current standards for use in public water systems and is not of sufficient strength, which has resulted in leaks and/or breaks. Replacing the main will help reduce system water loss and improve system reliability. The existing mains are located in rear-lot easements which are difficult to access for repairs. The mains are not sufficient to support fire flow nor are they accessible for emergency vehicles. One main in the street will replace the two existing mains on either side of the street in the rear easements. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-16 in Exhibit CC-1-A for more detail.
Total			**3,503 LF**							**$992,251**	

Mohave water district – PWS ID No. 08-032

SIB PLANT TABLE I, 4-1

2015 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-1	334	meters	1,479	5/8" to >2"	Copper/ Plastic	5/8"-$173 3/4"-$195 1"-$234 1½"-$367 2"-$447 >2"-$1,223	Meter Routes 1019, 1061, and 1111-1116 (see map M-1 in Exhibit CC-1)	12/2015	n/a	$266,908	Replace 1,408 - 5/8", 2 - 3/4", 39 – 1", and 30 – 2" (1,479 total) meters in Mohave district meter routes 1019, 1061, and 1111-1116. The existing meters in these routes will be between 12 and 16 years old at the time of replacement; most will be at least 15 years old. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help reduce system water loss. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map M-1 in Exhibit CC-1-A for more detail.
Total			**1,479**							**$266,908**	

Mohave water district – PWS ID No. 08-032

SIB PLANT TABLE I, 4-2

2016 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-2	334	meters	1,782	5/8" to >2"	Copper/ Plastic	5/8"-$173 3/4"-$195 1"-$234 1½"-$367 2"-$447 >2"-$1,223	Meter Routes 1005, 1105-1110, and 1130 (see map M-2 in Exhibit CC-1)	12/2016	n/a	$314,733	Replace 1,733 - 5/8", 34 – 1", 3 – 1.5", and 12 – 2" (1,782 total) meters in Mohave district meter routes 1005, 1105-1110, and 1130. The existing meters in these routes will be between 12 and 17 years old at the time of replacement; most will be at least 16 years old. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help reduce system water loss. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map M-2 in Exhibit CC-1-A for more detail.
Total			**1,782**							**$314,733**	

Mohave water district – PWS ID No. 08-032

SIB PLANT TABLE I, 4-3

2017 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-3	334	meters	1,638	5/8" to >2"	Copper/ Plastic	5/8"-$173 3/4"-$195 1"-$234 1½"-$367 2"-$447 >2"-$1,223	Meter Routes 1002, 1003, 1014, and 1101-1104 (see map M-3 in Exhibit CC-1)	12/2017	n/a	$298,679	Replace 1,557 - 5/8", 34 – 1", 1 – 1.5", and 46 – 2" (1,638 total) meters in Mohave district meter routes 1002, 1003, 1014, and 1101-1104. The existing meters in these routes will be between 16 and 23 years old at the time of replacement; most will be at least 17 years old. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help reduce system water loss. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map M-3 in Exhibit CC-1-A for more detail.
Total			**1,638**							**$298,679**	

Mohave water district – PWS ID Nos. 08-032 and 08-137

SIB PLANT TABLE I, 4-4

2018 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-4	334	meters	1,457	5/8" to >2"	Copper/ Plastic	5/8"-$173 3/4"-$195 1"-$234 1½"-$367 2"-$447 >2"-$1,223	Meter Routes 1008, 1009, 1011-1013, 1042, 1124, 1131, 1133, and 1137 (see map M-4 in Exhibit CC-1)	12/2018	n/a	$263,074	Replace 1,377 - 5/8", 37 – 1", and 43 – 1.5" (1,457 total) meters in Mohave district meter routes 1008, 1009, 1011-1013, 1042, 1124, 1131, 1133, and 1137. The existing meters in these routes will be between 13 and 19 years old at the time of replacement; most will be at least 14 years old. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help reduce system water loss. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map M-4 in Exhibit CC-1-A for more detail.
Total			**1,457**							**$263,074**	

Mohave water district – PWS ID Nos. 08-032, 08-333, and 08-068

SIB PLANT TABLE I, 4-5

2019 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-5	334	meters	2,118	5/8" to >2"	Copper/ Plastic	5/8"-$173, ¾"-$195 1"-$234 1½"-$367 2"-$447 >2"-$1,223	Meter Routes 1062, 1074, 1075, and NMVW (see map M-5 in Exhibit CC-1)	12/2019	n/a	$368,099	Replace 2,111 - 5/8", 4 – 1", and 3 – 2" (2,118 total) meters in Mohave district meter routes 1062, 1074, 1075, and North Mohave Valley Water. The existing meters in these routes will be between 13 and 19 years old at the time of replacement; most will be at least 14 years old. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help reduce system water loss. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map M-5 in Exhibit CC-1-A for more detail.
Total			**2,118**							**$368,099**	

SIB Table I

(Exhibit CC-2-B)

EPCOR Water (USA) Inc.

Sun City Water District

PWS ID No. 07-099

February 28, 2014

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 1-1

2015 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-1	333	service lines	42	2-1" 40-1.5"	Copper	1"-$3,881, 1.5"-$3,947	Kelso Dr	12/2015	n/a	$165,634	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (42 total on 107th Dr, 109th Ave, Caron Dr, Denham Dr, Kelso Dr and Mission Ln between 109th Ave and 107 Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-1 in Exhibit CC-1-B for more detail.
S-2	333	service lines	17	1"	Copper	1"-$3,881	Hatcher Rd	12/2015	n/a	$65,974	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (17 total on 109th Dr and Hatcher Rd between Kelso Dr and 107th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-2 in Exhibit CC-1-B for more detail.

S-3	333	service lines	18	14-1.5" 4-2"	Copper	1.5"-$3,947 2"-$4,013	110th Ave	12/2015	n/a	$71,306	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (18 total on 110th Ave and Apartments between Kelso Dr and Mountain View Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-3 in Exhibit CC-1-B for more detail.
S-4	333	service lines	16	1.5"	Copper	$3,947	Mountain View Rd	12/2015	n/a	$63,149	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (16 total on Mountain View Rd and Venturi Dr between Cumberland Dr and 107th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-4 in Exhibit CC-1-B for more detail.
S-5	333	service lines	22	1.5"	Copper	$3,947	Cheryl Dr	12/2015	n/a	$86,830	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on Cheryl Dr, Cinnabar Ave, Cumberland Dr, and Salem Dr between Mountain View Rd and 107th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-5 in Exhibit CC-1-B for more detail..
S-6	333	service lines	5	1.5"	Copper	$3,947	103rd Ave	12/2015	n/a	$19,734	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (5 total on 103rd Ave between Mountain View Rd and Olive Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-6 in Exhibit CC-1-B for more detail.

S-7	333	service lines	11	1.5"	Copper	$3,947	Balboa Dr	12/2015	n/a	$43,415	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (11 total on Balboa Dr between Mountain View Rd and Ironwood Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-7 in Exhibit CC-1-B for more detail.
S-8	333	service lines	24	1.5"	Copper	$3,947	108th Dr	12/2015	n/a	$94,723	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (24 total on 108th Ave, 108th Dr, Clair Dr, Deanne Cir and Peoria Ave between 109th Ave and 107th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-8 in Exhibit CC-1-B for more detail.
S-9	333	service lines	10	1.5"	Copper	$3,947	Clair Dr	12/2015	n/a	$39,468	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total on Clair Dr and Peoria Ave between 111th Ave and 108th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-9 in Exhibit CC-1-B for more detail.
Total			**165**							**$650,232**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 1-2

2017 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-10	333	service lines	11	2-1" 40-1.5"	Copper	1"-$3,881 1.5"-$3,947	105th Dr	12/2017	n/a	$43,415	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (11 total on 105th Ave, 105th Dr, 106th Ave, 106th Dr, Audrey Dr, Clair Dr and Deanne Dr between 107th Ave and 105th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-10 in Exhibit CC-1-B for more detail.
S-11	333	service lines	25	1"	Copper	1"-$3,881	Audrey Dr	12/2017	n/a	$98,670	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (25 total on Audrey Dr, Clair Dr, Corte Del Sol Este, Corte Del Sol Oeste, Deanne Dr and Peoria Ave between 105th Ave and 103 Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-11 in Exhibit CC-1-B for more detail.

S-12	333	service lines	22	14-1.5" 4-2"	Copper	1.5"-$3,947 2"-$4,013	Caron Dr	12/2017	n/a	$86,830	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on Tonada Dr, Caron Dr, Kelso Dr and109th Dr between 111th Ave and 109th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-12 in Exhibit CC-1-B for more detail.
S-13	333	service lines	14	11-1.5" 3-2"	Copper	1.5"-$3,947 2"-$4,013	Mountain View Rd West	12/2017	n/a	$55,453	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on 105th Ave, 105th Dr, 107th Ave, Mountain View Rd, Rodgers Cir and Winninger Cir between 107th and 103rd Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-13 in Exhibit CC-1-B for more detail.
S-14	333	service lines	14	1.5"	Copper	$3,947	Mountain View Rd East	12/2017	n/a	$55,255	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on Mountain View Rd between 103rd Ave and Balboa Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-14 in Exhibit CC-1-B for more detail.
S-15	333	service lines	4	1.5"	Copper	$3,947	Peoria Ave and 103rd Ave	12/2017	n/a	$15,787	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (4 total on Peoria Ave between 103th Ave and 99 Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-15 in Exhibit CC-1-B for more detail.

S-16	333	service lines	8	1.5"	Copper	$3,947	Abbott Ave West	12/2017	n/a	$31,574	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on Abbott Ave between 111th Ave and 109th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-16 in Exhibit CC-1-B for more detail.
S-17	333	service lines	14	1.5"	Copper	$3,947	Abbott Ave East	12/2017	n/a	$52,255	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on Abbott Ave and 107th Ave between 109th Ave and 107th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-17 in Exhibit CC-1-B for more detail.
S-18	333	service lines	3	2-1.5" 1-3"	Copper	1.5"-$3,947 3"-$4,145	Peoria Ave and 105th Ave	12/2017	n/a	$12,038	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (3 total on Peoria Ave and 105th Ave between 107th Ave and 105th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-18 in Exhibit CC-1-B for more detail.
S-19	333	service lines	1	1.5"	Copper	$3,947	Peoria Ave and 99th Ave	12/2017	n/a	$3,947	Replace aging service with copper service line to reduce water leaks and emergency repairs. (1 total on Peoria Ave between 99th Ave and 96th Ave.) This service is a priority because it was installed 40 to 50 years ago. Replacing the service will help reduce system water loss and improve customer pressure and flow. The service line replacement is for existing customers and not related to new growth. See Section 1 narrative and Map No. S-19 in Exhibit CC-1-B for more detail.
S-20	333	service lines	3	1.5"	Copper	$3,947	Snead Circle	12/2017	n/a	$11,840	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (3 total on Sneed Circle west of 103 Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-20 in Exhibit CC-1-B for

											more detail.
S-21	333	service lines	10	1.5"	Copper	$3,947	Coggins Dr	12/2017	n/a	$39,468	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total on Coggins Dr and Lakeview Cir between Sun City Blvd and Balboa Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-21 in Exhibit CC-1-B for more detail..
S-22	333	service lines	1	1.5"	Copper	$3,947	99th Ave	12/2017	n/a	$4,145	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (1 total on 99th Ave between Sun City Blvd and Peoria Ave.) This service is a priority because it was installed 40 to 50 years ago. Replacing the service will help reduce system water loss and improve customer pressure and flow. The service line replacement is for existing customers and not related to new growth. See Section 1 narrative and Map No. S-22 in Exhibit CC-1-B for more detail.
S-23	333	service lines	4	1.5"	Copper	$3,947	111th Ave South	12/2017	n/a	$15,787	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (4 total on 111th Ave between Elk Ave and Iowa Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-23 in Exhibit CC-1-B for more detail.
S-24	333	service lines	8	1.5"	Copper	$3,947	107th Ave South	12/2017	n/a	$31,574	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on 107th Ave between Connecticut Ave and Elk Ave and Hope Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-24 in Exhibit CC-1-B for more detail.

S-25	333	service lines	5	1.5"	Copper	$3,947	111th Ave North	12/2017	n/a	$19,734	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (5 total on 111th Ave and Alabama Ave between Elk Ave and Cherry Hills Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-25 in Exhibit CC-1-B for more detail.
S-26	333	service lines	12	1.5"	Copper	$3,947	107th Ave North	12/2017	n/a	$47,362	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (12 total on 107th Ave and Alabama Ave between Pebble Beach Dr and Connecticut Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-26 in Exhibit CC-1-B for more detail.
S-27	333	service lines	8	1.5"	Copper	$3,947	Alabama Ave and 107th Ave	12/2017	n/a	$31,574	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on 107th Ave and Alabama Ave between Cherry Hills Dr and 105th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-27 in Exhibit CC-1-B for more detail.
S-28	333	service lines	10	1.5"	Copper	$3,947	Alabama Ave at Thunderbird	12/2017	n/a	$39,468	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total on Alabama Ave and 103th Ave between 105th Ave and Oakmont Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-28 in Exhibit CC-1-B for more detail.

S-29	333	service lines	7	1.5"	Copper	$3,947	Alabama Ave at Coggins	12/2017	n/a	$27,628	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (7 total on Alabama Ave between 103rd Ave and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-29 in Exhibit CC-1-B for more detail.
S-30	333	service lines	27	14-1.5" 13-2"	Copper	1.5"-$3,947 2"-$4,013	Coggins Dr	12/2017	n/a	$107,422	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (27 total on Coggins Dr and Windsor Dr between 111th Ave and 108th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-30 in Exhibit CC-1-B for more detail.
S-31	333	service lines	10	8-1.5" 2-2"	Copper	1.5"-$3,947 2"-$4,013	Oakmont Dr West	12/2017	n/a	$39,600	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total on Oakmont Dr, 107th Ave and 108th Ave between Grand Ave and Cherry Hills Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-31 in Exhibit CC-1-B for more detail.
S-32	333	service lines	14	6-1.5" 8-2"	Copper	1.5"-$3,947 2"-$4,013	Oakmont Dr East	12/2017	n/a	$55,783	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on 105th Ave, Coggins Dr and Oakmont Dr between 107th Ave and 105th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-32 in Exhibit CC-1-B for more detail.

S-33	333	service lines	21	5-1.5" 16-2"	Copper	1.5"-$3,947 2"-$4,013	Newcastle Dr	12/2017	n/a	$83,939	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (21 total on Emerald Dr, Garden Court , Newcastle Dr, Silverbell Dr and Thunderbird Blvd between Emerald Dr and 111th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-33 in Exhibit CC-1-B for more detail.
S-34	333	service lines	25	4-1.5" 20-2" 1-2.5"	Copper	1.5"-$3,947 2"-$4,013 2.5"-$4,079	Santa Fe Dr West	12/2017	n/a	$100,122	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (25 total on 109th Ave, 110th Ave, 111th Ave, Santa Fe Dr and Thunderbird Blvd between 111th Ave and 109th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-34 in Exhibit CC-1-B for more detail.
S-35	333	service lines	32	10-1.5" 22-2"	Copper	1.5"-$3,947 2"-$4,013	Santa Fe Dr East	12/2017	n/a	$127,750	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (32 total on 108th Ave, 108th Dr, Santa Fe Dr and Thunderbird Blvd between 109th Ave and Del Webb Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-35 in Exhibit CC-1-B for more detail.
Total			**313**							**$1,241,420**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 1-3

2018 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-36	333	service lines	11	5-1.5" 5-2" 1-3"	Copper	1.5"-$3,947 2"-$4,013 3"-$4,145	Thunderbird Blvd	12/2018	n/a	$43,943	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (11 total on 105th Ave and Thunderbird Blvd between Del Webb Blvd and 103rd Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-36 in Exhibit CC-1-B for more detail.
S-37	333	service lines	9	7-1.5" 2-2"	Copper	1.5"-$3,947 2"-$4,013	Royal Oak Rd South	12/2018	n/a	$31,640	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (9 total on 103rd Ave, 99th Ave and Santa Fe Dr between 103rd Ave and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-37 in Exhibit CC-1-B for more detail.

S-38	333	service lines	39	2-1.5" 37-2"	Copper	1.5"-$3,947 2"-$4,013	Royal Oak Rd North	12/2018	n/a	$156,367	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (39 total on 100th Ave, 100th Dr, 99th Dr, Cedar Dr, Forrester Dr, Royal Oak Rd and Thunderbird Blvd between Thunderbird Bld and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-38 in Exhibit CC-1-B for more detail.
S-39	333	service lines	22	3-1.5" 19-2"	Copper	1.5"-$3,947 2"-$4,013	Hawthorn Dr	12/2018	n/a	$88,084	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on 100th Ave, Emberwood Dr, Hawthorn Dr and Thunderbird Blvd between Forrester Dr and Lancaster Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-39 in Exhibit CC-1-B for more detail.
S-40	333	service lines	14	1.5"	Copper	$3,947	Candlewood Dr	12/2018	n/a	$55,255	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (14 total on Royal Oak Rd and Candlewood Dr between 103rd Ave and Thunderbird Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-40 in Exhibit CC-1-B for more detail.
S-41	333	service lines	5	1.5"	Copper	$3,9477	Bolivar Dr	12/2018	n/a	$19,734	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (5 total on Bolivar Dr and Crown Pt between 103rd Ave and Teakwood Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-41 in Exhibit CC-1-B for more detail.

S-42	333	service lines	17	1.5"	Copper	$3,947	Tumble-brook Way	12/2018	n/a	$67,096	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (17 total on 99th Dr, Bolivar Dr, Thunderbird Blvd and Tumblebrook Way between LancasterDr and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-42 in Exhibit CC-1-B for more detail.
S-43	333	service lines	1	1.5"	Copper	$3,947	Thunderbird Ave	12/2018	n/a	$3,947	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (1 total on Thunderbird Rd between Sahara Dr and 93rd Ave.) This service is a priority because it was installed 40 to 50 years ago. Replacing the service will help reduce system water loss and improve customer pressure and flow. The service line replacement is for existing customers and not related to new growth. See Section 1 narrative and Map No. S-43 in Exhibit CC-1-B for more detail.
S-44	333	service lines	18	1-1.5" 17-2"	Copper	1.5"-$3,947 2"-$4,013	Newcastle Dr	12/2018	n/a	$72,164	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (18 total on Cameo Dr, Desert Butte Dr, Newcastle Dr, PalmRidge Dr and Thunderbird Blvd between Cameo Dr and Emerald Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-44 in Exhibit CC-1-B for more detail.
S-45	333	service lines	24	8-1.5" 16-2"	Copper	1.5"-$3,947 2"-$4,013	Palm Ridge Dr	12/2018	n/a	$95,779	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (24 total on 111th Ave, Cameo Dr and Palm Ridge Dr between Thunderbird Blvd and 111th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-45 in Exhibit CC-1-B for more detail.

S-46	333	service lines	20	6-1.5" 14-2"	Copper	1.5"-$3,947 2"-$4,013	Topaz Dr	12/2018	n/a	$79,860	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (20 total on 109th Ave, 110th Ave, Cameo Dr and Topaz Dr between 111th Ave and 109th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-46 in Exhibit CC-1-B for more detail.
S-47	333	service lines	33	8-1.5" 25-2"	Copper	1.5"-$3,947 2"-$4,013	108th Dr	12/2018	n/a	$131,894	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (33 total on 107th Dr, 108th Dr, Buccaneer Dr, Cameo Dr and Emerald Dr between 109th Ave and 107th Ln.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-47 in Exhibit CC-1-B for more detail.
S-48	333	service lines	8	7-1.5" 1-2"	Copper	1.5"-$3,947 2"-$4,013	Buccaneer Dr	12/2018	n/a	$31,640	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (8 total on Bayside Rd, Buccaneer Way and Del Webb Blvd between Cameo Dr and Buccaneer Way.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-48 in Exhibit CC-1-B for more detail.
S-49	333	service lines	32	1.5"	Copper	$3,947	Tropicana Cir South	12/2018	n/a	$126,298	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (32 total on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-49 in Exhibit CC-1-B for more detail.

S-50	333	service lines	22	1.5"	Copper	$3,947	Tropicana Cir North	12/2018	n/a	$86,830	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (22 total on Del Webb Blvd, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-50 in Exhibit CC-1-B for more detail.
S-51	333	service lines	41	1.5"	Copper	$3,947	El Capitan Cir	12/2018	n/a	$161,819	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (41 total on Camelot Cir, Del Webb Blvd, El Capitan Cir and Roundelay Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-51 in Exhibit CC-1-B for more detail.
Total			**316**							**$1,256,363**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 1-4

2019 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-52	333	service lines	10	5-1.5" 5-2"	Copper	1.5"-$3,947 2"-$4,013	Del Webb Blvd	12/2019	n/a	$39,798	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (10 total at the intersection of Del Webb Blvd, Thunderbird Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-52 in Exhibit CC-1-B for more detail.
S-53	333	service lines	49	1.5"	Copper	1.5"-$3,947	Saratoga Circle	12/2019	n/a	$193,393	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (49 total on Camelot Cir, El Capitan Cir, Roundelay Cir, Saratoga Cir and Tropicana Cir between Del Webb Blvd and Talisman Rd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-53 in Exhibit CC-1-B for more detail.

S-54	333	service lines	41	1.5"	Copper	1.5"-$3,947	Kingswood Cir West	12/2019	n/a	$161,819	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (41 total on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Talisman Rd and Boswell Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-54 in Exhibit CC-1-B for more detail.
S-55	333	service lines	43	42-1.5" 1-2"	Copper	1.5"-$3,947 2"-$4,013	Kingswood Cir East	12/2019	n/a	$169,778	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (43 total on Bright Angel Cir, Desert Forest Cir, Kingswood Cir and Prairie Hills Cir between Boswell Blvd and 103rd Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-55 in Exhibit CC-1-B for more detail.
S-56	333	service lines	53	49-1.5" 4-2"	Copper	1.5"-$3,947 2"-$4,013	Shasta Dr	12/2019	n/a	$209,444	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (53 total on Boswell Blvd, Desert Rose Dr, Pleasant Valley Rd, Sandstone Dr and Shasta Dr between Boswell Blvd and 99th Ave.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-56 in Exhibit CC-1-B for more detail.
S-57	333	service lines	44	42-1.5" 2-2"	Copper	1.5"-$3,947 2"-$4,013	Prairie Hills Cir	12/2019	n/a	$173,791	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (44 total on 103rd Ave, Boswell Blvd, Kingswood Cir, Newport Dr, Pineridge Dr, Prairie Hills Cir, Raintree Dr and Spruce Dr between 103rd Ave and Boswell Blvd.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-57 in Exhibit CC-1-B for more detail.

S-58	333	service lines	50	49-1.5" 1-2"	Copper	1.5"-$3,947 2"-$4,013	Sandstone Dr	12/2019	n/a	$197,406	Replace aging services with copper service lines to reduce water leaks and emergency repairs. (50 total on Cameo Dr, Lakeforest Dr, Long Hills Dr, Sandstone Dr and Shasta Dr between 99th Ave and Cameo Dr.) The services are old and are failing at a high rate. These services are a priority because they are galvanized steel pipe and they were installed 40 to 50 years ago. Galvanized pipe is prone to corrosion and has abeen shown to have a useful life of less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-58 in Exhibit CC-1-B for more detail.
Total			**290**							**$1,145,430**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 2-1

2015 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-1	331	gate valves	16	3-4" 10-6" 2-8" 1-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Youngtown and area north of Grand Ave between 95th Ave and 115th Ave (see map V-1 for detail)	12/2015	n/a	$76,375	Replace 3-4", 10-6", 2-8", and 1-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. See Section 2 narrative and Map V-1 in Exhibit CC-1-B for more detail.
Total			**16**							**$76,375**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 2-2

2016 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-2	331	gate valves	16	1-4" 8-6" 5-8" 1-12" 1-16"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 16"-$7,603	Tierra Del Rio, Agua Fria Ranch, and the area south of Bell Rd between 99th Ave and 111th Ave (see map V-2 for detail)	12/2016	n/a	$81,418	Replace 1-4", 8-6", 5-8", 1-12", and 1-16" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-2 in Exhibit CC-1-B for more detail.
Total			**16**							**$81,418**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 2-3

2017 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-3	331	gate valves	16	1-4" 8-6" 5-10" 2-12"	cast iron with rubberized epoxy coating	4"-$4,431 8"-$5,201 12"-$6,173	Coyote Lakes, Citrus Point, and area west of 99th Ave between Union Hills and Bell Rd (see map V-3 for detail)	12/2017	n/a	$82,188	Replace 1-4", 8-6", 5-10", and 2-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-3 in Exhibit CC-1-B for more detail.
Total			**16**							**$82,188**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 2-4

2018 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed *Cost/Unit* (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-4	331	gate valves	16	2-4" 12-6" 2-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 12"-$6,173	Area east of 99th Ave between Thunderbird and Union Beardsley and east of 99th Ave north of Beardsley (see map V-4 for detail)	12/2018	n/a	$77,018	Replace 2-4", 12-6", and 2-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-4 in Exhibit CC-1-B for more detail.
Total			**16**							**$77,018**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 2-5

2019 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-5	331	gate valves	16	1-4" 5-6" 7-8" 3-12"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173	Area between Grand Ave and Olive Ave and between 111th Ave/127th Ave and the Agua Fria Wash (see map V-5 for detail)	12/2019	n/a	$82,610	Replace 1-4", 5-6", 7-8", and 3-12" (estimated 16 total) distribution system valves that are no longer functioning. Approximately 20% of the valves will be tested annually. Valves found broken as a part of the annual valve maintenance program will be replaced. Over 42% of the valves in the system are over 40 years old. In the last year, approximately 2% of valves tested were found to be inoperable or broken. The same replacement rate is expected with this project. Replacing the valves decreases time required to shutdown water mains in the event of main break or other system maintenance, which reduces customer service disruption and decreases water loss during main breaks. The valve replacements are not related to new growth. . See Section 2 narrative and Map V-5 in Exhibit CC-1-B for more detail.
Total			**16**							**$82,610**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 3-1

2015 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-1	331	Mains	5,786 LF	2,842 LF-4" 2,944 LF-8"	PVC	$174	115th Dr, in north 1/3 of Coyote Lakes	12/2015	n/a	$1,005,087	Replace existing mains with 2,842 LF of 4" main and 2,944 LF of 8" main in 115th Dr and adjacent cul-de-sacs in the northern 1/3 of the Coyote Lakes development. The mains were installed in native soil which has resulted in several leaks due to rocks puncturing and cracking the pipe. Due to the high flows and pressures in this area, main breaks result in large amounts of lost water. Replacing the mains will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-1 in Exhibit CC-1-B for more detail.
Total			**5,786 LF**							**$1,005,087**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 3-2

2016 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-2	331	Mains	12,869 LF	4,871 LF-4" 832 LF-6" 6,004 LF-8" 1,170 LF-12"	PVC	$131	115th Dr, Coyote Lakes Pkwy, in south 2/3 of Coyote Lakes	12/2016	n/a	$1,680,440	Replace existing mains with 4,871 LF of 4", 832 LF of 6", 6,004 LF of 8", and 1,170 LF of 12" main in 115th Dr, in Coyote Lakes Pkwy, and in adjacent cul-de-sacs in the southern 2/3 of the Coyote Lakes development The mains were installed in native soil which has resulted in several leaks due to rocks puncturing and cracking the pipe. Due to the high flows and pressures in this area, main breaks result in large amounts of lost water. Replacing the mains will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-2 in Exhibit CC-1-B for more detail.
Total			**12,869 LF**							**$1,680,440**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 3-3

2017 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-3	331	Mains	3,854 LF	6"	PVC	$122	Cherry Hills Dr/Hillcrest Dr	12/2017	n/a	$471,483	Replace existing main with 3,854 LF of 6"main in Cherry Hills Dr and Hillcrest Dr south of Alabama Ave. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. The existing main is 4" in diameter which cannot support the flows necessary for fire protection. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-3 in Exhibit CC-1-B for more detail.
Total			**3,854 LF**							**$471,483**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 3-4

2018 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-4	331	Mains	2,633 LF	6"	PVC	$133	Riviera Dr	12/2018	n/a	$349,698	Replace existing main with 2,633 LF of 6"main in Riviera Dr between 103rd Ave and 99th Ave. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. The existing main is 4" in diameter which cannot support the flows necessary for fire protection. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-4 in Exhibit CC-1-B for more detail.
Total			**2,633 LF**							**$349,698**	

Sun City – PWS ID No. 07-099

SIB PLANT TABLE I, 3-5

2019 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-5	331	Mains	2,148 LF	6"	PVC	$144	105th Ave	12/2019	n/a	$308,391	Replace existing main with 2,148 LF of 6"main in 105th Ave between Alabama Ave and Desert Hills Dr. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-5 in Exhibit CC-1-B for more detail.
WM-6	331	Mains	1,676 LF	8"	PVC	$159	Oakmont Dr	12/2019	n/a	$266,771	Replace existing main with 1,676 LF of 8"main in Oakmont Dr between 107th Ave and 105th Ave. The main was installed in 1959 and has broken numerous times in the last 5 years. The pipe material is asbestos-cement, which is known to have a high failure rate as it ages and has not been used in water systems for decades. Replacing the mains will help reduce system water loss and improve customer pressure and flow. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-6 in Exhibit CC-1-B for more detail.
Total			**3,824 LF**							**$575,162**	

Sun City water district – PWS ID No. 07-099

SIB PLANT TABLE I, 4-1

2015 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-1	334	meters	2,100	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter Routes 128, 202, 203, 204, 205, and 229 (see map M-1 for detail)	12/2015	n/a	$409,508	Replace 1,857 - 5/8", 3 - 3/4", 13 – 1", 218 – 1.5", and 9 – 2" (2,100 total) meters in SC district Meter Routes 128, 202, 203, 204, 205, and 229. The existing meters in these routes will be at least 16 years old when replaced. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map No. M-1 in Exhibit CC-1-B for more detail.
Total			**2,100**							**$409,508**	

Sun City water district – PWS ID No. 07-099

SIB PLANT TABLE I, 4-2

2016 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (*DSIC-eligible plant*)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-2	334	meters	2,071	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter Routes 135, 206, 211, 216, 227, and 232 (see map M-2 for detail)	12/2016	n/a	$376,982	Replace 1,665 - 5/8", 351 – 3/4", 13 - 1", 24 – 1.5", and 18 – 2" (2,071 total) in SC district meter routes 135, 206, 211, 216, 227, and 232. The existing meters in these routes will be over 12 years old at replacement; meters in routes 227 and 232 will be 17 and 16 years old, respectively. They are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map No. M-2 in Exhibit CC-1-B for more detail.
Total			**2,071**							**$376,982**	

Sun City water district – PWS ID No. 07-099

SIB PLANT TABLE I, 4-3

2017 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-3	334	meters	2,292	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter routes 136, 210, 219, 222, 224, 225, and 228 (see map M-3 for detail)	12/2017	n/a	$432,728	Replace 1,762 - 5/8", 398 - 3/4", 12 – 1", 85 – 1.5", and 35 – 2" (2,292 total) meters in SC district meter routes 136, 210, 219, 222, 224, 225, and 228. The existing meters in these routes will be between 12 and 13 years when replaced. The meters are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map No. M-3 in Exhibit CC-1-B for more detail.
Total			**2,292**							**$432,728**	

Sun City water district – PWS ID No. 07-099

SIB PLANT TABLE I, 4-4

2018 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-4	334	meters	2,784	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter routes 131, 133, 212, 217, 218, 220, 221, and 231 (see map M-4 for detail)	12/2018	n/a	$534,279	Replace 2,380 - 5/8", 1 - 3/4", 215 – 1", 159 – 1.5", and 29 – 2" (2,784 total) meters in SC district meter routes 131, 133, 212, 217, 218, 220, 221, and 231. The existing meters in these routes will be between 12 and 17 years old when replaced. The meters are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map No. M-4 in Exhibit CC-1-B for more detail.
Total			**2,784**							**$534,279**	

Sun City water district – PWS ID No. 07-099

SIB PLANT TABLE I, 4-5

2019 Meter Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (new plant) (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
M-5	334	meters	2,351	5/8" to 2"	Copper/ Plastic	5/8"-$173 ¾"-$195 1"-$234 1½"-$367 2"-$447	Meter routes 207, 208, 209, 213, 214, 215, 223, and 226 (see map M-5 for detail)	12/2019	n/a	$470,906	Replace 2,018 - 5/8", 26 – 1", 277 – 1.5", and 30 – 2" (2,351 total) meters in SC district meter routes 207, 208, 209, 213, 214, 215, 223, and 226. The existing meters in these routes will be 14 years old when replaced. The meters are experiencing a rapid decline in meter accuracy. Prior to replacement, a 10% sample of the route meters will be tested for accuracy. The new meters will help keep system water loss below 10%. The meter replacements are for existing customers and not related to new growth. See Section 4 narrative and Map No. M-5 in Exhibit CC-1-B for more detail.
Total			**2,351**							**$470,906**	

SIB Table I

(Exhibit CC-2-C) EPCOR

Water (USA) Inc.

Paradise Valley Water District

PWS ID No. 0407056

February 28, 2014

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 1-1

2015 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-1	333	service lines	39	33-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Keim Dr	12/2015	n/a	$151,879	Replace 33-1", 4-1.5", and 2-2" (39 total) residential services between McDonald Dr, Keim Dr, 40th St, and 44th St. These services are a priority for replacement because they are galvanized steel pipe and will be about 58 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-1 in Exhibit CC-1-C for more detail.
S-2	333	service lines	23	18-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Hoghan Dr	12/2015	n/a	$89,720	Replace 18-1", 3-1.5", and 2-2" (23 total) residential services north of Keim Dr between 44th St and 40th St. These services are a priority for replacement because they are galvanized steel pipe and will be about 58 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth See Section 1 narrative and Map No. S-2 in Exhibit CC-1-C for more detail.

S-3	333	service lines	55	52-1" 3-1.5"	Copper	1"-$3,881 1.5"-$3,947	Lincoln Dr	12/2015	n/a	$213,642	Replace 52-1" and 3-1.5" (55 total) residential services north of Lincoln Dr between 40th St and Hillside Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth See Section 1 narrative and Map No. S-3 in Exhibit CC-1-C for more detail.
S-4	333	service lines	45	37-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Highlands Dr	12/2015	n/a	$175,362	Replace 37-1", 5-1.5", and 3-2" (45 total) residential services on Highlands Dr and Lamar Rd between 40th St and Hillside Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-4 in Exhibit CC-1-C for more detail.
S-5	333	service lines	47	39-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Upper Ridge Way	12/2015	n/a	$183,124	Replace 39-1", 5-1.5", and 3-2" (47 total) residential services on Lakeside Ln and Sandy Mountain Rd between 40th St and Upper Ridge Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2015. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-5 in Exhibit CC-1-C for more detail.
Total			**209**							**$813,727**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 1-2

2016 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-6	333	service lines	35	29-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Black Rock Trl	12/2016	n/a	$136,356	Replace 29-1", 4-1.5", and 2-2" (35 total) residential services along Black Rock Trl and Clearwater Pkwy north of Lakeside Ln. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-6 in Exhibit CC-1-C for more detail.
S-7	333	service lines	31	25-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Red Ledge Dr	12/2016	n/a	$120,833	Replace 25-1", 4-1.5", and 2-2" (31 total) residential services along Red Ledge Dr, Clearwater Pkwy, and Highcliff Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 56 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-7 in Exhibit CC-1-C for more detail.

S-8	333	service lines	36	30-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Praying Monk Rd	12/2016	n/a	$140,237	Replace 30-1", 4-1.5", and 2-2" (36 total) residential and commercial services along Praying monk Rd, Joshua Tree Ln, and Lincoln Dr between Tatum and Desert Fairways. These services are a priority for replacement because they are galvanized steel pipe and will be about 62 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-8 in Exhibit CC-1-C for more detail.
S-9	333	service lines	43	42-1" 1-2"	Copper	1"-$3,881 2"-$4,013	Camelback Inn	12/2016	n/a	$166,940	Replace 42-1" and 1-2" (43 total) residential and commercial services in the Camelback Inn north of Lincoln. These services are a priority for replacement because they are galvanized steel pipe and will be about 50 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-9 in Exhibit CC-1-C for more detail.
S-10	333	service lines	40	38-1" 2-2"	Copper	1"-$3,881 2"-$4,013	Lost Dutchman Dr	12/2016	n/a	$155,364	Replace 38-1" and 2-2" (40 total) residential and commercial services along Lost Dutchman Dr, Smoke Tree Ln, Cactus Wren Rd, and 59th St. These services are a priority for replacement because they are galvanized steel pipe and will be about 52 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-10 in Exhibit CC-1-C for more detail.
S-11	333	service lines	27	24-1" 3-2"	Copper	1"-$3,881 2"-$4,013	Berridge Ln	12/2016	n/a	$104,980	Replace 24-1" and 3-2" (27 total) residential and commercial services along Berridge ln and Sundown Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 58 years old in 2016. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-11 in Exhibit CC-1-C for more detail.
Total			**212**							**$824,710**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 1-3

2017 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-12	333	service lines	38	34-1" 4-1.5"	Copper	1"-$3,881 1.5"-$3,947	Cattletrack Rd	12/2017	n/a	$147,734	Replace 34-1" and 4-1.5" (38 total) residential and commercial services between Cattletrack Rd, 74th St, Lincoln Dr, and Whispering Winds Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 40 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-12 in Exhibit CC-1-C for more detail.
S-13	333	service lines	33	29-1" 4-2"	Copper	1"-$3,881 2"-$4,013	73rd Way	12/2017	n/a	$128,330	Replace 29-1" and 4-2" (33 total) residential and commercial services between 73rd Way, Scottsdale Rd, Lincoln Dr, and Citrus Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 45 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-13 in Exhibit CC-1-C for more detail.

S-14	333	service lines	33	33-1"	Copper	1"-$3,881	Balfour Rd	12/2017	n/a	$128,066	Replace 40-1" residential services south of Vista Dr between 68th St and Scottsdale Rd. These services are a priority for replacement because they are galvanized steel pipe will be about 59 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-14 in Exhibit CC-1-C for more detail.
S-15	333	service lines	21	16-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Paradise Canyon Rd	12/2017	n/a	$81,959	Replace 16-1", 3-1.5", and 2-2" (21 total) residential services along Las Brisas Ln and Paradise Canyon Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 46 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-15 in Exhibit CC-1-C for more detail.
S-16	333	service lines	22	17-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	54th St	12/2017	n/a	$85,840	Replace 17-1", 3-1.5", and 2-2" (22 total) residential services along 54th St, Desert Park Ln, Roadrunner Rd, and Desert Vista Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 43 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-16 in Exhibit CC-1-C for more detail.
S-17	333	service lines	32	26-1" 4-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Shadow Mountain Rd	12/2017	n/a	$124,714	Replace 26-1", 4-1.5", and 2-2" (32 total) residential services between Shadow Mountain Rd, Tatum Blvd, Roadrunner Rd, and Prickly Pear Ln. These services are a priority for replacement because they are galvanized steel pipe and will be about 61 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-17 in Exhibit CC-1-C for more detail.

S-18	333	service lines	60	51-1" 6-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Crestview Dr	12/2017	n/a	$233,640	Replace 51-1", 6-1.5", and 3-2" (60 total) residential services between Desert Jewel Dr, Roadrunner Rd, Tatum Blvd, and Shadow Mountain Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 47 years old in 2017. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-18 in Exhibit CC-1-C for more detail.
Total			**239**							**$930,283**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 1-4

2018 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-19	333	service lines	21	16-1" 3-1.5" 2-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Clearwater Pkwy	12/2018	n/a	$81,959	Replace 16-1", 3-1.5", and 2-2" (21 total) residential services Clearwater Pkwy and Tatum Blvd. These services are a priority for replacement because they are galvanized steel pipe and will be about 63 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-19 in Exhibit CC-1-C for more detail.
S-20	333	service lines	65	54-1" 7-1.5" 4-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Lakeside Ln	12/2018	n/a	$253,242	Replace 54-1", 7-1.5", and 4-2" (65 total) residential services along Lakeside Ln, Moonlight Way, Clearwater Pkwy, and Brookview Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 62 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-20 in Exhibit CC-1-C for more detail.

S-21	333	service lines	43	35-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Crystal Ln	12/2018	n/a	$167,600	Replace 35-1", 5-1.5", and 3-2" (43 total) residential services along Crystal Ln, Sparkling Ln, and Moonlight Way. These services are a priority for replacement because they are galvanized steel pipe and will be about 55 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-21 in Exhibit CC-1-C for more detail.
S-22	333	service lines	45	37-1" 5-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Desert Fairways Dr	12/2018	n/a	$175,362	Replace 37-1", 5-1.5", and 3-2" (45 total) residential services along Desert Fairways Dr, Palo Verde Pl, Pepper Tree Ln, and Arroyo Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 65 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-22 in Exhibit CC-1-C for more detail.
S-23	333	service lines	58	49-1" 6-1.5" 3-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Joshua Tree Ln	12/2018	n/a	$225,878	Replace 49-1", 6-1.5", and 3-2" (58 total) residential services between Indian Bend Rd, Lincoln Dr, 60th St, and Lost Dutchman Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 60 years old in 2018. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-23 in Exhibit CC-1-C for more detail.
Total			**232**							**$904,042**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 1-5

2019 Service Line Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. *Engineering Analysis shall also include narrative explaining* the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
S-24	333	service lines	62	51-1" 7-1.5" 4-2"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	51st Pl	12/2019	n/a	$241,600	Replace 51-1", 7-1.5", and 4-2" (62 total) residential services along 51st Pl, Valley Vista Ln, and Rovey Ave. These services are a priority for replacement because they are galvanized steel pipe and are will be about 66 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-24 in Exhibit CC-1-C for more detail.
S-25	333	service lines	63	63-1"	Copper	1"-$3,881	Marston Dr	12/2019	n/a	$244,490	Replace 63-1" residential and commercial services along Arroyo Verde Dr, Valley Vista Ln, and Marston Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 41 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-25 in Exhibit CC-1-C for more detail.

S-26	333	service lines	30	30-1"	Copper	1"-$3,881	Pebble Ridge Rd	12/2019	n/a	$116,424	Replace 30-1" residential services along Pebble Ridge Rd. These services are a priority for replacement because they are galvanized steel pipe and will be about 45 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-26 in Exhibit CC-1-C for more detail.
S-27	333	service lines	41	36-1" 5-1.5"	Copper	1"-$3,881 1.5"-$3,947 2"-$4,013	Claremont Ave and Maderos Del Cuenta Dr	12/2019	n/a	$159,443	Replace 36-1" and 5-1.5" (41 total) residential services on Claremont Ave, 42nd St, Marlette Ave, and Maderos Del Cuenta Dr. These services are a priority for replacement because they are galvanized steel pipe and will be about 41 years old in 2019. Galvanized pipe is prone to corrosion and has been shown to have a useful lifetime less than 40 years. Replacing the services will help reduce system water loss and improve customer pressure and flow. The service line replacements are for existing customers and not related to new growth. See Section 1 narrative and Map No. S-27 in Exhibit CC-1-C for more detail.
Total			**196**							**$761,957**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 2-1

2015 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-1	331	gate valves	40	5-4" 28-6" 6-8" 1-16"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 16"-$20,046	Area north of Lincoln Dr between 40th St and 54th Pl (see map V-1 for detail)	12/2015	n/a	$203,628	Replace 5-4", 28-6", 6-8", and 1-16" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-1 in Exhibit CC-1-C for more detail.
Total			**40**							**$203,628**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 2-2

2016 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-2	331	gate valves	40	5-4" 17-6" 14-8" 3-12" 1-24"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 24"-$33,246	Area south of Lincoln Dr between 40th St and Invergordon Dr (see map V-2 for detail)	12/2016	n/a	$225,795	Replace 5-4", 17-6", 14-8", 3-12", and 1-24" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-2 in Exhibit CC-1-C for more detail.
Total			**40**							**$225,795**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 2-3

2017 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-3	331	gate valves	40	7-4" 13-6" 12-8" 9-12" 1-24"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 24"-$33,246	Area between Desert Fairways and Mockingbird Ln north of Lincoln Dr and Invergordon Dr and Scottsdale Rd south of Lincoln Dr (see map V-3 for detail)	12/2017	n/a	$242,691	Replace 7-4", 13-6", 12-8", 9-12", and 1-24" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-3 in Exhibit CC-1-C for more detail.
Total			**40**							**$242,691**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 2-4

2018 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-4	331	gate valves	40	11-4" 20-6" 7-8" 1-12" 1-16"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 16"-$20,046	Area south of McDonald Dr between Invergordon Dr and Scottsdale Rd (see map V-4 for detail)	12/2018	n/a	$204,380	Replace 11-4", 20-6", 7-8", 1-12", and 1-16" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. This area represents approximately 20% of the total system valves. Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-4 in Exhibit CC-1-C for more detail.
Total			**40**							**$204,380**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 2-5

2019 Valve Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
V-5	331	gate valves	40	1-4" 15-6" 20-8" 3-12" 1-24"	cast iron with rubberized epoxy coating	4"-$4,431 6"-$4,651 8"-$5,201 12"-$6,173 24"-$33,246	Area east of Scottsdale Rd (see map V-5 for detail)	12/2019	n/a	$229,975	Replace 1-4", 15-6", 20-8", 3-12", and 1-24" (estimated, 40 total) distribution system valves that are leaking and/or inoperable. These numbers are only estimates and are based on the percentage of existing valve sizes in the project area. *This area represents approximately 20% of the total system valves.* Valves found broken as a part of the annual valve maintenance program will be replaced. Over a quarter of the system valves are nearing 70 years old. Making certain that all system valves are operational ensures that the time required to shut down water mains in the event of a main break or system maintenance is minimized. This reduces customer service disruptions and decreases water loss during main breaks. These valve replacements are not related to new growth. See Section 2 narrative and Map V-5 in Exhibit CC-1-C for more detail.
Total			**40**							**$229,975**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 3-1

2015 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-1	331	Distribution Main	2,179 LF	6"	PVC	$208	Pasadena Loop	12/2015	n/a	$454,179	Replace 2,179 LF of existing main with 6" PVC in Pasadena Ave, 70th St, 70th Pl, 1st St, and 71st Pl. Ln. The main was installed in 1951 and the existing pipe material is a combination of asbestos-cement and galvanized steel which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-1 in Exhibit CC-1-C for more detail.
Total			**2,088 LF**							**$454,179**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 3-2

2016 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-2	331	Distribution Main	1,462 LF	6"	PVC	$192	Mariposa Dr	12/2016	n/a	$280,944	Replace existing main in 69th Pl, Mariposa Dr, 69th St, 70th St, and Rancho Vista Dr with 1,462 feet of 6" main. The main was installed in 1954 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-2 in Exhibit CC-1-C for more detail.
WM-3	331	Distribution Main	520 LF	4"	PVC	$126	Silvercrest Way	12/2016	n/a	$65,670	Replace existing main in Silvercrest Way between Clearwater Hills Tanks 1 and 3 with 520 feet of 4" main. The main was installed in 1953 and the existing pipe material is asbestos-cement. This main is currently known to be leaking, but requires Clearwater Hills Tanks 1 and 3 be temporarily shut down in order to be replaced. Replacing the main will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-3 in Exhibit CC-1-C for more detail.
Total			**1,982 LF**							**$346,614**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 3-3

2017 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-4	331	Distribution Main	1,700 LF	6"	PVC	$171	Starlight Way	12/2017	n/a	$291,500	Replace existing main in Starlight Way between Cameldale Way and Superstition Ln with 1,700 feet of 6" main. Most of this main was installed in 1953 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-4 in Exhibit CC-1-C for more detail.
Total			**1,700 LF**							**$291,500**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 3-4

2018 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-5	331	Distribution Main	1,530 LF	6"	PVC	$180	Horseshoe Ln	12/2018	n/a	$274,802	Replace existing main in Horseshoe Ln and 66th Ln with 1,530 feet of 6" main. The main was installed in 1953 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-5 in Exhibit CC-1-C for more detail.
WM-6	331	Distribution Main	500 LF	6"	PVC	$175	Quail Run	12/2018	n/a	$87,340	Replace existing main in the rear lot easement between Quail Run and Quail Pl with with 500 feet of 4" main in Quail Run. The main was installed in 1955 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and increase system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-6 in Exhibit CC-1-C for more detail.
Total			**2,030 LF**							**$362,142**	

Paradise Valley – PWS ID No. 0407056

SIB PLANT TABLE I, 3-5

2019 Main Replacements

Information to be included with SIB-Eligible Project Notification

	NARUC Acct No. (DSIC-eligible plant)	Replacement Plant Description (DSIC-eligible plant)					Site (location description)	Replacement Plant			1. Provide narrative why Replacement Plant is necessary - replacement of existing plant that has exceeded its designated useful life and has worn out or is in deteriorating condition due to no fault of the utility - replacement of existing plant to address excessive water loss (10% or more) - replacement of existing plant for other reasons supported by persuasive showing by utility 2. Provide narrative explaining why this segment of plant is a priority. 3. Provide narrative explaining how replacing this plant will benefit existing customers. 4. Provide affirmation that Replacement Plant does not include the costs for extending or expanding facilities to serve new customers. 5. Provides reference to related page No. in the submitted detailed Engineering Analysis supporting the need for SIB. Engineering Analysis shall also include narrative explaining the utility's systematic assessment, inspection, maintenance, and repair/replacement program.
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Pipe length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (Estimated)		Expected In-Service Date	Estimated Subtotal Cost (by NARUC Acct No)	Estimated Subtotal Cost (by project)	
WM-7	331	Distribution Main	525 LF	6"	PVC	$173	68 Pl and Chaparral	12/2019	n/a	$90,943	Replace existing main on Chaparral Rd and 68th Pl with 525 feet of 6" main. The main was installed in 1958 and the existing pipe material is asbestos-cement which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The existing main is 4" in diameter, which is not appropriate for installing hydrants or supporting fire flow, nor is it sufficient to handle the high pressures in this area (>100 psi). The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-7 in Exhibit CC-1-C for more detail.
WM-8	331	Distribution Main	246 LF	4"	PVC	$165	Sierra Vista	12/2019	n/a	$40,493	Replace existing main in Sierra Vista with 246 feet of 4" main. The main was installed in 1960 and the existing pipe material is galvanized steel which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-8 in Exhibit CC-1-C for more detail.

WM-9	331	Distribution Main	655 LF	4"	PVC	$142	Tamanar Dr	12/2019	n/a	$92,934	Replace existing main in the four cul-de-sacs on Tamanar Dr with 655 feet of 4" main. The main was installed in 1960 and the existing pipe material is galvanized steel which has resulted in several leaks. Replacing the main will help reduce system water loss and improve system reliability. The main replacement is for existing customers and not related to new growth. See Section 3 narrative and Map No. WM-9 in Exhibit CC-1-C for more detail.
Total			**1,426 LF**							**$224,369**	

SIB Table II Template

(Exhibit CC-3-A)

EPCOR Water (USA) Inc.

Mohave Water District

PWS ID No. 08-032, 08-333, 08-068

February 28, 2014

Water System Name and PWS ID No. 08-032, 08-333, 08-068

SIB PLANT TABLE II (Page 1 of 2)

Information to be included with SIB-Eligible Completed Project Filings

	NARUC Acct No. (SIB-eligible plant)	Replacement Plant Description (new plant) (SIB-eligible plant)					Site (location description)	Replacement Plant			Original Plant (Plant Being Retired)			
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Installed Pipe/Plant Length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (actual cost)		In-Service Date (provide ADEQ AOC and other related approvals by state and/or federal agencies when applicable; pictures of installed plant)	Subtotal Actual Cost (by NARUC Acct No)	Subtotal Actual Cost (by project)	Actual Retirement Date	Original In-Service Date	Original Cost	Accumulated Depreciation Reserve (as of the actual retirement date)
Total Actual Cost														

Water System Name and PWS ID No. 08-032, 08-333, 08-068
SIB PLANT TABLE II (Page 2 of 2, Summary)

Information to be included with SIB-Eligible Completed Project Filings

Project No.	Project Description	Estimated Cost (from TABLE I)	Actual Cost	The project cost to be used in calculating the SIB Revenue Requirement shall be the lesser of the actual project cost listed in SIB Plant Table II or 110 percent of the estimated cost listed in SIB Plant Table I as approved in Decision No. _____. Unit costs shall be used if actual units constructed are less than estimated in SIB Plant Table I.
Total Cost				

SIB Table II Template

(Exhibit CC-3-B)

EPCOR Water (USA) Inc.

Sun City Water District

PWS ID No. 07-099

February 28, 2014

Water System Name and PWS ID No. 07-099

SIB PLANT TABLE II (Page 1 of 2)

Information to be included with SIB-Eligible Completed Project Filings

	NARUC Acct No. (SIB-eligible plant)	Replacement Plant Description (new plant) (SIB-eligible plant)					Site (location description)	Replacement Plant			Original Plant (Plant Being Retired)			
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Installed Pipe/Plant Length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (actual cost)		In-Service Date (provide ADEQ AOC and other related approvals by state and/or federal agencies when applicable; pictures of installed plant)	Subtotal Actual Cost (by NARUC Acct No)	Subtotal Actual Cost (by project)	Actual Retirement Date	Original In-Service Date	Original Cost	Accumulated Depreciation Reserve (as of the actual retirement date)
								Total Actual Cost						

Water System Name and PWS ID No. 07-099

SIB PLANT TABLE II (Page 2 of 2, Summary)

Information to be included with SIB-Eligible Completed Project Filings

Project No.	Project Description	Estimated Cost (from TABLE I)	Actual Cost	The project cost to be used in calculating the SIB Revenue Requirement shall be the lesser of the actual project cost listed in SIB Plant Table II or 110 percent of the estimated cost listed in SIB Plant Table I as approved in Decision No. _____. Unit costs shall be used if actual units constructed are less than estimated in SIB Plant Table I.
	Total Cost			

SIB Table II Template

(Exhibit CC-3-C) EPCOR

Water (USA) Inc.

Paradise Valley Water District

PWS ID No. 0407056

February 28, 2014

Water System Name and PWS ID No. 0407056

SIB PLANT TABLE II (Page 1 of 2)

Information to be included with SIB-Eligible Completed Project Filings

	NARUC Acct No. (SIB-eligible plant)	Replacement Plant Description (new plant) (SIB-eligible plant)					Site (location description)	Replacement Plant			Original Plant (Plant Being Retired)			
Project No.	**309 Supply Mains** **331 T&D Mains** **333 Services** **334 Meters** **335 Hydrants**	Description	Installed Pipe/Plant Length/ Quantity	Diameter/ Size	Material	Installed Cost/Unit (actual cost)		In-Service Date (provide ADEQ AOC and other related approvals by state and/or federal agencies when applicable; pictures of installed plant)	Subtotal Actual Cost (by NARUC Acct No)	Subtotal Actual Cost (by project)	Actual Retirement Date	Original In-Service Date	Original Cost	Accumulated Depreciation Reserve (as of the actual retirement date)
										Total Actual Cost				

Water System Name and PWS ID No. 0407056
SIB PLANT TABLE II (Page 2 of 2, Summary)

Information to be included with SIB-Eligible Completed Project Filings

Project No.	Project Description	Estimated Cost (from TABLE I)	Actual Cost	The project cost to be used in calculating the SIB Revenue Requirement shall be the lesser of the actual project cost listed in SIB Plant Table II or 110 percent of the estimated cost listed in SIB Plant Table I as approved in Decision No. _____. Unit costs shall be used if actual units constructed are less than estimated in SIB Plant Table I.
Total Cost				

System Improvements Benefit ("SIB")
Plan of Administration ("POA")
(Exhibit CC-4)

EPCOR Water

February 28, 2014

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I. GENERAL DESCRIPTION

This document is the Plan of Administration ("POA") for the System Improvement Benefits ("SIB") Mechanism approved for EPCOR Water's _____ Water District ("Company") by the Arizona Corporation Commission ("ACC" or "Commission") in Decision No. _____ on _____. The SIB provides for recovery of the capital costs (return on investment, income taxes and depreciation expense) associated with distribution system improvement projects listed in SIB Plant Table I that have been verified to be completed,[1] net of associated retirements and placed in service per SIB Plant Table II and where costs have not been included in rate base for recovery in Decision No._____. Any expenditures offset by contributions in aid of construction or advances in aid of construction are not eligible for inclusion in the SIB.

II. DEFINITIONS

- NARUC – National Association of Regulatory Utility Commissioners
- SIB – System Improvement Benefit mechanism to be implemented between rate proceedings to support investment in plant recorded in SIB Eligible NARUC accounts.
- SIB Eligible Plant – Investments in plant recorded in SIB Eligible NARUC accounts.
- SIB Eligible NARUC accounts:
  - NARUC Account No. 309 – Supply Mains
  - NARUC Account No. 331 – Mains
  - NARUC Account No. 333 – Services
  - NARUC Account No. 334 - Meters and Meter Installations;
  - NARUC Account No. 335 – Hydrants
- SIB Plant Table I (Exhibit CC-2)[2] – The schedule of planned SIB eligible projects approved in the Company's most recent rate case decision.
- SIB Plant Table II (Exhibit CC-3) – The schedule of completed and verified SIB eligible projects from SIB Plant Table I and associated retirements.

[1] Acceptable form of verifications may include the Maricopa County Environmental Services Department Approval of Construction, Professional Engineer's Certificate of Completion, etc.

[2] See Company filing of March 7, 2014.

- Total Revenue Requirement – The revenue requirement approved in Decision No. _____, plus the SIB Revenue Requirement.

- SIB Revenue Requirement – The revenue requirement equal to the return on investment, income taxes and depreciation expense necessary to support the SIB Plant Table II amounts.

- SIB Revenue Requirement Efficiency Credit – An amount equal to 5 percent of the SIB Revenue Requirement.

- SIB Authorized Revenue – Amount equal to the SIB Revenue Requirement less the SIB Revenue Requirement Efficiency Credit plus any SIB True up Adjustment.

- Gross SIB Surcharge – Amount to be shown on customers' bills based on meter sizes without consideration to the SIB Surcharge Efficiency Credit.

- SIB Surcharge Efficiency Credit – An amount equal to 5 percent of the Gross SIB Surcharge to be shown on customers' bills.

- SIB Surcharge – The amount equal to the Gross SIB Surcharge less the SIB Surcharge Efficiency Credit to be charged based on meter size, calculated to recover the SIB Authorized Revenue, to be shown on the customers' bills.

- SIB True-up Adjustment – An amount to adjust for over or under collection of the SIB Authorized Revenues as compared with the total SIB Surcharges collected for the preceding 12 month period. Each true–up shall also analyze the cumulative over or under collections to include a comparison of all past SIB Authorized Revenues, total SIB Surcharge collections, and prior true-ups to be used in calculation of the SIB true-up surcharge or credit.

III. SIB RELATED FILINGS

A. Progress Reports – Once a SIB is approved in a decision, the Company must file with Docket Control semi-annual status reports delineating the status of all SIB Eligible Plant, on a project by project basis as listed in SIB Plant Table I, starting 6 months after the decision and every 6 months thereafter.

B. Reconciliation and True Up – Once a SIB Surcharge is implemented, the Company must file annually to true up its SIB Surcharge collections over the preceding twelve months with the SIB Authorized Revenue for that period and establish a surcharge or credit to true up over or under collections, regardless of

whether it seeks a new surcharge. The filing dates for these annual true-ups shall be as established in the Commission's Decision approving the SIB Surcharge.

C. SIB Surcharge Requests – To obtain its SIB Surcharge the Company must file the following:

1. SIB Plant Table II (with supporting information and documentation), showing the SIB eligible projects completed for which the Company seeks cost recovery. Such projects must

   a) be projects listed in the Company's initial SIB Plant Table I, approved in Decision No._____, or have been added to said SIB Plant Table I pursuant to Section V of this POA;

   b) have been completed by the Company;

   c) have been verified; and

   d) be actually serving customers.

2. A summary of Commission approved SIB-eligible projects contemplated for the next twelve (12)-month SIB surcharge period from SIB Plant Table I.

3. SIB Schedule A (sample attached as Exhibit CC-4-A), showing a calculation of the SIB Revenue Requirement and SIB Revenue Requirement Efficiency Credit, SIB Authorized Revenue, Gross SIB Surcharge, SIB Surcharge Efficiency Credit, and the SIB Surcharge. Schedule A shall be supported by revenue requirements schedules supporting the revenue requirements in Decision No. _____ and the pro-forma revenue requirements including the effects of SIB Eligible Plant.

4. Schedule B (sample attached as Exhibit CC-4-B) showing the overall SIB True-up Adjustment calculation for the prior twelve-month SIB Surcharge period, as well as the individual SIB True-up Adjustment for each meter size.

5. SIB Schedule C (sample attached as Exhibit CC-4-C) showing the effect of the SIB Surcharge on a typical residential customer bill for both median and average usage.

6. SIB Schedule D (sample attached as Exhibit CC-4-D) which shall include an analysis of the impact of the SIB Eligible Plant on the fair value rate

base, revenue, and the fair value rate of return. The Company shall also file the following:

a) the most current balance sheet at the time of the filing;

b) the most current income statement;

c) an earnings test schedule;

d) a rate review schedule (including the incremental and pro forma effects of the proposed increase);

e) an adjusted rate base schedule; and

f) a Construction Work in Progress ledger (for each project showing accumulation of charges by month and paid vendor invoices).

D. The Company will maintain and provide Excel schedules with formulae intact supporting the revenue requirements approved in the rate decision that approved the SIB and provide same Excel schedules to incorporate the effects of SIB Eligible Plant for the current SIB Surcharge Request and any previously approved Surcharge and True-up requests.

E. The Company may make its initial SIB Surcharge Request through Docket Control no earlier than twelve months after the entry of Decision No._____.

F. The Company may make no more than one SIB Surcharge Request every twelve months with no more than five SIB Surcharge Requests between rate case decisions. A True-up must be filed with each Surcharge Request, except the first.

G. Unless otherwise authorized by the Commission, the Company shall be required to file its next general rate case no later than June 30, 2019, with a test year ending no later than December 31, 2018.

H. Any SIB Surcharges that are in effect shall be reset to zero upon the date new rates become effective in the Company's next general rate case.

I. The Company may request to add Plant to SIB Table I only under emergency circumstances. Any additions or modifications to SIB Plant Table I must be approved by the Commission.

IV. SURCHARGE CALCULATIONS

A. Calculations of Amounts to Be Collected By the SIB Surcharge

1. The amount to be collected by the SIB Authorized Revenue shall be equal to the SIB Revenue Requirement minus the SIB Revenue Requirements Efficiency Credit plus any SIB True up Adjustment.
For purposes of calculating the SIB Revenue Requirement:

    a. The required rate of return is equal to the overall rate of return authorized in Decision No. _____.

    b. The gross revenue conversion factor/tax multiplier is equal to the gross revenue conversion factor/tax multiplier approved in Decision No. _____; and

    c. The applicable depreciation rate(s) is equal to the depreciation rate(s) approved in Decision No. _____.

2. The project cost to be used in calculating the SIB Revenue Requirement shall be the lesser of the actual project cost listed in SIB Plant Table II or 110 percent of the estimated cost listed in SIB Plant Table I as approved in Decision No. _____. Unit costs shall be used if actual units constructed are less than estimated in SIB Plant Table I.

3. The amount to be collected by each SIB Surcharge Request shall be capped annually at five percent of the revenue requirement authorized in Decision No. _____.

B. Reconciliation And True-Ups

1. The revenue collected by the total SIB Surcharges over the preceding twelve months shall be trued-up and reconciled with the SIB Authorized Revenue for that period.

2. A new SIB Surcharge shall be combined with an existing SIB Surcharge such that a single SIB surcharge and SIB Efficiency Credit are shown on a customer's bill.

3. For each twelve (12) month period that a SIB surcharge is in effect, the Company shall reconcile the amounts collected by the SIB Surcharge with the SIB Authorized Revenue, for that twelve (12)-month period, consistent with Schedule B, attached hereto as Exhibit B.

4. Any under- or over-collected SIB Authorized Revenues shall be recovered or refunded, without interest, over a twelve-month period by means of a SIB True-up Surcharge or Credit.

5. Starting with the second annual SIB Surcharge, where there are over or under-collected balances, such over or undercollected balances shall be carried over to the next year, and considered in the calculation of the new SIB True-up Surcharge or Credit. If, after the five-year period there remains an over or undercollected balance, such balance shall be reset to zero, and addressed in the next rate case.

C. Earnings Test

1. Once a SIB Surcharge is in effect, the Company shall be required to perform an annual earnings test calculation for each SIB Surcharge Request to determine whether the actual rate of return reflected by the operating income for the affected system or division for the relevant 12-month period exceeded the most recently authorized fair value rate of return for the affected system or division.

2. The earnings test shall be:

a) based on the most recent available operating income,

b) adjusted for any operating revenue and expense adjustments adopted in the most recent general rate case; and

c) based on the rate base adopted in the most recent general rate case, updated to recognize changes in plant, accumulated depreciation, contributions in aid of construction, advances in aid of construction, and accumulated deferred income taxes through the most recent available financial statement (quarterly or longer).

V. ADDING PROJECTS TO SIB TABLE I UNDER EMERGENCY CIRCUMSTANCES

A. The Company can seek Commission approval to add projects in SIB Plant Table I only in the event of emergency circumstances. No such changes may be made without Commission approval.

B. Any addition to SIB Plant Table I must be plant investment that maintains or improves existing customer service, system reliability, integrity and safety. Eligible plant additions are limited to plant replacement projects. The costs of extending facilities or capacity to serve new customers are not recoverable through the SIB mechanism.

C. To be eligible for SIB treatment, a project must be SIB Eligible Plant.

D. SIB Eligible Plant must satisfy at least one of the following criteria:

1. Water loss for the system exceeds ten (10) percent, as calculated by the following formula: ((Volume of Water Produced and/ or Purchased) – (Volume of Water Sold + Volume of Water Put to Beneficial Use)) divided by (Volume of Water Produced and/or Purchased). If the Volume of Water Put to Beneficial Use is not metered, it shall be established in a reliable, verifiable manner.

2. Plant assets that have remained in service beyond their useful service lives (based on the Company's system's authorized utility plant depreciation rates) and are in need of replacement due to being worn out or in a deteriorating condition through no fault of the Company;

3. Any other engineering, operational or financial justification supporting the need for a plant asset replacement, other than the Company's negligence or improper maintenance, including, but not limited to:

   a. A documented increasing level of repairs to, or failures of, a plant asset justifying its replacement prior to reaching the end of its useful service life (e.g. black poly pipe);

   b. Assets that are required to be moved, replaced or abandoned by a governmental agency or political subdivision if the Company can show that it has made a good faith effort to seek reimbursement for all or part of the costs incurred.

VI. RATE DESIGN

A. The SIB Surcharge rate design shall be calculated as follows:

1) The SIB Surcharge shall be a fixed monthly surcharge containing a Gross SIB Surcharge and the SIB Surcharge Efficiency Credit as its two components.

2) The SIB Surcharge shall be calculated by dividing the SIB Authorized Revenue by the number of equivalent active 5/8-inch meters at the end of the most recent twelve (12) month period, and shall increase with meter size based on the following meter capacity multipliers:

5/8-inch x ¾-inch	1.0 times
¾-inch	1.5 times
1-inch	2.5 times

1½-inch	5 times
2-inch	8 times
3-inch	16 times
4-inch	25 times
6-inch	50 times
8-inch	80 times
10-inch & above	115 times

B. The SIB Surcharge shall apply to all of the Company's metered customers, including private fire service customers.

VII. SURCHARGE IMPLEMENTATION

A. SIB surcharges shall not become effective until approved by the Commission.

B. At least 30 days prior to the SIB surcharge becoming effective, the Company shall provide public notice in the form of a billing insert or customer letter in a form acceptable to Staff. Such notice shall include the following information:

1. The individual Gross SIB Surcharge, by meter size;

2. The individual SIB Surcharge Efficiency Credit, by meter size;

3. SIB Surcharge, by meter size; and

4. Directions where the customer may obtain a summary of the projects included in the current SIB Surcharge Request, including a description of each project and its cost.

EPCOR WATER-_____Water District
Docket No. W-XXXXXX-XX-XXXX
Test Year Ended _____

Exhibit CC-4-A

SIB Schedule A

Line No.	CALCULATION OF OVERALL SIB REVENUE REQUIREMENT & EFFICIENCY CREDIT		
1	Total Authorized Revenue Requirement, Per Decision xxxxx, See Attached Schedules	TBD	
2	*SIB Revenue CAP percentage*	5%	*Per Year*
3	SIB Revenue CAP	TBD	
4	SIB Eligible - Per SIB Table II, net of retirements	TBD	
5	Total Revenue Requirement, (with pro forma SIB investments). See attavhed revenue requirements schedules as provided by Company	TBD	
6	SIB Revenue Requirement (line 5 minus line 1)	TBD	
7	SIB Revenue Requirement Efficiency Credit	5%	
8	SIB True-up Adjustment (from SIB Schedule B)	TBD	
9	SIB Authorized Revenue (line 6 plus line 7 plus line 8)	TBD	
10	*Number of Equivalent Meters, below*	TBD	
11	Charge per 5/8" meter	TBD	

	No. of Customers at Year End	Multipliers	5/8 x 3/4-inch Equivalent Meters	Fixed Surcharge	Annual Rev by Meter Size
5/8 x 3/4-inch	TBD	1	TBD	TBD	TBD
3/4-inch	TBD	1.5	TBD	TBD	TBD
1-inch	TBD	2.5	TBD	TBD	TBD
1 1/2-inch	TBD	5	TBD	TBD	TBD
2-inch	TBD	8	TBD	TBD	TBD
3-inch	TBD	16	TBD	TBD	TBD
4-inch	TBD	25	TBD	TBD	TBD
6-inch	TBD	50	TBD	TBD	TBD
8-inch	TBD	80	TBD	TBD	TBD
10-inch	TBD	115	TBD	TBD	TBD
Totals	TBD		TBD		TBD

EPCOR WATER- _____Water District
Docket No. W-XXXXXX-XX-XXXX
Test Year Ended _____

Exhibit CC-4-B

SIB Schedule B

CALCULATION OF SIB TRUE-UP REVENUE REQUIREMENTS ADJUSTMENT	YEARS 1	2	3	4	5
SIB Authorized Revenuw, Per SIB Schedule A	TBD	TBD	TBD	TBD	TBD
Total SIB Surcharges collections for Period	TBD	TBD	TBD	TBD	TBD
SIB True-Up Adjustment	TBD	TBD	TBD	TBD	TBD

Note: The Company shall also provide an analysis of cumulative over or under collections and a net amount to be included in the SIB True-up Adjustment

EPCOR WATER- _____Water District
Docket No. W-XXXXXX-XX-XXXX
Test Year Ended _____

Exhibit CC-4-C

SIB Schedule C

TYPICAL BILL IMPACTS
3/4 -inch Customers

		Step 1			Step 2			Step 3			Step 4			Step 5		
Gallons	Per Dec. No. XXXXX(no SIB Surcharge)	Total Bill w/ SIB Year 1 *	SIB Inc.	Cumulative % Increase	Total Bill w/ SIB Year 2 *	SIB Inc.	Cumulative % Increase	Total Bill w/ SIB Year 3 *	SIB Inc.	Cumulative % Increase	Total Bill w/ SIB Year 4 *	SIB Inc.	Cumulative % Increase	Total Bill w/ SIB Year 5 *	SIB Inc.	Cumulative % Increase
0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
1000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
2000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
3000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
4000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
5000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
6000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
7000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
8000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
9000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
10000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
11000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
12000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
13000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
14000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
15000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
20000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
25000	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Median (Cite Usage)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
MEAN (Cite Usage)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

*: Bills in Years 1-5 are net of Efficiency Credit

EPCOR WATER- _____Water District
Docket No. W-XXXXXX-XX-XXXX
Test Year Ended _____

Exhibit CC-4-D

SIB Schedule D

EARNINGS TEST

	Per Dec. No XXXXXX	SIB Step 1	SIB Step 2	SIB Step 3	SIB Step 4	SIB Step 5	Total Pro-forma with SIB
Total Operating Revenue *	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Operating Expenses	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Operations & Maintenance	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Depreciation & Amortization	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Taxes Other then Income	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Income Taxes	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Total Operating Expenses	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Operatinf Income	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Rate Base	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Rate of Return on Rate Base	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Authorized Rate of Return on Rate Base	TBD	TBD	TBD	TBD	TBD	TBD	TBD

*: SIB Revenues in Years 1-5 are net of 5% Efficiency Credit

Murrey Direct

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

BOB STUMP - Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF THE APPLICATION OF EPCOR WATER ARIZONA INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE BY ITS MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WATER DISTRICT, TUBAC WATER DISTRICT, AND MOHAVE WASTEWATER DISTRICT.	DOCKET NO: WS-01303A-14-0010

DIRECT TESTIMONY OF SANDRA L. MURREY

March 7, 2014

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EXECUTIVE SUMMARY

Sandra L. Murrey testifies as follows in support of EPCOR Water Arizona Inc.'s Operating Income.

Sponsored Schedules

Ms. Murrey sponsors the following schedules for each district in the case:

- Schedule C-1 – Adjusted Test Year Income Statement
- Schedule C-2 – Income Statement Pro Forma Adjustments
- Schedule C-3 – Computation of Gross Revenue Conversion Factor
- Schedule E-1 – Comparative Balance Sheets
- Schedule E-2 – Comparative Income Statements
- Schedule E-3 – Comparative Statement of Changes in Financial Position
- Schedule E-4 – Statement of Changes in Stockholders Equity
- Schedule E-5 – Detail of Plant in Service
- Schedule E-6 – Comparative Departmental Statements of Operating Income Statements
- Schedule E-7 – Operating Statistics
- Schedule E-8 – Taxes Charged to Operations
- Schedule E-9 – Notes to Financial Statements
- Schedule F-1 – Projected Income Statements
- Schedule F-2 – Projected Statement of Changes in Financial Position
- Schedule F-3 – Projected Construction Requirements
- Schedule F-4 – Assumptions Used In Developing Projections

Operating Income Adjustments

Ms. Murrey sponsors the following necessary adjustments to operating income:

- Adjustment SM-1 – Remove Unbilled Revenue
- Adjustment SM-2 – Annualize Year End Customers - Residential
- Adjustment SM-3 – Annualize Year End Customers- Commercial
- Adjustment SM-4 – Annualize Payroll Expense
- Adjustment SM-5 – Annualize Payroll Tax Expense
- Adjustment SM-6 – Annualize 401k and Group Insurance
- Adjustment SM-7 – Amortize Rate Case Expense
- Adjustment SM-8 – Annualize Fuel and Power Expense

- Adjustment SM-9 – Annualize Postage Expense
- Adjustment SM-10 – Miscellaneous Expense Clean-Up
- Adjustment SM-11 – Remove Other Income and Deductions
- Adjustment SM-12 – Annualize Rent Expense
- Adjustment SM-13 – Depreciation and Amortization Expense
- Adjustment SM-14 – Federal and State Income Taxes
- Adjustment SM-15 – Annualize Property Expense
- Adjustment SM-16 – Interest Synchronization
- Adjustment SM-17 – Water Testing Expense
- Adjustment SM-18 – Annualize Corporate Allocation
- Adjustment SM-19 – Declining Usage Adjustment (all districts except Mohave Wastewater)
- Adjustment SM - 20 – Annualize Miscellaneous Revenues
- Adjustment SM - 21 – Reclassify Purchased Water (Mohave Water and Mohave Wastewater only)
- Adjustment SM - 22 – Reclassify Effluent Sales (Mohave Water and Mohave Wastewater only)
- Adjustment SM-23 - Annualize Rate Change (Mohave Water Only)
- Adjustment SM-24 – Tank Maintenance Expense (Paradise Valley Water only)
- Adjustment SM-25 – Remove CAP Expense Surcharge and Associated Expense (Paradise Valley Water only)
- Adjustment SM-26 – Remove CAP Expense Recovered Through Surcharge (Paradise Valley Water only)
- Adjustment SM-27– Adjust for Rate Difference on PVCC (Paradise Valley Water only)
- Adjustment SM-28 – Reclassify 2-inch Irrigation from Other Revenue to Water Revenue (Sun City Water only)
- Adjustment SM-29 – Reclassify Revenues (all districts except Mohave Wastewater and Tubac Water)
- Adjustment SM-30– Reclassify Revenue for ACRM Surcharge (Tubac Water only)
- Adjustment SM-31 – Amortize Arsenic Media Replacement (Tubac Water only)

I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Sandra L. Murrey. My business address is 2355 West Pinnacle Peak Road, Suite 300, Phoenix, Arizona 85027, and my business phone is 623-445-2490.

Q. IN WHAT CAPACITY AND BY WHOM ARE YOU EMPLOYED?

A. I am employed by EPCOR Water USA ("EWUS"), as a Senior Rate Analyst.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE COMPANY.

A. My primary responsibilities are to prepare and support rate applications and other regulatory filings for EPCOR Water Arizona Inc. ("EWAZ" or "Company") and EPCOR Water New Mexico Inc. ("EWNM").

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. I joined EWUS (formerly Arizona-American Water Company) in 2007 as a Regional Capital Compliance Analyst and was promoted to the position of Rate Analyst in December of 2008 and to my current position in April of 2012. I have over 23 years of experience working in the public utility industry, most of that time being employed with WE Energies. My responsibilities there included financial reporting, pension analysis, unbilled revenue calculations, accounts payable and power marketing settlements. I progressed to Project Manager in the Federal Regulatory Affairs and Policy Group where my responsibilities included monitoring tariffs to assure compliance with all federal/state decisions and rulings, tracking industry changes to determine company impact, as well as interactions with the Federal Energy Regulatory Commission, North American Electric

Reliability Corporation, North American Energy Standards Board, and the National Association of Regulatory Utility Commissioners (a.k.a, NARUC) to assure WE Energies' position was fairly represented.

I have a Bachelor of Business Administration degree with a double major in Accounting and Real Estate from the University of Wisconsin – Milwaukee. I am a certified public accountant, licensed in the states of Arizona and Wisconsin. I have also attended the NARUC Utility Rate School.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. The purpose of my testimony is to provide explanations of the pro forma adjustments that impact revenues and expenses in determining the revenue requirements for Mohave Water District, Paradise Water District, Sun City Water District, Tubac Water District, and Mohave Wastewater District.

Q. DOES YOUR TESTIMONY INCORPORATE RECOMMENDATIONS OF OTHER COMPANY WITNESSES?

A. Yes. I have incorporated recommendations sponsored by Mr. Shawn Bradford, Mr. Jeffrey Stuck, Mr. Jake Lenderking, and Ms. Sheryl Hubbard as pro forma adjustments to test year expenses and revenues when applicable.

II. <u>SPONSORED SCHEDULES</u>

Q. PLEASE IDENTIFY THE SCHEDULES YOU ARE SPONSORING.

A. I am sponsoring the following schedules for each of the four water districts and one wastewater district in this case:

- Schedule C-1: Adjusted Test Year Income Statement
- Schedule C-2: Income Statement Pro Forma Adjustments
- Schedule C-3: Computation of Gross Revenue Conversion Factor

- Schedule E-1: Comparative Balance Sheets
- Schedule E-2: Comparative Income Statements
- Schedule E-3: Comparative Statement of Changes in Financial Position
- Schedule E-4: Statement of Changes in Stockholders Equity
- Schedule E-5: Detail of Plant in Service
- Schedule E-6: Comparative Departmental Statements of Operating Income
- Schedule E-7: Operating Statistics
- Schedule E-8: Taxes Charged to Operations
- Schedule E-9: Notes to Financial Statements
- Schedule F-1: Projected Income Statements
- Schedule F-2: Projected Statement of Changes in Financial Position
- Schedule F-3: Projected Construction Requirements
- Schedule F-4: Assumptions Used in Developing Projections

III. EWAZ'S FINANCIAL STATEMENTS (ALL DISTRICTS)

Q. PLEASE EXPLAIN THE E SCHEDULES SUMMARIZED ABOVE.

A. Schedule E-1 for each of EWAZ's districts titled "Comparative Balance Sheets" contains balance sheets for the Test Year Ended June 30, 2013 and prior years ending June 30, 2012 and June 30, 2011.

Schedule E-2 is titled "Comparative Income Statements". This schedule summarizes each district's unadjusted Income Statements as reflected in the Company's accounting records, and includes the district's allocated share of Corporate expenses for the test year (12 months ending June 30, 2013), as well as for the prior two years.

Schedule E-3 is titled "Comparative Statements of Changes in Financial Position". This schedule summarizes the sources and applications of funds by the

districts for the test year (12 months ending June 2013), as well as for the prior two years.

Schedule E-4 is titled "Statement of Changes in Stockholders Equity." This schedule details the changes in components comprising stockholder's equity since June 30, 2010 through the end of the test year.

Schedule E-5 titled "Detail of Plant in Service" displays plant balances by NARUC sub account at June 30, 2012 and June 30, 2013. The net change in plant from June 30, 2012, to June 30, 2013, is presented in the column labeled Plant Additions, Reclassifications or Retirements.

Schedule E-6 titled "Comparative Departmental Statements of Operating Income" summarizes the operating income statements on a functional basis for the Test year Ended June 30, 2013, as well as for the prior two years.

Schedule E-7 titled "Operating Statistics" displays the operating statistics for sales quantities and customers for the test year as well as the prior two years.

Schedule E-8 titled "Taxes Charged to Operations" provides details regarding taxes incurred for the test year as well as the prior two years.

Schedule E-9 titled "Notes to Financial Statements" provides a list of notes specific to each district.

Q. PLEASE EXPLAIN THE F SCHEDULES YOU ARE SPONSORING.

A. Schedule F-1 titled "Projected Income Statements – Present and Proposed Rates" displays the test year income and forecasted income for the year ending June 30, 2014, using test year rates and proposed revenue from this case.

Schedule F-2 titled "Projected Statement of Changes in Financial Position – Present and Proposed Rates" displays the sources and applications of funds for the test year and projected results using the same assumptions as Schedule F-1.

Schedule F-3 titled "Projected Construction Requirements" presents the actual construction expenditures through the test year of June 30, 2013, as well as the projected construction expenditures for the periods June 30, 2014, June 30, 2015 and June 30, 2016, broken down by Investment Projects (IP) and Recurring Projects (RP). This schedule provides additional detail concerning the construction expenditures on Schedule A-4.

Schedule F-4 titled "Assumptions Used in Developing Projections" provides a summary of assumptions by district that the Company used in preparation of this filing.

IV. ADJUSTED OPERATING INCOME

Q. WHAT IS SCHEDULE C-1?

A. Schedule C-1 titled "Adjusted Test Year Income Statement" sets forth revenues and expenses and the resulting net income both on an historical unadjusted basis and an adjusted (including pro forma adjustments) basis. This schedule also contains a summary of the proposed revenue increase and the associated tax effects, and an allowance for bad debt expense related to the revenue increase.

Q. WHAT IS EWAZ'S ADJUSTED TEST YEAR OPERATING INCOME BY DISTRICT IN THIS PROCEEDING?

A. The following table summarizes Adjusted Test Year Operating Income for each water and wastewater district seeking rate increases in this proceeding:

Table 1 – Adjusted Test Year Operating Income -All Districts

	Mohave Water	Paradise Valley Water	Sun City Water	Tubac Water	Mohave Wastewater
Adjusted Test Year Operating Income	$424,406	$2,176,797	$782,241	($135,672)	$78,532

A. OPERATING REVENUES

Q. ARE YOU SPONSORING THE OPERATING REVENUES IN THIS PROCEEDING?

A. I am sponsoring Schedule C-2 and all of the Pro Forma adjustments on that schedule. I have provided the proposed revenue increase to Company witness Mr. Tom Bourassa who is responsible for the development of the H Schedules that support the derivation of the present and proposed revenues in this case. The following table summarizes adjusted test year operating revenues for each district.

Table 2 – Adjusted Test Year Revenues -All Districts

	Mohave Water	Paradise Valley Water	Sun City Water	Tubac Water	Mohave Wastewater
Adjusted Test Year Revenues	$6,354,293	$9,648,251	$10,265,553	$579,194	$1,055,839

B. OPERATING EXPENSES

Q. WHAT ARE EWAZ'S REQUESTED TOTAL OPERATING EXPENSES BY DISTRICT?

A. The following tables summarize adjusted test year operating expenses for each district.

Table 3 – Adjusted Test Year Operating Expenses -All Districts

	Mohave Water	Paradise Valley Water	Sun City Water	Tubac Water	Mohave Wastewater
Adjusted Test Year Operating Expenses	$5,929,887	$7,471,454	$9,483,313	$714,866	$977,308

C. PRO FORMA ADJUSTMENTS

Q. WHAT PRO FORMA ADJUSTMENTS IS EWAZ PROPOSING TO THE HISTORICAL TEST YEAR?

A. EWAZ has identified known and measurable changes to the historical test year revenues and expenses. Listed below are those pro forma adjustments that are common to all districts except where noted.

- Adjustment SM-1 – Remove Unbilled Revenue
- Adjustment SM-2 – Annualize Year End Customers - Residential
- Adjustment SM-3 – Annualize Year End Customers- Commercial
- Adjustment SM-4 – Annualize Payroll Expense
- Adjustment SM-5 – Annualize Payroll Tax Expense
- Adjustment SM-6 – Annualize 401k and Group Insurance
- Adjustment SM-7 – Amortize Rate Case Expense
- Adjustment SM-8 – Annualize Fuel and Power Expense
- Adjustment SM-9 – Annualize Postage Expense
- Adjustment SM-10 – Miscellaneous Expense Clean-Up
- Adjustment SM-11 – Remove Other Income and Deductions
- Adjustment SM-12 – Annualize Rent Expense
- Adjustment SM-13 – Depreciation and Amortization Expense
- Adjustment SM-14 – Federal & State Income Taxes
- Adjustment SM-15 – Annualize Property Taxes
- Adjustment SM-16 – Interest Synchronization
- Adjustment SM-17 – Water Testing Expense
- Adjustment SM-18 – Annualize Corporate Allocation
- Adjustment SM-19 – Declining Usage Adjustment (all districts except Mohave Wastewater)
- Adjustment SM-20 – Annualize Miscellaneous Revenues
- Adjustment SM-29 – Reclassify Revenues (all districts except Mohave Wastewater and Tubac)

Q. THERE ARE OTHER PRO FORMA ADJUSTMENTS PROPOSED. WHAT ARE THESE?

A. Yes. There are several pro forma adjustments that are district specific and listed below:

Mohave Water

- Adjustment SM-21 – Reclassify Purchased Water
- Adjustment SM-22 – Reclassify Effluent Sales
- Adjustment SM-23 – Annualize Rate Change

Mohave Wastewater

- Adjustment SM-21 – Reclassify Purchased Water
- Adjustment SM-22 – Reclassify Effluent Sales

Paradise Valley Water

- Adjustment SM-24 – Tank Maintenance
- Adjustment SM-25 – Remove CAP Expense Surcharge
- Adjustment SM-26 – Remove CAP Expense Recovered Through Surcharge
- Adjustment SM-27 – Adjust for Rate Difference on PVCC

Sun City Water

- Adjustment SM-28 – Reclassify 2-Inch Irrigation from Other to Water

Tubac Water

- Adjustment SM-30 – Reclassify Revenue for ACRM Surcharge
- Adjustment SM-31 – Amortize Arsenic Media Replacement

Q. ARE YOU SPONSORING ALL OF THE PRO FORMA ADJUSTMENTS LISTED ABOVE?

A. Yes. I will address all these adjustments starting first with those common to all districts and then those that are district specific.

Q. WHAT IS ADJUSTMENT SM-1 – REMOVE UNBILLED REVENUE?

A. Adjustment SM-1 is a *pro forma* adjustment to remove unbilled revenues from the test year booked revenues. Unbilled revenue is an estimate of the usage at the end of the month that has yet to be billed. Because the Company performs a separate bill analysis to annualize district revenues, which involves accommodating any changes in customer counts or rate increases that occurred in the test year, it is not appropriate to consider unbilled revenues in this calculation. Therefore, unbilled revenues are removed.

Q. WHAT ARE ADJUSTMENTS SM-2 - ANNUALIZE YEAR END CUSTOMERS – RESIDENTIAL, AND SM–3 - ANNUALIZE YEAR END CUSTOMERS - COMMERCIAL?

A. Adjustment SM-2 and Adjustment SM-3 are *pro forma* adjustments to annualize year end customer levels to reflect changes in the test year. This calculation computes the average number of monthly customers during the test year compared to the actual number of customers at month end for each customer class. This increase/decrease in number of monthly customers is multiplied by the average monthly revenue and totaled for the test year to get the annualized revenue adjustment. This calculation was performed for each customer class.

Q. DID YOU ALSO ADJUST OPERATING EXPENSES WHEN YOU ADJUSTED REVENUE FOR THE CHANGE IN TEST YEAR CUSTOMERS?

A. Yes. For each district, Purchased Water, Fuel & Power, and Chemicals expenses were adjusted based on the change in sales volumes per customer bill, whereas Postage and Customer Accounting expenses were updated based on the change in the number of customer bills.

Q. PLEASE EXPLAIN ADJUSTMENT SM-4 – ANNUALIZE PAYROLL EXPENSE AND ADJUSTMENT SM-5 – ANNUAL PAYROLL TAX EXPENSE?

A. These *pro forma* adjustments annualize the labor charges at the end of the test year and calculate the payroll tax expense associated with the change in payroll expense based on employees employed by EWAZ at the end of the test year. These adjustments recognize actual labor rates in effect as of this case's filing date and increases them by 3% to reflect labor costs at the time rates in this case are expected to go into effect.

Q. WHAT IS ADJUSTMENT SM-6 – ANNUALIZE 401K AND GROUP INSURANCE?

A. Adjustment SM-6 – Annualize 401K and Group Insurance is a pro forma adjustment to annualize the various employee benefit-related items including group insurance, 401K, and pension expense. Group Insurance includes premiums for life insurance, medical insurance, dental insurance, long-term disability insurance and short-term disability. A portion of this adjustment segregates all group insurance items and applies the current 2014 premium cost per benefit for each employee. Also included in this pro forma adjustment is the annualization of the Company's contribution to its employees' 401K retirement savings program. This consists of the Company's contribution of 5.25% of the employees' pay as well as the Company's 100% matching of the first 3% of employee contribution and an additional 50% matching of employee contributions greater than 3% up to 5%. Finally, employees hired before January 1, 2006, are eligible for a defined-benefit pension. This adjustment also annualizes the increase in pension costs based on the 2014 funding liability.

Q. PLEASE EXPLAIN ADJUSTMENT SM-7 – AMORTIZE RATE CASE EXPENSE?

A. Adjustment SM-7 is a *pro forma* adjustment necessary to include the annual rate case expense amortization to be recovered in customers' rates. This amortization is determined by taking the total estimated rate case expense and applying a three year amortization period. All prior case amortizations were removed from the test year amounts. Please refer to the Direct Testimony of Company witness Ms. Sheryl Hubbard for details on how the total estimated rate case expense was derived.

Q. WHAT IS ADJUSTMENT SM-8 – ANNUALIZE FUEL AND POWER EXPENSE?

A. Adjustment SM-8 is a *pro forma* adjustment to annualize the rate increases approved for Mohave Electric Cooperative ("MEC") effective 9/1/2012, and based on a UniSource Electric ("UNS") pending settlement approval. Although Arizona Public Service Company ("APS") did not have a general rate increase, we were provided an internal APS forecasting process study titled "Electric Industry Outlook and APS Rate Overview" which indicated the increase in associated power rate adjustors. These published changes and forecasted amounts are incorporated into the Company's power expense pro forma adjustment. The Company's Mohave Water and Mohave Wastewater districts are served by both UNS and MEC, whereas the Tubac Water District is served only by UNS. APS serves Sun City Water and Paradise Valley Water Districts.

Q. WHAT IS ADJUSTMENT SM-9 – ANNUALIZE POSTAGE EXPENSE?

A. Adjustment SM-9 is a *pro forma* adjustment to annualize changes in the first-class postage rate. The United States Postal Service increased rates in January 2013 and again in January 2014. The increase that was effective in January 2013 was a 2.47% increase over the prior rate of $0.242 for 5-digit automation whereas the 2014 rate increased by 5.25%. Postage expense for the first six months of the test year, July 1 through December 31, 2012, is adjusted for both of these postage rate increases. Postage expense for the second six month of the test year, January 1 through June 30, 2013, is adjusted for the postage rate increase that was effective in January 2014.

Q. WHAT IS ADJUSTMENT SM-10 – MISCELLANEOUS EXPENSE CLEAN-UP?

A. Adjustment SM-10 is a *pro forma* adjustment that removes expenses that would typically be disallowed for ratemaking purposes, such as charitable and civic contributions and other miscellaneous expenses that are normally not recoverable from customers. While we still believe these expenses should be recoverable through rates, we have removed them to minimize issues in dispute.

Q. WHAT IS ADJUSTMENT SM-11 – REMOVE OTHER INCOME AND DEDUCTIONS?

A. Adjustment SM-11 is a *pro forma* adjustment to remove items that are "below the line" or not related to the provision of water or wastewater service. This adjustment is necessary to exclude other revenue and expense items that are not included in the Company's cost of service to its customers.

Q. WHAT IS ADJUSTMENT SM-12 – ANNUALIZE RENT EXPENSE?

A. Adjustment SM-12 is a pro forma adjustment to annualize the changes in rent and lease costs. This adjustment updates each district's specific expenses plus their portion of corporate rent that is allocated to each district based on the 4-factor allocation.

Q. WHAT IS ADJUSTMENT SM-13 – DEPRECIATION AND AMORTIZATION EXPENSE?

A. Adjustment SM-13 annualizes the depreciation and amortization expense to reflect plant balances and CIAC balances at the end of the test year. The amortization of CIAC is accomplished by using each district's composite depreciation rate calculated in this adjustment. This adjustment also incorporates the effects of the 24-month deferral request as outlined in the direct testimony of Ms. Sheryl Hubbard as well as the amortization of regulatory assets. Also included is the

calculation of the annual depreciation expense associated with the Company's request to include some post-test year plant additions that will be completed during 2014 in the calculation of its Rate Base (post-test year plant additions are included on Rate Base Adjustment SLH-1). These post-test year plant additions are detailed in the Direct Testimony of Michael Worlton.

Q. IS THE COMPANY PROPOSING A CHANGE TO DEPRECIATION RATES?

A. Yes. The Company is proposing to update the depreciation rates for all districts in this case (Mohave Water already has these rates approved), as well as its corporate district, to those rates that were approved in Decision No. 73145 for our Agua Fria Water, Havasu Water and Mohave Water districts.

Q. DOES THE COMPANY HAVE ANY EXCEPTIONS TO THE PROPOSED DEPRECIATION RATES THAT WERE PREVIOUSLY APPROVED?

A. Yes, only one. The Company is proposing to change the depreciation rate for Account 334100 – Meters to 8.33% based on a 12-year service life. This change is requested in response to the Small Meter Replacement Program that is detailed in the direct testimony of Company witness Mr. Jeffrey W. Stuck.

Q. WHAT IS ADJUSTMENT SM-14 – FEDERAL AND STATE INCOME TAXES?

A. Adjustment SM-14 is a *pro forma* adjustment that adjusts test year income taxes to reflect the federal and state income tax effects of the *pro forma* adjustments included on Schedule C-2.

Q. WHAT IS ADJUSTMENT SM-15 – ANNUALIZE PROPERTY TAXES?

A. Adjustment SM-15 is a pro forma adjustment to adjust property taxes to the level based upon the adjusted test year revenue and also to compute a property tax factor to include in the gross revenue conversion factor calculation needed for the

property tax increases that will result from the revenue increases in this proceeding. The Company has applied an Assessment Ratio of 18.5% as outlined in HB 2001 Section 42-15001 for the period ending December 30, 2015.

Q. WHAT IS ADJUSTMENT SM-16 – INTEREST SYNCHRONIZATION?

A. Adjustment SM-16 is a *pro forma* adjustment to synchronize the interest deduction that is a function of rate base and weighted cost of debt and the interest deduction that is a component in the test year income tax calculation. For ratemaking purposes, a utility's revenue requirement reflects the recovery of interest expense based on the weighted cost of debt in the capital structure. It is this interest expense that should be used for the interest deduction when calculating the tax expense. An Interest Synchronization adjustment is necessary to match the rate base used in determining revenue requirements with the proportionate part of the total amount of debt and equity used to determine the cost of capital. The amount of interest expense that customers contribute through their payment of water rates should be the same as the amount of interest expense deducted from revenues in calculating tax expense. Synchronizing the interest deduction for ratemaking with the interest deduction for earnings purposes accomplishes this goal.

Q. WHAT IS ADJUSTMENT SM-17 – WATER TESTING?

A. Adjustment SM-17 is a *pro forma* adjustment that annualizes water testing expense. The Water Quality Group determined all necessary tests required over a three year period and priced them out at the current known contract price. Total costs for the three year period were used to determine an annual cost resulting in this pro forma adjustment.

Q. WHAT IS ADJUSTMENT SM-18 – ANNUALIZE CORPORATE ALLOCATION?

A. Adjustment SM-18 is a *pro forma* adjustment to annualize the effect of the payroll rate increase associated with the labor portion of Corporate Allocations excluding costs related to Public and Government Affairs. This adjustment is based on 2013 Corporate Allocation amounts and was increased by 3.5% for an estimated 2014 labor increase and 2.5% to reflect the estimated increase for 2015.

Q. WHAT IS ADJUSTMENT SM-19 – DECLINING USAGE ADJUSTMENT?

A. Adjustment SM-19 is a *pro forma* adjustment to compensate for the effect that declining residential usage per customer has on the ability to collect the authorized revenue requirement of a district. EWAZ has been experiencing declining usage per customer in all of its water districts for some time now and this prevents the Company from attaining its authorized revenue requirement for a given water district. Thus, in order for the Company to preserve its authorized revenue, a declining residential usage adjustment is necessary. The declining usage adjustment is based upon the decline in annual metered revenues that have occurred since the last test year which is measured by comparing the revenues from current level of customers at the average revenue per customer from the last rate case and the average revenue per customer during the test year. See Schedule H-1, page 4. The estimated decline in revenues is isolated to changes in water usage which is primarily caused by the inverted tier rate design and resulting conservation. This adjustment impacts all districts except Mohave Wastewater district.

Q. WHAT IS ADJUSTMENT SM-20 – ANNUALIZE MISCELLANEOUS REVENUES?

A. Adjustment SM-20 is a *pro forma* adjustment that annualizes the impact of the proposed rates for the miscellaneous service charges assuming the same occurrence level in the test year. Company witness Mr. Shawn Bradford is providing justification for the proposed changes in the miscellaneous service charges for each district.

Q. WHAT IS ADJUSTMENT SM-29 – RECLASS REVENUES?

A. Adjustment SM-29 is a *pro forma* adjustment that reclassifies revenues that were incorrectly coded. During the test year, revenues received from fire line protection and recycled water were miscoded to Other Revenue rather than Water Revenue. This adjustment properly moves these revenues to the Water Revenue line of the income statement. This adjustment impacts all districts except Mohave Wastewater and Tubac Water districts.

Q. YOU HAVE JUST ADDRESSED THE ADJUSTMENTS THAT ARE COMMON TO ALL OR MOST DISTRICTS. CAN YOU PLEASE NOW SUMMARIZE THE DISTRICT SPECIFIC ADJUSTMENTS?

A. Yes, I will start with those adjustments that impact Mohave Wastewater.

Q. PLEASE SUMMARIZE THE ADJUSTMENTS THAT ARE SPECIFIC TO THE MOHAVE WASTEWATER DISTRICT?

A. Mohave Wastewater has two district-specific adjustments. The first adjustment is SM-21- Reclassify Purchased Water recorded to Mohave Wastewater in error. During the test year there were a few invoices that were incorrectly coded to Mohave Wastewater rather than Mohave Water. This adjustment corrects that miscoding.

The other adjustment is Adjustment SM-22 – Reclassify Purchased Water recorded in Mohave Wastewater in error. EWAZ's Mohave Water District holds the CC&N giving it the exclusive authority to sell water within that district. Effluent sales have historically been included in the tariffs of that water district, but treatment costs to produce that effluent are recorded in the Company's Mohave Wastewater District's expenses. In that EWAZ holds both the water and the wastewater CC&Ns for the subject area, and to allow for more transparent rate setting for the sale of effluent within that area, EWAZ is proposing that effluent sales within the area be subject to an effluent rate tariff for the Mohave Wastewater District. I wish to note though that, by making this proposal, the Company is not waiving any rights it has under its Mohave Water District CC&N to be the exclusive water provider in the area subject to that CC&N. Also, both of these adjustments have corresponding adjustments in the Mohave Water district.

Q. PLEASE SUMMARIZE THOSE ADJUSTMENTS SPECIFIC TO MOHAVE WATER DISTRICT.

A. Aside from Adjustments SM-21 & SM-22 that were just discussed under the Mohave Wastewater section, Mohave Water only has one additional adjustment.

Adjustment SM-23 – Annualize Rate Change is a pro forma adjustment to annualize the rate increase that occurred at the beginning of the test year. Mohave Water received a rate increase in July 2012 per Commission Decision No. 73145 (issued May 1, 2012). Bills that were issued in July 2012, the first month that this rate increase was in effect, do not reflect a full month of the effective rate increase. The purpose of this adjustment is to annualize the rate increase to reflect a full 12 months of revenue due to the timing of the rate increase relative to the test year in this case, so that an accurate adjusted operating income figure could be derived and utilized in the revenue increase calculation. The rate increase annualization is

calculated by taking the test year customer billing determinants and applying the authorized rates from Decision No. 73145 to come up with a district level revenue figure. This figure is then subtracted from the actual billed revenues in the test year based on the same billing determinants to arrive at the rate increase annualization adjustment.

Q. PLEASE SUMMARIZE THE ADJUSTMENTS SPECIFIC TO PARADISE VALLEY WATER DISTRICT.

A. Paradise Valley Water district has several district-specific adjustments that I will address below.

Adjustment SM-24 – Tank Maintenance Expense is a pro forma adjustment to reflect tank maintenance expense. The Company is proposing a tank maintenance program in Paradise Valley Water District similar to programs already approved in our Sun City, Havasu and Mohave Water Districts. The costs for this program will amount to $185,851 annually. Please refer to the Direct Testimony of Company witness Mr. Jeffrey W. Stuck for more details.[1]

Adjustment SM -25 – Remove CAP Expense Surcharge and Associated Expense. This adjustment removed the impact of this surcharge from both the Purchased Water account and Other Revenues.

Adjustment SM-26 – Remove CAP Expenses Recovered Through Surcharge. All CAP related expenses and revenues are to be recovered through the Paradise Valley CAP Surcharge. There were several CAP related expense items that were incorrectly coded to acct #5618 - Purchased Water during the test year period. These items were reclassified on the Company's books prior to 2013 close and reflected here as a pro forma adjustment.

[1] *See* Direct Testimony of Jeffrey W. Stuck at 4-5.

The final adjustment in Paradise Valley Water District is Adjustment SM-27 – Adjust for Rate Difference on PVCC. The Paradise Valley Country Club has a contract with the Company that provides a 15% discount on the Turf Rate. This *pro forma* adjustment increases the Company's revenues by the amount discounted.

Q. DOES SUN CITY WATER HAVE ANY DISTRICT SPECIFIC ADJUSTMENTS?

A. Sun City Water only has one district specific *pro forma* adjustment, Adjustment SM-29 – Reclassify 2-Inch Irrigation from Other Revenue to Water Revenue. This adjustment is necessary to reclassify revenues that were incorrectly recorded.

Q. PLEASE EXPLAIN THE ADJUSTMENTS SPECIFIC TO THE TUBAC WATER DISTRICT?

A. Tubac Water District has a couple of district-specific adjustments that I will address below.

Adjustment SM – 30 – Annualize Revenue for ACRM Surcharge. In Decision No. 71867 issued September 1, 2010, Tubac Water District was allowed to implement a Phase 1 Arsenic Cost Recovery Mechanism. This ACRM began September 1, 2010. Amounts were collected in the Test Year for ACRM surcharges by meter size and recorded in Other Revenue (Account 4531). This adjustment moves those amounts from Other Revenue to Water Revenue.

Adjustment SM – 31 – Amortize Arsenic Media Replacement. In Decision No. 71410, Tubac Water District was authorized an Arsenic Cost Recovery Mechanism for the recovery of investment in an arsenic treatment facility to comply with the EPA's revised maximum contaminant level for arsenic effective in January 2006. In addition, Tubac Water District was authorized to defer O&M expenses related to arsenic media replacement cost. This adjustment includes an

amortization of the deferral and the on-going annual arsenic media replacement costs.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Bourassa Direct

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

BOB STUMP - Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF THE APPLICATION OF EPCOR WATER ARIZONA INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE BY ITS MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WATER DISTRICT, TUBAC WATER DISTRICT, AND MOHAVE WASTEWATER DISTRICT.	DOCKET NO: WS-01303A-14-0010

DIRECT TESTIMONY OF THOMAS J. BOURASSA

March 7, 2014

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EXECUTIVE SUMMARY

Thomas J. Bourassa testifies as follows:

Mr. Bourassa reports on the results of his cost of service studies (G Schedules) for the Mohave Water District, Paradise Valley Water District, Sun City Water District, Tubac Water District and the Mohave Wastewater District. The cost of service study provides a starting point for determining how proposed revenues should be allocated to the customer classes within each district (residential, commercial, irrigation, and other public authority) based on their respective costs of service. The cost of service study results provides meaningful information in the determination of rates for the customers of each district.

Mr. Bourassa's testimony explains the monthly minimum and commodity rate for a customer on a 5/8x3/4 inch meter when the allocations for expenses and plant for the functions of demand, customer, meters and services are included. He summarizes the cost of service results and recommends the indicated monthly minimums and single-tier commodity rates for each district and their respective customer classes.

Mr. Bourassa also discusses the present and proposed rates portions of the H Schedules. He explains the proposed rate designs for each district and the impact on customers. He compares the proposed rates to the results of his cost of service study. Generally, the Company's proposed monthly minimums are less than the indicated monthly minimums and below actual cost for the monthly minimum. The proposed lower tier commodity rates are discounted below the indicated commodity cost of water. As Mr. Bourassa explains, inverted multi-tiered rate designs as proposed in this case encourage conservation but this goal should be balanced with revenue stability. If conservation is actually achieved, usage will decline and it will cause a substantial shortfall in the revenues the Company collects, which means it will be impossible to actually achieve the authorized return.

I. INTRODUCTION, QUALIFICATIONS, AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Thomas J. Bourassa. My business address is 139 W. Wood Drive, Phoenix, Arizona 85029.

Q. WHAT IS YOUR PROFESSION AND BACKGROUND?

A. I am a Certified Public Accountant and am self-employed, providing consulting services to utility companies as well as general accounting services. I have a B.S. in Chemistry and Accounting from Northern Arizona University (1980) and an M.B.A. with an emphasis in Finance from the University of Phoenix (1991).

Q. COULD YOU BRIEFLY SUMMARIZE YOUR PRIOR WORK AND REGULATORY EXPERIENCE?

A. Yes. Prior to becoming a private consultant, I was employed by High-Tech Institute, Inc., and served as controller and chief financial officer. Prior to working for High-Tech Institute, I worked as a division controller for the Apollo Group, Inc. Before joining the Apollo Group, I was employed at Kozoman & Kermode, CPAs. In that position, I prepared compilations and other write-up work for water and wastewater utilities, as well as tax returns.

In my private practice, I have prepared and/or assisted in the preparation of several water and wastewater utility rate applications before the Arizona Corporation Commission ("Commission").

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying in this proceeding on behalf of the EPCOR Water Arizona Inc. ("EWAZ" or the "Company") for the Mohave Water District, Paradise Valley Water District, Sun City Water District, Tubac Water District, and Mohave Wastewater District. EWAZ is seeking increases in its rates and charges for water

utility service and wastewater service in these certificated service areas.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. The purpose of my testimony is to report on the results of my cost of service studies, explain the H schedules and to explain the proposed rate designs for each district.

II. COST OF SERVICE STUDY (G SCHEDULES)

A. Background

Q. WHY DID THE COMPANY PREPARE COST OF SERVICE STUDIES?

A. The cost of service studies provide a starting point for determining how proposed revenues should be allocated to the customer classes with in each district (e.g., residential, commercial, irrigation, and other public authority) based on their respective costs of service. These results provide meaningful information in the determination of cost of service based rates.

Q. WHAT IS A COST OF SERVICE STUDY?

A. A cost of service study is an analysis of the adequacy of water revenues and revenue requirements to be met by the various classes of customers under both existing and proposed rates. The study begins with an allocation of utility plant and expenses into cost and asset functions that are then allocated to customer classifications. The study attempts to trace the costs associated with meeting the customers' service requirements. Ideally, the revenues received from each customer class should equal the cost of providing service to that customer class. The cost to provide service includes the operating and maintenance expenses and the capital costs. Operating and maintenance expenses include the costs of operating the system and the costs of maintaining system facilities and equipment.

Capital costs include investment-related cash requirements such as debt service, contributions to debt service reserves, and capital requirements not financed by debt. Capital costs also include depreciation expense and either a return on rate base (for-profit utilities) or an operating margin (non-profit utilities) as well as incomes taxes and other taxes, if applicable.

Q. WHAT IS THE PURPOSE OF A COST OF SERVICE STUDY?

A. Typically, the purpose of preparing a cost of service study is to offer guidance in setting rates to be charged for utility service. The basic premise in establishing rates for the various classes of customers that are both adequate and equitable is that rates should reflect the cost of providing utility service. Generally, regulators should set rates based on the cost of service. This assures that the cost of providing service is allocated equitably among customers and customer classes. Cost-based rates also send an appropriate price signal to customers because the amount paid for service approximates the cost to provide the service. In other words, subsidies between customers are minimized.

There are many factors at play when rates are set, and this may result in rates that are not adequate and/or equitable between the various classes of customers. Non-economic factors may be at play when rates are set. For example, the regulatory body may favor subsidizing one class of customers by shifting costs to other classes of customers, or shifting revenues within one class of customers to subsidize members within that class. Lifeline or discounted rates, which are sometimes used to assist low-income customers in areas with high utility costs, are prime examples of subsidization of a class of customers by other customers. If possible, lifeline rates should not apply to a whole customer class. If lifeline rates are needed, they should be offered only to customers meeting some income test.

Another example is rate designs intended to encourage conservation. Conservation-based rates deviate from cost-of-service principles because larger water users pay more than their cost of service. Inverted-tier rates shift revenue recovery into the upper rate blocks in order to send a price signal to customers, regardless of the cost to serve those customers. This may be a desirable social policy, but these rates may also be regarded as unfair and discriminatory by larger water users on economic grounds.

Thus, public policy may have a significant impact on rate design. The Commission should consider the impact that these sorts of alternative rate designs have on other customers, and the degree that such approaches deviate from cost-based rates, which may result in inequities and, in extreme cases, cause customers to develop alternatives to service from the utility provider. In the end, the goal in setting new rates is for the Company to recover its revenue requirement.

Q. WHAT METHOD OF COST ALLOCATION WAS USED IN THE STUDIES?

A. I used the Commodity Demand Method which is described AWWA Manual M1, "Principles of Water Rates, Fees and Charges" published in 2000 and prior editions of the manual. It is the method prescribed by Schedule G of the Commission filing requirements. The commodity demand method allocates each item of the cost of providing water service to the several cost functions - commodity, demand, which is further separated into customer, meter and services functions. These functional costs are then allocated to the several customer classifications served by the system.

Q. HOW IS THE COST OF SERVICE STUDY ORGANIZED?

A. Each study used the test year revenue requirements developed by the Company in Schedules A through F and H. For each district, costs were allocated to each of the

cost functions described earlier and then to the customer classifications.

The cost of service study contains schedules G-1 through G-9. The standard filing requirements call for Schedules G-1 through G-7 and these schedules are included with my testimony. I have also included Schedules G-8 and G-9.[1] Schedule G-8 shows cost based rate designs based on each district's cost of service. Schedule G-9 shows the break-even point of the 5/8x3/4 inch residential customers (typically the largest customer class within each district) under the Company proposed rates. I will further explain these two schedules later in my testimony.

G Schedules with higher numbers (*i.e.*, 5, 6 and 7) contain the allocation factors and actual allocations to functions. These functions are then carried forward to the summary G schedules 1, 2, 3 and 4, which allocate expenses and plant (by function) to classes of customers.

I will use the Mohave Water District study and the test period revenue requirements to describe each of the schedules. I will start my analysis using Schedule G-7 and end with Schedules G-2 and G-1. I will then describe Schedules G-8 and G-9.

Q. BEFORE YOU PROCEED, WHAT IS A "FUNCTION"?

A. Functions refer to the plant and the expenses needed to get the water (the commodity) from the source (well or surface water) to the customer. The functions are commodity, demand, customer, services, and meters.

Commodity refers to the actual volume of water delivered. The commodity function is used to derive the commodity rate or the rate charged per unit of measurement, *i.e.*, 1,000 gallons of water. Demand refers to how the water system is sized to deliver the water, which is normally determined by total customers and

[1] Schedules G-8 and G-9 are excluded for MWWD.

fire flow requirements. Hence, the system is built to be able to deliver water (the commodity) to customers, as well as the demand placed on the water system when water is used to contain or fight a fire.

Customer, service, and meter functions are also used to develop the monthly minimum charged to each class of customer. The full cost of the demand function should also be included in the monthly minimum charge. However, the practice of Staff has been to allocate a portion of the demand function to both the commodity rate and the monthly minimum charge, and this has generally been adopted by the Commission in my experience.

Demand, customer, service and meter functions refer to the delivery of the water from the Company's wells, surface sources or reservoirs through the transmission and distribution mains to the individual customer's premises. The costs associated with demand, customer, service and meter functions are incurred whether the customer uses 1,000 gallons or 1,000,000 gallons of water each month.

Fire protection assets (*e.g.*, hydrants) and expenses associated with fire protection, including depreciation, should be allocated to the customer function because fire protection generally benefits all customers on the system. This has been the Commission's policy with regard to fire protection costs.

Q. WHAT TYPE OF COST OF SERVICE STUDY DID YOU PREPARE TO SUPPORT THE PROPOSED RATES?

A. I used the Commodity - Demand Method for the cost of service study. This method normally separates expenses and assets into three primary functions or components: commodity; demand; customer (with further breakdown of customer costs and plant into meters and services).

Commodity costs are costs that tend to vary (change) with the production or output of water. These costs would consist primarily of power costs, chemicals, water treatment, purchased water, and other variable expenses. Please note that I included a portion of the demand function into the commodity function to adhere to Commission Staff's past practices.

Demand costs are capital and maintenance costs of facilities related to meeting the peak demand or peak usage requirements. The plant assets which cause the bulk of the demand cost are transmission and distribution mains.

Customer costs are those costs related to serving and/or having customers, without regard to the amount of water used. These costs would include meter reading, billing, customer accounting and collection, and the capital costs and maintenance costs related to the meters, services, and customer equipment such as meters, service lines, computers, office furniture, and transportation equipment.

Q. AFTER COSTS ARE ALLOCATED TO FUNCTIONS, HOW ARE EXPENSES AND ASSETS THEN ALLOCATED TO THE INDIVIDUAL CLASSES OF CUSTOMERS?

A. After the expenses and assets are allocated to the commodity, demand, customer, service, and meter functions, the values for the functions are then allocated to various customer classes. Customer classes are based on meter sizes on the system.

Q. DOES A COST OF SERVICE STUDY PROVIDE DATA TO DETERMINE HOW THE TIERED RATE DESIGN SHOULD BE SET?

A. No. The cost of service study will provide the cost of the commodity, but it will not provide data on where rate tiers should be set. The tier rates can be based on studying the usage by the customers.

B. Explanation of Cost of Service Study Schedules

Q. WOULD YOU PLEASE DESCRIBE AND EXPLAIN THE SCHEDULES THAT COMPRISE THE COST OF SERVICE STUDY ("COSS"), AND DESCRIBE HOW THE VARIOUS FUNCTIONS WERE DEVELOPED?

A. The development of the class allocation factors are shown on Schedule G-7, pages 1 through 3.

The commodity allocation is based on the number of gallons of water used by customers on various sizes of meters, plus the gallons from the revenue annualization to year-end number of customers, divided by the total gallons of water sold (including gallons from the revenue annualization) during the Test Year. Thus, if 80,000,000 gallons of water were sold through the 5/8x3/4 inch meters, out of a total of 100,000,000 gallons of water sold by the water utility, this meter size would be allocated 80 percent of the commodity costs.

The demand allocation factor is based upon the average peak day demand for each customer class derived from the Company test year usage patterns reflected in the H-5 schedules. Peak day demand provides information about the relative demand each class places on the system.

The customer allocation factor is the number of customers on each size meter. The allocation is based on total meters, not equivalent meters. It costs no more to read a 6 inch meter than a 5/8x3/4 inch meter, and it costs the same to issue a bill. The customer numbers are grouped by customer class (residential, commercial, irrigation, and hydrant) and used as the customer allocation factors in the study.

The meter allocation factor was computed by multiplying the number of meters times the cost of installing a meter.[2] The dollar-weighted value of meters is

[2] Costs were used from the Commission Staff Engineering memorandum originated by

then divided by the total computed meter cost to derive the meter allocation factor to each class of customer. The dollar-weighted meter values are grouped by customer class and used as the meters allocation factors in the study.

The service line allocations were computed in the same manner as the meters. That is, the values listed on the Staff Memorandum[3] were used to derive a total value of the service lines. The allocation to each service line size was the result of dividing the dollar value of the service lines for each customer class by the total dollar value of the service lines. The dollar-weighted service line values are grouped by customer class (residential, commercial, irrigation, and hydrant) and used as the services allocation factors used in the study.

Schedule G-7, page 2.1 lists the allocation factors for plant and equipment. Allocation factors for these expenses were determined by examining the causal relationships of each expense to the various functions. The primary plant allocation factor uses information derived from the peak day demand to allocate between the demand function and the commodity function.

Schedule G-7, page 2.2 lists the allocation factors for repairs and maintenance expense, contractual services, purchased power, purchased water, transportation, chemicals, water testing, and salaries and wages. Allocation factors for these expenses were determined by examining the causal relationships of each expense to the various functions, which may include an examination of the recorded amounts during the test year and the use of professional judgment.

The depreciation expense allocations shown on Schedule G-6, page 3, apply the allocation factors shown on Schedule G-7, page 2.1, times the depreciation expense for each plant asset. For the demand function for Wells, Mains, Water

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Marlin Scott, Jr., dated February 21, 2008.

[3] *Id.*

Treatment Equipment, and Pumping Equipment, I assumed an allocation factor of 90 percent. Ten percent of plant values and related depreciation expense for Wells, Mains, Water Treatment Equipment, and Pumping Equipment was allocated to the commodity function.

The depreciation expense was computed using the Company's depreciation rates.

The operation and maintenance expense allocation to functions (commodity, demand, customer, service, and meter) are shown on Schedule G-6, page 1 (adjusted test year at present rates) and Schedule G-6, page 2 (adjusted test year at proposed rates).

On Schedule G-5, page 2, net plant and other rate base items were allocated to each customer class using the allocation factors set forth in Schedule G-7, page 2.1. AIAC and CIAC were deducted from the plant balances normally financed with AIAC and CIAC, which are primarily transmission and distribution mains. AIAC and CIAC were allocated to both the demand and commodity functions to be consistent with the allocation of the transmission and distribution mains.

Next, rate bases for each function (commodity, demand, customer, services and meters) were computed. The rate bases by function are shown on Schedule G-5, page 1.

Schedule G-4 allocates the commodity, demand, customer, and services and meters expenses to customer classes using the allocation factors developed on Schedule G-7, page 3. Schedule G-4, page 1 shows the allocated costs at present rates. Schedule G-4, page 2 shows the allocated costs at proposed rates.

Schedule G-3 allocates the rate bases for commodity, demand, customer, service, and meter to customer classes.

Schedules G-1 and G-2 derive the return on rate base by customer classes at present and proposed rates, respectively. The returns on rate base are computed by dividing the operating income for the customer class by the rate base for that customer class.

Property taxes are allocated based on revenue on Schedules G-1 and G-2. Revenue is the main factor in the method used by the Arizona Department of Revenue to determine the full cash value of the utility.

Income Taxes are allocated based on taxable income of each customer class on Schedules G-1 and G-2.

Q. DID YOU PREPARE SCHEDULES SHOWING RATE DESIGNS BASED ON THE COST OF SERVICE STUDY?

A. Yes. Cost based monthly minimums and commodity rates are shown on Schedule G-8.

C. <u>Indicated Monthly Minimums and Single Tier Commodity Rates</u>

Q. WOULD YOU PLEASE DISCUSS SCHEDULE G-8?

A. There are 4 sets of G-8 schedules: pages 1A through 4A show rate design computations for all customer classes combined; pages 1B through 4B show rate design computations for the residential class; pages 1C through 4C show rate design computations for the commercial class; pages 1D through 4D show rate design computations for the irrigation class; and, pages 1E through 4E show rate design computations for the hydrant class.

Page 1 of each set shows the derivation of the Customer Charge portion of the monthly minimums. Page 2 of each set shows the derivation of the Demand Charge portion of the monthly minimums. Page 3 of each set shows the derivation of a single-tier commodity rate and monthly minimums for each size meter assuming no portion of the customer charge and the demand charge are recovered

via the commodity rate. Finally, page 4 of each set shows the derivation of a single-tier commodity rate and monthly minimums for each meter size assuming a portion of the demand, customer, services and meters costs are recovered via the commodity rate.

Q. WHAT IS THE INDICATED MONTHLY MINIMUM AND COMMODITY RATE FOR A MOHAVE WATER DISTRICT CUSTOMER ON A 5/8X3/4 INCH METER BASED ON THE COST OF SERVICE STUDY?

A. Referring to Schedule G-8, page 3A (all customer classes), the monthly minimum, with no water usage included in that minimum, should be $29.93 when you include the allocations for expenses and plant for the function of demand, customer, meters and services. The single-tier commodity rate should be $0.9367.

Referring to Schedule G-8, page 3B (residential class), the monthly minimum, with no water usage included in that minimum, should be $27.05. The commodity rate should be $0.9367.

Referring to Schedule G-8, page 3C (apartment class), the monthly minimum, with no water usage included in that minimum, should be $62.23. The commodity rate should be $0.9367.

Referring to Schedule G-8, page 3D (commercial class), the monthly minimum, with no water usage included in that minimum, should be $55.31. The commodity rate should be $0.9367.

Referring to Schedule G-8, page 3E (other public authority), the monthly minimum, with no water in that minimum, should be $78.79. The commodity rate should be $0.9367.

D. Comparison of COSS-Indicated Rate Design and Company's Present and Proposed Rates

Q. HOW DOES THE COMPUTED MONTHLY MINIMUM CHARGE COMPARE TO THE COMPANY'S MOHAVE WATER DISTRICT PROPOSED MONTHLY MINIMUM?

A. The proposed monthly minimum for a 5/8x3/4 inch meter is $15.54, or approximately 52 percent of the computed monthly minimum of $29.93 as shown on Schedule G-8, page 3A.

Q. HOW DOES THE COMPUTED COMMODITY RATE COMPARE TO THE COMPANY'S PRESENT AND PROPOSED COMMODITY RATES FOR THE MOHAVE WATER DISTRICT 5/8X3/4 INCH RESIDENTIAL CUSTOMER?

A. The commodity rate under present rates being charged is $0.88 per 1,000 gallons for the first 3,000 gallons, $1.84 per 1,000 gallons for 3,001 gallons to 10,000 gallons, and $3.00 per 1,000 gallons over 10,000 gallons. The first tier rate is approximately 0.94 times what it costs to produce the water ($0.88 divided by $0.9763). The second tier rate is approximately 1.9 times the cost to produce the water ($1.84 divided by $0.9763). The third tier rate is approximately 3 times what it costs to produce the water ($3.00 divided by $0.9763).

The Company's proposed commodity rates are $1.55 for tier one, $2.50 for the tier two, and $3.25 for tier three. The first tier rate is approximately 1.6 times what it costs to produce the water ($1.55 divided by $0.9763). The second tier rate is approximately 2.6 times the cost to produce the water ($2.50 divided by $0.9763). The third tier rate is approximately 3.3 times what it costs to produce the water ($3.25 divided by $0.9763).

Q. WHAT IS THE IMPACT OF SETTING THE MONTHLY MINIMUMS AND COMMODITY RATES BELOW COST?

A. It adds substantial risk to revenue recovery. Inverted multi-tiered rates designs as proposed in this case encourage conservation. If conservation is actually achieved, usage will decline and it will cause a substantial shortfall in the revenues the Company collects. That means that it will be impossible to actually achieve the requested return. Revenue stability is compromised when the monthly minimums do not cover all of the demand, customer, services, and meter costs (the "fixed" costs in the cost of service). The Company's proposed design reduces the amount recovered from the monthly minimums which increases revenue instability.

Q. COULD YOU ILLUSTRATE THE ABOVE ANSWER?

A. Yes. Schedule G-9 illustrates what happens when conservation is achieved. On Schedule G-9, page 1, I have constructed the illustration showing the profit or loss from proposed rates that is achieved for the 5/8x3/4 inch metered residential customer at increments of 1,000 gallons through 100,000 gallons of monthly usage. The cross over point going from collecting or not collecting the full cost of service is between 10,000 and 12,000 gallons, well above the average monthly usage of 6,800 gallons and the median monthly usage of 5,000 gallons.[4]

By pricing the monthly minimum below cost and the commodity rates substantially above cost, the Company will under earn if water sales decrease. Conversely, if water sales increase, there is the potential to over earn.

Under the Company proposed rate design, the monthly minimum is being subsidized by the commodity rate. In other words, the Company must recover a large amount of fixed costs, through sales of water, which can vary based on

[4] *See* Schedule H-2, pages 1 and 2.

weather, or conservation efforts. Any conservation by customers will substantially impact the Company's net income.

Q. WHAT HAPPENS WHEN THE MONTHLY MINIMUMS AND COMMODITY RATES ARE NOT PRICED AT COST?

A. Two things can happen. If customers don't conserve and usage increases rather than decreases, the Company will over earn. If customers conserve, or just use less water due to more rainfall, the Company will under earn. If usage changes substantially, either up or down, the impacts I just referred to will be magnified.

Q. BUT EVEN IF THE MONTHLY MINIMUMS AND COMMODITY RATES ARE PRICED AT COST, WOULDN'T THE COMPANY STILL OVER OR UNDER EARN IF CUSTOMERS USE MORE OR LESS WATER?

A. Yes, but to a lesser extent.

E. Cost of Service Study Results by District

1. Mohave Water District

Q. WHAT WOULD BE A SINGLE TIERED RATE DESIGN ASSUMING A PORTION OF THE DEMAND, CUSTOMER, SERVICES, AND METER COSTS ARE RECOVERED VIA THE COMMODITY RATES?

A. On Schedule G-8, page 4A (all customer classes), I set forth a computation of a single tiered rate design which assumes a portion of the demand, customer, services, and meters costs (the "fixed costs") are recovered via the commodity rate. As shown, the 5/8x3/4 inch monthly minimum would be $16.17 and the commodity rate $2.391. My computation contemplates 40 percent of the demand costs and 40 percent of the customer, services and meters costs are recovered via the commodity rate. The overall revenue recovery from the monthly minimums translates to about 48 percent of total revenues.

As shown on Schedule G-8, page 4B (residential class), the 5/8x3/4 inch monthly minimum would be $16.08 and the commodity rate $2.503.

As shown on Schedule G-8, page 4C (apartment class), the 5/8x3/4 inch monthly minimum would be $13.40 and the commodity rate $2.210.

As shown on Schedule G-8, page 4D (irrigation class), the 5/8x3/4 inch monthly minimum would be $16.98 and the commodity rate $2.153.

As shown on Schedule G-8, page 4E (hydrant class), the 5/8x3/4 inch monthly minimum would be $21.79 and the commodity rate $2.099.

Q. HOW DO THE SINGLE TIER COMPUTED RATES COMPARE TO THE COMPANY'S PROPOSED RATES?

A. Referring to Schedule G-8, page 4A, the computed monthly minimum of $16.17 is higher than the proposed monthly minimum of $15.54 for a 5/8x3/4 inch metered customer; somewhat below the indicated monthly minimum. The computed commodity rate of $2.391 is well above the proposed first tier rate of $1.55, is approximately 104 percent the proposed second tier rate of $2.50, and is approximately 74 percent the third tier rate of $3.25. In other words, the proposed first tier rate is below cost while the proposed second and third tier rate is above cost.

Q. WHAT IS THE RANGE OF THE RETURNS FOR THE VARIOUS CUSTOMER CLASSES AT PRESENT RATES?

A. As shown on Schedule G-1, the returns vary substantially between the customer classes at the present rates. The largest customer class, the residential class, provides the lowest return under the present rates or -0.22 percent. The apartment and commercial classes are providing much higher returns at 8.68 percent and 7.17 percent, respectively.

Q. WHAT ARE THE RETURNS FOR THE CUSTOMER CLASSES AT PROPOSED RATES?

A. As shown on Schedule G-2, the returns at proposed rates also vary substantially between the customer classes. The largest customer class, the residential class, continues to provide the lowest return under the present rates at 5.08 percent. This is below the overall required return of 6.87 percent and indicates the residential class is not paying its full cost of service. The apartment and commercial classes continue to provide much higher returns at 13.73 percent and 11.47 percent, respectively. These results indicate that the apartment and commercial customer classes pay more than their respective cost of service and continue to subsidize the residential class under the Company's proposed rates.

2. **Paradise Valley Water District**

Q. WHAT WOULD BE A SINGLE TIERED RATE DESIGN ASSUMING A PORTION OF THE DEMAND, CUSTOMER, SERVICES, AND METER COSTS ARE RECOVERED VIA THE COMMODITY RATES?

A. On Schedule G-8, page 4A (all customer classes), I set forth a computation of a single tiered rate design which assumes a portion of the demand, customer, services, and meters costs (the "fixed costs") are recovered via the commodity rate. As shown, the 5/8x3/4 inch monthly minimum would be $32.65 and the commodity rate $1.946. My computation contemplates 40 percent of the demand costs and 40 percent of the customer, services and meters costs are recovered via the commodity rate. The overall revenue recovery from the monthly minimums translates to about 48 percent of total revenues.

As shown on Schedule G-8, page 4B (residential class), the 5/8x3/4 inch monthly minimum would be $30.74 and the commodity rate $2.027.

As shown on Schedule G-8, page 4C (turf class), the 5/8x3/4 inch monthly minimum would be $236.79 and the commodity rate $1.677.

As shown on Schedule G-8, page 4D (commercial class), the 5/8x3/4 inch monthly minimum would be $32.32 and the commodity rate $1.78.

As shown on Schedule G-8, page 4E (other public authority class), the 5/8x3/4 inch monthly minimum would be $14.45 and the commodity rate $2.444.

Q. HOW DO THE SINGLE TIER COMPUTED RATES COMPARE TO THE COMPANY'S PROPOSED RATES?

A. Referring to Schedule G-8, page 4A, the computed monthly minimum of $30.74 is higher than the proposed monthly minimum of $27.56 for a 5/8x3/4 inch metered customer; somewhat below the indicated monthly minimum. The computed commodity rate of $2.027 is well above the proposed first and second tier commodity rate of $1.154 and 1.3719, respectively. The proposed third tier rate of $2.4145 is approximately 119 percent higher than the computed commodity rate of $2.027, the fourth tier rate of $3.0181 is approximately 149 percent of the computed commodity rate, and the fifth tier rate of $3.5404 is approximately 175 percent of the computed commodity rate.

Q. WHAT IS THE RANGE OF THE RETURNS FOR THE VARIOUS CUSTOMER CLASSES AT PRESENT RATES?

A. As shown on Schedule G-1, the returns vary substantially between the customer classes at the present rates. The largest customer class, the residential class, provides the lowest return under the present rates or 6.00 percent. The turf, commercial, and other public authority classes are providing returns of 0.26 percent, 5.80 percent, and 8.21 percent, respectively.

Q. WHAT ARE THE RETURNS FOR THE CUSTOMER CLASSES AT PROPOSED RATES?

A. As shown on Schedule G-2, the returns at proposed rates also vary substantially between the customer classes. The largest customer class, the residential class provides a return under the present rates at 7.52 percent. This is above the overall required return of 6.78 percent and indicates the residential class is paying more than its full cost of service. The turf, commercial, and other public authority classes provide returns of 1.32 percent and 7.13 percent and 9.85 percent, respectively. These results indicate that the turf class pays less than its cost of service and the commercial and other public authority customer classes pay more than their respective cost of service.

3. **Sun City Water District**

Q. WHAT WOULD BE A SINGLE TIERED RATE DESIGN ASSUMING A PORTION OF THE DEMAND, CUSTOMER, SERVICES, AND METER COSTS ARE RECOVERED VIA THE COMMODITY RATES?

A. On Schedule G-8, page 4A (all customer classes), I set forth a computation of a single tiered rate design which assumes a portion of the demand, customer, services, and meters costs (the "fixed costs") are recovered via the commodity rate. As shown, the 5/8x3/4 inch monthly minimum would be $11.19 and the commodity rate $1.678. My computation contemplates 40 percent of the demand costs and 40 percent of the customer, services and meters costs are recovered via the commodity rate. The overall revenue recovery from the monthly minimums translates to about 48 percent of total revenues.

As shown on Schedule G-8, page 4B (residential class), the 5/8x3/4 inch monthly minimum would be $11.82 and the commodity rate $1.642.

As shown on Schedule G-8, page 4C (commercial class), the 5/8x3/4 inch monthly minimum would be $13.07 and the commodity rate $1.34.

As shown on Schedule G-8, page 4D (other class), the 5/8x3/4 inch monthly minimum would be $128.66 and the commodity rate $1.735.

Q. HOW DO THE SINGLE TIER COMPUTED RATES COMPARE TO THE COMPANY'S PROPOSED RATES?

A. Referring to Schedule G-8, page 4A, the computed monthly minimum of $11.19 is higher than the proposed monthly minimum of $10.70 for a 5/8x3/4 inch metered customer; somewhat below the indicated monthly minimum. The computed commodity rate of $1.678 is well above the proposed first, second, third tier rates of $0.75 and $1.3702, and 1.6602, respectively. The proposed third tier rate of $1.9002 is approximately at the computed commodity rate, the fourth tier rate is approximately 113 percent of the computed commodity rate, and the fifth tier rate of $2.1502 is approximately 128 percent the computed commodity rate. In other words, the proposed first and second tier commodity rates are below cost while the proposed fourth and fifth tier rates are above cost.

Q. WHAT IS THE RANGE OF THE RETURNS FOR THE VARIOUS CUSTOMER CLASSES AT PRESENT RATES?

A. As shown on Schedule G-1, the returns vary substantially between the customer classes at the present rates. The largest customer class, the residential class, provides the lowest return under the present rates or 1.90 percent. The commercial class is providing much higher returns at 12.15 percent. The remaining other class provides a -6.92 percent return.

Q. WHAT ARE THE RETURNS FOR THE CUSTOMER CLASSES AT PROPOSED RATES?

A. As shown on Schedule G-2, the returns at proposed rates also vary substantially

between the customer classes. The largest customer class, the residential class, provides a return (5.64 percent) that is below the overall required return of 6.87 percent and indicates the residential class is not paying its full cost of service. The commercial class continues to provide much higher returns at 17.22 percent. The remaining other class provides a -5.36 percent return. These results indicate that the commercial customer class pays more than their respective cost of service and continue to subsidize the residential class under the Company's proposed rates.

4. **Tubac Water District**

Q. WHAT WOULD BE A SINGLE TIERED RATE DESIGN ASSUMING A PORTION OF THE DEMAND, CUSTOMER, SERVICES, AND METER COSTS ARE RECOVERED VIA THE COMMODITY RATES?

A. On Schedule G-8, page 4A (all customer classes), I set forth a computation of a single tiered rate design which assumes a portion of the demand, customer, services, and meters costs (the "fixed costs") are recovered via the commodity rate. As shown, the 5/8x3/4 inch monthly minimum would be $45.97 and the commodity rate $7.251. My computation contemplates 40 percent of the demand costs and 40 percent of the customer, services and meters costs are recovered via the commodity rate. The overall revenue recovery from the monthly minimums translates to about 48 percent of total revenues.

As shown on Schedule G-8, page 4B (residential class), the 5/8x3/4 inch monthly minimum would be $49.00 and the commodity rate $7.486.

As shown on Schedule G-8, page 4C (commercial class), the 5/8x3/4 inch monthly minimum would be $38.29 and the commodity rate $6.643.

Q. HOW DO THE SINGLE TIER COMPUTED RATES COMPARE TO THE COMPANY'S PROPOSED RATES?

A. Referring to Schedule G-8, page 4A, the computed monthly minimum of $45.97 is lower than the proposed monthly minimum of $45.97 for a 5/8x3/4 inch metered customer. The computed commodity rate of $7.251 is well above the proposed first and second tier commodity rate of $5.45 and $6.95, respectively. The computed commodity rate is approximately 114 percent greater than the proposed third tier rate of $8.30, and is approximately 130 percent greater than the fourth tier rate of $9.50. In other words, the proposed first and second tier rate is below cost while the proposed third and fourth tier rates are above cost.

Q. WHAT IS THE RANGE OF THE RETURNS FOR THE VARIOUS CUSTOMER CLASSES AT PRESENT RATES?

A. As shown on Schedule G-1, the returns vary substantially between the customer classes at the present rates. The largest customer class, the residential class, provides the lowest return under the present rates or -11.52 percent. The commercial class is providing a higher return of 2.08 percent.

Q. WHAT ARE THE RETURNS FOR THE CUSTOMER CLASSES AT PROPOSED RATES?

A. As shown on Schedule G-2, the returns at proposed rates also vary substantially between the customer classes. The largest customer class, the residential class, continues to provide the lowest return under the present rates at 2.94 percent. This is below the overall required return of 6.87 percent and indicates the residential class is not paying its full cost of service. The commercial class continues to provide a much higher return at 19.86 percent. These results indicate that the commercial customer class pays more than its respective cost of service and continue to subsidize the residential class under the Company's proposed rates.

5. **Mohave Wastewater District**

Q. WHAT IS THE RANGE OF THE RETURNS FOR THE VARIOUS CUSTOMER CLASSES AT PRESENT RATES?

A. As shown on Schedule G-1, the returns vary substantially between the customer classes at the present rates. The largest customer class, the residential class, provides the lowest return under the present rates or 1.25 percent. The commercial and other public authority classes are providing much higher returns at 30.62 percent and 8.28 percent, respectively.

Q. WHAT ARE THE RETURNS FOR THE CUSTOMER CLASSES AT PROPOSED RATES?

A. As shown on Schedule G-2, the returns at proposed rates also vary substantially between the customer classes. The largest customer class, the residential class, continues to provide the lowest return under the present rates at 6.52 percent. This is below the overall required return of 6.87 percent and indicates the residential class is not paying its full cost of service. The commercial and other public authority classes continue to provide much higher returns at 49.00 percent and 14.96 percent, respectively. These results indicate that the commercial and other public authority customer classes pay more than their respective cost of service and continue to subsidize the residential class under the Company's proposed rates.

III. CURRENT AND PROPOSED RATES (H SCHEDULES)

Q. BRIEFLY DESCRIBE THE H SCHEDULES?

A. The Company's filing includes H Schedules for all districts. Schedule H-1 is a summary of the revenue billed under present rates and the amount that would be generated by the proposed increase in metered water rates. Schedule H-2 is an analysis of revenue at present and proposed rates by class and meter size in dollar

amount and percentage. The average number of customers derived from the bill count is also shown by meter size and in total. Schedule H-3 shows the present and proposed rate and presents a comparison of rates. Schedule H-4 compares present and proposed rates and the percentage increase at various consumption levels. Schedule H-5 is the bill count of the bills during the test year.

A. Rate Design

Q. PLEASE DESCRIBE THE DESIGN OF THE PROPOSED RATE STRUCTURE FOR THE DISTRICTS THAT ARE INCLUDED IN THIS RATE FILING.

A. The proposed rate structures as shown on Schedule H-3 balances the objectives of promoting water conservation through inverted tier rates, providing rates which are cost of service based, and providing revenue stability through increased revenue recovery from the monthly minimums and balanced commodity rates. As much as possible, the basic conservation oriented rate structures under existing rates are maintained. I will discuss specific changes to the rate structures, if any, for each district.

B. Mohave Water District

Q. PLEASE DISCUSS THE PROPOSED RATE DESIGN FOR THE MOHAVE WATER DISTRICT.

A. The Company is proposing to retain the inverted three tier rate design for the small residential customers (5/8x3/4 inch and ¾ inch) and the inverted two tier rate design for all other meter sizes and classes. The Company also proposes to retain the existing break-over points (or usage blocks). The proposed rates are set forth on Schedule H-3, pages 1 through 3.

Q. WHAT METER SIZE ARE THE MAJORITY OF CUSTOMERS ON AND WHAT WAS THE AVERAGE MONTHLY BILL DURING THE TEST YEAR?

A. The largest customer class is the 5/8x3/4 inch class comprising about 92 percent of customers. As shown on Schedule H-2, page 1, the average monthly bill under present rates for a 5/8x3/4 inch residential customer using an average 6,800 gallons is $23.63.

Q. WHAT WILL BE THE AVERAGE 5/8X3/4 INCH RESIDENTIAL CUSTOMER AVERAGE MONTHLY BILL UNDER THE NEW RATES?

A. As shown on Schedule H-2, page 1, the average monthly bill under proposed rates for a 5/8x3/4 inch residential customer using an average 6,800 gallons is $29.69 – a $9.06 increase over the present monthly bill, or a 43.92 percent increase.

Q. DOES THE H-2 SCHEDULE SHOW THE IMPACT FOR OTHER METER SIZES AND CLASSES?

A. Yes.

1. **Paradise Valley Water District**

Q. PLEASE DISCUSS THE PROPOSED RATE DESIGN FOR THE PARADISE VALLEY WATER DISTRICT.

A. The Company is proposing to retain the inverted five tier rate design for the 2 inch and smaller residential customers, an inverted two tier rate design for the commercial class, and the single tier rate design for the turf and other public authority classes. The Company also proposes to retain the existing break-over points (or usage blocks). The proposed rates are set forth on Schedule H-3, pages 1 through 3.

Q. WHAT METER SIZE ARE THE MAJORITY OF CUSTOMERS ON AND WHAT WAS THE AVERAGE MONTHLY BILL DURING THE TEST YEAR?

A. The two largest customer classes are the 5/8x3/4 inch and 1 inch residential class comprising about 43.5 percent and 40.8 percent of customers, respectively. As shown on Schedule H-2, page 1, the average monthly bill under present rates for a 5/8x3/4 inch residential customer using an average 19,271 gallons is $52.30. The average monthly bill under present rates for a 1 inch residential customer using an average 55,400 gallons is $165.40.

Q. WHAT WILL BE THE AVERAGE 5/8X3/4 INCH AND 1 INCH RESIDENTIAL CUSTOMER AVERAGE MONTHLY BILL UNDER THE NEW RATES?

A. As shown on Schedule H-2, page 1, the average monthly bill under proposed rates for a 5/8x3/4 inch residential customer using an average 19,271 gallons is $57.36 – a $5.06 increase over the present monthly bill or a 9.68 percent increase. The average monthly bill under proposed rates for a 1 inch residential customer using an average 55,400 gallons is $181.45 – a $16.05 increase over the present monthly bill or a 9.70 percent increase.

Q. DOES THE H-2 SCHEDULE SHOW THE IMPACT FOR OTHER METER SIZES AND CLASSES?

A. Yes.

2. **Sun City Water District**

Q. PLEASE DISCUSS THE PROPOSED RATE DESIGN FOR THE SUN CITY WATER DISTRICT.

A. The Company is proposing to retain the inverted five tier rate design for the 1 inch and smaller residential customers and eliminate the five tier design for the 1 ½ inch

and 2 inch residential meters. The Company is also proposing to retain the inverted two tier rate design for the commercial class, and the single tier rate design for the irrigation, and other classes. The Company also proposes to retain the existing break-over points (or usage blocks) with the exception of the 1 ½ inch and 2 inch residential customer who will have the same usage blocks as the 1 ½ and 2 inch commercial customers. The proposed rates are set forth on Schedule H-3, pages 1 through 3.

Q. WHY IS THE COMPANY PROPOSING A CHANGE TO THE 1 ½ INCH AND 2 INCH RESIDENTIAL RATE STRUCTURES?

A. The Company believes the five tier design for these two customer classes is not very meaningful as less than 5 percent of the customers in each of these classes use less than 12,000 gallons (the highest break-over point) on the five tier rate structure. The average usage for these classes is also well above the 12,000 gallon five tier rate structure break-over point.

Q. WHAT METER SIZE ARE THE MAJORITY OF CUSTOMERS ON AND WHAT WAS THE AVERAGE MONTHLY BILL DURING THE TEST YEAR?

A. The largest customer class is the 5/8x3/4 inch residential class comprising about 81 percent of customers. As shown on Schedule H-2, page 1, the average monthly bill under present rates for a 5/8x3/4 inch residential customer using an average 7,203 gallons is $17.35.

Q. WHAT WILL BE THE 5/8X3/4 INCH RESIDENTIAL CUSTOMER AVERAGE MONTHLY BILL UNDER THE COMPANY'S PROPOSED RATES?

A. As shown on Schedule H-2, page 1, the average monthly bill under proposed rates for a 5/8x3/4 inch residential customer using an average 7,203 gallons is $21.17 – a $3.82 increase over the present monthly bill or a 22.00 percent increase.

Q. DOES THE H-2 SCHEDULE SHOW THE IMPACT FOR OTHER METER SIZES AND CLASSES?

A. Yes.

3. **Tubac Water District**

Q. PLEASE DISCUSS THE PROPOSED RATE DESIGN FOR THE TUBAC WATER DISTRICT.

A. The Company is proposing to retain the inverted three tier rate design for the small residential customers (5/8x3/4 inch and ¾ inch) and the inverted two tier rate design for all other meter sizes and classes. The Company also proposes to retain the existing break-over points (or usage blocks). The proposed rates are set forth on Schedule H-3, pages 1 through 3.

Q. WHAT METER SIZE ARE THE MAJORITY OF CUSTOMERS ON AND WHAT WAS THE AVERAGE MONTHLY BILL DURING THE TEST YEAR?

A. The largest customer class is the 5/8x3/4 inch class comprising about 81 percent of customers. As shown on Schedule H-2, page 1, the average monthly bill under present rates for a 5/8x3/4 inch residential customer using an average 8,348 gallons is $53.57.

Q. WHAT WILL BE THE 5/8X3/4 INCH RESIDENTIAL CUSTOMER AVERAGE MONTHLY BILL UNDER THE NEW RATES?

A. As shown on Schedule H-2, page 1, the average monthly bill under proposed rates for a 5/8x3/4 inch residential customer using an average 8,348 gallons is $101.76 – a $48.19 increase over the present monthly bill or a 89.95 percent increase.

Q. DOES THE H-2 SCHEDULE SHOW THE IMPACT FOR OTHER METER SIZES AND CLASSES?

A. Yes.

Q. IS THE COMPANY PROPOSING TO INCORPORATE THE EXISTING ARSENIC COST RECOVERY SURCHARGE INTO THE BASE RATES?

A. Yes. As shown on Schedule H-3, page 5, the Company is proposing zero arsenic cost recovery surcharge as these charges are incorporated into the base rates.

Q. IS THE COMPANY PROPOSING TO ELIMINATE THE ARSENIC COST RECOVERY SURCHARGE?

A. Yes.

4. **Mohave Wastewater District**

Q. PLEASE DISCUSS THE PROPOSED RATE DESIGN FOR THE MOHAVE WASTEWATER DISTRICT.

A. The Company is proposing to retain the existing flat rate design currently in place for all customer classes except the large commercial class. For the large commercial class the Company proposes to retain the single tier rate design. The proposed rates are set forth on Schedule H-3, pages 1 through 3.

Q. WHAT METER SIZE ARE THE MAJORITY OF CUSTOMERS ON AND WHAT WAS THE MONTHLY BILL DURING THE TEST YEAR?

A. The largest customer class is the residential class comprising about 99 percent of customers. As shown on Schedule H-2, page 1, the monthly bill under present rates for a residential customer is $56.55.

Q. WHAT WILL BE THE RESIDENTIAL CUSTOMER MONTHLY BILL UNDER THE NEW RATES?

A. As shown on Schedule H-2, page 1, the monthly bill under proposed rates for a residential customer is $82.79 – a $26.24 increase over the present monthly bill, or a 46.40 percent increase.

Q. DOES THE H-2 SCHEDULE SHOW THE IMPACT FOR OTHER METER SIZES AND CLASSES?

A. Yes.

C. Miscellaneous Charges

Q. PLEASE DISCUSS THE PROPOSED CHANGES TO THE MISCELLANEOUS CHARGES.

A. The Company is proposing to change its miscellaneous charges for all of the districts in this rate filing. The proposed changes are to provide more uniformity among the districts. The proposed changes vary by district and can be found on the H-3 schedule (H-3, page 4, for the Mohave Water District, H-3, page 4, for the Paradise Valley Water District, H-3, page 5, for the Sun City Water District, H-3, page 3, for the Tubac Water District, and H-3, page 2, for the Mohave Wastewater District).

Q. DID THE COMPANY ANNUALIZE MISCELLANEOUS REVENUES FOR EACH DISTRICT BASED UPON THE PROPOSED CHANGES?

A. Yes. The annualization of miscellaneous charges can be found on Schedule H-5, page 5 for all districts except the Mohave Wastewater District which appear on Schedule H-5, page 4. The adjustment to miscellaneous revenues is included in the adjustments to the test year revenues on Schedule C-2 for each district.

D. Low Income Tariff

Q. PLEASE DISCUSS THE COMPANY'S PROPOSED LOW INCOME TARIFF.

A. The Company is proposing low income tariffs for its Paradise Valley Water District, Tubac Water District, and Mohave Wastewater District. The low income tariff is based upon the already existing low income tariffs for the Sun City Water District and the Mohave Water District. The existing low income tariff provides for a discounted monthly minimum for qualified customers (income at or below 150% of the federal poverty level). The low income program is limited and the proposed participation limits are set forth on Schedule H-3 for each district. A revenue surcharge recovery mechanism collects the amount of discounts provided though a commodity charge that is added to the highest cost commodity rate for residential and commercial customers in the district.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS CASE?

A. Yes.

Ahern Direct

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

BOB STUMP - Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF THE APPLICATION OF EPCOR WATER ARIZONA INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE BY ITS MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WATER DISTRICT, TUBAC WATER DISTRICT, AND MOHAVE WASTEWATER DISTRICT.	DOCKET NO: WS-01303A-14-0010

DIRECT TESTIMONY OF PAULINE M. AHERN, CRRA

COST OF CAPITAL

March 7, 2014

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EXECUTIVE SUMMARY

My testimony is on behalf of the Applicant EPCOR Water Arizona Inc. ("EWAZ" or the "Company") relative to the common equity cost rate that would afford EWAZ the opportunity to earn a fair return on its jurisdictional rate base.

My recommended common equity cost rate is 10.70% resulting from the application of market-based cost of common equity models, the Discounted Cash Flow ("DCF") approach, the Risk Premium Model ("RPM") and the Capital Asset Pricing Model ("CAPM"), to the market data of the proxy group of nine water companies of similar risk to that of EWAZ. Since EWAZ's common stock is not publicly traded, it is necessary to rely upon the market data of a proxy group of water companies of similar, but not necessarily identical, risk in determining a recommended common equity cost rate. Using the market data of a proxy group of relatively similar companies as well as using multiple common equity cost rate models adds reliability to the informed expert judgment applied in arriving at a recommended common equity cost rate.

I. INTRODUCTION AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Pauline M. Ahern. I am a Principal of AUS Consultants. My business address is 155 Gaither Drive, Suite A, Mt. Laurel, New Jersey 08054.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have offered expert testimony on behalf of investor-owned utilities before twenty-eight state regulatory commissions in the United States as well as one provincial regulatory commission in Canada on rate of return issues, including but not limited to common equity cost rate, fair rate of return, capital structure issues, and credit quality issues. I am a graduate of Clark University, Worcester, MA, where I received a Bachelor of Arts degree with honors in Economics. I have also received a Master of Business Administration with high honors and a concentration in finance from Rutgers University. The details of my educational background, expert witness appearances, presentations I have given and articles I have co-authored are shown in **Exhibit PMA-DT1**.

On behalf of the American Gas Association ("A.G.A."), I calculate the A.G.A. Gas Index, which serves as the benchmark against which the performance of the American Gas Index Fund ("AGIF") is measured monthly. The A.G.A. Gas Index and AGIF are a market capitalization weighted index and mutual fund, respectively, comprised of the common stocks of the publicly traded corporate members of the A.G.A.

I am also the Publisher of AUS Utility Reports, responsible for supervising the production, publication, distribution and marketing of its reports. I am responsible for overseeing the production of the annual Financial & Operating

Statistics Report for the National Association of Water Companies ("NAWC").

I am a member of the Society of Utility and Regulatory Financial Analysts ("SURFA") where I serve on its Board of Directors, having served two terms as President, from 2006 – 2008 and 2008 – 2010. Previously, I held the position of Secretary/Treasurer from 2004 – 2006. In 1992, I was awarded the professional designation "Certified Rate of Return Analyst" ("CRRA") by SURFA, which is based upon education, experience and the successful completion of a comprehensive written examination.

I am also an associate member of the National Association of Water Companies, serving on its Finance/Accounting/Taxation and Rates and Regulation Committees; a member of the Energy Association of Pennsylvania, formerly the Pennsylvania Gas Association; and a member of the American Finance, Financial Management and Energy Bar Associations. I am also a member of Edison Electric Institute's Cost of Capital Working Group, the Advisory Board of the Financial Research Institute of the University of Missouri and the Advisory Council of New Mexico State University's Center for Public Utilities.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose is to provide testimony on behalf of Applicant EPCOR Water Arizona Inc. ("EWAZ" or the "Company") relative to the common equity cost rate that would afford EWAZ the opportunity to earn a fair return on its jurisdictional rate base.

Q. HAVE YOU PREPARED AN EXHIBIT WHICH SUPPORTS YOUR RECOMMENDED COMMON EQUITY COST RATE?

A. Yes. It has been designated as **Exhibit PMA-DT2** and contains Schedules 1 through 9.

Q. WHAT IS YOUR RECOMMENDED COMMON EQUITY COST RATE?

A. I recommend that the Arizona Corporation Commission ("ACC" or "the Commission") authorize the Company the opportunity to earn a common equity cost rate of 10.70% on the common equity portion of its jurisdictional rate base.

II. SUMMARY

Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY COST RATE.

A. My recommended common equity cost rate of 10.70% is summarized on Schedule 1. As a wholly-owned subsidiary of EPCOR Water (USA), Inc. ("EPCOR" or "the Parent"), EWAZ's common stock is not publicly traded. Thus, a market-based common equity cost rate cannot be directly observed for the Company. Consequently, I have assessed the market-based common equity cost rates of relatively similar companies, but not necessarily identical risk, i.e., a proxy group for insight into a recommended common equity cost rate applicable to EWAZ. Using companies of relatively comparable similar risk as proxies is consistent with the principle of fair rate of return established in the *Hope*[1] and *Bluefield*[2] cases, adding reliability to the informed expert judgment necessary to arrive at a recommended common equity cost rate. However, no proxy group can be selected to be identical in risk to EWAZ. Therefore, the proxy group's results must be adjusted, if necessary, to reflect the unique relative financial (credit) and/or business risks of the Company.

My recommendation results from the application of market-based cost of common equity models, the Discounted Cash Flow ("DCF") approach, the Risk

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1 *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

2 *Bluefield Water Works Improvement Co. v. Public Serv. Comm'n*, 262 U.S. 679 (1922).

Premium Model ("RPM") and the Capital Asset Pricing Model ("CAPM"), to the market data of the proxy group of nine water companies whose selection will be discussed below.

The results derived from each are as follows:

Table 1

	Proxy Group of Nine Water Companies
Discounted Cash Flow Model	8.37%[3]
Risk Premium Model	11.25%
Capital Asset Pricing Model	9.93%
Indicated Common Equity Cost Rate	9.95%
Credit Risk Adjustment	0.44%
Business Risk Adjustment	0.30%
Indicated Common Equity Cost Rate	10.69%
Recommended Common Equity Cost Rate	10.70%

After reviewing the cost rates based upon these models, I conclude that a common equity cost rate of 9.95% is indicated before any adjustment for EWAZ's greater credit and business risks relative to the proxy group of nine water companies as I discuss in more detail below in my direct testimony. Thus, the

[3] As discussed later in my testimony, the current DCF model understates the required return on common equity by as much as 439 basis points due to a highly unusual and, in all likelihood temporary, convergence of historically anomalous market conditions. Accordingly, the results of that model should be given only very limited weight in deriving a reasonable return on equity in this proceeding.

indicated common equity cost rate based upon the nine water companies needs to be adjusted upward by 0.44% to reflect EWAZ's greater credit risk and by 0.30% to reflect its greater business risk. After adjustment, the common equity cost rate is 10.69%, which I have rounded to 10.70% for my recommended common equity cost rate.

III. GENERAL PRINCIPLES

Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT YOUR RECOMMENDED COMMON EQUITY COST RATE OF 10.70%?

A. In unregulated industries, the competition of the marketplace is the principal determinant of the price of products or services. For regulated public utilities, regulation must act as a substitute for marketplace competition. Assuring that the utility can fulfill its obligations to the public while providing safe and reliable service at all times requires a level of earnings sufficient to maintain the integrity of presently invested capital as well as permitting the attraction of needed new capital at a reasonable cost in competition with other firms of comparable risk. This is consistent with the fair rate of return standards established by the U.S. Supreme Court in the *Hope* and *Bluefield* cases. Consequently, marketplace data must be relied upon in assessing a common equity cost rate appropriate for ratemaking purposes. Therefore, my recommended common equity cost rate is based upon marketplace data for a proxy group of utilities as similar in risk as possible to EWAZ, based upon selection criteria that will be discussed subsequently. The use of the market data for the proxy group adds reliability to the informed expert judgment used in arriving at a recommended common equity cost rate, and the use of multiple common equity cost rate models also adds reliability when arriving at a recommended common equity cost rate.

IV. BUSINESS RISK

Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS IMPORTANT TO THE DETERMINATION OF A FAIR RATE OF RETURN.

A. Business risk is the riskiness of a company's common stock without the use of debt and/or preferred capital. Examples of general business risks faced by utilities, i.e., electric, natural gas distribution and water, include the quality of management, the regulatory environment, customer mix and concentration of customers, service territory growth, capital intensity and size, all of which have a direct bearing on earnings. An individual utility may face different levels of one or more a particular risks. This means that business risk is important to the determination of a fair rate of return because the greater the level of risk, the greater the rate of return investors demand, consistent with the basic financial principles of risk and return.

Q. WHAT BUSINESS RISKS DOES THE WATER AND WASTEWATER INDUSTRY IN GENERAL FACE TODAY?

A. Water is essential to life and unlike electricity or natural gas, water is the only utility product that is intended for customers to ingest. Consequently, water quality is of paramount importance to the health and wellbeing of customers. Water is therefore subject to additional and increasingly strict health and safety regulations. Beyond health and safety concerns, water utility customers also have significant aesthetic concerns regarding the water delivered to them and regulators pay close attention to these concerns because of the strong feelings they arouse in consumers. Also, unlike many electric and natural gas utilities, water utilities serve a production function in addition to the delivery functions served by electric and gas utilities.

Water utilities obtain supply from wells, aquifers, surface water reservoirs or streams and rivers. Throughout the years, well supplies and aquifers have been environmentally threatened, with historically minor purification treatment giving way to major well rehabilitation, extensive treatment or replacement. Simultaneously, safe drinking water quality standards have tightened considerably, requiring multiple treatments prior to water delivery. Supply availability is also limited by drought, water source overuse, runoff, threatened species/habitat protection and other operational, political and environmental factors. In addition, the Environmental Protection Agency ("EPA"), as well as individual state and local environmental agencies, are continually monitoring potential contaminants in the water supply and promulgating regulations for containment, which often results in the tightening of current regulations when necessary. Increasingly stringent environmental standards necessitate additional capital investment in the distribution and treatment of water, exacerbating the pressure on free cash flows that arises from increased capital expenditures for infrastructure repair and replacement. In the course of procuring water supplies and treating water to comply with Safe Drinking Water Act ("SDWA") standards, water utilities have an ever-increasing responsibility to be stewards of the environment from which supplies are drawn in order to preserve and protect the essential natural resources of the United States.

Water utilities are typically vertically engaged in the entire process of acquiring supply, production, treatment and distribution of water. In contrast, electric and natural gas companies, where transmission and distribution is often separate from generation, oftentimes do not produce the electricity or natural gas that which they transmit and distribute. Hence, water utilities require significant capital investment in not only distribution and transmission systems but also in

sources of supply and production (wells and treatment facilities) and storage facilities. The capital investment is necessary to both serve additional customers and to replace aging systems, creating a major risk facing the water and wastewater utility industry.

Because the water and wastewater industry is more capital-intensive than the electric, combination electric and gas or natural gas utilities, the investment required to produce a dollar of revenue is greater. For example, as shown on page 1 of Schedule 2, it took $3.51 of net utility plant on average to produce $1.00 in operating revenues in 2012 for the water utility industry as a whole. For EWAZ, it took a much lower $3.28 of net utility plant to produce $1.00 of operating revenues. In contrast, for the electric, combination electric and gas and natural gas utility industries, on average it took only $2.56, $2.13 and $1.56, respectively, to produce $1.00 in operating revenues in 2012. The greater capital intensity of water utilities is not a new phenomenon, as water utilities have exhibited a consistently and significantly greater capital intensity relative to electric, combination electric and gas and natural gas utilities during the ten years ended 2012, as shown on page 2 of Schedule 2. As financing needs have increased over the last decade, the competition for capital from traditional sources has increased, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important.

Q. WHY IS THERE AN INCREASED NEED FOR FINANCING?

A. There are a number of challenges facing the water, and also the wastewater industry. The National Association of Regulatory Commissioners ("NARUC") has highlighted the challenges facing the water and wastewater industry stemming from its capital intensity. NARUC's Board of Directors adopted the following

resolution in July 2013.[4]

WHEREAS, There is both a constitutional basis and judicial precedent allowing investor owned public water and wastewater utilities the opportunity to earn a rate of return that is reasonably sufficient to assure confidence in the financial soundness of the utility and its ability to provide quality service; *and*

WHEREAS, Through the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005), the National Association of Regulatory Utility Commissioners (NARUC) has previously recognized the role of innovative regulatory policies and mechanisms in the ability for public water and wastewater utilities to address significant infrastructure investment challenges facing water and wastewater system operators; *and*

* * *

WHEREAS, Recent analysis shows that as compared to other regulated utility sectors, significant and widespread discrepancies continue to be observed between commission authorized returns on equity and observed actual returns on equity among regulated water and wastewater utilities; *and*

WHEREAS, The extent of such discrepancies suggests the existence of challenges unique to the regulation of water and wastewater utilities; *and*

* * *

WHEREAS, Deficient returns present a clear challenge to the ability of the water and wastewater industry to attract the capital necessary to address future infrastructure investment requirements necessary to provide safe and reliable service, which could exceed one trillion dollars over a 20-year period; *and*

WHEREAS, The NARUC Committee on Water recognizes the critical role of the implementation and the effective use of sound regulatory practice [sic] and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"*; and

* * *

[4] "Resolution Supporting Consideration of Regulatory Policies Deemed as 'Best Practices'", Sponsored by the Committee on Water. Adopted by the NARUC Board of Directors, July 2013.

> **RESOLVED**, That the Board of Directors of the National Association of Regulatory Utility Commissioners, convened at its 2013 Summer Meeting in Denver, Colorado, identifies the implementation and effective use of sound regulatory practice [sic] and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005) as a critical component of a water and/or wastewater utility's reasonable ability to earn its authorized return; and *be it further*
>
> **RESOLVED**, That NARUC recommends that economic regulators carefully consider and implement appropriate ratemaking measures as needed so that water and wastewater utilities have a reasonable opportunity to earn their authorized returns within their jurisdictions...

Q. IS EWAZ FACING A SIGNIFICANT NEED FOR INFRASTRUCTURE INVESTMENT?

A. Yes, the Company is facing significant capital investment needs with projected net capital expenditures of $180,484,621 for 2014 through 2018, representing an increase of approximately 26% over 2012 net utility plant of $701,840,737.

Q. PLEASE CONTINUE WITH YOUR DISCUSSION OF BUSINESS RISKS.

A. Coupled with its capital-intensive nature, the water and wastewater utility industry also experiences lower relative depreciation rates as well. Lower depreciation rates, as one of the principal sources of internal cash flows for all utilities, mean that water and wastewater utility depreciation as a source of internally-generated cash is far less for water and wastewater utilities than for electric, combination electric and gas or natural gas. Water and wastewater utilities' assets have longer lives and, hence, longer capital recovery periods. As such, water and wastewater utilities face greater risk due to inflation which results in a higher replacement cost per dollar of net plant than for other types of utilities. As shown on page 3 of Schedule 2, water and wastewater utilities experienced an average depreciation rate of 3.1% for 2012 with EWAZ experiencing a slightly lower rate of 2.6%.

In contrast, in 2012, the electric, combination electric and gas and natural gas utilities experienced average depreciation rates of 3.2%, 3.5% and 4.1%, respectively. Similar to the greater capital intensity in the water utility industry, the lower relative depreciation rates of water and wastewater utilities are not a new phenomenon, as shown on page 4 of Schedule 2. Low depreciation rates signify that the pressure on cash flows remains significantly greater for water and wastewater utilities than for other types of utilities.

Not only is the water and wastewater utility industry historically capital intensive, it is expected to incur significant capital expenditure needs over the next 20 years.

In 2011, the EPA stated the following:[5]

> The survey estimated a total national infrastructure need is $384.2 billion for the 20-year period from January 2011 through December 2030.
>
> * * *
>
> The large magnitude of the national need reflects the challenges confronting water systems as they deal with an infrastructure network that has aged considerably since these systems were constructed, in many cases, 50 to 100 years ago.
>
> * * *
>
> With $247.5 billion in needs over the next 20 years, transmission and distribution projects represent the largest category of need. This result is consistent with the fact that transmission and distribution mains account for most of the nation's water infrastructure. The other categories, in descending order of need are: treatment, storage, source and a miscellaneous category of needs called "other".

[5] "Fact Sheet: "EPA's 2011 Drinking Water Infrastructure Needs Survey and Assessment," United States Environmental Protection Agency, Office of Water, April 2013.

Q. FROM WHERE IS ALL THIS NECESSARY CAPITAL GOING TO BE RAISED, MS. AHERN?

A. The question of where the necessary capital is going to be raised highlights the importance of capital attraction. Water and wastewater utility capital expenditures as large as those projected by the EPA will require significant financing. The three sources typically used for financing are debt, equity (common and preferred) and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the ability to achieve that return. Consistent with *Hope* and *Bluefield*, the return must be sufficient enough to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If it is unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow (operating cash flow (funds from operations) minus capital expenditures), both of which are directly linked to earning a sufficient rate of return. The level of free cash flows represents the financial flexibility of a company or a company's ability to meet the needs of its debt and equity holders. If either retained earnings or free cash flows are inadequate, it will be nearly impossible for the utility to attract the needed new capital on reasonable terms so it can invest in needed new infrastructure. It is clear that an insufficient rate of return can be financially devastating for utilities and for their customers. Page 5 of Schedule 2 demonstrates that the free cash flows (funds from operations minus capital expenditures) of water utilities as a percent of total operating revenues has been consistently negative and below that of the electric, combination electric and gas and natural gas utilities for the ten years ended 2012, showing some improvement in 2011 and 2012. Magnifying the impact of water and wastewater utilities' potentially inadequate cash flow position is a general inability to achieve their authorized rate of return on common equity.

In view of the foregoing, it is clear that the water utility industry's high degree of capital intensity and low depreciation rates, coupled with the need for substantial infrastructure capital spending, makes the need to maintain financial integrity and the ability to attract needed new capital increasingly important in order for water and wastewater utilities to be able to successfully meet the challenges they face.

Q. DOES A COMPANY'S SIZE HAVE A BEARING ON BUSINESS RISK?

A. Yes. Company size is a significant element of business risk for which investors expect to be compensated through higher returns on their investment. Smaller companies are simply less able to cope with significant events that affect sales, revenues and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small company than on a much bigger company with a larger, more diverse, customer base. Moreover, smaller companies are generally less diverse in their operations and have less financial flexibility.

Further evidence of the risk effects of size includes the fact that investors demand higher returns to compensate for the lack of marketability and liquidity of the securities of smaller firms. It is a basic financial principle that it is the use of funds invested and not the source of those funds that gives rise to the risk of any investment.[6] Consistent with the financial principle of risk and return discussed above, such increased risk due to small size must be taken into account in the allowed rate of return on common equity.

[6] Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (McGraw-Hill Book Company, 1996) 204-205, 229.

Q. PLEASE DISCUSS HOW EWAZ'S SIZE INCREASES ITS BUSINESS RISK RELATIVE TO THE PROXY GROUP.

A. EWAZ is smaller than the average company in the proxy group of nine water companies based upon estimated market capitalization. I will discuss this more below. For now, as shown on Schedule 9, page 1, EWAZ's estimated market capitalization of $339.890 million is lower than the average market capitalization of the proxy water group, $1.740 billion at October 31, 2013. Consequently, EWAZ has greater relative business risk because, all else being equal, size has a bearing on risk.

V. FINANCIAL RISK

Q. PLEASE DEFINE FINANCIAL RISK AND EXPLAIN WHY IT IS IMPORTANT TO THE DETERMINATION OF A FAIR RATE OF RETURN.

A. Financial risk is the additional risk created by the introduction of senior capital, i.e., debt and preferred stock, into the capital structure. The higher the proportion of senior capital in the capital structure, the higher the financial risk which must be factored into the common equity cost rate, consistent with the previously mentioned basic financial principle of risk and return, i.e., investors demand a higher common equity return as compensation for bearing higher investment risk.

S&P initially published its electric, gas, and water utility ratings rankings in a framework consistent with the manner in which it presents its rating conclusions across all other corporate sectors in November 2007. S&P then stated:[7]

[7] Standard & Poor's – Ratings Direct – "U.S. Utilities Ratings Analysis Now Portrayed In The S&P Corporate Ratings Matrix" (November, 30, 2007) 2.

> Incorporating utility ratings into a shared framework to communicate the fundamental credit analysis of a company furthers the goals of transparency and comparability in the ratings process.
>
> * * *
>
> The utilities rating methodology remains unchanged, and the use of the corporate risk matrix has not resulted in any changes to ratings or outlooks. The same five factors that we analyzed to produce a business risk score in the familiar 10-point scale are used in determining whether a utility possesses an "Excellent," "Strong," "Satisfactory," "Weak," or "Vulnerable" business risk profile.

In September 2012, S&P refined and expanded its Business Risk / Financial Risk Matrix in an effort to provide greater transparency to its corporate rating methodology without changing its rating criteria or standards (see Table 1-Business and Financial Risk Profile Matrix and Table 2-Financial Risk Indicative Ratios (Corporate), pages 2 and 3 of Schedule 3). Notwithstanding the financial benchmark metrics published in Table 2, S&P stated:

> We do not have any predetermined weights for these categories. The significance of specific factors varies from situation to situation.
>
> * * *
>
> The rating matrix indicative outcomes are what we typically observe – but are not meant to be precise indications or guarantees of future rating opinions. Positive and negative nuances in our analysis may lead to a notch higher or lower than the outcomes indicated in the various cells of the matrix.

As shown on Schedule 7, page 4, the average S&P bond rating of the nine water companies is a split A+/A. It is my opinion that if EWAZ's bonds were actually rated by either Moody's or S&P, or if EWAZ were to be assigned a credit rating by S&P, it would be rated in the Baa / BBB bond credit rating categories for three reasons.

One, as stated previously, smaller companies have less financial flexibility as they are unable to cope with significant events that affect sales, revenues and earnings. Because of their small size, smaller companies, in my opinion, need to maintain a higher equity ratio (or lower debt ratio), as mitigation, but not elimination, of the added risk due to their small size. Second, certain financial metrics of EWAZ, which will be discussed subsequently, are consistent with the Baa/BBB category, at best. Third, as will also be discussed subsequently relative to a credit risk adjustment, the bond rating agencies, specifically S&P, link the bond / credit ratings of subsidiaries with those of their parent holding companies. Therefore, in my opinion, if EWAZ were rated, it would be rated in the Baa / BBB rating category, a less credit-worthy, or riskier, bond / credit rating category than that of the proxy group of nine water companies.

Q. CAN THE COMBINED BUSINESS RISKS, I.E., INVESTMENT RISK OF AN ENTERPRISE, BE PROXIED BY BOND AND CREDIT RATINGS?

A. Yes, similar bond ratings/issuer credit (bond/credit) ratings reflect and are representative of similar combined business and financial risks, i.e., total risk faced by bond investors. Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are similar, albeit not necessarily equal, as the purpose of the bond/credit rating process is to assess credit quality or credit risk and not common equity risk. Risk distinctions within S&P's bond rating categories are recognized by a plus or minus, i.e., within the A category, an S&P rating can be at A+, A, or A-. Similarly, risk distinctions for Moody's ratings are distinguished by numerical rating gradations, i.e., within the A category, a Moody's rating can be A1, A2 and A3. For S&P, additional risk distinctions are reflected in the assignment of one of the six business risk profiles and six financial risk profiles, shown in Tables 1 and 2 on

pages 2 and 3 of Schedule 3, respectively.

In summary, it is clear that S&P's bond/credit rating process encompasses a qualitative analysis of business and financial risks (see page 3 of Schedule 4). While not a means by which one can specifically quantify the differential in common equity risk between companies, bond/credit ratings provide a useful means with which to compare/differentiate investment risk between companies because they are the result of a thorough and comprehensive analysis of all diversifiable business risks, i.e., investment risk.

Q. HAVE YOU REVIEWED FINANCIAL DATA FOR EWAZ?

A. Yes. EWAZ provides water service to approximately 200,000 water customers in Santa Cruz, Mohave and a portion of eastern Maricopa counties. As a wholly-owned subsidiary of EPCOR, EWAZ's common stock is not publicly traded.

As shown on page 1 of Schedule 4, during the five-year period ending 2012, the achieved average earnings rate on book common equity for EWAZ was 2.40%. The five-year ending 2012 average common equity ratio based upon permanent capital was 43.65%.

Total debt as a percent of earnings before interest, taxes, depreciation and amortization ("EBITDA") for the years 2008-2012 ranged between a negative 4.27 times and 7.85 times, averaging 5.77 times during the period, while funds from operations relative to total debt ranged from a *negative* 0.05% to 5.21%, averaging 1.76%. These metrics, although they are not meant to be precise indications of ratings opinions, confirm my opinion that if EWAZ's long-term debt were rated by either Moody's or S&P, it would likely be in the Baa / BBB bond rating category, specifically Baa1/BBB+. I will discuss this further below in my testimony.

VI. PROXY GROUP

Q. PLEASE EXPLAIN HOW YOU CHOSE THE PROXY GROUP OF NINE WATER COMPANIES.

A. I chose the proxy group by selecting those companies which meet the following criteria: 1) they are included in the Water Company Group of AUS Utility Reports (November 2013); 2) they have 70% or greater of 2012 total operating income derived from and 70% or greater of 2012 total assets devoted to regulated water operations; 3) at the time of the preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity, i.e., one publicly-traded utility merging with or acquiring another; 4) they have not cut or omitted their common dividends during the five years ending 2012 or through the time of the preparation of this testimony; 5) they have a *Value Line Investment Survey* (*Value Line*) adjusted beta; and 6) they have *Value Line*, Reuters, Zacks or Yahoo! Finance, consensus five-year earnings per share ("EPS") growth rate projections. The following nine companies met these criteria: American States Water Co., American Water Works Co., Inc., Aqua America, Inc., Artesian Resources Corp., California Water Service Corp., Connecticut Water Service, Inc., Middlesex Water Co., SJW Corp. and York Water Co.

Q. HAVE YOU REVIEWED FINANCIAL DATA FOR THE PROXY GROUP?

A. Yes. Page 2 of Schedule 4 contains comparative capitalization and financial statistics for the nine proxy group water companies for the years 2008-2012.

As shown on page 2 of Schedule 4, during the five-year period ending 2012, the historically achieved average earnings rate on book common equity for the group averaged 8.26%. The average common equity ratio based upon permanent capital (excluding short-term debt) was 49.42%, and the average dividend payout ratio was 65.95%.

Total debt as a percent of EBITDA for the years 2008-2012 ranged between 3.84 and 9.07 times, averaging 5.51 times, while funds from operations relative to total debt ranged between 16.14% to 20.65%, averaging 17.82%.

VII. COMMON EQUITY COST RATE MODELS

Q. ARE THE COST OF COMMON EQUITY MODELS YOU USE MARKET-BASED MODELS?

A. Yes. It is important to use market-based models because the cost of common equity is a function of investors' perception of risk, which is embodied in the market prices they pay. The DCF model is market-based in that market prices are utilized in developing the dividend yield component of the model. The RPM is market-based in that the bond ratings and expected bond yields used in the application of the RPM reflect the market's assessment of bond/credit risk. In addition, the use of betas to determine the equity risk premium also reflects the market's assessment of market/systematic risk as betas are derived from regression analyses of market prices. The CAPM is market-based for many of the same reasons that the RPM is market-based i.e., the use of expected bond (U.S. Treasury bond) yields and betas.

VIII. DISCOUNTED CASH FLOW MODEL ("DCF")

Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?

A. The theory underlying the DCF model is that the present value of an expected future stream of net cash flows during the investment holding period can be determined by discounting those cash flows at the cost of capital, or the investors' capitalization rate. DCF theory indicates that an investor buys a stock for an expected total return rate, which is derived from cash flows received in the form of dividends plus appreciation in market price (the expected growth rate). Mathematically, the dividend yield on market price plus a growth rate equals the

capitalization rate, i.e., the total common equity return rate expected by investors.

Q. WHICH VERSION OF THE DCF MODEL DO YOU USE?

A. I utilize the single-stage constant growth DCF model because, in my experience, it is the most widely utilized version of the DCF used in public utility rate regulation. In my opinion, it is widely utilized because utilities are generally in the mature stage of their lifecycles and not transitioning from one growth stage to another.

Q. PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN YOUR APPLICATION OF THE DCF MODEL.

A. The unadjusted dividend yields are based upon a recent (October 31, 2013) indicated dividend divided by the average of closing market prices for the 60 days ending October 31, 2013 as shown in Column 1 on page 1 of Schedule 5.

Q. PLEASE EXPLAIN THE ADJUSTED DIVIDEND YIELD SHOWN ON PAGE 1 OF SCHEDULE 5, COLUMN 7.

A. Because dividends are paid periodically (quarterly), as opposed to continuously (daily), an adjustment must be made to the dividend yield. This is often referred to as the discrete, or the Gordon Periodic, version of the DCF model.

DCF theory calls for the use of the full growth rate, or D_1, in calculating the dividend yield component of the model. However, since the various companies in the proxy group increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the dividend yield component, or $D_{1/2}$. This is a conservative approach, which does not overstate the dividend yield that should be representative of the next twelve-month period. Therefore, the actual average dividend yields in Column 1 on page 1 of Schedule 5 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES OF THE PROXY GROUP THAT YOU USE IN YOUR APPLICATION OF THE DCF MODEL.

A. Schedule 6 shows that on average approximately 50% of the common shares of the nine water companies are held by individuals as opposed to institutional investors. Institutional investors tend to have more extensive informational resources than most individual investors. Individual investors, with more limited resources, are therefore likely to place great significance on the opinions expressed by financial information services, such as *Value Line*, Reuters, Zacks and Yahoo! Finance, which are easily accessible and/or available on the Internet and through public libraries. Investors realize that analysts have significant insight into the dynamics of the industries and individual companies they analyze, as well as an entity's historical and future abilities to effectively manage the effects of changing laws and regulations and ever changing economic and market conditions.

Security analysts' earnings expectations have a more significant, but not sole, influence on market prices than dividend expectations and market price appreciation or the "growth" experienced by investors.[8] Moreover, over the long run, there can be no growth in dividends per share without growth in EPS. Thus, the use of earnings growth rates in a DCF analysis provides a better matching between investors' market price appreciation expectations and the growth rate component of the DCF.

Q. PLEASE SUMMARIZE YOUR DCF MODEL RESULTS.

A. As shown on page 1 of Schedule 5, the average result of the application of the single-stage DCF model is 8.86% while the median result is 8.37%. In arriving at a

[8] Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006) 298-303.

conclusion of a DCF-indicated common equity cost rate for the proxy group, I have relied upon the median of the results of the DCF, due to the wide range of DCF results as well as the continuing volatile capital market conditions in light of the continuing fragile economic recovery, and to not give undue weight to outliers on either the high or the low side. In my opinion, the median is a more accurate and reliable measure of central tendency, and provides recognition of all the DCF results.

Q. PLEASE COMMENT ON THE APPLICABILITY OF THE DCF MODEL IN ESTABLISHING A COST OF COMMON EQUITY FOR EWAZ.

A. The DCF model has a tendency to inaccurately measure investors' required common equity return rate when the market value of common stock differs significantly from its book value. Mathematically, because the "simplified" DCF model traditionally used in rate regulation assumes a market-to-book ratio of one, it understates/overstates investors' required return rate when market value exceeds or is less than book value. It does so because, in many instances, market prices reflect investors' assessments of long-range market price growth potentials (consistent with the infinite investment horizon implicit in the standard regulatory version of the DCF model) not fully reflected in analysts' shorter range forecasts of future growth in EPS, an accounting proxy. Thus, the market-based DCF model will result in a total annual dollar return on book common equity equal to the total annual dollar return expected by investors only when market and book values are equal, a rare and unlikely situation. In recent years, the market values of water utilities' common stocks have been well in excess of their book values as shown on page 2 of Schedule 4 ranging between 138.52% and 166.26% for the five years ending 2012.

Under DCF theory, the rate of return investors require is related to the market price paid for a security. Thus, market prices form the basis of investment decisions and investors' expected rates of return. In contrast, a regulated utility is generally limited to earning on a net book value (depreciated original cost) rate base. Although market prices are significantly influenced by analysts' EPS growth forecasts, market values can diverge from book values for a myriad of macroeconomic reasons including, but not limited to, EPS and DPS expectations, merger or acquisition expectations, interest rates, investor sentiment, unemployment levels, monetary policy, and fiscal policy.

Traditional rate base/rate of return regulation, where a market-based common equity cost rate is applied to a book value rate base, presumes that market-to-book ratios are at unity or 1.00. However, there is ample empirical evidence over sustained periods to demonstrate that this is an incorrect presumption. Since market-to-book ratios of unity or 1.00 are rarely the case as discussed above, regulatory allowed ROEs, i.e., earnings, have a limited effect on utilities' market/book ratios as the market prices of utility common stocks are also influenced by factors beyond the direct influence of the regulatory process.

As noted by Phillips:[9]

> Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.'

In addition, Bonbright[10] states:

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[9] Phillips, Charles F., The Regulation of Public Utilities – Theory and Practice (Public Utility Reports, Inc., 1993) 395.

[10] James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988) 334.

> In the first place, commissions cannot forecast, except within wide limits, the effect their rate orders will have on the market prices of the stocks of the companies they regulate. In the second place, *whatever the initial market prices may be, they are sure to change not only with the changing prospects for earnings, but with the changing outlook of an inherently volatile stock market.* In short, market prices are beyond the control, though not beyond the influence of rate regulation. Moreover, even if a commission did possess the power of control, any attempt to exercise it ... would result in harmful, uneconomic shifts in public utility rate levels. (Emphasis added)

Q. IS IT REASONABLE TO EXPECT THE MARKET VALUES OF UTILITIES' COMMON STOCKS TO CONTINUE TO SELL WELL ABOVE THEIR BOOK VALUES?

A. Yes. Market-to-book ratios of regulated utilities vary from year to year, due to such influences as the effects of the "Great Recession", subsequent economic and capital market turmoil and the fledgling recovery and the like. In my opinion, the common stocks of all utilities will continue to sell substantially above their book values, on average, because many investors will likely continue to commit a greater percentage of their available capital to common stocks in view of lower interest rate alternative investment opportunities. The recent past and current capital market environment is in stark and historical contrast to the late 1970's and early 1980's when very high (by historical standards) yields on secured debt instruments in public utilities were available. Despite the fact that the market dipped to a low in March 2009 as the "Great Recession" unfolded and the U.S. has begun to recover from the "Great Recession" at a slow pace, the majority of utility stocks, on average, have continued to sell at market prices well above their book value. In addition, as previously discussed, such sustained high market-to-book ratios have been influenced by factors other than fundamentals such as actual and reported growth in EPS and DPS.

Q. CAN THE UNDER- OR OVERSTATEMENT YOU ARE REFERRING TO BE DEMONSTRATED MATHEMATICALLY?

A. Yes. Page 2 of Schedule 5 demonstrates how a market-based DCF cost rate of 8.86% applied to a book value that is below market value will understate the investors' required return on market value. As shown, there is no realistic opportunity to earn the expected market-based rate of return on book value. In Column 1, investors expect an 8.86% return on a market price of $26.994. Column 2 shows that when the 8.86% return rate on market value is applied to a book value that is approximately 50% of market value, the total annual return opportunity is just $1.203 on book value versus the $2.392 return when applied to the market value. With an annual dividend of $0.837, there is an opportunity for growth of only $0.366, which is just 1.36% in contrast to the 5.75% growth in market price expected by investors.

The converse is also true. When the market-to-book value is below 1, the DCF cost rate will overstate the investors' required return on market value.

Hence, it is clear that the DCF model mis-specifies, that is, it either understates/overstates investors' required cost of common equity capital when market values exceed/are less than their underlying book values. It follows that multiple cost of common equity models should be relied upon, rather than exclusive reliance upon the DCF model, when estimating investors' expectations.

Q. ARE YOU AWARE THAT MANY REGULATORY COMMISSIONS PRIMARILY RELY UPON THE DCF MODEL?

A. Yes. However, in my experience, the majority of regulatory commissions, including those that primarily rely upon the DCF model, also consider a combination of the various cost of common equity models available.

Consideration of multiple cost of common equity models is always appropriate, but especially in view of all of the foregoing, when at this time the traditional application of the DCF cannot adequately measure investors' required return. The DCF specifically understates investors' required return, because of the confluence of recently rising market prices, the use of accounting measures as proxies for capital appreciation in the DCF, the recent dramatic rise in actual and forecasted interest rates discussed below. The magnitude of this understatement can be found in the difference between the 5.75% growth in market values, i.e., growth in EPS, shown in column 1 on page 2 of Schedule 5 and the growth in market value of 1.36%, shown in column 2, when the 8.86% DCF cost rate is applied to book value, or up to approximately 439 basis points. Coupled with the added reliability and accuracy that the use of multiple cost of common equity models provides in the estimation of the cost of common equity, it is more imperative than ever to not give exclusive, primary or even simply greater reliance to the DCF analysis at this time.

IX. THE RISK PREMIUM MODEL ("RPM")

Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE RPM.

A. The RPM is based upon the basic financial principle of risk and return, namely, that investors require greater returns for bearing greater risk. The RPM recognizes that common equity capital has greater investment risk than debt capital, as common equity shareholders are last in line in any claim on an entity's assets and earnings, with debt holders being first in line. Therefore, investors require higher returns from common stocks than from investment in bonds to compensate them for bearing the additional risk.

While the investors' required common equity return cannot be directly determined or observed, it is possible to directly observe bond returns and yields.

According to RPM theory, one can assess a common equity risk premium over bonds, either historically or prospectively, and then use that premium to derive a cost rate of common equity. In summary, according to RPM theory, the cost of common equity equals the expected cost rate for long-term debt capital plus a risk premium over that cost rate to compensate common shareholders for the added risk of being unsecured and last-in-line for any claim on the corporation's assets and earnings.

Q. PLEASE EXPLAIN HOW YOU DERIVED YOUR INDICATED COST OF COMMON EQUITY BASED UPON THE RPM.

A. I relied upon the results from the application of two risk premium methods. The first method is the Predictive Risk Premium Model™ (PRPM™), while the second method is a risk premium model using a total market approach.

Q. PLEASE EXPLAIN THE PRPM™.

A. The PRPM™, published in the *Journal of Regulatory Economics (JRE)*[11] and *The Electricity Journal (TEJ)*,[12] was developed from the work of Robert F. Engle who shared the Nobel Prize in Economics in 2003 "for methods of analyzing economic time series with time-varying volatility ("ARCH")"[13] with "ARCH" standing for autoregressive conditional heteroskedasticity. In other words, volatility changes over time and is related from one period to the next, especially in financial markets. Engle discovered that the volatility in prices and returns also clusters over time, making it highly predictable and available to predict future

[11] "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.
"Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", Pauline M. Ahern, Richard A. Michelfelder, Ph.D., Rutgers University, Dylan W. D'Ascendis, and Frank J. Hanley, The Electricity Journal (May, 2013).

[13] www.nobelprize.org

levels of risk and risk premiums. The PRPM™ estimates the risk / return relationship directly by analyzing the actual results of investor behavior rather than using subjective judgment as to the inputs required for the application of other cost of common equity models. In addition, the PRPM™ is not based upon an estimate of investor behavior, but rather upon the evaluation of the results of that behavior, i.e., the variance of historical equity risk premiums, in other words, the predicted equity risk premium is generated by the prediction of volatility (risk). Also, in the derivation of the premiums, greater weight is given to more recent time periods, in contrast to reliance upon the arithmetic mean premium which gives equal weight to each observed premium.

The inputs to the model are the historical returns on the common shares of each company in the proxy group minus the historical monthly yield on long-term U.S. Treasury securities through September 2013. Using a generalized form of ARCH, known as GARCH, each water company's projected equity risk premium was determined using Eviews© statistical software. The forecasted 30-year U.S. Treasury Bond (Note) yield of 4.31% is based upon the consensus forecast for the six quarters ending with the first quarter 2015, derived from the November 1, 2013 *Blue Chip Financial Forecasts (Blue Chip)*, was averaged with the long-range forecasts for 2015-2019 and 2020-2024 from the June 1, 2013 *Blue Chip* (shown on pages 9 and 10 of Schedule 7) as discussed below. The risk-free rate of 4.31% was then added to each company's PRPM™-derived equity risk premium to arrive at a PRPM™-derived cost of common equity as shown on page 2 of Schedule 7 which presents the results for each proxy company as well as the average and median results. As shown on page 2, the average PRPM™ indicated common equity cost rate is 13.67% and the median is 11.68% for the nine water companies. I rely upon the median PRPM™ result due to the wide range of results and to not

give any undue weight to any high or low outliers.

Q. PLEASE EXPLAIN THE TOTAL MARKET APPROACH RPM.

A. The total market approach RPM adds a prospective public utility bond yield to an equity risk premium which is derived from a beta-adjusted total market equity risk premium and an equity risk premium based upon the S&P Utilities Index.

Q. PLEASE EXPLAIN THE BASIS OF THE ADJUSTED PROSPECTIVE BOND YIELD OF 5.27% APPLICABLE TO THE NINE WATER COMPANIES SHOWN ON PAGE 3 OF SCHEDULE 7.

A. The first step in the total market approach RPM analysis is to determine the expected bond yield. Because both ratemaking and the cost of capital, including common equity cost rate, are prospective in nature, a prospective yield on similarly rated long-term debt is essential. Hence, I rely on a consensus forecast of about 50 economists of the expected yield on Aaa rated corporate bonds for the six calendar quarters ending with the first calendar quarter of 2015 as derived from the November 1, 2013 *Blue Chip* averaged with the long-range forecasts for 2015-2019 and 2020-2024 from the June 1, 2013 *Blue Chip* (shown on pages 9 and 10 of Schedule 7). As shown on Line No. 1 of page 3 of Schedule 7, the average expected yield on Moody's Aaa rated corporate bonds is 5.08%. An adjustment of 0.23% is necessary to adjust that average Aaa corporate bond yield to be equivalent to a Moody's A rated public utility bond, as shown on Line No. 2 and explained in Note 2 resulting in an expected bond yield applicable to a Moody's A rated public utility bond of 5.31% as shown on Line No. 3.

Since the nine water companies' average Moody's bond rating is A1/A2, a downward adjustment of 0.04% is necessary to make the prospective bond yield applicable to an A1/A2 public utility bond, as detailed in Note 3 on page 3 of Schedule 7. Therefore, the adjusted prospective bond yield is 5.27% for the nine

water companies as shown on Line No. 5.

Q. PLEASE EXPLAIN THE METHOD UTILIZED TO ESTIMATE THE EQUITY RISK PREMIUM.

A. I evaluated the results of two different market equity risk premium studies based upon Ibbotson Associates' data, *Value Line's* forecasted total annual market return in excess of the prospective yield on Moody's Aaa corporate bonds, as well as two different studies of the equity risk premium for public utilities with Moody's A rated bonds as detailed on pages 8 and 11 of Schedule 7. As shown on Line No. 3, page 7 of Schedule 7, the average equity risk premium is 4.69% applicable to the nine water companies. This estimate is the result of an average of a beta-derived equity risk premium as well as the mean public utility equity risk premium relative to bonds rated A by Moody's based upon holding period returns.

Q. PLEASE EXPLAIN THE BASIS OF THE BETA-DERIVED EQUITY RISK PREMIUM.

A. The basis of the beta-derived equity risk premium applicable to the proxy group is shown on page 8 of Schedule 7. The beta-determined equity risk premium should receive substantial weight because betas are derived from the market prices of common stocks over a recent five-year period. Beta is a meaningful measure of prospective relative risk to the market as a whole and a logical means by which to allocate an entity's/proxy group's share of the market's total equity risk premium relative to corporate bond yields.

The total market equity risk premium utilized is 6.67%, based upon an average of the long-term arithmetic mean historical market equity risk premium, a predicted market equity risk premium based upon the PRPM^{TM} and a forecasted market risk premium based upon *Value Line's* projected market appreciation and dividend yield.

Q. HOW DID YOU DERIVE THE LONG-TERM HISTORICAL MARKET EQUITY RISK PREMIUM?

A. To derive the historical (expectational) market equity risk premium, I used the most recent Morningstar data on holding period returns for the large company common stocks from the Ibbotson® SBBI® 2013 Valuation Yearbook – Market Results for Stocks, Bonds, Bill and Inflation ("SBBI – 2013")[14] and the average historical yield on Moody's Aaa and Aa rated corporate bonds for the period 1926-2012. The use of holding period returns over a very long period of time is useful because it is consistent with the long-term investment horizon presumed by the DCF model. It is also consistent with the nature of a share of stock in EWAZ, the investment we are analyzing. The stock is ill liquid, meaning not easily sold or disposed of, equating to a long or even infinite holding period.

Consequently, as explained in note 1 on page 8 of Schedule 7, the long-term arithmetic mean monthly total return rate on large company common stocks of 11.83% and the long-term arithmetic mean monthly yield on Moody's Aaa and Aa rated corporate bonds of 6.23% were used. As shown on Line No. 1, the resultant long-term historical equity risk premium on the market as a whole is 5.60%.

I used arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for cost of capital purposes as noted in the SBBI – 2013. Arithmetic mean return rates and yields are appropriate because ex-post (historical) total returns and equity risk premiums differ in size and direction over time, providing insight into the variance and standard deviation of returns. Because the arithmetic mean captures the prospect for variance in returns and

[14] Ibbotson® SBBI® Valuation Yearbook – Market Results for Stocks, Bonds, Bills and Inflation Morningstar, Inc., 2013) .

equity risk premiums, it provides the valuable insight needed by investors in estimating future risk when making a current investment. Absent such valuable insight into the potential variance of returns, investors cannot meaningfully evaluate prospective risk. If investors alternatively relied upon the geometric mean of ex-post equity risk premiums, they would have no insight into the potential variance of future returns because the geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, *critical to risk analysis.*

Only the arithmetic mean takes into account all of the returns / premiums, hence, providing meaningful insight into the variance and standard deviation of those returns / premiums.

Q. PLEASE EXPLAIN THE DERIVATION OF PRPM™ MARKET EQUITY RISK PREMIUM.

A. The inputs to the model are the historical monthly returns on large company common stocks minus the monthly yields on Aaa and Aa corporate bonds during the period from January 1928 through September 2013, consistent with the rationale for using of the long-term historical arithmetic equity risk premium discussed above. Using the previously discussed generalized form of ARCH, known as GARCH, the market's projected equity risk premium was determined using Eviews© statistical software. The resulting predicted market equity risk premium based upon the PRPM™ of 9.22% is shown on Line No. 2 on page 8 of Schedule 7.

Q. PLEASE EXPLAIN HOW YOU INCORPORATED AN EQUITY RISK PREMIUM BASED UPON AN AVERAGE OF *VALUE LINE'S* 3-5 YEAR ESTIMATED MEDIAN TOTAL ANNUAL MARKET RETURN MINUS THE PROSPECTIVE YIELD ON AAA RATED CORPORATE BONDS IN YOUR DEVELOPMENT OF AN EQUITY RISK PREMIUM FOR YOUR RPM ANALYSIS.

A. Because both ratemaking and the cost of capital, including the cost rate of common equity are prospective, a prospective market equity risk premium is essential. The derivation of the *Value Line* based forecasted or prospective market equity risk premium can be found in note 3 on page 8 of Schedule 7. Consistent with the development of the dividend yield component of my DCF analysis, it is derived from an average of the most recent thirteen weeks ending November 1, 2013 3-5 year estimated median market price appreciation potential by *Value Line* plus an average of the median estimated dividend yield for the common stocks of the 1,700 firms covered in *Value Line*'s Standard Edition as explained in detail in Note 1 on page 2 of Schedule 8.

The average median expected price appreciation is 37%, which translates to an 8.19% annual appreciation and, when added to the average (similarly calculated) median dividend yield of 2.08% equates to a forecasted annual total return rate on the market as a whole of 10.27%. The forecasted total market equity risk premium of 5.19%, shown on Line No. 3, page 8 of Schedule 7, is derived by deducting the November 1, 2013 *Blue Chip* consensus estimate of about 50 economists of the expected yield on Moody's Aaa rated corporate bonds for the six calendar quarters ending with the first calendar quarter 2015 averaged with the projected long-range forecasts for 2015-2019 and 2020-2024 from the June 1, 2013 *Blue Chip* of 5.08%, from the *Value Line*-derived projected market return of

10.27% (5.19% = 10.27% - 5.08%).

In arriving at my conclusion of equity risk premium of 6.67% on Line No. 4 on page 8, I have given equal weight to the historical market equity risk premium of 5.60%, the PRPM^{TM} based market equity risk premium of 9.22% and the forecasted market equity risk premium of 5.19% shown on Line Nos. 1, 2 and 3, respectively (6.67% = (5.60% + 9.22% + 5.19%)/3).

Q. WHAT IS YOUR CONCLUSION OF A BETA-DERIVED EQUITY RISK PREMIUM FOR USE IN YOUR RPM ANALYSIS?

A. As shown on page 1 of Schedule 8, the most current median *Value Line* beta for the nine water companies is 0.70. Applying the median beta of the proxy group of 0.70 (consistent with my reliance upon the median PRPM^{TM} results as previously discussed), to the market equity risk premium of 6.67%, on Line No. 4 of page 8 of Schedule 7, results in a beta adjusted equity risk premium of 4.67% for the nine water companies.

Q. HOW DID YOU DERIVE THE 4.70% EQUITY RISK PREMIUM BASED UPON THE S&P UTILITY INDEX AND MOODY'S A RATED PUBLIC UTILITY BONDS?

A. First, I derived the long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.69% and monthly A rated public utility bond yields of 6.53% from 1928-2012 to arrive at an equity risk premium of 4.16% as shown on Line No. 3 on page 11 of Schedule 7. I then performed the PRPM^{TM} using the same historical monthly equity risk premiums to arrive at the PRPM^{TM} derived equity risk premium of 5.24% for the S&P Utility Index shown on Line No. 4, on page 11. The average of these equity risk premiums is 4.70%, shown on Line No. 5 (4.70% = (4.16% + 5.24%)/2).

Q. WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR USE IN YOUR TOTAL MARKET APPROACH RPM ANALYSIS?

A. The equity risk premium applicable to the proxy group of nine water companies is the average of the beta-derived premium, 4.67%, and that based upon the holding period returns of public utilities with A rated bonds, 4.70%, as summarized on Line No. 3 on Schedule 7, page 7, i.e., 4.69% (4.69% = (4.67% + 4.70%)/2).

Q. WHAT IS THE INDICATED RPM COMMON EQUITY COST RATE BASED UPON THE TOTAL MARKET APPROACH?

A. It is 9.96% for the nine water companies as shown on Line No. 7 on Schedule 7, page 3.

Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE PRPM™ AND THE TOTAL MARKET APPROACH RPM?

A. As shown on page 1 of Schedule 7, the indicated RPM-derived common equity cost rate is 11.25%, derived by giving greater weight to the PRPM™ results because the PRPM™ is based upon a minimum of restrictive assumptions.[15] In addition, the PRPM™ is "not based upon an *estimate* of investor behavior, but rather, upon a statistical analysis of actual investor behavior" because it evaluates the results of that behavior, i.e., the volatility of historical equity risk premiums.[16]

X. <u>THE CAPITAL ASSET PRICING MODEL ("CAPM")</u>

Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.

A. CAPM theory defines risk as the covariability of a security's returns with the market's returns as measured by beta (β). A beta less than 1.0 indicates lower variability while a beta greater than 1.0 indicates greater variability than the market.

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[15] Ahern, Hanley, Michelfelder 277.

[16] The Electricity Journal.

The CAPM assumes that all other risk, i.e., all non-market or unsystematic risk, can be eliminated through diversification. The risk that cannot be eliminated through diversification is called market or systematic risk. In addition, the CAPM presumes that investors require compensation only for these systematic risks that are the result of macroeconomic and other events that affect the returns on all assets. The model is applied by adding a risk-free rate of return to a market risk premium, which is adjusted proportionately to reflect the systematic risk of the individual security relative to the total market as measured by beta. The traditional CAPM model is expressed as:

$$R_s = R_f + \beta(R_m - R_f)$$

Where: R_s = Return rate on the common stock

R_f = Risk-free rate of return

R_m = Return rate on the market as a whole

β = Adjusted beta (volatility of the security relative to the market as a whole)

Numerous tests of the CAPM have measured the extent to which security returns and betas are related as predicted by the CAPM confirming its validity. The empirical CAPM (ECAPM) reflects the reality that while the results of these tests support the notion that beta is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.[17]

In view of theory and practical research, I have applied both the traditional CAPM and the ECAPM to the companies in the proxy group and averaged the

[17] Morin 175.

results.

Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF RETURN.

A. As shown in column 3 on page 1 of Schedule 8, the risk-free rate adopted for both applications of the CAPM is 4.31%. The risk-free rate for my CAPM analysis is based upon the average of the consensus forecast of the reporting economists in the November 1, 2013 *Blue Chip* of the expected yields on 30-year U.S. Treasury bonds for the six quarters ending with the first calendar quarter of 2015 averaged with the long-range forecasts for 2015-2019 and 2020-2024 from the June 1, 2013 *Blue Chip*, as shown in note 2, page 2 of Schedule 8.

Q. WHY HAVE YOU AVERAGED THE PROSPECTIVE AND HISTORICAL YIELDS ON U.S. TREASURY SECURITIES?

A. I have averaged the prospective and historical yields on U.S. Treasury Securities because in the current U.S. Treasury securities market, the Federal Reserve Bank is artificially and indefinitely keeping interest rates low until certain economic thresholds are met; i.e., unemployment falls to 6.5% and inflation rises to 2.5%, amid concerns over the struggling U.S. economy. As a result, current 30-year U.S. Treasury Bond yields and the consensus forecasted yields are near historical and unprecedented lows. As such, they are, by definition, not currently representative of the long-term cost of capital.

Q. WHY ARE CURRENT AND CONSENSUS FORECASTED YIELDS FOR THE NEXT SIX QUARTERS ON 30-YEAR U.S. TREASURY BONDS NOT REPRESENTATIVE OF EXPECTED LONG-TERM CAPITAL COSTS?

A. On August 23, 2013, *Value Line* published its Quarterly Forecast for the U.S. Economy. *Value Line* projects interest rates to rise significantly by 2017. Specifically, the yield on the 3-month Treasury Bill is expected to rise from a

current (November 8, 2013) 0.06%[18] to 3.0% in 2017; the yield on long-term Treasury securities to rise from a current (November 8, 2013) 3.84%[19] to 4.8% in 2017; the yield on Aaa Corporate Bonds to rise from 4.69%[20] (November 8, 2013) to 6.0% in 2017; and, the prime rate to rise from a recent (November 8, 2013) 3.25%[21] to 7.0% in 2017. These are significant anticipated increases in interest rates and indicate increasing capital costs in the next few years.

The press release of the Federal Open Market Committee (FOMC) on October 18, 2013, indicated that the Committee "decided to await more evidence that progress will be sustained before adjusting the pace of its [asset] purchases." In addition, the press release noted that "when the Committee decides to begin to remove policy accommodation, it will take a balanced approach consistent with its longer run goals of maximum employment and inflation of 2 percent."[22] In addition, one FOMC member, Esther L. George, voted against the FOMC monetary policy, due to a concern "that the continued high level of monetary accommodation increased the risks of future economic and financial imbalances and, over time, could cause an increase in long-term inflation expectations."[23]

All of this is pushing the stock market to near record levels. However, *Value Line* notes that while the FOMC left its aggressive accommodation efforts in place following its October meeting, should *Value Line*'s expectations of economic growth moving toward 3%, with new leadership, the Fed "might gradually shift gears."[24] In this event, in my opinion, interest rates will continue to rise, but more

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18 Federal Reserve Statistical Release, November 12, 2013.
19 Federal Reserve, November 12, 2013.
20 Federal Reserve, November 12, 2013.
21 Federal Reserve, November 12, 2013.
22 Federal Reserve Press Release, October 30, 2013.
23 Federal Reserve Press Release, October 30, 2013.
24 The Value Line Investment Survey, *Selection & Opinion*, November 15, 2013, 641.

rapidly.

In my opinion, the end of the low interest rate environment of the last five years or so, a product of intentional Fed policy, is coming to a close sooner rather than later and capital costs will continue to rise in general in the months and years to come, certainly during the life of the rates set in this proceeding. Hence, current and short-term consensus forecasted yields are not representative of current expected long-term capital costs.

Q. WHY IS THE YIELD ON LONG-TERM U.S. TREASURY BONDS APPROPRIATE FOR USE AS THE RISK-FREE RATE?

A. The yield on long-term U.S. Treasury T-Bonds is almost risk-free and its term is consistent with the long-term cost of capital to public utilities measured by the yields on A rated public utility bonds, the long-term investment horizon inherent in utilities' common stocks, the long-term investment horizon presumed in the standard DCF model employed in regulatory ratemaking, and the long-term life of the jurisdictional rate base to which the allowed fair rate of return (i.e., cost of capital) will be applied. In contrast, short-term U.S. Treasury yields are more volatile and largely a function of Federal Reserve monetary policy.

Q. PLEASE EXPLAIN THE ESTIMATION OF THE EXPECTED EQUITY RISK PREMIUM FOR THE MARKET.

A. The basis of the market equity risk premium is explained in detail in Note 1 on page 2 of Schedule 8. It is derived from *Value Line's* 3-5 year median total market price appreciation projections averaged over the most recent thirteen weeks ending November 1, 2013; the PRPM^{TM} predicted market equity risk premium using monthly equity risk premiums for large company common stocks relative to long-term U.S. Treasury securities from January 1926 through September 2013; and, the arithmetic mean monthly equity risk premiums of large company common stocks

relative to long-term U.S. Treasury bond income yields from SBBI-2013 from 1926-2012.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the 4.31% risk-free rate discussed above from the *Value Line* projected total annual market return of 10.27%, resulting in a forecasted total market equity risk premium of 5.96%. The PRPM^{TM} market equity risk premium is 10.32%; derived using the PRPM^{TM}, discussed above, relative to the yields on long-term U.S. Treasury securities from January 1926 through September 2013 (the latest available at the time of the preparation of this testimony). The long-term income return on U.S. Government Securities of 5.28% was deducted from the SBBI-2013 monthly historical total market return of 11.83% resulting in an historical market equity risk premium of 6.55%.

These three market equity risk premiums, when averaged, result in an average total market equity risk premium of 7.61% (7.61% = (5.96% + 10.32% + 6.55%)/3).

Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE TRADITIONAL AND EMPIRICAL CAPM TO THE PROXY GROUP?

A. As shown on Schedule 8, page 1, the average traditional CAPM cost rate is 9.55%, while the median is 9.64% for the nine water companies. The average ECAPM cost rate is 10.14%, while the median is 10.21%. Consistent with my reliance upon the median PRPM^{TM} results discussed above, I rely upon the median results of the traditional CAPM and ECAPM for the proxy group, 9.64% and 10.21%, respectively. Thus, as shown on column 6 on page 1, the CAPM cost rate applicable to the proxy group is 9.93%[25], the average of the traditional CAPM and ECAPM results for the proxy group.

[25] 9.93% = (9.64% + 10.21%)/2.

XI. CONCLUSION OF COMMON EQUITY COST RATE

Q. WHAT IS YOUR RECOMMENDED COMMON EQUITY COST RATE?

A. It is 10.70% based upon the indicated common equity cost rate resulting from the application of multiple cost of common equity models to the nine water companies adjusted for EWAZ's credit and business risks.

As shown above, I employ multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate because: 1) no single model is so inherently precise that it can be relied upon solely to the exclusion of other theoretically sound models; 2) all of the models are market-based; 3) the use of multiple models adds reliability to the estimation of the common equity cost rate; and 4) the prudence of using multiple cost of common equity models is supported in both the financial literature and regulatory precedent. Therefore, no single model should be relied upon exclusively to estimate investors' required rate of return on common equity.

The results of the cost of common equity models applied to the nine water companies are shown on Schedule 1, and summarized below:

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Table 2

	Proxy Group of Nine Water Companies
Discounted Cash Flow Model	8.37%
Risk Premium Model	11.25%
Capital Asset Pricing Model	9.93%
Indicated Common Equity Cost Rate	9.95%
Credit Risk Adjustment	0.44%
Business Risk Adjustment	0.30%
Indicated Common Equity Cost Rate	10.69%
Recommended Common Equity Cost Rate	10.70%

XII. CREDIT RISK ADJUSTMENT

Q. IS THERE A WAY TO QUANTIFY A CREDIT RISK ADJUSTMENT DUE TO EWAZ'S LIKELY MOODY'S AND S&P'S BOND RATINGS OF BAA1/BBB+?

A. Yes. As discussed previously, it is my opinion, that if Moody's and S&P were to rate EWAZ's long-term debt, they would likely assign bond ratings of Baa1/BBB+ to the bonds because EWAZ's parent, EPCOR, has been assigned a BBB+ credit rating by S&P which links the credit rating of "a wholly owned or substantially controlled utility subsidiary … to the credit quality of its parent".[26] Since the nine

[26] Standard & Poor's Global Credit Portal® RatingsDirect® Methodology: Differentiating the Issuer. Credit Ratings of a Utility Subsidiary and Its Parent,

water companies have an average S&P credit rating of A, S&P's bond rating of A+/A, in my opinion, S&P would likely assign a BBB+ credit and bond ratings to EWAZ based upon EPCOR's BBB+ credit rating. In addition, since Moody's bond ratings are generally analogous to S&P's bond rating, it is my opinion that EWAZ would likely be assigned a bond rating of Baa1 by Moody's, which is comparable to a BBB+ by S&P. Since the average Moody's and S&P bond ratings of the proxy group of nine water companies are A1/A2 and A+/A, respectively, as shown on page 2 of Schedule 7, the nine water companies enjoy lower credit risk than EWAZ and an upward adjustment to the common equity cost rate based upon the nine water companies is warranted. An indication of the magnitude of such an adjustment is five-sixths (5/6) of a recent three-month average spread between Moody's A and Baa rated public utility bond yields of 0.53% shown on page 6 of Schedule 7, or 0.44% (0.44% = 0.53% * (5/6)).

XIII. BUSINESS RISK ADJUSTMENT

Q. IS THERE A WAY TO QUANTIFY A BUSINESS RISK ADJUSTMENT DUE TO EWAZ'S SMALL SIZE RELATIVE TO THE PROXY GROUP?

A. Yes. As discussed above, increased risk due to small size must be taken into account in the cost of common equity consistent with the financial principle of risk and return. Since the Company is smaller in size relative to the proxy group, measured by the estimated market capitalization of common equity for EWAZ, whose common stock is not traded, it has greater business risk than the average company in the proxy group.

Table 3

	Market Capitalization(1) ($ Millions)	Times Greater than the Company
EWAZ	$ 339.890	
Proxy Group of Nine Water Companies	1,740.082	5.1x

(1) From page 1 of Schedule 9.

As shown on page 2 of Schedule 9, EWAZ's estimated market capitalization on October 31, 2013 was $339.890 million. In contrast, the market capitalization of the average water company was $1.740 billion on October 31, 2013, or 5.1 times the size of EWAZ's market capitalization.

Therefore, it is necessary to upwardly adjust the common equity cost rate of 9.95% based upon the nine water companies to reflect EWAZ's greater risk due to its smaller relative size. The determination is based upon the size premiums for decile portfolios of New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ listed companies for the 1926-2012 period and related data from SBBI® – 2013. The average size premium for the 6th decile in which the nine water companies fall has been compared with the average size premium for the 9th decile in which the market capitalization of EWAZ falls. As shown on page 1, the size premium spread between the 9th decile and the 6th decile is 0.98%. In view of the foregoing, an upward adjustment of 0.30% to reflect EWAZ's greater relative business risk due to its smaller size is both reasonable and conservative.

Adding a credit risk adjustment of 0.44% and a business risk adjustment of 0.30% to the 9.95% indicated common equity cost rate based upon the nine water companies before adjustment, results in a credit and business risk-adjusted

common equity cost rate of 10.69%[27] which, when rounded to 10.70%, is my recommended common equity cost rate. In my opinion, a common equity cost rate of 10.70% is both reasonable and conservative.

A common equity cost rate of 10.70% is consistent with the *Hope* and *Bluefield* standards of a fair and reasonable return, which is a return that ensures the integrity of presently invested capital *and* enables the attraction of needed new capital on reasonable terms. It also ensures the continued reliability and quality of service to the benefit of ratepayers. Thus, it balances the interests of both ratepayers and the Company.

A common equity cost rate of 10.70% is also reasonable in light of current and expected economic and capital market conditions given the previous discussion of expected rising interest rates and capital costs.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

[27] 10.69% = 9.9525% + 0.44% + 0..30%.

APPENDIX A

PROFESSIONAL QUALIFICATIONS

OF

PAULINE M. AHERN, CRRA
PRINCIPAL

AUS CONSULTANTS

PROFESSIONAL QUALIFICATIONS
OF
PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS

PROFESSIONAL EXPERIENCE

1994-Present

In 1996, I became a Principal of AUS Consultants, continuing to offer testimony as an expert witness on the subjects of fair rate of return, cost of capital and related issues before state public utility commissions. I provide assistance and support to clients throughout the entire ratemaking litigation process. In addition, I supervise the financial analyst and administrative staff in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. The team also assists in the preparation of interrogatory responses, as well as rebuttal exhibits.

As the Publisher of AUS Utility Reports (formerly C. A. Turner Utility Reports), I am responsible for the production, publishing, and distribution of the reports. AUS Utility Reports provides financial data and related ratios for about 80 public utilities, i.e., electric, combination gas and electric, natural gas distribution, natural gas transmission, telephone, and water utilities, on a monthly, quarterly and annual basis. Among the subscribers of AUS Utility Reports are utilities, many state regulatory commissions, federal agencies, individuals, brokerage firms, attorneys, as well as public and academic libraries. The publication has continuously provided financial statistics on the utility industry since 1930.

I am also responsible for maintaining and calculating the performance of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 70 corporate members of the AGA, which serves as the benchmark for the AGA Gas Utility Index Fund.

As an Assistant Vice President from 1994 - 1996, I prepared fair rate of return and cost of capital exhibits which were filed along with expert testimony before various state and federal public utility regulatory bodies. These supporting exhibits include the determination of an appropriate ratemaking capital structure and the development of embedded cost rates of senior capital. The exhibits also support the determination of a recommended return on common equity through the use of various market models, such as, but not limited to, Discounted Cash Flow analysis, Capital Asset Pricing Model and Risk Premium Methodology, as well as an assessment of the risk characteristics of the client utility. I also assisted in the preparation of responses to any interrogatories received regarding such testimonies filed on behalf of client utilities. Following the filing of fair rate of return testimonies, I assisted in the evaluation of opposition testimony in order to prepare interrogatory questions, areas of cross-examination, and rebuttal testimony. I also evaluated and assisted in the preparation of briefs and exceptions following the hearing process. I also submitted testimony before state public utility commissions regarding appropriate capital structure ratios and fixed capital cost rates.

1990-1994

As a Senior Financial Analyst, I supervised two analysts and assisted in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. The team also assisted in the preparation of interrogatory responses.

I evaluated the final orders and decisions of various commissions to determine whether further actions were warranted and to gain insight which assisted in the preparation of future rate of return studies.

I assisted in the preparation of an article authored by Frank J. Hanley and A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" published in the July 15, 1991 issue of Public Utilities Fortnightly.

In 1992, I was awarded the professional designation "Certified Rate of Return Analyst" (CRRA) by the National Society of Rate of Return Analysts (now the Society of Utility and Regulatory Financial Analysts (SURFA)). This designation is based upon education, experience and the successful completion of a comprehensive examination.

As Administrator of Financial Analysis for AUS Utility Reports, which then reported financial data for over 200 utility companies with approximately 1,000 subscribers, I oversaw the preparation of this monthly publication, as well as the accompanying annual publication, Financial Statistics - Public Utilities.

1988-1990

As a Financial Analyst, I assisted in the preparation of fair rate of return studies including capital structure determination, development of senior capital cost rates, as well as the determination of an appropriate rate of return on equity. I also assisted in the preparation of interrogatory responses, interrogatory questions of the opposition, areas of cross-examination and rebuttal testimony. I also assisted in the preparation of the annual publication C. A. Turner Utility Reports - Financial Statistics - Public Utilities.

1973-1975

As a Research Assistant in the Research Department of the Regional Economics Division of the Federal Reserve Bank of Boston, I was involved in the development and maintenance of econometric models to simulate regional economic conditions in New England in order to study the effects of, among other things, the energy crisis of the early 1970's and property tax revaluations on the economy of New England. I was also involved in the statistical analysis and preparation of articles for the New England Economic Review. Also, I was Assistant Editor of New England Business Indicators.

1972

As a Research Assistant in the Office of the Assistant Secretary for International Affairs, U.S. Treasury Department, Washington, D.C., I developed and maintained econometric models which simulated the economy of the United States in order to study the results of various alternate foreign trade policies so that national trade policy could be formulated and recommended.

Clients Served

I have offered expert testimony before the following commissions:

Arkansas
Arizona
British Columbia
California
Connecticut
Delaware
Florida
Hawaii
Idaho
Illinois
Indiana
Iowa
Kentucky
Louisiana
Maine
Maryland
Michigan
Missouri
Nevada
New Hampshire
New Jersey
New York
North Carolina
Ohio
Pennsylvania
Rhode Island
South Carolina
Virginia
Washington

I have sponsored testimony on fair rate of return and related issues for:

Alpena Power Company
Apple Canyon Utility Company
Applied Wastewater Management, Inc.
Aqua Illinois, Inc.
Aqua New Jersey, Inc.
Aqua North Carolina, Inc.
Aqua Ohio, Inc.
Aqua Virginia, Inc.
Aquarion Water Company
Aquarion Water Co. of New Hampshire, Inc.
Arizona Water Company
Artesian Water Company
Bermuda Water Company
The Atlantic City Sewerage Company
Audubon Water Company
The Borough of Hanover, PA
Carolina Pines Utilities, Inc.
Carolina Water Service, Inc. of NC
Carolina Water Service, Inc. of SC
Chaparral City Water Company
The Columbia Water Company
The Connecticut Water Company
Consumers Illinois Water Company
Consumers Maine Water Company
Consumers New Jersey Water Company
City of DuBois, Pennsylvania
Corix Utilities, Inc.
Elizabethtown Water Company
Emporium Water Company
GTE Hawaiian Telephone Inc.
Greenridge Utilities, Inc.
Illinois American Water Company
Iowa American Water Company
Jersey Central Power & Light Co.
Water Services Corp. of Kentucky
Lake Wildwood Utilities Corp.
Land'Or Utility Company
Long Island American Water Company
Long Neck Water Company
Louisiana Water Service, Inc.
Maine Water Company
Massanutten Public Service Company
Middlesex Water Company
Missouri-American Water Company
Missouri Gas Energy
Mt. Holly Water Company
Nero Utility Services, Inc.
New Jersey Utilities Association
The Newtown Artesian Water Company
NRG Energy Center Pittsburgh LLC
NRG Energy Center Harrisburg LLC
Ohio-American Water Company
Penn Estates Utilities
Pinelands Water Company
Pinelands Waste Water Company
Pioneer Water LLC
Pittsburgh Thermal
San Gabriel Valley Water Company
San Jose Water Company
Southland Utilities, Inc.
Spring Creek Utilities, Inc.
Sussex Shores Water Company
Tega Cay Water Services, Inc.
Total Environmental Services, Inc. – Treasure Lake Water & Sewer Divisions
Thames Water Americas
Tidewater Utilities, Inc.
Transylvania Utilities, Inc.
Trigen – Philadelphia Energy Corporation
Twin Lakes Utilities, Inc.
United Utility Companies
United Water Arkansas, Inc.
United Water Arlington Hills Sewerage, Inc.
United Water Connecticut, Inc.
United Water Delaware, Inc.
United Water Great Gorge Inc. / United Water Vernon Transmission, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New Rochelle, Inc.
United Water New York, Inc.
United Water Owego / Nichols, Inc.
United Water Pennsylvania, Inc.
United Water Rhode Island, Inc.
United Water South County, Inc.
United Water Toms River, Inc.
United Water Vernon Sewage Inc.
United Water Virginia, Inc.
United Water Westchester, Inc.
United Water West Lafayette, Inc.
United Water West Milford, Inc.
Utilities, Inc.
Utilities Inc. of Central Nevada
Utilities, Inc. of Florida
Utilities, Inc. of Louisiana
Utilities, Inc. of Nevada
Utilities, Inc. of Pennsylvania
Utilities, Inc. - Westgate
Utilities Services of South Carolina
Utility Center, Inc.
Valley Energy, Inc.
Wellsboro Electric Company
Western Utilities, Inc.

I have sponsored testimony on generic/uniform methodologies for determining the return on common equity for:

Aquarion Water Company
United Water Connecticut, Inc.

The Connecticut Water Company
Corix Multi-Utility Services, Inc.
Utilities, Inc.

I have sponsored testimony on the rate of return and capital structure effects of merger and acquisition issues for:

California-American Water Company
New Jersey-American Water Company

I have sponsored testimony on capital structure and senior capital cost rates for the following clients:

Alpena Power Company
Arkansas-Western Gas Company
Associated Natural Gas Company
PG Energy Inc.
United Water Delaware, Inc.
Washington Natural Gas Company

I have sponsored testimony on Distribution System Improvement Charges (DSIC):

Arizona Water Company

I have assisted in the preparation of rate of return studies on behalf of the following clients:

Algonquin Gas Transmission Company
Anadarko Petroleum Corporation
Arizona Water Company
Arkansas-Louisiana Gas Company
Arkansas Western Gas Company
Artesian Water Company
Associated Natural Gas Company
Atlantic City Electric Company
Bridgeport-Hydraulic Company
Cambridge Electric Light Company
Carolina Power & Light Company
Citizens Gas and Coke Utility
City of Vernon, CA
Columbia Gas/Gulf Transmission Cos.
Commonwealth Electric Company
Commonwealth Telephone Company
Conestoga Telephone & Telegraph Co.
Connecticut Natural Gas Corporation
Consolidated Gas Transmission Company
Consumers Power Company
CWS Systems, Inc.
Delmarva Power & Light Company
East Honolulu Community Services, Inc.
Equitable Gas Company
Equitrans, Inc.
Florida Power & Light Company
Gary Hobart Water Company
Gasco, Inc.
GTE Arkansas, Inc.
GTE California, Inc.
GTE Florida, Inc.
GTE Hawaiian Telephone
GTE North, Inc.
GTE Northwest, Inc.
GTE Southwest, Inc.
Great Lakes Gas Transmission L.P.
Hawaiian Electric Company
Hawaiian Electric Light Company
IES Utilities Inc.
Illinois Power Company
Interstate Power Company
Interstate Power & Light Co.
Iowa Electric Light and Power Company
Iowa Southern Utilities Company
Kentucky-West Virginia Gas Company
Lockhart Power Company
Middlesex Water Company
Milwaukee Metropolitan Sewer District
Mountaineer Gas Company
National Fuel Gas Distribution Corp.
National Fuel Gas Supply Corp.
Newco Waste Systems of NJ, Inc.
New Jersey Natural Gas Company
New Jersey-American Water Company
New York-American Water Company
North Carolina Natural Gas Corp.
Northumbrian Water Company
Ohio-American Water Company
Oklahoma Natural Gas Company
Orange and Rockland Utilities
Paiute Pipeline Company
PECO Energy Company
Penn Estates Utilities, Inc.
Penn-York Energy Corporation
Pennsylvania-American Water Co.
PG Energy Inc.
Philadelphia Electric Company
Providence Gas Company
South Carolina Pipeline Company
Southwest Gas Corporation
Stamford Water Company
Tesoro Alaska Petroleum Company

Tesoro Refining & Marketing Co.
United Telephone of New Jersey
United Utility Companies
United Water Arkansas, Inc.
United Water Delaware, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New York, Inc.
United Water Pennsylvania, Inc.
United Water Virginia, Inc.
United Water West Lafayette, Inc.
Utilities, Inc. of Pennsylvania
Utilities, Inc. - Westgate
Vista-United Telecommunications Corp.
Washington Gas Light Company
Washington Natural Gas Company
Washington Water Power Corporation
Waste Management of New Jersey – Transfer Station A
Wellsboro Electric Company
Western Reserve Telephone Company
Western Utilities, Inc.
Wisconsin Power and Light Company

EDUCATION:

1973 – Clark University – B.A. – Honors in Economics (Concentration: Econometrics and Regional/International Economics)
1991 – Rutgers University – M.B.A. – High Honors (Concentration: Corporate Finance)

PROFESSIONAL AFFILIATIONS:

Advisory Council – New Mexico State University Center for Public Utilities
Advisory Board – Financial Research Institute – University of Missouri's Trulaske School of Business
Edison Electric Institute – Cost of Capital Working Group
National Association of Water Companies – Member of the Finance/Accounting/Taxation and Rates and Regulation Committees
Society of Utility and Regulatory Financial Analysts
Member, Board of Directors – 2010-2014
President – 2006-2008 and 2008-2010
Secretary/Treasurer – 2004-2006
American Finance Association
Financial Management Association
Energy Bar Association
Energy Association of Pennsylvania

SPEAKING ENGAGEMENTS:

"Regulatory Training in Financing, Planning, Strategies and Accounting Issues for Publicly- and Privately-Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 13-18, 2013, Instructor (Cost of Capital).

"Regulated Utilities – Access to Capital", (panelist) - Innovation: Changing the Future of Energy, 2013 Deloitte Energy Conference, Deloitte Center for Energy Solutions, May 22, 2013, Washington, DC.

"Comparative Evaluation of the Predictive Risk Premium Model, the Discounted Cash Flow Model and the Capital Asset Pricing Model for Estimating the Cost of Common Equity", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 32nd Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 17, 2013, Rutgers University, Shawnee on the Delaware, PA.

"Decoupling: Impact on the Risk and Cost of Common Equity of Public Utility Stocks", before the Society of Utility and Regulatory Financial Analysts: 45th Financial Forum, April 17-18, 2013, Indianapolis, IN.

"Issues Surrounding the Determination of the Allowed Rate of Return", before the Staff Subcommittee on Electricity of the National Association of Regulatory Utility Commissioners, Winter 2013 Committee Meetings, February 3, 2013, Washington, DC.

"Leadership in the Financial Services Sector", Guest Professor – Cost of Capital, Business Leader Development Program, Rutgers University School of Business, February 1, 2013, Camden, NJ.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, December 12, 2012, Instructor (Financial Statement Analysis).

"Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 14-19, 2012, Instructor (Cost of Financial Capital).

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Edison Electric Institute Cost of Capital Working Group, October 3, 2012, Webinar.

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Commissioners, September 10, 2012, St. Paul, MN.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, August 7, 2012, Instructor (Financial Statement Analysis).

"Advanced Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, May 13-17, 2012, Instructor (Cost of Financial Capital).

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", before the Finance and Regulatory Committees of the National Association of Water Companies, March 29, 2012, Telephonic Conference.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Frank J. Hanley, Principal and Director, AUS Consultants) before the Water Committee of the National Association of Regulatory Utility Commissioners' Winter Committee Meetings, February 7, 2012, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University and Frank J. Hanley, Principal and Director, AUS Consultants) before the Wall Street Utility Group, December 19, 2011, New York City, NY.

"Advanced Cost and Finance Issues for Water", (co-presenter with Gary D. Shambaugh, Principal & Director, AUS Consultants), 2011 Advanced Regulatory Studies Program – Ratemaking, Accounting and Economics, September 29, 2011, Kellogg Center at Michigan State University – Institute for Public Utilities, East Lansing, MI.

"Public Utility Betas and the Cost of Capital", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 30th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2011, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 43rd Financial Forum – "Impact of Cost Recovery Mechanisms on the Perception of Public Utility Risk", April 14-15, 2011, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Hot Topic Hotline Webinar, December 3, 2010, Financial Research Institute of the University of Missouri.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) before the Indiana Utility Regulatory Commission Cost of Capital Task Force, September 28, 2010, Indianapolis, IN

Tomorrow's Cost of Capital: Cost of Capital Issues 2010, Deloitte Center for Energy Solutions, 2010 *Deloitte Energy Conference*, "Changing the Great Game: Climate, Customers and Capital", June 7-8, 2010, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 29th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2010, Rutgers University, Skytop, PA

Moderator: Society of Utility and Regulatory Financial Analysts: 42nd Financial Forum – "The Changing Economic and Capital Market Environment and the Utility Industry", April 29-30, 2010, Washington, DC

"A New Model for Estimating the Equity Risk Premium for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Spring 2010 Meeting of the Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Utility Commissioners, March 17, 2010, Charleston, SC

"New Approach to Estimating the Cost of Common Equity Capital for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) - Advanced Workshop in Regulation and Competition, 28th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 14, 2009, Rutgers University, Skytop, PA

Moderator: Society of Utility and Regulatory Financial Analysts: 41st Financial Forum – "Estimating the Cost of Capital in Today's Economic and Capital Market Environment", April 16-17, 2009, Washington, DC

"Water Utility Financing: Where Does All That Cash Come From?", AWWA Pre-Conference Workshop: Water Utility Ratemaking, March 25, 2008, Atlantic City, NJ

PAPERS:

"Empirical Tests of the Generalized Consumption Asset Pricing Model for Estimating the Cost of Common Equity Capital for Public Utilities", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University, Dylan W. D'Ascendis, (Working Paper).

"Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University, Dylan W. D'Ascendis, and Frank J. Hanley, The Electricity Journal, May, 2013.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", co-authored with Frank J. Hanley and Richard A. Michelfelder, Ph.D., Rutgers University, The Journal of Regulatory Economics (December 2011), 40:261-278.

"Comparable Earnings: New Life for Old Precept" co-authored with Frank J. Hanley, Financial Quarterly Review, (American Gas Association), Summer 1994.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

BOB STUMP - Chairman
GARY PIERCE
BRENDA BURNS
BOB BURNS
SUSAN BITTER SMITH

IN THE MATTER OF THE APPLICATION OF EPCOR WATER ARIZONA INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE BY ITS MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WATER DISTRICT, TUBAC WATER DISTRICT, AND MOHAVE WASTEWATER DISTRICT.	DOCKET NO: WS-01303A-14-0010

EXHIBIT PMA-DT2

TO ACCOMPANY THE

DIRECT TESTIMONY OF
PAULINE M. AHERN, CRRA

COST OF CAPITAL

March 7, 2014

Table of Contents
to Exhibit PMA-DT 2
of Pauline M. Ahern, CRRA

	Exhibit
Summary of Cost of Capital and Fair Rate of Return	1
Capital Intensity and Depreciation Rates for EPCOR Water Arizona and the AUS Utility Reports Companies	2
Standard & Poor's Public Utility Rating Methodology Profile and Revised Public Utility Financial Indicative Ratios	3
Financial Profile of EPCOR Water Arizona. Inc. and the Proxy Group of Nine Water Companies	4
Application of the Discounted Cash Flow Model (DCF) to the Proxy Group of Nine Water Companies	5
Current Institutional Holdings	6
Application of the Risk Premium Model (RPM) to the Proxy Group of Nine Water Companies	7
Application of the Capital Asset Pricing Model (CAPM) to the Proxy Group of Nine Water Companies	8
Estimated Market Capitalization for EPCOR Water Arizona, Inc. and the Proxy Group of Nine Water Companies	9

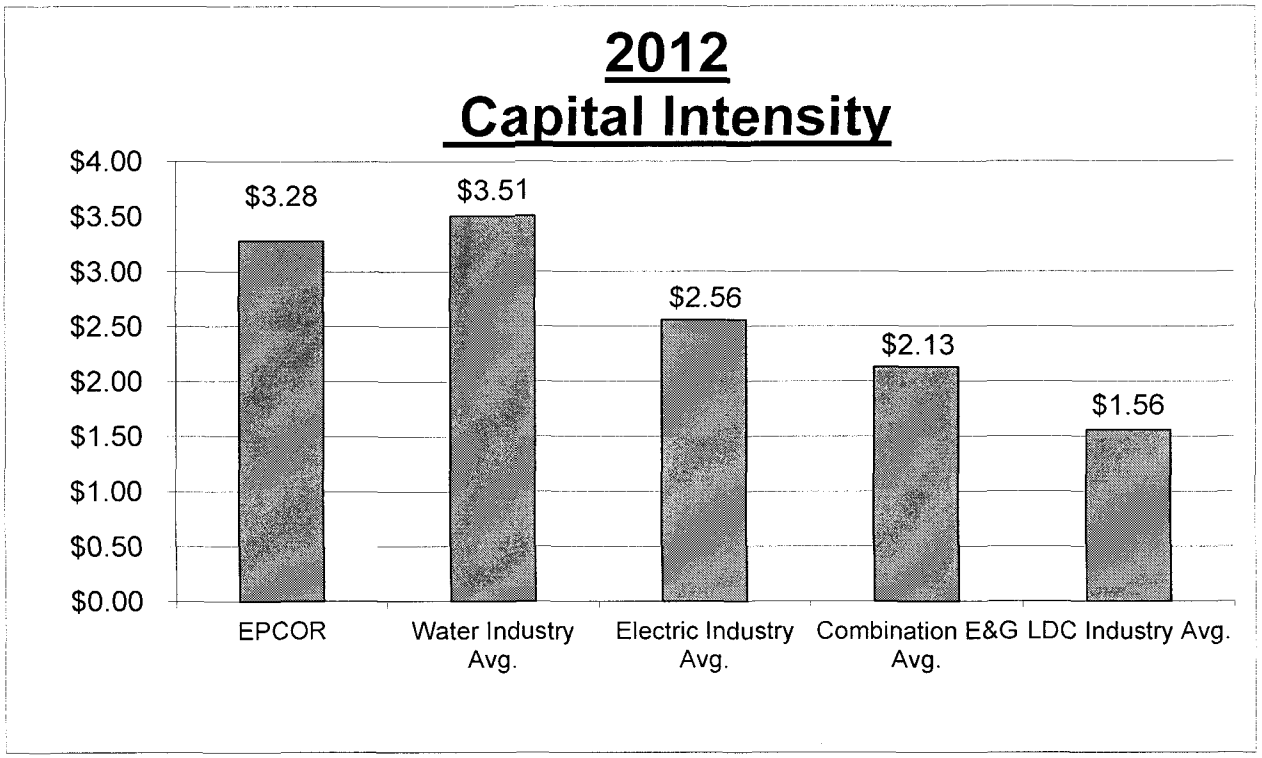
EPCOR Water Arizona, Inc.
Brief Summary of Common Equity Cost Rate

No.	Principal Methods	Proxy Group of Nine Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	8.37 %
2.	Risk Premium Model (RPM) (2)	11.25
3.	Capital Asset Pricing Model (CAPM) (3)	9.93
5.	Indicated Common Equity Cost Rate before Adjustment for Business Risks	9.95 %
6.	Credit Risk Adjustment (4)	0.44
7	Business Risk Adjustment (5)	0.30
8.	Indicated Common Equity Cost Rate	10.69 %
9.	Recommended Common Equity Cost Rate	10.70 %

Notes:
(1) From Schedule 5.
(2) From page 1 of Schedule 7.
(3) From page 1 of Schedule 8.
(4) Credit risk adjustment to reflect the financial risk of the capital structure employed by for rate making purposes relative to the proxy group as detailed in Ms. Ahern's accompanying direct testimony.
(5) Business risk adjustment to reflect EPCOR Water Arizona, Inc.'s greater business risk due to its small size relative to the proxy group as detailed in Ms. Ahern's accompanying direct testimony.

EPCOR Water Arizona, Inc.
2012 Capital Intensity of EPCOR Water Arizona, Inc. and
AUS Utility Reports Utility Companies Industry Averages

	Average Net Plant ($ mill)	Average Operating Revenue ($ mill)	Capital Intensity ($)	Capital Intensity EPCOR v. Other Industries (times)
EPCOR Water Arizona, Inc.	$ 345.39	$ 105.32	$ 3.28	- -
Water Industry Average	$ 2,038.90	$ 581.03	$ 3.51	93.45%
Electric Industry Average	$ 15,355.22	$ 6,000.19	$ 2.56	128.13%
Combination Elec. & Gas Industry Average	$ 13,351.03	$ 6,263.01	$ 2.13	153.99%
Gas Distribution Average	$ 3,345.95	$ 2,149.69	$ 1.56	210.26%



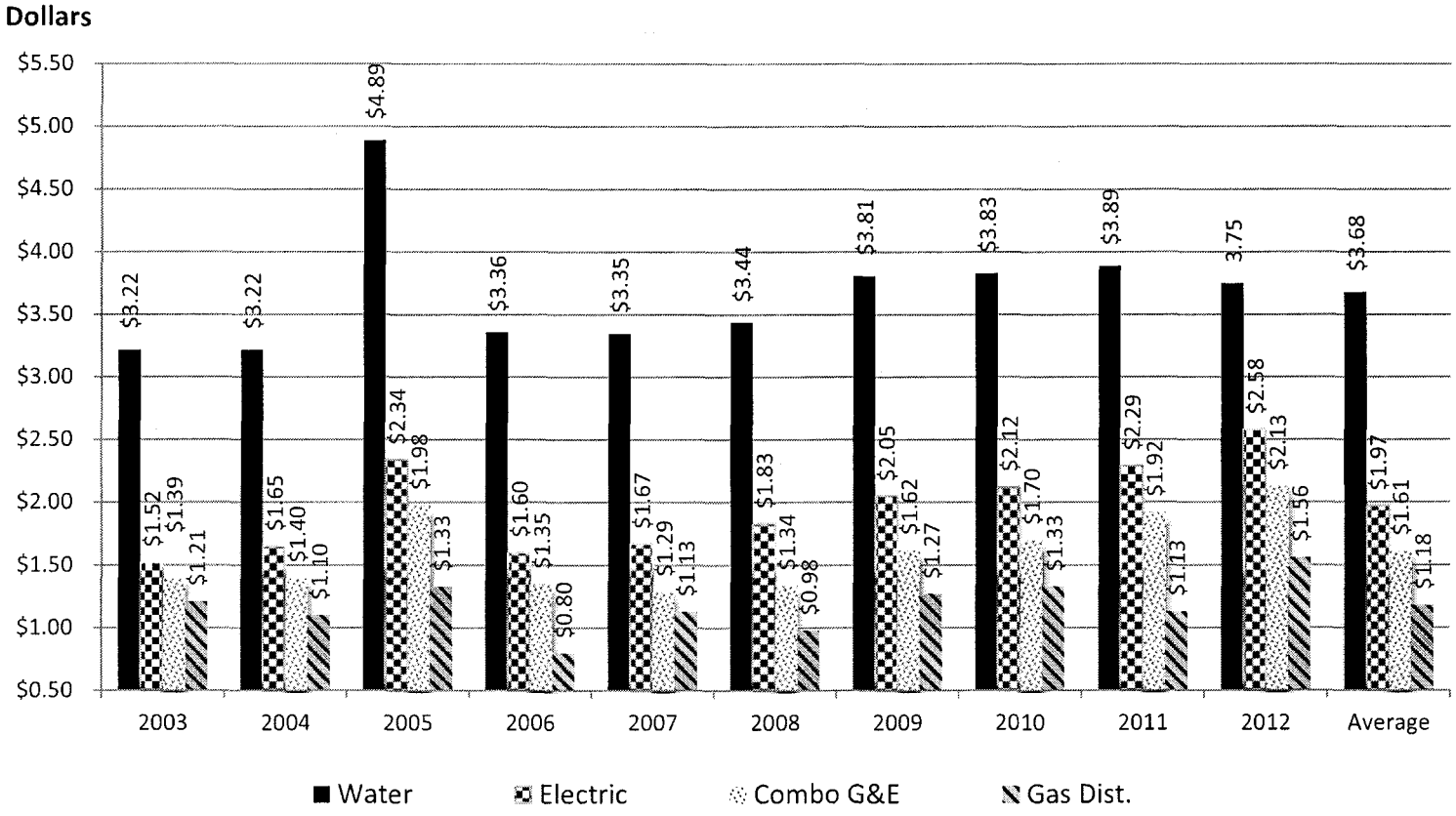
Notes:
Capital Intensity is equal to Net Plant divided by Total Operating Revenue.

Source of Information:
EDGAR Online's I-Metrix Database
Company Annual Forms 10-K

AUS Utility Reports - May 2012
Published By AUS Consultants

Company Provided Information

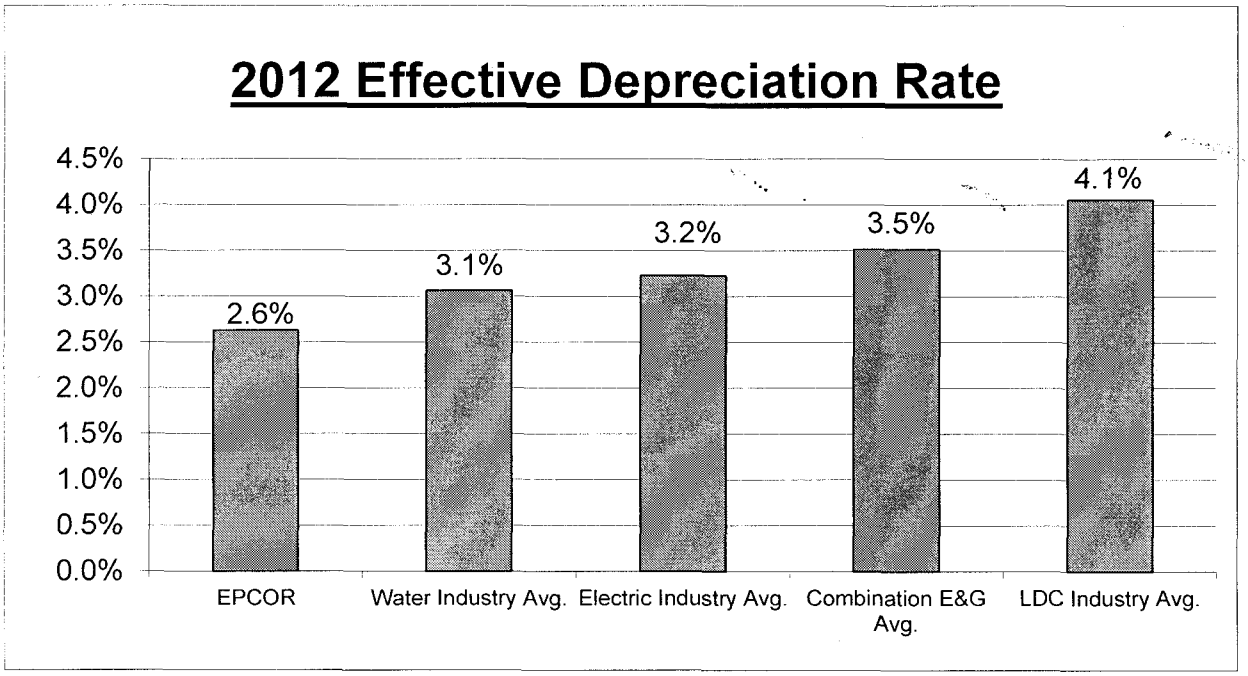
Capital Intensity of the AUS Utility Reports Companies
2003 - 2012



Source of Information: SEC Edgar I-Metrix Online Database

EPCOR Water Arizona, Inc.
2012 Depreciation Rate of EPCOR Water Arizona, Inc. and
AUS Utility Reports Utility Companies Industry Averages

	Depreciation Depletion & Amort. Expense ($ mill)	Average Total Gross Plant Less CWIP ($ mill)	Depreciation Rate (%)	Depreciation Rate EPCOR v. Other Industries (times)
EPCOR Water Arizona, Inc.	$ 22.38	$ 850.86	2.6%	- -
Water Industry Average	$ 73.48	$ 2,397.71	3.1%	83.87%
Electric Industry Average	$ 658.38	$ 20,391.08	3.2%	81.25%
Combination Elec. & Gas Industry Average	$ 650.61	$ 18,499.01	3.5%	74.29%
LDC Gas Distribution Industry Average	$ 175.22	$ 4,318.74	4.1%	63.41%



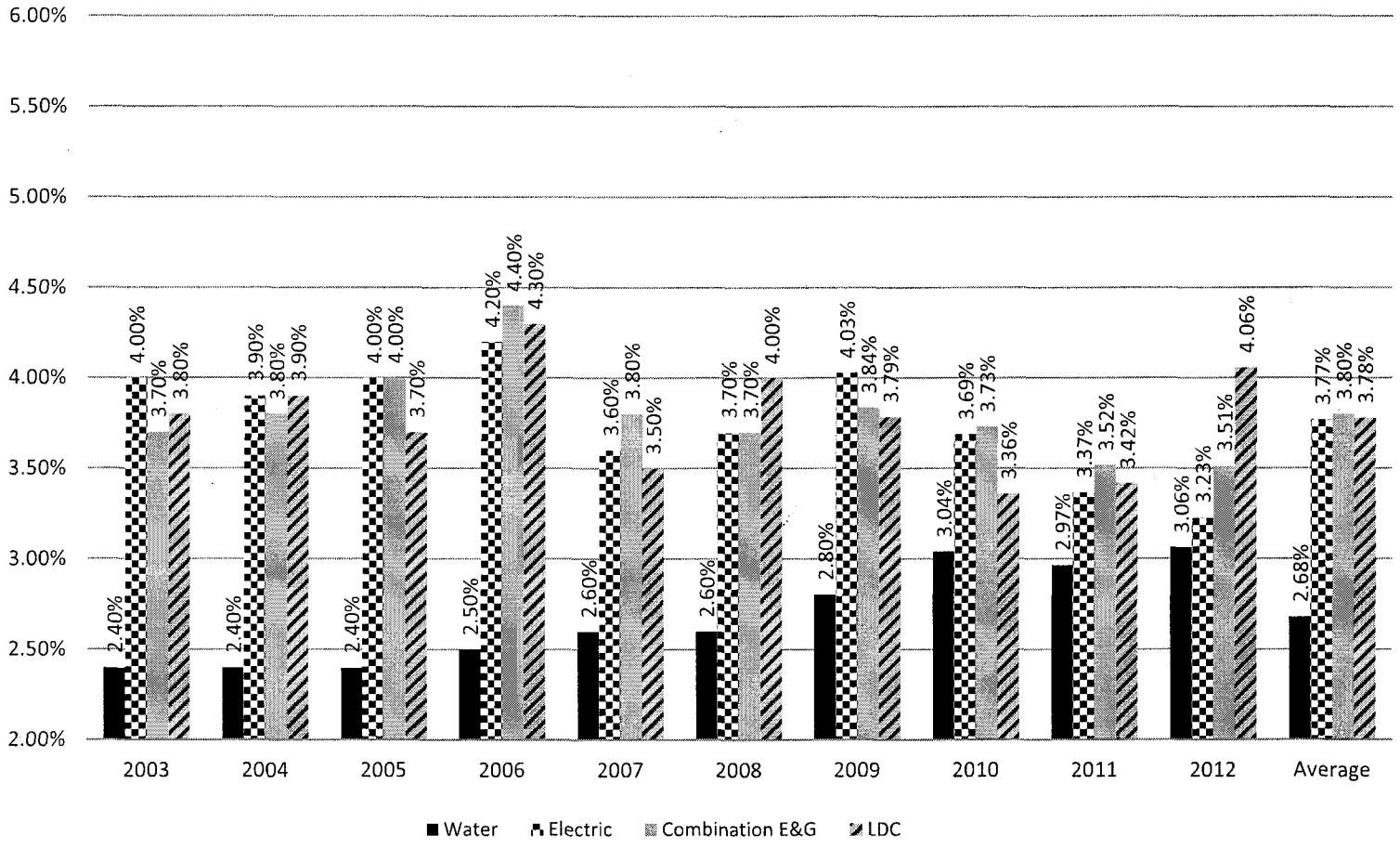
Notes:
Effective Depreciation Rate is equal to Depreciation, Depletion and Amortization Expense divided by average beginning and ending year's Gross Plant minus Construction Work in Progress.

Source of Information:
EDGAR Online's I-Metrix Database
Company Annual Forms 10-K

AUS Utility Report - May 2012
Published by AUS Consultants

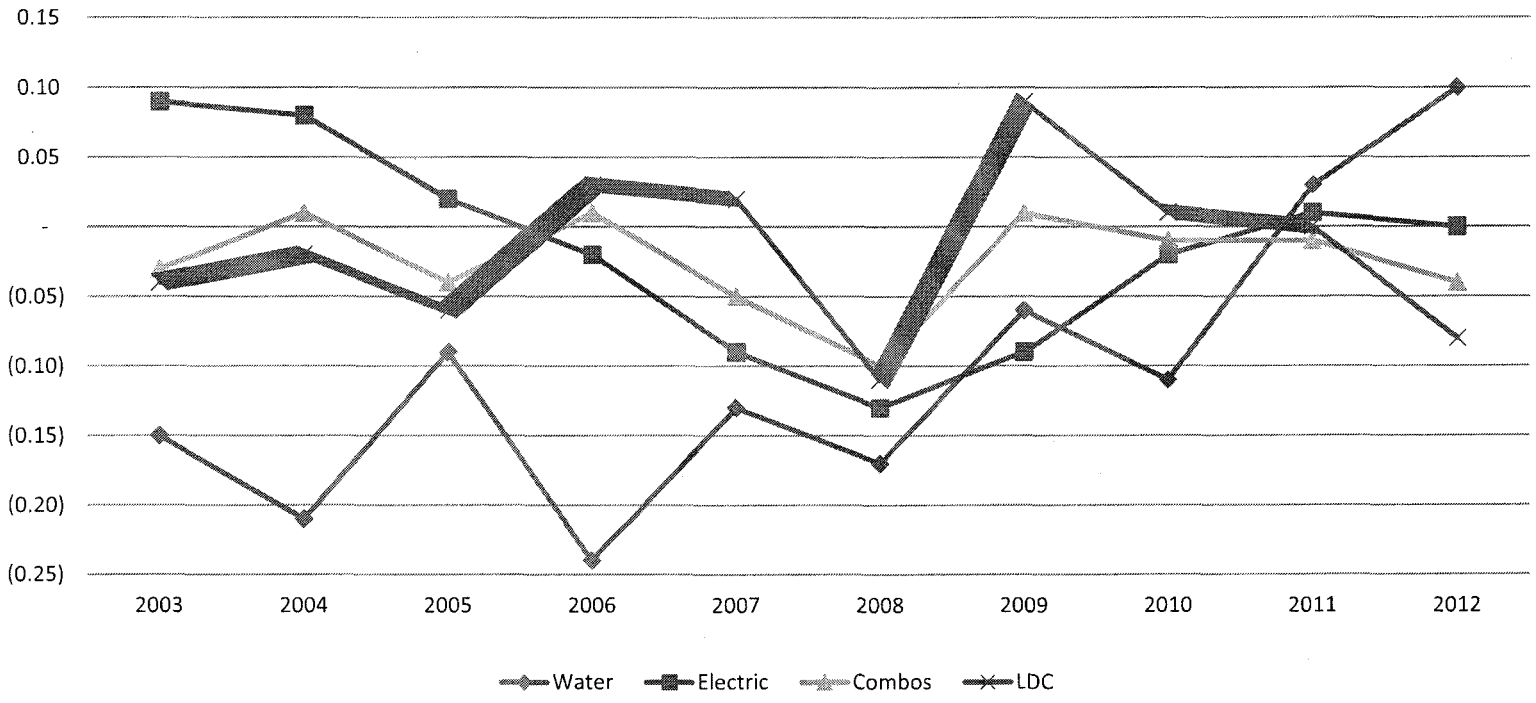
Company Provided Information

Depreciation Rates for the AUS Utility Reports Companies 2003-2012



Source of Information: SEC Edgar I-Metrix Online

Free Cash Flow / Operating Revenues for the AUS Utility Reports Companies 2003-2012



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Criteria | Corporates | General:

Methodology: Business Risk/Financial Risk Matrix Expanded

Criteria Officer:
Mark Puccia, Managing Director, New York (1) 212-438-7233; mark_puccia@standardandpoors.com

Table Of Contents

Business Risk/Financial Risk Framework

Updated Matrix

Financial Benchmarks

How To Use The Matrix--And Its Limitations

Related Criteria And Research

Criteria | Corporates | General:

Methodology: Business Risk/Financial Risk Matrix Expanded

1. Standard & Poor's Ratings Services is refining its methodology for corporate ratings related to its business risk/financial risk matrix, which we published as part of "2008 Corporate Ratings Criteria" on April 15, 2008. We subsequently updated this matrix in the article "Criteria Methodology: Business Risk/Financial Risk Matrix Expanded," published May 27, 2009. In order to provide greater transparency on the methodology used to evaluate corporate ratings, this article updates table 1 of the May 27, 2009, article to reflect how we analyze companies with an excellent business risk profile and minimal financial risk profile, as well as companies with a vulnerable business risk profile and a highly leveraged financial risk profile. This article amends and supersedes both the 2008 and 2009 articles mentioned above. This article is related to "Principles Of Credit Ratings," published on Feb. 16, 2011.

2. We introduced the business risk/financial risk matrix in 2005. The relationships depicted in the matrix represent an essential element of our corporate analytical methodology (see table 1).

Table 1

Business And Financial Risk Profile Matrix

Business Risk Profile	--Financial Risk Profile--					
	Minimal	**Modest**	**Intermediate**	**Significant**	**Aggressive**	**Highly Leveraged**
Excellent	AAA/AA+	AA	A	A-	BBB	--
Strong	AA	A	A-	BBB	BB	BB-
Satisfactory	A-	BBB+	BBB	BB+	BB-	B+
Fair	--	BBB-	BB+	BB	BB-	B
Weak	--	--	BB	BB-	B+	B-
Vulnerable	--	--	--	B+	B	B- or below

These rating outcomes are shown for guidance purposes only. Actual rating should be within one notch of indicated rating outcomes.

3. The rating outcomes refer to issuer credit ratings. The ratings indicated in each cell of the matrix are the midpoints of a range of likely rating possibilities. This range would ordinarily span one notch above and below the indicated rating.

Business Risk/Financial Risk Framework

4. Our corporate analytical methodology organizes the analytical process according to a common framework, and it divides the task into several categories so that all salient issues are considered. The first categories involve fundamental business analysis; the financial analysis categories follow.

5. Our ratings analysis starts with the assessment of the business and competitive profile of the company. Two companies with identical financial metrics can be rated very differently, to the extent that their business challenges and prospects differ. The categories underlying our business and financial risk assessments are:

Business risk

- Country risk
- Industry risk
- Competitive position
- Profitability/Peer group comparisons

Financial risk

- Accounting
- Financial governance and policies/risk tolerance
- Cash flow adequacy
- Capital structure/asset protection
- Liquidity/short-term factors

6. We do not have any predetermined weights for these categories. The significance of specific factors varies from situation to situation.

Updated Matrix

7. We developed the matrix to make explicit the rating outcomes that are typical for various business risk/financial risk combinations. It illustrates the relationship of business and financial risk profiles to the issuer credit rating.

8. We tend to weight business risk slightly more than financial risk when differentiating among investment-grade ratings. Conversely, we place slightly more weight on financial risk for speculative-grade issuers (see table 1, again).

9. This version of the matrix represents a refinement--not any change in rating criteria or standards--and, consequently, no rating changes are expected. However, the expanded matrix should enhance the transparency of the analytical process.

Financial Benchmarks

Table 2

Financial Risk Indicative Ratios (Corporates)

	FFO/Debt (%)	Debt/EBITDA (x)	Debt/Capital (%)
Minimal	greater than 60	less than 1.5	less than 25
Modest	45-60	1.5-2.0	25-35
Intermediate	30-45	2-3	35-45
Significant	20-30	3-4	45-50
Aggressive	12-20	4-5	50-60
Highly Leveraged	less than 12	greater than 5	greater than 60

How To Use The Matrix--And Its Limitations

10. The rating matrix indicative outcomes are what we typically observe--but are not meant to be precise indications or

guarantees of future rating opinions. Positive and negative nuances in our analysis may lead to a notch higher or lower than the outcomes indicated in the various cells of the matrix.

11. In certain situations there may be specific, overarching risks that are outside the standard framework, e.g., a liquidity crisis, major litigation, or large acquisition. This often is the case regarding issuers at the lowest end of the credit spectrum--i.e., the 'CCC' category and lower. These ratings, by definition, reflect some impending crisis or acute vulnerability, and the balanced approach that underlies the matrix framework just does not lend itself to such situations.

12. Similarly, some matrix cells are blank because the underlying combinations are highly unusual--and presumably would involve complicated factors and analysis.

13. The following hypothetical example illustrates how the tables can be used to better understand our rating process (see tables 1 and 2).

14. We believe that Company ABC has a satisfactory business risk profile, typical of a low investment-grade industrial issuer. If we believed its financial risk were intermediate, the expected rating outcome should be within one notch of 'BBB'. ABC's ratios of cash flow to debt (35%) and debt leverage (total debt to EBITDA of 2.5x) are indeed characteristic of intermediate financial risk.

15. It might be possible for Company ABC to be upgraded to the 'A' category by, for example, reducing its debt burden to the point that financial risk is viewed as minimal. Funds from operations (FFO) to debt of more than 60% and debt to EBITDA of only 1.5x would, in most cases, indicate minimal financial risk.

16. Conversely, ABC may choose to become more financially aggressive--perhaps it decides to reward shareholders by borrowing to repurchase its stock. It is possible that the company may fall into the 'BB' category if we view its financial risk as significant. FFO to debt of 20% and debt to EBITDA of 4x would, in our view, typify the significant financial risk category.

17. Still, it is essential to realize that the financial benchmarks are guidelines, neither gospel nor guarantees. They can vary in nonstandard cases: For example, if a company's financial measures exhibit very little volatility, benchmarks may be somewhat more relaxed.

18. Moreover, our assessment of financial risk is not as simplistic as looking at a few ratios. It encompasses:

    - A view of accounting and disclosure practices;
    - A view of corporate governance, financial policies, and risk tolerance;
    - The degree of capital intensity, flexibility regarding capital expenditures and other cash needs, including acquisitions and shareholder distributions; and
    - Various aspects of liquidity--including the risk of refinancing near-term maturities.

19. The matrix addresses a company's standalone credit profile, and does not take account of external influences, which would pertain in the case of government-related entities or subsidiaries that in our view may benefit or suffer from affiliation with a stronger or weaker group. The matrix refers only to local-currency ratings, rather than foreign-currency ratings, which incorporate additional transfer and convertibility risks. Finally, the matrix does not

apply to project finance or corporate securitizations.

Related Criteria And Research

- Principles Of Credit Ratings, Feb. 16, 2011
- Criteria Methodology: Business Risk/Financial Risk Matrix Expanded, May 27, 2009
- 2008 Corporate Ratings Criteria, April 15, 2008

20. These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as Standard & Poor's Ratings Services' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.

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EPCOR Water Arizona, Inc.
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2008 - 2012, Inclusive

	2012	2011	2010	2009	2008	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$ 392.586	$ 356.159	$ 351.857	$ 338.999	$ 349.274	
SHORT-TERM DEBT	-	-	-	-	-	
TOTAL-CAPITAL EMPLOYED	$ 392.586	$ 356.159	$ 351.857	$ 338.999	$ 349.274	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	4.34 %	4.63 %	5.15 %	4.15 %	5.68 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	61.22 %	54.88 %	55.58 %	54.31 %	55.76 %	56.35 %
PREFERRED STOCK	-	-	-	-	-	-
COMMON EQUITY	38.78	45.12	44.42	45.69	44.24	43.65
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	61.22 %	54.88 %	55.58 %	54.31 %	55.76 %	56.35 %
PREFERRED STOCK	-	-	-	-	-	-
COMMON EQUITY	38.78	45.12	44.42	45.69	44.24	43.65
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
DIVIDEND PAYOUT RATIO	- %	- %	- %	- %	- %	- %
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	6.60 %	6.42 %	1.49 %	(0.06) %	(2.46) %	2.40 %
TOTAL DEBT / EBITDA (3)	4.83 x	4.27 x	5.65 x	6.27 x	7.85 x	5.77 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	4.29 %	5.21 %	1.19 %	(0.05) %	(1.84) %	1.76 %
TOTAL DEBT / TOTAL CAPITAL	61.22 %	54.88 %	55.58 %	54.31 %	55.76 %	56.35 %

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt as a percentage of EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization)

(4) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges as a percentage of total debt.

Source of Information: Epcor Water Arizona, Inc.'s Annual Reports to the Arizona Corporation Commission

Proxy Group of Nine Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2008 - 2012, Inclusive

	2012	2011	2010	2009	2008	
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$1,801.379	$1,736.912	$1,712.951	$1,641.561	$1,537.371	
SHORT-TERM DEBT	$55.136	$81.076	$53.463	$31.243	$84.104	
TOTAL CAPITAL EMPLOYED	$1,856.515	$1,817.988	$1,766.414	$1,672.804	$1,621.475	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	5.41 %	5.36 %	5.37 %	5.31 %	5.58 %	
PREFERRED STOCK	5.53	5.53	5.54	5.54	4.32	
CAPITAL STRUCTURE RATIOS						5 YEAR AVERAGE
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	49.12 %	50.69 %	50.97 %	50.80 %	50.35 %	50.39 %
PREFERRED STOCK	0.16	0.18	0.19	0.21	0.22	0.19
COMMON EQUITY	50.72	49.13	48.84	48.99	49.43	49.42
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	50.79 %	52.55 %	53.49 %	53.33 %	53.43 %	52.72 %
PREFERRED STOCK	0.15	0.17	0.18	0.19	0.21	0.18
COMMON EQUITY	49.06	47.28	46.33	46.48	46.36	47.10
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	6.45 %	6.33 %	6.38 %	4.64 %	5.91 %	5.94 %
MARKET / AVERAGE BOOK RATIO	166.26	156.32	150.17	138.52	155.49	153.35
DIVIDEND YIELD	3.84	4.09	4.26	4.72	4.49	4.28
DIVIDEND PAYOUT RATIO	61.46	67.87	66.67	60.06	73.68	65.95
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	9.94 %	8.99 %	8.98 %	6.99 %	6.39 %	8.26 %
TOTAL DEBT / EBITDA (3)	3.84 X	4.34 X	4.75 X	5.53 X	9.07 X	5.51 X
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	20.65 %	18.82 %	17.10 %	16.41 %	16.14 %	17.82 %
TOTAL DEBT / TOTAL CAPITAL	50.79 %	52.55 %	53.49 %	53.33 %	53.43 %	52.72 %

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt relative to EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).

(4) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges as a percentage of total debt.

Source of Information: I-Metrix Database
Company SEC Form 10-K

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Nine Water Companies
2008 - 2012, Inclusive

	2012	2011	2010	2009	2008	5 YEAR AVERAGE
American States Water Co.						
Long-Term Debt	42.49 %	45.46 %	44.30 %	46.95 %	46.25 %	45.09 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	57.51	54.54	55.70	53.05	53.75	54.91
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Co., Inc.						
Long-Term Debt	54.30 %	55.72 %	56.73 %	56.98 %	53.75 %	55.49 %
Preferred Stock	0.21	0.27	0.29	0.30	0.32	0.28
Common Equity	45.49	44.01	42.98	42.72	45.93	44.23
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Aqua America, Inc.						
Long-Term Debt	53.41 %	54.11 %	57.05 %	56.59 %	54.21 %	55.08 %
Preferred Stock	0.01	0.02	0.02	0.02	0.09	0.03
Common Equity	46.58	45.87	42.93	43.39	45.70	44.89
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Artesian Resources Corp.						
Long-Term Debt	47.60 %	48.93 %	52.84 %	54.12 %	59.57 %	52.61 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	52.40	51.07	47.16	45.88	40.43	47.39
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	50.39 %	52.04 %	52.51 %	47.93 %	41.88 %	48.95 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	49.61	47.96	47.49	52.07	58.12	51.05
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Connecticut Water Service, Inc.						
Long-Term Debt	49.03 %	53.05 %	49.32 %	50.59 %	46.94 %	49.79 %
Preferred Stock	0.21	0.30	0.34	0.35	0.39	0.32
Common Equity	50.76	46.65	50.34	49.06	52.67	49.89
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Company						
Long-Term Debt	43.53 %	43.12 %	43.91 %	47.35 %	49.10 %	45.40 %
Preferred Stock	1.02	1.06	1.07	1.24	1.22	1.12
Common Equity	55.45	55.82	55.02	51.41	49.68	53.48
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Corporation						
Long-Term Debt	55.39 %	56.63 %	53.79 %	49.52 %	46.08 %	52.28 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	44.61	43.37	46.21	50.48	53.92	47.72
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
York Water Company						
Long-Term Debt	45.98 %	47.16 %	48.28 %	47.16 %	55.31 %	48.78 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	54.02	52.84	51.72	52.84	44.69	51.22
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Nine Water Companies						
Long-Term Debt	49.12 %	50.69 %	50.97 %	50.80 %	50.35 %	50.39 %
Preferred Stock	0.16	0.18	0.19	0.21	0.22	0.19
Common Equity	50.72	49.13	48.84	48.99	49.43	49.42
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information
EDGAR Online's I-Metrix Database
Annual Forms 10-K

EPCOR Water Arizona, Inc.
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for
the Proxy Group of Nine Water Companies

	1	2	3	4	5	6	7	8
Proxy Group of Nine Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Reuters Mean Consensus Projected Five Year Growth Rate in EPS	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Co.	2.94 %	6.00 %	2.00 %	2.00 %	2.00 %	3.00 %	2.98 %	5.98 %
American Water Works Co., Inc.	2.73	10.00	8.50	7.20	7.45	8.29	2.84	11.13
Aqua America, Inc.	2.46	8.00	7.40	5.30	5.80	6.63	2.54	9.17
Artesian Resources Corp.	3.76	NA	NA	NA	4.00	4.00	3.84	7.84
California Water Service Group	3.14	6.50	NA	6.00	6.00	6.17	3.24	9.41
Connecticut Water Service, Inc.	3.16	5.50	5.00	5.00	5.00	5.13	3.24	8.37
Middlesex Water Company	3.65	4.00	NA	NA	2.70	3.35	3.71	7.06
SJW Corporation	2.64	7.50	NA	NA	14.00	10.75	2.78	13.53
York Water Company	2.70	4.00	NA	NA	4.90	4.45	2.76	7.21
Average								8.86 %
Median								8.37 %

NA= Not Available
NMF = Not Meaningful Figure

Notes:

(1) Indicated dividend at 10/31/2013 divided by the average closing price of the last 60 trading days ending 10/31/2013 for each company.
(2) From pages 3 through 11 of this Exhibit.
(3) Average of columns 2 through 5 excluding negative growth rates.
(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co., 2.94% x (1.00+(1/2 x 0.030))= 2.98%.
(5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey
www.reuters.com Downloaded on 11/01/2013
www.zacks.com Downloaded on 11/01/2013
www.yahoo.com Downloaded on 11/01/2013

EPCOR Water Arizona, Inc.
Example of the Inadequacy of
DCF Return Rate Related to Book Value
When Market Value Exceeds Book Value

Line No.		Based on the Proxy Group of Nine Water Companies (1) Market Value	(2) Book Value
1.	Per Share	$ 26.994 (1)	$ 13.574 (2)
2.	DCF Cost Rate (3)	8.86%	8.86%
3.	Return in Dollars	$ 2.392	$ 1.203
4.	Dividends	$ 0.837 (4)	$ 0.837 (4)
5.	Growth in Dollars	$ 1.555	$ 0.366
6.	Return on Market Value (5)	8.86%	4.46%
7.	Rate of Growth on Market Value (6)	5.75%	1.36%

Notes:

(1) Average market price of Ms. Ahern's proxy group of water companies as shown in column 4 on page 2 of Schedule 10.

(2) Average book value of Ms. Ahern's proxy group of water companies as shown in column 2 on page 2 of Schedule 10.

(3) From page 1 of Schedule 5.

(4) Dividends per share based upon a 3.10% adjusted dividend yield. $0.837 = $26.994 * 3.10%.

(5) Line 3 / market value per share (line 1 column (a)).

(6) Line 6 - average dividend yield from page 1 of this Schedule.

AMER. STATES WATER NYSE-AWR

RECENT PRICE 26.48 | P/E RATIO 17.9 (Trailing: 17.4 Median: 22.0) | RELATIVE P/E RATIO 1.02 | DIV'D YLD 3.1% | VALUE LINE

TIMELINESS 3 Lowered 8/16/13
SAFETY 2 Raised 7/20/12
TECHNICAL 3 Raised 8/23/13
BETA .70 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	40	(+50%)	14%
Low	30	(+15%)	7%

Insider Decisions

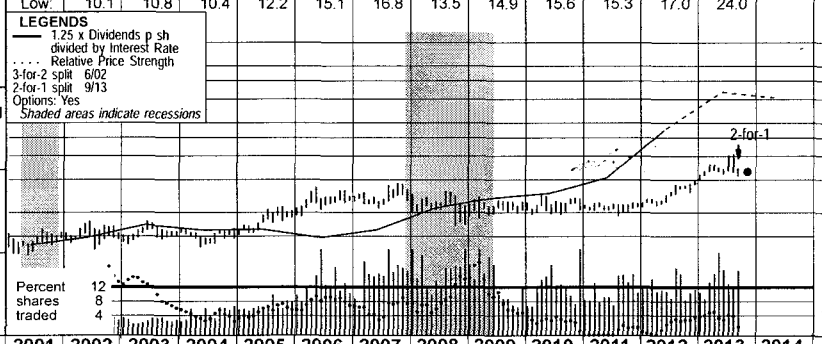
	N	D	J	F	M	A	M	J	J
to Buy	0	1	0	0	0	0	2	1	0
Options	1	1	1	0	0	1	4	4	0
to Sell	2	3	1	0	0	0	5	5	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	77	93	98
to Sell	64	59	70
Hld's(000)	24066	24964	24268

	High:	14.5	14.5	13.4	17.3	21.9	23.1	21.0	19.4	19.8	18.2	24.1	33.1
	Low:	10.1	10.8	10.4	12.2	15.1	16.8	13.5	14.9	15.6	15.3	17.0	24.0

LEGENDS
— 1.25 x Dividends p sh divided by Interest Rate
···· Relative Price Strength
3-for-2 split 6/02
2-for-1 split 9/13
Options: Yes
Shaded areas indicate recessions



Percent shares traded 12 8 4

Target Price Range 2016 | 2017 | 2018
128 96 80 64 48 40 32 24 16 12

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	27.6	31.2
3 yr.	68.6	60.1
5 yr.	66.2	110.2

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
5.72	5.51	6.45	6.08	6.53	6.89	6.99	6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.30	12.50	Revenues per sh	12.75
.92	1.02	1.13	1.10	1.26	1.27	1.04	1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.60	2.65	"Cash Flow" per sh	3.20
.52	.54	.60	.64	.67	.67	.39	.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.50	1.55	Earnings per sh A	1.70
.42	.42	.43	.43	.43	.44	.44	.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	Div'd Decl'd per sh B■	.95
1.29	1.56	2.15	1.51	1.59	1.34	1.88	2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.15	2.20	Cap'l Spending per sh	2.10
5.62	5.74	5.91	6.37	6.61	7.02	6.98	7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	11.85	12.50	Book Value per sh	14.25
26.87	26.87	26.87	30.24	30.24	30.36	30.42	33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	39.00	40.00	Common Shs Outst'g C	44.00
14.5	15.5	17.1	15.9	16.7	18.3	31.9	23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	19.5
.84	.81	.97	1.03	.86	1.00	1.82	1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91			Relative P/E Ratio	1.30
5.5%	5.0%	4.2%	4.2%	3.9%	3.6%	3.5%	3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%			Avg Ann'l Div'd Yield	3.1%
212.7	228.0	236.2	268.6	301.4	318.7	361.0	398.9	419.3	466.9	480	500	Revenues ($mill)	560
11.9	16.5	22.5	23.1	28.0	26.8	29.5	41.4	42.0	54.1	58.0	60.0	Net Profit ($mill)	73.0
43.5%	37.4%	47.0%	40.5%	42.6%	37.8%	38.9%	43.2%	41.7%	39.9%	40.0%	40.0%	Income Tax Rate	40.0%
--	--	--	12.2%	8.5%	6.9%	3.2%	5.8%	2.0%	2.5%	2.5%	2.5%	AFUDC % to Net Profit	2.5%
52.0%	47.7%	50.4%	48.6%	46.9%	46.2%	45.9%	44.3%	45.4%	42.2%	43.0%	43.0%	Long-Term Debt Ratio	43.0%
48.0%	52.3%	49.6%	51.4%	53.1%	53.8%	54.1%	55.7%	54.6%	57.8%	57.0%	57.0%	Common Equity Ratio	57.0%
442.3	480.4	532.5	551.6	569.4	577.0	665.0	677.4	749.1	787.0	805	875	Total Capital ($mill)	1025
602.3	664.2	713.2	750.6	776.4	825.3	866.4	855.0	896.5	917.8	940	985	Net Plant ($mill)	1100
4.6%	5.2%	5.4%	6.0%	6.7%	6.4%	5.9%	7.6%	7.1%	8.3%	7.0%	7.0%	Return on Total Cap'l	6.5%
5.6%	6.6%	8.5%	8.1%	9.3%	8.6%	8.2%	11.0%	10.3%	11.9%	12.5%	12.0%	Return on Shr. Equity	11.5%
5.6%	6.6%	8.5%	8.1%	9.3%	8.6%	8.2%	11.0%	10.3%	11.9%	12.5%	12.0%	Return on Com Equity	11.5%
NMF	1.0%	2.8%	2.7%	3.9%	3.1%	3.2%	5.8%	5.3%	6.6%	6.0%	6.0%	Retained to Com Eq	5.0%
113%	84%	67%	67%	58%	64%	61%	47%	49%	45%	51%	54%	All Div'ds to Net Prof	56%

CAPITAL STRUCTURE as of 6/30/13
Total Debt $335.8 mill. **Due in 5 Yrs** $10.6 mill.
LT Debt $332.4 mill. **LT Interest** $8.0 mill.
(LT interest earned: 5.2x: total interest coverage: 4.9x) (42% of Cap'l)
Leases, Uncapitalized: Annual rentals $3.0 mill.
Pension Assets-12/12 $107.6 mill. **Oblig.** $163.2 mill.
Pfd Stock None.
Common Stock 38,688,804 shs.
as of 8/6/13 *(Reflects 2-for-1 stock split paid 9/3/13.)*
MARKET CAP: $1.0 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	1.3	23.5	8.5
Other	164.3	160.5	172.6
Current Assets	165.6	184.0	181.1
Accts Payable	37.9	40.6	55.2
Debt Due	.3	3.3	3.4
Other	66.2	49.8	43.8
Current Liab.	104.4	93.7	102.4
Fix. Chg. Cov.	401%	442%	450%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	5.5%	7.5%	2.0%
"Cash Flow"	6.5%	9.0%	6.0%
Earnings	6.5%	11.5%	6.0%
Dividends	3.0%	4.5%	9.0%
Book Value	5.0%	5.5%	2.0%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	88.4	95.5	111.3	103.7	398.9
2011	94.3	109.8	119.9	95.3	419.3
2012	107.6	114.3	133.5	111.5	466.9
2013	110.5	120.7	*135*	*113.8*	*480*
2014	*115*	*125*	*140*	*120*	*500*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	.23	.24	.31	.33	1.11
2011	.19	.34	.42	.17	1.12
2012	.27	.40	.49	.26	1.41
2013	.35	.43	*.48*	*.24*	*1.50*
2014	*.33*	*.42*	*.55*	*.30*	*1.60*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.125	.125	.125	.13	.51
2010	.13	.13	.13	.13	.52
2011	.13	.14	.14	.14	.55
2012	.14	.14	.178	.178	.64
2013	.178	.178	.203		

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Company, it supplies water to more than 250,000 customers in 75 communities in 10 counties. Service areas include the greater metropolitan areas of Los Angeles and Orange Counties. The company also provides electric utility services to nearly 23,250 customers in the city of Big Bear Lake and in areas of San Bernardino County. Sold Chaparral City Water of Arizona (6/11). Has 728 employees. Officers & directors own 2.9% of common stock (4/12 Proxy). Chairman: Lloyd Ross. President & CEO: Robert J. Sprowls. Inc: CA. Addr: 630 East Foothill Boulevard, San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

Nonutility operations are a key component of American States Water. Last year, its nonregulated subsidiary, American States Utilities Services (ASUS), accounted for $0.39 a share, or 28% of the company's share net. This percentage was easily the highest among the eight water utilities that *Value Line* follows.

Estimating future profits from these businesses will be more difficult in the years ahead. The core of the ASUS profits has come from operating and maintaining water services at eight U.S. military bases. Some analysts on Wall Street believe that 2012 was perhaps the peak earnings year for ASUS, but we think that these projections are conservative. True, the company's backlog of new projects isn't large. However, with a substantial number of military facilities yet to be privatized, we believe that ASUS' good reputation with the Department of Defense will greatly help it win a fair share of future contracts. Thus, we think earnings of between $0.40 a share and $0.50 a share from this segment are attainable to the 2016-2018 pull. Since winning contracts is less predictable than its core business, American States earnings might experience greater swings than in the past.

Meanwhile, core regulated operations are doing fine. Due mostly TO a recent rate increase granted to Golden State Water (the main water utility), earnings growth should be somewhere in the 5%-7% range. Indeed,

We're raising our earnings projections again. For the second straight quarter, American States share net exceeded expectations in the June period. As a result, we are nudging the company's earnings-per-share estimates higher by $0.05 in 2013, and $0.10 in 2014, respectively. *(Please note that all figures on the page have been changed to reflect the two-for-one stock split paid on September 3rd.)*

American States' shares offer slightly better-than-average potential long-term returns for a water utility. The current yield is typical for the industry, but dividend growth prospects are higher than the group norm. Moreover, the company is the third-largest water utility we follow, and is the only one that rates an A Financial Strength Rating.

James A. Flood *October 18, 2013*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '08, (14¢); '10, (23¢) '11, 10¢. Next earnings report due early November. Quarterly egs. may not add due to rounding.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for splits.

Company's Financial Strength	A
Stock's Price Stability	90
Price Growth Persistence	75
Earnings Predictability	90

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AMERICAN WATER NYSE-AWK

RECENT PRICE 40.09 | P/E RATIO 18.0 (Trailing: 19.5 Median: NMF) | RELATIVE P/E RATIO 1.02 | DIV'D YLD 2.9% | VALUE LINE

TIMELINESS 3 Raised 10/4/13
SAFETY 3 New 7/25/08
TECHNICAL 3 Lowered 8/9/13
BETA .65 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	60	(+50%)	13%
Low	45	(+10%)	6%

Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	0	0	0	0	0	0	0	0	0
Options	4	0	0	0	8	0	3	0	0
to Sell	4	0	0	0	8	0	3	0	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	188	191	165
to Sell	175	186	209
Hld's(000)	146609	145912	144834

LEGENDS
1.00 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
Options: Yes
Shaded areas indicate recessions

High: 23.7 23.0 25.8 32.8 39.4 43.7
Low: 16.5 16.2 19.4 25.2 31.3 37.0

Target Price Range 2016 | 2017 | 2018: 80, 60, 50, 40, 30, 25, 20, 15, 10, 7.5

Percent shares traded: 21, 14, 7

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	14.4	31.2
3 yr.	93.8	60.1
5 yr.	127.5	110.2

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006E	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
--	--	--	--	--	--	--	--	--	13.08	13.84	14.61	13.98	15.49	15.18	16.25	*16.60*	*17.50*	Revenues per sh	*20.25*
--	--	--	--	--	--	--	--	--	.65	d.47	2.87	2.89	3.56	3.73	4.27	*4.45*	*4.70*	"Cash Flow" per sh	*5.25*
--	--	--	--	--	--	--	--	--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	*2.20*	*2.40*	Earnings per sh A	*2.90*
--	--	--	--	--	--	--	--	--	--	--	.40	.82	.86	.91	.96	*1.06*	*1.20*	Div'd Decl'd per sh B■	*1.40*
--	--	--	--	--	--	--	--	--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	*5.35*	*5.35*	Cap'l Spending per sh	*5.50*
--	--	--	--	--	--	--	--	--	23.86	28.39	25.64	22.91	23.59	24.11	25.10	*26.40*	*27.50*	Book Value per sh D	*30.00*
--	--	--	--	--	--	--	--	--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	*178.50*	*180.00*	Common Shs Outst'g g C	*185.00*
--	--	--	--	--	--	--	--	--	--	--	18.9	15.6	14.6	16.8	16.7	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*18.5*
--	--	--	--	--	--	--	--	--	--	--	1.14	1.04	.93	1.05	1.07			Relative P/E Ratio	*1.25*
--	--	--	--	--	--	--	--	--	--	--	1.9%	4.2%	3.8%	3.1%	2.7%			Avg Ann'l Div'd Yield	*2.7%*
--	--	--	--	--	--	--	--	--	2093.1	2214.2	2336.9	2440.7	2710.7	2666.2	2876.9	*2960*	*3150*	Revenues ($mill)	*3750*
--	--	--	--	--	--	--	--	--	d155.8	d342.3	187.2	209.9	267.8	304.9	375.0	*390*	*430*	Net Profit ($mill)	*535*
--	--	--	--	--	--	--	--	--	--	--	37.4%	37.9%	40.4%	39.5%	40.7%	*40.0%*	*40.0%*	Income Tax Rate	*40.0%*
--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.5%	6.2%	*8.0%*	*10.0%*	AFUDC % to Net Profit	*12.0%*
--	--	--	--	--	--	--	--	--	56.1%	50.9%	53.1%	56.9%	56.8%	55.7%	53.8%	*54.0%*	*54.0%*	Long-Term Debt Ratio	*54.5%*
--	--	--	--	--	--	--	--	--	43.9%	49.1%	46.9%	43.1%	43.2%	44.2%	46.0%	*46.0%*	*46.0%*	Common Equity Ratio	*45.5%*
--	--	--	--	--	--	--	--	--	8692.8	9245.7	8750.2	9289.0	9561.3	9580.3	9652.7	*10300*	*10800*	Total Capital ($mill)	*11800*
--	--	--	--	--	--	--	--	--	8720.6	9318.0	9991.8	10524	11059	11021	11739	*12300*	*12800*	Net Plant ($mill)	*14200*
--	--	--	--	--	--	--	--	--	NMF	NMF	3.7%	3.8%	4.4%	4.8%	5.5%	*5.5%*	*5.5%*	Return on Total Cap'l	*6.0%*
--	--	--	--	--	--	--	--	--	NMF	NMF	4.6%	5.2%	6.5%	7.2%	8.4%	*8.0%*	*8.5%*	Return on Shr. Equity	*9.5%*
--	--	--	--	--	--	--	--	--	NMF	NMF	4.6%	5.2%	6.5%	7.2%	8.4%	*8.0%*	*8.5%*	Return on Com Equity	*9.5%*
--	--	--	--	--	--	--	--	--	NMF	NMF	3.0%	1.8%	2.8%	3.5%	4.6%	*4.5%*	*4.5%*	Retained to Com Eq	*4.5%*
--	--	--	--	--	--	--	--	--	--	--	34%	65%	56%	52%	45%	*48%*	*50%*	All Div'ds to Net Prof	*50%*

CAPITAL STRUCTURE as of 6/30/13
Total Debt $5761.0 mil. **Due in 5 Yrs** $1034.0 mil.
LT Debt $5180.7 mil. **LT Interest** $301.0 mil.
(Total interest coverage: 4.4x) *(53% of Cap'l)*

Leases, Uncapitalized: Annual rentals $28.1 mill.
Pension Assets $1157.7 mill
Oblig. $1621.2 mill.
Pfd Stock $17.6 mill. **Pfd Div'd** $.7 mill

Common Stock 177,964,133 shs.
as of 8/1/13

MARKET CAP: $7.1 billion (Large Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	14.2	24.4	20.4
Other	1383.5	475.0	525.4
Current Assets	1397.7	499.4	545.8
Accts Payable	243.7	279.6	178.4
Debt Due	543.9	385.9	580.3
Other	701.5	329.3	290.6
Current Liab.	1489.1	994.8	1049.3
Fix. Chg. Cov.	256%	292%	*300%*

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	--	3.0%	*5.0%*
"Cash Flow"	--	NMF	*6.5%*
Earnings	--	--	*10.0%*
Dividends	--	--	*9.0%*
Book Value	--	-1.5%	*4.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	588.1	671.2	786.9	664.5	2710.7
2011	596.7	668.8	760.9	639.8	2666.2
2012	618.7	745.6	831.8	680.8	2876.9
2013	636.1	724.3	*890*	*709.6*	*2960*
2014	*670*	*775*	*945*	*760*	*3150*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	.18	.42	.71	.23	1.53
2011	.23	.42	.73	.32	1.72
2012	.28	.66	.87	.30	2.11
2013	.32	.57	*.90*	*.41*	*2.20*
2014	*.35*	*.65*	*1.00*	*.40*	*2.40*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.20	.20	.21	.21	.82
2010	.21	.21	.22	.22	.86
2011	.22	.23	.23	.23	.91
2012	.23	.23	.25	.25	.96
2013	.25	.25	.28		

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to over 14 million people in over 30 states and Canada. It's nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 89.1% of 2012 revenues. New Jersey is its biggest market accounting for 22.2% of revenues. Has roughly 7,000 employees. Depreciation rate, 2.6% in '12. BlackRock, Inc., owns 10.3% of the common stock outstanding. Off. & dir. own less than 1% (3/13 Proxy). President & CEO; Jeffry Sterba. Chairman; George Mackenzie. Address: 1025 Laurel Oak Road, Voorhees, NJ 08043. Telephone: 856-346-8200. Internet: www.amwater.com.

American Water Works continues to do a good job of staying on the right side of regulators. The company must contend with 30 different state regulatory commissions in order to recoup the large sums that it is investing in its individual water systems located throughout the country. The utility's basic formula for success in dealing with regulators has been to keep costs low. This feat has been achieved by improving operating margins and continually reducing expense ratios, a trend we expect to continue. Indeed, effective cost containment makes it much more difficult for state commissions to deny much needed rate increases.

Expansion via acquisitions will remain a key element to American Water's long-term growth. The company should continue to scoop up some of the small water utilities that cash-strapped municipalities are willing to sell. Sixteen purchases were made last year and 10 have already been completed so far in 2013. It is American Water's expertise in integrating these new entities into its existing operations and reducing overhead that is behind its leaner cost structure.

American Water's construction budget should be large but manageable. Capital expenditures will probably be close to $1 billion a year over the next 3- to 5-year period, due to the need to upgrade and repair the company's aging infrastructure. Internally generated funds will probably cover only about 75% of the outlays over this time frame. As a result, American Water will most likely have to issue more debt to make up the difference.

American Water's earnings and dividend growth prospects are good. The combination of efficient operations, inorganic growth, and greater contributions from nonutility businesses should enable annual earnings and dividend increases in the 7% to 10% range (versus about 5% for the industry) for the foreseeable future.

Long-term, income-oriented investors might like these shares. The yield on AWK's stock is close to the industry norm, yet its dividend growth prospects are well above-average. So, even though the stock is currently not timely, it still holds more appeal than most water utilities to the pull to 2016-2018.

James A. Flood *October 18, 2013*

(A) Diluted earnings. Excludes nonrecurring losses: '08, $4.62; '09, $2.63; '11, $0.07. Discontinued operations: '06, (4¢); '11, 3¢; '12, (10¢). Next earnings report due late October. Quarterly earnings may not sum due to rounding. (B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available. (C) In millions. (D) Includes intangibles. In 2012: $1.207 billion, $6.82/share. (E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B+
Stock's Price Stability	95
Price Growth Persistence	90
Earnings Predictability	20

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AQUA AMERICA NYSE-WTR

RECENT PRICE 23.97 | P/E RATIO 20.3 (Trailing: 22.7 Median: 24.0) | RELATIVE P/E RATIO 1.15 | DIV'D YLD 2.6% | VALUE LINE

TIMELINESS 3 Lowered 5/24/13
SAFETY 2 Raised 4/20/12
TECHNICAL 3 Raised 9/13/13
BETA .60 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	40	(+65%)	19%
Low	25	(+5%)	4%

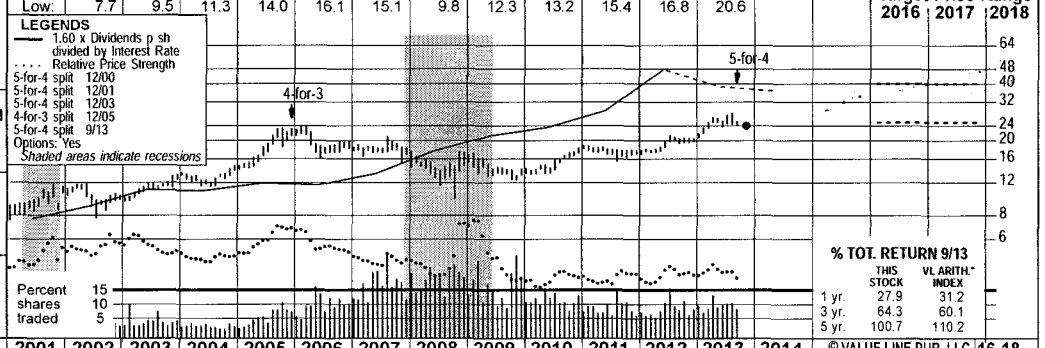
Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	0	0	0	0	0	0	0	0	0
Options	0	1	3	2	2	0	0	1	3
to Sell	0	0	2	0	0	0	0	2	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	118	136	141
to Sell	117	116	130
Hld's(000)	83977	82403	82501

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
	1.61	1.67	1.93	1.97	2.16	2.28	2.38	2.78	3.08	3.23	3.61	3.71	3.93	4.21	4.10	4.32	*4.45*	*4.60*	Revenues per sh	*4.95*
	.45	.49	.58	.61	.69	.76	.77	.87	.97	1.01	1.10	1.14	1.29	1.42	1.45	1.51	*1.60*	*1.70*	"Cash Flow" per sh	*1.85*
	.27	.32	.33	.37	.41	.43	.46	.51	.57	.56	.57	.58	.62	.72	.83	.87	*1.15*	*1.25*	Earnings per sh A	*1.45*
	.19	.20	.22	.23	.24	.26	.28	.29	.32	.35	.38	.41	.44	.47	.50	.54	*.58*	*.64*	Div'd Decl'd per sh B■	*.85*
	.46	.65	.72	.93	.87	.96	1.06	1.23	1.47	1.64	1.43	1.58	1.66	1.89	1.90	1.98	*2.15*	*2.15*	Cap'l Spending per sh	*2.15*
	2.27	2.57	2.74	3.08	3.32	3.49	4.27	4.71	5.04	5.57	5.85	6.26	6.50	6.81	7.21	7.90	*8.90*	*9.60*	Book Value per sh	*11.50*
	84.33	90.25	133.50	139.78	142.47	141.49	154.31	158.97	161.21	165.41	166.75	169.21	170.61	172.46	173.60	175.43	*177.50*	*179.50*	Common Shs Outst'g C	*184.00*
	17.8	22.5	21.2	18.2	23.6	23.6	24.5	25.1	31.8	34.7	32.0	24.9	23.1	21.1	21.3	21.9	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*22.5*
	1.03	1.17	1.21	1.18	1.21	1.29	1.40	1.33	1.69	1.87	1.70	1.50	1.54	1.34	1.34	1.40			Relative P/E Ratio	*1.50*
	3.9%	2.9%	3.0%	3.3%	2.5%	2.5%	2.5%	2.3%	1.8%	1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%			Avg Ann'l Div'd Yield	*2.6%*
							367.2	442.0	496.8	533.5	602.5	627.0	670.5	726.1	712.0	757.8	*790*	*830*	Revenues ($mill)	*915*
							67.3	80.0	91.2	92.0	95.0	97.9	104.4	124.0	144.8	153.1	*205*	*225*	Net Profit ($mill)	*265*
							39.3%	39.4%	38.4%	39.6%	38.9%	39.7%	39.4%	39.2%	32.9%	39.0%	*40.0%*	*40.0%*	Income Tax Rate	*40.0%*
							--	--	--	--	--	--	--	--	2.9%	3.1%	*3.0%*	*3.0%*	AFUDC % to Net Profit	*2.0%*
							51.4%	50.0%	52.0%	51.6%	55.4%	54.1%	55.6%	56.6%	52.7%	52.7%	*50.0%*	*50.0%*	Long-Term Debt Ratio	*50.0%*
							48.6%	50.0%	48.0%	48.4%	44.6%	45.9%	44.4%	43.4%	47.3%	47.3%	*50.0%*	*50.0%*	Common Equity Ratio	*50.0%*
							1355.7	1497.3	1690.4	1904.4	2191.4	2306.6	2495.5	2706.2	2646.8	2929.7	*3150*	*3450*	Total Capital ($mill)	*4230*
							1824.3	2069.8	2280.0	2506.0	2792.8	2997.4	3227.3	3469.3	3612.9	3936.2	*4150*	*4350*	Net Plant ($mill)	*4900*
							6.4%	6.7%	6.9%	6.4%	5.9%	5.7%	5.6%	5.9%	6.9%	6.6%	*6.0%*	*6.0%*	Return on Total Cap'l	*6.5%*
							10.2%	10.7%	11.2%	10.0%	9.7%	9.3%	9.4%	10.6%	11.6%	11.0%	*12.0%*	*12.0%*	Return on Shr. Equity	*12.5%*
							10.2%	10.7%	11.2%	10.0%	9.7%	9.3%	9.4%	10.6%	11.6%	11.0%	*12.0%*	*12.0%*	Return on Com Equity	*12.5%*
							4.2%	4.6%	4.9%	3.7%	3.2%	2.8%	2.7%	3.7%	4.6%	4.3%	*6.0%*	*6.0%*	Retained to Com Eq	*5.0%*
							59%	57%	56%	63%	67%	70%	72%	65%	60%	61%	*52%*	*52%*	All Div'ds to Net Prof	*59%*



Target Price Range 2016 | 2017 | 2018

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	27.9	31.2
3 yr.	64.3	60.1
5 yr.	100.7	110.2

CAPITAL STRUCTURE as of 6/30/13
Total Debt $1648.4 mill. Due in 5 Yrs $368.3 mill.
LT Debt $1489.8 mill. LT Interest $60.0 mill.
(LT interest earned: 5.0x; total interest coverage: 4.1x) (51% of Cap'l)
Pension Assets-12/12 $190.1 mill.
Oblig. $303.1 mill.
Pfd Stock None
Common Stock 176,463,469 shares
as of 7/26/13 *(Reflects 5-for-4 stock split paid 9/1/13.)*
MARKET CAP: $4.2 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	8.2	5.5	4.3
Receivables	81.1	92.9	98.3
Inventory (AvgCst)	11.2	11.8	12.5
Other	220.0	150.7	106.5
Current Assets	320.5	260.9	221.6
Accts Payable	68.3	55.5	47.0
Debt Due	80.4	125.4	158.6
Other	277.0	93.3	101.1
Current Liab.	425.7	274.2	306.7
Fix. Chg. Cov.	367%	398%	*398%*

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	8.0%	7.5%	*3.5%*
"Cash Flow"	8.5%	8.0%	*4.5%*
Earnings	6.5%	4.5%	*8.0%*
Dividends	7.5%	8.0%	*8.0%*
Book Value	9.0%	7.0%	*6.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2010	160.5	178.5	207.8	179.3	726.1
2011	163.6	178.3	197.3	172.7	712.0
2012	164.0	191.7	214.6	187.5	757.8
2013	180.0	195.7	*219.3*	*195*	*790*
2014	*190*	*215*	*225*	*200*	*830*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2010	.13	.18	.26	.15	.72
2011	.18	.22	.24	.19	.83
2012	.15	.24	.29	.19	.87
2013	.26	.30	*.34*	*.25*	*1.15*
2014	*.25*	*.32*	*.40*	*.28*	*1.25*

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.108	.108	.108	.116	.44
2010	.116	.116	.116	.124	.47
2011	.124	.124	.124	.132	.50
2012	.132	.132	.132	.14	.54
2013	.14	.14	.152		

BUSINESS: Aqua America, Inc. is the holding company for water and wastewater utilities that serve approximately three million residents in Pennsylvania, Ohio, North Carolina, Illinois, Texas, New Jersey, Florida, Indiana, and five other states. Acquired AquaSource, 7/03; Consumers Water, 4/99; and others. Water supply revenues '12: residential, 60.5%; commercial, 16.1%; industrial & other, 23.4%. Officers and directors own 1.4% of the common stock; Blackrock, Inc, 6.3%; State Street Capital Corp., 5.7%; Vanguard Group 5.6% (4/13 Proxy). Chairman & Chief Executive Officer: Nicholas DeBenedictis. Incorporated: Pennsylvania. Address: 762 West Lancaster Avenue, Bryn Mawr, Pennsylvania 19010. Telephone: 610-525-1400. Internet: www.aquaamerica.com.

Aqua America's main long-term strategy is to grow through acquisitions. The United States is filled with thousands of small water utilities that are run by local municipalities. Due to the lack of proper maintenance, many of the facilities are in terrible shape. Since a large number of local governments are financially strapped, they find it more advantageous to sell their water systems to entities that have both greater managerial experience and the financial wherewithal to invest the funds required for the systems to operate properly. Aqua America bought 18 new companies last year and should add a similar number of new utilities in 2013.

Aqua America has been successful driving synergies through acquisitions. Historically, many of the operational benefits promised to shareholders of companies involved in acquisitions never take place. However, Aqua America has proven that it can purchase other water utilities and slash redundant overhead costs to improve operating margins.

Dividend growth prospects are excellent. Last quarter's 9% hike in the quarterly payout (all of our numbers have been adjusted for the recent five-for-four stock split) was much higher than that of a typical utility. Thanks in part to the company's low payout ratio, we estimate that the annual dividend hike will average about 10% for the foreseeable future.

Nonutility operations will play a larger role in the company's future. Aqua America recently completed another extension of its water pipeline in Pennsylvania. The pipeline is used to supply water to natural gas producers drilling in the Marcellus Shale. We expect the company to become much more involved in constructing pipelines because this is a more efficient way of providing the water needed for drilling than by using trucks.

Investors have to pay a slight premium for these shares. The average yield for a water utility is close to 3%. Thus, WTR's payout is about 40 basis points lower than the industry norm. We believe that this is a very reasonable price to pay for the company's robust dividend growth prospects, which should provide better-than-average total returns for a water utility over the pull to 2016-2018.

James A. Flood *October 18, 2013*

(A) Diluted egs. Excl. nonrec. gains (losses): '99, (9¢); '00, 2¢; '01, 2¢; '02, 4¢; '03, 3¢; '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 3¢. May not sum due to rounding. Next earnings report due late October.
(B) Dividends historically paid in early March, June, Sept. & Dec. ■ Div'd. reinvestment plan available (5% discount).
(C) In millions, adjusted for stock splits.

Company's Financial Strength	B++
Stock's Price Stability	100
Price Growth Persistence	70
Earnings Predictability	100

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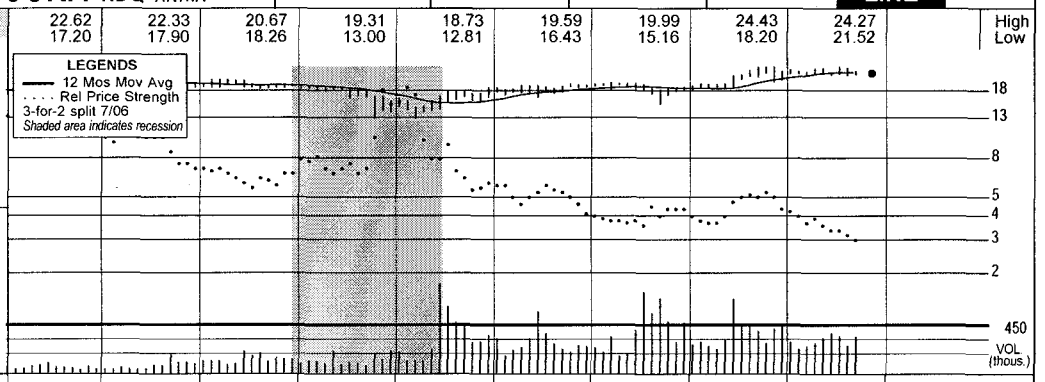
ARTESIAN RES. CORP. NDQ--ARTNA

RECENT PRICE 22.18 | TRAILING P/E RATIO 22.2 | RELATIVE P/E RATIO 1.15 | DIV'D YLD 3.7% | VALUE LINE

RANKS

PERFORMANCE 2 Above Average
Technical 2 Above Average
SAFETY 3 Average
BETA .60 (1.00 = Market)

Financial Strength B
Price Stability 95
Price Growth Persistence 60
Earnings Predictability 85



© VALUE LINE PUBLISHING LLC	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014/2015
SALES PER SH	7.52	7.77	7.20	7.59	8.11	8.48	7.56	8.10	--	
"CASH FLOW" PER SH	1.56	1.75	1.57	1.65	1.84	1.92	1.64	2.04	--	
EARNINGS PER SH	.81	.97	.90	.86	.97	1.00	.83	1.13	*1.05* [A,B]	*1.23* [C]/NA
DIV'DS DECL'D PER SH	.58	.61	.66	.71	.72	.75	.76	.79	--	
CAP'L SPENDING PER SH	3.35	5.08	3.66	6.09	2.32	2.57	1.83	2.36	--	
BOOK VALUE PER SH	9.60	10.15	11.66	11.86	12.15	12.44	13.12	13.57	--	
COMMON SHS OUTST'G (MILL)	6.02	6.09	7.30	7.40	7.51	7.65	8.61	8.71	--	
AVG ANN'L P/E RATIO	24.2	20.3	21.5	20.1	16.4	18.2	22.5	18.3	*21.1*	*18.0/NA*
RELATIVE P/E RATIO	1.28	1.10	1.14	1.21	1.09	1.16	1.41	1.17	--	
AVG ANN'L DIV'D YIELD	2.9%	3.1%	3.4%	4.1%	4.5%	4.1%	4.1%	3.8%	--	
SALES ($MILL)	45.3	47.3	52.5	56.2	60.9	64.9	65.1	70.6	--	
OPERATING MARGIN	100.0%	45.6%	45.6%	45.1%	46.9%	46.5%	45.5%	48.7%	--	
DEPRECIATION ($MILL)	4.4	4.6	5.2	5.8	6.6	7.0	7.4	7.9	--	
NET PROFIT ($MILL)	5.0	6.1	6.3	6.4	7.3	7.6	6.7	9.8	--	
INCOME TAX RATE	39.9%	39.0%	39.8%	40.8%	40.1%	40.0%	40.8%	40.2%	--	
NET PROFIT MARGIN	11.1%	12.8%	11.9%	11.4%	11.9%	11.7%	10.4%	14.0%	--	
WORKING CAP'L ($MILL)	d1.8	d8.8	2.5	d20.9	d23.3	d27.9	d11.4	d11.4	--	
LONG-TERM DEBT ($MILL)	92.4	92.1	91.8	107.6	106.0	105.1	106.5	106.3	--	
SHR. EQUITY ($MILL)	57.8	61.8	85.1	87.8	91.2	95.1	113.0	118.2	--	
RETURN ON TOTAL CAP'L	5.3%	5.8%	5.3%	4.7%	5.2%	5.6%	4.6%	5.9%	--	
RETURN ON SHR. EQUITY	8.7%	9.8%	7.4%	7.3%	8.0%	8.0%	6.0%	8.3%	--	
RETAINED TO COM EQ	2.7%	3.8%	2.1%	1.4%	2.1%	2.0%	.5%	2.5%	--	
ALL DIV'DS TO NET PROF	69%	61%	71%	81%	74%	75%	92%	70%	--	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

[A]*No. of analysts changing earn. est. in last 4 days: 0 up, 0 down, consensus 5-year earnings growth not available.* [B]*Based upon 4 analysts' estimates.* [C]*Based upon 4 analysts' estimates.*

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	1.5%	7.0%
"Cash Flow"	3.0%	24.0%
Earnings	2.0%	36.0%
Dividends	4.5%	4.0%
Book Value	4.5%	3.5%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/11	14.8	16.5	17.7	16.1	65.1
12/31/12	16.7	17.9	19.0	17.0	70.6
12/31/13	16.3	17.8			
12/31/14					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/10	.22	.24	.38	.16	1.00
12/31/11	.14	.23	.26	.20	.83
12/31/12	.28	.32	.33	.20	1.13
12/31/13	.19	.28	***.34***	***.25***	
12/31/14	***.20***				

Cal-endar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2010	.187	.188	.188	.189	.75
2011	.19	.19	.19	.193	.76
2012	.193	.198	.198	.203	.79
2013	.203	.206	.206	.209	

INSTITUTIONAL DECISIONS

	4Q'12	1Q'13	2Q'13
to Buy	28	32	31
to Sell	32	26	30
Hld's(000)	3052	3036	3029

ASSETS ($mill.)	2011	2012	6/30/13
Cash Assets	.3	.6	.5
Receivables	8.6	8.7	9.1
Inventory	1.5	1.4	1.5
Other	2.9	2.8	1.2
Current Assets	13.3	13.5	12.3
Property, Plant & Equip, at cost	435.0	454.4	--
Accum Depreciation	77.4	83.8	--
Net Property	357.6	370.6	374.8
Other	7.8	7.6	7.6
Total Assets	378.7	391.7	394.7
LIABILITIES ($mill.)			
Accts Payable	2.8	3.5	1.9
Debt Due	13.8	12.6	10.7
Other	8.1	8.8	9.2
Current Liab	24.7	24.9	21.8

LONG-TERM DEBT AND EQUITY as of 6/30/13

Total Debt $116.8 mill. **Due in 5 Yrs.** NA
LT Debt $106.1 mill.
Including Cap. Leases NA (47% of Cap'l)
Leases, Uncapitalized *Annual rentals* NA

Pension Liability $.4 mill. in '12 vs. $.5 mill. in '11

Pfd Stock None **Pfd Div'd Paid** None

Common Stock 8,781,642 shares (53% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Artesian Resources Corporation, through its subsidiaries, provides water, wastewater, and other services on the Delmarva Peninsula. It distributes and sells water to residential, commercial, industrial, municipal, and utility customers in Delaware, Maryland, and Pennsylvania. The company also offers water for public and private fire protection to customers in its service territories. In addition, it provides contract water and wastewater services, water and sewer service line protection plans, and wastewater management services, as well as design, construction, and engineering services. As of December 31, 2012, the company served approximately 79,000 metered water customers through 1,162 miles of transmission and distribution mains. Has 229 employees. Chairman, C.E.O. & President: Dian C. Taylor. Address: 664 Churchmans Rd., Newark, DE 19702. Tel.: (302) 453-6900. Internet: http://www.artesianwater.com.

J.V.

October 18, 2013

TOTAL SHAREHOLDER RETURN

Dividends plus appreciation as of 9/30/2013

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
0.79%	0.84%	-0.68%	31.05%	63.01%

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CALIFORNIA WATER NYSE-CWT

RECENT PRICE 19.73 | P/E RATIO 22.4 (Trailing: 21.2 / Median: 21.0) | RELATIVE P/E RATIO 1.27 | DIV'D YLD 3.4% | VALUE LINE

TIMELINESS 4 Lowered 10/4/13
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Lowered 8/23/13
BETA .65 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	30	(+50%)	13%
Low	20	(Nil)	4%

Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	0	0	0	0	20	0	0	0	0
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	0	0	0	0	0	0	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	54	86	61
to Sell	63	39	57
Hld's(000)	22078	26409	26677

	2012	2013	2014	2015	2016	2017	2018
High:	13.4	15.7	19.0	21.1	22.9	22.7	23.3	24.1	19.8	19.4	19.3	22.3	
Low:	10.2	11.8	13.0	15.6	16.4	17.1	13.8	16.7	16.9	16.7	16.8	18.4	

LEGENDS
1.33 x Dividends p sh divided by Interest Rate
Relative Price Strength
2-for-1 split 6/11
Options: Yes
Shaded areas indicate recessions

Target Price Range 2016 | 2017 | 2018: 64 / 48 / 40 / 32 / 24 / 20 / 16 / 12 / 8 / 6

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	12.6	31.2
3 yr.	21.6	60.1
5 yr.	24.3	110.2

Percent shares traded: 18 / 12 / 6

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
7.74	7.38	7.98	8.08	8.13	8.67	8.18	8.59	8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.55	14.15	Revenues per sh	16.00
1.46	1.30	1.37	1.26	1.10	1.32	1.26	1.42	1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.05	2.25	"Cash Flow" per sh	2.75
.92	.73	.77	.66	.47	.63	.61	.73	.74	.67	.75	.95	.98	.91	.86	1.02	.80	1.05	Earnings per sh A	1.35
.53	.54	.54	.55	.56	.56	.56	.57	.57	.58	.58	.59	.59	.60	.62	.63	.64	.68	Div'd Decl'd per sh B ■	.90
1.30	1.37	1.72	1.23	2.04	2.91	2.19	1.87	2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.65	2.90	Cap'l Spending per sh	3.00
6.50	6.69	6.71	6.45	6.48	6.56	7.22	7.83	7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	13.40	13.85	Book Value per sh C	15.00
25.24	25.24	25.87	30.29	30.36	30.36	33.86	36.73	36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.75	48.00	Common Shs Outst'g D	50.0
12.6	17.8	17.8	19.6	27.1	19.8	22.1	20.1	24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	19.0
.73	.93	1.01	1.27	1.39	1.08	1.26	1.06	1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14			Relative P/E Ratio	1.25
4.6%	4.2%	4.0%	4.3%	4.4%	4.5%	4.2%	3.9%	3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%			Avg Ann'l Div'd Yield	3.6%
						277.1	315.6	320.7	334.7	367.1	410.3	449.4	460.4	501.8	560.0	590	650	Revenues ($mill) E	800
						19.4	26.0	27.2	25.6	31.2	39.8	40.6	37.7	36.1	42.6	40.0	53.0	Net Profit ($mill)	67.0
						39.9%	39.6%	42.4%	37.4%	39.9%	37.7%	40.3%	39.5%	40.5%	37.5%	34.0%	39.0%	Income Tax Rate	39.0%
						10.3%	3.2%	3.3%	10.6%	8.3%	8.6%	7.6%	4.2%	7.6%	8.0%	8.0%	8.5%	AFUDC % to Net Profit	10.0%
						50.2%	48.6%	48.3%	43.5%	42.9%	41.6%	47.1%	52.4%	51.7%	47.8%	42.0%	46.5%	Long-Term Debt Ratio	50.0%
						49.1%	50.8%	51.1%	55.9%	56.6%	58.4%	52.9%	47.6%	48.3%	52.2%	58.0%	53.5%	Common Equity Ratio	50.0%
						498.4	565.9	568.1	670.1	674.9	690.4	794.9	914.7	931.5	908.2	1050	1125	Total Capital ($mill)	1400
						759.5	800.3	862.7	941.5	1010.2	1112.4	1198.1	1294.3	1381.1	1457.1	1510	1575	Net Plant ($mill)	1825
						5.6%	6.1%	6.3%	5.2%	5.9%	7.1%	6.5%	5.5%	5.5%	6.3%	5.5%	6.0%	Return on Total Cap'l	6.5%
						7.8%	8.9%	9.3%	6.8%	8.1%	9.9%	9.6%	8.6%	8.0%	9.0%	7.0%	8.0%	Return on Shr. Equity	9.5%
						7.9%	9.0%	9.3%	6.8%	8.1%	9.9%	9.6%	8.6%	8.0%	9.0%	7.0%	8.0%	Return on Com Equity	9.5%
						.7%	2.1%	2.1%	1.0%	1.8%	3.8%	3.8%	3.0%	2.3%	3.4%	1.5%	3.0%	Retained to Com Eq	3.0%
						91%	77%	78%	86%	77%	61%	60%	66%	71%	62%	75%	62%	All Div'ds to Net Prof	67%

CAPITAL STRUCTURE as of 6/30/13
Total Debt $507.6 mill. **Due in 5 Yrs** $65.3 mill.

LT Debt $430.7 mill. **LT Interest** $29.5 mill.
(LT interest earned: 6.7x; total int. cov.: 6.0x)
(43% of Cap'l)
Pension Assets-12/12 $202.9 mill.
Oblig. $402.9 mill.
Pfd Stock None

Common Stock 47,734,035 shs.
as of 8/1/13

MARKET CAP: $950 million (Small Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	27.2	38.8	38.8
Other	86.7	107.8	125.4
Current Assets	113.9	146.6	164.1
Accts Payable	48.9	46.8	46.7
Debt Due	53.7	136.3	76.9
Other	49.3	59.7	72.6
Current Liab.	151.9	242.8	196.2
Fix. Chg. Cov.	278%	297%	325%

ANNUAL RATES (of change (per sh))	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	4.0%	7.0%	4.5%
"Cash Flow"	5.5%	7.5%	4.5%
Earnings	5.0%	5.5%	6.5%
Dividends	1.0%	1.5%	6.5%
Book Value	5.0%	4.5%	5.5%

Calendar	QUARTERLY REVENUES ($ mill.) E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2010	90.3	118.3	146.3	105.5	460.4
2011	98.1	131.4	169.3	103.0	501.8
2012	116.8	143.6	178.1	121.5	560.0
2013	111.4	154.6	190	134	590
2014	135	165	210	140	650

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2010	.05	.25	.49	.12	.91
2011	.03	.29	.50	.04	.86
2012	.03	.31	.56	.12	1.02
2013	d.03	.28	.50	.05	.80
2014	.05	.30	.55	.15	1.05

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.148	.148	.148	.148	.59
2010	.149	.149	.149	.149	.60
2011	.154	.154	.154	.154	.62
2012	.1575	.1575	.1575	.1575	.63
2013	.16	.16	.16		

BUSINESS: California Water Service Group provides regulated and nonregulated water service to roughly 471,900 customers in 83 communities in California, Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '12: residential, 66%; business, 18%; public authorities, 4%; industrial, 4%; other 8%. '12 reported depreciation rate: 2.8%. Has 1,131 employees. President, Chairman, and Chief Executive Officer: Peter C. Nelson. Inc.: Delaware. Address: 1720 North First Street, San Jose, California 95112-4598. Telephone: 408-367-8200. Internet: www.calwatergroup.com.

This will not be an easy year for the California Water Service Group. As expected, the utility posted its second-consecutive year-over-year negative earnings comparison in the June-ended period. What's more, we expect this trend to continue for the second half of the year.

What's behind the bad earnings? In California, utilities run on three-year regulatory cycles. This means that they can only seek rate relief every third year. Quite often, by the final year of the cycle, expenses have outpaced the higher revenues that were originally permitted.

A major rate case is close to being settled. In mid-2012, California filed a petition with the California Public Utility Commission (CPUC) seeking to raise its rates by 20%. The utility has been in negotiations with the CPUC for months, and it now believes that 95% of the matters involved are resolved. Even though many of California Water's expenses were prudently spent on improving its infrastructure, that doesn't mean that its request will be automatically approved. There is a tremendous amount of political pressure brought upon regulators to keep water customers (i.e. voters) rates low. On balance, we estimate the final decision will be fairly reasonable. The allowed return on equity will most likely be low on a relative basis, but the utility will at least have a good chance of earning it.

All told, earnings should decline sharply in 2013, but rebound in 2014. Due to the aforementioned reasons, we think that California Water's share net will plunge 22% this year. Next year, due mostly to rate relief, we expect the bottom line to snap back, by $0.25, to $1.05 a share.

We think that there are other stocks in the water utility industry that hold greater appeal than California Water. On the plus side, these shares have a yield that is nearly 70 basis points greater than certain of its peers. Moreover, as a result of a large stock issuance earlier this year, the company's finances have improved significantly. However, the utility's subpar dividend growth potential over the next several years and the equity's Below Average Timeliness rank more than offset these positives, in our opinion.

James A. Flood *October 18, 2013*

(A) Basic EPS. Excl. nonrecurring gain (loss): '00, (4¢); '01, 2¢; '02, 4¢; '11, 4¢. Next earnings report due mid-August.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '12: $18.8 mill., $0.44/sh.
(D) In millions, adjusted for splits.
(E) Excludes non-reg. rev.

Company's Financial Strength	B++
Stock's Price Stability	100
Price Growth Persistence	50
Earnings Predictability	90

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CONNECTICUT WATER NDQ-CTWS

RECENT PRICE 31.35 | P/E RATIO 18.9 (Trailing: 21.5 Median: 23.0) | RELATIVE P/E RATIO 1.07 | DIV'D YLD 3.2% | VALUE LINE

TIMELINESS 4 Lowered 3/29/13
SAFETY 3 New 1/18/13
TECHNICAL 3 Lowered 10/11/13
BETA .75 (1.00 = Market)

2016-18 PROJECTIONS

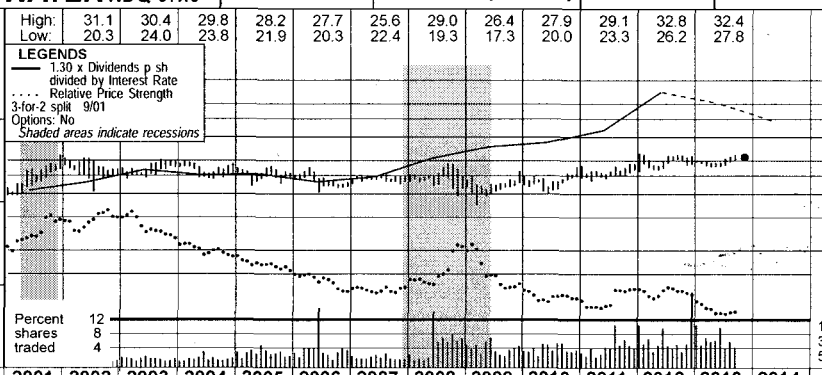
	Price	Gain	Ann'l Total Return
High	40	(+30%)	10%
Low	30	(-5%)	3%

Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	0	2	0	0	0	0	0	0	0
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	0	0	0	0	0	0	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	48	52	39
to Sell	16	21	39
Hld's(000)	4069	4336	4492



	2016	2017	2018
Target Price Range	80	60	50

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	4.1	31.2
3 yr.	48.7	60.1
5 yr.	33.5	110.2

	High:	31.1	30.4	29.8	28.2	27.7	25.6	29.0	26.4	27.9	29.1	32.8	32.4
	Low:	20.3	24.0	23.8	21.9	20.3	22.4	19.3	17.3	20.0	23.3	26.2	27.8

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
5.67	5.58	5.87	5.70	5.93	5.77	5.91	6.04	5.81	5.68	7.05	7.24	6.93	7.65	7.93	7.63	8.65	8.90	Revenues per sh	11.25
1.51	1.59	1.65	1.73	1.78	1.78	1.89	1.91	1.62	1.52	1.90	1.95	1.93	2.04	2.11	2.10	2.55	2.65	"Cash Flow" per sh	2.75
1.00	1.02	1.03	1.09	1.13	1.12	1.15	1.16	.88	.81	1.05	1.11	1.19	1.13	1.13	1.53	1.60	1.70	Earnings per sh A	1.80
.77	.78	.79	.79	.80	.81	.83	.84	.85	.86	.87	.88	.90	.92	.94	.96	.98	1.01	Div'd Decl'd per sh B■	1.11
1.99	1.12	1.42	1.43	1.86	1.98	1.49	1.58	1.96	1.96	2.24	2.44	3.28	3.06	2.61	2.34	2.75	2.85	Cap'l Spending per sh	2.90
8.26	8.52	8.61	8.92	9.25	10.06	10.46	10.94	11.52	11.60	11.95	12.23	12.67	13.05	13.50	16.89	17.25	17.80	Book Value per sh D	20.40
6.79	6.80	7.26	7.28	7.65	7.94	7.97	8.04	8.17	8.27	8.38	8.46	8.57	8.68	8.76	10.97	11.10	11.25	Common Shs Outst'g C	12.00
12.9	15.5	18.2	18.2	21.5	24.3	23.5	22.9	28.6	29.0	23.0	22.2	18.4	20.7	23.0	19.4	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	20.0
.74	.81	1.04	1.18	1.10	1.33	1.34	1.21	1.52	1.57	1.22	1.34	1.23	1.32	1.44	1.24			Relative P/E Ratio	1.35
6.0%	4.9%	4.2%	4.0%	3.3%	3.0%	3.0%	3.1%	3.4%	3.6%	3.6%	3.6%	4.1%	3.9%	3.6%	3.2%			Avg Ann'l Div'd Yield	3.4%
						47.1	48.5	47.5	46.9	59.0	61.3	59.4	66.4	69.4	83.8	95.0	100	Revenues ($mill)	135
						9.2	9.4	7.2	6.7	8.8	9.4	10.2	9.8	9.9	13.6	17.5	19.0	Net Profit ($mill)	21.0
						17.9%	22.9%	--	23.5%	32.4%	27.2%	19.5%	35.2%	41.3%	32.0%	32.0%	33.0%	Income Tax Rate	35%
						--	--	--	--	--	1.7%	--	--	1.8%	1.7%	2.0%	2.0%	AFUDC % to Net Profit	3.0%
						43.5%	42.8%	44.9%	44.4%	47.8%	46.9%	50.6%	49.5%	53.2%	49.0%	49.5%	49.5%	Long-Term Debt Ratio	48.5%
						55.9%	56.7%	54.6%	55.1%	51.8%	52.7%	49.1%	50.2%	46.5%	50.8%	50.5%	50.5%	Common Equity Ratio	51.5%
						148.9	155.1	172.3	174.1	193.2	196.5	221.3	225.6	254.2	364.6	375	395	Total Capital ($mill)	475
						238.9	246.1	247.7	268.1	284.3	302.3	325.2	344.2	362.4	447.9	470	490	Net Plant ($mill)	550
						7.5%	7.0%	5.0%	4.9%	5.5%	5.9%	5.5%	5.4%	4.9%	4.8%	5.5%	5.0%	Return on Total Cap'l	5.5%
						10.9%	10.6%	7.5%	6.9%	8.7%	9.0%	9.3%	8.6%	8.3%	7.3%	9.0%	9.5%	Return on Shr. Equity	8.5%
						11.0%	10.6%	7.6%	7.0%	8.7%	9.1%	9.4%	8.7%	8.3%	7.3%	9.0%	9.5%	Return on Com Equity	8.5%
						3.2%	3.1%	.3%	NMF	1.6%	1.9%	2.3%	1.6%	1.4%	2.7%	3.5%	3.5%	Retained to Com Eq	3.0%
						71%	71%	95%	105%	82%	79%	76%	81%	83%	62%	62%	59%	All Div'ds to Net Prof	62%

CAPITAL STRUCTURE as of 6/30/13
Total Debt $180.2 mill. **Due in 5 Yrs** $14.8 mill.
LT Debt $178.7 mill. **LT Interest** $7.6 mill.
(Total interest coverage: 8.8x)
(49% of Cap'l)
Leases, Uncapitalized: Annual rentals $.2 mill.
Pension Assets $45.4 mill.
Oblig. $66.5 mill.

Pfd Stock $0.8 mill. **Pfd Divd** NMF

Common Stock 11,003,512 shs.
as of 7/31/13
MARKET CAP: $350 million (Small Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	1.0	13.2	7.5
Accounts Receivable	14.9	11.5	12.1
Other	3.0	11.7	13.5
Current Assets	18.9	36.4	33.1
Accts Payable	7.2	10.0	7.3
Debt Due	--	3.0	1.5
Other	23.2	2.9	3.1
Current Liab.	30.4	15.9	11.9
Fix. Chg. Cov.	419%	455%	460%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	3.5%	6.0%	6.5%
"Cash Flow"	2.5%	6.0%	4.5%
Earnings	1.5%	6.5%	5.5%
Dividends	1.5%	2.0%	3.5%
Book Value	5.5%	6.5%	6.0%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	13.8	15.9	21.0	15.7	66.4
2011	16.0	17.4	20.6	15.4	69.4
2012	18.5	21.3	24.5	19.5	83.8
2013	21.5	22.5	27.0	24.0	95.0
2014	22.0	24.0	30.0	24.0	100

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	.12	.27	.54	.20	1.13
2011	.26	.37	.39	.11	1.13
2012	.22	.47	.67	.16	1.53
2013	.24	.39	.68	.29	1.60
2014	.30	.47	.68	.25	1.70

Calendar	QUARTERLY DIVIDENDS PAID B Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.222	.222	.228	.228	.90
2010	.228	.228	.233	.233	.922
2011	.233	.233	.238	.238	.942
2012	.238	.238	.2425	.2425	.962
2013	.2425	.2425	.2475		

BUSINESS: Connecticut Water Service, Inc. is a non-operating holding company, whose income is derived from earnings of its wholly-owned subsidiary companies (regulated water utilities). Its largest subsidiary, Connecticut Water, accounted for about 85% of the holding company's net income in 2012, and provides water services to 400,000 people in 55 towns throughout Connecticut and Maine. Acquired The Maine Water Co., 1/12; Biddeford and Saco Water, 12/12. Inc.: CT. Has about 260 employees. Chairman/President/CEO: Eric W. Thornburg. Officers and directors own 2.2% of the common stock; BlackRock, Inc. 6.7%; The Vanguard Group, 5.3%. Address: 93 West Main Street, Clinton, CT 06413. Telephone: (860) 669-8636. Internet: www.ctwater.com.

Connecticut Water Service has finally reached a definitive deal with all of the state's regulators. In September, the Connecticut Public Regulatory Authority (PURA) agreed to a deal that had been reached earlier among Connecticut Water and the state's Attorney General and Consumer Council. PURA was the final hurdle in the approval process, and it didn't alter the agreement in any meaningful way.

Ratepayers will benefit from the settlement. Customers will see their water bills decline over the next two years as Connecticut Water will pass along to them a tax refund it was granted by the IRS for the 2010-2012 period. In addition, the utility agreed not to seek higher rates before October, 2015.

Connecticut Water will benefit too. Permission was granted for the company to establish a Revenue Adjustment Mechanism, which will allow it to keep the tax benefit from the IRS refund going forward. These funds will be allowed to flow through to shareholders until the next time the company seeks higher rates.

The earnings picture looks brighter. Following four static years of earnings, the company enjoyed strong results in 2012, as share net rose 35%. With the new arrangement with regulators in place, we think that Connecticut Water's bottom line will increase close to 5%, both this year and next. Moreover, the company will earn close to its allowed return on equity.

The recent dividend hike was somewhat disappointing. Over the past five- and 10-year periods, Connecticut Water's dividend growth rate averaged only 2.0%, and 1.5%, respectively. Both percentages were among the lowest in the water utility industry. Following the company's solid profits in 2012, along with its improved earning prospects, we had hoped that the most recent quarterly payout to shareholders would have been more generous than the 2% increase declared in August.

We can't find too many reasons to recommend these shares at this juncture. While the stock's yield is slightly higher than the average of its peers, its dividend growth prospects to 2016-2018 are subpar for the group. Furthermore, this equity carries a 4 (Below Average) rank for Timeliness.

James A. Flood *October 18, 2013*

(A) Diluted earnings. Next earnings report due mid-November. Quarterly earnings do no add in '12 due to rounding.
(B) Dividends historically paid in mid-March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.
(D) Includes intangibles. In '12: $31.7 million/$2.89 a share.

Company's Financial Strength	B+
Stock's Price Stability	90
Price Growth Persistence	50
Earnings Predictability	80

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MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 20.31 | P/E RATIO 20.9 (Trailing: 19.7 Median: 22.0) | RELATIVE P/E RATIO 1.19 | DIV'D YLD 3.7% | VALUE LINE

TIMELINESS 2 Raised 6/7/13
SAFETY 2 New 10/21/11
TECHNICAL 3 Lowered 10/18/13
BETA .70 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	25	(+25%)	9%
Low	20	(Nil)	4%

Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	0	0	0	0	0	0	0	1	0
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	0	0	0	0	0	0	1

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	38	38	37
to Sell	28	30	35
Hld's(000)	6696	6579	6489

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
High:	20.0	21.2	21.8	23.5	20.5	20.2	19.8	17.9	19.3	19.4	19.6	22.5				
Low:	13.7	15.8	16.7	17.1	16.5	16.9	12.0	11.6	14.7	16.5	17.5	18.6				
	5.87	5.98	6.12	6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	*7.50*	*7.70*	Revenues per sh	*9.10*
	1.18	1.20	1.15	1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	*1.65*	*1.85*	"Cash Flow" per sh	*2.30*
	.66	.73	.61	.73	.71	.82	.87	.89	.72	.96	.84	.90	*1.00*	*1.05*	Earnings per sh A	*1.15*
	.62	.63	.65	.66	.67	.68	.69	.70	.71	.72	.73	.74	*.75*	*.76*	Div'd Decl'd per sh B■	*.80*
	1.25	1.59	1.87	2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	*1.50*	*1.65*	Cap'l Spending per sh	*2.00*
	7.11	7.39	7.60	8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	*11.75*	*12.10*	Book Value per sh D	*12.90*
	10.17	10.36	10.48	11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	*16.00*	*16.25*	Common Shs Outst'g C	*17.00*
	24.6	23.5	30.0	26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	*Bold figures are*		Avg Ann'l P/E Ratio	*20.0*
	1.26	1.28	1.71	1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.33	*Value Line*		Relative P/E Ratio	*1.35*
	3.8%	3.7%	3.5%	3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	*estimates*		Avg Ann'l Div'd Yield	*3.6%*
	64.1	71.0	74.6	81.1	86.1	91.0	91.2	102.7	102.1	110.4	*120*	*125*			Revenues ($mill)	*155*
	6.6	8.4	8.5	10.0	11.8	12.2	10.0	14.3	13.4	14.4	*15.5*	*17.0*			Net Profit ($mill)	*20.0*
	32.8%	31.1%	27.6%	33.4%	32.6%	33.2%	34.1%	32.1%	32.7%	33.9%	*34.0%*	*34.0%*			Income Tax Rate	*34.0%*
	--	--	--	--	--	--	--	6.8%	6.1%	3.4%	*4.5%*	*4.5%*			AFUDC % to Net Profit	*5.0%*
	53.8%	53.8%	55.3%	49.5%	49.0%	45.6%	46.6%	43.1%	42.3%	41.5%	*43.0%*	*43.0%*			Long-Term Debt Ratio	*43.0%*
	44.0%	42.5%	41.3%	47.5%	49.6%	51.8%	52.1%	55.8%	56.6%	57.4%	*57.0%*	*57.0%*			Common Equity Ratio	*57.0%*
	181.1	214.5	231.7	264.0	268.8	259.4	267.9	310.5	312.5	316.5	*330*	*345*			Total Capital ($mill)	*400*
	230.9	262.9	288.0	317.1	333.9	366.3	376.5	405.9	422.2	435.2	*440*	*450*			Net Plant ($mill)	*510*
	5.0%	5.1%	5.0%	5.1%	5.6%	5.8%	5.0%	5.7%	5.2%	5.4%	*4.5%*	*5.0%*			Return on Total Cap'l	*5.5%*
	7.9%	8.5%	8.2%	7.5%	8.6%	8.6%	7.0%	8.1%	7.5%	7.8%	*8.0%*	*8.5%*			Return on Shr. Equity	*9.0%*
	8.0%	9.0%	8.6%	7.8%	8.7%	8.9%	7.0%	8.2%	7.5%	7.8%	*8.0%*	*8.5%*			Return on Com Equity	*9.0%*
	NMF	.9%	.6%	1.3%	1.8%	2.0%	.1%	2.1%	1.0%	1.4%	*2.0%*	*2.5%*			Retained to Com Eq	*3.0%*
	106%	90%	94%	84%	79%	78%	98%	75%	87%	83%	*80%*	*73%*			All Div'ds to Net Prof	*70%*

Target Price Range 2016 | 2017 | 2018

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	16.0	31.2
3 yr.	42.8	60.1
5 yr.	50.6	110.2

LEGENDS
1.20 x Dividends p sh divided by Interest Rate
Relative Price Strength
3-for-2 split 1/02
4-for-3 split 11/03
Options: No
Shaded areas indicate recessions

CAPITAL STRUCTURE as of 6/30/13
Total Debt $166.7 mill. Due in 5 Yrs $60.0 mill.
LT Debt $133.5 mill. LT Interest $7.0 mill.
(LT interest coverage: 4.1x)
(42% of Cap'l)

Pension Assets-12/12 $37.9 mill.
Oblig. $62.8 mill.
Pfd Stock $3.4 mill. Pfd Div'd: $.2 mill.

Common Stock 15,847,729 shs.
as of 7/31/13

MARKET CAP: $325 million (Small Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	3.1	3.0	3.0
Other	19.8	21.6	23.1
Current Assets	22.9	24.6	26.1
Accts Payable	5.7	3.8	5.1
Debt Due	4.6	11.1	33.2
Other	36.4	41.1	17.6
Current Liab.	46.7	56.0	55.9
Fix. Chg. Cov.	380%	410%	*415%*

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	1.5%	1.0%	*5.5%*
"Cash Flow"	3.0%	2.0%	*7.0%*
Earnings	3.5%	2.5%	*4.0%*
Dividends	1.5%	1.5%	*1.5%*
Book Value	4.5%	4.0%	*2.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	21.6	26.5	29.6	25.0	102.7
2011	24.0	26.1	28.7	23.3	102.1
2012	23.5	27.4	32.3	27.1	110.4
2013	27.0	29.1	*34.0*	*29.9*	*120*
2014	*30.0*	*30.0*	*35.0*	*30.0*	*125*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	.11	.31	.37	.17	.96
2011	.17	.23	.32	.12	.84
2012	.11	.23	.38	.17	.90
2013	.20	.28	*.35*	*.17*	*1.00*
2014	*.17*	*.28*	*.40*	*.20*	*1.05*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.178	.178	.178	.180	.71
2010	.180	.180	.180	.183	.72
2011	.183	.183	.183	.185	.73
2012	.185	.185	.185	.1875	.74
2013	.1875	.1875	.1875		

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 60,000 retail customers, primarily in Middlesex County, New Jersey. In 2012, the Middlesex System accounted for 65% of total revenues. At 12/31/12, the company had 279 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers/directors own 3.1% of the common stock; BlackRock, 6.3%; The Vanguard Group, 5.7% (4/13 proxy). Address: 1500 Ronson Road, Iselin, NJ 08830. Tel.: 732-634-1500. Internet: www.middlesexwater.com.

Historically, Middlesex Water's dividend increases have been incredibly consistent. Over the past nine years, (from 2003 to 2012), the utility has raised its annual payout by $0.01 a share.

Sometimes predictability isn't a positive. Over the past five and 10 years, respectively, the average dividend hike has been a meager 1.5%. This ranks near the bottom when compared to the other seven water utilities that *Value Line* covers.

Could Middlesex finally break its streak this quarter? Late October is usually the time when the company implements its annual dividend rate hike. With decent earnings comparisons, it's possible that Middlesex could go against convention and raise the payout by more than the traditional one-quarter of a cent per share. We are taking a show-me approach, with our figures representing the usual quarterly increase.

The utility's earnings have been improving. In the June period, Middlesex experienced its fourth-consecutive positive earnings comparison. This was mostly due to the implementation of higher rates in mid-2012, as well a better contract with the borough of Avalon, NJ, a wholesale client.

Performance in the industrial markets has impaired Middlesex. The utility lost a contract to supply water to the borough of Sayreville, NJ this past August. Another setback was the closure of a Hess oil refinery earlier in the year.

The company is targeting the residential market. Despite recently winning a contract to privatize the water system at the Dover Air Force Base in Delaware, Middlesex has budgeted $25 million a year over the next three years to improve the infrastructure of its residential business. We agree with this strategy as the residential market is both more predictable and profitable.

Middlesex shares are ranked to outperform the market in the year ahead. Some investors may also be attracted to the stock's high current yield. Those with a long-term horizon, however, can find other water utilities with higher total-return potential through the pull to 2016-2018.

James A. Flood *October 18, 2013*

(A) Diluted earnings. May not sum due to rounding. Next earnings report due early November.
(B) Dividends historically paid in mid-Feb., May, Aug., and November. ● Div'd reinvestment plan available.
(C) In millions, adjusted for splits.
(D) Intangible assets in 2012: $9.2 million, $0.58 a share.

Company's Financial Strength	B++
Stock's Price Stability	95
Price Growth Persistence	40
Earnings Predictability	80

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SJW CORP. NYSE-SJW

RECENT PRICE 27.72 | P/E RATIO 20.8 (Trailing: 21.7 Median: 23.0) | RELATIVE P/E RATIO 1.18 | DIV'D YLD 2.7% | VALUE LINE

TIMELINESS 1 Raised 8/9/13
SAFETY 3 New 4/22/11
TECHNICAL 4 Lowered 10/18/13
BETA .85 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	40	(+45%)	12%
Low	30	(+10%)	5%

Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	4	0	0	0	0	0	0	0	0
Options	0	1	0	0	0	0	0	0	0
to Sell	0	1	0	0	0	0	0	0	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	34	46	47
to Sell	30	20	28
Hld's(000)	9043	10000	10629

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
	5.79	5.58	6.40	6.74	7.45	7.97	8.20	9.14	9.86	10.35	11.25	12.12	11.68	11.62	12.85	14.01	14.05	14.75	Revenues per sh	16.30
	1.27	1.26	1.43	1.23	1.49	1.55	1.75	1.89	2.21	2.38	2.30	2.44	2.21	2.38	2.80	2.97	3.25	3.50	"Cash Flow" per sh	3.65
	.80	.76	.87	.58	.77	.78	.91	.87	1.12	1.19	1.04	1.08	.81	.84	1.11	1.18	1.30	1.40	Earnings per sh A	1.60
	.38	.39	.40	.41	.43	.46	.49	.51	.53	.57	.61	.65	.66	.68	.69	.71	.73	.75	Div'd Decl'd per sh B■	.90
	1.27	1.81	1.77	1.89	2.63	2.06	3.41	2.31	2.83	3.87	6.62	3.79	3.17	5.65	3.75	5.67	5.25	5.20	Cap'l Spending per sh	4.85
	7.02	7.53	7.88	7.90	8.17	8.40	9.11	10.11	10.72	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.40	16.40	Book Value per sh	19.15
	19.02	19.01	18.27	18.27	18.27	18.27	18.27	18.27	18.27	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.25	21.00	Common Shs Outst'g C	23.00
	11.2	13.1	15.5	33.1	18.5	17.3	15.4	19.6	19.7	23.5	33.4	26.2	28.7	29.1	21.2	20.4	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	22.0
	.65	.68	.88	2.15	.95	.94	.88	1.04	1.05	1.27	1.77	1.58	1.91	1.85	1.33	1.30			Relative P/E Ratio	1.45
	4.3%	3.9%	3.0%	2.1%	3.0%	3.4%	3.5%	3.0%	2.4%	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%			Avg Ann'l Div'd Yield	2.6%
							149.7	166.9	180.1	189.2	206.6	220.3	216.1	215.6	239.0	261.5	285	310	Revenues ($mill)	375
							16.7	16.0	20.7	22.2	19.3	20.2	15.2	15.8	20.9	22.3	26.0	29.0	Net Profit ($mill)	37.0
							36.2%	42.1%	41.6%	40.8%	39.4%	39.5%	40.4%	38.8%	41.1%	41.1%	41.0%	40.0%	Income Tax Rate	40.0%
							1.6%	2.1%	1.6%	2.1%	2.7%	2.3%	2.0%	--	2.0%	2.0%	3.0%	4.0%	AFUDC % to Net Profit	5.0%
							45.6%	43.7%	42.6%	41.8%	47.7%	46.0%	49.4%	53.7%	56.6%	55.0%	54.5%	54.0%	Long-Term Debt Ratio	51.0%
							54.4%	56.3%	57.4%	58.2%	52.3%	54.0%	50.6%	46.3%	43.4%	45.0%	45.5%	46.0%	Common Equity Ratio	49.0%
							306.0	328.3	341.2	391.8	453.2	470.9	499.6	550.7	607.9	610.2	685	745	Total Capital ($mill)	900
							428.5	456.8	484.8	541.7	645.5	684.2	718.5	785.5	756.2	831.6	890	950	Net Plant ($mill)	1150
							6.9%	6.5%	7.6%	7.0%	5.7%	5.8%	4.4%	4.3%	4.9%	5.0%	5.0%	5.0%	Return on Total Cap'l	6.0%
							10.0%	8.7%	10.6%	9.7%	8.2%	8.0%	6.0%	6.2%	7.9%	8.1%	8.5%	8.5%	Return on Shr. Equity	8.5%
							10.0%	8.7%	10.6%	9.7%	8.2%	8.0%	6.0%	6.2%	7.9%	8.1%	8.5%	8.5%	Return on Com Equity	8.5%
							4.7%	3.6%	5.6%	5.2%	3.5%	3.3%	1.2%	1.2%	3.1%	3.3%	3.5%	4.0%	Retained to Com Eq	3.5%
							53%	58%	47%	46%	57%	59%	80%	80%	61%	59%	56%	54%	All Div'ds to Net Prof	56%

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	13.6	31.2
3 yr.	24.0	60.1
5 yr.	7.9	110.2

CAPITAL STRUCTURE as of 6/30/13
Total Debt $335.8 mill. Due in 5 Yrs $21.2 mill.
LT Debt $335.3 mill. LT Interest $18.6 mill.
(Total interest coverage: 4.6x) (52% of Cap'l)

Leases, Uncapitalized: Annual rentals $4.7 mill.

Pension Assets $75.5 mill.
Oblig. $141.0 mill.

Pfd Stock None.

Common Stock 20,137,197 shs.
as of 7/26/13
MARKET CAP: $550 million (Small Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	26.7	2.5	4.0
Other	42.2	40.4	44.2
Current Assets	68.9	42.9	48.2
Accts Payable	7.4	8.5	15.9
Debt Due	.8	20.7	.5
Other	20.1	19.9	28.8
Current Liab.	28.3	49.1	45.2
Fix. Chg. Cov.	276%	247%	231%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	5.5%	4.0%	4.0%
"Cash Flow"	6.5%	3.5%	5.0%
Earnings	4.0%	-1.5%	7.5%
Dividends	5.0%	4.0%	4.5%
Book Value	5.5%	3.5%	5.0%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	40.4	54.1	70.3	50.8	215.6
2011	43.7	59.0	73.9	62.4	239.0
2012	51.1	65.6	82.4	62.4	261.5
2013	50.1	74.2	90.7	70.0	285
2014	60.0	75.0	100	75.0	310

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	.055	.24	.44	.11	.84
2011	.03	.29	.44	.35	1.11
2012	.06	.28	.53	.31	1.18
2013	.07	.37	.54	.32	1.30
2014	.10	.35	.60	.35	1.40

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.165	.165	.165	.165	.66
2010	.17	.17	.17	.17	.68
2011	.173	.173	.173	.173	.69
2012	.1775	.1775	.1775	.1775	.71
2013	.1825	.1825	.1825		

BUSINESS: SJW Corporation engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 227,000 connections that serve a population of approximately one million people in the San Jose area and 8,700 connections that serve approximately 36,000 residents in a service area in the region between San Antonio and Austin, Texas. The company offers nonregulated water-related services, including water system operations, cash remittances, and maintenance contract services. SJW also owns and operates commercial real estate investments. Has about 375 employees. Chrm.: Charles J. Toeniskoetter. Inc.: CA. Address: 110 W. Taylor Street, San Jose, CA 95110. Tel.: (408) 279-7800. Int: www.sjwater.com.

A final decision on SJW's pending rate case will be delayed. The California Public Utility Commission (CPUC) has had to divert much of its resources to investigate the San Bruno gas pipeline explosion, which killed eight people in 2010.

Meanwhile, 2013 is benefiting from interim rate relief. SJW is seeking substantial rate increases of 21.5% for 2013, 4.9% in 2014, and 12.6% in 2016. Until a final decision is reached on this request, the utility has been allowed to raise rates on an interim basis. Though earnings comparisons won't be impressive in the second half of the year, we still think that the utility's share net can increase 10%, to $1.30

SJW's future is in the hands of regulators. While this statement is true for all utilities, SJW is more vulnerable than most. This is due to the enormous size of the rate hikes that it has petitioned for. Even though we view the company's expenditures as essential to the operations of its system, the sheer size of the requests puts the CPUC in a difficult position. It is politically very hard to raise rate payers' bills by such a large extent without a significant amount of political blow-back.

Therefore, our 2014 profit estimate for the company is pretty tenuous. Earnings should be fine as long as the interim rate relief is in place. Once the CPUC makes a final decision, things could change for the worse. In any case, we should point out that California regulators have been reasonable in the past, and hopefully some sort of deal that satisfies both sides can be reached.

We expect SJW to tap the external markets in the years ahead. The company estimates that it will have to invest $100 million annually through 2016-2018 in order to upgrade its aging infrastructure. Internal cash flow will fall well short of generating sufficient funds to meet these outlays. Thus, there will be dilutive equity offerings and costly debt issuance. Both of these moves will impair the company's earnings growth.

SJW shares now carry our Highest rank (1) for Timeliness. Momentum investors may find this stock of interest, others might be scared off by the possibility of a harsh regulatory decision.

James A. Flood *October 18, 2013*

(A) Diluted earnings. Excludes nonrecurring losses : '03, $1.97; '04, $3.78; '05, $1.09; '06, $16.36; '08, $1.22; '10, 46¢. Next earnings report due late October. Quarterly egs. may not add due to rounding.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for stock splits.

Company's Financial Strength	B+
Stock's Price Stability	80
Price Growth Persistence	50
Earnings Predictability	80

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YORK WATER NDQ-YORW

RECENT PRICE 19.90 | P/E RATIO 25.8 (Trailing: 26.5 / Median: 25.0) | RELATIVE P/E RATIO 1.47 | DIV'D YLD 2.9% | VALUE LINE

TIMELINESS 4 Lowered 10/4/13
SAFETY 2 New 7/19/13
TECHNICAL 3 Lowered 8/2/13
BETA .70 (1.00 = Market)

2016-18 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	25	(+25%)	8%
Low	17	(-15%)	Nil

Insider Decisions

	N	D	J	F	M	A	M	J	J
to Buy	0	0	4	0	0	4	0	1	5
Options	0	0	0	0	0	0	0	0	0
to Sell	0	1	0	0	0	1	0	0	0

Institutional Decisions

	4Q2012	1Q2013	2Q2013
to Buy	26	33	32
to Sell	27	21	26
Hld's(000)	3178	3375	3346

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	© VALUE LINE PUB. LLC	16-18
High:					13.4	13.5	14.0	17.9	21.0	18.5	16.5	18.0	18.0	18.1	18.5	22.0				
Low:					8.2	9.3	11.0	11.7	15.3	15.5	6.2	9.7	12.8	15.8	16.8	17.6				
Revenues per sh	--	--	--	--	2.05	2.05	2.17	2.18	2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	*3.40*	*3.50*		*3.55*
"Cash Flow" per sh	--	--	--	--	.59	.57	.65	.65	.79	.77	.86	.88	.95	1.07	1.09	1.12	*1.20*	*1.30*		*1.40*
Earnings per sh A	--	--	--	--	.43	.40	.47	.49	.56	.58	.57	.57	.64	.71	.71	.72	*.75*	*.85*		*.90*
Div'd Decl'd per sh B	--	--	--	--	.34	.35	.37	.39	.42	.45	.48	.49	.51	.52	.53	.54	*.55*	*.57*		*.65*
Cap'l Spending per sh	--	--	--	--	.75	.66	1.07	2.50	1.69	1.85	1.69	2.17	1.18	.83	.74	.94	*.90*	*.80*		*.90*
Book Value per sh	--	--	--	--	3.79	3.90	4.06	4.65	4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	*8.05*	*8.35*		*8.60*
Common Shs Outst'g C	--	--	--	--	9.46	9.55	9.63	10.33	10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	*13.00*	*13.20*		*14.00*
Avg Ann'l P/E Ratio	--	--	--	--	17.8	26.9	24.5	25.7	26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	*Bold figures are Value Line estimates*			*22.5*
Relative P/E Ratio	--	--	--	--	.91	1.47	1.40	1.36	1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55				*1.50*
Avg Ann'l Div'd Yield	--	--	--	--	4.4%	3.3%	3.2%	3.1%	2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%				*3.2%*
Revenues ($mill)					20.9	22.5	26.8	28.7	31.4	32.8	37.0	39.0	40.6	41.4	*43.0*	*46.0*				*50.0*
Net Profit ($mill)					4.4	4.8	5.8	6.1	6.4	6.4	7.5	8.9	9.1	9.3	*10.2*	*11.3*				*12.6*
Income Tax Rate					34.8%	36.7%	36.7%	34.4%	36.5%	36.1%	37.9%	38.5%	35.3%	37.6%	*36.0%*	*36.0%*				*36.0%*
AFUDC % to Net Profit					--	--	--	7.2%	3.6%	10.1%	--	1.2%	1.1%	1.1%	*1.0%*	*1.0%*				*1.0%*
Long-Term Debt Ratio					43.4%	42.5%	44.1%	48.3%	46.5%	54.5%	45.7%	48.3%	47.1%	46.0%	*45.0%*	*45.0%*				*43.0%*
Common Equity Ratio					56.6%	57.5%	55.9%	51.7%	53.5%	45.5%	54.3%	51.7%	52.9%	54.0%	*55.0%*	*55.0%*				*57.0%*
Total Capital ($mill)					69.0	83.6	90.3	126.5	125.7	153.4	160.1	176.4	180.2	184.8	*190*	*197*				*220*
Net Plant ($mill)					116.5	140.0	155.3	174.4	191.6	211.4	222.0	228.4	233.0	240.3	*245*	*250*				*265*
Return on Total Cap'l					8.5%	7.6%	8.4%	6.2%	6.7%	5.7%	6.2%	6.5%	6.4%	6.4%	*6.5%*	*7.0%*				*7.0%*
Return on Shr. Equity					11.4%	10.0%	11.6%	9.3%	9.5%	9.2%	8.6%	9.8%	9.5%	9.3%	*9.5%*	*10.0%*				*10.0%*
Return on Com Equity					11.4%	10.0%	11.6%	9.3%	9.5%	9.2%	8.6%	9.8%	9.5%	9.3%	*9.5%*	*10.0%*				*10.0%*
Retained to Com Eq					2.6%	2.1%	3.0%	2.2%	1.7%	1.4%	1.9%	2.7%	2.5%	2.4%	*3.0%*	*3.0%*				*3.0%*
All Div'ds to Net Prof					77%	79%	74%	77%	82%	85%	78%	72%	73%	74%	*71%*	*67%*				*72%*

Percent shares traded: 12, 8, 4

% TOT. RETURN 9/13

	THIS STOCK	VL ARITH.* INDEX
1 yr.	11.9	31.2
3 yr.	36.1	60.1
5 yr.	89.4	110.2

Target Price Range 2016 | 2017 | 2018: 64, 48, 40, 32, 24, 20, 16, 12, 8, 6

LEGENDS
1.10 x Dividends p sh divided by Interest Rate
Relative Price Strength
2-for-1 split 5/02
3-for-2 split 9/06
Options: No
Shaded areas indicate recessions

CAPITAL STRUCTURE as of 6/30/13
Total Debt $84.9 mill. **Due in 5 Yrs** $19.5 mill.
LT Debt $84.9 mill. **LT Interest** $5.2 mill.
(Total interest coverage: 2.9x)
(46% of Cap'l)
Pension Assets 12/12 $22.7 mill.
Oblig. $34.7 mill.

Pfd Stock None

Common Stock 12,912,243 shs.
as of 8/6/13

MARKET CAP: $250 million (Small Cap)

CURRENT POSITION ($MILL.)	2011	2012	6/30/13
Cash Assets	4.0	4.0	4.2
Accounts Receivable	6.0	6.4	4.0
Other	1.4	1.2	4.0
Current Assets	11.4	11.6	12.2
Accts Payable	1.1	1.1	1.5
Debt Due	.1	.1	--
Other	4.1	4.3	4.0
Current Liab.	5.3	5.5	5.5
Fix. Chg. Cov.	160%	156%	154%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '10-'12 to '16-'18
Revenues	4.5%	3.5%	*2.0%*
"Cash Flow"	6.5%	6.5%	*4.0%*
Earnings	5.5%	4.5%	*4.0%*
Dividends	1.5%	3.0%	*3.5%*
Book Value	7.0%	6.0%	*2.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	9.0	9.7	10.5	9.8	39.0
2011	9.6	10.5	10.5	10.0	40.6
2012	9.6	10.4	11.0	10.4	41.4
2013	10.1	10.7	*11.2*	*11.0*	*43.0*
2014	*10.5*	*11.5*	*12.2*	*11.8*	*46.0*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2010	.15	.18	.21	.17	.71
2011	.17	.19	.19	.16	.71
2012	.15	.17	.22	.18	.72
2013	.17	.18	*.21*	*.19*	*.75*
2014	*.19*	*.21*	*.23*	*.22*	*.85*

Calendar	QUARTERLY DIVIDENDS PAID B Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2009	.126	.126	.126	.126	.504
2010	.128	.128	.128	.128	.512
2011	.131	.131	.131	.131	.524
2012	.134	.134	.134	.134	.535
2013	.138	.138	.138	.138	

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2012, the company's average daily availability was 35.0 million gallons and its service territory had an estimated population of 189,000. Has more than 63,000 customers. Residential customers accounted for 63% of 2012 revenues; commercial and industrial (29%); other (8%). It also provides sewer billing services. Incorporated: PA. York had 103 full-time employees at 12/31/12. President/CEO: Jeffrey R. Hines. Officers/directors own 1.2% of the common stock (3/13 proxy). Address: 130 East Market Street York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

There have been very few surprises at The York Water Company in the recent past. From 2010 through 2012, the company's annual share earnings varied by only $0.01 a share. The dividend was also very predictable, as it rose by just $0.01 a share annually during the same time span.

York is awaiting the outcome of a major rate case. Last May, the utility petitioned Pennsylvania regulators for a 17% rate increase (about $7.1 million in revenues a year). The request was to recoup the $49 million that York has spent since 2010 to modernize and update its aging infrastructure. In addition, along with the help of a large rate increase for wastewater customers, the added funds will help the utility replace 30 miles of pipeline and reduce water leakage for the 190,000 people it services.

We think that the outcome will be relatively reasonable. There is no doubt that the current and projected expenditures by York are essential to keeping the system operating efficiently. However, we should point out that no matter how justified utility spending is, regulators face strong political pressure not to implement significant rate hikes.

Dividend growth should remain relatively modest in the years ahead. Though we think that the company will raise its annual payout by $0.02 a share in 2014, the growth rate over the next three- to five-year period will be slightly on the low side for a water utility.

Finances are in decent shape. The equity-to-total capital ratio is healthy at a solid 54%. Still, our Financial Strength rating for York is an average B+. This metric would be higher if the company's capital base was more substantial.

There is nothing particularly noteworthy about York Water's shares. Both the equity's current yield and dividend growth prospects are in line with those of most of its peers. Moreover, the stock has performed fairly well of late and is now trading at over 25 times our 12 month share-earnings estimate. And finally, according to our proprietary Timeliness Ranking System, York shares should underperform the market averages in the upcoming six- to 12-month period.

James A. Flood *October 18, 2013*

(A) Diluted earnings. Next earnings report due early November.
(B) Dividends historically paid in mid-January, April, July, and October.
(C) In millions, adjusted for splits.

Company's Financial Strength	B+
Stock's Price Stability	90
Price Growth Persistence	75
Earnings Predictability	100

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EPCOR Water Arizona, Inc.
Current Institutional Holdings and Individual Holdings
the Proxy Group of Nine Water Companies

	1 October 31, 2013 Percentage of Institutional Holdings	2 October 31, 2013 Percentage of Individual Holdings (1)
Proxy Group of Nine Water Companies		
American States Water Co.	62.12 %	37.88 %
American Water Works Co., Inc.	81.96	18.04
Aqua America, Inc.	47.24	52.76
Artesian Resources Corp.	37.90	62.10
California Water Service Group	56.98	43.02
Connecticut Water Service, Inc.	41.63	58.37
Middlesex Water Company	39.10	60.90
SJW Corporation	52.89	47.11
York Water Company	26.08	73.92
Average	49.54 %	50.46 %

Notes:
(1) (1 - column 1).

Source of Information: pro.edgar-online.com, October 31, 2013

EPCOR Water Arizona, Inc.
Summary of Risk Premium Models for the
Proxy Group of Nine Water Companies

	Proxy Group of Nine Water Companies
Predictive Risk Premium Model ™ (PRPM™) (1)	11.68 %
Risk Premium Using an Adjusted Market Approach (2)	9.96 %
Average	11.25 %

Notes:
(1) From page 2 of this Exhibit.
(2) From page 3 of this Exhibit.

EPCOR Water Arizona, Inc.
Derivation of Common Equity Cost Rate
Using the Predictive Risk Premium Model ™ (PRPM ™)
Proxy Group of Nine Water Companies (1)

	American States Water Co.	American Water Works Co., Inc.	Aqua America, Inc.	Artesian Resources Corp.	California Water Service Group	Connecticut Water Service, Inc.	Middlesex Water Company	SJW Corporation	York Water Company
GARCH Coefficient (2)	1.516803327	4.769091604	2.221510553	2.117502072	1.75823285	1.73798	1.972679422	1.337948339	1.946299283
Average Variance (2)	0.39%	0.28%	0.48%	0.30%	0.31%	0.29%	0.27%	0.42%	0.46%
PRPM™ Derived Risk Premium (2)	7.37%	17.45%	13.51%	8.02%	6.81%	6.11%	6.56%	6.97%	11.40%
Risk-Free Rate (3)	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%
Indicated Cost of Common Equity	11.68%	21.76%	17.82%	12.33%	11.12%	10.42%	10.87%	11.28%	15.71%
								Average	13.67%
								Median	11.68%

Notes:
(1) PRPM™ calculated from first available trading month through September 2013.
(2) Based upon data from CRSP(R) Data © 2012, Center For Research in Security Prices (CRSP(R)), The University of Chicago Booth School of Business.
(3) From note 3 on page 2 of Schedule 8.

EPCOR Water Arizona, Inc.
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Nine Water Companies
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	5.08 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	0.23 (2)
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	5.31 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	(0.04) (3)
5.	Adjusted Prospective Bond Yield	5.27 %
6.	Equity Risk Premium (4)	4.69
7.	Risk Premium Derived Common Equity Cost Rate	9.96 %

Notes:
(1) From note 3 on page 8 of this Schedule.
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.23% from page 6 of this Schedule.
(3) Adjustment to reflect the A1/A2 Moody's bond rating of the proxy group of nine water companies as shown on page 4 of this Schedule. The 4 basis point adjustment is derived by taking 1/6 of the spread between Aa2 and A2 Public Utility Bonds of 0.22% as shown on page 6 of this schedule (1/6 * 0.22% = 0.04%).
(4) From page 7 of this Schedule.

EPCOR Water Arizona, Inc.
Comparison of Bond Ratings, Business Risk and Financial Risk Profiles for the
Proxy Group of Nine Water Companies

	Moody's Bond Rating November 2013		Standard & Poor's Bond Rating November 2013							
	Bond Rating	Numerical Weighting (1)	Bond Rating	Numerical Weighting (1)	Credit Rating	Numerical Weighting (1)	Business Risk Profile (2)	Numerical Weighting (1)	Financial Risk Profile (2)	Numerical Weighting (1)
American States Water Co. (3)	A2	6.0	A+	5.0	A+	5.0	Excellent	1.0	Intermediate	3.0
American Water Works Co., Inc. (4)	A1	5.0	A	6.0	BB+	5.0	Excellent	1.0	Significant	4.0
Aqua America, Inc. (5)	NR	--	AA-	4.0	A+	8.0	Excellent	1.0	Intermediate	3.0
Artesian Resources Corp.	NR	--	NR	--	NR	--	NR	--	NR	--
California Water Service Group (6)	NR	--	AA-	4.0	A+	5.0	Excellent	1.0	Intermediate	3.0
Connecticut Water Service, Inc. (7)	NR	--	A	6.0	A	6.0	Excellent	1.0	Significant	4.0
Middlesex Water Company	NR	--	A	6.0	A-	7.0	Excellent	1.0	Significant	4.0
SJW Corporation (8)	NR	--	A	6.0	A	6.0	Excellent	1.0	Significant	4.0
York Water Company	NR	--	A-	7.0	A-	7.0	Excellent	1.0	Significant	4.0
Average	A1/A2	5.5	A+/A	5.5	A	6.1	Excellent	1.0	Significant	3.6

Notes: (1) From page 5 of this Schedule.
(2) From Standard & Poor's Issuer Ranking: U.S. Regulated Gas and Water Utilities, Strongest to Weakest, July 30, 2013.
(3) Ratings, business risk and financial risk profiles are those of Golden State Water Company.
(4) Rating, business risk and financial risk profiles are those of Pennsylvania and New Jersey American Water.
(5) Ratings, business risk and financial risk profiles are those of Aqua Pennsylvania, Inc.
(6) Ratings, business risk and financial risk profiles are those of California Water Service Co.
(7) Ratings, business risk and financial risk profiles are those of Connecticut Water Company.
(8) Ratings, business risk and financial risk profiles are those of San Jose Water Co.

Source Information: Moody's Investors Service
Standard & Poor's Global Utilities Rating Service

Numerical Assignment for
Moody's and Standard & Poor's Bond Ratings
and Standard & Poor's Business and Financial Risk Profiles

Moody's Bond Rating	Numerical Bond Weighting	Standard & Poor's Bond Rating
Aaa	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	A
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-

Standard & Poor's

Business Risk Profile	Numerical Weighting	Financial Risk Profile	Numerical Weighting
Excellent	1	Minimal	1
Strong	2	Modest	2
Satisfactory	3	Intermediate	3
Fair	4	Significant	4
Weak	5	Aggressive	5
Vulnerable	6	Highly Leveraged	6

Moody's
Comparison of Interest Rate Trends
for the Three Months Ending September 2013 (1)

Months	Corporate Bonds Aaa Rated	Public Utility Bonds Aa Rated	Public Utility Bonds A Rated	Public Utility Bonds Baa Rated	Spread - Corporate v. Public Utility Bonds: Aa (Pub. Util.) over Aaa (Corp.)	Spread - Corporate v. Public Utility Bonds: A (Pub. Util.) over Aaa (Corp.)	Spread - Corporate v. Public Utility Bonds: Baa (Pub. Util.) over Aaa (Corp.)	Spread - Public Utility Bonds: A over Aa	Spread - Public Utility Bonds: Baa over A
September-13	4.64 %	4.58 %	4.80 %	5.31 %					
August-13	4.54	4.53	4.73	5.28					
July-13	4.34	4.44	4.68	5.21					
Average of Last 3 Months	4.51 %	4.52 %	4.74 %	5.27 %	0.01 %	0.23 %	0.76 %	0.22 %	0.53 %

Notes: (1) All yields are distributed yields.

Source of Information: Mergent Bond Record, October 2013, Vol. 80, No. 10.

EPCOR Water Arizona, Inc.
Judgment of Equity Risk Premium for
the Proxy Group of Nine Water Companies

Line No.		Proxy Group of Nine Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	4.67 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	4.70
3.	Average equity risk premium	4.69 %

Notes: (1) From page 8 of this Exhibit.
(2) From page 11 of this Exhibit.

EPCOR Water Arizona, Inc.
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
the Proxy Group of Nine Water Companies

Line No.		Proxy Group of Nine Water Companies
	Based on SBBI Valuation Yearbook Data:	
1.	Ibbotson Equity Risk Premium (1)	5.60 %
2.	Ibbotson Equity Risk Premium based on PRPM™ (2)	9.22
	Based on Value Line Summary and Index:	
3.	Equity Risk Premium Based on Value Line Summary and Index (3)	5.19
4.	Conclusion of Equity Risk Premium (4)	6.67 %
5.	Adjusted Value Line Beta (5)	0.70
6	Beta Adjusted Equity Risk Premium	4.67 %

Notes: (1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2013 Valuation Yearbook - Market Results for Stocks, Bonds, Bills, and Inflation minus the arithmetic mean monthly yield of Moody's Aaa and Aa corporate bonds from 1926 - 2012. (11.83% - 6.23% = 5.60%).

(2) The Predictive Risk Premium Model (PRPM™) is discussed in Ms. Ahern's accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM™ is derived by applying the PRPM™ to the monthly risk premiums between Ibbotson large company common stock monthly returns minus the average Aaa and Aa corporate monthly bond yields, from January 1928 through September 2013.

(3) The equity risk premium based on the Value Line Summary and Index is derived from taking the average 3-5 year estimated median total annual market return of 10.27% (described fully in note 1 of page 2 of Schedule 9) and subtracting the average consensus forecast of Aaa corporate bonds of 5.08%, as derived below. (10.27% - 5.08% = 5.19%).

Fourth Quarter 2013	4.50
First Quarter 2014	4.60
Second Quarter 2014	4.70
Third Quarter 2014	4.80
Fourth Quarter 2014	4.90
First Quarter 2015	5.00
2015-2019	5.80
2020-2024	6.30
	5.08

(4) Average of Lines 1, 2, & 3.

(5) Median beta shown on page 1 of Schedule 8.

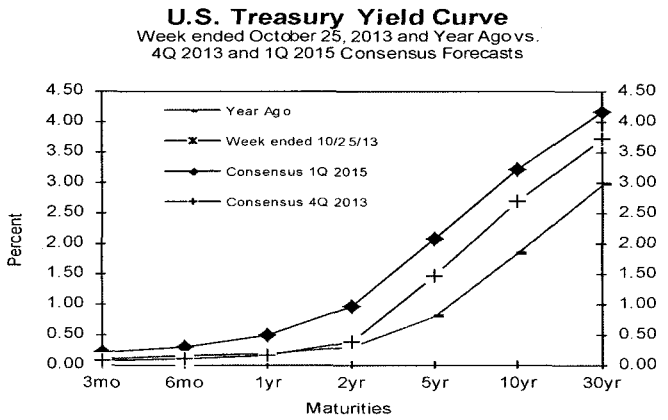
Sources of Information:

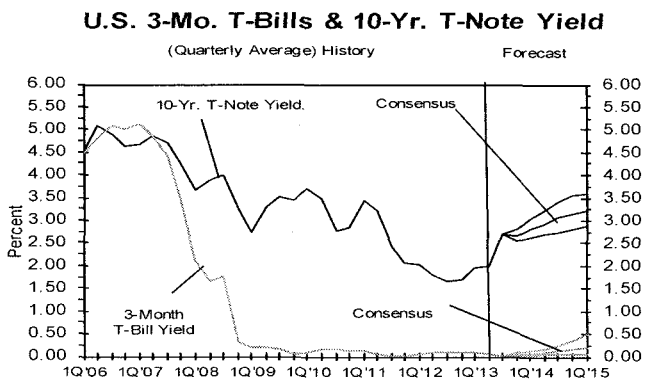
Ibbotson® SBBI® 2013 Valuation Yearbook - Market Results for Stocks, Bonds, Bills, and Inflation, Morningstar, Inc., 2013 Chicago, IL.
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, June 1 and November 1, 2013

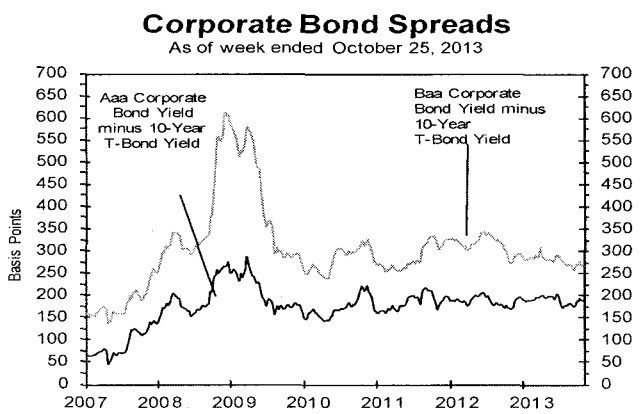
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

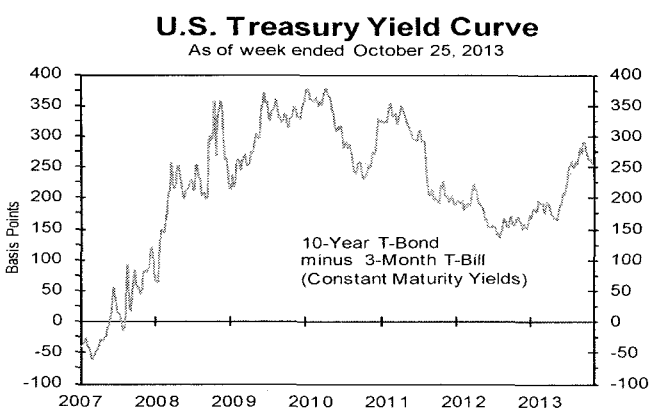
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Q	4Q	1Q	2Q	3Q	4Q	1Q
Interest Rates	Oct. 25	Oct. 18	Oct. 11	Oct. 4	Sep.	Aug.	July	3Q 2013	2013	2014	2014	2014	2014	2015
Federal Funds Rate	0.09	0.10	0.08	0.08	0.08	0.08	0.09	0.08	0.1	0.1	0.2	0.2	0.2	0.2
Prime Rate	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.3	3.3	3.3	3.3	3.3	3.3
LIBOR, 3-mo.	0.24	0.24	0.24	0.24	0.25	0.26	0.27	0.26	0.3	0.3	0.3	0.3	0.4	0.4
Commercial Paper, 1-mo.	0.06	0.11	0.10	0.05	0.05	0.05	0.06	0.05	0.1	0.1	0.1	0.2	0.2	0.3
Treasury bill, 3-mo.	0.04	0.08	0.05	0.02	0.02	0.04	0.04	0.03	0.1	0.1	0.1	0.1	0.2	0.2
Treasury bill, 6-mo.	0.07	0.11	0.07	0.04	0.04	0.07	0.07	0.06	0.1	0.1	0.1	0.2	0.2	0.3
Treasury bill, 1 yr.	0.11	0.14	0.14	0.11	0.12	0.13	0.12	0.12	0.1	0.2	0.2	0.3	0.4	0.5
Treasury note, 2 yr.	0.32	0.34	0.37	0.33	0.40	0.36	0.34	0.37	0.4	0.4	0.6	0.7	0.8	1.0
Treasury note, 5 yr.	1.34	1.39	1.43	1.39	1.60	1.52	1.40	1.51	1.4	1.6	1.7	1.8	1.9	2.1
Treasury note, 10 yr.	2.58	2.66	2.68	2.64	2.81	2.74	2.58	2.71	2.7	2.8	2.9	3.1	3.2	3.2
Treasury note, 30 yr.	3.64	3.70	3.72	3.71	3.79	3.76	3.61	3.72	3.7	3.8	3.9	4.0	4.1	4.2
Corporate Aaa bond	4.48	4.55	4.58	4.58	4.64	4.54	4.34	4.51	4.5	4.6	4.7	4.8	4.9	5.0
Corporate Baa bond	5.24	5.32	5.38	5.41	5.47	5.42	5.32	5.40	5.4	5.5	5.6	5.7	5.8	5.9
State & Local bonds	4.56	4.68	4.57	4.53	4.79	4.82	4.56	4.72	4.6	4.6	4.7	4.8	4.8	4.9
Home mortgage rate	4.13	4.28	4.23	4.22	4.49	4.46	4.37	4.44	4.4	4.5	4.6	4.7	4.8	4.9
	History								Consensus Forecasts-Quarterly					
	4Q	1Q	2Q	3Q	4Q	1Q	1Q	*3Q**	4Q	1Q	2Q	3Q	4Q	1Q
Key Assumptions	2011	2012	2012	2012	2012	2013	2013	*2013*	2013	2014	2014	2014	2014	2015
Major Currency Index	72.4	72.9	73.9	74.0	73.2	74.7	76.4	76.6	75.7	75.8	76.3	76.6	77.0	77.0
Real GDP	4.9	3.7	1.2	2.8	0.1	1.1	2.5	*2.1*	2.1	2.7	2.8	2.8	2.9	3.0
GDP Price Index	0.5	2.0	1.8	2.3	1.1	1.3	0.6	*1.7*	1.7	1.8	1.8	1.9	2.0	2.0
Consumer Price Index	1.4	2.3	1.0	2.1	2.2	1.4	0.0	*2.1*	1.7	1.9	1.9	2.2	2.1	2.2

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data for interest rates except LIBOR is from Federal Reserve Release (FRSR) H.15. LIBOR quotes available from *The Wall Street Journal*. Interest rate definitions are same as those in FRSR H.15. Treasury yields are reported on a constant maturity basis. Historical data for Fed's Major Currency Index is from FRSR H.10 and G.5. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). *Figures for 3Q 2013 Real GDP, the GDP Chained Price Index and the Consumer Price Index are consensus forecasts based on a special question asked of the panelists' this month.*









Long-Range Forecasts:

The table below contains results of our semi-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are estimates for the years 2015 through 2019 and averages for the five-year periods 2015-2019 and 2020-2024. Apply these projections cautiously. Few economic, demographic and political forces can be evaluated accurately over such long time spans.

		Average For The Year					Five-Year Averages	
Interest Rates		**2015**	**2016**	**2017**	**2018**	**2019**	**2015-2019**	**2020-2024**
1. Federal Funds Rate	**CONSENSUS**	**0.8**	**2.0**	**3.1**	**3.6**	**3.9**	**2.7**	**3.8**
	Top 10 Average	1.6	3.4	4.3	4.4	4.6	3.7	4.6
	Bottom 10 Average	0.2	0.8	1.7	2.5	3.1	1.7	2.9
2. Prime Rate	**CONSENSUS**	**3.9**	**5.1**	**6.1**	**6.6**	**6.9**	**5.7**	**6.8**
	Top 10 Average	4.7	6.5	7.3	7.6	7.6	6.7	7.5
	Bottom 10 Average	3.3	3.9	4.8	5.5	6.1	4.7	6.0
3. LIBOR, 3-Mo.	**CONSENSUS**	**1.1**	**2.4**	**3.3**	**3.9**	**4.1**	**3.0**	**4.1**
	Top 10 Average	2.0	3.8	4.6	4.8	4.9	4.0	4.9
	Bottom 10 Average	0.5	1.1	2.0	2.8	3.3	1.9	3.0
4. Commercial Paper, 1-Mo.	**CONSENSUS**	**1.0**	**2.3**	**3.2**	**3.7**	**3.9**	**2.8**	**3.7**
	Top 10 Average	1.7	3.4	4.3	4.5	4.6	3.7	4.5
	Bottom 10 Average	0.5	1.2	2.1	2.8	3.1	1.9	2.8
5. Treasury Bill Yield, 3-Mo.	**CONSENSUS**	**0.9**	**2.0**	**3.1**	**3.5**	**3.8**	**2.7**	**3.7**
	Top 10 Average	1.7	3.4	4.3	4.5	4.6	3.7	4.5
	Bottom 10 Average	0.2	0.8	1.7	2.4	2.9	1.6	2.7
6. Treasury Bill Yield, 6-Mo.	**CONSENSUS**	**1.0**	**2.2**	**3.2**	**3.7**	**3.9**	**2.8**	**3.9**
	Top 10 Average	1.8	3.5	4.4	4.7	4.7	3.8	4.6
	Bottom 10 Average	0.3	1.0	1.8	2.6	3.0	1.7	2.8
7. Treasury Bill Yield, 1-Yr.	**CONSENSUS**	**1.2**	**2.4**	**3.3**	**3.8**	**4.0**	**2.9**	**4.0**
	Top 10 Average	2.1	3.6	4.5	4.8	4.9	4.0	4.8
	Bottom 10 Average	0.4	1.1	1.9	2.7	3.1	1.9	3.0
8. Treasury Note Yield, 2-Yr.	**CONSENSUS**	**1.6**	**2.7**	**3.6**	**4.1**	**4.2**	**3.2**	**4.2**
	Top 10 Average	2.4	3.8	4.7	5.0	5.1	4.2	5.0
	Bottom 10 Average	0.8	1.6	2.4	3.0	3.3	2.2	3.1
10. Treasury Note Yield, 5-Yr.	**CONSENSUS**	**2.3**	**3.3**	**4.1**	**4.4**	**4.6**	**3.8**	**4.5**
	Top 10 Average	3.2	4.4	5.1	5.3	5.5	4.7	5.3
	Bottom 10 Average	1.5	2.3	3.1	3.4	3.6	2.8	3.5
11. Treasury Note Yield, 10-Yr.	**CONSENSUS**	**3.2**	**4.1**	**4.6**	**4.9**	**5.0**	**4.4**	**4.9**
	Top 10 Average	4.0	5.0	5.5	5.8	5.9	5.3	5.7
	Bottom 10 Average	2.5	3.2	3.6	3.8	4.0	3.4	4.0
12. Treasury Bond Yield, 30-Yr.	**CONSENSUS**	**4.2**	**4.8**	**5.4**	**5.6**	**5.7**	**5.2**	**5.6**
	Top 10 Average	5.0	5.9	6.4	6.6	6.8	6.1	6.5
	Bottom 10 Average	3.5	3.9	4.4	4.6	4.7	4.2	4.7
13. Corporate Aaa Bond Yield	**CONSENSUS**	**4.9**	**5.5**	**6.0**	**6.2**	**6.3**	**5.8**	**6.3**
	Top 10 Average	5.6	6.5	7.0	7.1	7.3	6.7	7.1
	Bottom 10 Average	4.1	4.5	5.1	5.3	5.4	4.9	5.4
13. Corporate Baa Bond Yield	**CONSENSUS**	**5.8**	**6.6**	**7.1**	**7.4**	**7.5**	**6.9**	**7.4**
	Top 10 Average	6.6	7.6	8.0	8.3	8.5	7.8	8.3
	Bottom 10 Average	5.1	5.6	6.2	6.4	6.5	5.9	6.5
14. State & Local Bonds Yield	**CONSENSUS**	**4.4**	**5.1**	**5.5**	**5.6**	**5.7**	**5.2**	**5.6**
	Top 10 Average	5.2	6.1	6.5	6.5	6.6	6.2	6.4
	Bottom 10 Average	3.8	4.1	4.6	4.7	4.9	4.4	4.8
15. Home Mortgage Rate	**CONSENSUS**	**4.8**	**5.6**	**6.2**	**6.4**	**6.5**	**5.9**	**6.5**
	Top 10 Average	5.7	6.6	7.1	7.4	7.4	6.8	7.3
	Bottom 10 Average	4.1	4.6	5.1	5.4	5.5	5.0	5.5
A. FRB - Major Currency Index	**CONSENSUS**	**78.6**	**79.1**	**79.3**	**79.6**	**79.6**	**79.2**	**80.0**
	Top 10 Average	82.7	83.7	84.7	85.2	85.3	84.3	85.9
	Bottom 10 Average	74.4	74.2	73.9	73.9	74.1	74.1	74.2
		Year-Over-Year, % Change					Five-Year Averages	
		2015	**2016**	**2017**	**2018**	**2019**	**2015-2019**	**2020-2024**
B. Real GDP	**CONSENSUS**	**3.0**	**2.9**	**2.8**	**2.7**	**2.6**	**2.8**	**2.5**
	Top 10 Average	3.5	3.3	3.2	3.1	3.1	3.2	2.9
	Bottom 10 Average	2.6	2.6	2.4	2.3	2.3	2.4	2.2
C. GDP Chained Price Index	**CONSENSUS**	**2.1**	**2.1**	**2.2**	**2.2**	**2.2**	**2.1**	**2.2**
	Top 10 Average	2.4	2.5	2.6	2.6	2.6	2.5	2.5
	Bottom 10 Average	1.6	1.7	1.8	1.8	1.8	1.7	1.9
D. Consumer Price Index	**CONSENSUS**	**2.3**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
	Top 10 Average	2.7	2.8	2.9	2.9	2.9	2.8	2.8
	Bottom 10 Average	1.8	1.9	1.8	1.9	2.0	1.9	2.0

EPCOR Water Arizona, Inc.
Derivation of Mean Equity Risk Premium Based on a Study
Using Holding Period Returns of Public Utilities

		Over A Rated Moody's Public Utility Bonds - AUS Consultants Study (1)
1.	Arithmetic Mean Holding Period Returns on the Standard & Poor's Utility Index 1928-2012 (2):	10.69 %
2.	Arithmetic Mean Yield on Moody's A Rated Public Utility Yields 1928-2012	(6.53)
3.	Historical Equity Risk Premium	4.16 %
4.	Forecasted Equity Risk Premium Based on PRPM™ (3)	5.24
5.	Average of Historical and PRPM™ Equity Risk Premium	4.70 %

Notes: (1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2012, (AUS Consultants, 2013).

(2) Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.

(3) The Predictive Risk Premium Model (PRPM™) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A rated public utility bonds from 1928 - 2012.

EPCOR Water Arizona, Inc.
Indicated Common Equity Cost Rate Through Use
of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

	1	2	3	4	5	6
Proxy Group of Nine Water Companies	Value Line Adjusted Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate (3)	ECAPM Cost Rate (4)	Indicated Common Equity Cost Rate (5)
American States Water Co.	0.70	7.61 %	4.31 %	9.64 %	10.21 %	
American Water Works Co., Inc.	0.65	7.61	4.31	9.26	9.92	
Aqua America, Inc.	0.60	7.61	4.31	8.88	9.64	
Artesian Resources Corp.	0.60	7.61	4.31	8.88	9.64	
California Water Service Group	0.65	7.61	4.31	9.26	9.92	
Connecticut Water Service, Inc.	0.75	7.61	4.31	10.02	10.49	
Middlesex Water Company	0.70	7.61	4.31	9.64	10.21	
SJW Corporation	0.85	7.61	4.31	10.78	11.06	
York Water Company	0.70	7.61	4.31	9.64	10.21	
Average	0.69			9.55 %	10.14 %	9.85 %
Median	0.70			9.64 %	10.21 %	9.93 %

See page 2 for notes.

EPCOR Water Arizona, Inc.
Development of the Market-Required Rate of Return on Common Equity Using
the Capital Asset Pricing Model for
the Proxy Group of Nine Water Companies
Adjusted to Reflect a Forecasted Risk-Free Rate and Market Return

Notes:

(1) For reasons explained in Ms. Ahern's accompanying direct testimony, from the 13 weeks ending November 1, 2013, Value Line Summary & Index, a forecasted 3-5 year total annual market return of 10.27% can be derived by averaging the 13 weeks ending November 1, 2013 forecasted total 3-5 year total appreciation, converting it into an annual market appreciation and adding the Value Line average forecasted annual dividend yield.

The average 3-5 year estimated median total market appreciation of 37% produces a four-year average annual return of 8.19% ($(1.37^{0.25})$ - 1). When the average annual forecasted dividend yield of 2.08% is added, a total average market return of 10.27% (2.08% + 8.19%) is derived.

The 13 weeks ending November 1, 2013 forecasted total market return of 10.27% minus the risk-free rate of 4.31 (developed in Note 2) is 5.96% (10.27% - 4.31%).

The Predictive Risk Premium Model (PRPM™) market equity risk premium of 10.32% is derived by applying the PRPM™ to the monthly equity risk premium of large company common stocks over the income return on long-term U.S. Government Securities from January 1926 through September 2013.

The Morningstar, Inc. (Ibbotson Associates) calculated arithmetic mean monthly market equity risk premium of 6.55% for the period 1926-2012 results from a total market return of 11.83%% less the arithmetic mean income return on long-term U.S. Government Securities of 5.28% (11.83% - 5.28% = 6.55%).

These three expectational risk premiums are then averaged, resulting in a 7.61% market equity risk premium, which is then multiplied by the beta in column 1 of page 1 of this Schedule. ((5.96% + 10.32% + 6.55%)/3).

(2) For reasons explained in Ms. Ahern's direct testimony, the risk-free rate that Ms. Ahern relies upon for her CAPM analysis is the average forecast of 30-year Treasury Note yields per the consensus of nearly 50 economists reported in the Blue Chip Financial Forecasts dated June 1 and November 1, 2013 (see pages 9 & 10 of Exhibit PMA-7).The estimates are detailed below:

	30-Year Treasury Note Yield
Fourth Quarter 2013	3.70%
First Quarter 2014	3.80%
Second Quarter 2014	3.90%
Third Quarter 2014	4.00%
Fourth Quarter 2014	4.10%
First Quarter 2015	4.20%
2015 – 2019	5.20%
2020 – 2024	5.60%
Average	4.31%

(3) The traditional Capital Asset Pricing Model (CAPM) is applied using the following formula:

$R_S = R_F + \beta (R_M - R_F)$

Where R_S = Return rate of common stock
R_F = Risk Free Rate
β = Value Line Adjusted Beta
R_M = Return on the market as a whole

(4) The empirical CAPM is applied using the following formula:

$R_S = R_F + .25 (R_M - R_F) + .75 \beta (R_M - R_F)$

Where R_S = Return rate of common stock
R_F = Risk-Free Rate
β = Value Line Adjusted Beta
R_M = Return on the market as a whole

Source of Information:
Value Line Summary & Index
Blue Chip Financial Forecasts, June 1 & November 1, 2013
Value Line Investment Survey, (Standard Edition)
2013 Ibbotson® SBBI® Valuation Yearbook, Morningstar, Inc., 2013, Chicago, IL

EPCOR Water Arizona, Inc.
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.		1 Market Capitalization on October 31, 2013 (1) (millions)	(times larger)	2 Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	3 Applicable Size Premium (3)	4 Spread from Applicable Size Premium for (4)
1.	EPCOR Water Arizona, Inc.					
a.	Based Upon the Proxy Group of Nine Water Companies	$ 339.890		9	2.70%	
2.	Proxy Group of Nine Water Companies	$ 1,740.082	5.1 x	6	1.72%	0.98%

	(A) Decile	(B) Number of Companies (millions)	(C) Recent Total Market Capitalization (millions)	(D) Recent Average Market Capitalization (millions)	(E) Size Premium (Return in Excess of CAPM) (2)
Largest	1	173	$ 10,255,341.469	$ 59,279.430	-0.37%
	2	193	2,219,118.548	$ 11,498.024	0.76%
	3	187	1,072,861.025	$ 5,737.225	0.92%
	4	202	695,897.336	$ 3,445.036	1.14%
	5	205	473,139.360	$ 2,307.997	1.70%
	6	234	377,485.205	$ 1,613.185	1.72%
	7	317	329,504.738	$ 1,039.447	1.73%
	8	329	214,084.258	$ 650.712	2.46%
	9	466	166,708.095	$ 357.743	2.70%
Smallest	10	1068	107,517.520	$ 100.672	6.03%

*From Ibbotson 2013 Yearbook

Notes:
(1) From Page 2 of this Schedule.
(2) Gleaned from Column (D) on the bottom of this page. The appropriate decile (Column (A)) corresponds to the market capitalization of the proxy group, which is found in Column 1.
(3) Corresponding risk premium to the decile is provided on Column (E) on the bottom of this page.
(4) Line No. 1a Column 3 – Line No. 2 Column 3 and Line No. 1b, Column 3 – Line No. 3 of Column 3 etc.. For example, the 0.98% in Column 4, Line No. 2 is derived as follows 0.98% = 2.7% - 1.72%.

EPCOR Water Arizona, Inc.
Market Capitalization of EPCOR Water Arizona, Inc. and
the Proxy Group of Nine Water Companies

		1	2	3	4	5	6
Company	Exchange	Common Stock Shares Outstanding at Fiscal Year End 2012 (millions)	Book Value per Share at Fiscal Year End 2012 (1)	Total Common Equity at Fiscal Year End 2012 (millions)	Closing Stock Market Price on October 31, 2013	Market-to-Book Ratio on October 31, 2013 (2)	Market Capitalization on October 31, 2013 (3) (millions)
EPCOR Water Arizona, Inc.		NA	NA	$ 160.704 (4)	NA		
Based Upon the Proxy Group of Nine Water Companies						211.5 % (5)	$ 339.890 (6)
Proxy Group of Nine Water Companies							
American States Water Co.		38.474	$ 11.815	$ 454.579	$ 28.480	241.0 %	$ 1,095.752
American Water Works Co., Inc.		176.988	$ 25.115	$ 4,444.988	$ 42.870	170.7	$ 7,587.476
Aqua America, Inc.		175.209	$ 7.909	$ 1,385.704	$ 25.180	318.4	$ 4,411.765
Artesian Resources Corp.		7.838	$ 15.078	$ 118.180	$ 22.900	151.9	$ 179.492
California Water Service Group		41.908	$ 11.304	$ 473.712	$ 21.800	192.9	$ 913.599
Connecticut Water Service, Inc.		10.939	$ 17.014	$ 186.121	$ 32.050	188.4	$ 350.611
Middlesex Water Company		15.795	$ 11.499	$ 181.632	$ 20.730	180.3	$ 327.430
SJW Corporation		18.671	$ 14.708	$ 274.604	$ 28.230	191.9	$ 527.070
York Water Company		12.919	$ 7.727	$ 99.825	$ 20.710	268.0	$ 267.545
Average		55.416	$ 13.574	$ 846.594	$ 26.994	211.5 %	$ 1,740.082

NA= Not Available

Notes: (1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 5 * Column 3.
(4) From Financial Statements of EPCOR Water Arizona, Inc. for Fiscal Year End-2012.
(5) The market-to-book ratio of EPCOR Water Arizona, Inc. on October 31, 2013 is assumed to be equal to the *market-to-book ratio of the Proxy Group of Nine* Water Companies at October 31, 2013.
(6) EPCOR Water Arizona, Inc.'s common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at October 31, 2013 of the Proxy Group of Nine Water Companies, 211.5%, and EPCOR Water Arizona, Inc.'s market capitalization on October 31, 2013 would therefore have been $339.89 million.

Source of Information: 2012 Annual Forms 10K
yahoo.finance.com