Appendices to the Economic Analysis for the Final Long Term 2 Enhanced Surface Water Treatment Rule

Volume II (H - U)

Office of Water (4606-M) EPA 815-R-06-001 December 2005 www.epa.gov/safewater

Appendix H
Regulatory Flexibility Screening Analysis

H.1 Summary

EPA is required by the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) (5 U.S.C. 601 et seq.), to prepare a Regulatory Flexibility Analysis for any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or other statutes, unless the Agency certifies that the rule will not have a significant economic impact on a substantial number of small entities (5 U.S.C. 603(a)).

This appendix describes EPA's initial assessment of the impacts on small entities as a result of the LT2ESWTR. Based on the results of this screening analysis, EPA certifies that the LT2ESWTR will not have a significant impact on a substantial number of small entities.

H.2 Methodology

The screening analysis involves four major tasks: (1) defining "small entities" for the rule being analyzed, including PWSs run by "small businesses," "small governments," and "small organizations;" (2) determining what number constitutes a "substantial number" of these entities; (3) determining how "significant impacts" will be measured; and (4) completing a screening analysis. If the screening analysis determines that a substantial number of small entities may face significant impacts as a result of the rule, then a formal FRFA may be required.

H.2.1 Defining "Small Entities" Affected by the Rule

The RFA defines small entities as including "small businesses," "small governments," and "small organizations" (5 U.S.C. 601). The RFA references the definition of "small business" found in the Small Business Act, which authorizes the Small Business Administration (SBA) to further define "small business" by regulation. The RFA also authorizes an agency to adopt alternative definitions for each category of small entity "which are appropriate to the activities of the Agency after proposing the alternative definition(s) in the *Federal Register* and taking comment" (5 U.S.C. secs. 601(3) - (5)). In addition to the above, agencies must consult with SBA's Chief Council for Advocacy to establish an alternative small business definition.

The RFA references the definition of "small business" found in the Small Business Act, which authorizes the SBA to define "small business" further by regulation. The SBA defines small businesses by category using the North American Industry Classification System (NAICS). The NAICS code for public water supplies (PWSs) is 22131 (Water Supply and Irrigation Systems), and State agencies that include drinking water programs are classified as 92411 (Administration of Air and Water Resource and Solid Waste Management Programs) or 923120 (Administration of Public Health Programs). Ancillary systems (i.e., those that supplement the function of other establishments like factories, power plants, mobile home parks, etc.) cannot be categorized in a single NAICS code. For ancillary systems, the NAICS code is that of the primary establishment or industry. Examples of small businesses include small, privately owned PWSs and for-profit businesses where provision of water may be ancillary, such as mobile home parks or day-care centers. Examples of small organizations include churches, schools, and homeowner associations.

The LT2ESWTR will apply to all PWSs using surface water and GWUDI as a source. A small PWS can be a business, a government, or an organization, since all entity types may meet the definition of a CWS, NTNCWS, or TNCWS. Although the SBA and the RFA provide clear definitions for small businesses, organizations, and governmental jurisdictions, small entities are not necessarily small water systems. The size of the entity has no relation to the number of people it serves as a water supply. Furthermore, data are not collected on businesses, organizations, and governmental jurisdictions in terms of the number of water customers they serve. Therefore, EPA chose to use an alternative definition for small entities.

For purposes of assessing the impacts of the LT2ESWTR on small entities, EPA considered small entities to be PWSs serving 10,000 or fewer people. This is the cut-off level specified by Congress in the 1996 Amendments to the Safe Drinking Water Act for small system flexibility provisions. Because this definition does not correspond to the RFA's definitions for small businesses, governments, and nonprofit organizations, EPA requested comment on an alternative definition of a small entity in the preamble to the proposed Consumer Confidence Report (CCR) regulation (63 FR 7620 February 13, 1998). In the preamble to the final CCR regulation (63 FR 4511 August 19, 1998), EPA stated its intent to establish this alternative definition for regulatory flexibility assessments under the RFA for all drinking water regulations and has, therefore, used it for the LT2ESWTR.

H.2.2 Determining What Number Constitutes a Substantial Number

This initial assessment assumes that all small PWSs that use surface water or GWUDI are potentially affected by the rule, approximately 6,574 small entity. The Interim Guidance for EPA Rulewriters for the RFA as amended by the SBREFA (March 1999) uses the following criteria to determine what constitutes a substantial number of affected entities: no more than 1,000 systems affected by a rule, representing less than 20 percent of all small systems affected by the rule, may experience economic impacts of 1 percent of their revenues or greater. In addition, no more than 100 systems may experience economic impacts of 3 percent of their revenues or greater. The LT2ESWTR falls under these thresholds.

To evaluate the impact that a small entity is expected to incur as a result of the rule, this analysis calculates the entity's annualized compliance cost as a percentage of sales (for privately owned entities) or the entity's annualized compliance cost as a percentage of annual governmental revenue or expenditures (for publicly owned entities).

H.2.3 Obtaining Data on the Number of Small PWSs and Their Revenues or Expenditures

EPA obtained data on the number of small entities in each category, which are presented in Column A of Exhibit H.1. The numbers of entities and their distribution among categories are derived from EPA's Baseline Handbook (USEPA 2001c) and the 1995 CWSS (USEPA 1997c), respectively. Approximately 49.0 percent of small entities are owned by governments, 33.7 percent are owned by businesses and ancillary systems, and 17.3 percent are owned by organizations.

EPA also estimated the annual revenues or expenditures of small PWSs, presented in Column B of Exhibit H.1. PWS inventories, managed by EPA and other organizations, have traditionally been categorized by size and by the characteristics of the population served (i.e., CWSs, NTNCWSs, and TNCWSs) rather than by NAICS code. Revenues by NAICS code are not readily applicable to EPA's

categorization of systems. Therefore, alternative methods for determining revenue were developed, as discussed below.

The estimated revenues for small entities in Exhibit H.1 are from the Bureau of the Census (U.S. Department of Commerce 1992), the Safe Drinking Water Information System (SDWIS), and additional data on independent privately owned CWSs, special districts, and authorities from the 1995 Community Water System Survey (USEPA 1997c). Column A of Exhibit H.1 shows the numbers of systems classified as small businesses, governments, and organizations, obtained using information from the Third Edition of the Baseline Handbook (USEPA 2001c). These numbers were used to determine the weighted averages of estimated revenue. Column B shows the estimated revenues.

Small government systems include municipal, county, state, federal, military, and special district systems. Data on revenue for townships and municipalities were obtained from the *1992 Census of Governments* (U.S. Department of Commerce 1992), converted to 2003 dollars by applying a conversion factor calculated from the national income and product account tables of the U.S. Bureau of Economic Analysis.[1] Specifically, the price deflators were obtained from Price Indexes for Government Consumption Expenditures and Gross Investment (U.S. Department of Commerce, BEA 2004b). The average revenue for all small governments with PWSs was calculated at $2,649,186.

Small business-run PWSs in Exhibit H.1 include both CWSs and NTNCWSs, such as privately owned CWSs, mobile home parks, country clubs, hotels, manufacturers, hospitals, and other establishments. For this analysis, all hospitals and day care centers are assumed to be businesses, as are 50 percent of systems classified as "other."[2] Estimated average revenue for the small businesses affected by the LT2ESWTR is $2,555,888.

Small organizations include primarily nonprofit NTNCWS such as schools and homeowners associations. The revenue estimates for small nonprofit organizations serving more than 500 people are actually higher than those for small businesses because the total number of such systems is small, and a large proportion of these organizations are schools and colleges with large budgets. This category also includes 50 percent of systems classified as "other." The average estimated revenue for small organizations affected by the LT2ESWTR is $4,750,838.

EPA also calculated the average estimated revenue for all entities. This estimate is weighted to account for the number of small entity PWSs in each category (government, business, and organization) affected by the LT2ESWTR. This overall average is $2,981,331.

H.2.4 Measuring Significant Impacts

To evaluate the impact that a small entity is expected to incur as a result of the rule, this analysis calculates the entity's annualized compliance costs as a percentage of sales (for privately owned systems) or the entity's annualized compliance costs as a percentage of annual governmental revenue or expenditures (for publicly owned systems). The Interim Guidance for EPA Rulewriters for the RFA as amended by SBREFA (March 1999) suggests using 1 percent as a threshold for determining significance, although additional factors may be considered. If compliance costs are less than 1 percent of sales or revenues for fewer than 1,000 entities, which represent less than 20 percent of all affected small entities,

[1] Methodology recommended by Bruce E. Baker, State and Local Governments, Government Division, U.S. Bureau of Economic Analysis.

[2] The "other" category contains systems that do not yet have a specific function identified.

then in most cases there is no significant impact. In addition, the guidance suggests that if fewer than 100 systems experience economic impacts of 3 percent of their revenues or greater, than in most cases there is no significant impact.

Exhibit H.1 presents the data EPA used for the screening analysis to determine if the LT2ESWTR will have a substantial impact on a significant number of small entities. The numbers of systems expected to incur costs of more than 1 and 3 percent of their revenues are presented in Columns E and G, respectively. The numbers of systems experiencing impacts of more than 1 and 3 percent of their revenues were compared to the total number of systems in each size category to calculate percentages, shown in Columns D and F.

EPA determined that a total of 152 small entities, representing 2.3 percent of all small entities affected by the LT2ESWTR, will experience an impact of 1 percent or greater of average annual revenues. This is less than the criteria of 1,000 systems or 20 percent of systems used to determine significant impact. Further, the Agency has determined that 18 small entities, representing 0.3 percent of all small entities subject to the LT2ESWTR, will experience an impact of 3 percent or greater of average annual revenues. This is less than the criterion of 100 systems used to determine significant impact at this cost level. Based on the large number of small entities, the nature of the economics for community water systems, and the information presented in Exhibits 8.1, EPA is certifying that the Stage 2 DBPR will not lead to significant economic impacts for a substantial number of small entities. CWSs have many resources available to them that other industries do not have. For example, financial assistance to small systems may be available from programs administered by EPA or other Federal agencies, as described in Chapter 8.

Because EPA is certifying that the Stage 2 DBPR will not lead to significant economic impacts for a substantial number of small entities, EPA is not required by the RFA, as amended by SBREFA, to conduct a final regulatory flexibility analysis (FRFA). Nevertheless, EPA has tried to reduce the impact of this rule on small systems.

Exhibit H.1: Annualized Compliance Cost of the LT2ESWTR as a Percentage of Revenue and Number of Small Entities Experiencing Impacts ($2003)

PWSs by Ownership Type and System Size	Number of Small Systems	Percent of Small Systems	Average Annual Estimated Revenues[1] per System ($)	Systems Experiencing Costs of ≥1% of their Revenues		Systems Experiencing Costs of ≥3% of their Revenues	
				Number of Systems	Percent of Systems	Number of Systems	Percent of Systems
	A	B	C	D = A*E	E	F = A*G	G
Small Government PWSs	3,221	49%	$2,649,186	74	2.3%	9	0.3%
Small Business PWSs	2,215	34%	$2,555,888	51	2.3%	6	0.3%
Small Organization PWSs	1,137	17%	$4,750,838	4	0.4%	1	0.1%
All Small Entity PWSs	**6,574**	**100%**	**$2,981,331**	**152**	**2.3%**	**18**	**0.3%**

Notes: Detail may not add due to independent rounding. Cost data (annualized at 3 percent over 20 years) are based on the means of the highest modeled distributions generated using the ICR occurrence data set.
[1] Revenue information was used whenever available. When it was not available, other measures such as sales or annual operating expenditures were used. Data were not available to differentiate revenue by system size.
[2] Compliance costs were compared to average annual revenue to determine whether 20 percent of small entities would incur costs exceeding 1 percent of their average annual revenues. Thresholds to determine whether a rule has a significant impact on a substantial number of small entities are taken from the Interim Guidance for EPA Rulewriters for the RFA as amended by the SBREFA (March 1999).
[3] Compliance costs incurred by each entity were compared to 1 percent of average annual revenues to determine whether 1,000 or more entities will experience an impact of 1 percent or greater of average annual revenues.
[4] Compliance costs incurred by each entity were compared to 3 percent of average annual revenues to determine whether 100 or more entities will experience an impact of 3 percent or greater of average annual revenues.

Sources:
(A) Number of disinfecting CWSs and NTNCWSs serving fewer than 10,000 people from the system baseline in Exhibit 4.3, multiplied by 43%, 37.3%, and 19.7% to obtain number of small government, small businesses, and small organizations, respectively.
(B) Percent of small governments, businesses, and organizations derived from the 1995 CWSS (USEPA 1997c).
(C) Small Governments: Revenues from 1992 Census of Governments, GC92(4)-4: Finances of Municipal and Township Governments, U.S. Dept. of Commerce, Bureau of the Census; price deflators from Table 8.11, Chain-Type Quantity and Price Indexes for Government. All other price adjustments were calculated using the Consumer Price Index.
(E, G) Derived from Column B and compliance costs from the LT2ESWTR Cost Model (Appendix U).

Appendix I
Unit Costs for Uncovered Finished Water Reservoirs

I.1 Introduction

This appendix presents unit cost tables for covering or treating uncovered finished water reservoirs. This appendix supports the discussion of these rule activities in Chapter 6. General conditions and assumptions are provided first, followed by a discussion of each treatment option.

I.2 Conditions and Assumptions

The EPA Regions provided an inventory of the nation's uncovered finished water reservoirs. To develop national cost estimates, EPA derived unit costs for the two options of covering the reservoir or disinfecting the reservoir effluent. Where surface area information is unavailable for a reservoir, a depth is assumed to determine surface area for a given reservoir volume.

The data are then divided into 14 size categories for assessing technology costs according to mean values per size category. For each size category, an assumed average hydraulic residence time is used to calculate average daily and design flows. The average daily flow is then used to calculate mean surface area per size category. Exhibit I.1 presents the data used in the costing efforts.

Exhibit I.1: Baseline Conditions for Uncovered Reservoirs by Size Category

Size Category (MG)	Number of Uncovered Reservoirs	Mean Volume (MG)	Mean Surface Area ($ft.^2$)	Estimated Average Hydraulic Residence Time (day)	Average Flow (MGD)	Design Flow (MGD)
	A	B	C	D	E = B/D	F = 3*E
0 - 0.1	3	0.093	500	1.00	0.09	0.28
> 0.1 - 1	9	0.478	2,555	1.00	0.48	1.43
> 1 - 5	10	3.165	16,924	1.00	3.17	9.50
> 5 - 10	4	8.000	42,778	2.00	4.00	12.00
> 10 - 20	12	15.200	81,278	3.00	5.07	15.20
> 20 - 40	5	28.080	150,150	3.00	9.36	28.08
> 40 - 60	10	51.422	274,964	3.00	17.14	51.42
> 60 - 80	7	67.843	362,772	3.00	22.61	67.84
> 80 - 100	3	94.000	502,641	3.00	31.33	94.00
> 100 - 150	6	127.255	680,461	4.00	31.81	95.44
> 150 - 200	1	179.000	957,156	4.00	44.75	134.25
> 200 - 250	4	208.500	1,114,900	4.00	52.13	156.38
> 250 - 1000	6	694.679	3,714,615	14.00	49.62	148.86
> 1000	1	3,313.718	17,719,245	21.00	157.80	473.39
Total	81	0.000	0	-	-	-

Note: Average daily flow is assumed to be one-third of design flow.

Source: (A-C) EPA Regions
(D) Professional judgment.

I.3 Covers

Uncovered finished water reservoirs are susceptible to contamination from bird and animal waste and airborne deposition. Covering the reservoirs can provide protection from water quality deterioration. In addition to providing public health protection, covers prevent algal growth and reduce the amount of chlorine lost during storage by excluding sunlight (Griffith 1988).

Covers can be either fixed or floating. A number of factors are involved in determining a suitable cover, including reservoir size and shape, geological stability of the area, estimated snow, wind and seismic loads put on the reservoir, length of time the reservoir would be taken off-line for construction, existing reservoir rehabilitation, and construction and operations and maintenance (O&M) costs. The remainder of this section explains the estimated capital and O&M costs associated with fixed and floating covers. Fixed and floating cover costs do not include any costs associated with the design, re-design, or rehabilitation of a reservoir.

I.3.1 Floating Covers

Floating covers are flexible membrane structures made of either air-supported fabric or polypropylene material that rest on the surface of open reservoirs. For drainage purposes, floating covers should be flexible as they tend to collect rainwater and washwater. Routine monitoring for damage and proper maintenance and cleaning of the cover will extend its useful life. For this Economic Analysis (EA), floating cover material is assumed to be polypropylene. The costs were estimated by obtaining vendor quotes. The vendor quotes were checked with actual project data to ensure they were consistent with costs experienced by water utilities.

The vendors indicated that costs were size dependent, and there were significant economies of scale for larger covers. The cost analysis uses different unit costs for reservoir surface areas above and below 100,000 square feet. For reservoirs smaller than 100,000 square feet, an average cost of $4.00 per

square foot was used. An average cost of $3.33 per square foot was used for reservoirs larger than 100,000 square feet. O&M cost estimates are 3 percent of total capital costs (USEPA 1999c). For each size category, material costs are estimated for the mean surface area.

Based on best professional judgment, engineering contingencies (construction, standby power, contractor overhead and profit, legal, fiscal, and administrative costs) are estimated to be 35 percent of material costs. Exhibit I.2 presents capital and O&M costs associated with floating covers.

Exhibit I.2: Floating Cover Costs for Uncovered Reservoirs

Size Category (MG)	Mean Surface Area ($ft.^2$)	Cost per Square Foot	Capital Costs	Annual O&M Costs
	A	B	C = A*B	D = C*3%
0 - 0.1	500	$ 4.95	$ 2,475	$ 74
> 0.1 - 1	2,555	$ 4.95	$ 12,655	$ 380
> 1 - 5	16,924	$ 4.95	$ 83,811	$ 2,514
> 5 - 10	42,778	$ 4.95	$ 211,845	$ 6,355
> 10 - 20	81,278	$ 4.95	$ 402,506	$ 12,075
> 20 - 40	150,150	$ 4.12	$ 619,028	$ 18,571
> 40 - 60	274,964	$ 4.12	$ 1,133,598	$ 34,008
> 60 - 80	362,772	$ 4.12	$ 1,495,607	$ 44,868
> 80 - 100	502,641	$ 4.12	$ 2,072,246	$ 62,167
> 100 - 150	680,461	$ 4.12	$ 2,805,351	$ 84,161
> 150 - 200	957,156	$ 4.12	$ 3,946,086	$ 118,383
> 200 - 250	1,114,900	$ 4.12	$ 4,596,418	$ 137,893
> 250 - 1000	3,714,615	$ 4.12	$ 15,314,317	$ 459,430
> 1000	17,719,245	$ 4.12	$ 73,051,478	$ 2,191,544

Source: (A) Exhibit I.1, column C.
(B) Vendor quotes, including a 35% increase for engineering, contractor overhead and contingencies, legal and permit fees, and additional power.

I.3.2 Fixed Covers

Fixed covers are permanent structures constructed to direct drainage away from the reservoir and prevent other contamination of the stored water (USEPA 1999c). These permanent structures can be made from wood, steel, reinforced concrete, or aluminum.

For this EA, fixed cover material is assumed to be common concrete. In the same manner as the floating cover cost model, costs are estimated for the mean surface area for each size category. Material costs are $22.00/sq.ft. (USEPA 1999c). O&M costs are assumed to be 0.1 percent of total capital cost.[1]

As with floating cover cost estimates, engineering contingencies are included at 35 percent of capital costs. Exhibit I.3 presents capital and O&M costs associated with fixed covers.

[1] Estimate obtained from the Report on Water Quality Issues at Sheffield Reservoir for the City of Santa Barbara (Carollo 1999).

Exhibit I.3: Fixed Cover Costs for Uncovered Reservoirs

Size Category (MG)	Mean Surface Area ($ft.^2$)	Cost per Square Foot	Capital Costs	Annual O&M Costs
	A	B	C = A*B	D = C*0.1%
0 - 0.1	500	$ 29.70	$ 14,843	$ 15
> 0.1 - 1	2,555	$ 29.70	$ 75,895	$ 76
> 1 - 5	16,924	$ 29.70	$ 502,643	$ 503
> 5 - 10	42,778	$ 29.70	$ 1,270,504	$ 1,271
> 10 - 20	81,278	$ 29.70	$ 2,413,958	$ 2,414
> 20 - 40	150,150	$ 29.70	$ 4,459,470	$ 4,459
> 40 - 60	274,964	$ 29.70	$ 8,166,420	$ 8,166
> 60 - 80	362,772	$ 29.70	$ 10,774,330	$ 10,774
> 80 - 100	502,641	$ 29.70	$ 14,928,425	$ 14,928
> 100 - 150	680,461	$ 29.70	$ 20,209,699	$ 20,210
> 150 - 200	957,156	$ 29.70	$ 28,427,532	$ 28,428
> 200 - 250	1,114,900	$ 29.70	$ 33,112,516	$ 33,113
> 250 - 1000	3,714,615	$ 29.70	$ 110,324,075	$ 110,324
> 1000	17,719,245	$ 29.70	$ 526,261,590	$ 526,262

Source: (A) Exhibit I.1, column C.
(B) Vendor quotes, including a 35% increase for engineering, contractor overhead and contingencies, legal and permit fees, and additional power. Costs are in 1999 dollars.

I.4 Disinfection

As stated previously, uncovered finished water reservoirs are susceptible to human and animal contamination. In order to maintain a potable water supply without installing a cover, systems may treat the reservoir effluent if they do not cover the reservoir. The rule requires 2 log *Cryptosporidium*, 3 log *Giardia*, and 4 log virus inactivation. To achieve the disinfection requirements, the combination of UV and chlorine provide the least expensive option in this analysis.

I.4.1 Chlorination

To develop costs associated with booster chlorination disinfection, the analysis uses the Water Model (USEPA 1984) and the Water and Wastewater (W/W) Costs and Design Criteria Guidelines Model (CWC 1994). These cost models cover 45 different unit treatment processes. Since these reservoirs contain finished or already treated water, low-dose gas chlorination is assumed to maintain sufficient disinfectant residual in the distribution system; hereafter, this is referred to as "booster chlorination." For reservoirs containing less than 100,000 gallons, 150 pound cylinders were assumed to be used and the Water Model was used to calculate costs. A cost factor of 2.5 was used with the Water Model to calculate total costs. The cost factor accounts for cost items such as design, engineering, installation, site work, and installation. For reservoirs containing more than 100,000 gallons it was assumed that 1-ton chlorine cylinders would be used and the W/W model was used to calculate costs. A cost factor of 2.0 was used for the W/W model to obtain total capital costs. The cost factor represents cost items such as design, engineering, installation, site work, and installation.

EPA evaluated CT requirements from the 1996 SWTR Guidance Manual and determined that a chlorine dose of 1.0 mg/l would provide adequate virus inactivation in most cases. Other assumptions for booster chlorination are given in Exhibit I.4.

Exhibit I.4: Assumptions for Booster Chlorination

Size Category (MG)	Design Flow (mgd)	Cl2 Dose (mg/l)	Cl2 Design Flow (lb/day)	Average Daily Flow (mgd)	Average Daily Flow (lb/day)	Cl2 Dose (ton/year)
	A	B	C = A*B*8.34	D	E = B*D*8.34	F = E*365/2000
0 - 0.1	0.28	1.00	2.34	0.09	0.78	0.14
> 0.1 - 1	1.43	1.00	11.96	0.48	3.99	0.73
> 1 - 5	9.50	1.00	79.19	3.17	26.40	4.82
> 5 - 10	12.00	1.00	100.08	4.00	33.36	6.09
> 10 - 20	15.20	1.00	126.77	5.07	42.26	7.71
> 20 - 40	28.08	1.00	234.19	9.36	78.06	14.25
> 40 - 60	51.42	1.00	428.86	17.14	142.95	26.09
> 60 - 80	67.84	1.00	565.81	22.61	188.60	34.42
> 80 - 100	94.00	1.00	783.96	31.33	261.32	47.69
> 100 - 150	95.44	1.00	795.98	31.81	265.33	48.42
> 150 - 200	134.25	1.00	1,119.65	44.75	373.22	68.11
> 200 - 250	156.38	1.00	1,304.17	52.13	434.72	79.34
> 250 - 1000	148.86	1.00	1,241.49	49.62	413.83	75.52
> 1000	473.39	1.00	3,948.06	157.80	1,316.02	240.17

Source: (A) Exhibit I.1, column F.
(B) Expert opinion and review of 1996 SWTR Guidance Manual.
(D) Exhibit I.1, column E.

Both cost models require standard indices and unit costs from the Bureau of Labor Statistics (BLS) and the Engineering News Record (ENR) to generate capital and O&M costs. For booster chlorination, these cost models take into account typical process equipment and chemical building costs and, therefore, do not require additional adjustments. As adapted from the *Technology and Cost Document* (USEPA 2003a), values used in estimating booster chlorination costs are reported in Exhibit I.5.

Exhibit I.5: Cost Indices Used in the Cost Models

Parameter	Cost Index
ENR Building Cost	3,505
ENR Skilled Labor	5,596
ENR Material Prices	2,228
Electricity	$0.08/k Wh
Natural Gas	$0.006/ft^3
Diesel Fuel	$1.25/ft^2
Housing Costs	$125/ft^2
Labor: 0- 5 MG	$14.5/hr
Labor: > 5 MG	$28.0/hr
Engineering	15% of total equipment costs
Sitework, Interface Piping	15% of total equipment costs
Subsurface Considerations	10% of total equipment costs
Standby Power	5% of total equipment costs
Land Cost	$0/acre
Interest Rate During Construction	7%
Number of Years	20
Chlorine, 1-ton cylinder (> 1MG, ≤ 250 MG)	$350/ton
Chlorine, bulk (> 250 MG)	$280/ton

Exhibit I.6 presents cost model outputs for capital and O&M costs associated with booster chlorination for uncovered reservoirs.

Exhibit I.6: Booster Chlorination Costs for Uncovered Finished Water Reservoirs

Size Category (MG)	Model Process Cost	Raw Process Cost	Total Unit Capital Cost	Unit Housing Cost	Total Capital Unit Cost Including Indirect Costs	Unit O&M Cost
	A	B	C	D	E = (C+D)*3539/3574	F
0 - 0.1	B	C	D	E	F = (D + E)*3539/3574	G
> 0.1 - 1	$29,042	$11,506	$28,766	$0	$28,484	$5,875
> 1 - 5	$21,132	$21,620	$43,240	$5,865	$48,624	$12,935
> 5 - 10	$26,831	$26,831	$53,662	$10,057	$63,095	$15,739
> 10 - 20	$30,884	$30,884	$61,768	$13,318	$74,351	$16,726
> 20 - 40	$32,894	$32,894	$65,788	$14,936	$79,933	$17,206
> 40 - 60	$43,640	$43,640	$87,280	$23,579	$109,773	$19,774
> 60 - 80	$63,190	$63,190	$126,380	$39,306	$164,063	$24,450
> 80 - 100	$80,978	$80,978	$161,956	$48,113	$208,012	$28,007
> 100 - 150	$104,465	$104,465	$208,930	$56,392	$262,724	$32,253
> 150 - 200	$104,931	$104,931	$209,862	$56,556	$263,809	$32,351
> 200 - 250	$145,548	$145,548	$291,096	$73,852	$361,374	$41,230
> 250 - 1000	$157,034	$157,034	$314,068	$80,512	$390,716	$44,659
> 1000	$163,097	$163,097	$326,194	$84,027	$406,204	$46,462

Sources:
(A, D) Taken from the Water Model for the '0 - 0.1' category, and the W/W Model for the remainder.
(B) The Model Process cost for the '0 - 0.1' category are multiplied by 39.2% to reflect the actual equipment costs and remove the electrical, piping, site work, etc.
(C) The Raw Process Costs are multiplied by a capital cost factor of 2.5 or 2 to account for electrical, piping, site work, etc.
(F) Costs are multiplied by 3539/3574 to convert costs in the same year as other cost estimates used in the treatment model.

I.4.2 UV Disinfection

The UV disinfection predicted to be installed uses the same unit cost as the treatment plants. See Appendix E for more information.

I.5 National Cost Estimate

To determine national costs for covering or treating uncovered finished water reservoirs, the number of reservoirs selecting each technology uses a least-cost approach, but assumes only 50 percent of reservoirs will be able to disinfect. The technology selection for uncovered finished water reservoirs is presented in Exhibit I.7.

Although disinfection is the least expensive approach for the remaining systems, the ability of a system to use booster chlorination depends on its current residual disinfectant type. Approximately 50 percent of all surface water systems are predicted to use chloramination following implementation of the Stage 2 DBPR. Adding chlorine to water treated with chloramines can cause quality problems; therefore, a maximum of 50 percent of systems were assumed to add booster chlorination and UV after the reservoir. UV alone was not considered a practical option because the dose requirements for virus inactivation are high, making the capital and O&M costs higher than for chlorine.

Because the technology selection is based on least costs, and fixed-cover costs are the most expensive treatment option considered, no systems were assumed to install fixed covers. EPA recognizes

that some systems may select fixed covers for other reasons, but these incremental costs are not attributable to this rule.

Exhibit I.7: Technology Selection for Uncovered Finished Water Reservoirs

Size Category (MG)	Number of Uncovered Reservoirs	Floating Cover (%)	Booster Chlorination & UV Disinfection (%)
	A	B	C
0 - 0.1	3	100	-
> 0.1 - 1	9	100	-
> 1 - 5	10	100	-
> 5 - 10	4	100	-
> 10 - 20	12	100	-
> 20 - 40	5	50	50
> 40 - 60	10	50	50
> 60 - 80	7	50	50
> 80 - 100	3	50	50
> 100 - 150	6	50	50
> 150 - 200	1	50	50
> 200 - 250	4	50	50
> 250 - 1000	6	50	50
> 1000	1	50	50

Source: (A) Exhibit I.1, column C.
(B-D) Best professional judgement.

To determine national costs to comply with the uncovered reservoir requirement of the LT2ESWTR, the number of reservoirs selecting each technology is multiplied by the capital and O&M costs for that technology. To account for uncertainty when the total costs are modeled, a triangular distribution of $\pm$ 15 percent around the mean estimate is assumed for O&M costs; a triangular distribution of $\pm$ 30 percent around the mean estimate for capital costs is also assumed. For each value, 10,000 values are drawn to generate a distribution. Present value is calculated for the mean and 5^{th} and 95^{th} percentile at both 3 and 7 percent discount rates, then annualized at those rates. Exhibit I.8 shows the annual cost estimates for complying with the uncovered reservoir requirement of the LT2ESWTR.

Exhibit I.8: Annual National Cost Estimate for Uncovered Finished Water Reservoirs

System Size (Population Served)	Annualized Cost at 3%			Annualized Cost at 7%		
	Capital	O&M	Total	Capital	O&M	Total
< 10,000	$0.01	$0.00	$0.01	$0.01	$0.00	$0.02
$\geq$ 10,000	$13.04	$7.46	$20.50	$18.79	$7.36	$26.15
Total	$13.05	$7.46	$20.51	$18.80	$7.37	$26.16

Source: (A) Exhibit I.1, column C.

I.6 Number of Households Expected To Incur Costs

To determine the number of households incurring costs attributed to covering or treating the uncovered finished water reservoirs, the 14 reservoir volume categories are assigned to the nine population size categories. A CWS regression equation from the Model Systems Report (USEPA 2000a) is used for this purpose. Using the average daily flow, calculated from the volume and assumed detention time, a population is calculated. Reservoirs are then assigned to size categories using this population. For these purposes, the flow through the reservoir is estimated to be the entire system flow. Although this may not be an accurate assumption in all cases, there is no basis on which to make another assumption. Exhibit I.9 presents the categorization of the 81 reservoirs by population served.

Exhibit I.9: Number of Uncovered Finished Water Reservoirs by System Size

System Size (Population Served)	Number of Reservoirs
<100	3
100 - 499	0
500 - 999	0
1,000 - 3,299	0
3,300 - 9,999	9
10,000 - 49,999	26
50,000 - 99,999	5
100,000 - 999,999	37
≥1,000,000	1
Total	**81**

Source: Exhibit I.1

To determine the number of households incurring costs, the number of systems is then multiplied by the average number of households per system. The average number of households per system is the ratio of the average number of people per system from the Baseline Handbook (USEPA 2001c) to the average number of people per household (2.59). Exhibit I.10 presents the total number of households incurring the cost of covering or treating the nation's uncovered finished water reservoirs.

Exhibit I.10: Number of Households Incurring Costs for Uncovered Finished Water Reservoirs

System Size (Population Served)	Number of Households
<100	63
100 - 499	0
500 - 999	0
1,000 - 3,299	0
3,300 - 9,999	20,159
10,000 - 49,999	217,257
50,000 - 99,999	106,926
100,000 - 999,999	2,774,523
≥1,000,000	267,187
Total	**3,386,115**

Source: Derived from Exhibit 4.28.

Appendix J
Estimation of Household Costs

J.1 Introduction

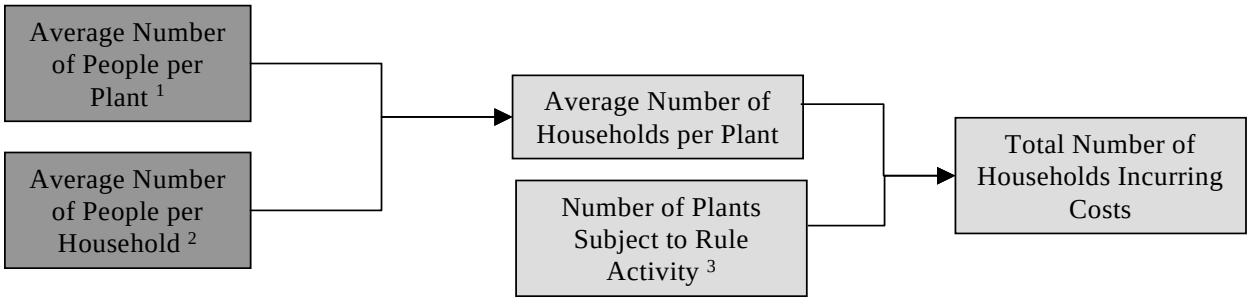
The complexities involved in calculating the costs for the LT2ESWTR make the derivation of household costs particularly difficult. Household costs are presented as average, or mean, household costs incurred for all systems and for those systems adding treatment. Distributions of household costs are also developed, graphically showing the variability in costs for households impacted by the rule. This appendix is intended to take the reader through the household cost calculation process.

J.2 Calculation of Household Costs

Step 1: Calculating the Number of Households Incurring Costs

The first step in arriving at annual household cost estimates is calculating the total number of households subject to LT2ESWTR provisions for each system size category. The number of households per plant is calculated by dividing the average number of people served per plant by the average number of people per household (2.59 people per household) for each system size category (U.S. Census Bureau 2001a). SDWIS data provides system populations for all community water systems (CWSs) according to the established system population size categories (this analysis is limited to CWSs because only those systems serve residential customers) (USEPA 2003e). The average number of people served per plant (presented in Chapter 4) is derived from the SDWIS data, while the number of people per household is the 2000 Census Bureau data estimate. This calculation results in the number of households per plant for a given size category. The following flowchart illustrates this calculation.

[1] Average number of people per plant is derived from the 2003 SDWIS database and the Model Systems Report.
[2] Average number of people per household is taken from 2000 U.S. Census data



[3] Evaluated separately for filtered plants, unfiltered plants, and uncovered finished water reservoirs

The number of households incurring costs is estimated separately for filtered plants, unfiltered plants and uncovered finished water reservoirs and for each rule activity (implementation, monitoring, and treatment).

Filtered Plants

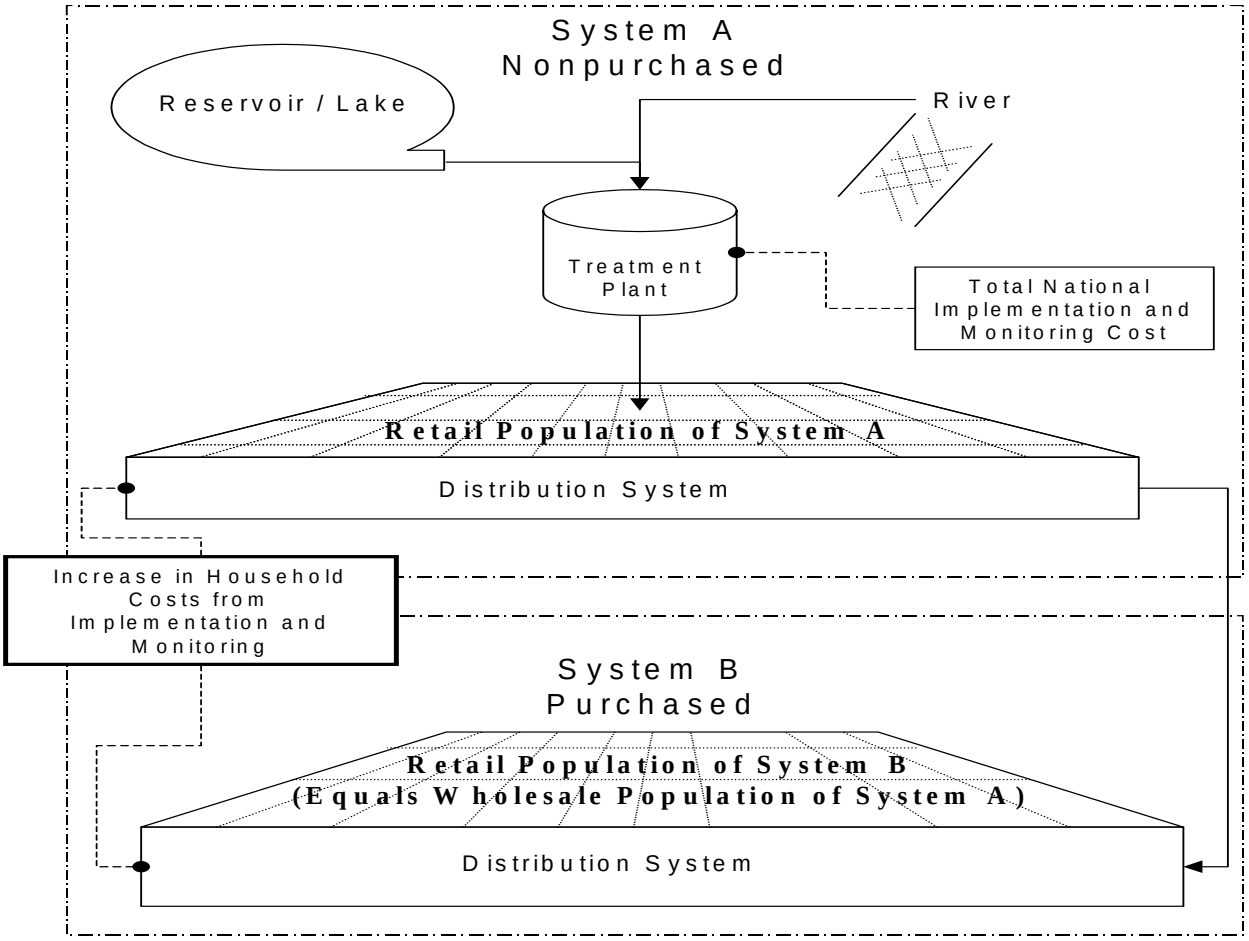
The total number of households subject to each rule activity is estimated by multiplying the average number of households per plant by the number of plants subject to the activity. The number of plants implementing the rule is the same for all regulatory alternatives but the number monitoring or adding treatment varies depending on the regulatory alternative and the modeled *Cryptosporidium*

occurrence distribution. The percentage of plants conducting each activity is shown below and is derived from Chapter 6:

- Implementation - 100 percent of plants (Implementation is based on a system level, but 100 percent of systems perform implementation activities; therefore, 100 percent of plants would also incur implementation costs.)
- *E. coli* Monitoring - 96 to 99.6 percent of plants
- *Cryptosporidium* Monitoring - 34 to 99.6 percent of plants
- Future Monitoring for *E. coli* - 70 to 90 percent of plants
- Future Monitoring for *Cryptosporidium* - 27 to 71 percent of plants

The baseline number of plants performing implementation and conducting *E. coli* monitoring is the number of nonpurchased plants (EPA assumes that purchased plants do not have untreated source waters and that they buy all their water from another system). EPA expects that the nonpurchased plants will pass their costs onto all customers, including other systems that purchase water from them. Because purchased systems will experience wholesale cost increases that reflect implementation and monitoring, households in purchased systems are included in the household calculation as well. Below is an illustration that represents how monitoring and implementation costs are applied to households in purchased and nonpurchased systems.

Exhibit J.1: Distribution of Costs Between Purchased and Nonpurchased Systems



Treatment costs are estimated for both purchased and nonpurchased systems (see Chapter 4 for explanation of why this is appropriate considering the system classification scheme).

To properly determine the impact of costs on households belonging to small purchased systems, the actual costs passed onto the purchased system from the nonpurchased system are taken into account. The costs incurred by the customers of these small purchased systems are included in the size category to which the purchaser belongs and not to the larger size category of the seller. To accomplish this, the number of households in each linked size category as described in Chapter 4 is determined. Then the percentage of households in a linked size category deriving from each of the unlinked size categories is determined. This percentage is multiplied by the total number of households in the linked size category. The resulting cost is then multiplied by the household water usage number for the unlinked size category to determine the household costs for households served by that purchased system.

For example, in the size category serving between 500 and 1,000 people (S3), there are 70,321 people served by surface water or ground water under the direct influence of surface water (GWUDI) systems. Of these, 1,690 come from purchased systems in the 100 to 499 people served category (S2) and 132 people come from the systems in the <100 people served size category (S1). Therefore, 2.4 percent of the total population in the S3 category is associated with purchased systems in the S2 category and 0.2 percent with purchased systems in the S1 category. These percentages would then be

multiplied by the total number of households in the size category to obtain the number of households incurring the cost for the S3 category. Therefore, for each technology cost in the S3 category, 97.6 percent would be allocated to the S3 category, 1.4 percent would be placed in the S2 category, and 0.2 percent would be placed in the S1 category. This step has no effect on the national household cost distributions but only affects analyses which are broken down by size category.

Unfiltered Plants

The total number of households affected by the rule is estimated by multiplying the average number of households per plant by the number of unfiltered plants subject to the rule. The percentage of plants subject to each rule activity is the same for all regulatory alternatives and is derived from Chapter 6:

- Implementation - 100 percent of plants (Implementation is based on systems, but 100 percent of systems perform implementation activities, therefore, 100 percent of plants will also incur implementation costs.)
- Adding Treatment for *Cryptosporidium* Control - 100 percent of plants
- Monitoring - 100 percent of plants

Implementation costs are applied to households in both purchased and nonpurchased systems in a manner similar to that for filtered plants.

Uncovered Finished Water Reservoirs

The total number of households affected by the rule is estimated by determining the average daily flow for each reservoir size category and using flow per population regression equations from the Model Systems Report. The number of households affected by the rule is the same for all regulatory alternatives.

Step 2: Household Unit Costs for Each Treatment Technology

The capital and operations and maintenance (O&M) costs for applicable technologies and the average daily flow for each system size are used to calculate a household unit cost (Appendix E)[1]. Flows for CWSs are presented in Chapter 4. Costs are annualized according to system size and ownership at discount rates of about 5 to 6 percent (see Exhibit J.2 for specific rates). The percentage of plants publicly and privately owned is derived from SDWIS and described in Chapter 4.

[1] Detailed descriptions of the assumptions and processes used in the development of treatment capital and O&M costs can be found in *"Technologies and Costs for Control of Microbial Contaminants and Disinfection By-products."* (USEPA 2003a) as well as preceding sections of this document.

Household unit costs for each technology can be represented by the following equation—

HHUC =(ACC+O&M)/(ADF*1,000*365)

where: HHUC = Household Unit Cost ($/1000 gal)
ACC = Annualized Capital Cost ($) (as described in Chapter 6 and Appendix C)
ADF = Average Daily Flow (MGD) (as presented in Chapter 4)
O&M = Annual Operations and Maintenance Costs (as described in Chapter 6 and Appendix C) ($/1000 gal)

Once average household unit costs for each treatment technology are determined, they are multiplied by the annual water usage per household to arrive at average annual household treatment costs. Annual water usage rates used in this calculation are derived from residential usage from the Baseline Handbook and are shown in Exhibit J.2.

Exhibit J.2: Data Used to Estimate Household Costs

System Size (population served)	Average HH/ Plant	Discount Rate		Annual Water Usage per Household (kgal/yr)
		Public	Private	
≤100	22	5.31%	6.22%	83
101-500	109	5.31%	6.22%	83
501-1,000	289	5.58%	6.22%	104
1,001-3,300	760	5.58%	6.22%	87
3,301-10,000	2,285	5.58%	6.22%	97
10,001-50,000	8,779	5.20%	5.66%	109
50,001-100,000	26,182	5.24%	6.27%	119
100,001-1 Million	95,969	5.24%	6.27%	125
> 1 Million	844,639	5.24%	6.27%	125

Source: Baseline Handbook (USEPA, 2001c)

Step 3: Distribution of Annual Household Treatment Costs (cost per household)

Once the annual household costs for each technology are derived, they are paired with the number of households incurring costs for that specific treatment technology. For example, in the 100-500 population served size category, the number of households served by a plant installing microfiltration will be paired with the annual household cost for microfiltration as calculated above. This process is repeated for each treatment technology that is forecast to be employed within a given system size category. The end result of this process is a distribution of treatment costs across a given system size category.

Step 4: Distribution of Annual Household Implementation and Annual Household Monitoring Costs (cost per household)

Annual household implementation and monitoring costs are estimated in the same manner as annual household treatment costs. Implementation costs as well as *E. coli* monitoring costs are assigned to all households. Costs for *Cryptosporidium* monitoring, future *E. coli* monitoring, future *Cryptosporidium* monitoring, and uncovered finished water reservoirs apply to just a percentage of the total plants and therefore to a percentage of the total households. The household unit cost for each size category and the percentage of plants in each size category that must pay that cost are used to generate the total national household cost distribution.

Step 5: Summation and Presentation of Results

Implementation and *E. coli* monitoring household costs are applied to all households. Each technology unit cost is then added to the proportion of households using that technology as the proportion of overall households incurring that type of cost. The costs for *Cryptosporidium* monitoring, future *E. coli* and *Cryptosporidium* monitoring, and uncovered finished water reservoirs are added to a portion of households for each technology. For example, for the ICR occurrence distribution, 51 percent of plants are required to monitor *Cryptosporidium*. Therefore, in the household costs distribution, the unit cost for *Cryptosporidium* monitoring is added to 51 percent of the plants in each technology. Other types of costs are similarly apportioned. This procedure results in the non-treatment costs being spread out randomly over all systems. EPA recognizes that this may not accurately reflect the true distribution of monitoring and reservoir costs, but the errors introduced are small and it is difficult to predict whether for example systems with uncovered reservoirs would have to install treatment on their plant as well.

J.3 Household Costs

EPA assumes that increases in system costs stemming from implementation of the LT2ESWTR will be passed onto customers. Exhibit J.3 presents mean expected increases in yearly household costs by system size and source water category. These cost increases incorporate costs for rule implementation, monitoring for bin classification, uncovered filtered water reservoirs, future monitoring for bin changes, and treatment changes. Household costs are estimated separately for each of the three modeled *Cryptosporidium* occurrence distributions.

Households served by systems required to make treatment changes under the LT2ESWTR will face much larger increases in household water costs than other systems. Costs for only this subset of households are also presented in Exhibit J.4 to enable separate evaluation. Cost increases to households served by systems making treatment changes are important for evaluating how the rule will affect annual household expenditures nationwide.

EPA estimates that 100 percent of the households served by surface and GWUDI sources will face some increase in household costs due to the LT2ESWTR (except for those very few served by systems that have already installed 5.5 logs of treatment for *Cryptosporidium* (see Chapter 4 for a summary of households served by systems affected by various LT2ESWTR provisions). Approximately 95 percent of the households potentially affected by the rule are served by systems serving at least 10,000 people; these systems experience the lowest increases in costs due to economies of scale. Households served by small systems that install advanced technologies will face the greatest increases in annual costs because they are not able to achieve the economies of scale of larger systems.

All households will face costs less than $389 per year. Ninety percent of all households are predicted to incur costs less than $6.43 per year. Exhibits J.5 and J.6 provide cumulative distributions of household costs for all systems and for those households in systems adding treatment. Cumulative

distributions for households in small systems and for small systems adding treatment are shown in Exhibits J.7 and J.8. Because the cost model limits the selection of UV and other technologies, a very small fraction of plants are predicted to select MF/UF, the most expensive technology (see Appendix F for discussion on the decision tree and limits of technology selection). The household cost model further allows for all combinations of costs for the various rule activities. For example, the combination of MF/UF, all source water monitoring for first and second rounds, and installing a reservoir cover is included in the cost model. As a result, a very small fraction (less than 0.1 percent), have high unit household costs that are not shown on the graphs. EPA believes systems are not likely to incur such costs.

Exhibit J.3: Summary of Annual Household Cost Increases ($/Year)

System Type/Size	Households	Mean	Median	90th Percentile	95th Percentile	Percent of Systems with Household Cost Increase < $12	Percent of Systems with Household Cost Increase < $120
ICR							
All CWS	68,857,992	$2.59	$0.21	$6.43	$9.97	96.49%	99.99%
CWS ≤ 10,000	5,587,602	$4.14	$0.56	$9.97	$14.79	91.19%	99.88%
CWS < 500	158,900	$13.09	$3.86	$28.66	$53.60	63.20%	98.87%
ICRSSL							
All CWS	68,857,992	$1.67	$0.09	$6.37	$6.42	97.96%	100.00%
CWS ≤ 10,000	5,587,602	$2.49	$0.36	$6.60	$9.37	96.46%	99.94%
CWS < 500	158,900	$8.58	$2.91	$17.44	$29.01	72.61%	99.50%
ICRSSM							
All CWS	68,857,992	$1.97	$0.09	$6.37	$6.85	97.47%	99.99%
CWS ≤ 10,000	5,587,602	$3.00	$0.49	$7.02	$11.39	95.19%	99.93%
CWS < 500	158,900	$10.10	$2.90	$26.24	$35.97	68.73%	99.31%
ICR - High							
All CWS	68,857,992	$2.84	$0.21	$6.43	$9.97	96.09%	99.99%
CWS ≤ 10,000	5,587,602	$4.58	$0.61	$11.50	$15.30	90.22%	99.86%
CWS < 500	158,900	$7.21	$2.91	$16.81	$26.25	75.79%	99.80%
ICRSSL - Low							
All CWS	68,857,992	$1.42	$0.03	$5.65	$6.42	98.37%	100.00%
CWS ≤ 10,000	5,587,602	$2.06	$0.23	$6.58	$7.47	97.21%	99.96%
CWS < 500	158,900	$14.42	$4.79	$30.00	$54.42	62.07%	98.58%

Exhibit J.4: Summary of Annual Household Cost Increases for Plants Adding Treatment ($/Year)

System Type/Size	Households	Mean	Median	90th Percentile	95th Percentile	Percent of Systems with Household Cost Increase < $12	Percent of Systems with Household Cost Increase < $120
ICR							
All CWS	25,653,938	$6.20	$3.62	$10.99	$18.37	90.69%	99.98%
CWS ≤ 10,000	1,940,775	$10.48	$6.93	$16.69	$20.48	76.11%	99.67%
CWS < 500	54,404	$25.67	$16.76	$54.35	$66.52	44.70%	97.51%
ICRSSL							
All CWS	17,769,951	$5.23	$3.62	$9.97	$14.47	92.22%	99.98%
CWS ≤ 10,000	1,260,320	$8.91	$6.58	$14.66	$18.31	86.26%	99.77%
CWS < 500	34,939	$21.40	$16.08	$46.37	$64.34	45.58%	98.15%
ICRSSM							
All CWS	20,786,502	$5.50	$3.62	$10.23	$15.22	91.76%	99.98%
CWS ≤ 10,000	1,522,890	$9.19	$6.57	$14.73	$18.37	84.10%	99.76%
CWS < 500	42,445	$22.43	$16.08	$46.42	$64.88	45.45%	97.91%
ICR - High							
All CWS	28,234,408	$6.29	$3.62	$11.05	$18.37	90.55%	99.97%
CWS ≤ 10,000	2,165,489	$10.54	$6.97	$16.72	$20.74	76.00%	99.66%
CWS < 500	60,828	$26.30	$16.75	$54.42	$67.67	44.73%	96.92%
ICRSSL - Low							
All CWS	14,871,580	$4.99	$3.62	$9.97	$14.37	92.61%	99.98%
CWS ≤ 10,000	1,006,777	$8.87	$6.58	$14.37	$18.37	86.82%	99.77%
CWS < 500	27,693	$ 20.77	$ 16.08	$ 46.32	$ 62.35	45.49%	98.88%

Exhibit J.5: Cumulative Distribution of Annual Household Costs–All Systems

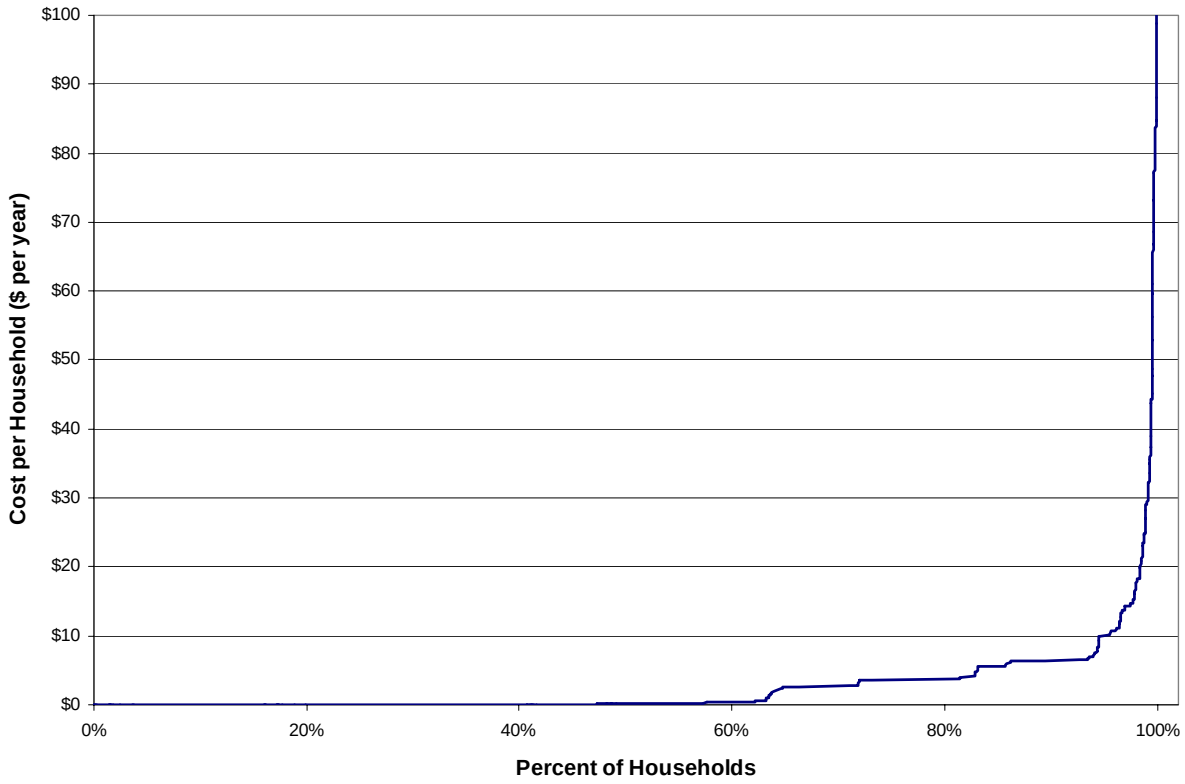


Exhibit J.6: Cumulative Distribution of Annual Household Costs– All Affected Systems

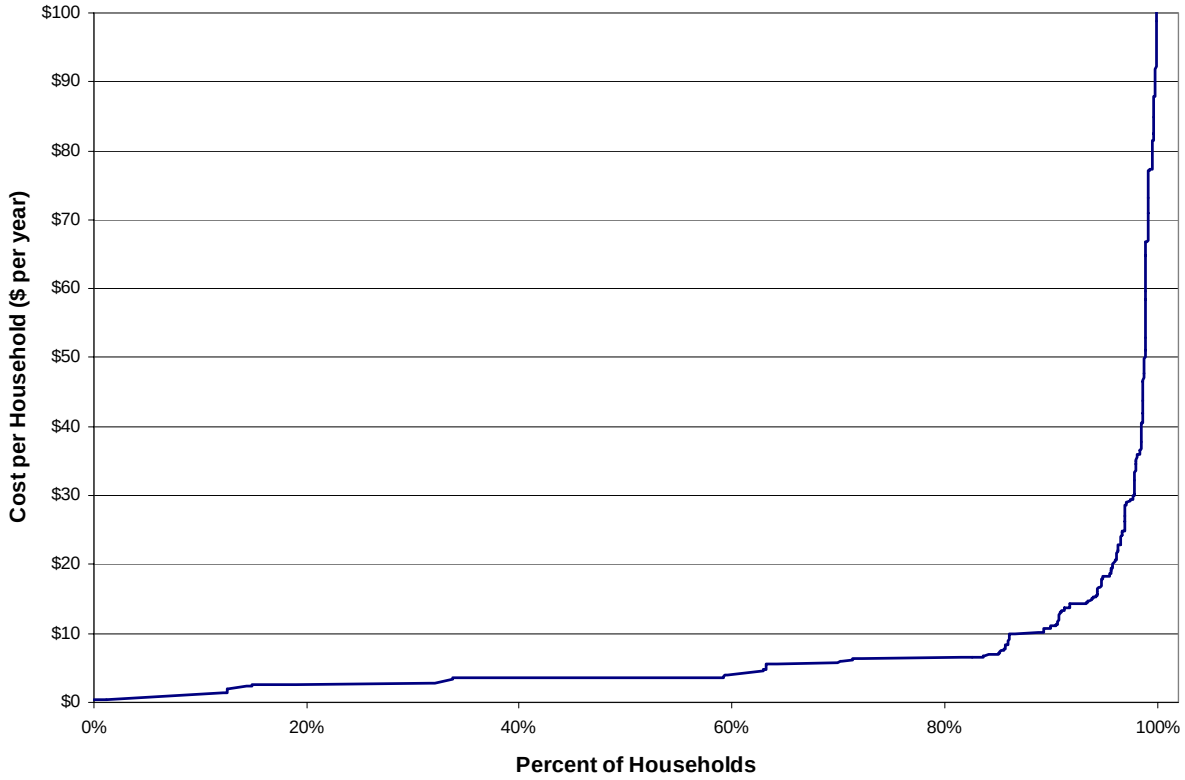


Exhibit J.7: Cumulative Distribution of Annual Household Costs– All Small Systems

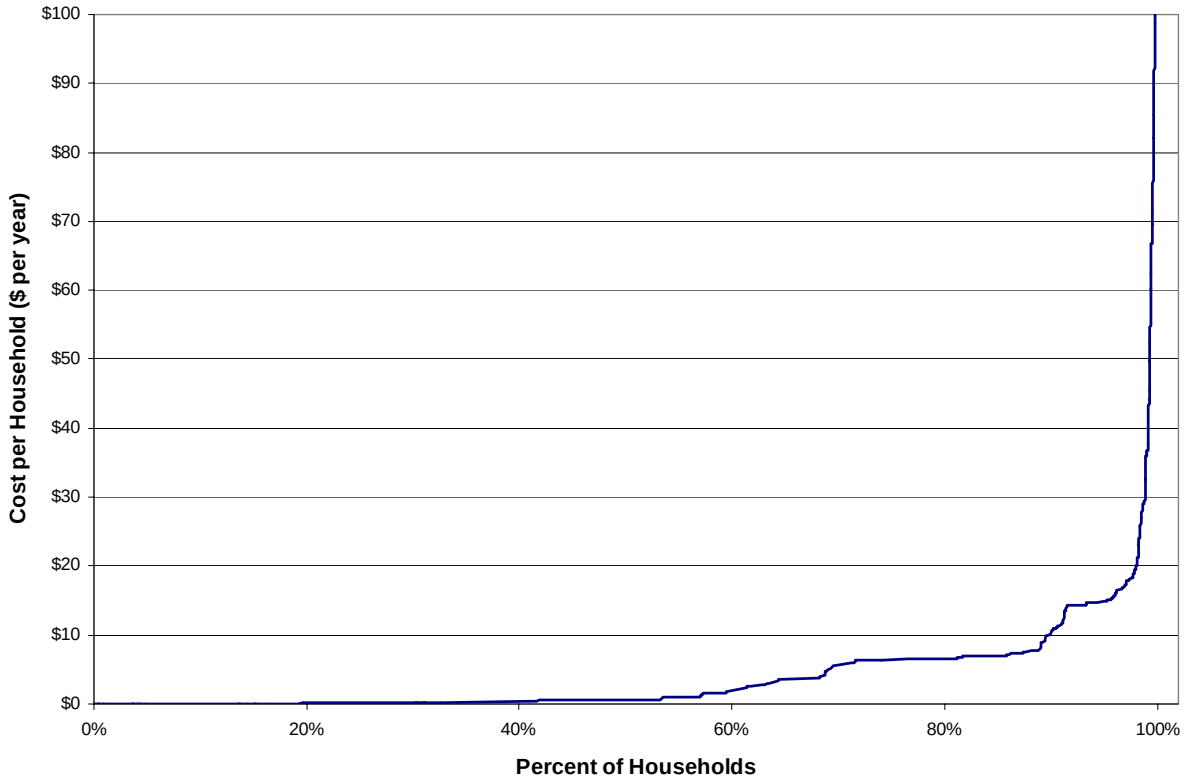
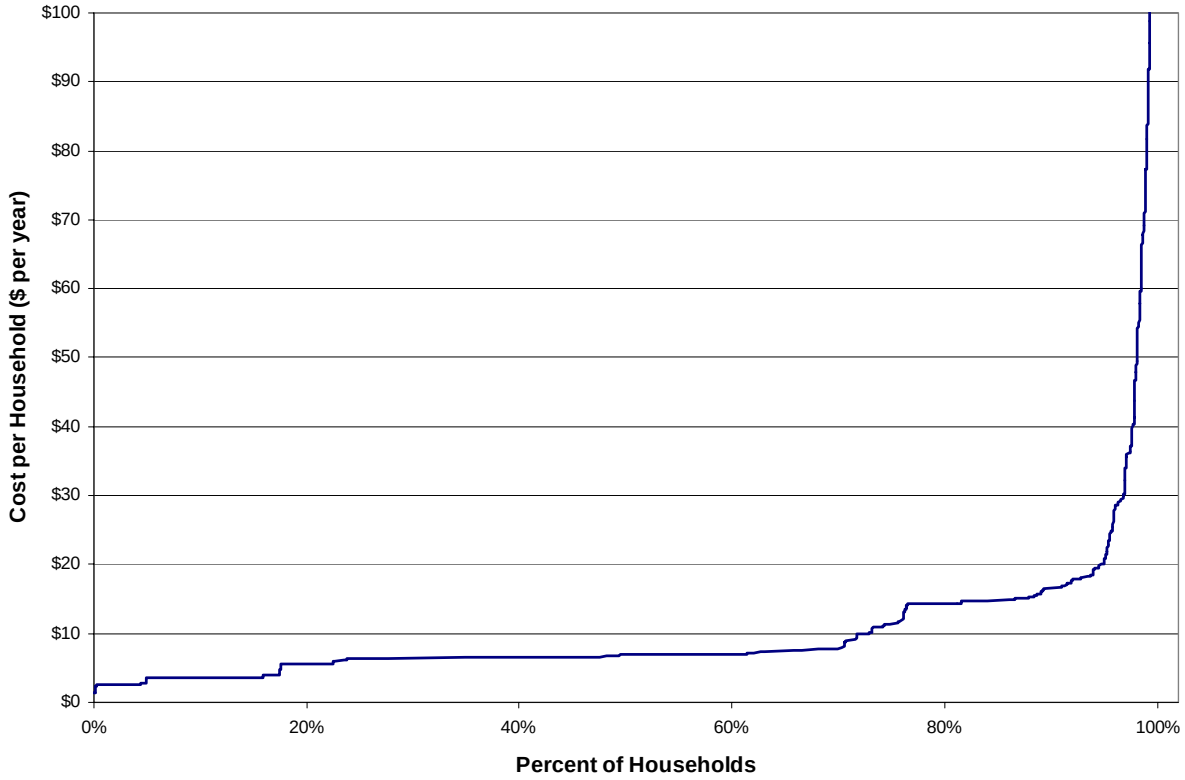


Exhibit J.8: Cumulative Distribution of Annual Household Costs– Affected Small Systems



Appendix K
Additional Information on the Approach For Valuing Time Losses

K.1 Introduction

As discussed in the main text of this report, the value of averting cryptosporidiosis-related morbidity is estimated based on information on (1) the medical costs associated with the illness and (2) the value of time lost due to illness[1]. This appendix provides a more in-depth discussion of this approach, describing both the overall selection of the cost of illness (COI) method and the details of the approach used to value time losses. The appendix focuses on the rationale for the methodological choices made for this analysis; information on the specific numerical values used to apply this approach are described in Appendix L.

Appendix K begins by discussing the rationale for relying on COI methods rather than other measures of social welfare (i.e., willingness to pay (WTP) estimates) for valuing the reductions in risk from cryptosporidiosis morbidity. This discussion provides a brief introduction to the concept of WTP, then describes its relationship to COI methods. It next describes the potential applicability of the available WTP literature to the types of morbidity risks considered in this analysis and the problems with relying on this literature. EPA's Science Policy Council has also considered these issues and the reader can find more detail in its *Handbook for Non-Cancer Health Effects Valuation*.

The appendix then introduces the two approaches used to value time losses in this Economic Analysis. One approach, the Traditional Cost of Illness (COI), is based on the human capital approach typically applied in COI studies, focusing on the effect of illness on labor productivity (as measured by work time lost, whether market or nonmarket). Another approach, the Enhanced COI, attempts to provide a more complete estimate of the social welfare impacts of time losses due to illness based on the existing data and literature. The subsequent sections of the appendix then discuss these approaches for valuing each type of time loss in more detail.

K.2 WTP and COI Approaches

In the context of benefit-cost analysis, the valuation of human health risk reductions is based on the principles of neoclassical welfare economics[2]. These principles assume that each individual is the best judge of his or her own well-being (referred to as "utility" by economists), and that individual preferences should form the basis of valuing any changes that affect societal welfare.

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[1] The effect of illness on the use of time is referred to as time losses in this report to separate these effects from the other social welfare impacts of illness that are evaluated separately. In reality, these losses are shifts in the use of time from its preferred use to illness-related activities, and hence in economic terms can be more accurately described as one of the components of utility losses associated with illness.

[2] This section provides a brief overview of several topics that are covered in more detail in EPA's *Guidelines for Preparing Economic Analyses* (USEPA 2000d).

In theory, the dollar value of the benefits associated with a risk reduction is most appropriately measured by determining the change in income that has the same effect on utility (or the level of individual well-being) as the change in risk. Because utility is impossible to measure directly, economists typically rely instead on estimates of WTP or willingness to accept (WTA) compensation. WTP is the maximum amount of money an individual would voluntarily exchange to obtain an improvement (such as a risk reduction) given his or her budget constraints. WTA is the least amount of money an individual would accept to forego the improvement. These two measures are not necessarily equal. However, in practice, economists usually rely on measures of WTP because of concerns about the accuracy and reliability of the methods available for estimating WTA compensation.

WTP is a different concept than cost or price. "Cost" refers to the resources needed to produce a good or service; it does not measure the value of the good or service to members of society. "Price" is determined by the interactions of producers and consumers in the marketplace. For some individuals, the market price may exceed WTP, in which case they will not purchase the good. For other individuals, WTP may exceed the current price, in which case these individuals will benefit from the fact that the market price is less than they are willing to pay.

Estimates of WTP can be derived, however, from price and quantity data for goods that are bought and sold in the marketplace (i.e., "market goods"). For other, "nonmarket," goods—such as health risk reductions, economists generally group methods for estimating WTP into two categories. The first category, "stated preference" methods, involves asking individuals what they would be willing to pay for a change in health risk or another nonmarket good. The most commonly used stated preference approach is the contingent valuation method, which involves surveying individuals and asking them how much they would be willing to pay for a hypothetical nonmarket good given their existing household budget.

The second category of valuation approaches for nonmarket goods includes "revealed preference" methods, and involves looking at behavior for related goods. One example of these methods is wage-risk studies, which estimate the change in wages required for riskier jobs, using statistical methods to control for the many factors other than risk that affect wage levels. Another example of revealed preference methods is averting behavior models, which consider market goods that are purchased at least in part to achieve risk reductions—such as bottled water or home filters. These latter methods are rarely used in practice however, due to difficulties in sorting out the value of risk reductions from the values associated with other characteristics of the product (e.g., improved taste or convenience).

COI studies differ from these stated and revealed preference methods in that they are a measure of cost rather than WTP. These studies examine the actual direct costs (e.g., medical expenses such as doctor visits, medication, and hospital stays) incurred by individuals affected by the illness. The COI method is relatively easy to apply because: (1) it is well developed, widely used, and easily explained; (2) many of the types of costs it includes are easily measured; and (3) existing studies provide estimates for a large number of illnesses. For these reasons, this method is often used in economic analyses despite its shortcomings as a proxy for WTP.

In general, the logic for using COI methods is that, if illness imposes the costs of medical expenditures and foregone earnings, then a policy that reduces illness yields benefits equal, at a minimum, to the costs saved (Tolley et al. 1994). However, COI estimates may underestimate individual WTP because they do not explicitly address the value of avoiding the pain and suffering associated with the illness (especially the Traditional COI), nor the costs that individuals incur to avoid the illness (often

referred to as defensive or averting expenditures)[3]. In addition, COI estimates do not reflect aversion to risk, i.e., the effect of fear of illness on WTP. In contrast to welfare measures based on *ex ante* WTP to avert health risks, COI measures examine the actual *ex post* costs to society associated with treating the health effects. Finally, in cases where treatment does not return people to their original health state, these methods will underestimate the benefit of avoiding the illness entirely.

COI studies sometimes include indirect as well as direct costs. These indirect costs usually include lost earnings due to missed market work time, and occasionally include costs associated with lost nonmarket work (e.g., housekeeping), (both are included in the Traditional COI and Enhanced COI estimates), and reduced productivity while at work (which is included in the Enhanced COI). Typically, these costs are estimated using the human capital approach, which (as discussed in more detail later in this appendix) focuses on the effect of time use on the production of goods and services and ignores other aspects of time use that affect individual well-being.

Given these concerns, the COI method is an imperfect substitute that is applied in cases where suitable WTP studies are not available. The following section discusses the available WTP literature and its relevance to the health risks assessed in this report. It also summarizes studies that have explored the relationship between WTP and COI for specific health effects.

K.3 Review of the Literature on WTP for Morbidity Risk Reductions

This analysis uses a variant of the COI approach to value reductions in cryptosporidiosis morbidity risks because of the lack of suitable WTP studies of reasonable quality. EPA conducted several reviews of the valuation literature and found relatively few studies that address morbidity risks[4]. Many of these studies focus on relatively serious and often chronic conditions such as asthma, chronic bronchitis, or angina; a few consider very minor acute affects such as drowsiness, headache, or eye irritation. In general, these conditions appear significantly dissimilar to the effects of cryptosporidiosis and, hence, do not provide suitable valuation estimates for the purposes of this analysis.

Of particular interest are two inter-related studies of nausea (as well as other minor health symptoms) that were completed by overlapping groups of researchers in 1984-1985 in Chicago and Denver.

- Based on a contingent valuation survey, Berger et al. (1987) explored individual WTP to avoid one additional day of nausea. The authors report results only for the 17 individuals sampled who had experienced the symptom, and found a mean value of $48 per day (dollar year not reported).[5]

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[3] COI estimates may, in some limited cases, overstate WTP–for example, because the availability of insurance may lead people to agree to treatments that they would not willingly finance themselves.

[4] See, for example, EPA's *Handbook for Non-Cancer Health Effects Valuation* (USEPA 2000f). The literature review in the *Handbook* was updated and extended to include cancers in: Industrial Economics, Incorporated, (unpublished).

[5] Assuming that the estimate is for the year 1985, the year 2000 equivalent is $77 per additional day, inflated using the Consumer Price Index for all Urban Consumers (CPI-U).

- Another contingent valuation study by Tolley et al. (1986) also considered nausea, described as a "lingering urge to vomit" with strong distress, but no pain. The mean value for avoiding one additional day of nausea was $50 (dollar year not reported) among the 176 respondents[6].

Both estimates appear unsuitable for the analysis of cryptosporidiosis morbidity risks in terms of both applicability and quality, based on EPA guidelines for determining whether benefits estimates are suitable for transfer to other contexts[7]. First, they describe a symptom that is substantially less severe than the suite of symptoms typically associated with cryptosporidiosis, which often involves several days of diarrhea, abdominal cramping, fever, and vomiting, as well as nausea. Second, Berger in particular relies on a small sample that may not be representative of the U.S. population (or of the subset of this population affected by this rulemaking), and may be best described as a pilot or illustrative study[8]. Given the more severe symptoms associated with cryptosporidiosis, WTP to avoid cryptosporidiosis is likely to exceed the WTP values for nausea found in these studies.

Due to the lack of suitable WTP estimates, this report instead relies largely on COI estimates from the studies cited in the main text. These studies have the advantage of directly addressing cryptosporidiosis or illnesses that have very similar health effects (i.e., giardiasis). However, they are likely to underestimate individual WTP for risk reductions. Research on the ratio of WTP to COI estimates suggests that the ratio of these values varies greatly depending on the nature of the health effect, the characteristics of the affected individuals, and the factors included in constructing each estimate. The resulting WTP to COI ratios for the illnesses studied range from about a factor of 2 to as much as a factor of 79 (in one case); many of the ratios are between 3 and 6[9]. In other words, the COI estimates are typically one-third to one-sixth of the WTP estimates. Much of this literature focuses on individual (out-of-pocket) costs of illness rather than the full costs (including costs paid by insurers), and considers relatively minor health effects (where the costs borne by insurers may be minimal). Few of these studies include lost earnings or other indirect costs in the COI estimates, and instead focus largely on medical expenditures.

The approach used to estimate medical costs in constructing the COI estimates used in this report is discussed in detail in Chapter 5 and Appendix L. The remainder of this appendix focuses on the approaches used in this Economic Analysis to value lost time. As discussed below, this approach uses both a traditional approach (that is, similar to other studies) and an "enhanced" approach, which is a significant departure from the approach typically used to value time losses in the COI literature because it attempts to provide a more complete measure of the effects of lost time on social welfare.

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[6] Assuming that the estimate is for the year 1985, the year 2000 equivalent is $80 per additional day, inflated using the CPI-U.

[7] See, for example, Chapter 7 of EPA's *Guidelines for Preparing Economic Analyses* (USEPA 2000d) and Chapter 4 of EPA's *Assessing the Benefits of Drinking Water Regulations* (USEPA 2001a).

[8] EPA has used Tolley et al. (1986) to value respiratory effects associated with minor restricted activity days associated with air pollution; for these effects, other studies are available that appear to support the Tolley et al. findings. See, for example, the approach applied in EPA's *Final Heavy Duty Engine/Diesel Fuel Rule: Air Quality Estimation, Selected Health and Welfare Effects Methods, and Benefits Results* (USEPA 2000g), pp.4-32.

[9] See Appendix B of EPA's *Handbook for Non-Cancer Health Effects Valuation* (USEPA 2000f) for a review of these studies.

K.4 Welfare Effects of Time Losses Due to Illness

Much of the research on the value of time losses due to illness focuses on the effects of such losses on the production of goods and services by the affected individuals. In the context of benefit-cost analysis, analysts are interested in a more complete measure of the welfare effects of these time losses. As discussed by A. Myrick Freeman III (1993) in his seminal work on benefits valuation:

> *The economic concept of value employed here has its foundation in neoclassical welfare economics. The basic premises of welfare economics are that the purpose of economic activity is to increase the well-being of individuals who make up society, and that each individual is the best judge of how well off he or she is in a given situation. Each individual's welfare depends not only on that individual's consumption of private goods and of goods and services produced by the government, but also on the quantities and qualities each receives of nonmarket goods and service flows....*

In this context, analysts are concerned with the effect of illness on foregone market production (paid work), foregone nonmarket production (e.g., volunteer or household activities), and any additional diminished utility (or sense of well-being) associated with market work, nonmarket work, and leisure activities. Analysts are also concerned with the impacts on other individuals such as dependent children or nonmarket caregivers.[10]

In contrast, most of the work on valuing time losses has been completed in the context of estimating the market impacts of illness, focusing on the ill individual. In this context, lost time generally has been measured using the human capital approach, which views individuals as mechanisms of production; i.e., as capital. Under this approach, an individual is valuable to the extent that he or she produces goods or services, and the value of his or her marginal product is equal to the compensation provided[11]. The analyst is generally not concerned with other (nonmarket) factors affecting individuals' sense of well-being (except, of course, if they affect market productivity). To again cite Freeman (1993):

> *The human capital approach is fundamentally at odds with the individualistic perspective of welfare economics and the theory of value. By in effect asking what the individual is worth to society, the human capital approach ignores the individual's own well being, preferences, and willingness to pay.*

One approach to developing a more complete measure of the value of lost time would be to rely on estimates of individual WTP to avoid the time losses. While the WTP literature includes some studies that address time losses directly or indirectly, these studies are of limited relevance to the types of time losses discussed in this report, as discussed below.

Some WTP studies include explicit information on time losses when eliciting the value of averting particular health effects. For example, Rowe and Chestnut (1986) surveyed 90 asthmatic individuals in

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[10] Paid care is included in the medical cost component of the analysis and, hence, is not discussed in the section on time losses.

[11] This approach implicitly assumes that labor markets are in equilibrium and that there is little or no unemployment (i.e., workers cannot be replaced).

1983 to estimate their WTP for a program that would reduce their bad asthma days. The survey elicited information on the effects of asthma on work, school, chores, and leisure activities. However, the authors ask the respondents to report their WTP for a program to decrease bad asthma days; an estimate of WTP to avoid time losses is not reported separately.

Researchers interested in valuing the availability of recreational activities also consider time costs in the context of recreational demand, or travel cost, studies. These studies typically value time spent traveling to a recreation site at a fixed fraction of the individual's wage rate, which represents the disutility associated with travel[12]. The precise fraction of the wage rate used to value travel time costs has ranged from zero to one in published empirical studies. Unfortunately, these studies are focused on a particular use of leisure time, i.e., for travel. The resulting estimates are, therefore, not necessarily applicable to other types of leisure activities.

Another potentially relevant approach is assessing the value of restricted activity days. These days are generally defined as time periods when individuals find that their activities are more limited than normal due to illness or other factors. This concept is frequently applied in the context of assessing health effects associated with air pollution. For example, researchers have linked self-reported data on activity restrictions to data on air pollution levels to estimate the effects of this pollution on normal activities. Information on WTP for avoiding these restrictions (derived from studies of minor respiratory symptoms) is then applied to the estimates of activity-restricted days to determine their value[13]. However, this value will vary depending on the type and severity of the activity limitations, as well as the nature of the health effects experienced. As noted earlier, sparse information is available on WTP to avoid the types of health effects or activity restrictions associated with cryptosporidiosis. In the absence of this information, it is not possible to apply this approach to the health effects considered in this report.

This analysis instead relies on wage and compensation data to estimate opportunity costs to the individual and society, due to the lack of applicable studies that estimate WTP for time losses due to illness. The opportunity cost approach recognizes that, because resources are limited, any decision to use resources for one purpose means that they cannot be used for other purposes. Hence, the value of the resource can be determined based on the value of its next best use. This approach is likely to understate the full value of time losses, since individuals may hold values that exceed the opportunity costs represented by measures of compensation.

The use of wage and compensation data to estimate opportunity costs is consistent with the basic principles of welfare economics and is explored in detail in the labor economics literature. For example, as summarized in the Gold et al. (1996) study of "best practices" for cost-effectiveness analysis:

> *The fundamental assumption of this literature is that people will take their opportunity cost into account when allocating their time, choosing to devote it to the activities that produce the greatest utility. They will work an extra hour,*

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[12] Travel cost studies are focused on the costs (or negative impacts) associated with traveling longer distances. They assume that travel time has some positive effects (or utility), otherwise time costs would be valued at the full wage rate (i.e., as a complete loss).

[13] See, for example, the approach applied in EPA's *Final Heavy Duty Engine/Diesel Fuel Rule: Air Quality Estimation, Selected Health and Welfare Effects Methods, and Benefits Results* (USEPA 2000g).

for example, if the compensation they receive exceeds the value they place on their time in other activities.

The application of the opportunity cost approach to estimate the value of lost market (paid) work time is relatively clear, since compensation can be used to estimate these costs. For other (unpaid) time spent in nonmarket work or leisure activities, wage data are also used based on the assumption that (at the margin) the wage represents the opportunity cost of engaging in such activities[14]. To again cite Gold et al. (1996):

> *The labor-leisure trade-off, which is at the heart of the theory of labor supply, illustrates the method used to value time which is not spent at work: if there is perfect competition; if workers and employers are perfectly well informed; if the worker has declining marginal utility of leisure time (i.e., the more time spent away from work, the lower the value of each incremental increase in leisure time) and diminishing marginal utility of income; and if the quantity of labor supplied in the market is continuously variable, then the worker "consumes" leisure time up to the point at which the value of an additional hour of leisure equals the (hourly) wage that he or she can receive by working.*

As indicated by this quote, the use of wage data to estimate opportunity costs is based on a number of simplifying assumptions regarding the operations of labor markets and the process by which individuals choose among different activities. In addition to the limitations cited above, this approach assumes that an individual has complete flexibility in choosing the number of hours he or she spends in paid work, whereas in reality employers may be willing to provide jobs only for set increments of time (e.g., 40 hours per week). In its simplest form, it also does not take into account a number of complexities related to how individuals are actually compensated, such as the difference between hourly and salaried employees and variation in how benefits are determined.

In addition, relying on wage data for valuing lost time presents difficulties in the case of individuals for whom these data are not available, such as children, the unemployed who are seeking employment, and those out of the labor market. It also can be difficult to define a value when there are trade-offs between two uncompensated activities. Perhaps most important, the use of wage rates may understate the total utility associated with the activity even in the case of paid work, because individuals may derive intrinsic pleasure from the activity above and beyond the income they receive.

The use of compensation data to value time losses and its limitations are explored in detail in the following sections of this appendix. The following section describes the compensation measures used for each time use category (market work, nonmarket work, leisure, and sleep), the next section then considers issues related to those populations for whom wage data are not available.

[14] For a more detailed and technical discussion of the use of opportunity costs, see Posnett et al. (1996).

K.5 Approach for Each Time Loss Category

This appendix discusses four types of normal time use:

- Market (paid) work time
- Nonmarket (unpaid) work time
- Leisure time
- Sleep time

These time loss categories are briefly defined in Exhibit K.1 below.

Exhibit K.1: Definitions of Time Loss Categories

Category	Definition
Market Work Time	Time that an individual spends engaged in productive activity in exchange for a salary or wage at a price set in the labor market.
Nonmarket Work Time	Time spent on productive work without monetary compensation in the home (e.g., housework) or outside the home (e.g., volunteer work).
Leisure Time	Time spent engaged in activities other than market work, nonmarket work, or sleep.
Sleep Time	Time spent sleeping.

As discussed in detail in the main text of this report, cryptosporidiosis often involves several days of diarrhea, abdominal cramping, fever, and vomiting, as well as nausea. Many characteristics of this illness are of particular importance when considering the approach to valuing time losses in each of these four categories. Specifically, the valuation approach needs to accomplish the following:

- Consider time losses associated with *morbidity, not mortality* because other, well-established valuation methods are applied to mortality risks.
- Apply to acute, not chronic, illnesses, that generally result in a *temporary rather than permanent* change in activities.
- Address illnesses that may lead individuals to both *spend fewer hours engaged in normal activities*, and *have a lower level of productivity or utility when they continue normal activities*.
- Consider effects that may occur throughout the day, potentially affecting all types of time usage.

- Apply to individuals of *all ages* that may be affected by this illness, including the very old and the very young.

- Reflect the need of some ill individuals for the *attention of a caretaker* (i.e., a friend or family member, not a paid health care provider) for a portion of the time while they are ill.[15]

Because empirical research on the value of time is limited, this analysis relies primarily on data on compensation as a proxy for the value of lost time. The specific approach for each of the four time loss categories is summarized in Exhibit K.2.

Exhibit K.2: Overview of Valuation Approach

Time Loss Category	Approach for Estimate of Value	
	Enhanced COI	**Traditional COI**
Market Work Time	Gross (pre-tax) wage plus benefits, reflecting both the wages received by the individual and the value of his or her product to the employer and society	
Nonmarket Work Time	Net (post-tax) wage, based on the opportunity costs to the individual	Half the net (post-tax) wage, based on the replacement cost of labor
Leisure Time	Net (post-tax) wage, based on the opportunity costs to the individual	Not included
Sleep Time	Zero, due to lack of information on the dollar value	

In this analysis, lost market work time is valued at the pre-tax wage rate plus benefits. Using the Enhanced COI estimate, lost nonmarket work and leisure time are valued at the post-tax wage rate. The Traditional COI estimate values nonmarket work time at half the net post-tax wage rate, and does not include a value for leisure time. Lost sleep time is conservatively valued at "zero." Losses are assessed for nonmarket caretakers whose normal activities are affected by illness as well as for the ill individual.

In the Enhanced COI estimate, these values are applied to both complete losses of time (time spent in illness-related activities rather than normal activities), as well as to partial losses (time spent in normal activities that are less productive or pleasurable than in the absence of illness). In the latter case, however, the dollar value of the loss is prorated to reflect the fact that the individual does not completely lose the productivity or utility associated with the activity. In the Traditional COI estimate, these values are applied only to complete losses of time (time spent in illness-related activities rather than normal activities), because less productive time is not included.

Both of these approaches are likely to understate the utility of time spent in its *preferred* use (i.e., of normal activities in the absence of illness) for variety of reasons[16]. Individuals may place a value on

[15] Paid care is covered in the medical cost estimates rather than in the time loss estimates.

[16] There are a number of simplifying assumptions inherent in the application of this approach that may lead it to further under- or over-state the value of time in its preferred use, related to factors such as the functioning of the labor

market work that exceeds total compensation because of the effect of working on their sense of well-being. For nonmarket work and leisure, the value of the activity to the individual may exceed the opportunity cost for similar reasons. In addition, nonmarket work and other activities can provide benefits to other members of society that are not reflected in the individual wage rate. Finally, neither approach includes the value of sleep.

However, it is unclear whether the use of these estimates over- or under-state the *disutility*, or loss, associated with illness; i.e., the loss associated with spending time in illness-related, rather than normal, activities. In some cases, it seems reasonable to assume that the illness-related activity represents a complete loss of utility (e.g., time spent coping with a bout of diarrhea rather than working). For these losses, the approaches used in this report will understate the value of the loss, as discussed in the prior paragraph. In other cases, the illness-related activity may have some utility (e.g., time spent watching TV or reading instead of working) that is less than the utility of the preferred activity, but greater than "zero." Even in this case, there would likely be some offsetting utility losses from the discomfort and stress of being sick. In these cases, the actual amount of the loss could conceivably be less than the estimates used in this analysis. The basis for these approaches is described in more detail below.

K.5.1 Lost Market Work Time

In a social welfare context, the value of marginal changes in market work time has two components: (1) the value of the time loss to that individual, and (2) any additional value to the rest of society. In this analysis, lost market work is valued at the median gross (pre-tax) wage rate plus benefits, also referred to as total compensation or employer's costs[17]. This approach is most representative of the full social impact of lost work time because it incorporates both the loss to the individual in terms of lost income and the loss to society in terms of reduced tax revenue or decreased production of goods and services.

This approach recognizes that, when an individual misses work or is less productive due to illness, he or she loses the associated utility. This loss is, in part, measured by income, which the individual can trade for goods and services. However, income is an incomplete measure of value, because the individual may derive utility from working that exceeds post-tax wages or take home pay. Hence the post-tax wage rates provide a lower bound estimate of the value of paid work time from the individual perspective.

This approach also recognizes that the employer (and society) loses the value of the individual's productivity, and that this value exceeds the value of the post-tax wages received by the employee. From the employer's perspective, the value of the individual's productivity is equal at minimum to his or her total

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market, the treatment of individuals who are not labor force participants, and the use of average or median, rather than marginal, earnings data. It is unclear whether, in total, these practical limitations serve to increase or decrease the bias that results from the sources discussed in this paragraph.

[17] Embedded in this approach are a number of assumptions (discussed earlier) regarding the operations of the labor market and the factors that influence individual choice. In addition, the actual effect of missed work time will vary depending on how individuals are compensated; e.g., on whether they are salaried or hourly employees and on whether they receive sick leave or disability payments. For example, if the individual has access to paid sick leave, a marginal loss of work time (within certain limits) will not result in an immediate loss of income. However, a loss will accrue to the employer, who must pay wages without the benefit of the worker's productivity. The individual also has the ability to save this sick leave for another time.

compensation (pre-tax wages plus benefits). This perspective is similar to that of the human capital approach, which assumes that an employer would not pay more to an employee, in salary plus benefits, than that employee is worth to the company (i.e., the value of the employee's marginal product) and hence to society[18]. Some of this value is reflected in the employee's take home pay, the remainder accrues in terms of taxes paid and reflects the value of product created above and beyond what is reflected in pre-tax wages.[19]

Ideally, the estimates used in this analysis would reflect the value of marginal changes in work time, since the impacts of cryptosporidiosis-related morbidity are likely to be acute and temporary. In other words, affected individuals may work fewer hours or be less productive while working for a limited period of time, but are not likely to change employment or become unemployed as a result of the illness. Empirically, analysts generally use estimates of average or median compensation as a proxy for marginal rates due to difficulties inherent in determining the marginal rates relevant to the particular impact under consideration[20]. Data on average and median U.S. compensation rates are easily accessible and frequently updated in a number of publications.

K.5.2 Lost Nonmarket Work, Leisure Time, and Sleep Time

In this analysis, two alternative measures are used to value nonmarket work and leisure time. In the Enhanced COI estimate, net (post-tax) wages are used to estimate the value of both lost nonmarket work and leisure time. In the Traditional COI estimate, the value of lost nonmarket work time is half the post-tax wage, and no value is assigned to leisure time.

While the distinctions between market work and sleep are relatively easy to distinguish, the line between nonmarket work and leisure is often difficult to draw[21]. In general parlance, nonmarket work refers to activities that are undertaken primarily because they are productive, whereas leisure refers to activities that are undertaken primarily for the pleasure of the individual. However, this distinction is hard to apply in practice. Some nonmarket tasks seem clearly productive, such as doing the laundry or vacuuming, but individuals may also derive pleasure from these tasks. Other activities, such as childcare or gardening, encompass aspects of both productive work and of leisure.

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[18] A number of COI studies use lost earnings to estimate indirect costs. For example, the total compensation approach is used in Buzby et al. (1996), Rice et al. (1992), and Waitzman et al. (1996).

[19] For a recent discussion that indicates that illness-related losses of work time can substantially exceed the wage rate, see: Pauley et al. (2002).

[20] Hartunian et al. (1981) and others argue that average wages are a reasonable approximation of the value of lost production in most industrialized countries.

[21] A number of groups have been working on approaches for measuring and categorizing different types of time usage, as summarized in National Research Council (2000).

Nonmarket Work

One of the two alternative measures used in this analysis to value nonmarket work time is the net (post-tax) wages, which are used to estimate the value of lost nonmarket work in the Enhanced COI estimate. If illness affects an individual's ability to engage in nonmarket work, he or she loses the value of his or her own productivity. Presumably, that individual chooses to engage in nonmarket rather than market work because, at the margin, the utility (productivity plus any additional enjoyment) from performing nonmarket work was greater than the utility (as represented by income) that he or she would have gained from market work[22]. Therefore, that individual must value a marginal hour of his or her nonmarket work time at a rate at least equal to the marginal net wage per hour he or she could have earned in the job market[23]. It is not unreasonable to assume that on average (across all these individuals), the opportunity costs for these individuals would be similar to the opportunity costs for employed individuals. To a large extent, these individuals may choose to be out of the labor market because they value their time at a rate that exceeds the compensation they would receive by working. More research would be needed to confirm the extent to which this assumption is supported by detailed studies of the factors that affect decision-making by these groups. As before, this approach involves a number of simplifying assumptions regarding the functioning of labor markets and the choices faced by individuals, but provides one reasonable proxy for how this time is valued. This is the basis used in the Enhanced COI estimate.

The Traditional COI estimate has a different basis. The approach advocated most frequently in the literature to distinguish between market and nonmarket work, particularly in the context of adjusting national accounts to include nonmarket work, relies on estimates of replacement costs rather than estimates of opportunity costs and is known as the "third person" or "market replacement" criterion. This approach is used largely because of the emphasis of these studies on measuring productivity rather than utility[24]. Under the human capital approach, time spent engaged in nonmarket labor activities is considered productive, due to the fact that activities such as childcare, cooking, and general home maintenance—if not performed by a member of the household—could be performed by a professional in return for compensation (i.e., as market labor). As defined by Reid (1934), "If an activity is of such a character that it might be delegated to a paid worker, then that activity shall be deemed productive."[25] Tasks that can only be performed by the individual himself (or herself) are included in the leisure category. Therefore, gardening and childcare would be viewed as nonmarket work, whereas watching television would be considered a leisure activity.[26]

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[22] For more detailed surveys of different approaches for valuing nonmarket work time, see Goldschmidt-Clermont (1982) and Gronau (1986).

[23] Benefits are conservatively left out of this calculation, under that assumption that marginal changes in the number of hours worked would not affect the total amount of benefits received.

[24] For example, a series of studies funded by the Australian Bureau of Statistics focus on adding the value of nonmarket work to national accounts and use the replacement cost method for this purpose. See, for example, Trewin (October 2000).

[25] As cited in Goldschmidt-Clermont (1982), p. 4.

[26] Time use researchers have been attempting to develop classification schemes that can be used internationally for these types of studies. Many refer to four general categories: contracted time (paid work plus education and training), committed time (nonmarket work, including housework, shopping, and volunteer work), necessary time

In some studies, housekeeper wage rates are used to value the productivity of nonmarket labor[27]. This is the measure used to value lost nonmarket work time for the Traditional COI. The value used is half of the after-tax wage. The use of 50 percent of the wage rate is consistent with a practice common in the human capital literature of valuing nonmarket work time at the market rate for domestic workers[28]. Because this approach may undervalue the true productivity of this labor due to the wide range of activities undertaken in addition to housekeeping (e.g., cooking, childcare, and home repairs), other studies use market value composite rates. This alternative approach would involve developing a composite of the wage rates paid to individuals employed in the labor market to perform the various activities typically associated with nonmarket labor (e.g., cooks, daycare providers, maids, nannies, and handymen).[29,30] In some applications, this approach has been expanded to also include volunteer work[31].

Leisure

For the Enhanced COI estimate, the approach used to value lost leisure time is the same as that applied to nonmarket work. This approach reflects two considerations: (1) the difficulties inherent in developing a clear-cut distinction between hours spent in nonmarket work and leisure as noted above, and (2) the assumption that, at the margin, an individual will choose to engage in nonmarket work or leisure activities only if the value of these activities exceeds the wage rate that the individual would otherwise earn. The individual presumably chooses to engage in activities other than market work because, at the margin, the utility gained from these other activities is greater than the utility gained from market work. This approach is a simplification of how individuals are likely to view leisure time. Leisure activities are undertaken for a number of different purposes—e.g., to relax, for exercise, or to maintain emotional connections with loved ones. Some leisure activities involve extensive planning and travel time, like major vacations, while others, like watching television, require almost no planning, travel, or even thought. Hence, in reality the utility of leisure is likely to vary depending on the activity affected. Even with these uncertainties, the opportunity cost approach provides a more complete measure of the value of time losses from the perspective of the individual as well as society. This approach is supported by the travel cost

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(personal care, including sleep), and free time (religious, cultural and civic participation, social time, sports, hobbies, and mass media). (See, for example, Ministry of Women's Affairs, Statistics New Zealand (1999).) These classification schemes differ somewhat from the categories used in the report, and require more detailed data on the types of time uses affected than are available for this analysis.

[27] A pioneering example of this approach is presented in Rice (1966). A more recent example, which uses data on the value of housekeeping services based on Current Population Survey data from the Bureau of Labor statistics, is Ray et al. (1998).

[28] A pioneering example of this approach is Rice 1966; a more recent example is Thamer et al. (1998).

[29] One early demonstration of this market value approach is Cooper et al. (1976). A more recent approach is provided in Hoffman et al. (1976), which uses values based on research reported in Douglas et al. (1990). Another recent example is Ray et al. (1998).

[30] Trewin (2000, p.24) notes that the replacement cost approach "...is based on the key assumption that household members and market replacements are equally productive in their work activities.... In practice it is difficult to identify exact matches between household work activities and occupations...."

[31] See, for example, Trewin (2000).

studies noted earlier, which suggest that even relatively mundane forms of leisure (such as travel time) may have utility that approaches the wage rate. The fact that workers often demand a higher hourly wage for "overtime" work further supports the notion that the marginal value of nonmarket work and leisure time exceeds the usual wage rate.

Leisure time is generally not valued in COI studies due to the emphasis of these studies on measuring productivity rather than utility. While leisure time may have some impact on an individual's productivity, this impact is believed to be largely captured in the valuation of market and nonmarket work. From the human capital perspective, including a separate value for leisure runs the risk of double-counting. The loss of leisure time is not included in the Traditional COI estimate.

Lost Sleep Time

Sleep time presents special problems in this analysis, in part because data on the effect of cryptosporidiosis-related morbidity on the amount or quality of sleep time are not available. In addition, sleep is rarely valued in the literature due to problems related to determining its dollar value. Sleep time is not addressed in most COI studies because (like leisure) its effect on productivity is believed to be largely captured in the value of market and nonmarket work time.

However, from an opportunity cost perspective, it is possible to argue that lost sleep should be valued at the wage rate. For example, assuming that some minimal level of sleep is necessary, sleep time missed at night may be made up through daytime naps. These naps in turn may displace some of the time the individual would otherwise spend engaged in leisure, nonmarket work, or market work activities.

This analysis conservatively assumes that lost sleep time has zero value. Given that individuals derive utility from sleep and, thus, are likely to value it at a rate greater than zero, this approach will understate the value of related time losses.

K.6 Special Considerations

Several sub-groups of the population present specific valuation challenges, because they often do not engage in market work and hence wage rate data may not be an appropriate measure of the value of their time losses due to illness. These groups include the following.

- **Children**: Children do not generally engage in market work, and wage rate data are not generally collected for those who do. The definition of "child" can vary, but the age cut-off is usually at 16 or 18 years of age. The Bureau of Labor Statistics does not collect employment data on individuals under the age of 16.

- **Elderly Individuals**: As individuals age, they generally leave the work force. However, retired persons may value their time differently than younger workers who are out of the labor force due to the availability of pensions and Social Security. These individuals may lose benefits if they increase their job-related income.

- **Unemployed Individuals**: Individuals not currently engaged in market work, but actively seeking employment, would prefer to earn a wage, but are not currently doing so.

- **Individuals Not in the Labor Force**: Individuals not currently engaged in market work, and not seeking employment, presumably value their time at a rate higher than the earnings they could gain from paid employment. However, at times they may be engaged in nonmarket work (such as child care) where the cost of hiring a replacement worker exceeds the amount they could earn as a member of the labor force.

The approach taken in this analysis is to value all time losses at rates applicable to adult wage earners (or their theoretical adult replacements in the case of the Traditional COI's estimate for the value of nonmarket work time).

Valuation of the effects on children present a number of difficult challenges related to the fact that children are not **?**economic actors" who can answer valuation questions or engage in market activities that reflect their own preferences. Under the human capital approach, the primary issue concerning the valuation of children's time losses is that of double counting. Analysts assume that time spent in school or other productive activities will be reflected in future earnings, and generally assign a value of "zero" to childhood time losses.[32]

However, from a social welfare perspective, children can be profoundly affected by illness. These effects may be direct—i.e., children may be unable to engage in normal activities because they are ill; or they may be indirect—i.e., children may receive a lesser quantity or quality of care due to the illness of their caretakers. The dollar values of these impacts are highly uncertain.

For the other groups listed above, the challenge is largely the absence of compensation data as a proxy for opportunity costs. Whether the approaches taken in this analysis under-state or over-state the value of time for these individuals is uncertain.

[32] Although an argument can be made for including the discounted present value of any decrease in future earnings, the types of acute illnesses considered in this analysis are not likely to have a measurable impact on future earnings.

Appendix L
Calculations Supporting the Cost of Illness (COI) Analysis

L.1 Introduction

This appendix presents data and calculations that the Economic Analysis (EA) uses to estimate the monetized morbidity benefits of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) rule. The resulting data are used in Chapters 5 and 8. The general methodology for using a cost of illness (COI) approach is presented in Appendix K. Appendix L applies that methodology, identifies the data from other sources that are used, and describes the methodology used to estimate the duration of illness for moderate and severe cases of cryptosporidiosis. The approach used to value reductions in nonfatal cases of cryptosporidiosis combines estimates of the medical costs of illness with estimates of the value of related time losses under two sets of assumptions: the Enhanced and Traditional COI. Many of the values in the analysis rely on data from the 1993 Milwaukee outbreak of cryptosporidiosis collected by Corso et al. (2003) and MacKenzie et al. (1994, 1995).

MacKenzie et al. (1994) conducted two random telephone surveys after the outbreak—one of just the area served by the Milwaukee Water Works, and one of the greater Milwaukee area. The first survey asked participants what symptoms they had, how long the symptoms lasted, and whether they sought medical care. The second survey asked similar questions but correlated cases with zip code to determine where in the metropolitan area cryptosporidiosis was most prevalent. In a separate study, MacKenzie et al. (1995) conducted a telephone survey of people to determine the percentage of people who experienced a recurrence of cryptosporidiosis. The authors separately surveyed Milwaukee residents and nonresidents who had visited the Milwaukee area briefly during the outbreak. Using nonresidents ensured that any recurrence was probably not due to additional *Cryptosporidium* exposure from drinking water or secondary transmission but was actually a recurrence of the initial illness. Recurrence in visitors was found to be similar to that in Milwaukee residents (21 percent).

Corso et al. (2003) reviewed medical and financial records to determine direct medical costs for people with mild, moderate, and severe illness. To calculate the cost of the outbreak, they then multiplied these costs (as well as lost work costs) by the total number of people estimated to fall into each category, based on MacKenzie et al. (1994) estimates of the number of people affected by the outbreak. Corso et al. reviewed about 2,000 records from 11 of 14 hospitals in the area, searching for laboratory-confirmed cryptosporidiosis cases, as well as cases of diarrhea lasting at least 2 days. From the records, they also collected data on ambulance use, self-medication prior to admission or emergency room visit, doctor visits prior to hospitalization, and physician-prescribed medication. They found 155 cases that met the definition of moderate illness and 223 that met the definition of severe illness. Hospitalization costs for those with severe illness included costs for diagnostic services, laboratory tests, technical services (e.g., physical or respiratory therapy), attending physician and nursing staff, medication, supplies, the hospital room, and emergency room services. These charges do not include costs for specialists, due to insufficient data. Corso et al. also obtained costs for ambulance transport and physician visits from the Milwaukee Health Department. Where necessary, the authors converted charges to actual costs using a charge-to-cost ratio of 0.67.

These studies had the advantage of being based on cryptosporidiosis, the same illness of concern in this EA. The telephone surveys were conducted within a month or two of the outbreak, so participants' recollections of their symptoms and duration of illness were still good. However, self-reported results are considered less accurate than those documented by professionals. EPA contacted the authors to ask for the original survey data, hoping to get information on duration of illness and age of those infected, but data were no longer available.

L.2 Related to the Cost of Cryptosporidiosis

Some of the most directly relevant data for this COI estimate derives from the outbreak of cryptosporidiosis in Milwaukee in 1993. MacKenzie et al. (1994) conducted two random telephone surveys after the outbreak—one of just the area served by the Milwaukee Water Works, and one of the greater Milwaukee area. According to Corso et al. (2003), based on the survey data, 88 percent of those who reported cryptosporidiosis symptoms experienced mild illness, 11 percent had moderate illness, and 1 percent had severe illness (these statistics are not actually reported in MacKenzie et al.). The severity of illness was defined as follows.

- mild: the person did not seek medical care for the illness, but may have taken over-the-counter medication
- moderate: the person had one or more outpatient visits to a physician or emergency room, but the person was not hospitalized
- severe: the person was hospitalized one or more times.

Corso et al. reviewed medical and financial records to determine direct medical costs for people with mild, moderate, and severe illness. To calculate the cost of the outbreak, they then multiplied these costs (as well as lost work costs) by the total number of people estimated to fall into each category. Corso et al. reviewed about 2,000 records from 11 of 14 hospitals in the area, searching for laboratory-confirmed cryptosporidiosis cases, as well as cases of diarrhea lasting at least 2 days. From the records, they also collected data on ambulance use, self-medication prior to admission or emergency room visit, doctor visits prior to hospitalization, and physician-prescribed medication. They found 155 cases that met the definition of moderate illness and 223 that met the definition of severe illness. Hospitalization costs for those with severe illness included costs for diagnostic services, laboratory tests, technical services (e.g., physical or respiratory therapy), attending physician and nursing staff, medication, supplies, the hospital room, and emergency room services. These charges do not include costs for specialists, due to insufficient data. Corso et al. also obtained costs for ambulance transport and physician visits from the Milwaukee Health Department. Where necessary, the authors converted charges to actual costs using a charge-to-cost ratio of 0.67.

The cost of hospitalization for severe cases varied depending on whether the patient had AIDS or an underlying condition. For those with no underlying condition, hospital costs were only $3,131 in 1993$. For those with an underlying condition other than AIDS, hospitalization costs averaged $5,520. For those with AIDS, the average hospitalization cost was $17,388. These differences are due at least partly to longer hospitalization periods for patients with underlying conditions. The weighted average cost for

hospitalization came to $6,312 (1993$). Note that for this EA, the cost of hospitalization was modified to separate out the cost of emergency room visits (see Exhibit L.1).

For this EA, EPA used Corso et al. data for per-illness medical costs but conducted a separate analysis for lost work and productivity. Costs used from the Corso et al. (2003) study are presented in Exhibit L.1 and are averages per illness (in 1993 dollars).

Exhibit L.1 Cryptosporidiosis Cost-Related Data From Corso et al. (2003)

Cost Category	Mild	Moderate	Severe
Number of Days Lost [1] (Mean days)	1.3 days	3.8 days	13.5 days
Duration of Illness	4.7 days	see L.4	see L.4
Number of Days Lost for Caregivers [2]	0.1 day	1.3 days	3.9 days
Percent Taking Medication Before Health Care	30%	30%	29%
Average Total Cost of Medication for Those Taking Medication Before Health Care [3]	$5.73	$5.92	$6.74
Percent That Visited a Physician[4]	NA	95%	29%
Cost of a Physician Visit	NA	$45	$45
Percent Taking Medication after Health Care	NA	54%	48%
Average Total Cost of Medication Taken after Health Care for Those Taking Medication	NA	$8.91	$70.52

[1]Number of days lost does not include number of days lost due to recurrence of cryptosporidiosis. Respondents provided estimates of days of normal activities lost due to illness.

[2]Number of days lost does not include any days lost due to the recurrence of cryptosporidiosis. Estimates of days lost for mild and moderate cases are averages from survey respondents. The days lost for caregivers assisting severe cases was an estimate based on half the duration of the hospital stay.

[3]Average total cost of medication is the cost of medication used before receiving medical attention for those who took medication and does not include the cost of medication for recurrence. For moderate and severe cases, data are from medical records, but for mild cases, the percentage of moderate cases self-medicating before health care was used, and other sources and author assumptions were used regarding, dosage, frequency, and duration of illness.

[4]Of the moderately ill persons, an estimated 95 percent saw a physician rather than visiting an Emergency Room (ER), and of severely ill persons, 29 percent saw a physician before being hospitalized (according to medical records).

Exhibit L.1 Cryptosporidiosis Cost-Related Data From Corso et al. (2003)

Cost Category	Mild	Moderate	Severe
Percent with Recurrence of Illness[5]	21%	21%	21%
Length of Recurrence of Illness [6]	2 days	2 days	2 days
Average Medication Cost for a Recurrence	$2.44	$2.44	$2.44
Percent That Visited an ER [7]	NA	5%	71%
Cost of the ER	NA	$224	$224
Percent Hospitalized	NA	NA	100%
Cost of Hospitalization [8]	NA	NA	$6,152.96
Percent Taking an Ambulance, of Those Who Went to the ER or Hospital [9]	NA	4.9%	16.3%
Cost of an Ambulance	NA	$228	$228

Note: NA=not applicable.
Dollar amounts reported in 1993$

L.3 Calculation of Direct Medical Costs

In Corso et al. (2003), the total cost of illness is reported as $79 (in 1993$) derived from the above data. This Economic Analysis uses different rounding conventions, notably, the rounding of the percent of the population with each severity of illness. For comparison, these changes generate an estimate of about $73 (in 1993$) (not shown). Further, this Economic Analysis inflates the 1993 data to 2003$, so the final estimate for direct medical costs is $106.91. The calculations, shown in Exhibit L.2, are based on the data in Exhibit L.1.

[5]Corso et al. (2003) cite MacKenzie et al. (1995).

[6]Corso et al. (2003) cite Osewe et al., 1996.

[7]Of the moderately ill, 5 percent were assumed to go to the emergency room (ER), and of severely ill persons, 71 percent visited the ER (the other 29 percent visited a doctor and were admitted to the hospital without going to the ER).

[8]The cost of hospitalization reported by Corso et al. (2003) is $6,312, which includes the ER costs for the 71 percent of patients that visited the ER. EPA broke out the cost of the ER visits ($224) and treated them separately, resulting in a hospitalization cost of $6152.96 [$6,312-(71%*$224)=$6,152.96].

[9]For moderately ill persons, of those admitted to the ER, 4.9 percent used an ambulance. For severely ill persons, 16.3 percent took an ambulance to the ER or hospital. These percentages are from review of medical records.

Exhibit L.2 Direct Medical Costs of a Case of Cryptosporidiosis

	Average Cost [1]						Average Cost Per Patient		
	1993$			December 2003$			December 2003$		
Medical Cost	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild (88%)	Moderate (11%)	Severe (1%)
Doctor Visits	NA	$45.00	$45.00	NA	$66.15	$66.15	NA	95%*$66.15 =$62.84	29%*$66.15 =$19.18
Emergency Room Visits	NA	$224.00	$224.00	NA	$329.28	$329.28	NA	5%*$329.28 =$16.46	71%*$329.28 =$233.79
Hospital Stays	NA	NA	$6,152.96	NA	NA	$9,044.85	NA	NA	100%*$9,044.85 =$9,044.85
Ambulance	NA	$228.00	$228.00	NA	$335.16	$335.16	NA	4.9%*5%* $335.16 =$0.82	16.3%*$335.16 =$54.63
Medication	$5.73	$5.92	$6.74	$8.42	$8.70	$9.91	30%*$8.42 =$2.53	30%*$8.70 =$2.61	29%*$9.91 =$2.87
Medication after Health Care	NA	$8.91	$70.52	NA	$13.10	$103.66	NA	54%*$13.10 =$7.07	48%*$103.66 =$49.76
Medication Taken upon Recurrence	$2.44	$2.44	$2.44	$3.59	$3.59	$3.59	21%*$3.59 =$0.75	21%*$3.59 =$0.75	21%*$3.59 =$0.75
Totals							$3.28	$90.56	$9,405.84
								Weighted Total	$106.91

Notes: Detail may not add to totals due to independent rounding
[1] All direct medical costs were obtained in December 1993$ and are updated by a 1.47 CPI-U update factor to December 2003$. Bureau of Labor Statistics, 302.1 (Dec2003$)/205.2 (Dec1993$) = (rounded to) 1.47.
Sources: 1993$ average cost data from Corso et al. (2003).

L.4 Calculations for Duration of Illness for Moderate and Severe Cases

Corso et al. (2003) does not provide estimates of duration of illness for moderate and severe cases, but does report that medical care was sought in approximately 12 percent of cases: 11 percent being "moderate" cases, and 1 percent being "severe" cases.

Using data from MacKenzie et al. (1994), a data set was constructed to provide a hypothetical population that could be evaluated to estimate the duration of illness for moderate and severe cases. This was done because the MacKenzie et al. (1994) distribution represents patients with laboratory-confirmed cases of cryptosporidiosis, who, since they sought medical care, fit into the moderate and severe illness categories. While the duration of illness might differ between those whose doctors ordered laboratory tests from those that did not, no evidence is available to suggest a difference or to provide a factor by which to adjust these data. In the absence of any better data, the analysis assumes that this distribution of illness duration can be used to reasonably represent the collection of moderate and severe cases. Further, an assumption is made that the severe cases are best represented by the upper tail of the distribution, and moderate cases are best represented by the lower tail of the distribution. While it is likely the case that some severe cases were of shorter duration that at least some of the moderate cases, no data are

available to estimate the potential overlap. The mean duration for moderate cases was therefore determined by calculating the average of the lowest 11/12 of the distribution. The mean for severe cases was determined by calculating the average of the highest 1/12 of the distribution.

The data set constructed is intended to approximate the distribution described by MacKenzie et al. (1994): one with a reported duration of illness with a "range of 1 to 55 days, mean of 12, and median of 9." These summary statistics suggest a nearly lognormal distribution, and we therefore assumed a lognormal distribution with parameters mu and sigma,

$$X = \text{duration of illness} \sim \text{lognormal } (\mu, \sigma)$$

Or equivalently,

$$\log (X) \sim \text{normal } (m, s^2)$$

To generate a population of data with a lognormal distribution, the analysis used a Monte Carlo program that required a mean and standard deviation to define the lognormal distribution. To derive the standard deviation from the mean and median, we used the following relationships that hold for all lognormal distributions.

$$(1) \qquad \text{mean } (X) = \exp(m + s^2/2)$$

$$(2) \qquad \text{var } (X) = \exp(2m + s^2) (\exp(s^2) - 1)$$

and

$$(3) \qquad \text{median } (X) = \exp(\text{median } (\log (X))) = \exp(m)$$

Then,

$$9 = \text{median } (X) = \exp(m) \Rightarrow m = \ln (9)$$

$$12 = \text{mean } (X) = \exp(m + s^2/2) \Rightarrow s^2 = 2(\ln(12) - \ln(9))$$

Using formula 3 above and these values for m and s^2 we can compute the variance of X as Var (X) = 112, which yields a standard deviation of 10.58.

A Monte Carlo program was used to generate a data set based on this mean and standard deviation. In this program, the assumed distribution was thus set at a mean of 12 and a standard deviation of 10.58, with a range of 1 to 55, and multiplied by "1 " for 50,000 iterations. The derived overall mean and median of this 50,000 item data set (which match the MacKenzie et al. (1994) statistics reasonably well) are presented in Exhibit L.3 along with the decile distribution.

Exhibit L.3 Moderate and Severe Data Set of Patients with Cryptosporidiosis

Value	Percentile
1.00	0%
3.25	10%
4.62	20%
5.91	30%
7.26	40%
8.79	**50%**
10.70	60%
13.16	70%
16.73	80%
23.31	90%
54.95	100%
11.46	***mean***

Source: Monte Carlo simulations based on MacKenzie et al. 1994 summary data.

The final step involves dividing this data set into two parts to represent moderate and severe cases. Again, the mean for moderate cases was determined by calculating the average of the lowest 11/12 of the distribution. The mean for severe cases was determined by calculating the average of the highest 1/12 of the distribution. The results are shown in Exhibit L.4.

Exhibit L.4 Mean Duration of Illness for Moderate and Severe Cases (Days)

Moderate Cases	9.4
Severe Cases	34.0

Source: Monte Carlo simulations.

L.5 Calculation for Weighted Average Days Lost

After calculating the mean duration of illness for moderate and severe cases, data on the days with lost productivity (i.e., work is done but with reduced productivity), by degree of severity of illness, can be derived by subtracting the mean number of days lost (where no work is done) from the mean duration of illness, for each level of severity. The results are presented in Exhibit L.5.

Exhibit L.5 Derivation of Days with Lost Productivity, by Severity of Illness

Row	Derivation	Time Category	Mild Cases	Moderate Cases	Severe Cases
a		Mean Duration of Illness	4.7	9.4	34.0
b		Number of Days Lost	1.3	3.8	13.5
c	a-b	Days with Lost Productivity	3.4	5.6	20.5

Source: Number of days lost and the mean duration of illness (mild cases) and are from Corso et al. (2003). Duration of moderate and severe cases is from Exhibit L.4.

The average number of days of lost work, lost productivity, and lost work for caregivers can be calculated using the data from Exhibit L.5 and the percentages of each severity of illness and the extent of recurrence. The results are shown in Exhibit L.6.

Exhibit L.6 Weighted Average Days Lost for Work, Caregivers, and Productivity

	Severity	Days Lost	Weight	Weighted Average Days
Work (Patients)	Mild	1.3	88%	1.144
	Moderate	3.8	11%	0.418
	Severe	13.5	1%	0.135
	Total			**1.697**
Caregivers	Mild	0.1	88%	0.088
	Moderate	1.3	11%	0.143
	Severe	3.9	1%	0.039
	Total			**0.270**
Productivity Losses	Mild	3.4	88%	2.992
	Moderate	5.6	11%	0.616
	Severe	20.5	1%	0.205
	Recurrence	2.0	21%	0.420
	Total			**4.233**

Source: Exhibit L.5 and Corso et al. (2003)

L.6 Allocation of Time Across Activities

Among the items included in the Benefits Analysis is the value of the decrease in the hours and productivity lost to illness. In general, it is expected that people will value their time differently depending on what activities they are engaged in. Therefore, to assign monetary values to the hours and productivity lost to illness, it is necessary to determine how people allocate their time across activities.

The U.S. Census Bureau compiles data on weekly hours worked, and loss of work hours is a key loss category used in this analysis. For the year 2002, that figure was 39.2 hours per week for the civilian noninstitutional population 16 years old or older who are working full or part-time.[10] This figure excludes those employed but not working because of vacations, illness, strikes, etc.; noncivilians; institutionalized persons; and those in the labor pool but unemployed. This group of workers includes about 60.3 percent of the population in this age range.[11] Over the whole population, the average lost work hours per day of illness is, therefore, about 3.4 hours.[12]

In addition to paid labor, another important component of lost time is the time spent performing nonmarket work (e.g., errands, housework, child care). In recent years, a number of research teams have explored the allocation of time across various activities. For example, a recent National Research Council (2000) study lists more than 50 major time-use surveys that have been completed internationally. However, the majority of the studies completed in recent years address countries other than the United States. The most recent U.S. studies were completed by the University of Michigan in 1981-1982 and by the University of Maryland in 1985; the U.S. Bureau of Labor Statistics is in the process of developing a new time-use study and expects the results to be available in 2004 (Bureau of Labor Statistics, undated).

These studies generally address a large number of activities. For example, the proposed United States survey may include nine groups (personal care, employment activities, education activities, domestic activities, care for dependent household members, purchasing activities, voluntary work and care, social and community interaction, and recreation and leisure) that are subdivided into 99 subgroups, each of which is further subdivided into a number of discrete categories (National Research Council 2000).[13] For the purpose of analyzing time losses associated with nonfatal cases of cryptosporidiosis, the dollar value applied (as discussed below) varies across three larger categories: market work, nonmarket work, and leisure activities, so more aggregate data can be used.

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[10]Based on annual average of monthly figures, U.S. Census Bureau, Statistical Abstract of the United States, 2003, Table No. 602, sourced to U.S. Bureau of Labor Statistics, *Employment and Earnings*, monthly, January 2003 issue, and based on the Current Population Survey.

[11]Derived from the estimate of 131,019 thousand people at work (year 2002, based on annual average of monthly figures, U.S. Census Bureau, Statistical Abstract of the United States, 2003, Table No. 602, sourced to U.S. Bureau of Labor Statistics, Employment and Earnings, monthly, January 2003 issue, and based on the Current Population Survey) of the 217,570 thousand people in this age range (year 2002, based on annual average of monthly figures, U.S. Census Bureau, Statistical Abstract of the United States, 2003, Table No. 587, sourced to U.S. Bureau of Labor Statistics, Bulletin 2307 and *Employment and Earnings*, monthly, January issues; Monthly Labor Review, November 2001; and based on the Current Population Survey). 131,091 thousand/ 217,570 thousand = 60.3 percent.

[12]39.2 hours/week ÷ 7 days/week x (131,091 thousand/ 217,570 thousand)=3.4 hours/day.

[13] EPA's National Human Activity Pattern Survey, conducted in 1992-1993, also provides data on time use. However, the easily accessible data from this survey focus on time spent in selected activities and micro-environments for the purpose of exposure assessment, and do not provide the comprehensive summary data necessary for this analysis. See USEPA 1997d for more information on this and related exposure studies.

In lieu of a recent United States-based study, assumptions were made about time usage, which were then compared to existing data for reasonableness. Specifically, this economic analysis computes nonmarket work time of 40 hours per week and applies it to the 39.7 percent of the population not otherwise employed. While applied to the population of nonmarket individuals, this estimate is not an assumption that this entire population is performing full time (although nonmarket) work, because this group includes infants, retired persons, and others. Nor is it an assumption that market workers do not also perform nonmarket work. For an average day for the whole population, the average lost nonmarket work hours per day of illness is about 2.3 hours.[14]

This analysis also assumes that, for the population as a whole, leisure time is the time left after subtracting sleep time (which is assumed to be 8 hours) and the time spent in market and nonmarket work from a 24-hour day. That estimate for leisure time is then about 10.3 hours per day.[15]

These estimates of time allocation compare reasonably with those from other studies. For example, a recent Canadian study addresses a different population but has similar results. Exhibit L.7 summarizes those results, which provide national estimates for individuals ages 15 and older in 1998. The hours-per-day estimates are based on a 7-day week for all time categories. It seems reasonable to expect that Canadian time-use patterns will be similar to U.S. patterns due to the proximity of the two countries and the similarity of their economies.

Exhibit L.7 Time Allocation Estimates Compared to 1998 Canadian Study (hours)

Time Category	Estimates Used in EA (rounded data)	Canadian Estimates
Market Work	3.4	3.3
Nonmarket Work and Leisure	12.6	12.6
Nonmarket Work	2.3	
Leisure	10.3	
Sleep	8.0	8.1

Note: Market work includes paid work time only. The nonmarket and leisure category includes all other activities except sleep, including nonmarket work-related activities such as commuting time. Sleep includes night sleep only.

Source: Canadian data from Statistics Canada 1999 and see text and footnotes.

[14]40 hours/week ÷ 7 days/week x (131,091 thousand/ 217,570 thousand)= 2.3 hours/day (rounded).

[15]24 hours - 8 hours sleep - 3.4 market hours (rounded) - 2.3 nonmarket hours (rounded) = 10.3 hours/day (rounded).

The time allocation estimates appear to be reasonably consistent with data from other sources as well. In particular, the estimates of time devoted to night sleep are similar across studies. For the United States, 1985 data indicate that individuals aged 18-64 averaged 7.8 hours of night sleep (USEPA 1997d). A 1998-1999 New Zealand study found that individuals aged 12 years and older devoted 8.6 hours to sleep, but did not distinguish between night sleep and naps (Statistics New Zealand 1999).

L.7 Dollar Value of Time Losses

This section uses compensation data to estimate the opportunity costs of lost market work, nonmarket work, and leisure time. There are numerous sources of U.S. compensation data, each of which focuses on somewhat different data elements and uses different approaches to data collection. The estimates developed for this analysis are based on well-established and frequently cited sources of national data, relying largely on year 2000 data included in the *Statistical Abstract of the United States.*

The starting point for the development of these estimates is median weekly earnings for the year 2002 for full-time workers ($609 per week), as reported by the United States Bureau of Labor Statistics (United States Census Bureau, November 2003, Table 642). This value is derived from the Current Population Survey and includes wages and salaries, but not other costs (e.g., benefits) paid by the employer.

This analysis uses median rather than average earnings as the starting point, consistent with other EPA analyses.[16] The distribution of income in the United States is highly skewed due to the small number of people who are extremely highly compensated, hence average income is significantly higher than the median. Use of the median reflects the notion that the small fraction of the U.S. population affected by this rulemaking are likely to be better represented by the median than by the mean value, which is closer to the upper tail of the distribution.

The next step is to convert median weekly earnings to earnings per hour. According to the Bureau of Labor Statistics, individuals usually working at paid, full-time jobs averaged 42.9 hours per week at work in 2002 (United States Census Bureau, November 2003, Table 602). This means that median earnings per hour averaged about $14.20 ($609/42.9).

For market work time, the measure of opportunity costs used in this analysis is total pre-tax compensation from the perspective of the employer. The earnings number reported above does not reflect employer-paid benefits. To adjust this estimate upwards to reflect total compensation, the analysis uses the ratio of average wages and salaries to average total compensation, as reported by the Bureau of Labor Statistics for private industry workers for 2002 (United States Census Bureau, December 2003, Table 646). These data show that total compensation per hour averages about 1.41 times wages and salaries for full time workers. Using these data to adjust median hourly earnings (as reported above) leads to an estimate of about $20.02 per hour for total compensation. The value is then updated to 2003 dollars ($20.82) using the Employment Cost Index (ECI) (United States Bureau, 2004).

For nonmarket work and leisure time (excluding sleep), two measures were used (see Appendix K for more background on these measures). The first measure, used in the Enhanced Cost of Illness (Enhanced COI), is after-tax earnings, i.e., the "take-home" pay of the median working individual. This measure assumes that the average individual values an hour of non-paid work at its opportunity cost,

[16] See, for example, *Final Heavy Duty Engine/Fuel Rule: Air Quality Planning and Standards.*

which is what he or she could have earned on the job. Data taken from the Current Population Survey data on household income before and after taxes (United States Census Bureau, March 2002) are used to determine the percent of earnings paid as taxes. In 2002, the median before tax income was $42,409 and median after tax income was $35,812.[17] Thus, after-tax income was about 84.4 percent of the pre-tax amount. Applying these data to median hourly earnings leads to estimated after-tax earnings of about $11.98 per hour. This value is then updated to 2003 dollars ($12.46) using the ECI. This figure was used to value both lost nonmarket work time and lost leisure time in the Enhanced COI. It was also a component of the value of the lost caregiver time.

A second measure was used to value lost nonmarket work time for the Traditional COI. The value is half of the after-tax wage, or about $6.23 per hour. The use of 50 percent of the wage rate is consistent with the common practice in the human capital literature of valuing nonmarket work time at the market rate for domestic workers[18]. This literature uses replacement cost as a measure of the productivity of nonmarket work, rather than focusing on the opportunity cost (or utility loss) for the individual who chooses to engage in nonmarket work. The median weekly earnings of private household workers in the service industry were $276 per week in 2002, about 45 percent of the median weekly earnings of $609 for all workers (U.S. Census Bureau Table 641). Private household workers include childcare workers, cleaners, and servants. The Traditional COI does not include values for lost leisure time or lost productivity. The results of these calculations are reported in Exhibit L.8 below.

Exhibit L.8 Per-Hour Dollar Values of Time for Different Activities

Time Loss Category	Basis for Estimate of Value	Per Hour Dollar Value (rounded)
Market work time	Median gross (pre-tax) wage plus benefits	$20.82
Nonmarket Work and Leisure Time (Enhanced COI)	Median after-tax wage	$12.46
Nonmarket Work Time (Traditional COI)	Half the median after-tax wage	$6.23

Note: Rounded data are shown here, but full precision was used in all calculations.
Sources: Derived from U.S. Census Bureau 2002 and 2003.

Exhibit L.9 multiplies these dollar-per-hour values by the time allocations to determine the average value of time per day. The exhibit also shows the value of a caregiver day, which is the sum of the per-day values of lost market work days, nonmarket work days, and nonmarket leisure days.

[17]This median income estimates differ from the earnings estimates cited earlier because it reflects household income, rather than individual earnings, and relies on a different data source.

[18] A pioneering example of this approach is Rice 1966; a more recent example is Thamer et al. 1998.

Exhibit L.9 Weighted Average Value of Time

Enhanced COI

Time Loss Category	Hours Per-Day of Illness	Per-Hour Value	Per-Day Value
Market Work Time	3.4	$20.82	$70.79
Nonmarket Work Time	2.3	$12.46	$28.66
Nonmarket Leisure Time	10.3	$12.46	$128.34
Caregiver Day	Sum of per-day value of lost market work, nonmarket work, and leisure days		$227.79

Traditional COI

Time Loss Category	Hours Per-Day of Illness	Per-Hour Value	Per-Day Value
Market Work Time	3.4	$20.82	$70.79
Nonmarket Work Time	2.3	$6.23	$14.33
Caregiver Day	Sum of per-day value of lost market and nonmarket work days		$85.12

Note: Rounded data are shown here, but full precision was used in all calculations.

Source: Exhibits L.7 and L.8.

L.8 Lost Productivity (Enhanced COI Only)

Time losses associated with nonfatal cases of cryptosporidiosis may include (1) a *reduction in time* (hours) engaged in normal activities and (2) an additional *loss of productivity* (or effectiveness) that occurs even when the ill individual continues to engage in normal activities. Reductions in time (or hours) would result, for example, when an ill individual spends time on doctor visits, bed rest, or in the hospital rather than engaging in normal market work and nonmarket work activities. Additional losses occur when the individual continues to engage in normal activities, but is less productive or finds them less enjoyable due to illness.

A reasonable estimate for lost productivity assumes that time spent in normal activities is 30 percent less productive than it would be normally, i.e., an individual produces 30-percent less per unit of time engaged in market or nonmarket work, and is 30 percent less effective at leisure activities. Furthermore, the best estimate assumes that the dollar value (i.e., the utility loss, estimated based on opportunity costs) of this reduction is equal to the reduction in productivity multiplied by the relevant dollar-per-hour value (from Exhibit L.9 above). In other words, the 30 percent loss in productivity is multiplied by $70.79 per day to estimate the value of reduced productivity while at work, by $28.66 per day to estimate the value of reduced productivity while engaged in nonmarket work, and by $128.34 per day for leisure activities. As noted earlier, the value of sleep time is conservatively estimated as "zero" as the effect of illness on sleep time is not quantified in this analysis.

The 30 percent productivity loss is based on Harrington et al. (1991), which reports the results of a survey of individuals affected by a 1983 giardiasis outbreak in Luzerne County, Pennsylvania. In addition to asking questions about missed work time, the Harrington et al. survey asks:

> *"If you went to work during this illness, did your illness affect your ability to work as hard as you usually do at your job?"* (Harrington et al. (1991), p. 126)

This question was followed by a bounded multiple-choice question regarding the percent decrease in normal capacity while working with the illness. The researchers found that respondents identified as workers reported a 30.4 percent average loss, while those identified as homemakers reported a 34.0 percent average loss (Harrington et al. (1991), p. 103). For the analysis of cryptosporidiosis contained in this report, these values are rounded to 30 percent. These losses are to the employer for market work time, and to the individual for nonmarket work time.

In addition to applying this 30 percent loss rate to market and nonmarket work time, the Enhanced COI analysis applies this rate to leisure time. The Harrington et al. survey asked respondents whether their leisure activities changed as a result of the illness, as well as whether the illness required them to change their normal routines. While percentage losses were not requested for time engaged in leisure activities while ill, the survey results did confirm that these activities were altered as a result of the illness. While these changes in leisure activities are partially captured in the analysis of time losses (i.e., decreased hours spent in market work, nonmarket work, and leisure activities), it appears reasonable to assume that the utility or pleasure associated with those leisure activities that are pursued while ill is also reduced as a result of the illness.

The effects of giardiasis are very similar to the effects of cryptosporidiosis, and a review of the literature failed to identify any other recent U.S. studies that report productivity losses for similar gastrointestinal illnesses. Harrington et al.'s survey was conducted relatively soon after the giardiasis outbreak, so the survey participants' recollections were still fresh. The Harrington et al. estimate of an approximately 30 percent reduction also appears reasonable based on review of studies estimating productivity losses due to other illnesses, as discussed in more detail in Appendix P.

L.9 Estimates for Enhanced and Traditional Costs of Illness

The data discussed throughout this appendix are the basis for the Traditional and Enhanced Cost of Illness and are presented in Exhibit L.10. These estimates are discussed in Chapter 5, section 5.3.1 and are used to estimate morbidity benefits.

Exhibit L.10 Total Value of Lost Time Loss Per Case of Illness, Enhanced and Traditional COI

Loss Category	Average Days Lost Per Illness	Value Per Day		Total Loss Per Case	
		Enhanced COI	Traditional COI	Enhanced COI	Traditional COI
				A x B	A x C
	A	B	C	D	E
Total				**$844.24**	**$274.34**
Direct Medical Costs				**$106.61**	**$106.91**
Lost Time Subtotal				**$737.33**	**$167.43**
Lost Market Work Days	1.697	$70.79	$70.79	$120.13	$120.13
Lost Nonmarket Work Days		$28.66	$14.33	$48.64	$24.32
Lost Leisure Time		$128.34	-	$217.79	-
Lost Caregiver Days	0.270	$227.79	$85.12	$61.50	$22.98
Lost Leisure Productivity	4.233	$128.34 x 30%	-	$162.98	-
Lost Productivity, Market and Nonmarket Work		($70.79 + $28.66) x 30%	-	$126.29	-

Note: Detail may not calculate to totals due to independent rounding.
Source: Exhibits L.6 and L.9.

L.10 Year-By-Year Estimates for Enhanced and Traditional Costs of Illness

Using data presented in Appendix C, the results presented in Exhibit L.10 are adjusted to reflect increases in real income growth and, therefore, the value of time, each year to 2027. Income growth causes the cost of an illness to increase over time because the lost time is recovered by wage rates or their equivalent. The same per-capita GDP values used to value mortality in the future (and presented in Exhibit C.12), are employed to compute income growth between the future year and the year 2003 (the baseline year for cost of illness calculations). Using the data from 2003 as the base year, the lost-time portion of the cost of illness is adjusted to reflect the annual percent change in income (the real GDP per capita). In the benefits model, the cases avoided in each year are valued as shown in Exhibit L.11 (using unrounded data).

Exhibit L.11 Yearly Value of Lost Time Per Case of Illness, Enhanced and Traditional COI

Year	Annual Percent Change in Income (Real GDP per Capita)	Lost Time		Direct Medical Costs	Total Loss Per Case	
		Enhanced COI	Traditional COI		Enhanced COI	Traditional COI
		(1 + A) x previous year	(1 + A) x previous year		B + D	C + D
	A	B	C	D	E	F
2005	3.9%	$783.82	$177.99	$106.91	$890.73	$284.90
2006	3.3%	$809.88	$183.90	$106.91	$916.79	$290.81
2007	2.3%	$828.85	$188.21	$106.91	$935.76	$295.12
2008	1.9%	$844.23	$191.70	$106.91	$951.14	$298.61
2009	2.0%	$860.79	$195.46	$106.91	$967.70	$302.37
2010	2.0%	$877.73	$199.31	$106.91	$984.64	$306.22
2011	1.8%	$893.29	$202.84	$106.91	$1,000.20	$309.75
2012	1.7%	$908.22	$206.23	$106.91	$1,015.13	$313.14
2013	1.7%	$923.39	$209.68	$106.91	$1,030.30	$316.59
2014	1.7%	$938.83	$213.19	$106.91	$1,045.74	$320.10
2015	1.7%	$954.55	$216.76	$106.91	$1,061.46	$323.67
2016	1.7%	$970.57	$220.39	$106.91	$1,077.48	$327.30
2017	1.7%	$986.89	$224.10	$106.91	$1,093.80	$331.01
2018	1.7%	$1,003.55	$227.88	$106.91	$1,110.46	$334.79
2019	1.7%	$1,020.55	$231.74	$106.91	$1,127.46	$338.65
2020	1.7%	$1,037.91	$235.68	$106.91	$1,144.82	$342.59
2021	1.7%	$1,055.60	$239.70	$106.91	$1,162.51	$346.61
2022	1.7%	$1,073.60	$243.79	$106.91	$1,180.51	$350.70
2023	1.7%	$1,091.91	$247.95	$106.91	$1,198.82	$354.86
2024	1.7%	$1,110.54	$252.18	$106.91	$1,217.45	$359.09
2025	1.7%	$1,129.50	$256.48	$106.91	$1,236.41	$363.39
2026	1.7%	$1,148.81	$260.87	$106.91	$1,255.72	$367.78

Year	Annual Percent Change in Income (Real GDP per Capita)	Lost Time		Direct Medical Costs	Total Loss Per Case	
		Enhanced COI	Traditional COI		Enhanced COI	Traditional COI
2027	1.7%	$1,168.48	$265.33	$106.91	$1,275.39	$372.24
2028	1.7%	$1,188.34	$269.84	$106.91	$1,295.25	$376.75
2029	1.7%	$1,208.55	$274.43	$106.91	$1,315.46	$381.34

Note: Full precision is used in model calculations. Rounded data are shown here.
The Traditional COI only includes valuation for medical costs and lost work time (including some portion of nonmarket household production). The Enhanced COI also factors in valuations for lost personal time (non-work time) such as child care and homemaking (to the extent not covered by the traditional COI), time with family, and recreation, and lost productivity at work on days when workers are ill but go to work anyway.
Source: Col. A: Exhibit C.12
Year 2003 and Col. D: Exhibit L.10.

Appendix M
Small Community Surface Water and GWUDI Systems by State

This appendix presents the data used to develop Exhibits 7.5 and 7.6, which depict the percent of the population of CWSs served by small surface and GWUDI systems. The numbers are based on the total unlinked population served by CWSs using surface water or GWUDI, derived directly from SDWIS 4th Quarter Year 2003 Freeze data (USEPA 2003e).

Exhibit M.1: Small Community Surface Water and GWUDI Systems by State

State	Number of Small Community SW & GWUDI Systems	Population Served by Small Community SW & GWUDI Systems	Population Served by All SW & GWUDI Systems	Percent of CWS Population Served by Small Community SW & GWUDI Systems
	A	B	C	D = B/C
Alabama	178	628,064	3,503,275	17.9%
Alaska	117	107,863	271,337	39.8%
American Samoa	10	2,840	2,840	100.0%
Arizona	34	37,338	3,135,983	1.2%
Arkansas	241	477,532	1,373,810	34.8%
California	520	1,031,906	25,896,708	4.0%
Colorado	220	385,258	3,470,578	11.1%
Connecticut	39	125,441	2,346,030	5.3%
Delaware	1	425	457,225	0.1%
D.C.	0	0	595,000	0.0%
Florida	39	127,394	2,229,070	5.7%
Georgia	132	457,114	5,109,405	8.9%
Guam	1	1,635	88,850	1.8%
Hawaii	13	29,516	87,582	33.7%
Idaho	56	51,287	251,339	20.4%
Illinois	414	933,392	8,229,110	11.3%
Indiana	83	236,918	2,262,499	10.5%
Iowa	125	207,153	1,251,348	16.6%
Kansas	308	342,461	1,672,967	20.5%

State	Number of Small Community SW & GWUDI Systems	Population Served by Small Community SW & GWUDI Systems	Population Served by All SW & GWUDI Systems	Percent of CWS Population Served by Small Community SW & GWUDI Systems
	A	B	C	D = B/C
Kentucky	256	948,948	3,993,419	23.8%
Louisiana	46	161,734	2,066,994	7.8%
Maine	45	100,048	412,960	24.2%
Maryland	52	105,213	4,094,391	2.6%
Massachusetts	56	200,376	6,851,895	2.9%
Michigan	191	602,871	5,328,797	11.3%
Minnesota	21	78,032	1,408,686	5.5%
Mississippi	5	6,943	110,609	6.3%
Missouri	210	388,584	3,143,083	12.4%
Montana	85	126,057	850,453	14.8%
N. Mariana Is.	0	0	50,769	0.0%
Nebraska	12	24,505	555,814	4.4%
Nevada	33	51,986	1,392,181	3.7%
New Hampshire	42	99,409	495,395	20.1%
New Jersey	30	172,144	5,276,474	3.3%
New Mexico	28	46,568	204,868	22.7%
New York	683	1,135,884	13,279,347	8.6%
North Carolina	464	771,762	4,446,374	17.4%
North Dakota	55	57,478	349,257	16.5%
Ohio	219	542,683	6,809,974	8.0%
Oklahoma	588	775,578	2,775,685	27.9%
Oregon	173	276,869	2,455,009	11.3%
Palau	14	11,660	11,660	100.0%
Pennsylvania	360	830,393	8,980,210	9.2%
Puerto Rico	172	233,267	4,378,264	5.3%
Rhode Island	12	56,276	823,380	6.8%
South Carolina	126	413,124	2,636,666	15.7%
South Dakota	117	106,791	381,709	28.0%

State	Number of Small Community SW & GWUDI Systems	Population Served by Small Community SW & GWUDI Systems	Population Served by All SW & GWUDI Systems	Percent of CWS Population Served by Small Community SW & GWUDI Systems
	A	B	C	D = B/C
Tennessee	348	957,072	3,754,947	25.5%
Texas	789	1,695,522	14,161,144	12.0%
Utah	53	125,593	1,616,005	7.8%
Vermont	97	163,141	361,954	45.1%
Virginia	266	521,961	6,033,605	8.7%
Virgin Islands	133	30,473	94,473	32.3%
Washington	159	231,714	2,703,880	8.6%
West Virginia	322	554,247	1,549,200	35.8%
Wisconsin	17	61,678	1,661,338	3.7%
Wyoming	71	100,020	295,789	33.8%

Note: Systems that are wholesalers serving a population of 0 or 1 were not included in this analysis. Unlinked system numbers were used for this analysis.

Appendix N
Infectivity Dose-Response Analysis

N.1 Introduction

As discussed in Chapter 5, the dose-response component of the risk model is a function of two factors: (1) the *Cryptosporidium* dose, which is equal to the concentration of organisms in the water and the volume of water ingested, and (2) the infection probability, or infectivity (*r*), which is the probability of a single *Cryptosporidium* oocyst causing infection when ingested.

Estimates of the second factor, infectivity, are variable and uncertain due to variation among different species and strains (or isolates) of *Cryptosporidium*, variation in host susceptibility, and limitations in available data. To address this variability and uncertainty, EPA has estimated distributions of possible infectivity (*r*) values by applying different models to dose-response data from human volunteer feeding studies.

This appendix presents research and analyses for *Cryptosporidium* infectivity that EPA considered for this EA. This includes data from human volunteer feeding studies used in the primary LT2ESWTR risk assessment, data from additional volunteer studies used in a sensitivity analysis, and the results of different models used to estimate distributions of infectivity values with these data. Finally, the appendix presents a verification of the modeled infectivity values using estimates based on the 1993 cryptosporidiosis outbreak in Milwaukee.

N.2 *Cryptosporidium* Infectivity Research

Researchers have identified numerous species of *Cryptosporidium*. At least five species are known to infect humans–*C. hominis*, C. *parvum*, *C. meleagridis*, *C. felis*, and *C. canis* (Xiao et al., 2001, Morgan-Ryan et al., 2002)–among which *C. hominis* and *C. parvum* cause most infections to humans. Until recently, *C. parvum* had been characterized as having two distinct types–genotype I, of human origin, and genotype II, of animal or human origin. These genotypes are now characterized as separate species, with genotype I named *C. hominis* and genotype II remaining *C. parvum* (Morgan-Ryan et al., 2002).

Analyses of 92 outbreak and sporadic cases of cryptosporidiosis in the United States by Sulaiman et al. (1998) found *C. hominis* more prevalent than *C. parvum*. However, Hunter et al. (2004) analyzed 111 sporadic cases in England and Wales where the species occurrence was close to even–55 percent for *C. hominis* and 45 percent for *C. parvum*.

N.2.1 Infectivity Data from Human Volunteer Studies

Data on the infectivity of *Cryptosporidium* in humans are available from studies conducted by Chappell, Okhuysen and colleagues at the University of Texas. These studies involved dosing healthy adult volunteers with different amounts of *Cryptosporidium* oocysts. Subjects were then evaluated for *Cryptosporidium* in stool samples and for diarrheal and other enteric illness symptoms. Due to the high detection limit for *Cryptosporidium* in stool samples (10,000 oocysts/ml), researchers classified subjects as "presumed infected" if they manifested diarrheal or other enteric illness symptoms without measurable oocyst shedding within 30 days after being dosed.

Data from Human Volunteer Studies Used in the Primary LT2ESWTR Risk Assessment

For the primary LT2ESWTR risk assessment shown in Chapter 5, infectivity estimates are based on volunteer feeding studies with three *C. parvum* isolates: TAMU (collected from a veterinary student exposed during necropsy of an infected foal), Iowa (derived from a calf), and UCP (derived from a calf). Each isolate was tested in a separate study. Dose-response data from Okhuysen et al. (1999) for the three isolates are presented in Exhibits N.1, N.2, and N.3.

In general, the data show that the fraction infected (number infected divided by number of subjects) tends to increase with dose. All volunteers dosed at the highest levels became infected, as did a significant fraction of those dosed at the lowest study levels. The data indicate differences in infectivity among the isolates, with TAMU the most infectious and UCP the least.

Exhibit N.1: TAMU (*C. parvum*) Isolate Data (Okhuysen et al. 1999)

Dose (No. of oocysts)	No. of Subjects	No. of Infections	Percent Infected
10	3	2	67%
30	3	2	67%
100	3	3	100%
500	5	5	100%

Exhibit N.2: Iowa (*C. parvum*) Isolate Data (Okhuysen et al. 1999)

Dose (No. of oocysts)	No. of Subjects	No. of Infections	Percent Infected
30	5	2	40%
100	8	4	50%
300	3	2	67%
500	6	5	83%
1,000	2	2	100%
10,000	3	3	100%
100,000	1	1	100%
1,000,000	1	1	100%

Exhibit N.3: UCP (*C. parvum*) Isolate Data (Okhuysen et al. 1999)

Dose (No. of oocysts)	No. of Subjects	No. of Infections	Percent Infected
500	5	3	60%
1,000	3	2	67%
5,000	5	2	40%
10,000	4	4	100%

Additional Human Volunteer Study Data

Following proposal of the LT2ESWTR, EPA acquired data from human volunteer feeding studies for three additional isolates: TU502, a *C. hominis* isolate collected from an infected human, Moredun, a *C. parvum* isolate collected from a red deer calf and laboratory passaged for many years in sheep, and 16W, a *C. parvum* isolate from a calf. Exhibits N.4, N.5, and N.6 show dose-response data for these isolates. These dose-response data are used in a sensitivity analysis for the risk assessment presented in section N.4.

The results for the *C. hominis* isolate, TU502, are of particular interest because, as discussed earlier, this species has been identified in a significant fraction of *Cryptosporidium* infections. The volunteer study results indicate that the infectivity of the *C. hominis* isolate is similar to the most infectious *C. parvum* isolates (Chappell et al., 2004). The modeled infectivity values for all the additional isolates fall within the range estimated for the three isolates used in the primary risk assessment (see Exhibit N.19). These additional volunteer feeding study data, therefore, support the range of infectivity values in the primary risk assessment.

Exhibit N.4: TU502 (*C. hominis*) Isolate Data (Chappell et al. 2004)

Dose (No. of oocysts)	No. of Subjects	No. of Infections	Percent Infected
10	5	5	100%
30	5	3	67%
100	7	5	71%
500	4	3	75%

Exhibit N.5: Moredun (*C. parvum*) Isolate Data (Okhuysen et al. 2002)

Dose (No. of oocysts)	No. of Subjects	No. of Infections	Percent Infected
100	4	3	75%
300	5	3	60%
1,000	3	2	67%
3,000	4	3	75%

Exhibit N.6: 16W (*C. parvum*) Isolate Data (Chappell et al. 2004)

Dose (No. of oocysts)	No. of Subjects	No. of Infections	Percent Infected
30	7	5	71%
100	5	3	60%
500	4	4	100%

N.2.2 Infectivity of Additional *C. parvum* Isolates in Laboratory Assays

Rochelle et al. (2002) conducted an infectivity study of five *C. parvum* isolates–Iowa, TAMU, Moredun, Maine, and Glasgow–using a mouse and different cell culture assays. While results from these assays cannot be directly extrapolated to human infectivity, they provide a point of comparison for relative infectivity among the isolates. Specifically, they provide information on the relative infectivity of two isolates, Maine and Glasgow, for which infectivity data from human volunteer feeding studies are not available (see section N.2.1 for volunteer study results for Iowa, TAMU, and Moredun isolates).

In CD-1 mice, the TAMU, Moredun, Maine, and Glasgow isolates showed similar infectivity (ID_{50} values ranging from 16 to 23), while the Iowa isolate was less infectious (ID_{50} value of 347). Among the cell culture systems evaluated, HCT-8 cells produced results closest to the mouse assay. The infectivity values of TAMU and Moredun were similar in HCT-8 cells (ID_{50} values of 27 and 30), and the Maine, Glasgow, and Iowa isolates were similar but less infectious (ID_{50} values ranging from 81 to 106).

These results indicate that infectivity values from mouse and cell-culture assays do not correlate closely with available data from volunteer feeding studies. However, they suggest that the infectivity of the additional isolates, Maine and Glasgow, may fall within the range of values for the isolates evaluated in the volunteer feeding studies.

N.2.3 Host Sensitivity

Another area of uncertainty in the analysis of *Cryptosporidium* infectivity is variation in susceptibility to infection among people. Children and people with weakened immune systems (e.g., AIDS patients and others with immune system disorders, transplant recipients, the elderly) are likely more susceptible to infection by *Cryptosporidium*. Studies of these groups have observed higher morbidity rates and greater illness severity in comparison to the general population (DuPont et al., 1995; CDC, 2001; McDonald et al., 2001).

Serological studies have identified the presence of cryptosporidiosis antibodies, which may provide some resistance to infection. The degree and duration of such resistance is unclear, however. Some studies have not observed a correlation between the development of some identified antibodies and protection from illness (Okhuysen et al., 1998). Studies generally show older adults to have higher levels of antigens present compared to younger adults (Egorov et al. 2003; Frost et al. 1998).

The dose-response results used to model infectivity (Okhuysen et al. 1999) represent healthy adults. Data indicate that the participants in these studies were a mix of naive and previously exposed individuals (Muller et al., 2001; SAB, 2003). The study data do not, of course, include any individuals from sensitive subpopulations. Consequently, EPA lacked data to account for sensitive subpopulations in the infectivity model and recognizes this as a potential source of conservatism in the infectivity estimates. Accordingly, those communities with a demographic structure that includes more children or other

sensitive persons may have a higher annual risk of illness occurring from any predefined level of exposure.

Although available data used to estimate infectivity in this EA do not account for sensitive subpopulations, EPA researched infectivity models that recognize variation in host susceptibility of a healthy adult population. Section N.4 describes these models.

N.3 Infectivity Model Development for the Primary Risk Assessment

For the *Cryptosporidium* risk assessment presented in Chapter 5, EPA analyzed dose-response data from Okhuysen et al. (1999) for three isolates (shown in Exhibits N.1 - N.3). Data analysis was performed using a statistical model that addressed uncertainty due to limitations in the number of isolates and subjects studied. The analysis treated the three isolates as a random sample from a larger population of environmental isolates. The model used the dose-response data to estimate the infectivity of the three isolates. Combining this information, the model predicts infectivity of an unknown environmental isolate, which serves as input to the benefits model. By the nature of the dose-response data, the model considered the study subjects as a random sample from the U.S. population of healthy individuals. As noted earlier, the use of healthy adults does not account for differences in subject susceptibility due to age and other immune system factors, and thus, potentially underestimates infectivity.

Background–Infectivity in the benefits model

Chapter 5 describes the dose-response component of the model used to estimate risk and benefits for the LT2ESWTR. The daily probability of infection is equal to $1 - e^{-E(r)*vol*V*C}$, where E(r) is the expected mean infectivity, vol is the volume of water ingested during a day (in liters), V is the fraction of environmental oocysts that are infectious, and C is the finished water concentration (oocysts per liter).

The parameter (r) is the probability that ingestion of a single organism will cause infection. It is not possible to know the true mean value of r, given the limitations in available data, variability between isolates (strains), and the likelihood of unknown strains present in the environment. E(r) is the expected value of r, derived from a distribution of *r* values that reflect the uncertainty within and variability among strains, including environmental strains for which there are no data.

The structure of the benefits model contains inner and outer loops to incorporate variability and uncertainty of the individual variables, respectively. The expected mean infectivity, E(r), is selected in the outer loop to reflect the uncertainty of the E(r) values. Variability is accounted for when estimating the distribution of E(r) values.

This section describes the model structure, model output, and data analyses used to estimate the E(r) values serving as input data to the benefits model. The section is organized as follows:

N.3.1 Model Development and Structure - gives the basis for the model structure

N.3.2 Model Descriptions - provides mathematical descriptions of the models

N.3.3 Model Check–MCMC Performance - analyzes distribution of modeled parameters to ensure model is not biased

N.3.4 Model Outputs - describes the data output by the four models and presents distributions

N.3.5 Infectivity Calculation from Model Outputs - presents mean infectivity values from model outputs and randomly selects mean values for input to the benefits model

N.3.1 Model Development and Structure

Based on the exponential dose-response model described in section 5.3.2, EPA has developed four models to estimate expected *r* values from the dose-response data shown in Exhibits N.1 - N.3. These expected r values, or E(r), serve as input to the benefits model (this second step is described in section N.3.5). In 2001, the Science Advisory Board (SAB) reviewed EPA's dose-response analysis and recommended removing the results for the UCP isolate of *C. parvum* from the analysis, based on concerns about the age of the isolate and its poor performance in cell culture assays in comparison to other *C. parvum* isolates (SAB 2003). After discussions with Dr. Cynthia Chappell, a co-author of the study reporting the UCP results, EPA decided to run the analysis in a way to combine two distributions–one that included and one that excluded the UCP data.

With only two (Iowa and TAMU isolates) or three (Iowa, TAMU, and UCP isolates) sets of data, model uncertainty is a concern. To address model uncertainty, SAB statisticians recommended using a 50/50 mix of two models; lognormal and log-t (3 degrees of freedom) (SAB 2003). Because the infectivity parameter *r* is a probability, lognormal and log-t distributions would have to be constrained to less than or equal to one. To overcome the technical difficulty posed by this truncation, EPA used logit transformation rather than natural logarithms. The two models are logit-normal and logit-t. For the logit-normal model, logit(r)[1] is normally distributed with parameters mu and sigma. For the logit-t model, [logit(r) - mu] / sigma is Student's t distributed with 3 degrees of freedom. Exhibit N.5 summarizes the four models.

Exhibit N.7: Four Models Used to Calculate the Distribution of Infectivity

Isolates Used	Logit(r) ~ Normal	Logit(r) ~ t_3
Iowa, TAMU, and UCP	Model 1	Model 2
Iowa and TAMU	Model 1b	Model 2b

N.3.2 Model Descriptions

Different isolates may have different infectivity parameters, and the Iowa, TAMU, and UCP infectivity parameters were assumed to represent samples from a much larger environmental distribution of *Cryptosporidium* infectivity parameters. Under the logit-normal model (Model 1 and Model 1b), the distribution of logit(r) is normal with unknown parameters (mu, phi), where phi is precision, and is equal to $1/\text{sigma}^2$. Under the logit-t model (Model 2 and Model 2b) the distribution of $[\text{logit}(r)-\text{mu}] / \text{phi}^{-1/2}$ is Student's t with 3 degrees of freedom.

Prior to analyzing the data, little was known about parameters mu and phi for these models. However, mu was unlikely to lie outside the range (-14.2, 2.2) and phi was unlikely to be outside the range [0.04, 100]. If mu were less than -14.2 (rounded to -14 in the model), then the median value of *r*

[1] $\text{logit}(r) = \ln(r/(1-r))$

would be less than 10^{-6}. If mu were greater than 2.2, then the median value of *r* would exceed 0.9. Available dose-response data indicate that for the median value for *r* (the probability of infection, given exactly one oocyst ingested) to be outside the range (10^{-6}, 0.9) would not be credible.

Regarding phi, it is unlikely that a 95 percent interval for logit(r) is wider than logit(10^{-5}) to logit(0.5). This interval is 11.513 logit units wide. If a 2-sigma interval (containing 68.3 percent of the probability mass) is 10 logit units wide, the corresponding precision, phi, would be 0.04. At the other extreme, the precision may be very large. A precision of 100 would correspond to a standard deviation of 1/10, which would require the relative standard deviation of *r* to be about 10 percent. Given the differences in isolate sources, history, and handling, the standard deviation of *r* is unlikely to be smaller than this. Therefore, the feasible range for phi was assumed as (0.04, 100).

Within these ranges, (-14, and 2.2) for mu and (0.04, 100) for phi, it was assumed that mu and phi could fall anywhere. Rather than construct a more complex prior, the model used uniform priors on these ranges.

The program code for BUGS for one of the models (Model 1b) is shown below as an example. The code for Model 2b is almost identical. The difference is that Model 2b defines a as dt(mu, phi, df) and c as dt(mu, phi, df), with df = 3. The codes for Model 1 and Model 2 include UCP; Model 1b and Model 2b exclude UCP.

BUGS program code for Model 1b

```
Model;                                   Remarks
{
  TAMU <- exp(a) / (1 + exp(a))          a is the logit of r for TAMU
  IOWA <- exp(c) / (1 + exp(c))          c is the logit of r for IOWA
  R <- exp(d)/(1+exp(d))                 d is the logit of r for environmental
  for( i in 1 : 4 ) {
    TAMUr[i] <- 1 - exp(( -TAMUd[i]) * TAMU)   TAMUr[i] is the probability of infection in group i
    TAMUi[i] ~ dbin(TAMUr[i],TAMUs[i])         TAMUi[i] is the number of infected subjects in group i
  }
  for( k in 1 : 8 ) {
    IOWAr[k] <- 1 - exp(( -IOWAd[k]) * IOWA)   IOWAr[k] is the probability of infection in group k
    IOWAi[k] ~ dbin(IOWAr[k],IOWAs[k])         IOWAi[k] is the number of infected subjects in group k
  }
  mu ~ dunif(-14, 2.2)                   mu and phi define the normal distribution of logit[r]
  phi ~ dunif(0.04,100)                  priors for mu and phi are uniform, with feasibility constraints
  a ~ dnorm(mu,phi)                      a and c constitute a sample of size 2 from the population
  c ~ dnorm(mu,phi)
  d ~ dnorm(mu, phi)
}
```

N.3.3 Model Check—MCMC Performance

The outputs of the models are, as expected, autocorrelated between close runs. Selecting data from non-consecutive iterations at a set frequency instead of using consecutive iterations, referred to as thinning, essentially removes this autocorrelation. To help determine the needed degree of thinning, autocorrelation plots for the hyperparameters mu and phi were prepared, and these plots are shown in Exhibits N.8 and N.9 using Model 2 as an example. These plots are based on a sample size of 100,000 without thinning.

Exhibit N.8: Autocorrelation Plot for mu

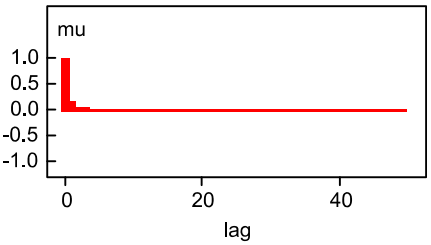
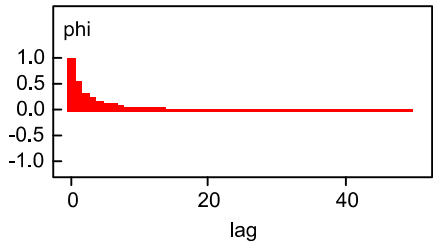


Exhibit N.9: Autocorrelation Plot for phi



As can be seen, autocorrelation is not noticeable for phi after about 20 iterations. Thus, thinning to 1 in 20 (discarding 19 of every 20 mu-phi pairs), the program produced a sample of 10,000 mu-phi pairs with negligible autocorrelation. Scatterplots (not shown) of (mu, phi) also confirmed good mixing.

The program required 200 selected iterations before reaching central tendency, so the first 200 (mu, phi) pairs of each analysis were discarded and not included in the final output set. Ten thousand mu-phi ordered pairs were generated for each model (logit-normal and logit-t).

Examples of posterior hyperparameter densities are shown for Model 1b and Model 2b in Exhibits N.10 through N.13. The definite peaks of these distributions show that the prior limits for these parameters did not strongly influence the posteriors.

Exhibit N.10: Model 1b Density Function for mu

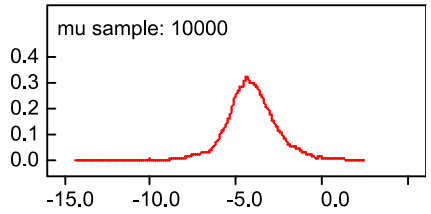


Exhibit N.11: Model 1b Density Function for phi

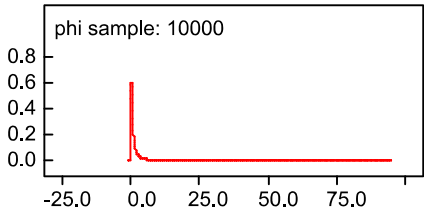


Exhibit N.12: Model 2b Density Function for mu

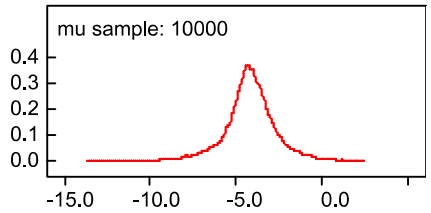
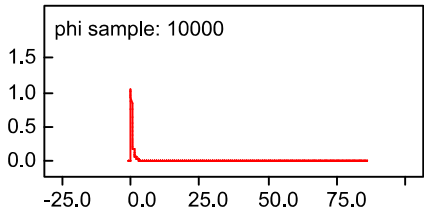


Exhibit N.13: Model 2b Density Function for phi



Posteriors for isolate-specific infectivity parameters among models were similar. For example, Exhibits N.14 and N.15 are the densities for the Iowa isolate produced by Model 1b and Model 2b, respectively.

Exhibit N.14: Model 1b Density Function for Iowa

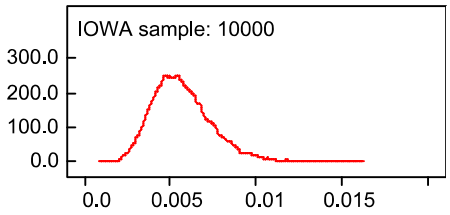
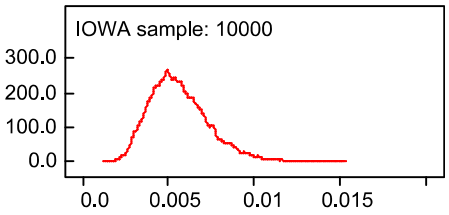


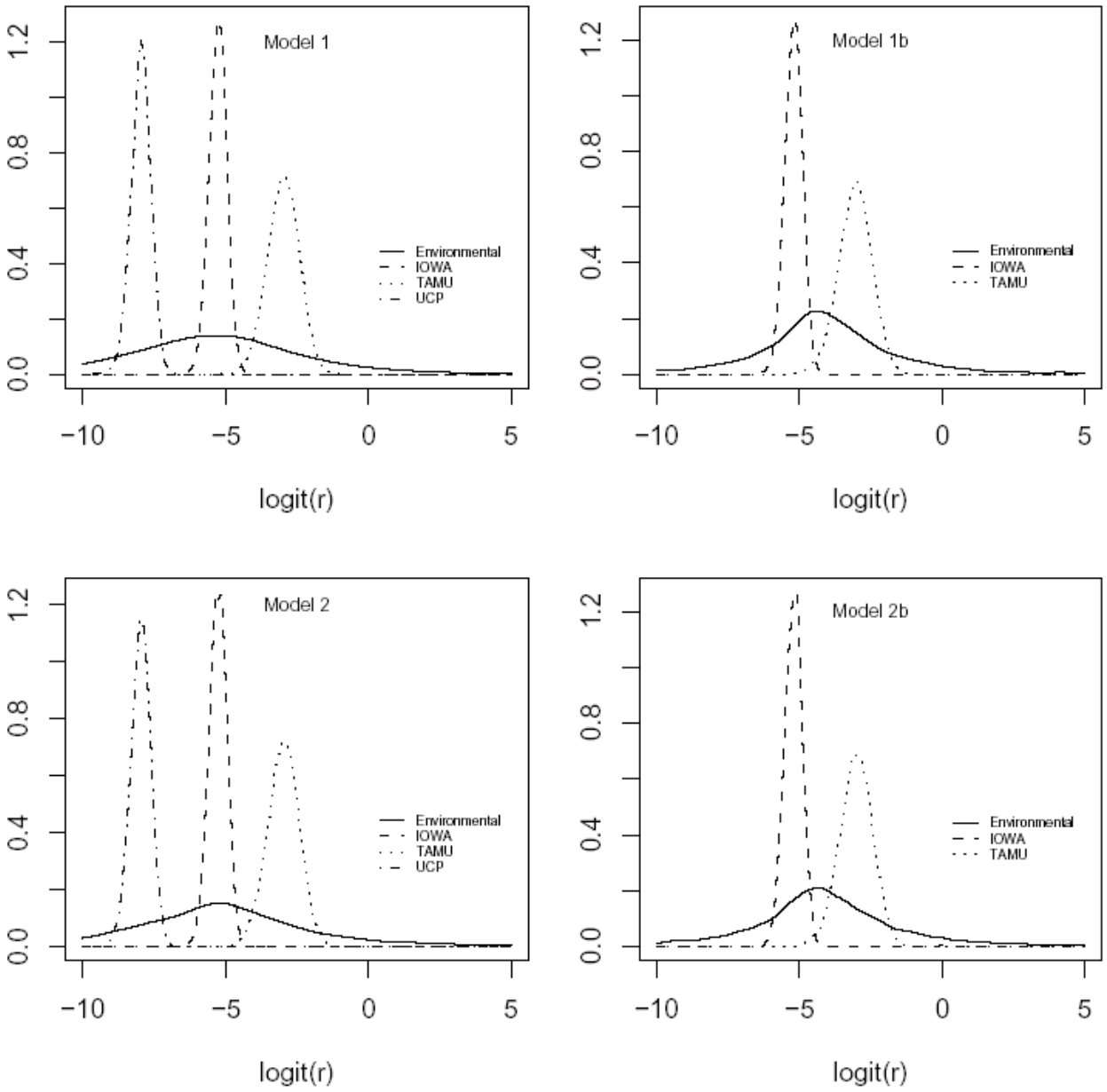
Exhibit N.15: Model 2b Density Function for Iowa



N.3.4 Model Outputs

Each model estimates a distribution of *r* values (as 10,000 mu-phi pairs). Exhibit N.16 shows the distribution of *r* for each isolate, including the environmental isolate. The environmental isolate accounts for uncertainty within each of the three study isolates and the uncertainty between those isolates. Consequently, the distribution of the environmental isolate represents the infectivity of all *Cryptosporidium* isolates. All graphs in Exhibit N.14 show that the highest density (peak of the distribution) of the environmental isolate distribution falls in the middle of the individual isolates, indicating no one isolate is driving the predicted *r* values.

Exhibit N.16: Density Functions for Predicted Infectivity by Strain



N.3.5 Infectivity Calculation from Model Outputs

The *r* values (represented by 10,000 mu-phi pairs) output from the each model had to be translated to a representative distribution of expected values, E(r), for input into the benefits model. EPA used numerical integration to derive expected *r* values for each mu-phi (or mu-sigma)[2] pair. The integrations for Model 1 and 1b, named Er1, and Model 2 and 2b, named Er2 are as follows:

[2]Phi is the inverse of sigma squared. The BUGS program uses phi and the benefits model uses sigma.

$$Er1_n := \int_{mu_n - 5 \cdot s_n}^{mu_n + 5 \cdot s_n} dnorm(x, mu_n, s_n) \left(\frac{e^x}{1 + e^x} \right) d\,x$$

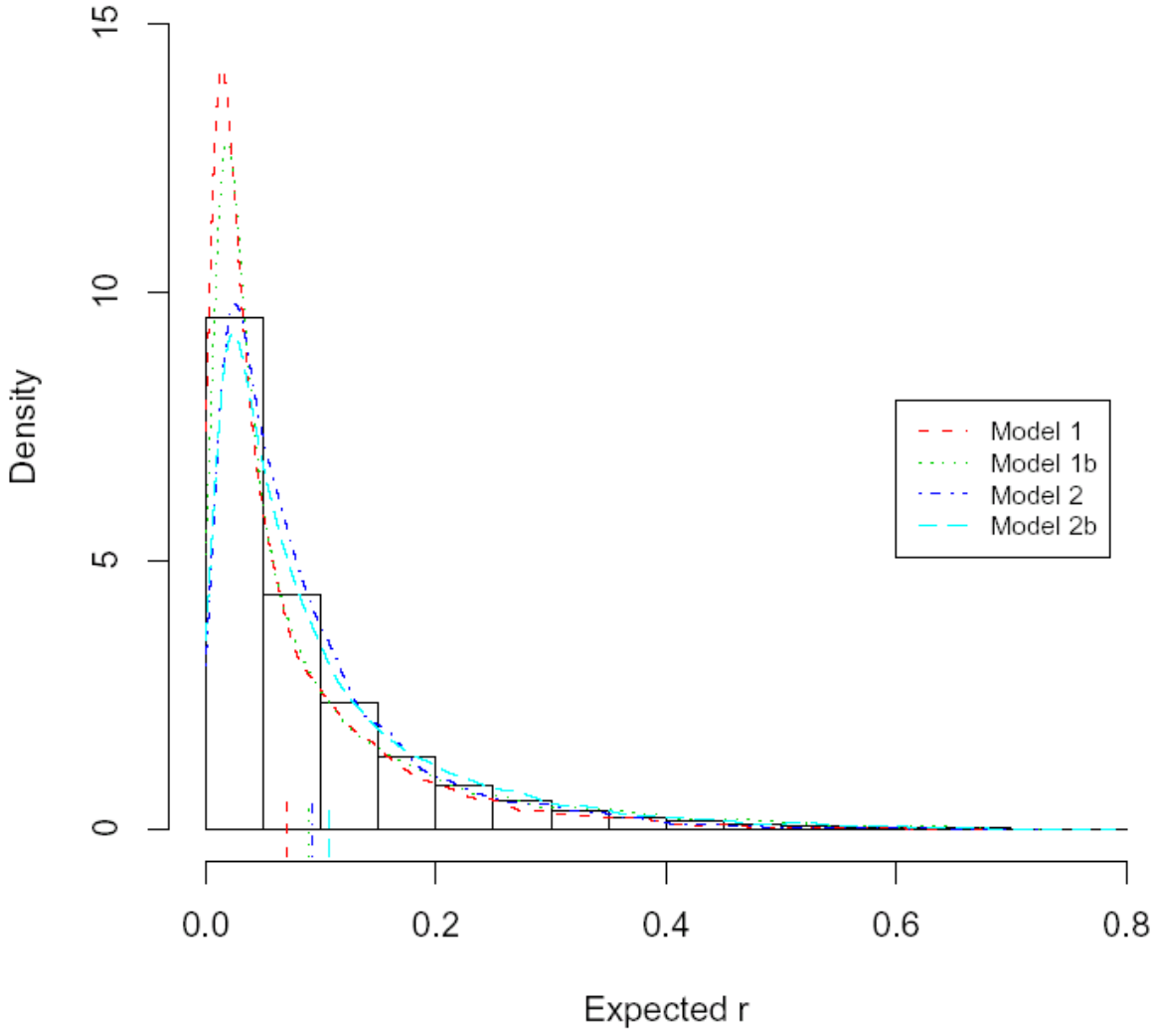
$$Er2_n := \int_{-20}^{20} dt(x, 3) \cdot \frac{e^{mu_n + x \cdot s_n}}{1 + e^{mu_n + x \cdot s_n}} dx$$

The four models produced 40,000 estimates of E(r) values, and a Monte Carlo simulation randomly selected 8,000 values for input to the benefits model. Exhibit N.17 presents the statistics of the E(r) for each model and the 8,000 input values for the benefits model. Exhibit N.18 shows the distribution of each model and a histogram representing the 8,000 expected *r* values. The short, dashed vertical lines along the x-axis represent the means of the model distributions. These exhibits show that the benefits model input E(r) values fall in the range of the average of the models, indicating each model was sampled equally.

Exhibit N.17: Statistics of E(r) Values for Each Model and the Benefits Model Input

	Mean	5 %ile	25 %ile	Median	75 %ile	95 %ile
Model 1	0.0729	0.0047	0.0160	0.0389	0.0964	0.2567
Model 1b	0.0908	0.0083	0.0200	0.0457	0.1156	0.3388
Model 2	0.0905	0.0101	0.0294	0.0612	0.1176	0.2818
Model 2b	0.1021	0.0099	0.0287	0.0640	0.1341	0.3326
Benefits Model Input	0.0907	0.0074	0.0227	0.0539	0.1197	0.3044

Exhibit N.18: Distribution of Infectivity



N.4 Alternative Models with Additional Human Dose-Response Data

The additional human volunteer study data described in section N.2.1 provided EPA with the opportunity to test the infectivity model estimates used in the primary risk assessment with a larger data set and to explore other dose-response models. Changing the data set can influence the dose-response relationship to the extent that another model provides a better fit to the data. This section describes six dose-response models—two used for the primary analysis and four alternatives. Using the original and additional human volunteer study data, each model was run to estimate infectivity and subsequent impacts on benefits.

N.4.1 Model Descriptions

Models 1 and 2 - Exponential with Logit-normal and Logit-t Distributions

As described in section 5.2.3, Haas et al. (1996) evaluated several models for describing *Cryptosporidium* infectivity to humans and found the exponential form of $P_I(d,r) = 1=e^{-dr}$ to have the best fit. Models 1 and 2, used for the primary risk assessment and described in section N.3, use this form and assume r varies among the isolates following either a logit-normal or logit-t distribution.

Model 1: $Pr\{inf|d, isolate\} = Pr\{inf|d\} = 1 - \exp(-dr_{isolate})$; where $logit(r_{isolate}) \sim Normal(\mu,\sigma)$

Model 2: $Pr\{inf|d, isolate\} = Pr\{inf|d\} = 1 - \exp(-dr_{isolate})$; where $logit((r_{isolate}-\mu)/\sigma) \sim$ Student's t(3).

Alternate Models

Model 3 - Exponential with Beta Distribution

Model 3 has the same form as Models 1 and 2, but assumes r follows a beta distribution.

Model 3: $Pr\{inf|d\} = 1 - \exp(-dr_{isolate})$; where $r_{isolate} \sim Beta(\alpha,\beta)$

Model 4 - Exponential with Additional Parameter

The dose-response data reflect both the infectiousness of the isolate and the susceptibility of the host (humans in this case). Available data suggest that a fraction of the population may be resistant to infection by *Cryptosporidium* at a given point in time. Model 4 introduces an additional parameter to Model 3 by incorporating information on both isolate and host into the model. The additional parameter, gamma, represents variation in host susceptibility where the fraction of individuals having immunity to infection at the time of exposure equals 1-gamma. A prior distribution of beta(10, 0.1) was used to influence gamma towards a value of one, but never equal one.

Model 4: $Pr\{inf|d\} = \gamma * (1 - \exp(-dr_{isolate})$; where $r_{isolate} \sim Beta(\alpha,\beta)$

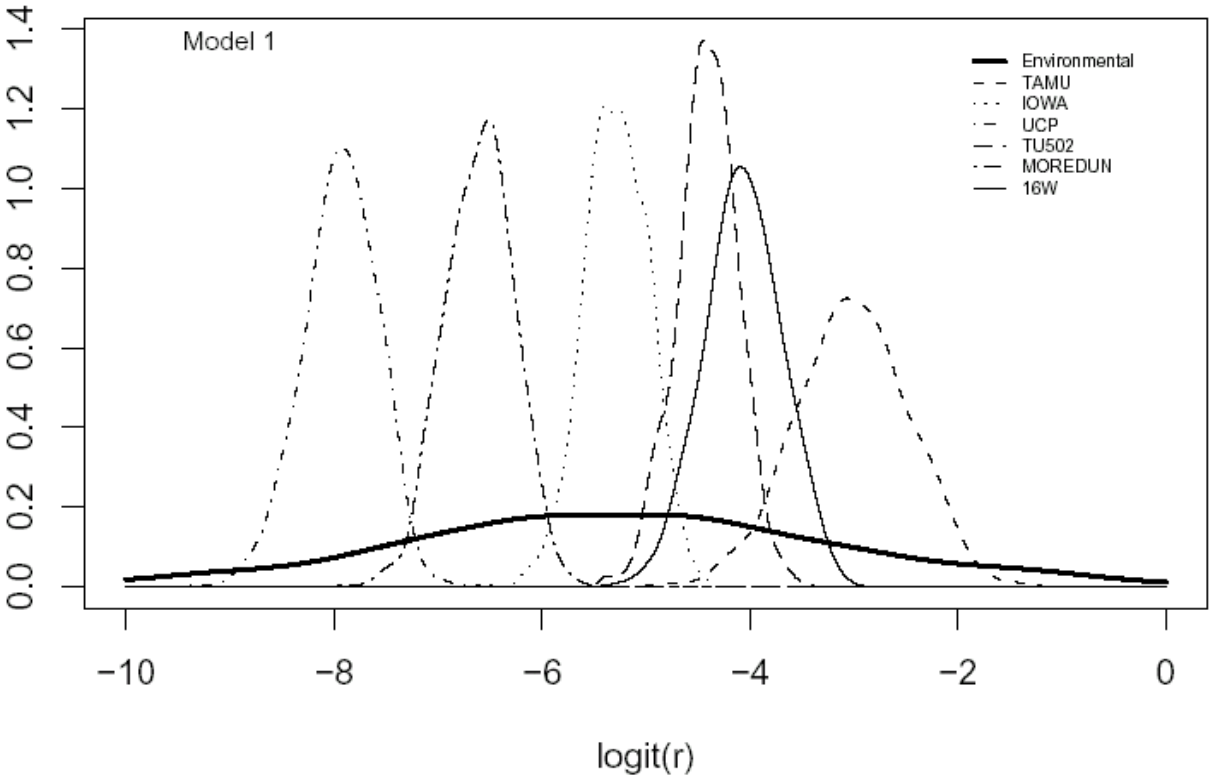
Models 5 and 6 - r Varying by Individual

Models 5 and 6 further tests the sensitivity of host susceptibility. These models are the same form of Models 3 and 4, respectively, but assume r varies by individual instead of isolate. Models 1 through 4 group the human challenge data by isolate, estimating a distribution of r values for each strain. This model allows each subject or individual to have a different r value, but does not recognize differences by strain.

N.4.2 Model Results

Exhibit N.19 shows the graph of all isolates for Models 1 and 2. The additional human volunteer challenge data fall within the ranges of the original data (UCP and TAMU remain the least and most infectious, respectively).

Exhibit N.19: Distribution of Infectivity for All Isolates



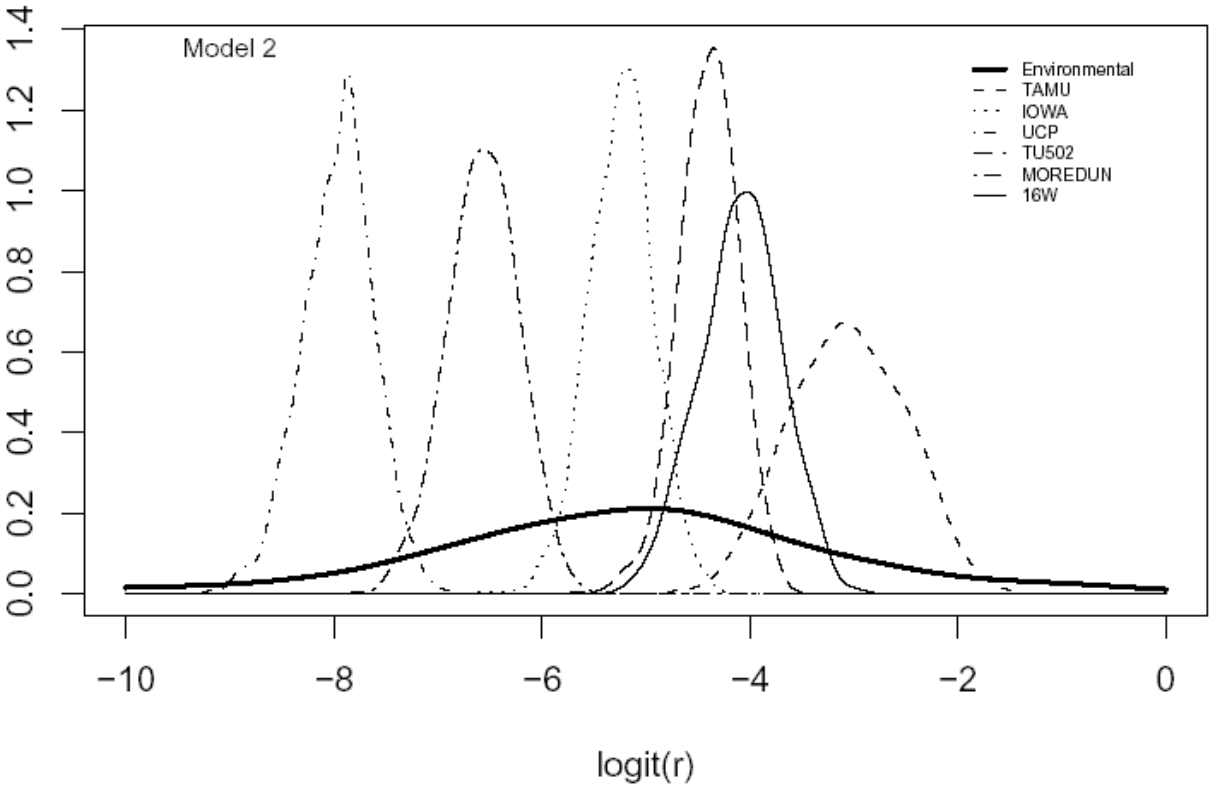


Exhibit N.20 shows the results of expected r values generated by each model using all the human volunteer challenge data. The results show Models 1 and 2 have a lower average infectivity but wider distribution than the other models. Although Model 4 shows a higher mean expected r value than the other models, the gamma offsets the effect on probability of illness by reducing the number of people that may incur an infection.

The deviance information criterion (DIC) values indicates how well one model fits the data compared to another model. A lower DIC value indicates a better fit. The infectivity variable in Models 1-4 is different from the input variable in Models 5 and 6 (isolate versus individual). Therefore, comparison among all models is not appropriate and is limited between Models 1 through 4 and Model 5 and Model 6. The DIC values indicate Model 4 is a better predictor of infectivity than Models 1-3. Similarly, Model 5 is favored over Model 6.

Exhibit N.20: Infectivity Statistics for Each Alternative Model

Model	Variable	Mean	5 %ile	25 %ile	Median	75 %ile	95 %ile	DIC
Vary by Isolate								
Model 1	r	0.0437	0.0001	0.0015	0.0056	0.0227	0.2107	122.6
Model 2	r	0.0581	0.0001	0.0017	0.0069	0.0251	0.3626	122.4
Model 3	r	0.0556	0.0095	0.0188	0.0331	0.0639	0.1838	111.3
Model 4	r	0.2117	0.0866	0.1404	0.1995	0.2680	0.3887	66.3
	Gamma	0.7364	0.6659	0.7081	0.7380	0.7645	0.8045	
Vary by Individual								
Model 5	r	0.1524	0.0667	0.1039	0.1415	0.1907	0.2771	54.6
Model 6	r	0.1233	0.0809	0.1035	0.1212	0.1407	0.1727	37.0
	Gamma	0.9057	0.8574	0.8883	0.9080	0.9254	0.9474	

EPA compared the primary risk assessment estimates to estimates generated with each of the six alternative dose-response models using all the human volunteer challenge data. Exhibit N.21 shows the estimated number of illnesses avoided for each regulatory alternative, based on the mean ICR occurrence distribution. As shown in Exhibit N.21, estimates for Models 1-3 were lower than the primary risk assessment estimate by one third to one half. Estimates with Models 4-6 were approximately one third to two thirds higher than the primary risk assessment.

Exhibit N.21: Number of Illnesses Avoided for Alternative Infectivity Models

	Regulatory Alternative			
Model	A1	A2	A3	A4
Primary Analysis	989,954	975,326	964,360	902,500
Model 1	369,328	363,178	358,732	332,908
Model 2	413,857	406,609	401,401	372,903
Model 3	689,748	680,404	673,445	633,853
Model 4	1,501,445	1,477,257	1,459,126	1,360,326
Model 5	1,495,997	1,473,280	1,456,257	1,360,725
Model 6	1,283,450	1,265,854	1,252,707	1,178,298

N.5 Verification Test

One method to test the results of the EA infectivity values is to compare them to an independent data source. Infectivity data from human feeding studies are limited to one research group, and the primary study was used to establish the distribution of *r* values for the benefits model. Consequently, an independent set of measured *Cryptosporidium* infectivity values is not available. However, illness and *Cryptosporidium* contamination data are available from the 1993 Milwaukee outbreak and can be used to back-calculate infectivity. The following analysis determines possible *r* values of the *Cryptosporidium* that caused the Milwaukee outbreak and compares these values to those used in the benefits model. This analysis builds on an approach used by Haas and Rose (1994).

N.5.1 Methodology

This analysis applied a Monte Carlo simulation to the risk equation described previously. Using a combination of Milwaukee outbreak data and EA data, the simulation generated the mean, median, 5th, and 95th percentile of *r* values. Exhibit N.22 lists the input data and their sources. A discussion of the data follows the table.

Exhibit N.22: Data Input to Calculate Infectivity from LT2ESWTR Benefits Model

	`	Mean	Uncertainty	Source
Pm	Individual risk of illness (illnesses/population)	0.26		Mac Kenzie et al. (1994)
M	Morbidity factor	50%	30% - 70%	Section 5.2.3 - Okhuysen et al. (1998); Haas et al. (1996); Du Pont et al. (1995)
S	Secondary spread	5%	1.0% - 9.0%	Mac Kenzie et al. (1995a)
C	Concentration (oocyst/L)	0.0995	Range of 0.067 to 0.132 oocysts/L	Mac Kenzie et al. (1994)
	Recovery	11.4%	Beta distribution	Section 5.2.4.1 - ICR; Haas and Rose (1994)
v	Percent infectious	20%	15% - 25%	Section 5.2.4.1 - ICR; Le Chevallier et al. (2003)
I	Individual consumption (L)	1.071		Section 5.2.4.2 - USDA 1994-6 survey
n	Annual days of exposure	21	15-30 days	Mac Kenzie et al. (1994)

Individual risk of illness (P_m)

Mac Kenzie et al. (1994) conducted a phone survey of Milwaukee residents following the outbreak and estimated 26 percent of people in the Milwaukee area became ill.

Morbidity factor

The morbidity factor is the probability of becoming ill given infection. The EA estimates a factor of 30 to 70 percent, applied as a triangular distribution.

Secondary spread

Mac Kenzie et al. (1995a) identified adults visiting the Milwaukee area between March 15th and April 15th (the period in which the drinking water was likely contaminated with *Cryptosporidium*), and studied their household members for symptoms of cryptosporidiosis. They estimated a mean secondary transmission rate of 5 percent, with a 95 confidence interval of 1.2 to 8.9 percent. This analysis

incorporates those results into a symmetrical triangular distribution (consistent with the type of distribution used in the EA model). The boundary of the triangle is 1.0 percent and 9.0 percent calculated from the 95 percent interval.

Average annual days of exposure

Mac Kenzie et al. (1994) provide finished water turbidity data for the months of March and April 1993. Prior to March 18th, the turbidity did not exceed 0.25 NTU. On March 18 turbidity began to increase, with excessive levels occurring from March 23rd to April 1 and April 3rd to April 6th. A boil water notice was announced the evening of April 7th and the plant was closed temporarily on April 9th. Haas and Rose (1994) estimate a duration of 15 to 30 days exposure, with a mean of 21 days. Since the Haas and Rose estimate appeared consistent with the operational data, this analysis also uses the 15 to 30 day range and mean of 21 days (triangular distribution).

Cryptosporidium Concentration

In the time surrounding the outbreak, very few samples were analyzed for *Cryptosporidium*. Samples taken from ice blocks made on March 25th and April 9th showed *Cryptosporidium* concentrations of 13.2 and 6.7 oocysts per 100 liters, respectively (Mac Kenzie et al. 1994). Due to the small amount of data available, this analysis assumed a uniform distribution for measured *Cryptosporidium* concentration with 13.2 and 6.7 oocysts per 100 liters as the bounds. No analytical method recovery information was given for the sample analysis, although Haas and Rose (1994) suggested a 10 percent recovery as reasonable. Recoveries were likely similar, or lower than, those observed during the ICR (mean recovery of 12 percent), which involved a similar method. Therefore, this analysis used the same recovery distribution used in the EA for the ICR–a beta distribution (1.44, 11.2).

Haas and Rose (1994) report *Cryptosporidium* results from distribution samples taken during the latter stages of the outbreak, with a geometric mean of 2.5 oocysts per 100 liters from 4 positive of 8 samples tested. The Haas and Rose data were not incorporated since it is unclear when their samples were collected.

Percent infectious

No information regarding the percent of oocysts infectious to humans was available. Therefore, this analysis uses the same input data as the benefits model for ICR data—a triangular distribution with a model of 20 percent and a range of 15 to 25 percent.

Consumption

The EA model value of 1.071 liters per person per day is used.

N.5.2 Results

Exhibit N.23 compares the infectivity results calculated from the Milwaukee data to the infectivity values used in the benefits model. Overall, the infectivity estimated for the benefits model is less than that estimated from the Milwaukee data, but within a reasonable range. One would expect the confidence bounds of the benefits model infectivity distribution to be wider since the benefits model inputs are developed to reflect all possible strains. The substantially lower 5th percentile value of the benefits model and higher 95th percentile estimated from the Milwaukee data suggests EPA underestimates infectivity.

Exhibit N.23: Comparison of Estimated Infectivity

	Mean	Median	5th %ile	95th %ile
Milwaukee data	0.1875	0.1436	0.0196	0.5051
Benefits model input (E(r))	0.0907	0.0539	0.0074	0.3044

Appendix O
Assigning LT2ESWTR Costs and Benefits

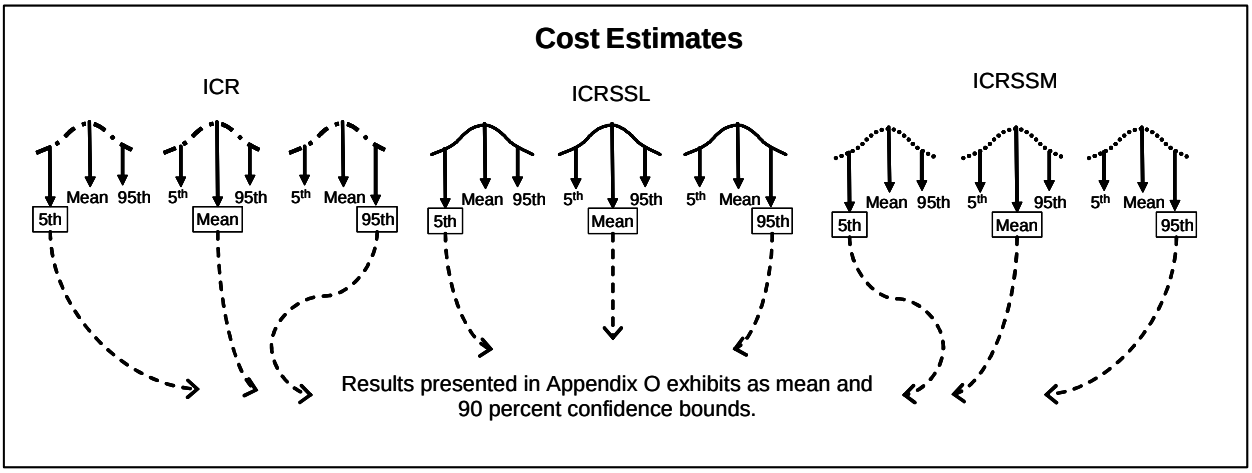
This appendix presents data used to calculate the costs and benefits associated with full implementation of the LT2ESWTR. In order to extract cost and benefit data from the model and present them in comparable terms, it is necessary to calculate the annualized value of all costs and benefits over the lifetime of the implementation schedule. LT2ESWTR implementation will occur over several years as States and public water systems (PWSs) learn the requirements of the rule, train their staffs, perform initial monitoring, and add any treatment necessary to comply with the rule. A 25-year horizon is used for this economic analysis (EA) and the EA for the Stage 2 Disinfection Byproducts Rule. This time frame accounts for both the 20-year life for technologies considered in this analysis, and the 5-year period that systems have to comply with treatment requirements.

O.1 Benefit and Cost Distributions

Both costs and benefits are presented as distributions of values. As described in Chapter 5, the benefits model incorporates multiple estimates of occurrence to address both the uncertainty and variability of *Cryptosporidium* occurrence data sets (ICR, ICRSSL, and ICRSSM). The output from the benefits model is one distribution of benefits (illnesses and deaths avoided) for each occurrence data set. From these distributions, the mean, 5th percentile, and 95th percentile values are presented in relevant chapters and appendices and used in subsequent analyses (e.g., monetizing benefits).

The cost model also uses occurrence information from the three data sets. However, unlike the benefits model it does not sample multiple times from a distribution. Instead, using the mean, 5th percentile, and 95th percentile occurrence distributions, Monte Carlo simulations are conducted to predict the percent of plants falling into each bin (Appendix B describes the binning analyses). The results of the simulations are binning percentages based on occurrence data set and distribution (nine total) and regulatory alternative (four alternatives). The cost model incorporates the uncertainty of the unit cost estimates and estimates the mean, 5th percentile, and 95th percentile values for each distribution. However, this appendix, and all cost model results of treatment presented in the EA, show only the mean and 90 percent confidence bound for each occurrence data set–the mean of mean occurrence, the 5th percentile cost of the 5th percentile occurrence distribution, and the 95th percentile cost of the 95th percentile occurrence distribution. Exhibit O.1 illustrates this concept.

Exhibit O.1: Derivation of Cost Distributions



O.2 Benefit and Cost Values

Costs and benefits models output values that are representative of the value they would have if they were all incurred immediately. These values are referred to as the value at full implementation throughout this appendix. In order to be able to compare these values properly, the costs and benefits must be distributed over the period in which they are expected to occur and the costs must be brought into comparable terms.

Exhibits O.7 through O.9 show the schedules over which the various components of costs and benefits are distributed (for the State, implementation and monitoring, and treatment, respectively). Most of the cost numbers are one-time costs that are incurred only once during the 25-year period examined. The data given in Exhibits O.7 through O.9 are the percentage of the value at full implementation expected to be incurred in the given year. In general, it is assumed that such expenses are evenly distributed over the time frame allowed by the regulation. For example, *E. coli* monitoring for large systems must be completed in 1 year, so 100 percent of these costs is applied to 1 year. Installation of covers or treatment for uncovered reservoirs, however, has a 5 year period in which to comply. Therefore, it is assumed that 20 percent of the costs will be incurred in each of those 5 years.

Operation and maintenance (O&M) and compliance monitoring costs, as well as benefits, are annual values expected to be incurred every year once treatment is installed and operational. The value at full implementation represents the annual cost once *all* plants have treatment fully installed and operational. As shown in Exhibit O.9, the schedules for O&M costs and benefits are delayed 1 year from the treatment schedule to allow for installation and implementation of the technology.

Once the costs and benefits are distributed across the 25-year time frame, they must be brought into comparable terms. This is done in two ways. The first is by expressing the values as present values using a social discount rate. The second is by taking the present value and annualizing it.

The present value of a cost or benefit incurred in a given year is calculated by the following formula:

$$PV = V(t) / (1 + R)^t$$

Where: t = The number of years from the reference period
R = Social discount rate
V(t) = The cost occurring t years from the reference period

The total present value of a given component is then the sum of the present value calculated for each year from 1 to 25.

The formula for converting the present value into an annualized value is as follows:

$$A = PV*R(1 + R)^{25}/[(1 + R)^{25} - 1]$$

Where: A = Annualized value
PV = Present value
R = Social discount rate

Exhibits O.4 through O.6 show the undiscounted value at full implementation. Exhibits O.10 through O.15 show the present value (Year 2003$). Exhibits O.16 through O.21 show the annualized value. The present and annualized values are calculated at both a 3 and 7 percent social discount rate.

Exhibits O.2 and O.3 summarize the content of the rest of the Appendix O exhibits. Exhibit O.2 summarizes the exhibits by number. Exhibit O.3 describes the different variations of each numbered exhibit.

Exhibit O.2: Exhibit List (by Number) for Appendix O

Exhibit Number	Description
O.4	State Costs - Nominal Value
O.5	Implementation and Monitoring - Nominal Value
O.6	Treatment Uncertainty - Nominal Value
O.7	State Schedule for Assigning LT2ESWTR Costs and Benefits
O.8	Implementation and Monitoring Schedule for Assigning LT2ESWTR Cost and Benefits
O.9	Treatment Schedule for Assigning LT2ESWTR Cost and Benefits
O.10	State Costs - Present Value, 3% Discount Rate
O.11	Implementation and Monitoring - Present Value (PV), 3% Discount Rate
O.12	Treatment Uncertainty - Present Value (PV), 3% Discount Rate
O.13	State Costs - Present Value, 7% Discount Rate
O.14	Implementation and Monitoring - Present Value (PV), 7% Discount Rate

Exhibit Number	Description
O.15	Treatment Uncertainty - Present Value (PV), 7% Discount Rate
O.16	State Costs - Annualized, 3% Discount Rate
O.17	Implementation and Monitoring - Annualized, 3% Discount Rate
O.18	Treatment Uncertainty - Annualized, 3% Discount Rate
O.19	State Costs - Annualized, 7% Discount Rate
O.20	Implementation and Monitoring - Annualized, 7% Discount Rate
O.21	Treatment Uncertainty - Annualized, 7% Discount Rate

The exhibits in Appendix O are often different variations of the same type of analysis. For example, Exhibit O.4 (State Costs - Nominal Value) has seven versions, *a*-*i*, each different by data set and occurrence distribution. For instance, Exhibit O.4*a* is an analysis of State Costs - Nominal Value for the ICR data set using the mean occurrence distribution. Exhibit O.4*b* is an analysis of State Costs -Nominal Value for the ICR data set using the "low" (5^{th} percentile) occurrence distribution. Exhibits O.4*a* through O.4*i* continue to display the analysis of all data sets–ICR, ICRSSM, and ICRSSL–and all occurrence distributions–low (5^{th} percentile), mean, and high (95^{th} percentile). Some Exhibits only have three variations–one for each data set (ICR, ICRSSM, ICRSSL). Exhibit O.3 shows the classification of exhibits by letter (*a*-*i*) and the Appendix O exhibit numbers to which these letters apply.

Exhibit O.3: Exhibit List (by Letter) for Appendix O

Exhibit Letter	Description	
Applies to Appendix O Exhibit Numbers:	*4,5,10,11,13,14,16,17,19,20*	6,12,15,18,21
a	ICR, Mean Occurrence	ICR
b	ICR, Low Occurrence	ICRSSM
c	ICR, High Occurrence	ICRSSL
d	ICRSSM, Mean Occurrence	
e	ICRSSM, Low Occurrence	
f	ICRSSM, High Occurrence	
g	ICRSSL, Mean Occurrence	
h	ICRSSL, Low Occurrence	
i	ICRSSL, High Occurrence	

Exhibit O.4a: State Costs - Nominal Value (ICR, Mean)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.23	$ 0.000	$ 1.36
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.06	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.07	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.93	$ 0.003	$ 9.02
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.02	$ 0.05	$ 0.000	$ 0.14
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.04	$ -	$ 0.47
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.01	$ 0.02	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.02	$ 0.06	$ -	$ 2.72
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.02	$ 0.06	$ 0.000	$ 7.47
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.09	$ 0.000	$ 1.38
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.03	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.12	$ 0.36	$ 0.003	$ 20.41
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.03	$ 0.000	$ 7.43
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.08	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.09	$ 0.27	$ 0.003	$ 20.28
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.03	$ 0.000	$ 7.43
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.08	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.03	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.09	$ 0.27	$ 0.003	$ 20.29
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.04	$ 0.000	$ 1.32
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.69
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.05	$ 0.14	$ 0.003	$ 20.11

Exhibit O.4b: State Costs - Nominal Value (ICR, Low)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.04	$ 0.000	$ 0.14
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.04	$ -	$ 0.46
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.01	$ 0.02	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.02	$ 0.06	$ -	$ 2.71
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.02	$ 0.05	$ 0.000	$ 7.46
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.08	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.03	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.11	$ 0.34	$ 0.003	$ 20.38
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.67
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.02	$ 0.000	$ 7.42
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.07	$ 0.000	$ 1.36
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.08	$ 0.24	$ 0.003	$ 20.25
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.67
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.02	$ 0.000	$ 7.42
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.08	$ 0.000	$ 1.36
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.08	$ 0.25	$ 0.003	$ 20.25
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.03	$ 0.000	$ 1.31
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.69
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.04	$ 0.12	$ 0.003	$ 20.09

Exhibit O.4c: State Costs - Nominal Value (ICR, High)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.02	$ 0.05	$ 0.000	$ 0.15
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.04	$ -	$ 0.47
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.01	$ 0.02	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.02	$ 0.07	$ -	$ 2.73
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.02	$ 0.06	$ 0.000	$ 7.47
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.10	$ 0.000	$ 1.39
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.03	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.03	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.01	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.14	$ 0.40	$ 0.003	$ 20.47
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.04	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.46
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.03	$ 0.000	$ 7.43
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.09	$ 0.000	$ 1.38
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.03	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.10	$ 0.29	$ 0.003	$ 20.32
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.04	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.46
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.03	$ 0.000	$ 7.43
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.09	$ 0.000	$ 1.38
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.03	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.01	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.10	$ 0.30	$ 0.003	$ 20.32
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.04	$ 0.000	$ 1.32
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.69
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.05	$ 0.14	$ 0.003	$ 20.11

Exhibit O.4d: State Costs - Nominal Value (ICRSSM, Mean)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.04	$ -	$ 2.70
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.04	$ 0.000	$ 7.45
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.07	$ 0.000	$ 1.36
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.09	$ 0.28	$ 0.003	$ 20.30
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.02	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.35
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.07	$ 0.19	$ 0.003	$ 20.19
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.02	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.35
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.07	$ 0.20	$ 0.003	$ 20.19
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.40
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.03	$ 0.000	$ 1.30
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.68
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.04	$ 0.11	$ 0.003	$ 20.07

Exhibit O.4e: State Costs - Nominal Value (ICRSSM, Low)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.04	$ -	$ 2.69
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.04	$ 0.000	$ 7.44
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.07	$ 0.000	$ 1.35
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.09	$ 0.25	$ 0.003	$ 20.26
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.34
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.06	$ 0.18	$ 0.003	$ 20.16
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.34
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.06	$ 0.18	$ 0.003	$ 20.16
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.40
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.02	$ 0.000	$ 1.29
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.68
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.03	$ 0.10	$ 0.003	$ 20.06

Exhibit O.4f: State Costs - Nominal Value (ICRSSM, High)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.04	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.02	$ 0.05	$ -	$ 2.70
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.02	$ 0.04	$ 0.000	$ 7.45
10,000-49,999	$ 1.04				$ 0.22	$ 0.03	$ 0.08	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.91
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.71
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.10	$ 0.30	$ 0.003	$ 20.33
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.02	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.07	$ 0.000	$ 1.35
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.07	$ 0.21	$ 0.003	$ 20.21
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.02	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.07	$ 0.000	$ 1.36
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.07	$ 0.21	$ 0.003	$ 20.21
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.40
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.03	$ 0.000	$ 1.30
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.68
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.04	$ 0.12	$ 0.003	$ 20.08

Exhibit O.4g: State Costs - Nominal Value (ICRSSL, Mean)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.04	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.03	$ 0.000	$ 7.44
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.35
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.08	$ 0.24	$ 0.003	$ 20.25
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.05	$ 0.000	$ 1.33
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.06	$ 0.17	$ 0.003	$ 20.15
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.05	$ 0.000	$ 1.33
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.06	$ 0.17	$ 0.003	$ 20.15
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.40
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.02	$ 0.000	$ 1.29
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.88
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.68
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.03	$ 0.09	$ 0.003	$ 20.05

Exhibit O.4h: State Costs - Nominal Value (ICRSSL, Low)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.03	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.03	$ 0.000	$ 7.43
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.05	$ 0.000	$ 1.34
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.01	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.07	$ 0.21	$ 0.003	$ 20.20
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.04	$ 0.000	$ 1.32
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.69
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.05	$ 0.14	$ 0.003	$ 20.12
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.04	$ 0.000	$ 1.32
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.69
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.05	$ 0.14	$ 0.003	$ 20.12
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.43
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.40
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.02	$ 0.000	$ 1.28
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.00	$ 0.000	$ 0.88
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.00	$ 0.003	$ 3.68
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.03	$ 0.09	$ 0.003	$ 20.04

Exhibit O.4i: State Costs - Nominal Value (ICRSSL, High)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.02	$ 0.05	$ 0.000	$ 0.07
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.04	$ -	$ 0.07
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.02	$ -	$ 0.04
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.08	$ 0.23	$ -	$ 0.40
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.07	$ 0.21	$ 0.000	$ 0.54
10,000-49,999	$ 1.04				$ -	$ 0.08	$ 0.24	$ 0.000	$ 1.37
50,000-99,999	$ 0.73				$ -	$ 0.02	$ 0.07	$ 0.000	$ 0.81
100,000-999,999	$ 3.04				$ -	$ 0.03	$ 0.08	$ 0.003	$ 3.14
1,000,000+	$ 2.57				$ -	$ 0.00	$ 0.01	$ 0.000	$ 2.59
Total	$ 7.77	$ -	$ -	$ -	$ -	$ 0.32	$ 0.95	$ 0.003	$ 9.04
Rule Alternative A2									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.13
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.03	$ -	$ 0.45
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.04	$ -	$ 2.69
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.01	$ 0.04	$ 0.000	$ 7.44
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.07	$ 0.000	$ 1.36
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.12
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.09	$ 0.27	$ 0.003	$ 20.28
Rule Alternative A3									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.34
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.06	$ 0.18	$ 0.003	$ 20.17
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.03	$ 0.000	$ 0.12
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.01	$ 0.02	$ -	$ 2.66
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.41
10,000-49,999	$ 1.04				$ 0.22	$ 0.02	$ 0.06	$ 0.000	$ 1.34
50,000-99,999	$ 0.73				$ 0.15	$ 0.01	$ 0.02	$ 0.000	$ 0.90
100,000-999,999	$ 3.04				$ 0.64	$ 0.01	$ 0.02	$ 0.003	$ 3.70
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.06	$ 0.18	$ 0.003	$ 20.17
Rule Alternative A4									
<100	$ 0.00	$ 0.03	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.02	$ 0.000	$ 0.11
100-499	$ 0.01	$ 0.14	$ 0.09	$ 0.12	$ 0.06	$ 0.01	$ 0.02	$ -	$ 0.44
500-999	$ 0.02	$ 0.16	$ 0.10	$ 0.13	$ 0.07	$ 0.00	$ 0.01	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.86	$ 0.57	$ 0.74	$ 0.37	$ 0.00	$ 0.01	$ -	$ 2.65
3,300-9,999	$ 0.26	$ 2.41	$ 1.61	$ 2.07	$ 1.04	$ 0.00	$ 0.01	$ 0.000	$ 7.40
10,000-49,999	$ 1.04				$ 0.22	$ 0.01	$ 0.02	$ 0.000	$ 1.29
50,000-99,999	$ 0.73				$ 0.15	$ 0.00	$ 0.01	$ 0.000	$ 0.89
100,000-999,999	$ 3.04				$ 0.64	$ 0.00	$ 0.01	$ 0.003	$ 3.68
1,000,000+	$ 2.57				$ 0.54	$ 0.00	$ 0.00	$ 0.000	$ 3.11
Total	$ 7.77	$ 3.59	$ 2.39	$ 3.09	$ 3.09	$ 0.03	$ 0.10	$ 0.003	$ 20.06

Exhibit O.5a: Implementation and Monitoring - Nominal Value (ICR, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.13	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.28	$ 0.01	$ 1.69
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.35	$ 0.00	$ 0.45
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.46	$ 0.01	$ 0.60
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.00	$ 0.02	$ 7.18
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.83	$ 15.66	$ 0.16	$ 0.02	$ 0.18	$ 0.00	$ 38.64
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.06	$ 17.55	$ 0.19	$ 0.02	$ 0.16	$ -	$ 42.90
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.84	$ 7.15	$ 0.10	$ 0.01	$ 0.10	$ -	$ 17.77
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.50	$ 12.68	$ 0.18	$ 0.04	$ 0.33	$ -	$ 34.06
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.38	$ 11.65	$ 0.16	$ 0.03	$ 0.30	$ 0.00	$ 31.27
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.68	$ 10.08	$ 0.13	$ 0.06	$ 0.48	$ 0.01	$ 28.71
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.16	$ 2.42	$ 0.03	$ 0.02	$ 0.13	$ 0.00	$ 6.92
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.14	$ 2.91	$ 0.04	$ 0.02	$ 0.17	$ 0.01	$ 8.18
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.02	$ 0.50	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.42
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 8.62	$ 80.59	$ 1.00	$ 0.21	$ 1.88	$ 0.02	$ 209.87
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 6.36	$ 0.18	$ 1.89	$ 5.64	$ 0.16	$ 0.01	$ 0.13	$ 0.00	$ 16.75
100-499	$ 0.27	$ 2.35	$ 7.03	$ 0.21	$ 2.13	$ 6.32	$ 0.19	$ 0.01	$ 0.12	$ -	$ 18.64
500-999	$ 0.14	$ 0.98	$ 2.93	$ 0.11	$ 0.87	$ 2.58	$ 0.10	$ 0.01	$ 0.07	$ -	$ 7.80
1,000-3,299	$ 0.29	$ 1.96	$ 6.01	$ 0.23	$ 1.74	$ 5.13	$ 0.20	$ 0.02	$ 0.17	$ -	$ 15.75
3,300-9,999	$ 0.27	$ 1.80	$ 5.51	$ 0.21	$ 1.60	$ 4.71	$ 0.19	$ 0.02	$ 0.15	$ 0.00	$ 14.47
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.72	$ 10.59	$ 0.14	$ 0.05	$ 0.44	$ 0.01	$ 29.22
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.17	$ 2.54	$ 0.03	$ 0.01	$ 0.12	$ 0.00	$ 7.03
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 3.06	$ 0.05	$ 0.02	$ 0.16	$ 0.01	$ 8.32
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.52	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.45
Total	$ 1.59	$ 10.79	$ 52.73	$ 1.29	$ 9.30	$ 41.10	$ 1.08	$ 0.16	$ 1.39	$ 0.02	$ 119.44
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 6.36	$ 0.18	$ 1.89	$ 5.64	$ 0.16	$ 0.01	$ 0.13	$ 0.00	$ 16.75
100-499	$ 0.27	$ 2.35	$ 7.03	$ 0.21	$ 2.13	$ 6.32	$ 0.19	$ 0.01	$ 0.12	$ -	$ 18.64
500-999	$ 0.14	$ 0.98	$ 2.93	$ 0.11	$ 0.87	$ 2.58	$ 0.10	$ 0.01	$ 0.07	$ -	$ 7.80
1,000-3,299	$ 0.29	$ 1.96	$ 6.01	$ 0.23	$ 1.74	$ 5.13	$ 0.20	$ 0.02	$ 0.17	$ -	$ 15.75
3,300-9,999	$ 0.27	$ 1.80	$ 5.51	$ 0.21	$ 1.60	$ 4.70	$ 0.19	$ 0.02	$ 0.15	$ 0.00	$ 14.47
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.71	$ 10.49	$ 0.14	$ 0.05	$ 0.45	$ 0.01	$ 29.11
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.17	$ 2.52	$ 0.03	$ 0.01	$ 0.12	$ 0.00	$ 7.01
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 3.04	$ 0.05	$ 0.02	$ 0.16	$ 0.01	$ 8.30
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.52	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.44
Total	$ 1.59	$ 10.79	$ 52.73	$ 1.29	$ 9.29	$ 40.93	$ 1.08	$ 0.16	$ 1.41	$ 0.02	$ 119.27
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 5.54	$ 0.18	$ 1.96	$ 5.08	$ 0.17	$ 0.01	$ 0.09	$ 0.00	$ 15.40
100-499	$ 0.27	$ 2.35	$ 6.13	$ 0.21	$ 2.20	$ 5.69	$ 0.20	$ 0.01	$ 0.08	$ -	$ 17.15
500-999	$ 0.14	$ 0.98	$ 2.56	$ 0.11	$ 0.90	$ 2.32	$ 0.11	$ 0.01	$ 0.05	$ -	$ 7.18
1,000-3,299	$ 0.29	$ 1.96	$ 5.26	$ 0.23	$ 1.89	$ 4.85	$ 0.22	$ 0.01	$ 0.07	$ -	$ 14.78
3,300-9,999	$ 0.27	$ 1.80	$ 4.83	$ 0.21	$ 1.73	$ 4.45	$ 0.21	$ 0.01	$ 0.06	$ 0.00	$ 13.57
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.89	$ 13.18	$ 0.17	$ 0.02	$ 0.22	$ 0.01	$ 31.77
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.21	$ 3.16	$ 0.04	$ 0.01	$ 0.06	$ 0.00	$ 7.64
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.19	$ 3.80	$ 0.06	$ 0.01	$ 0.07	$ 0.01	$ 9.02
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.65	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.56
Total	$ 1.59	$ 10.79	$ 49.20	$ 1.29	$ 10.02	$ 43.19	$ 1.18	$ 0.08	$ 0.72	$ 0.02	$ 118.07

Exhibit O.5b: Implementation and Monitoring - Nominal Value (ICR, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.85	$ 15.86	$ 0.16	$ 0.02	$ 0.16	$ 0.00	$ 38.85
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.09	$ 17.76	$ 0.19	$ 0.02	$ 0.15	$ -	$ 43.13
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.85	$ 7.24	$ 0.10	$ 0.01	$ 0.09	$ -	$ 17.86
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.53	$ 12.98	$ 0.18	$ 0.03	$ 0.30	$ -	$ 34.38
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.41	$ 11.92	$ 0.17	$ 0.03	$ 0.28	$ 0.00	$ 31.56
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.70	$ 10.37	$ 0.14	$ 0.05	$ 0.46	$ 0.01	$ 29.00
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.17	$ 2.49	$ 0.03	$ 0.01	$ 0.12	$ 0.00	$ 6.98
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 2.99	$ 0.04	$ 0.02	$ 0.16	$ 0.01	$ 8.26
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.02	$ 0.51	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.43
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 8.77	$ 82.13	$ 1.02	$ 0.20	$ 1.76	$ 0.02	$ 211.44
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 5.92	$ 0.18	$ 1.91	$ 5.30	$ 0.16	$ 0.01	$ 0.12	$ 0.00	$ 15.97
100-499	$ 0.27	$ 2.35	$ 6.54	$ 0.21	$ 2.15	$ 5.93	$ 0.20	$ 0.01	$ 0.11	$ -	$ 17.78
500-999	$ 0.14	$ 0.98	$ 2.73	$ 0.11	$ 0.88	$ 2.42	$ 0.10	$ 0.01	$ 0.07	$ -	$ 7.44
1,000-3,299	$ 0.29	$ 1.96	$ 5.60	$ 0.23	$ 1.77	$ 4.86	$ 0.21	$ 0.02	$ 0.14	$ -	$ 15.09
3,300-9,999	$ 0.27	$ 1.80	$ 5.14	$ 0.21	$ 1.63	$ 4.46	$ 0.19	$ 0.01	$ 0.13	$ 0.00	$ 13.87
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.74	$ 10.95	$ 0.14	$ 0.05	$ 0.41	$ 0.01	$ 29.56
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.18	$ 2.62	$ 0.03	$ 0.01	$ 0.11	$ 0.00	$ 7.12
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 3.16	$ 0.05	$ 0.02	$ 0.14	$ 0.01	$ 8.42
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.54	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.46
Total	$ 1.59	$ 10.79	$ 50.81	$ 1.29	$ 9.45	$ 40.25	$ 1.10	$ 0.14	$ 1.27	$ 0.02	$ 116.70
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 5.92	$ 0.18	$ 1.91	$ 5.30	$ 0.16	$ 0.01	$ 0.12	$ 0.00	$ 15.97
100-499	$ 0.27	$ 2.35	$ 6.54	$ 0.21	$ 2.15	$ 5.93	$ 0.20	$ 0.01	$ 0.11	$ -	$ 17.78
500-999	$ 0.14	$ 0.98	$ 2.73	$ 0.11	$ 0.88	$ 2.42	$ 0.10	$ 0.01	$ 0.07	$ -	$ 7.44
1,000-3,299	$ 0.29	$ 1.96	$ 5.60	$ 0.23	$ 1.77	$ 4.86	$ 0.21	$ 0.02	$ 0.14	$ -	$ 15.09
3,300-9,999	$ 0.27	$ 1.80	$ 5.14	$ 0.21	$ 1.63	$ 4.46	$ 0.19	$ 0.01	$ 0.13	$ 0.00	$ 13.86
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.73	$ 10.86	$ 0.14	$ 0.05	$ 0.42	$ 0.01	$ 29.47
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.18	$ 2.60	$ 0.03	$ 0.01	$ 0.11	$ 0.00	$ 7.10
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 3.14	$ 0.05	$ 0.02	$ 0.15	$ 0.01	$ 8.40
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.53	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.46
Total	$ 1.59	$ 10.79	$ 50.81	$ 1.29	$ 9.44	$ 40.10	$ 1.10	$ 0.14	$ 1.28	$ 0.02	$ 116.56
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 5.13	$ 0.18	$ 1.99	$ 4.77	$ 0.17	$ 0.01	$ 0.07	$ 0.00	$ 14.68
100-499	$ 0.27	$ 2.35	$ 5.67	$ 0.21	$ 2.23	$ 5.31	$ 0.20	$ 0.01	$ 0.07	$ -	$ 16.32
500-999	$ 0.14	$ 0.98	$ 2.37	$ 0.11	$ 0.91	$ 2.16	$ 0.11	$ 0.01	$ 0.05	$ -	$ 6.83
1,000-3,299	$ 0.29	$ 1.96	$ 4.88	$ 0.23	$ 1.89	$ 4.50	$ 0.22	$ 0.01	$ 0.06	$ -	$ 14.05
3,300-9,999	$ 0.27	$ 1.80	$ 4.48	$ 0.21	$ 1.74	$ 4.12	$ 0.21	$ 0.01	$ 0.06	$ 0.00	$ 12.90
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.91	$ 13.45	$ 0.18	$ 0.02	$ 0.19	$ 0.01	$ 32.03
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.22	$ 3.22	$ 0.04	$ 0.01	$ 0.05	$ 0.00	$ 7.70
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.19	$ 3.87	$ 0.06	$ 0.01	$ 0.07	$ 0.01	$ 9.09
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.66	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.57
Total	$ 1.59	$ 10.79	$ 47.41	$ 1.29	$ 10.11	$ 42.07	$ 1.20	$ 0.07	$ 0.64	$ 0.02	$ 115.17

Exhibit O.5c: Implementation and Monitoring - Nominal Value (ICR, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.80	$ 15.43	$ 0.15	$ 0.02	$ 0.19	$ 0.00	$ 38.40
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.03	$ 17.30	$ 0.18	$ 0.02	$ 0.18	$ -	$ 42.63
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.83	$ 7.05	$ 0.10	$ 0.01	$ 0.10	$ -	$ 17.66
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.44	$ 12.20	$ 0.17	$ 0.04	$ 0.37	$ -	$ 33.55
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.32	$ 11.20	$ 0.16	$ 0.04	$ 0.34	$ 0.00	$ 30.81
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.63	$ 9.38	$ 0.12	$ 0.06	$ 0.54	$ 0.01	$ 28.02
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.15	$ 2.25	$ 0.03	$ 0.02	$ 0.15	$ 0.00	$ 6.75
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.13	$ 2.71	$ 0.04	$ 0.02	$ 0.19	$ 0.01	$ 8.00
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.02	$ 0.46	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.39
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 8.37	$ 77.98	$ 0.96	$ 0.24	$ 2.10	$ 0.02	$ 207.22
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 7.12	$ 0.18	$ 1.88	$ 6.26	$ 0.16	$ 0.02	$ 0.14	$ 0.00	$ 18.12
100-499	$ 0.27	$ 2.35	$ 7.86	$ 0.21	$ 2.11	$ 7.01	$ 0.19	$ 0.01	$ 0.13	$ -	$ 20.16
500-999	$ 0.14	$ 0.98	$ 3.27	$ 0.11	$ 0.87	$ 2.86	$ 0.10	$ 0.01	$ 0.08	$ -	$ 8.42
1,000-3,299	$ 0.29	$ 1.96	$ 6.70	$ 0.23	$ 1.71	$ 5.66	$ 0.20	$ 0.02	$ 0.18	$ -	$ 16.96
3,300-9,999	$ 0.27	$ 1.80	$ 6.15	$ 0.21	$ 1.58	$ 5.20	$ 0.19	$ 0.02	$ 0.17	$ 0.00	$ 15.58
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.68	$ 10.03	$ 0.13	$ 0.06	$ 0.49	$ 0.01	$ 28.66
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.16	$ 2.40	$ 0.03	$ 0.02	$ 0.13	$ 0.00	$ 6.90
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.14	$ 2.91	$ 0.04	$ 0.02	$ 0.17	$ 0.01	$ 8.18
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.02	$ 0.49	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.42
Total	$ 1.59	$ 10.79	$ 55.98	$ 1.29	$ 9.16	$ 42.83	$ 1.06	$ 0.17	$ 1.53	$ 0.02	$ 124.41
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 7.12	$ 0.18	$ 1.88	$ 6.26	$ 0.16	$ 0.02	$ 0.14	$ 0.00	$ 18.12
100-499	$ 0.27	$ 2.35	$ 7.86	$ 0.21	$ 2.11	$ 7.01	$ 0.19	$ 0.01	$ 0.13	$ -	$ 20.16
500-999	$ 0.14	$ 0.98	$ 3.27	$ 0.11	$ 0.87	$ 2.86	$ 0.10	$ 0.01	$ 0.08	$ -	$ 8.42
1,000-3,299	$ 0.29	$ 1.96	$ 6.70	$ 0.23	$ 1.71	$ 5.66	$ 0.20	$ 0.02	$ 0.18	$ -	$ 16.96
3,300-9,999	$ 0.27	$ 1.80	$ 6.15	$ 0.21	$ 1.58	$ 5.19	$ 0.19	$ 0.02	$ 0.17	$ 0.00	$ 15.58
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.67	$ 9.91	$ 0.13	$ 0.06	$ 0.50	$ 0.01	$ 28.55
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.16	$ 2.38	$ 0.03	$ 0.02	$ 0.13	$ 0.00	$ 6.88
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.14	$ 2.88	$ 0.04	$ 0.02	$ 0.18	$ 0.01	$ 8.15
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.02	$ 0.49	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.41
Total	$ 1.59	$ 10.79	$ 55.98	$ 1.29	$ 9.15	$ 42.64	$ 1.06	$ 0.17	$ 1.55	$ 0.02	$ 124.22
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 6.20	$ 0.18	$ 1.99	$ 5.77	$ 0.17	$ 0.01	$ 0.07	$ 0.00	$ 16.75
100-499	$ 0.27	$ 2.35	$ 6.85	$ 0.21	$ 2.22	$ 6.41	$ 0.20	$ 0.01	$ 0.07	$ -	$ 18.60
500-999	$ 0.14	$ 0.98	$ 2.86	$ 0.11	$ 0.90	$ 2.60	$ 0.11	$ 0.01	$ 0.05	$ -	$ 7.76
1,000-3,299	$ 0.29	$ 1.96	$ 5.86	$ 0.23	$ 1.89	$ 5.42	$ 0.22	$ 0.01	$ 0.07	$ -	$ 15.95
3,300-9,999	$ 0.27	$ 1.80	$ 5.38	$ 0.21	$ 1.73	$ 4.97	$ 0.21	$ 0.01	$ 0.06	$ 0.00	$ 14.64
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.87	$ 12.93	$ 0.17	$ 0.03	$ 0.24	$ 0.01	$ 31.52
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.21	$ 3.09	$ 0.04	$ 0.01	$ 0.07	$ 0.00	$ 7.57
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.18	$ 3.73	$ 0.06	$ 0.01	$ 0.08	$ 0.01	$ 8.95
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.64	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.55
Total	$ 1.59	$ 10.79	$ 52.04	$ 1.29	$ 10.02	$ 45.56	$ 1.18	$ 0.08	$ 0.73	$ 0.02	$ 123.30

Exhibit O.5d: Implementation and Monitoring - Nominal Value (ICRSSM, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.91	$ 16.33	$ 0.16	$ 0.01	$ 0.13	$ 0.00	$ 39.34
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.15	$ 18.28	$ 0.20	$ 0.01	$ 0.11	$ -	$ 43.67
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.88	$ 7.45	$ 0.10	$ 0.01	$ 0.07	$ -	$ 18.09
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.63	$ 13.82	$ 0.19	$ 0.03	$ 0.24	$ -	$ 35.25
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.50	$ 12.68	$ 0.18	$ 0.02	$ 0.22	$ 0.00	$ 32.35
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.74	$ 10.97	$ 0.14	$ 0.05	$ 0.41	$ 0.01	$ 29.58
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.18	$ 2.63	$ 0.03	$ 0.01	$ 0.11	$ 0.00	$ 7.12
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 3.17	$ 0.05	$ 0.02	$ 0.14	$ 0.01	$ 8.42
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.54	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.46
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 9.16	$ 85.87	$ 1.07	$ 0.17	$ 1.46	$ 0.02	$ 215.29
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 4.98	$ 0.18	$ 1.94	$ 4.53	$ 0.17	$ 0.01	$ 0.10	$ 0.00	$ 14.27
100-499	$ 0.27	$ 2.35	$ 5.50	$ 0.21	$ 2.19	$ 5.07	$ 0.20	$ 0.01	$ 0.09	$ -	$ 15.89
500-999	$ 0.14	$ 0.98	$ 2.30	$ 0.11	$ 0.90	$ 2.07	$ 0.11	$ 0.01	$ 0.06	$ -	$ 6.67
1,000-3,299	$ 0.29	$ 1.96	$ 4.74	$ 0.23	$ 1.85	$ 4.26	$ 0.22	$ 0.01	$ 0.09	$ -	$ 13.66
3,300-9,999	$ 0.27	$ 1.80	$ 4.35	$ 0.21	$ 1.70	$ 3.91	$ 0.20	$ 0.01	$ 0.09	$ 0.00	$ 12.55
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.79	$ 11.69	$ 0.15	$ 0.04	$ 0.35	$ 0.01	$ 30.30
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.19	$ 2.80	$ 0.04	$ 0.01	$ 0.09	$ 0.00	$ 7.29
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.37	$ 0.05	$ 0.01	$ 0.12	$ 0.01	$ 8.62
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.57	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.49
Total	$ 1.59	$ 10.79	$ 46.76	$ 1.29	$ 9.75	$ 38.27	$ 1.14	$ 0.11	$ 1.01	$ 0.02	$ 110.74
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 4.98	$ 0.18	$ 1.94	$ 4.53	$ 0.17	$ 0.01	$ 0.10	$ 0.00	$ 14.27
100-499	$ 0.27	$ 2.35	$ 5.50	$ 0.21	$ 2.19	$ 5.07	$ 0.20	$ 0.01	$ 0.09	$ -	$ 15.89
500-999	$ 0.14	$ 0.98	$ 2.30	$ 0.11	$ 0.90	$ 2.07	$ 0.11	$ 0.01	$ 0.06	$ -	$ 6.67
1,000-3,299	$ 0.29	$ 1.96	$ 4.74	$ 0.23	$ 1.85	$ 4.26	$ 0.22	$ 0.01	$ 0.09	$ -	$ 13.66
3,300-9,999	$ 0.27	$ 1.80	$ 4.35	$ 0.21	$ 1.70	$ 3.91	$ 0.20	$ 0.01	$ 0.09	$ 0.00	$ 12.55
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.79	$ 11.63	$ 0.15	$ 0.04	$ 0.35	$ 0.01	$ 30.24
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.19	$ 2.79	$ 0.04	$ 0.01	$ 0.10	$ 0.00	$ 7.28
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.36	$ 0.05	$ 0.01	$ 0.12	$ 0.01	$ 8.60
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.57	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.49
Total	$ 1.59	$ 10.79	$ 46.76	$ 1.29	$ 9.74	$ 38.18	$ 1.14	$ 0.11	$ 1.02	$ 0.02	$ 110.64
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 3.94	$ 0.18	$ 1.98	$ 3.64	$ 0.17	$ 0.01	$ 0.08	$ 0.00	$ 12.35
100-499	$ 0.27	$ 2.35	$ 4.36	$ 0.21	$ 2.22	$ 4.07	$ 0.20	$ 0.01	$ 0.07	$ -	$ 13.77
500-999	$ 0.14	$ 0.98	$ 1.83	$ 0.11	$ 0.91	$ 1.66	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.80
1,000-3,299	$ 0.29	$ 1.96	$ 3.80	$ 0.23	$ 1.90	$ 3.47	$ 0.22	$ 0.01	$ 0.06	$ -	$ 11.94
3,300-9,999	$ 0.27	$ 1.80	$ 3.48	$ 0.21	$ 1.75	$ 3.18	$ 0.21	$ 0.01	$ 0.05	$ 0.00	$ 10.97
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.95	$ 14.09	$ 0.19	$ 0.02	$ 0.14	$ 0.01	$ 32.66
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.23	$ 3.38	$ 0.04	$ 0.00	$ 0.04	$ 0.00	$ 7.85
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.20	$ 4.05	$ 0.06	$ 0.01	$ 0.05	$ 0.01	$ 9.26
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.69	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.60
Total	$ 1.59	$ 10.79	$ 42.29	$ 1.29	$ 10.17	$ 38.23	$ 1.21	$ 0.06	$ 0.55	$ 0.02	$ 106.19

Exhibit O.5e: Implementation and Monitoring - Nominal Value (ICRSSM, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.92	$ 16.45	$ 0.16	$ 0.01	$ 0.12	$ 0.00	$ 39.47
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.16	$ 18.42	$ 0.20	$ 0.01	$ 0.11	$ -	$ 43.81
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.89	$ 7.51	$ 0.10	$ 0.01	$ 0.07	$ -	$ 18.14
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.67	$ 14.14	$ 0.20	$ 0.02	$ 0.21	$ -	$ 35.59
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.53	$ 12.98	$ 0.18	$ 0.02	$ 0.20	$ 0.00	$ 32.66
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.77	$ 11.45	$ 0.15	$ 0.04	$ 0.37	$ 0.01	$ 30.06
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.19	$ 2.74	$ 0.04	$ 0.01	$ 0.10	$ 0.00	$ 7.23
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.30	$ 0.05	$ 0.01	$ 0.13	$ 0.01	$ 8.55
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.56	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.48
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 9.32	$ 87.56	$ 1.09	$ 0.15	$ 1.32	$ 0.02	$ 217.00
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 4.39	$ 0.18	$ 1.95	$ 4.01	$ 0.17	$ 0.01	$ 0.10	$ 0.00	$ 13.17
100-499	$ 0.27	$ 2.35	$ 4.86	$ 0.21	$ 2.20	$ 4.49	$ 0.20	$ 0.01	$ 0.09	$ -	$ 14.68
500-999	$ 0.14	$ 0.98	$ 2.03	$ 0.11	$ 0.90	$ 1.83	$ 0.11	$ 0.01	$ 0.06	$ -	$ 6.17
1,000-3,299	$ 0.29	$ 1.96	$ 4.21	$ 0.23	$ 1.87	$ 3.79	$ 0.22	$ 0.01	$ 0.08	$ -	$ 12.66
3,300-9,999	$ 0.27	$ 1.80	$ 3.86	$ 0.21	$ 1.72	$ 3.48	$ 0.20	$ 0.01	$ 0.08	$ 0.00	$ 11.64
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.82	$ 12.13	$ 0.16	$ 0.04	$ 0.31	$ 0.01	$ 30.73
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.20	$ 2.91	$ 0.04	$ 0.01	$ 0.08	$ 0.00	$ 7.39
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.49	$ 0.05	$ 0.01	$ 0.11	$ 0.01	$ 8.73
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.60	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.51
Total	$ 1.59	$ 10.79	$ 44.24	$ 1.29	$ 9.85	$ 36.73	$ 1.15	$ 0.10	$ 0.91	$ 0.02	$ 106.68
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 4.39	$ 0.18	$ 1.95	$ 4.01	$ 0.17	$ 0.01	$ 0.10	$ 0.00	$ 13.17
100-499	$ 0.27	$ 2.35	$ 4.86	$ 0.21	$ 2.20	$ 4.49	$ 0.20	$ 0.01	$ 0.09	$ -	$ 14.68
500-999	$ 0.14	$ 0.98	$ 2.03	$ 0.11	$ 0.90	$ 1.83	$ 0.11	$ 0.01	$ 0.06	$ -	$ 6.17
1,000-3,299	$ 0.29	$ 1.96	$ 4.21	$ 0.23	$ 1.87	$ 3.79	$ 0.22	$ 0.01	$ 0.08	$ -	$ 12.66
3,300-9,999	$ 0.27	$ 1.80	$ 3.86	$ 0.21	$ 1.71	$ 3.48	$ 0.20	$ 0.01	$ 0.08	$ 0.00	$ 11.63
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.82	$ 12.07	$ 0.16	$ 0.04	$ 0.31	$ 0.01	$ 30.67
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.20	$ 2.89	$ 0.04	$ 0.01	$ 0.09	$ 0.00	$ 7.38
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.48	$ 0.05	$ 0.01	$ 0.11	$ 0.01	$ 8.72
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.59	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.51
Total	$ 1.59	$ 10.79	$ 44.24	$ 1.29	$ 9.84	$ 36.65	$ 1.15	$ 0.10	$ 0.92	$ 0.02	$ 106.60
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 3.46	$ 0.18	$ 1.98	$ 3.20	$ 0.17	$ 0.01	$ 0.08	$ 0.00	$ 11.44
100-499	$ 0.27	$ 2.35	$ 3.84	$ 0.21	$ 2.23	$ 3.58	$ 0.20	$ 0.01	$ 0.07	$ -	$ 12.76
500-999	$ 0.14	$ 0.98	$ 1.61	$ 0.11	$ 0.91	$ 1.46	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.38
1,000-3,299	$ 0.29	$ 1.96	$ 3.36	$ 0.23	$ 1.91	$ 3.05	$ 0.22	$ 0.01	$ 0.05	$ -	$ 11.09
3,300-9,999	$ 0.27	$ 1.80	$ 3.09	$ 0.21	$ 1.75	$ 2.80	$ 0.21	$ 0.01	$ 0.05	$ 0.00	$ 10.19
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.97	$ 14.28	$ 0.19	$ 0.01	$ 0.12	$ 0.01	$ 32.85
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.23	$ 3.42	$ 0.05	$ 0.00	$ 0.03	$ 0.00	$ 7.89
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.20	$ 4.10	$ 0.06	$ 0.00	$ 0.04	$ 0.01	$ 9.30
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.70	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.61
Total	$ 1.59	$ 10.79	$ 40.24	$ 1.29	$ 10.21	$ 36.60	$ 1.22	$ 0.06	$ 0.51	$ 0.02	$ 102.51

Exhibit O.5f: Implementation and Monitoring - Nominal Value (ICRSSM, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.89	$ 16.18	$ 0.16	$ 0.02	$ 0.14	$ 0.00	$ 39.18
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.13	$ 18.12	$ 0.19	$ 0.01	$ 0.13	$ -	$ 43.50
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.87	$ 7.39	$ 0.10	$ 0.01	$ 0.08	$ -	$ 18.02
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.60	$ 13.52	$ 0.19	$ 0.03	$ 0.26	$ -	$ 34.93
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.47	$ 12.41	$ 0.17	$ 0.03	$ 0.24	$ 0.00	$ 32.07
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.71	$ 10.54	$ 0.14	$ 0.05	$ 0.44	$ 0.01	$ 29.16
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.17	$ 2.53	$ 0.03	$ 0.01	$ 0.12	$ 0.00	$ 7.02
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.15	$ 3.05	$ 0.05	$ 0.02	$ 0.16	$ 0.01	$ 8.31
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.52	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.44
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 9.01	$ 84.24	$ 1.04	$ 0.18	$ 1.59	$ 0.02	$ 213.64
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 5.47	$ 0.18	$ 1.94	$ 4.96	$ 0.16	$ 0.01	$ 0.11	$ 0.00	$ 15.19
100-499	$ 0.27	$ 2.35	$ 6.05	$ 0.21	$ 2.18	$ 5.55	$ 0.20	$ 0.01	$ 0.10	$ -	$ 16.92
500-999	$ 0.14	$ 0.98	$ 2.53	$ 0.11	$ 0.89	$ 2.26	$ 0.10	$ 0.01	$ 0.06	$ -	$ 7.09
1,000-3,299	$ 0.29	$ 1.96	$ 5.20	$ 0.23	$ 1.83	$ 4.65	$ 0.22	$ 0.01	$ 0.10	$ -	$ 14.49
3,300-9,999	$ 0.27	$ 1.80	$ 4.77	$ 0.21	$ 1.69	$ 4.27	$ 0.20	$ 0.01	$ 0.10	$ 0.00	$ 13.32
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.77	$ 11.32	$ 0.15	$ 0.04	$ 0.38	$ 0.01	$ 29.93
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.18	$ 2.71	$ 0.04	$ 0.01	$ 0.10	$ 0.00	$ 7.20
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.27	$ 0.05	$ 0.02	$ 0.13	$ 0.01	$ 8.52
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.56	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.48
Total	$ 1.59	$ 10.79	$ 48.90	$ 1.29	$ 9.66	$ 39.55	$ 1.13	$ 0.12	$ 1.10	$ 0.02	$ 114.15
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 5.47	$ 0.18	$ 1.94	$ 4.96	$ 0.16	$ 0.01	$ 0.11	$ 0.00	$ 15.19
100-499	$ 0.27	$ 2.35	$ 6.05	$ 0.21	$ 2.18	$ 5.55	$ 0.20	$ 0.01	$ 0.10	$ -	$ 16.92
500-999	$ 0.14	$ 0.98	$ 2.53	$ 0.11	$ 0.89	$ 2.26	$ 0.10	$ 0.01	$ 0.06	$ -	$ 7.09
1,000-3,299	$ 0.29	$ 1.96	$ 5.20	$ 0.23	$ 1.83	$ 4.65	$ 0.22	$ 0.01	$ 0.10	$ -	$ 14.49
3,300-9,999	$ 0.27	$ 1.80	$ 4.77	$ 0.21	$ 1.68	$ 4.26	$ 0.20	$ 0.01	$ 0.10	$ 0.00	$ 13.31
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.76	$ 11.25	$ 0.15	$ 0.04	$ 0.38	$ 0.01	$ 29.86
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.18	$ 2.70	$ 0.04	$ 0.01	$ 0.10	$ 0.00	$ 7.19
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.25	$ 0.05	$ 0.02	$ 0.13	$ 0.01	$ 8.50
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.55	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.48
Total	$ 1.59	$ 10.79	$ 48.90	$ 1.29	$ 9.66	$ 39.44	$ 1.12	$ 0.12	$ 1.11	$ 0.02	$ 114.04
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 4.38	$ 0.18	$ 1.97	$ 4.04	$ 0.17	$ 0.01	$ 0.08	$ 0.00	$ 13.18
100-499	$ 0.27	$ 2.35	$ 4.84	$ 0.21	$ 2.22	$ 4.52	$ 0.20	$ 0.01	$ 0.07	$ -	$ 14.70
500-999	$ 0.14	$ 0.98	$ 2.03	$ 0.11	$ 0.91	$ 1.84	$ 0.11	$ 0.01	$ 0.05	$ -	$ 6.18
1,000-3,299	$ 0.29	$ 1.96	$ 4.20	$ 0.23	$ 1.90	$ 3.85	$ 0.22	$ 0.01	$ 0.06	$ -	$ 12.72
3,300-9,999	$ 0.27	$ 1.80	$ 3.85	$ 0.21	$ 1.74	$ 3.53	$ 0.21	$ 0.01	$ 0.06	$ 0.00	$ 11.68
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.94	$ 13.92	$ 0.18	$ 0.02	$ 0.15	$ 0.01	$ 32.50
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.23	$ 3.33	$ 0.04	$ 0.00	$ 0.04	$ 0.00	$ 7.81
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.20	$ 4.01	$ 0.06	$ 0.01	$ 0.05	$ 0.01	$ 9.21
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.68	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.60
Total	$ 1.59	$ 10.79	$ 44.17	$ 1.29	$ 10.14	$ 39.72	$ 1.20	$ 0.06	$ 0.58	$ 0.02	$ 109.56

Exhibit O.5g: Implementation and Monitoring - Nominal Value (ICRSSL, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.93	$ 16.50	$ 0.16	$ 0.01	$ 0.11	$ 0.00	$ 39.52
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.17	$ 18.47	$ 0.20	$ 0.01	$ 0.10	$ -	$ 43.87
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.89	$ 7.53	$ 0.10	$ 0.01	$ 0.06	$ -	$ 18.17
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.70	$ 14.38	$ 0.20	$ 0.02	$ 0.19	$ -	$ 35.84
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.56	$ 13.19	$ 0.19	$ 0.02	$ 0.18	$ 0.00	$ 32.89
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.78	$ 11.56	$ 0.15	$ 0.04	$ 0.36	$ 0.01	$ 30.16
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.19	$ 2.77	$ 0.04	$ 0.01	$ 0.10	$ 0.00	$ 7.26
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.34	$ 0.05	$ 0.01	$ 0.13	$ 0.01	$ 8.58
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.57	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.49
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 9.40	$ 88.31	$ 1.10	$ 0.14	$ 1.26	$ 0.02	$ 217.78
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 4.09	$ 0.18	$ 1.96	$ 3.75	$ 0.17	$ 0.01	$ 0.09	$ 0.00	$ 12.61
100-499	$ 0.27	$ 2.35	$ 4.53	$ 0.21	$ 2.20	$ 4.20	$ 0.20	$ 0.01	$ 0.08	$ -	$ 14.06
500-999	$ 0.14	$ 0.98	$ 1.90	$ 0.11	$ 0.90	$ 1.71	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.91
1,000-3,299	$ 0.29	$ 1.96	$ 3.94	$ 0.23	$ 1.88	$ 3.56	$ 0.22	$ 0.01	$ 0.07	$ -	$ 12.16
3,300-9,999	$ 0.27	$ 1.80	$ 3.62	$ 0.21	$ 1.73	$ 3.27	$ 0.21	$ 0.01	$ 0.07	$ 0.00	$ 11.18
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.84	$ 12.35	$ 0.16	$ 0.03	$ 0.29	$ 0.01	$ 30.95
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.20	$ 2.96	$ 0.04	$ 0.01	$ 0.08	$ 0.00	$ 7.44
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.56	$ 0.05	$ 0.01	$ 0.10	$ 0.01	$ 8.79
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.61	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.52
Total	$ 1.59	$ 10.79	$ 42.97	$ 1.29	$ 9.91	$ 35.95	$ 1.16	$ 0.10	$ 0.86	$ 0.02	$ 104.63
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 4.09	$ 0.18	$ 1.96	$ 3.75	$ 0.17	$ 0.01	$ 0.09	$ 0.00	$ 12.61
100-499	$ 0.27	$ 2.35	$ 4.53	$ 0.21	$ 2.20	$ 4.20	$ 0.20	$ 0.01	$ 0.08	$ -	$ 14.06
500-999	$ 0.14	$ 0.98	$ 1.90	$ 0.11	$ 0.90	$ 1.71	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.91
1,000-3,299	$ 0.29	$ 1.96	$ 3.94	$ 0.23	$ 1.88	$ 3.56	$ 0.22	$ 0.01	$ 0.07	$ -	$ 12.16
3,300-9,999	$ 0.27	$ 1.80	$ 3.62	$ 0.21	$ 1.72	$ 3.26	$ 0.21	$ 0.01	$ 0.07	$ 0.00	$ 11.17
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.83	$ 12.30	$ 0.16	$ 0.03	$ 0.29	$ 0.01	$ 30.90
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.20	$ 2.95	$ 0.04	$ 0.01	$ 0.08	$ 0.00	$ 7.43
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.55	$ 0.05	$ 0.01	$ 0.10	$ 0.01	$ 8.78
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.60	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.52
Total	$ 1.59	$ 10.79	$ 42.97	$ 1.29	$ 9.90	$ 35.88	$ 1.16	$ 0.10	$ 0.87	$ 0.02	$ 104.56
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 2.93	$ 0.18	$ 1.99	$ 2.72	$ 0.17	$ 0.01	$ 0.08	$ 0.00	$ 10.43
100-499	$ 0.27	$ 2.35	$ 3.26	$ 0.21	$ 2.23	$ 3.04	$ 0.20	$ 0.01	$ 0.07	$ -	$ 11.65
500-999	$ 0.14	$ 0.98	$ 1.37	$ 0.11	$ 0.91	$ 1.24	$ 0.11	$ 0.01	$ 0.05	$ -	$ 4.92
1,000-3,299	$ 0.29	$ 1.96	$ 2.88	$ 0.23	$ 1.91	$ 2.59	$ 0.22	$ 0.01	$ 0.05	$ -	$ 10.15
3,300-9,999	$ 0.27	$ 1.80	$ 2.65	$ 0.21	$ 1.75	$ 2.37	$ 0.21	$ 0.01	$ 0.05	$ 0.00	$ 9.32
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.98	$ 14.48	$ 0.19	$ 0.01	$ 0.11	$ 0.01	$ 33.05
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.23	$ 3.47	$ 0.05	$ 0.00	$ 0.03	$ 0.00	$ 7.94
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.20	$ 4.16	$ 0.06	$ 0.00	$ 0.04	$ 0.01	$ 9.36
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.71	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.62
Total	$ 1.59	$ 10.79	$ 37.98	$ 1.29	$ 10.25	$ 34.79	$ 1.22	$ 0.05	$ 0.47	$ 0.02	$ 98.44

Exhibit O.5h: Implementation and Monitoring - Nominal Value (ICRSSL, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.94	$ 16.63	$ 0.16	$ 0.01	$ 0.10	$ 0.00	$ 39.65
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.19	$ 18.61	$ 0.20	$ 0.01	$ 0.09	$ -	$ 44.02
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.90	$ 7.59	$ 0.11	$ 0.01	$ 0.06	$ -	$ 18.23
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.75	$ 14.83	$ 0.21	$ 0.02	$ 0.16	$ -	$ 36.30
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.61	$ 13.60	$ 0.19	$ 0.02	$ 0.15	$ 0.00	$ 33.31
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.83	$ 12.23	$ 0.16	$ 0.03	$ 0.30	$ 0.01	$ 30.83
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.20	$ 2.93	$ 0.04	$ 0.01	$ 0.08	$ 0.00	$ 7.42
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.53	$ 0.05	$ 0.01	$ 0.10	$ 0.01	$ 8.76
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.60	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.52
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 9.61	$ 90.55	$ 1.13	$ 0.12	$ 1.07	$ 0.02	$ 220.05
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 3.24	$ 0.18	$ 1.97	$ 2.98	$ 0.17	$ 0.01	$ 0.09	$ 0.00	$ 10.99
100-499	$ 0.27	$ 2.35	$ 3.59	$ 0.21	$ 2.21	$ 3.33	$ 0.20	$ 0.01	$ 0.08	$ -	$ 12.26
500-999	$ 0.14	$ 0.98	$ 1.51	$ 0.11	$ 0.91	$ 1.36	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.17
1,000-3,299	$ 0.29	$ 1.96	$ 3.16	$ 0.23	$ 1.89	$ 2.83	$ 0.22	$ 0.01	$ 0.06	$ -	$ 10.66
3,300-9,999	$ 0.27	$ 1.80	$ 2.90	$ 0.21	$ 1.74	$ 2.60	$ 0.21	$ 0.01	$ 0.06	$ 0.00	$ 9.80
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.88	$ 12.98	$ 0.17	$ 0.03	$ 0.23	$ 0.01	$ 31.56
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.21	$ 3.11	$ 0.04	$ 0.01	$ 0.06	$ 0.00	$ 7.59
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.18	$ 3.73	$ 0.06	$ 0.01	$ 0.08	$ 0.01	$ 8.95
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.64	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.55
Total	$ 1.59	$ 10.79	$ 39.28	$ 1.29	$ 10.02	$ 33.55	$ 1.18	$ 0.08	$ 0.73	$ 0.02	$ 98.54
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 3.24	$ 0.18	$ 1.97	$ 2.98	$ 0.17	$ 0.01	$ 0.09	$ 0.00	$ 10.99
100-499	$ 0.27	$ 2.35	$ 3.59	$ 0.21	$ 2.21	$ 3.33	$ 0.20	$ 0.01	$ 0.08	$ -	$ 12.26
500-999	$ 0.14	$ 0.98	$ 1.51	$ 0.11	$ 0.91	$ 1.36	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.17
1,000-3,299	$ 0.29	$ 1.96	$ 3.16	$ 0.23	$ 1.89	$ 2.83	$ 0.22	$ 0.01	$ 0.06	$ -	$ 10.66
3,300-9,999	$ 0.27	$ 1.80	$ 2.90	$ 0.21	$ 1.74	$ 2.60	$ 0.21	$ 0.01	$ 0.06	$ 0.00	$ 9.80
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.88	$ 12.94	$ 0.17	$ 0.03	$ 0.24	$ 0.01	$ 31.53
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.21	$ 3.10	$ 0.04	$ 0.01	$ 0.07	$ 0.00	$ 7.58
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.18	$ 3.72	$ 0.06	$ 0.01	$ 0.08	$ 0.01	$ 8.95
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.63	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.55
Total	$ 1.59	$ 10.79	$ 39.28	$ 1.29	$ 10.02	$ 33.50	$ 1.18	$ 0.08	$ 0.74	$ 0.02	$ 98.49
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 2.27	$ 0.18	$ 1.99	$ 2.11	$ 0.17	$ 0.01	$ 0.07	$ 0.00	$ 9.16
100-499	$ 0.27	$ 2.35	$ 2.53	$ 0.21	$ 2.24	$ 2.36	$ 0.20	$ 0.01	$ 0.06	$ -	$ 10.24
500-999	$ 0.14	$ 0.98	$ 1.07	$ 0.11	$ 0.92	$ 0.96	$ 0.11	$ 0.00	$ 0.04	$ -	$ 4.34
1,000-3,299	$ 0.29	$ 1.96	$ 2.28	$ 0.23	$ 1.91	$ 2.01	$ 0.22	$ 0.01	$ 0.05	$ -	$ 8.96
3,300-9,999	$ 0.27	$ 1.80	$ 2.09	$ 0.21	$ 1.76	$ 1.84	$ 0.21	$ 0.01	$ 0.05	$ 0.00	$ 8.24
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.99	$ 14.68	$ 0.19	$ 0.01	$ 0.09	$ 0.01	$ 33.24
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.24	$ 3.52	$ 0.05	$ 0.00	$ 0.02	$ 0.00	$ 7.99
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.21	$ 4.21	$ 0.06	$ 0.00	$ 0.03	$ 0.01	$ 9.41
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.04	$ 0.72	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.63
Total	$ 1.59	$ 10.79	$ 35.12	$ 1.29	$ 10.29	$ 32.40	$ 1.23	$ 0.05	$ 0.43	$ 0.02	$ 93.19

Exhibit O.5i: Implementation and Monitoring - Nominal Value (ICRSSL, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Bin Class. Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Bin Class. Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.20	$ 0.00	$ 0.45
100-499	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 0.18	$ -	$ 0.48
500-999	$ 0.14	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.11	$ -	$ 0.26
1,000-3,299	$ 0.29	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.14	$ 1.22	$ -	$ 1.64
3,300-9,999	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.13	$ 1.14	$ 0.00	$ 1.53
10,000-49,999	$ 0.26	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 1.34	$ 0.01	$ 1.76
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 0.36	$ 0.00	$ 0.47
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 0.49	$ 0.01	$ 0.62
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.08	$ 0.00	$ 0.10
Total	$ 1.59	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 5.12	$ 0.02	$ 7.30
Rule Alternative A2											
<100	$ 0.23	$ 2.13	$ 18.26	$ 0.18	$ 1.91	$ 16.38	$ 0.16	$ 0.01	$ 0.12	$ 0.00	$ 39.39
100-499	$ 0.27	$ 2.35	$ 20.09	$ 0.21	$ 2.15	$ 18.34	$ 0.20	$ 0.01	$ 0.11	$ -	$ 43.73
500-999	$ 0.14	$ 0.98	$ 8.34	$ 0.11	$ 0.88	$ 7.48	$ 0.10	$ 0.01	$ 0.07	$ -	$ 18.11
1,000-3,299	$ 0.29	$ 1.96	$ 16.86	$ 0.23	$ 1.66	$ 14.05	$ 0.19	$ 0.02	$ 0.22	$ -	$ 35.49
3,300-9,999	$ 0.27	$ 1.80	$ 15.46	$ 0.21	$ 1.52	$ 12.89	$ 0.18	$ 0.02	$ 0.20	$ 0.00	$ 32.57
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.75	$ 11.02	$ 0.15	$ 0.05	$ 0.40	$ 0.01	$ 29.64
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.18	$ 2.64	$ 0.03	$ 0.01	$ 0.11	$ 0.00	$ 7.13
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.16	$ 3.19	$ 0.05	$ 0.02	$ 0.14	$ 0.01	$ 8.44
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.54	$ 0.01	$ 0.00	$ 0.03	$ 0.00	$ 1.47
Total	$ 1.59	$ 10.79	$ 103.89	$ 1.29	$ 9.24	$ 86.53	$ 1.07	$ 0.16	$ 1.40	$ 0.02	$ 215.98
Rule Alternative A3											
<100	$ 0.23	$ 2.13	$ 4.68	$ 0.18	$ 1.95	$ 4.27	$ 0.17	$ 0.01	$ 0.10	$ 0.00	$ 13.71
100-499	$ 0.27	$ 2.35	$ 5.18	$ 0.21	$ 2.19	$ 4.78	$ 0.20	$ 0.01	$ 0.09	$ -	$ 15.28
500-999	$ 0.14	$ 0.98	$ 2.16	$ 0.11	$ 0.90	$ 1.95	$ 0.11	$ 0.01	$ 0.06	$ -	$ 6.42
1,000-3,299	$ 0.29	$ 1.96	$ 4.47	$ 0.23	$ 1.87	$ 4.04	$ 0.22	$ 0.01	$ 0.08	$ -	$ 13.17
3,300-9,999	$ 0.27	$ 1.80	$ 4.10	$ 0.21	$ 1.72	$ 3.71	$ 0.20	$ 0.01	$ 0.08	$ 0.00	$ 12.11
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.81	$ 11.92	$ 0.16	$ 0.04	$ 0.33	$ 0.01	$ 30.52
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.19	$ 2.86	$ 0.04	$ 0.01	$ 0.09	$ 0.00	$ 7.34
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.44	$ 0.05	$ 0.01	$ 0.11	$ 0.01	$ 8.68
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.59	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.51
Total	$ 1.59	$ 10.79	$ 45.48	$ 1.29	$ 9.82	$ 37.55	$ 1.15	$ 0.11	$ 0.95	$ 0.02	$ 108.74
Rule Alternative A3 UV90-10B											
<100	$ 0.23	$ 2.13	$ 4.68	$ 0.18	$ 1.95	$ 4.27	$ 0.17	$ 0.01	$ 0.10	$ 0.00	$ 13.71
100-499	$ 0.27	$ 2.35	$ 5.18	$ 0.21	$ 2.19	$ 4.78	$ 0.20	$ 0.01	$ 0.09	$ -	$ 15.28
500-999	$ 0.14	$ 0.98	$ 2.16	$ 0.11	$ 0.90	$ 1.95	$ 0.11	$ 0.01	$ 0.06	$ -	$ 6.42
1,000-3,299	$ 0.29	$ 1.96	$ 4.47	$ 0.23	$ 1.87	$ 4.04	$ 0.22	$ 0.01	$ 0.08	$ -	$ 13.17
3,300-9,999	$ 0.27	$ 1.80	$ 4.10	$ 0.21	$ 1.71	$ 3.71	$ 0.20	$ 0.01	$ 0.08	$ 0.00	$ 12.10
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.80	$ 11.87	$ 0.16	$ 0.04	$ 0.33	$ 0.01	$ 30.47
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.19	$ 2.84	$ 0.04	$ 0.01	$ 0.09	$ 0.00	$ 7.33
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.17	$ 3.43	$ 0.05	$ 0.01	$ 0.12	$ 0.01	$ 8.67
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.58	$ 0.01	$ 0.00	$ 0.02	$ 0.00	$ 1.50
Total	$ 1.59	$ 10.79	$ 45.48	$ 1.29	$ 9.82	$ 37.46	$ 1.15	$ 0.11	$ 0.96	$ 0.02	$ 108.65
Rule Alternative A4											
<100	$ 0.23	$ 2.13	$ 3.52	$ 0.18	$ 1.98	$ 3.26	$ 0.17	$ 0.01	$ 0.08	$ 0.00	$ 11.55
100-499	$ 0.27	$ 2.35	$ 3.90	$ 0.21	$ 2.23	$ 3.64	$ 0.20	$ 0.01	$ 0.07	$ -	$ 12.89
500-999	$ 0.14	$ 0.98	$ 1.64	$ 0.11	$ 0.91	$ 1.49	$ 0.11	$ 0.01	$ 0.05	$ -	$ 5.43
1,000-3,299	$ 0.29	$ 1.96	$ 3.41	$ 0.23	$ 1.91	$ 3.10	$ 0.22	$ 0.01	$ 0.05	$ -	$ 11.19
3,300-9,999	$ 0.27	$ 1.80	$ 3.14	$ 0.21	$ 1.75	$ 2.84	$ 0.21	$ 0.01	$ 0.05	$ 0.00	$ 10.28
10,000-49,999	$ 0.26	$ 1.05	$ 15.76	$ 0.21	$ 0.97	$ 14.28	$ 0.19	$ 0.01	$ 0.12	$ 0.01	$ 32.85
50,000-99,999	$ 0.06	$ 0.25	$ 3.79	$ 0.05	$ 0.23	$ 3.42	$ 0.05	$ 0.00	$ 0.03	$ 0.00	$ 7.89
100,000-999,999	$ 0.07	$ 0.22	$ 4.53	$ 0.07	$ 0.20	$ 4.11	$ 0.06	$ 0.00	$ 0.04	$ 0.01	$ 9.31
1,000,000+	$ 0.01	$ 0.04	$ 0.81	$ 0.01	$ 0.03	$ 0.70	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 1.61
Total	$ 1.59	$ 10.79	$ 40.49	$ 1.29	$ 10.21	$ 36.84	$ 1.22	$ 0.06	$ 0.51	$ 0.02	$ 103.01

Exhibit O.6a: Treatment Uncertainty - Nominal Value (ICR)

	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
Size Category	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 18.08	$ 21.56	$ 25.03	$ 1.63	$ 1.76	$ 1.88	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 19.73	$ 23.35	$ 26.95
100-499	$ 27.07	$ 31.91	$ 36.76	$ 2.81	$ 3.05	$ 3.28	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 29.98	$ 35.09	$ 40.19
500-999	$ 18.44	$ 21.64	$ 24.84	$ 2.69	$ 2.94	$ 3.19	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 21.40	$ 24.90	$ 28.40
1,000-3,299	$ 97.54	$ 117.98	$ 138.25	$ 9.49	$ 10.40	$ 11.32	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 109.11	$ 130.80	$ 152.31
3,300-9,999	$ 300.50	$ 367.54	$ 434.24	$ 13.69	$ 14.87	$ 16.05	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 320.00	$ 389.24	$ 458.15
10,000-49,999	$ 938.87	$1,072.03	$ 1,205.65	$ 41.61	$ 44.12	$ 46.65	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 998.20	$ 1,135.35	$ 1,272.99
50,000-99,999	$ 562.97	$ 646.03	$ 728.71	$ 21.35	$ 22.62	$ 23.91	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 593.31	$ 678.86	$ 764.07
100,000-999,999	$ 1,637.96	$1,868.25	$ 2,098.30	$ 71.51	$ 75.73	$ 80.02	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 1,820.31	$ 2,058.35	$ 2,296.23
1,000,000+	$ 731.32	$ 833.39	$ 935.46	$ 40.67	$ 43.05	$ 45.45	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 1,163.56	$ 1,364.55	$ 1,564.36
Total	$ 4,332.74	$4,980.35	$ 5,627.23	$ 205.45	$ 218.54	$ 231.76	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 5,075.61	$ 5,840.49	$ 6,603.64
Rule Alternative A2																					
<100	$ 8.44	$ 10.11	$ 12.72	$ 0.76	$ 0.89	$ 1.07	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 9.22	$ 11.02	$ 13.83
100-499	$ 12.52	$ 15.14	$ 19.07	$ 1.10	$ 1.27	$ 1.53	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 13.71	$ 16.53	$ 20.75
500-999	$ 8.56	$ 10.41	$ 13.12	$ 0.84	$ 0.96	$ 1.15	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.68	$ 11.69	$ 14.64
1,000-3,299	$ 34.56	$ 42.87	$ 54.94	$ 2.86	$ 3.30	$ 4.00	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 39.50	$ 48.58	$ 61.69
3,300-9,999	$ 98.04	$ 122.76	$ 158.53	$ 4.84	$ 5.49	$ 6.61	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 108.70	$ 135.08	$ 172.99
10,000-49,999	$ 293.46	$ 357.49	$ 455.42	$ 12.65	$ 14.24	$ 17.03	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 323.83	$ 390.93	$ 493.14
50,000-99,999	$ 174.33	$ 214.73	$ 275.63	$ 6.01	$ 6.80	$ 8.10	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 189.33	$ 231.74	$ 295.19
100,000-999,999	$ 493.86	$ 605.53	$ 772.24	$ 18.70	$ 21.24	$ 25.29	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 623.41	$ 741.14	$ 915.45
1,000,000+	$ 218.69	$ 267.82	$ 341.16	$ 10.31	$ 11.75	$ 14.00	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 620.56	$ 767.68	$ 938.61
Total	$ 1,342.46	$1,646.85	$ 2,102.83	$ 58.06	$ 65.94	$ 78.79	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,937.94	$ 2,354.40	$ 2,926.28
Rule Alternative A3																					
<100	$ 6.26	$ 7.91	$ 9.99	$ 0.51	$ 0.62	$ 0.74	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 6.79	$ 8.55	$ 10.76
100-499	$ 8.77	$ 11.11	$ 13.95	$ 0.70	$ 0.84	$ 1.00	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.57	$ 12.08	$ 15.10
500-999	$ 5.92	$ 7.52	$ 9.42	$ 0.48	$ 0.58	$ 0.68	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.68	$ 8.41	$ 10.47
1,000-3,299	$ 21.90	$ 28.14	$ 35.39	$ 1.69	$ 2.04	$ 2.43	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 25.66	$ 32.59	$ 40.57
3,300-9,999	$ 59.39	$ 76.99	$ 97.32	$ 3.29	$ 3.90	$ 4.64	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 68.49	$ 87.72	$ 109.82
10,000-49,999	$ 239.65	$ 301.28	$ 381.06	$ 9.58	$ 11.18	$ 13.24	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 266.95	$ 331.66	$ 414.99
50,000-99,999	$ 141.96	$ 180.87	$ 230.94	$ 4.26	$ 5.01	$ 5.92	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 155.21	$ 196.10	$ 248.30
100,000-999,999	$ 393.39	$ 499.36	$ 633.76	$ 12.79	$ 15.17	$ 17.87	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 517.03	$ 628.90	$ 769.55
1,000,000+	$ 171.11	$ 217.44	$ 275.89	$ 7.05	$ 8.38	$ 9.87	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 569.73	$ 713.93	$ 869.21
Total	$ 1,048.35	$1,330.62	$ 1,687.73	$ 40.34	$ 47.71	$ 56.40	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,626.10	$ 2,019.93	$ 2,488.78
Rule Alternative A3 UV90-10B																					
<100	$ 6.26	$ 7.91	$ 9.99	$ 0.51	$ 0.62	$ 0.74	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 6.79	$ 8.55	$ 10.76
100-499	$ 8.77	$ 11.11	$ 13.95	$ 0.70	$ 0.84	$ 1.00	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.57	$ 12.08	$ 15.10
500-999	$ 5.92	$ 7.52	$ 9.42	$ 0.48	$ 0.58	$ 0.68	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.68	$ 8.41	$ 10.47
1,000-3,299	$ 21.91	$ 28.15	$ 35.41	$ 1.69	$ 2.04	$ 2.43	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 25.67	$ 32.60	$ 40.59
3,300-9,999	$ 60.39	$ 78.12	$ 98.75	$ 3.31	$ 3.93	$ 4.68	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 69.52	$ 88.88	$ 111.28
10,000-49,999	$ 265.46	$ 332.76	$ 419.54	$ 10.49	$ 12.27	$ 14.56	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 293.67	$ 364.23	$ 454.79
50,000-99,999	$ 160.13	$ 202.70	$ 256.76	$ 4.94	$ 5.85	$ 6.95	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 174.06	$ 218.77	$ 275.16
100,000-999,999	$ 457.41	$ 577.36	$ 727.92	$ 15.76	$ 18.79	$ 22.29	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 584.02	$ 710.51	$ 868.12
1,000,000+	$ 206.37	$ 261.02	$ 328.92	$ 8.77	$ 10.49	$ 12.46	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 606.71	$ 759.62	$ 924.83
Total	$ 1,192.62	$1,506.67	$ 1,900.66	$ 46.65	$ 55.40	$ 65.79	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,776.69	$ 2,203.66	$ 2,711.10
Rule Alternative A4																					
<100	$ 3.52	$ 4.64	$ 6.04	$ 0.26	$ 0.31	$ 0.37	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.81	$ 4.97	$ 6.45
100-499	$ 4.70	$ 6.07	$ 7.81	$ 0.35	$ 0.41	$ 0.49	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02							$ 5.15	$ 6.60	$ 8.45
500-999	$ 3.10	$ 3.98	$ 5.10	$ 0.21	$ 0.25	$ 0.30	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04							$ 3.59	$ 4.56	$ 5.77
1,000-3,299	$ 10.24	$ 13.28	$ 17.12	$ 0.81	$ 0.96	$ 1.16	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20							$ 13.13	$ 16.66	$ 21.02
3,300-9,999	$ 27.37	$ 35.65	$ 46.17	$ 1.74	$ 2.10	$ 2.55	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 34.93	$ 44.58	$ 56.58
10,000-49,999	$ 96.48	$ 127.53	$ 163.73	$ 4.40	$ 5.23	$ 6.23	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 118.60	$ 151.96	$ 190.65
50,000-99,999	$ 56.88	$ 76.21	$ 98.82	$ 1.85	$ 2.19	$ 2.60	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 67.72	$ 88.62	$ 112.87
100,000-999,999	$ 151.98	$ 202.11	$ 260.53	$ 4.85	$ 5.77	$ 6.84	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 267.68	$ 322.24	$ 385.29
1,000,000+	$ 65.10	$ 86.64	$ 111.76	$ 2.40	$ 2.89	$ 3.43	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 459.08	$ 577.63	$ 698.64
Total	$ 419.37	$ 556.12	$ 717.08	$ 16.89	$ 20.11	$ 23.98	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 973.68	$ 1,217.83	$ 1,485.71

Exhibit O.6b: Treatment Uncertainty - Nominal Value (ICRSSM)

	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
Size Category	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 18.08	$ 21.56	$ 25.03	$ 1.63	$ 1.76	$ 1.88	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 19.73	$ 23.35	$ 26.95
100-499	$ 27.07	$ 31.91	$ 36.76	$ 2.81	$ 3.05	$ 3.28	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 29.98	$ 35.09	$ 40.19
500-999	$ 18.44	$ 21.64	$ 24.84	$ 2.69	$ 2.94	$ 3.19	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 21.40	$ 24.90	$ 28.40
1,000-3,299	$ 97.54	$ 117.98	$ 138.25	$ 9.49	$ 10.40	$ 11.32	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 109.11	$ 130.80	$ 152.31
3,300-9,999	$ 300.50	$ 367.54	$ 434.24	$ 13.69	$ 14.87	$ 16.05	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 320.00	$ 389.24	$ 458.15
10,000-49,999	$ 938.87	$1,072.03	$ 1,205.65	$ 41.61	$ 44.12	$ 46.65	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 998.20	$1,135.35	$ 1,272.99
50,000-99,999	$ 562.97	$ 646.03	$ 728.71	$ 21.35	$ 22.62	$ 23.91	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 593.31	$ 678.86	$ 764.07
100,000-999,999	$ 1,637.96	$1,868.25	$ 2,098.30	$ 71.51	$ 75.73	$ 80.02	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 1,820.31	$2,058.35	$ 2,296.23
1,000,000+	$ 731.32	$ 833.39	$ 935.46	$ 40.67	$ 43.05	$ 45.45	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 1,163.56	$1,364.55	$ 1,564.36
Total	$ 4,332.74	$4,980.35	$ 5,627.23	$ 205.45	$ 218.54	$ 231.76	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 5,075.61	$5,840.49	$ 6,603.64
Rule Alternative A2																					
<100	$ 6.51	$ 8.29	$ 10.21	$ 0.52	$ 0.63	$ 0.75	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 7.05	$ 8.94	$ 10.99
100-499	$ 9.15	$ 11.61	$ 14.34	$ 0.77	$ 0.92	$ 1.09	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 10.02	$ 12.66	$ 15.58
500-999	$ 6.14	$ 7.79	$ 9.63	$ 0.59	$ 0.71	$ 0.84	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.00	$ 8.82	$ 10.84
1,000-3,299	$ 24.90	$ 32.20	$ 40.34	$ 2.11	$ 2.55	$ 3.01	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 29.08	$ 37.16	$ 46.09
3,300-9,999	$ 70.99	$ 92.85	$ 117.10	$ 3.71	$ 4.44	$ 5.20	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 80.51	$ 104.12	$ 130.16
10,000-49,999	$ 220.37	$ 285.00	$ 353.83	$ 9.63	$ 11.46	$ 13.32	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 247.72	$ 315.66	$ 387.84
50,000-99,999	$ 130.15	$ 170.45	$ 213.69	$ 4.42	$ 5.25	$ 6.11	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 143.56	$ 185.91	$ 231.24
100,000-999,999	$ 362.47	$ 471.03	$ 588.31	$ 13.19	$ 15.71	$ 18.31	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 486.51	$ 601.11	$ 724.53
1,000,000+	$ 159.10	$ 206.63	$ 257.98	$ 7.09	$ 8.46	$ 9.89	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 557.75	$ 703.20	$ 851.32
Total	$ 989.78	$1,285.85	$ 1,605.43	$ 42.02	$ 50.14	$ 58.51	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,569.22	$1,977.59	$ 2,408.60
Rule Alternative A3																					
<100	$ 4.31	$ 5.81	$ 7.35	$ 0.33	$ 0.40	$ 0.48	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.65	$ 6.24	$ 7.86
100-499	$ 5.80	$ 7.73	$ 9.70	$ 0.44	$ 0.54	$ 0.64	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.34	$ 8.39	$ 10.49
500-999	$ 3.86	$ 5.13	$ 6.42	$ 0.28	$ 0.35	$ 0.42	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.42	$ 5.80	$ 7.20
1,000-3,299	$ 13.63	$ 18.26	$ 23.08	$ 1.03	$ 1.29	$ 1.54	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 16.74	$ 21.96	$ 27.37
3,300-9,999	$ 35.95	$ 48.75	$ 62.15	$ 2.19	$ 2.72	$ 3.24	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 43.95	$ 58.31	$ 73.25
10,000-49,999	$ 167.47	$ 221.62	$ 278.08	$ 6.54	$ 7.99	$ 9.40	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 191.74	$ 248.81	$ 308.17
50,000-99,999	$ 98.85	$ 132.63	$ 168.09	$ 2.77	$ 3.39	$ 3.99	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 110.61	$ 146.24	$ 183.53
100,000-999,999	$ 269.36	$ 359.51	$ 453.82	$ 7.98	$ 9.81	$ 11.56	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 388.19	$ 483.69	$ 583.29
1,000,000+	$ 116.01	$ 155.06	$ 195.87	$ 4.33	$ 5.33	$ 6.29	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 511.91	$ 648.49	$ 785.60
Total	$ 715.24	$ 954.50	$ 1,204.56	$ 25.88	$ 31.83	$ 37.55	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,278.54	$1,627.93	$ 1,986.77
Rule Alternative A3 UV90-10B																					
<100	$ 4.31	$ 5.81	$ 7.35	$ 0.33	$ 0.40	$ 0.48	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.65	$ 6.24	$ 7.86
100-499	$ 5.80	$ 7.73	$ 9.70	$ 0.44	$ 0.54	$ 0.64	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.34	$ 8.39	$ 10.49
500-999	$ 3.86	$ 5.13	$ 6.42	$ 0.28	$ 0.35	$ 0.42	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.42	$ 5.80	$ 7.20
1,000-3,299	$ 13.64	$ 18.27	$ 23.10	$ 1.03	$ 1.29	$ 1.54	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 16.75	$ 21.98	$ 27.39
3,300-9,999	$ 36.62	$ 49.57	$ 63.12	$ 2.21	$ 2.75	$ 3.27	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 44.64	$ 59.14	$ 74.24
10,000-49,999	$ 183.50	$ 241.07	$ 301.46	$ 7.16	$ 8.73	$ 10.26	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 208.38	$ 269.01	$ 332.41
50,000-99,999	$ 109.81	$ 145.93	$ 183.86	$ 3.21	$ 3.94	$ 4.64	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 122.02	$ 160.09	$ 199.95
100,000-999,999	$ 306.76	$ 405.53	$ 508.96	$ 9.95	$ 12.21	$ 14.41	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 427.55	$ 532.11	$ 641.28
1,000,000+	$ 136.68	$ 180.61	$ 226.34	$ 5.49	$ 6.76	$ 7.99	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 533.74	$ 675.48	$ 817.78
Total	$ 800.98	$1,059.66	$ 1,330.31	$ 30.09	$ 36.97	$ 43.64	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,368.49	$1,738.23	$ 2,118.60
Rule Alternative A4																					
<100	$ 2.19	$ 3.02	$ 3.94	$ 0.16	$ 0.20	$ 0.24	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.38	$ 3.25	$ 4.21
100-499	$ 2.93	$ 3.95	$ 5.08	$ 0.22	$ 0.27	$ 0.32	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.24	$ 4.35	$ 5.55
500-999	$ 1.93	$ 2.59	$ 3.31	$ 0.13	$ 0.16	$ 0.20	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.34	$ 3.08	$ 3.88
1,000-3,299	$ 6.30	$ 8.56	$ 11.05	$ 0.51	$ 0.63	$ 0.76	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.89	$ 11.60	$ 14.55
3,300-9,999	$ 16.99	$ 23.15	$ 29.99	$ 1.08	$ 1.36	$ 1.66	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 23.89	$ 31.34	$ 39.51
10,000-49,999	$ 52.96	$ 72.99	$ 94.85	$ 2.58	$ 3.20	$ 3.83	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 73.26	$ 95.39	$ 119.37
50,000-99,999	$ 31.24	$ 43.61	$ 57.25	$ 1.09	$ 1.35	$ 1.61	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 41.33	$ 55.18	$ 70.30
100,000-999,999	$ 82.86	$ 114.81	$ 149.89	$ 2.77	$ 3.44	$ 4.12	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 196.48	$ 232.61	$ 271.92
1,000,000+	$ 35.47	$ 49.16	$ 64.21	$ 1.33	$ 1.66	$ 2.00	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 428.37	$ 538.93	$ 649.66
Total	$ 232.86	$ 321.84	$ 419.57	$ 9.88	$ 12.27	$ 14.73	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 780.16	$ 975.71	$ 1,178.95

Exhibit O.6c: Treatment Uncertainty - Nominal Value (ICRSSL)

	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
Size Category	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile	5th Percentile	Mean	95th Percentile
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 18.08	$ 21.56	$ 25.03	$ 1.63	$ 1.76	$ 1.88	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 19.73	$ 23.35	$ 26.95
100-499	$ 27.07	$ 31.91	$ 36.76	$ 2.81	$ 3.05	$ 3.28	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 29.98	$ 35.09	$ 40.19
500-999	$ 18.44	$ 21.64	$ 24.84	$ 2.69	$ 2.94	$ 3.19	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 21.40	$ 24.90	$ 28.40
1,000-3,299	$ 97.54	$ 117.98	$ 138.25	$ 9.49	$ 10.40	$ 11.32	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 109.11	$ 130.80	$ 152.31
3,300-9,999	$ 300.50	$ 367.54	$ 434.24	$ 13.69	$ 14.87	$ 16.05	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 320.00	$ 389.24	$ 458.15
10,000-49,999	$ 938.87	$1,072.03	$ 1,205.65	$ 41.61	$ 44.12	$ 46.65	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 998.20	$1,135.35	$ 1,272.99
50,000-99,999	$ 562.97	$ 646.03	$ 728.71	$ 21.35	$ 22.62	$ 23.91	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 593.31	$ 678.86	$ 764.07
100,000-999,999	$ 1,637.96	$1,868.25	$ 2,098.30	$ 71.51	$ 75.73	$ 80.02	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 1,820.31	$2,058.35	$ 2,296.23
1,000,000+	$ 731.32	$ 833.39	$ 935.46	$ 40.67	$ 43.05	$ 45.45	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 1,163.56	$1,364.55	$ 1,564.36
Total	$ 4,332.74	$4,980.35	$ 5,627.23	$ 205.45	$ 218.54	$ 231.76	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 5,075.61	$5,840.49	$ 6,603.64
Rule Alternative A2																					
<100	$ 5.44	$ 7.41	$ 9.43	$ 0.42	$ 0.54	$ 0.66	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 5.89	$ 7.98	$ 10.12
100-499	$ 7.50	$ 10.17	$ 12.91	$ 0.61	$ 0.78	$ 0.95	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.21	$ 11.08	$ 14.01
500-999	$ 4.99	$ 6.76	$ 8.59	$ 0.45	$ 0.59	$ 0.72	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.73	$ 7.68	$ 9.68
1,000-3,299	$ 19.60	$ 27.32	$ 35.24	$ 1.65	$ 2.16	$ 2.64	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 23.33	$ 31.89	$ 40.62
3,300-9,999	$ 55.56	$ 78.46	$ 102.07	$ 3.02	$ 3.88	$ 4.70	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 64.40	$ 89.18	$ 114.62
10,000-49,999	$ 171.88	$ 242.35	$ 312.90	$ 7.68	$ 9.88	$ 11.89	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 197.28	$ 271.43	$ 345.48
50,000-99,999	$ 101.27	$ 144.80	$ 188.90	$ 3.46	$ 4.45	$ 5.36	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 113.72	$ 159.47	$ 205.71
100,000-999,999	$ 278.96	$ 396.69	$ 514.90	$ 9.99	$ 13.01	$ 15.70	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 399.80	$ 524.07	$ 648.51
1,000,000+	$ 121.91	$ 173.37	$ 224.90	$ 5.25	$ 6.90	$ 8.36	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 518.73	$ 668.37	$ 816.71
Total	$ 767.13	$1,087.33	$ 1,409.84	$ 32.54	$ 42.21	$ 50.97	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,337.08	$1,771.14	$ 2,205.46
Rule Alternative A3																					
<100	$ 3.13	$ 4.72	$ 6.25	$ 0.23	$ 0.32	$ 0.39	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.39	$ 5.07	$ 6.67
100-499	$ 4.18	$ 6.21	$ 8.13	$ 0.31	$ 0.43	$ 0.52	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.59	$ 6.76	$ 8.80
500-999	$ 2.78	$ 4.11	$ 5.36	$ 0.19	$ 0.27	$ 0.33	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.25	$ 4.70	$ 6.06
1,000-3,299	$ 9.58	$ 14.32	$ 18.82	$ 0.72	$ 1.00	$ 1.24	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 12.38	$ 17.73	$ 22.81
3,300-9,999	$ 25.00	$ 37.82	$ 50.15	$ 1.57	$ 2.18	$ 2.70	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 32.38	$ 46.83	$ 60.70
10,000-49,999	$ 121.48	$ 179.33	$ 233.78	$ 4.72	$ 6.41	$ 7.82	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 143.91	$ 204.94	$ 262.29
50,000-99,999	$ 71.63	$ 107.25	$ 141.26	$ 1.97	$ 2.68	$ 3.27	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 82.59	$ 120.14	$ 155.98
100,000-999,999	$ 194.32	$ 289.30	$ 379.44	$ 5.60	$ 7.63	$ 9.31	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 310.76	$ 411.30	$ 506.67
1,000,000+	$ 83.50	$ 124.45	$ 163.32	$ 3.02	$ 4.12	$ 5.04	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 478.09	$ 616.68	$ 751.81
Total	$ 515.60	$ 767.51	$ 1,006.51	$ 18.33	$ 25.04	$ 30.62	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,071.35	$1,434.15	$ 1,781.79
Rule Alternative A3 UV90-10B																					
<100	$ 3.13	$ 4.72	$ 6.25	$ 0.23	$ 0.32	$ 0.39	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.39	$ 5.07	$ 6.67
100-499	$ 4.18	$ 6.21	$ 8.13	$ 0.31	$ 0.43	$ 0.52	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.59	$ 6.76	$ 8.80
500-999	$ 2.78	$ 4.11	$ 5.36	$ 0.19	$ 0.27	$ 0.33	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.25	$ 4.70	$ 6.06
1,000-3,299	$ 9.59	$ 14.33	$ 18.84	$ 0.72	$ 1.00	$ 1.24	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 12.39	$ 17.74	$ 22.82
3,300-9,999	$ 25.49	$ 38.47	$ 50.92	$ 1.58	$ 2.19	$ 2.72	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 32.88	$ 47.50	$ 61.50
10,000-49,999	$ 132.44	$ 194.02	$ 251.89	$ 5.15	$ 6.99	$ 8.52	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 155.31	$ 220.21	$ 281.09
50,000-99,999	$ 79.09	$ 117.24	$ 153.37	$ 2.28	$ 3.10	$ 3.78	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 90.36	$ 130.55	$ 168.59
100,000-999,999	$ 219.80	$ 323.48	$ 421.14	$ 6.99	$ 9.50	$ 11.57	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 337.63	$ 447.35	$ 550.63
1,000,000+	$ 97.48	$ 143.41	$ 186.59	$ 3.85	$ 5.24	$ 6.39	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 492.90	$ 636.76	$ 776.44
Total	$ 573.98	$ 846.00	$ 1,102.50	$ 21.31	$ 29.04	$ 35.46	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 1,132.71	$1,516.64	$ 1,882.61
Rule Alternative A4																					
<100	$ 1.40	$ 2.18	$ 3.07	$ 0.10	$ 0.15	$ 0.19	$ 0.01	$ 0.01	$ 0.02	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.53	$ 2.35	$ 3.29
100-499	$ 1.87	$ 2.85	$ 3.96	$ 0.14	$ 0.19	$ 0.25	$ 0.08	$ 0.11	$ 0.13	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 3.17	$ 4.36
500-999	$ 1.23	$ 1.86	$ 2.58	$ 0.08	$ 0.12	$ 0.15	$ 0.25	$ 0.29	$ 0.33	$ 0.03	$ 0.03	$ 0.04	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.59	$ 2.30	$ 3.10
1,000-3,299	$ 4.01	$ 6.13	$ 8.58	$ 0.33	$ 0.46	$ 0.59	$ 1.90	$ 2.22	$ 2.54	$ 0.17	$ 0.19	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.41	$ 9.00	$ 11.92
3,300-9,999	$ 10.84	$ 16.65	$ 23.37	$ 0.69	$ 0.98	$ 1.29	$ 5.44	$ 6.44	$ 7.45	$ 0.23	$ 0.25	$ 0.27	$ 0.13	$ 0.13	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 17.35	$ 24.46	$ 32.52
10,000-49,999	$ 32.39	$ 49.65	$ 70.29	$ 1.62	$ 2.24	$ 2.91	$ 8.10	$ 9.55	$ 11.01	$ 0.38	$ 0.41	$ 0.44	$ 8.97	$ 8.97	$ 8.97	$ 0.27	$ 0.27	$ 0.27	$ 51.73	$ 71.09	$ 93.90
50,000-99,999	$ 19.11	$ 29.66	$ 42.40	$ 0.68	$ 0.95	$ 1.23	$ 6.34	$ 7.55	$ 8.76	$ 0.24	$ 0.26	$ 0.28	$ 2.30	$ 2.30	$ 2.30	$ 0.11	$ 0.11	$ 0.11	$ 28.79	$ 40.83	$ 55.08
100,000-999,999	$ 50.55	$ 77.81	$ 110.63	$ 1.72	$ 2.38	$ 3.10	$ 18.75	$ 22.19	$ 25.66	$ 0.94	$ 1.02	$ 1.10	$ 88.04	$ 88.04	$ 88.04	$ 3.11	$ 3.11	$ 3.11	$ 163.11	$ 194.56	$ 231.65
1,000,000+	$ 21.64	$ 33.30	$ 47.38	$ 0.81	$ 1.13	$ 1.49	$ 372.23	$ 468.62	$ 563.83	$ 1.20	$ 1.34	$ 1.48	$ 17.57	$ 17.57	$ 17.57	$ 0.57	$ 0.57	$ 0.57	$ 414.03	$ 522.54	$ 632.32
Total	$ 143.05	$ 220.09	$ 312.28	$ 6.18	$ 8.60	$ 11.20	$ 413.11	$ 516.98	$ 619.74	$ 3.22	$ 3.52	$ 3.82	$ 117.03	$ 117.03	$ 117.03	$ 4.07	$ 4.07	$ 4.07	$ 686.65	$ 870.29	$ 1,068.14

Exhibit O.7: State Schedule for Assigning LT2ESWTR Costs and Benefits

Year	Implementation	Small System E. coli Monitoring Review Initial Monitoring	Small System Crypto Monitoring Review Initial Monitoring	Large System Monitoring Review Second Round	M1 (10k - <50k) Monitoring Review Second Round	M2 (50k - <100k) Monitoring Review Second Round	Small System E. coli Monitoring Review Second Round	Small System Crypto Monitoring Review Second Round
	A	B	C	D	E	F	G	H
2005	50%							
2006	50%							
2007								
2008		100%						
2009								
2010								
2011			100%					
2012								
2013								
2014								
2015				100%				
2016						100%		
2017					100%		100%	
2018								
2019								100%
2020								
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								

Exhibit O.7: State Schedule for Assigning LT2ESWTR Costs and Benefits

Year	Small System Benchmarking	Large System Benchmarking	M1 (10k - <50k) System Benchmarking	M2 (50k - <100k) System Benchmarking	Small System Technology Monitoring	Large System Technology Monitoring	M1 (10k - <50k) System Technology Monitoring	M2 (50k - <100k) System Technology Monitoring	Uncovered Finished Water Reservoir Reporting
	I	J	K	L	M	N	O	P	Q
2005									
2006									50.00%
2007									50.00%
2008		20%		10.00%					
2009		20%	10.00%	20.00%					
2010		20%	20.00%	20.00%					
2011	22.22%	20%	20.00%	20.00%		60.00%		45%	
2012	22.22%	20%	20.00%	20.00%		80.00%	45%	70%	
2013	22.22%		20.00%	10.00%	40.00%	100.00%	70%	90%	
2014	22.22%		10.00%		50.00%	100.00%	90%	100%	
2015	11.11%				80.00%	100.00%	100%	100%	
2016					90.00%	100.00%	100%	100%	
2017					100.00%	100.00%	100%	100%	
2018					100.00%	100.00%	100%	100%	
2019					100.00%	100.00%	100%	100%	
2020					100.00%	100.00%	100%	100%	
2021					100.00%	100.00%	100%	100%	
2022					100.00%	100.00%	100%	100%	
2023					100.00%	100.00%	100%	100%	
2024					100.00%	100.00%	100%	100%	
2025					100.00%	100.00%	100%	100%	
2026					100.00%	100.00%	100%	100%	
2027					100.00%	100.00%	100%	100%	
2028					100.00%	100.00%	100%	100%	
2029					100.00%	100.00%	100%	100%	

Exhibit O.8: Implementation and Monitoring Schedule for Assigning LT2ESWTR Costs and Benefits

Year	Small System Implementation	Small System Initial E. coli Monitoring	Small System Initial Crypto Monitoring	Small System Initial Bin Class Reporting	Small System Second Round E. coli Monitoring	Small System Second Round Crypto Monitoring	Small System Second Round Reporting	Small System Benchmarking	Small System Technology Reporting	M1 (10k - <50k) System Implementation	M2 (50k - <100k) System Implementation
	A	B	C	D	E	F	G	H	I	J	K
2005											100%
2006										100%	
2007	100%	50%									
2008		50%									
2009			50%	50%							
2010			50%	50%							
2011								22%			
2012								22%			
2013								22%	40.00%		
2014								22%	50.00%		
2015								11%	80.00%		
2016									90.00%		
2017					100%				100.00%		
2018						50%	50%		100.00%		
2019						50%	50%		100.00%		
2020									100.00%		
2021									100.00%		
2022									100.00%		
2023									100.00%		
2024									100.00%		
2025									100.00%		
2026									100.00%		
2027									100.00%		
2028									100.00%		
2029									100.00%		

Exhibit O.8: Implementation and Monitoring Schedule for Assigning LT2ESWTR Costs and Benefits

Year	Large System Implementation	M1 (10k - <50k) System Initial Round Monitoring	M1 (10k - <50k) System Initial Round Reporting	M2 (50k - <100k) System Initial Round Monitoring	M2 (50k - <100k) System Initial Round Reporting	Large System Initial Round Monitoring	Large System Initial Round Reporting	M1 (10k - <50k) System 2nd Round Monitoring	M1 (10k - <50k) System 2nd Round Reporting	M1 (10k - <50k) System Technology Reporting
	L	M	N	O	P	Q	R	S	T	U
2005	100%					25%	25%			
2006				50%	50%	50%	50%			
2007		50%	50%	50%	50%	25%	25%			
2008		50%	50%							
2009										
2010										
2011										
2012										45%
2013										70%
2014										90%
2015								25%	25%	100%
2016								50%	50%	100%
2017								25%	25%	100%
2018										100%
2019										100%
2020										100%
2021										100%
2022										100%
2023										100%
2024										100%
2025										100%
2026										100%
2027										100%
2028										100%
2029										100%

Exhibit O.8: Implementation and Monitoring Schedule for Assigning LT2ESWTR Costs and Benefits

Year	M2 (50k - <100k) System Second Round Monitoring	M2 (50k - <100k) System Second Round Reporting	M2 (50k - <100k) System Technology Reporting	Large System Second Round Monitoring	Large System Second Round Reporting	Large Systems Technology Reporting	M1 (10k - <50k) System Benchmarking	M2 (50k - <100k) System Benchmarking	Large System Benchmarking	Uncovered Finished Water Reservoir Reporting
	V	W	X	Y	Z	AA	AB	AC	AD	AE
2005										50%
2006										50%
2007										
2008								10.00%	20%	
2009							10.00%	20.00%	20%	
2010							20.00%	20.00%	20%	
2011			45%			60.00%	20.00%	20.00%	20%	
2012			70%			80.00%	20.00%	20.00%	20%	
2013			90%			100.00%	20.00%	10.00%		
2014	25%	25%	100%	50%	50%	100.00%	10.00%			
2015	50%	50%	100%	50%	50%	100.00%				
2016	25%	25%	100%			100.00%				
2017			100%			100.00%				
2018			100%			100.00%				
2019			100%			100.00%				
2020			100%			100.00%				
2021			100%			100.00%				
2022			100%			100.00%				
2023			100%			100.00%				
2024			100%			100.00%				
2025			100%			100.00%				
2026			100%			100.00%				
2027			100%			100.00%				
2028			100%			100.00%				
2029			100%			100.00%				

Exhibit O.9: Treatment Schedule for Assigning LT2ESWTR Costs and Benefits

Year	Small System Filtered Treatment Capital	Small System Filtered Treatment O&M	Small System Unfiltered Treatment Capital	Small System Unfiltered Treatment O&M	Small System Uncovered Reservoirs Capital	Small System Uncovered Reservoirs O&M	M1 (10k - <50k) System Filtered Treatment Capital	M1 (10k - <50k) System Filtered Treatment O&M	M1 (10k - <50k) System Unfiltered Treatment Capital	M1 (10k - <50k) System Unfiltered Treatment O&M	M1(10k - <50k) System Uncovered Reservoirs Capital	M1 (10k - <50k) Systems Uncovered Reservoirs O&M
	A	B	C	D	E	F	G	H	I	J	K	L
2005					33%						33%	
2006					33%	33%					33%	33%
2007					33%	67%					33%	67%
2008						100%						100%
2009						100%	5%		5%			100%
2010						100%	15%	5.00%	15%	5.00%		100%
2011	10.00%		10.00%			100%	25%	20.00%	25%	20.00%		100%
2012	20.00%	10.00%	20.00%	10.00%		100%	25%	45.00%	25%	45.00%		100%
2013	30.00%	30.00%	30.00%	30.00%		100%	20%	70.00%	20%	70.00%		100%
2014	30.00%	50.00%	30.00%	50.00%		100%	10.00%	90.00%	10.00%	90.00%		100%
2015	10.00%	80.00%	10.00%	80.00%		100%		100.00%		100.00%		100%
2016		90.00%		90.00%		100%		100.00%		100.00%		100%
2017		100.00%		100.00%		100%		100.00%		100.00%		100%
2018		100.00%		100.00%		100%		100.00%		100.00%		100%
2019		100.00%		100.00%		100%		100.00%		100.00%		100%
2020		100.00%		100.00%		100%		100.00%		100.00%		100%
2021		100.00%		100.00%		100%		100.00%		100.00%		100%
2022		100.00%		100.00%		100%		100.00%		100.00%		100%
2023		100.00%		100.00%		100%		100.00%		100.00%		100%
2024		100.00%		100.00%		100%		100.00%		100.00%		100%
2025		100.00%		100.00%		100%		100.00%		100.00%		100%
2026		100.00%		100.00%		100%		100.00%		100.00%		100%
2027		100.00%		100.00%		100%		100.00%		100.00%		100%
2028		100.00%		100.00%		100%		100.00%		100.00%		100%
2029		100.00%		100.00%		100%		100.00%		100.00%		100%

Exhibit O.9: Treatment Schedule for Assigning LT2ESWTR Costs and Benefits

Year	M2 (50k - <100k) System Filtered Treatment Capital	M2 (50k - <100k) System Filtered Treatment O&M	M2 (50k - <100k) System Unfiltered Treatment Capital	M2 (50k - <100k) System Unfiltered Treatment O&M	M2(50k - <100k) System Uncovered Reservoirs Capital	M2 (50k - <100k) System Uncovered Reservoirs O&M	Large System Filtered Treatment Capital	Large System Filtered Treatment O&M	Large System Unfiltered Treatment Capital	Large System Unfiltered Treatment O&M	Large System Uncovered Reservoirs Capital	Large System Uncovered Reservoirs O&M
	M	N	O	P	Q	R	S	T	U	V	W	X
2005					33%						33%	
2006					33%	33%					33%	33%
2007					33%	67%					33%	67%
2008	5%		5%			100%	10.00%		10.00%			100%
2009	15%	5.00%	15%	5.00%		100%	20.00%	10.00%	20.00%	10.00%		100%
2010	25%	20.00%	25%	20.00%		100%	30.00%	30.00%	30.00%	30.00%		100%
2011	25%	45.00%	25%	45.00%		100%	20.00%	60.00%	20.00%	60.00%		100%
2012	20%	70.00%	20%	70.00%		100%	20.00%	80.00%	20.00%	80.00%		100%
2013	10.00%	90.00%	10.00%	90.00%		100%		100.00%		100.00%		100%
2014		100.00%		100.00%		100%		100.00%		100.00%		100%
2015		100.00%		100.00%		100%		100.00%		100.00%		100%
2016		100.00%		100.00%		100%		100.00%		100.00%		100%
2017		100.00%		100.00%		100%		100.00%		100.00%		100%
2018		100.00%		100.00%		100%		100.00%		100.00%		100%
2019		100.00%		100.00%		100%		100.00%		100.00%		100%
2020		100.00%		100.00%		100%		100.00%		100.00%		100%
2021		100.00%		100.00%		100%		100.00%		100.00%		100%
2022		100.00%		100.00%		100%		100.00%		100.00%		100%
2023		100.00%		100.00%		100%		100.00%		100.00%		100%
2024		100.00%		100.00%		100%		100.00%		100.00%		100%
2025		100.00%		100.00%		100%		100.00%		100.00%		100%
2026		100.00%		100.00%		100%		100.00%		100.00%		100%
2027		100.00%		100.00%		100%		100.00%		100.00%		100%
2028		100.00%		100.00%		100%		100.00%		100.00%		100%
2029		100.00%		100.00%		100%		100.00%		100.00%		100%

Exhibit O.10a: State Costs - Present Value, 3% (ICR, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.00	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.00	$ 0.00	$ 2.31
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.48	$ 0.00	$ 3.58
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.72	$ 0.00	$ 1.45
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.87	$ 0.00	$ 3.89
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.15	$ 0.00	$ 2.69
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.52		$ 17.44
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.44	$ 0.00	$ 0.52
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.38	$ -	$ 0.72
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.17	$ -	$ 0.56
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.02	$ 0.59	$ -	$ 2.73
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.54	$ 0.00	$ 6.50
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.93	$ 0.00	$ 2.14
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.27	$ 0.00	$ 1.10
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.32	$ 0.00	$ 3.80
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.06	$ 0.00	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.10	$ 3.71	$ 0.00	$ 21.07
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.34	$ 0.00	$ 0.41
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.29	$ -	$ 0.63
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.13	$ -	$ 0.52
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.30	$ -	$ 2.43
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.27	$ 0.00	$ 6.23
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.85	$ 0.00	$ 2.06
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.25	$ 0.00	$ 1.08
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.29	$ 0.00	$ 3.77
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.00	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.77	$ 0.00	$ 20.11
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.34	$ 0.00	$ 0.41
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.29	$ -	$ 0.63
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.13	$ -	$ 0.52
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.30	$ -	$ 2.43
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.27	$ 0.00	$ 6.23
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.87	$ 0.00	$ 2.07
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.25	$ 0.00	$ 1.08
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.30	$ 0.00	$ 3.77
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.00	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.80	$ 0.00	$ 20.14
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.23	$ 0.00	$ 0.30
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.19	$ -	$ 0.53
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.12	$ -	$ 2.25
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.11	$ 0.00	$ 6.06
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.42	$ 0.00	$ 1.61
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.12	$ 0.00	$ 0.95
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.14	$ 0.00	$ 3.61
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.03	$ 0.00	$ 2.96
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.04	$ 1.46	$ 0.00	$ 18.76

Exhibit O.10b: State Costs - Present Value, 3% (ICR, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 14.97
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.003	$ 29.94
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.40	$ 0.000	$ 0.48
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.35	$ -	$ 0.69
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.16	$ -	$ 0.54
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.02	$ 0.54	$ -	$ 2.68
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.50	$ 0.000	$ 6.46
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.89	$ 0.000	$ 2.09
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.26	$ 0.000	$ 1.09
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.31	$ 0.003	$ 3.78
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.06	$ 0.000	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.09	$ 3.46	$ 0.003	$ 20.82
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.31	$ 0.000	$ 0.38
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.26	$ -	$ 0.60
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.12	$ -	$ 0.51
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.26	$ -	$ 2.39
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.23	$ 0.000	$ 6.19
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.79	$ 0.000	$ 2.00
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.23	$ 0.000	$ 1.06
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.27	$ 0.003	$ 3.75
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.53	$ 0.003	$ 19.86
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.31	$ 0.000	$ 0.38
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.26	$ -	$ 0.60
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.12	$ -	$ 0.51
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.26	$ -	$ 2.39
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.24	$ 0.000	$ 6.19
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.81	$ 0.000	$ 2.01
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.24	$ 0.000	$ 1.07
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.28	$ 0.003	$ 3.75
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.55	$ 0.003	$ 19.89
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.00	$ 0.17	$ 0.000	$ 0.25
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.16	$ -	$ 0.50
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.11	$ -	$ 2.24
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.11	$ 0.000	$ 6.06
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.38	$ 0.000	$ 1.57
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.11	$ 0.000	$ 0.94
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.13	$ 0.003	$ 3.60
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.02	$ 0.000	$ 2.96
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.03	$ 1.28	$ 0.003	$ 18.58

Exhibit O.10c: State Costs - Present Value, 3% (ICR, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.00	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.00	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.00	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.00	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.00	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.00	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.00	$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.48	$ 0.00	$ 0.56
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.42	$ -	$ 0.76
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.01	$ 0.19	$ -	$ 0.57
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.02	$ 0.66	$ -	$ 2.80
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.02	$ 0.60	$ 0.00	$ 6.57
10,000-49,999	$ 1.03				$ 0.15	$ 0.03	$ 1.05	$ 0.00	$ 2.26
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.31	$ 0.00	$ 1.14
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.36	$ 0.00	$ 3.84
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.06	$ 0.00	$ 3.00
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.11	$ 4.13	$ 0.00	$ 21.51
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.36	$ 0.00	$ 0.44
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.31	$ -	$ 0.65
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.14	$ -	$ 0.53
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.33	$ -	$ 2.46
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.30	$ 0.00	$ 6.26
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.94	$ 0.00	$ 2.15
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.28	$ 0.00	$ 1.11
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.32	$ 0.00	$ 3.80
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.06	$ 0.00	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.08	$ 3.04	$ 0.00	$ 20.39
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.36	$ 0.00	$ 0.44
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.31	$ -	$ 0.65
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.14	$ -	$ 0.53
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.33	$ -	$ 2.46
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.30	$ 0.00	$ 6.26
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.96	$ 0.00	$ 2.17
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.28	$ 0.00	$ 1.11
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.33	$ 0.00	$ 3.81
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.06	$ 0.00	$ 3.00
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.08	$ 3.08	$ 0.00	$ 20.42
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.00	$ 0.18	$ 0.00	$ 0.25
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.17	$ -	$ 0.51
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.12	$ -	$ 2.25
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.11	$ 0.00	$ 6.07
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.46	$ 0.00	$ 1.66
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.14	$ 0.00	$ 0.97
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.16	$ 0.00	$ 3.63
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.03	$ 0.00	$ 2.96
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.04	$ 1.46	$ 0.00	$ 18.77

Exhibit O.10d: State Costs - Present Value, 3% (ICRSSM, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	F	G	H	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75		$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.31	$ 0.000	$ 0.39
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.27	$ -	$ 0.61
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.13	$ -	$ 0.51
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.43	$ -	$ 2.56
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.39	$ 0.000	$ 6.35
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.79	$ 0.000	$ 1.99
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.23	$ 0.000	$ 1.06
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.27	$ 0.003	$ 3.74
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.08	$ 2.87	$ 0.003	$ 20.21
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.26	$ 0.000	$ 0.33
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.21	$ -	$ 0.55
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.11	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.17	$ -	$ 2.29
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.15	$ 0.000	$ 6.11
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.67	$ 0.000	$ 1.87
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.20	$ 0.000	$ 1.03
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.23	$ 0.003	$ 3.70
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 2.03	$ 0.003	$ 19.35
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.26	$ 0.000	$ 0.33
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.21	$ -	$ 0.55
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.11	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.17	$ -	$ 2.29
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.15	$ 0.000	$ 6.11
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.68	$ 0.000	$ 1.88
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.20	$ 0.000	$ 1.03
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.23	$ 0.003	$ 3.70
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 2.05	$ 0.003	$ 19.37
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.20	$ 0.000	$ 0.28
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.17	$ -	$ 0.51
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.47
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.10	$ -	$ 2.23
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.10	$ 0.000	$ 6.05
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.27	$ 0.000	$ 1.46
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.08	$ 0.000	$ 0.91
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.09	$ 0.003	$ 3.56
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.02	$ 0.000	$ 2.95
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.03	$ 1.11	$ 0.003	$ 18.41

Exhibit O.10e: State Costs - Present Value, 3% (ICRSSM, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.003	$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.29	$ 0.000	$ 0.37
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.25	$ -	$ 0.59
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.12	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.38	$ -	$ 2.52
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.35	$ 0.000	$ 6.31
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.71	$ 0.000	$ 1.91
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.21	$ 0.000	$ 1.04
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.24	$ 0.003	$ 3.72
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.59	$ 0.003	$ 19.93
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.24	$ 0.000	$ 0.31
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.20	$ -	$ 0.54
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.15	$ -	$ 2.27
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.13	$ 0.000	$ 6.09
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.60	$ 0.000	$ 1.80
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.18	$ 0.000	$ 1.00
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.20	$ 0.003	$ 3.68
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.97
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 1.84	$ 0.003	$ 19.15
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.24	$ 0.000	$ 0.31
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.20	$ -	$ 0.54
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.15	$ -	$ 2.27
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.13	$ 0.000	$ 6.09
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.61	$ 0.000	$ 1.80
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.18	$ 0.000	$ 1.01
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.21	$ 0.003	$ 3.68
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.97
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 1.85	$ 0.003	$ 19.17
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.20	$ 0.000	$ 0.27
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.16	$ -	$ 0.50
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.47
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.10	$ -	$ 2.22
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.09	$ 0.000	$ 6.04
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.24	$ 0.000	$ 1.43
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.07	$ 0.000	$ 0.90
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.08	$ 0.003	$ 3.55
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.02	$ 0.000	$ 2.95
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.03	$ 1.04	$ 0.003	$ 18.33

Exhibit O.10f: State Costs - Present Value, 3% (ICRSSM, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.003	$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.34	$ 0.000	$ 0.42
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.29	$ -	$ 0.63
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.14	$ -	$ 0.52
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.47	$ -	$ 2.61
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.43	$ 0.000	$ 6.39
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.86	$ 0.000	$ 2.07
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.25	$ 0.000	$ 1.08
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.30	$ 0.003	$ 3.77
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.99
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.08	$ 3.13	$ 0.003	$ 20.48
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.27	$ 0.000	$ 0.34
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.23	$ -	$ 0.57
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.11	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.19	$ -	$ 2.31
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.17	$ 0.000	$ 6.12
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.73	$ 0.000	$ 1.93
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.21	$ 0.000	$ 1.04
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.25	$ 0.003	$ 3.72
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.06	$ 2.20	$ 0.003	$ 19.52
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.27	$ 0.000	$ 0.34
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.23	$ -	$ 0.57
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.11	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.19	$ -	$ 2.31
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.17	$ 0.000	$ 6.13
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.74	$ 0.000	$ 1.94
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.22	$ 0.000	$ 1.05
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.25	$ 0.003	$ 3.73
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.06	$ 2.22	$ 0.003	$ 19.54
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.21	$ 0.000	$ 0.28
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.17	$ -	$ 0.51
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.11	$ -	$ 2.23
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.10	$ 0.000	$ 6.05
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.30	$ 0.000	$ 1.49
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.09	$ 0.000	$ 0.92
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.10	$ 0.003	$ 3.57
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.02	$ 0.000	$ 2.96
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.03	$ 1.18	$ 0.003	$ 18.48

Exhibit O.10g: State Costs - Present Value, 3% (ICRSSL, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.003	$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.28	$ 0.000	$ 0.36
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.24	$ -	$ 0.58
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.12	$ -	$ 0.50
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.35	$ -	$ 2.48
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.32	$ 0.000	$ 6.28
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.69	$ 0.000	$ 1.89
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.20	$ 0.000	$ 1.03
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.24	$ 0.003	$ 3.71
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.48	$ 0.003	$ 19.81
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.23	$ 0.000	$ 0.31
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.19	$ -	$ 0.53
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.13	$ -	$ 2.26
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.12	$ 0.000	$ 6.07
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.56	$ 0.000	$ 1.76
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.16	$ 0.000	$ 0.99
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.19	$ 0.003	$ 3.66
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.97
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 1.73	$ 0.003	$ 19.04
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.23	$ 0.000	$ 0.31
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.19	$ -	$ 0.53
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.13	$ -	$ 2.26
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.12	$ 0.000	$ 6.08
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.57	$ 0.000	$ 1.77
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.17	$ 0.000	$ 1.00
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.19	$ 0.003	$ 3.66
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.97
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 1.74	$ 0.003	$ 19.05
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.19	$ 0.000	$ 0.26
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.16	$ -	$ 0.49
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.08	$ -	$ 0.47
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.09	$ -	$ 2.22
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.09	$ 0.000	$ 6.04
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.20	$ 0.000	$ 1.39
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.06	$ 0.000	$ 0.89
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.07	$ 0.003	$ 3.53
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.01	$ 0.000	$ 2.95
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.03	$ 0.96	$ 0.003	$ 18.25

Exhibit O.10h: State Costs - Present Value, 3% (ICRSSL, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.003	$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.26	$ 0.000	$ 0.33
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.22	$ -	$ 0.56
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.11	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.29	$ -	$ 2.42
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.26	$ 0.000	$ 6.22
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.58	$ 0.000	$ 1.78
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.17	$ 0.000	$ 1.00
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.20	$ 0.003	$ 3.67
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.97
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.06	$ 2.11	$ 0.003	$ 19.43
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.22	$ 0.000	$ 0.29
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.18	$ -	$ 0.52
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.12	$ -	$ 2.24
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.11	$ 0.000	$ 6.06
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.46	$ 0.000	$ 1.65
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.13	$ 0.000	$ 0.96
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.15	$ 0.003	$ 3.63
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.03	$ 0.000	$ 2.96
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.04	$ 1.48	$ 0.003	$ 18.79
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.22	$ 0.000	$ 0.29
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.18	$ -	$ 0.52
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.48
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.12	$ -	$ 2.24
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.11	$ 0.000	$ 6.06
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.46	$ 0.000	$ 1.66
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.14	$ 0.000	$ 0.96
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.16	$ 0.003	$ 3.63
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.03	$ 0.000	$ 2.97
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.04	$ 1.49	$ 0.003	$ 18.80
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.18	$ 0.000	$ 0.25
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.15	$ -	$ 0.49
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.08	$ -	$ 0.47
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.09	$ -	$ 2.21
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.08	$ 0.000	$ 6.04
10,000-49,999	$ 1.03				$ 0.15	$ 0.00	$ 0.17	$ 0.000	$ 1.36
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.05	$ 0.000	$ 0.88
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.06	$ 0.003	$ 3.52
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.01	$ 0.000	$ 2.95
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.02	$ 0.87	$ 0.003	$ 18.16

Exhibit O.10i: State Costs - Present Value, 3% (ICRSSL, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.50	$ 0.000	$ 0.51
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.43	$ -	$ 0.46
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.01	$ 0.19	$ -	$ 0.21
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.06	$ 2.18	$ -	$ 2.33
3,300-9,999	$ 0.26	$ -	$ -	$ -	$ -	$ 0.06	$ 2.01	$ 0.000	$ 2.32
10,000-49,999	$ 1.03				$ -	$ 0.07	$ 2.61	$ 0.000	$ 3.70
50,000-99,999	$ 0.72				$ -	$ 0.02	$ 0.76	$ 0.000	$ 1.49
100,000-999,999	$ 2.99				$ -	$ 0.02	$ 0.92	$ 0.003	$ 3.93
1,000,000+	$ 2.53				$ -	$ 0.00	$ 0.16	$ 0.000	$ 2.70
Total	$ 7.66	$ -	$ -	$ -	$ -	$ 0.26	$ 9.75	$ 0.003	$ 17.67
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.31	$ 0.000	$ 0.38
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.26	$ -	$ 0.60
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.12	$ -	$ 0.51
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.01	$ 0.40	$ -	$ 2.53
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.01	$ 0.36	$ 0.000	$ 6.32
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.78	$ 0.000	$ 1.98
50,000-99,999	$ 0.72				$ 0.11	$ 0.01	$ 0.23	$ 0.000	$ 1.06
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.27	$ 0.003	$ 3.74
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.07	$ 2.77	$ 0.003	$ 20.11
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.24	$ 0.000	$ 0.32
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.20	$ -	$ 0.54
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.15	$ -	$ 2.27
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.13	$ 0.000	$ 6.09
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.63	$ 0.000	$ 1.83
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.19	$ 0.000	$ 1.01
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.22	$ 0.003	$ 3.69
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 1.90	$ 0.003	$ 19.22
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.24	$ 0.000	$ 0.32
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.01	$ 0.20	$ -	$ 0.54
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.10	$ -	$ 0.49
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.15	$ -	$ 2.27
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.13	$ 0.000	$ 6.09
10,000-49,999	$ 1.03				$ 0.15	$ 0.02	$ 0.64	$ 0.000	$ 1.84
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.19	$ 0.000	$ 1.02
100,000-999,999	$ 2.99				$ 0.47	$ 0.01	$ 0.22	$ 0.003	$ 3.69
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.04	$ 0.000	$ 2.98
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.05	$ 1.92	$ 0.003	$ 19.23
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.20	$ 0.000	$ 0.27
100-499	$ 0.01	$ 0.12	$ 0.08	$ 0.08	$ 0.04	$ 0.00	$ 0.16	$ -	$ 0.50
500-999	$ 0.02	$ 0.14	$ 0.09	$ 0.09	$ 0.04	$ 0.00	$ 0.09	$ -	$ 0.47
1,000-3,299	$ 0.09	$ 0.79	$ 0.48	$ 0.52	$ 0.24	$ 0.00	$ 0.10	$ -	$ 2.22
3,300-9,999	$ 0.26	$ 2.20	$ 1.35	$ 1.46	$ 0.69	$ 0.00	$ 0.09	$ 0.000	$ 6.04
10,000-49,999	$ 1.03				$ 0.15	$ 0.01	$ 0.24	$ 0.000	$ 1.43
50,000-99,999	$ 0.72				$ 0.11	$ 0.00	$ 0.07	$ 0.000	$ 0.90
100,000-999,999	$ 2.99				$ 0.47	$ 0.00	$ 0.08	$ 0.003	$ 3.55
1,000,000+	$ 2.53				$ 0.40	$ 0.00	$ 0.02	$ 0.000	$ 2.95
Total	$ 7.66	$ 3.28	$ 2.00	$ 2.17	$ 2.16	$ 0.03	$ 1.04	$ 0.003	$ 18.33

Exhibit O.11a: Implementation and Monitoring - PV, 3% (ICR, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.13
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.89	$ 0.00	$ 11.24
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 13.76	$ 0.01	$ 14.13
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.00	$ 0.00	$ 4.09
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.48	$ 0.01	$ 5.60
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.95	$ 0.00	$ 0.97
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 51.48	$ 0.02	$ 53.46
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.28	$ 10.51	$ 0.10	$ 0.02	$ 1.69	$ 0.00	$ 31.94
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.44	$ 11.77	$ 0.13	$ 0.01	$ 1.57	$ -	$ 35.14
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.59	$ 4.80	$ 0.07	$ 0.01	$ 0.91	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.05	$ 8.51	$ 0.12	$ 0.03	$ 3.15	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 0.97	$ 7.82	$ 0.11	$ 0.03	$ 2.93	$ 0.00	$ 27.50
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.49	$ 7.28	$ 0.10	$ 0.05	$ 5.19	$ 0.01	$ 29.16
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.12	$ 1.80	$ 0.02	$ 0.01	$ 1.51	$ 0.00	$ 7.45
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.20	$ 0.03	$ 0.02	$ 2.04	$ 0.01	$ 9.13
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.37	$ 0.01	$ 0.00	$ 0.37	$ 0.00	$ 1.60
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.07	$ 55.06	$ 0.68	$ 0.17	$ 19.35	$ 0.02	$ 186.66
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 5.57	$ 0.16	$ 1.33	$ 3.79	$ 0.11	$ 0.01	$ 1.28	$ 0.00	$ 14.44
100-499	$ 0.25	$ 2.18	$ 6.15	$ 0.19	$ 1.50	$ 4.24	$ 0.13	$ 0.01	$ 1.18	$ -	$ 15.83
500-999	$ 0.13	$ 0.91	$ 2.57	$ 0.10	$ 0.61	$ 1.73	$ 0.07	$ 0.01	$ 0.72	$ -	$ 6.84
1,000-3,299	$ 0.27	$ 1.82	$ 5.26	$ 0.20	$ 1.22	$ 3.44	$ 0.14	$ 0.01	$ 1.60	$ -	$ 13.97
3,300-9,999	$ 0.25	$ 1.67	$ 4.83	$ 0.19	$ 1.12	$ 3.16	$ 0.13	$ 0.01	$ 1.48	$ 0.00	$ 12.85
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.52	$ 7.66	$ 0.10	$ 0.04	$ 4.72	$ 0.01	$ 29.10
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.89	$ 0.02	$ 0.01	$ 1.38	$ 0.00	$ 7.41
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.31	$ 0.03	$ 0.02	$ 1.84	$ 0.01	$ 9.07
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.39	$ 0.01	$ 0.00	$ 0.33	$ 0.00	$ 1.59
Total	$ 1.51	$ 10.04	$ 47.82	$ 1.15	$ 6.56	$ 28.61	$ 0.74	$ 0.13	$ 14.53	$ 0.02	$ 111.11
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 5.57	$ 0.16	$ 1.33	$ 3.79	$ 0.11	$ 0.01	$ 1.28	$ 0.00	$ 14.44
100-499	$ 0.25	$ 2.18	$ 6.15	$ 0.19	$ 1.50	$ 4.24	$ 0.13	$ 0.01	$ 1.18	$ -	$ 15.83
500-999	$ 0.13	$ 0.91	$ 2.57	$ 0.10	$ 0.61	$ 1.73	$ 0.07	$ 0.01	$ 0.72	$ -	$ 6.84
1,000-3,299	$ 0.27	$ 1.82	$ 5.26	$ 0.20	$ 1.22	$ 3.44	$ 0.14	$ 0.01	$ 1.60	$ -	$ 13.97
3,300-9,999	$ 0.25	$ 1.67	$ 4.83	$ 0.19	$ 1.12	$ 3.16	$ 0.13	$ 0.01	$ 1.49	$ 0.00	$ 12.86
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.51	$ 7.58	$ 0.10	$ 0.04	$ 4.82	$ 0.01	$ 29.11
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.87	$ 0.02	$ 0.01	$ 1.41	$ 0.00	$ 7.42
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.29	$ 0.03	$ 0.02	$ 1.88	$ 0.01	$ 9.08
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.39	$ 0.01	$ 0.00	$ 0.34	$ 0.00	$ 1.59
Total	$ 1.51	$ 10.04	$ 47.82	$ 1.15	$ 6.55	$ 28.49	$ 0.74	$ 0.13	$ 14.71	$ 0.02	$ 111.16
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 4.85	$ 0.16	$ 1.38	$ 3.41	$ 0.11	$ 0.01	$ 0.88	$ 0.00	$ 12.99
100-499	$ 0.25	$ 2.18	$ 5.36	$ 0.19	$ 1.55	$ 3.82	$ 0.13	$ 0.01	$ 0.79	$ -	$ 14.28
500-999	$ 0.13	$ 0.91	$ 2.24	$ 0.10	$ 0.63	$ 1.56	$ 0.07	$ 0.00	$ 0.52	$ -	$ 6.17
1,000-3,299	$ 0.27	$ 1.82	$ 4.61	$ 0.20	$ 1.32	$ 3.26	$ 0.15	$ 0.01	$ 0.64	$ -	$ 12.28
3,300-9,999	$ 0.25	$ 1.67	$ 4.23	$ 0.19	$ 1.22	$ 2.98	$ 0.14	$ 0.01	$ 0.60	$ 0.00	$ 11.29
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.64	$ 9.53	$ 0.13	$ 0.02	$ 2.34	$ 0.01	$ 28.71
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.16	$ 2.35	$ 0.03	$ 0.01	$ 0.69	$ 0.00	$ 7.21
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.14	$ 2.87	$ 0.04	$ 0.01	$ 0.88	$ 0.01	$ 8.70
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.49	$ 0.01	$ 0.00	$ 0.17	$ 0.00	$ 1.53
Total	$ 1.51	$ 10.04	$ 44.73	$ 1.15	$ 7.06	$ 30.27	$ 0.81	$ 0.07	$ 7.50	$ 0.02	$ 103.16

Exhibit O.11b: Implementation and Monitoring - PV, 3% (ICR, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.30	$ 10.64	$ 0.11	$ 0.01	$ 1.54	$ 0.00	$ 31.94
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.46	$ 11.92	$ 0.13	$ 0.01	$ 1.43	$ -	$ 35.16
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.60	$ 4.86	$ 0.07	$ 0.01	$ 0.85	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.07	$ 8.71	$ 0.12	$ 0.03	$ 2.92	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 0.99	$ 8.00	$ 0.11	$ 0.03	$ 2.72	$ 0.00	$ 27.50
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.51	$ 7.49	$ 0.10	$ 0.04	$ 4.92	$ 0.01	$ 29.13
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.85	$ 0.02	$ 0.01	$ 1.44	$ 0.00	$ 7.43
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.26	$ 0.03	$ 0.02	$ 1.93	$ 0.01	$ 9.10
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.39	$ 0.01	$ 0.00	$ 0.35	$ 0.00	$ 1.59
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.19	$ 56.12	$ 0.70	$ 0.16	$ 18.10	$ 0.02	$186.60
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 5.18	$ 0.16	$ 1.34	$ 3.56	$ 0.11	$ 0.01	$ 1.17	$ 0.00	$ 13.72
100-499	$ 0.25	$ 2.18	$ 5.72	$ 0.19	$ 1.51	$ 3.98	$ 0.13	$ 0.01	$ 1.07	$ -	$ 15.05
500-999	$ 0.13	$ 0.91	$ 2.39	$ 0.10	$ 0.62	$ 1.62	$ 0.07	$ 0.01	$ 0.66	$ -	$ 6.51
1,000-3,299	$ 0.27	$ 1.82	$ 4.91	$ 0.20	$ 1.24	$ 3.26	$ 0.14	$ 0.01	$ 1.38	$ -	$ 13.24
3,300-9,999	$ 0.25	$ 1.67	$ 4.50	$ 0.19	$ 1.14	$ 3.00	$ 0.13	$ 0.01	$ 1.28	$ 0.00	$ 12.18
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.54	$ 7.91	$ 0.10	$ 0.04	$ 4.40	$ 0.01	$ 29.04
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.95	$ 0.03	$ 0.01	$ 1.29	$ 0.00	$ 7.39
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.39	$ 0.04	$ 0.01	$ 1.71	$ 0.01	$ 9.02
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.41	$ 0.01	$ 0.00	$ 0.31	$ 0.00	$ 1.58
Total	$ 1.51	$ 10.04	$ 46.14	$ 1.15	$ 6.66	$ 28.08	$ 0.75	$ 0.12	$ 13.27	$ 0.02	$107.74
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 5.18	$ 0.16	$ 1.34	$ 3.56	$ 0.11	$ 0.01	$ 1.17	$ 0.00	$ 13.72
100-499	$ 0.25	$ 2.18	$ 5.72	$ 0.19	$ 1.51	$ 3.98	$ 0.13	$ 0.01	$ 1.07	$ -	$ 15.05
500-999	$ 0.13	$ 0.91	$ 2.39	$ 0.10	$ 0.62	$ 1.62	$ 0.07	$ 0.01	$ 0.66	$ -	$ 6.51
1,000-3,299	$ 0.27	$ 1.82	$ 4.91	$ 0.20	$ 1.24	$ 3.26	$ 0.14	$ 0.01	$ 1.38	$ -	$ 13.24
3,300-9,999	$ 0.25	$ 1.67	$ 4.50	$ 0.19	$ 1.14	$ 2.99	$ 0.13	$ 0.01	$ 1.29	$ 0.00	$ 12.18
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.53	$ 7.84	$ 0.10	$ 0.04	$ 4.48	$ 0.01	$ 29.06
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.94	$ 0.03	$ 0.01	$ 1.31	$ 0.00	$ 7.39
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.37	$ 0.04	$ 0.01	$ 1.74	$ 0.01	$ 9.03
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.40	$ 0.01	$ 0.00	$ 0.32	$ 0.00	$ 1.58
Total	$ 1.51	$ 10.04	$ 46.14	$ 1.15	$ 6.65	$ 27.97	$ 0.75	$ 0.12	$ 13.42	$ 0.02	$107.78
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 4.49	$ 0.16	$ 1.40	$ 3.20	$ 0.11	$ 0.01	$ 0.67	$ 0.00	$ 12.23
100-499	$ 0.25	$ 2.18	$ 4.96	$ 0.19	$ 1.56	$ 3.56	$ 0.14	$ 0.01	$ 0.67	$ -	$ 13.52
500-999	$ 0.13	$ 0.91	$ 2.07	$ 0.10	$ 0.64	$ 1.45	$ 0.07	$ 0.00	$ 0.49	$ -	$ 5.86
1,000-3,299	$ 0.27	$ 1.82	$ 4.27	$ 0.20	$ 1.33	$ 3.02	$ 0.15	$ 0.01	$ 0.60	$ -	$ 11.68
3,300-9,999	$ 0.25	$ 1.67	$ 3.92	$ 0.19	$ 1.22	$ 2.77	$ 0.14	$ 0.01	$ 0.57	$ 0.00	$ 10.74
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.66	$ 9.72	$ 0.13	$ 0.02	$ 2.08	$ 0.01	$ 28.67
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.16	$ 2.40	$ 0.03	$ 0.01	$ 0.62	$ 0.00	$ 7.19
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.14	$ 2.93	$ 0.04	$ 0.01	$ 0.79	$ 0.01	$ 8.66
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.50	$ 0.01	$ 0.00	$ 0.15	$ 0.00	$ 1.52
Total	$ 1.51	$ 10.04	$ 43.16	$ 1.15	$ 7.13	$ 29.54	$ 0.82	$ 0.06	$ 6.64	$ 0.02	$100.07

Exhibit O.11c: Implementation and Monitoring - PV, 3% (ICR, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.26	$ 10.36	$ 0.10	$ 0.02	$ 1.85	$ 0.00	$ 31.93
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.42	$ 11.61	$ 0.12	$ 0.02	$ 1.72	$ -	$ 35.11
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.58	$ 4.73	$ 0.07	$ 0.01	$ 0.99	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.01	$ 8.18	$ 0.11	$ 0.03	$ 3.52	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 0.93	$ 7.52	$ 0.11	$ 0.03	$ 3.27	$ 0.00	$ 27.51
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.46	$ 6.78	$ 0.09	$ 0.05	$ 5.83	$ 0.01	$ 29.27
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.11	$ 1.68	$ 0.02	$ 0.01	$ 1.70	$ 0.00	$ 7.51
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.10	$ 2.05	$ 0.03	$ 0.02	$ 2.29	$ 0.01	$ 9.24
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.35	$ 0.01	$ 0.00	$ 0.41	$ 0.00	$ 1.62
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 5.90	$ 53.25	$ 0.66	$ 0.19	$ 21.59	$ 0.02	$186.92
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 6.23	$ 0.16	$ 1.32	$ 4.20	$ 0.11	$ 0.01	$ 1.38	$ 0.00	$ 15.61
100-499	$ 0.25	$ 2.18	$ 6.88	$ 0.19	$ 1.48	$ 4.71	$ 0.13	$ 0.01	$ 1.27	$ -	$ 17.11
500-999	$ 0.13	$ 0.91	$ 2.87	$ 0.10	$ 0.61	$ 1.92	$ 0.07	$ 0.01	$ 0.77	$ -	$ 7.38
1,000-3,299	$ 0.27	$ 1.82	$ 5.87	$ 0.20	$ 1.20	$ 3.80	$ 0.14	$ 0.02	$ 1.75	$ -	$ 15.07
3,300-9,999	$ 0.25	$ 1.67	$ 5.38	$ 0.19	$ 1.11	$ 3.49	$ 0.13	$ 0.02	$ 1.62	$ 0.00	$ 13.86
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.49	$ 7.25	$ 0.10	$ 0.05	$ 5.24	$ 0.01	$ 29.18
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.12	$ 1.79	$ 0.02	$ 0.01	$ 1.53	$ 0.00	$ 7.46
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.19	$ 0.03	$ 0.02	$ 2.04	$ 0.01	$ 9.15
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.37	$ 0.01	$ 0.00	$ 0.37	$ 0.00	$ 1.60
Total	$ 1.51	$ 10.04	$ 50.67	$ 1.15	$ 6.45	$ 29.72	$ 0.72	$ 0.14	$ 15.99	$ 0.02	$116.41
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 6.23	$ 0.16	$ 1.32	$ 4.20	$ 0.11	$ 0.01	$ 1.38	$ 0.00	$ 15.61
100-499	$ 0.25	$ 2.18	$ 6.88	$ 0.19	$ 1.48	$ 4.71	$ 0.13	$ 0.01	$ 1.27	$ -	$ 17.11
500-999	$ 0.13	$ 0.91	$ 2.87	$ 0.10	$ 0.61	$ 1.92	$ 0.07	$ 0.01	$ 0.77	$ -	$ 7.38
1,000-3,299	$ 0.27	$ 1.82	$ 5.87	$ 0.20	$ 1.20	$ 3.80	$ 0.14	$ 0.02	$ 1.75	$ -	$ 15.07
3,300-9,999	$ 0.25	$ 1.67	$ 5.38	$ 0.19	$ 1.11	$ 3.48	$ 0.13	$ 0.02	$ 1.64	$ 0.00	$ 13.86
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.48	$ 7.16	$ 0.09	$ 0.05	$ 5.35	$ 0.01	$ 29.20
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.12	$ 1.77	$ 0.02	$ 0.01	$ 1.56	$ 0.00	$ 7.47
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.17	$ 0.03	$ 0.02	$ 2.08	$ 0.01	$ 9.17
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.37	$ 0.01	$ 0.00	$ 0.37	$ 0.00	$ 1.60
Total	$ 1.51	$ 10.04	$ 50.67	$ 1.15	$ 6.44	$ 29.58	$ 0.72	$ 0.14	$ 16.19	$ 0.02	$116.46
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 5.43	$ 0.16	$ 1.39	$ 3.87	$ 0.11	$ 0.01	$ 0.68	$ 0.00	$ 13.85
100-499	$ 0.25	$ 2.18	$ 6.00	$ 0.19	$ 1.56	$ 4.30	$ 0.14	$ 0.01	$ 0.70	$ -	$ 15.33
500-999	$ 0.13	$ 0.91	$ 2.50	$ 0.10	$ 0.63	$ 1.74	$ 0.07	$ 0.00	$ 0.51	$ -	$ 6.61
1,000-3,299	$ 0.27	$ 1.82	$ 5.13	$ 0.20	$ 1.32	$ 3.64	$ 0.15	$ 0.01	$ 0.66	$ -	$ 13.20
3,300-9,999	$ 0.25	$ 1.67	$ 4.71	$ 0.19	$ 1.21	$ 3.33	$ 0.14	$ 0.01	$ 0.62	$ 0.00	$ 12.14
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.63	$ 9.35	$ 0.12	$ 0.02	$ 2.56	$ 0.01	$ 28.75
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.16	$ 2.30	$ 0.03	$ 0.01	$ 0.76	$ 0.00	$ 7.23
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.14	$ 2.82	$ 0.04	$ 0.01	$ 0.98	$ 0.01	$ 8.73
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.48	$ 0.01	$ 0.00	$ 0.18	$ 0.00	$ 1.53
Total	$ 1.51	$ 10.04	$ 47.22	$ 1.15	$ 7.07	$ 31.83	$ 0.81	$ 0.07	$ 7.66	$ 0.02	$107.38

Exhibit O.11d: Implementation and Monitoring - PV, 3% (ICRSSM, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.34	$ 10.96	$ 0.11	$ 0.01	$ 1.20	$ 0.00	$ 31.96
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.51	$ 12.27	$ 0.13	$ 0.01	$ 1.10	$ -	$ 35.23
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.62	$ 5.00	$ 0.07	$ 0.01	$ 0.68	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.14	$ 9.27	$ 0.13	$ 0.02	$ 2.29	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 1.05	$ 8.51	$ 0.12	$ 0.02	$ 2.13	$ 0.00	$ 27.49
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.54	$ 7.92	$ 0.10	$ 0.04	$ 4.38	$ 0.01	$ 29.04
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.96	$ 0.03	$ 0.01	$ 1.28	$ 0.00	$ 7.39
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.39	$ 0.04	$ 0.01	$ 1.70	$ 0.01	$ 9.02
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.41	$ 0.01	$ 0.00	$ 0.31	$ 0.00	$ 1.58
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.46	$ 58.69	$ 0.73	$ 0.13	$ 15.09	$ 0.02	$ 186.44
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 4.36	$ 0.16	$ 1.36	$ 3.04	$ 0.11	$ 0.01	$ 0.98	$ 0.00	$ 12.21
100-499	$ 0.25	$ 2.18	$ 4.82	$ 0.19	$ 1.53	$ 3.40	$ 0.13	$ 0.01	$ 0.88	$ -	$ 13.40
500-999	$ 0.13	$ 0.91	$ 2.01	$ 0.10	$ 0.63	$ 1.39	$ 0.07	$ 0.01	$ 0.57	$ -	$ 5.82
1,000-3,299	$ 0.27	$ 1.82	$ 4.15	$ 0.20	$ 1.30	$ 2.86	$ 0.15	$ 0.01	$ 0.90	$ -	$ 11.66
3,300-9,999	$ 0.25	$ 1.67	$ 3.81	$ 0.19	$ 1.19	$ 2.62	$ 0.14	$ 0.01	$ 0.83	$ 0.00	$ 10.72
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.57	$ 8.45	$ 0.11	$ 0.03	$ 3.71	$ 0.01	$ 28.94
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.08	$ 0.03	$ 0.01	$ 1.09	$ 0.00	$ 7.33
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.55	$ 0.04	$ 0.01	$ 1.44	$ 0.01	$ 8.92
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.43	$ 0.01	$ 0.00	$ 0.26	$ 0.00	$ 1.56
Total	$ 1.51	$ 10.04	$ 42.60	$ 1.15	$ 6.87	$ 26.82	$ 0.78	$ 0.09	$ 10.66	$ 0.02	$ 100.55
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 4.36	$ 0.16	$ 1.36	$ 3.04	$ 0.11	$ 0.01	$ 0.98	$ 0.00	$ 12.21
100-499	$ 0.25	$ 2.18	$ 4.82	$ 0.19	$ 1.53	$ 3.40	$ 0.13	$ 0.01	$ 0.88	$ -	$ 13.40
500-999	$ 0.13	$ 0.91	$ 2.01	$ 0.10	$ 0.63	$ 1.39	$ 0.07	$ 0.01	$ 0.57	$ -	$ 5.82
1,000-3,299	$ 0.27	$ 1.82	$ 4.15	$ 0.20	$ 1.30	$ 2.86	$ 0.15	$ 0.01	$ 0.90	$ -	$ 11.66
3,300-9,999	$ 0.25	$ 1.67	$ 3.81	$ 0.19	$ 1.19	$ 2.62	$ 0.14	$ 0.01	$ 0.84	$ 0.00	$ 10.72
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.57	$ 8.40	$ 0.11	$ 0.03	$ 3.77	$ 0.01	$ 28.95
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.07	$ 0.03	$ 0.01	$ 1.10	$ 0.00	$ 7.34
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.54	$ 0.04	$ 0.01	$ 1.46	$ 0.01	$ 8.92
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.43	$ 0.01	$ 0.00	$ 0.27	$ 0.00	$ 1.56
Total	$ 1.51	$ 10.04	$ 42.60	$ 1.15	$ 6.87	$ 26.75	$ 0.78	$ 0.09	$ 10.77	$ 0.02	$ 100.59
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 3.45	$ 0.16	$ 1.39	$ 2.44	$ 0.11	$ 0.01	$ 0.78	$ 0.00	$ 10.53
100-499	$ 0.25	$ 2.18	$ 3.82	$ 0.19	$ 1.56	$ 2.73	$ 0.14	$ 0.01	$ 0.69	$ -	$ 11.57
500-999	$ 0.13	$ 0.91	$ 1.60	$ 0.10	$ 0.64	$ 1.11	$ 0.07	$ 0.00	$ 0.47	$ -	$ 5.04
1,000-3,299	$ 0.27	$ 1.82	$ 3.32	$ 0.20	$ 1.33	$ 2.33	$ 0.15	$ 0.01	$ 0.55	$ -	$ 9.99
3,300-9,999	$ 0.25	$ 1.67	$ 3.05	$ 0.19	$ 1.23	$ 2.13	$ 0.14	$ 0.00	$ 0.52	$ 0.00	$ 9.19
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.69	$ 10.18	$ 0.13	$ 0.01	$ 1.49	$ 0.01	$ 28.57
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.17	$ 2.51	$ 0.03	$ 0.00	$ 0.44	$ 0.00	$ 7.14
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.15	$ 3.06	$ 0.05	$ 0.00	$ 0.56	$ 0.01	$ 8.57
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.03	$ 0.52	$ 0.01	$ 0.00	$ 0.11	$ 0.00	$ 1.50
Total	$ 1.51	$ 10.04	$ 38.69	$ 1.15	$ 7.18	$ 27.03	$ 0.83	$ 0.05	$ 5.62	$ 0.02	$ 92.11

Exhibit O.11e: Implementation and Monitoring - PV, 3% (ICRSSM, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.35	$ 11.04	$ 0.11	$ 0.01	$ 1.12	$ 0.00	$ 31.97
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.52	$ 12.36	$ 0.13	$ 0.01	$ 1.02	$ -	$ 35.24
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.62	$ 5.04	$ 0.07	$ 0.01	$ 0.64	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.17	$ 9.49	$ 0.13	$ 0.02	$ 2.05	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 1.08	$ 8.71	$ 0.12	$ 0.02	$ 1.91	$ 0.00	$ 27.48
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.56	$ 8.27	$ 0.11	$ 0.03	$ 3.93	$ 0.01	$ 28.97
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.04	$ 0.03	$ 0.01	$ 1.15	$ 0.00	$ 7.35
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.50	$ 0.04	$ 0.01	$ 1.53	$ 0.01	$ 8.95
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.43	$ 0.01	$ 0.00	$ 0.28	$ 0.00	$ 1.57
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.57	$ 59.87	$ 0.75	$ 0.12	$ 13.62	$ 0.02	$ 186.27
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 3.85	$ 0.16	$ 1.37	$ 2.69	$ 0.11	$ 0.01	$ 0.92	$ 0.00	$ 11.30
100-499	$ 0.25	$ 2.18	$ 4.26	$ 0.19	$ 1.54	$ 3.01	$ 0.13	$ 0.01	$ 0.83	$ -	$ 12.40
500-999	$ 0.13	$ 0.91	$ 1.78	$ 0.10	$ 0.63	$ 1.23	$ 0.07	$ 0.00	$ 0.54	$ -	$ 5.40
1,000-3,299	$ 0.27	$ 1.82	$ 3.69	$ 0.20	$ 1.31	$ 2.55	$ 0.15	$ 0.01	$ 0.79	$ -	$ 10.78
3,300-9,999	$ 0.25	$ 1.67	$ 3.38	$ 0.19	$ 1.20	$ 2.34	$ 0.14	$ 0.01	$ 0.73	$ 0.00	$ 9.91
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.59	$ 8.76	$ 0.12	$ 0.03	$ 3.31	$ 0.01	$ 28.87
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.15	$ 2.16	$ 0.03	$ 0.01	$ 0.97	$ 0.00	$ 7.30
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.64	$ 0.04	$ 0.01	$ 1.28	$ 0.01	$ 8.85
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.45	$ 0.01	$ 0.00	$ 0.24	$ 0.00	$ 1.55
Total	$ 1.51	$ 10.04	$ 40.40	$ 1.15	$ 6.95	$ 25.83	$ 0.79	$ 0.08	$ 9.61	$ 0.02	$ 96.37
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 3.85	$ 0.16	$ 1.37	$ 2.69	$ 0.11	$ 0.01	$ 0.92	$ 0.00	$ 11.30
100-499	$ 0.25	$ 2.18	$ 4.26	$ 0.19	$ 1.54	$ 3.01	$ 0.13	$ 0.01	$ 0.83	$ -	$ 12.40
500-999	$ 0.13	$ 0.91	$ 1.78	$ 0.10	$ 0.63	$ 1.23	$ 0.07	$ 0.00	$ 0.54	$ -	$ 5.40
1,000-3,299	$ 0.27	$ 1.82	$ 3.69	$ 0.20	$ 1.31	$ 2.55	$ 0.15	$ 0.01	$ 0.79	$ -	$ 10.78
3,300-9,999	$ 0.25	$ 1.67	$ 3.38	$ 0.19	$ 1.20	$ 2.33	$ 0.14	$ 0.01	$ 0.74	$ 0.00	$ 9.92
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.59	$ 8.72	$ 0.12	$ 0.03	$ 3.36	$ 0.01	$ 28.88
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.15	$ 2.15	$ 0.03	$ 0.01	$ 0.99	$ 0.00	$ 7.30
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.63	$ 0.04	$ 0.01	$ 1.30	$ 0.01	$ 8.86
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.45	$ 0.01	$ 0.00	$ 0.24	$ 0.00	$ 1.55
Total	$ 1.51	$ 10.04	$ 40.40	$ 1.15	$ 6.94	$ 25.77	$ 0.79	$ 0.08	$ 9.70	$ 0.02	$ 96.40
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 3.03	$ 0.16	$ 1.39	$ 2.15	$ 0.11	$ 0.01	$ 0.76	$ 0.00	$ 9.79
100-499	$ 0.25	$ 2.18	$ 3.36	$ 0.19	$ 1.56	$ 2.40	$ 0.14	$ 0.01	$ 0.67	$ -	$ 10.76
500-999	$ 0.13	$ 0.91	$ 1.41	$ 0.10	$ 0.64	$ 0.98	$ 0.07	$ 0.00	$ 0.46	$ -	$ 4.71
1,000-3,299	$ 0.27	$ 1.82	$ 2.94	$ 0.20	$ 1.34	$ 2.05	$ 0.15	$ 0.00	$ 0.53	$ -	$ 9.31
3,300-9,999	$ 0.25	$ 1.67	$ 2.70	$ 0.19	$ 1.23	$ 1.88	$ 0.14	$ 0.00	$ 0.50	$ 0.00	$ 8.57
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.70	$ 10.32	$ 0.14	$ 0.01	$ 1.32	$ 0.01	$ 28.54
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.17	$ 2.55	$ 0.03	$ 0.00	$ 0.39	$ 0.00	$ 7.13
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.15	$ 3.10	$ 0.05	$ 0.00	$ 0.49	$ 0.01	$ 8.54
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.03	$ 0.53	$ 0.01	$ 0.00	$ 0.10	$ 0.00	$ 1.50
Total	$ 1.51	$ 10.04	$ 36.89	$ 1.15	$ 7.20	$ 25.95	$ 0.83	$ 0.05	$ 5.22	$ 0.02	$ 88.86

Exhibit O.11f: Implementation and Monitoring - PV, 3% (ICRSSM, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.33	$ 10.86	$ 0.11	$ 0.01	$ 1.31	$ 0.00	$ 31.96
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.49	$ 12.16	$ 0.13	$ 0.01	$ 1.21	$ -	$ 35.21
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.61	$ 4.96	$ 0.07	$ 0.01	$ 0.73	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.12	$ 9.07	$ 0.13	$ 0.02	$ 2.52	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 1.03	$ 8.33	$ 0.12	$ 0.02	$ 2.34	$ 0.00	$ 27.49
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.52	$ 7.61	$ 0.10	$ 0.04	$ 4.78	$ 0.01	$ 29.11
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.88	$ 0.02	$ 0.01	$ 1.40	$ 0.00	$ 7.42
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.11	$ 2.30	$ 0.03	$ 0.02	$ 1.86	$ 0.01	$ 9.08
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.39	$ 0.01	$ 0.00	$ 0.34	$ 0.00	$ 1.59
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.35	$ 57.56	$ 0.71	$ 0.15	$ 16.48	$ 0.02	$ 186.59
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 4.79	$ 0.16	$ 1.36	$ 3.33	$ 0.11	$ 0.01	$ 1.02	$ 0.00	$ 12.98
100-499	$ 0.25	$ 2.18	$ 5.30	$ 0.19	$ 1.53	$ 3.73	$ 0.13	$ 0.01	$ 0.93	$ -	$ 14.25
500-999	$ 0.13	$ 0.91	$ 2.21	$ 0.10	$ 0.63	$ 1.52	$ 0.07	$ 0.01	$ 0.59	$ -	$ 6.17
1,000-3,299	$ 0.27	$ 1.82	$ 4.55	$ 0.20	$ 1.29	$ 3.12	$ 0.14	$ 0.01	$ 1.00	$ -	$ 12.40
3,300-9,999	$ 0.25	$ 1.67	$ 4.18	$ 0.19	$ 1.18	$ 2.86	$ 0.13	$ 0.01	$ 0.92	$ 0.00	$ 11.40
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.55	$ 8.18	$ 0.11	$ 0.04	$ 4.06	$ 0.01	$ 28.99
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.02	$ 0.03	$ 0.01	$ 1.19	$ 0.00	$ 7.36
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.47	$ 0.04	$ 0.01	$ 1.57	$ 0.01	$ 8.97
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.42	$ 0.01	$ 0.00	$ 0.29	$ 0.00	$ 1.57
Total	$ 1.51	$ 10.04	$ 44.47	$ 1.15	$ 6.81	$ 27.65	$ 0.77	$ 0.10	$ 11.56	$ 0.02	$ 104.08
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 4.79	$ 0.16	$ 1.36	$ 3.33	$ 0.11	$ 0.01	$ 1.02	$ 0.00	$ 12.98
100-499	$ 0.25	$ 2.18	$ 5.30	$ 0.19	$ 1.53	$ 3.73	$ 0.13	$ 0.01	$ 0.93	$ -	$ 14.25
500-999	$ 0.13	$ 0.91	$ 2.21	$ 0.10	$ 0.63	$ 1.52	$ 0.07	$ 0.01	$ 0.59	$ -	$ 6.17
1,000-3,299	$ 0.27	$ 1.82	$ 4.55	$ 0.20	$ 1.29	$ 3.12	$ 0.14	$ 0.01	$ 1.00	$ -	$ 12.40
3,300-9,999	$ 0.25	$ 1.67	$ 4.18	$ 0.19	$ 1.18	$ 2.86	$ 0.13	$ 0.01	$ 0.93	$ 0.00	$ 11.41
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.55	$ 8.13	$ 0.11	$ 0.04	$ 4.12	$ 0.01	$ 29.00
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.01	$ 0.03	$ 0.01	$ 1.21	$ 0.00	$ 7.36
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.46	$ 0.04	$ 0.01	$ 1.60	$ 0.01	$ 8.98
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.42	$ 0.01	$ 0.00	$ 0.29	$ 0.00	$ 1.57
Total	$ 1.51	$ 10.04	$ 44.47	$ 1.15	$ 6.81	$ 27.57	$ 0.77	$ 0.10	$ 11.69	$ 0.02	$ 104.12
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 3.83	$ 0.16	$ 1.38	$ 2.71	$ 0.11	$ 0.01	$ 0.80	$ 0.00	$ 11.20
100-499	$ 0.25	$ 2.18	$ 4.24	$ 0.19	$ 1.56	$ 3.03	$ 0.14	$ 0.01	$ 0.71	$ -	$ 12.31
500-999	$ 0.13	$ 0.91	$ 1.77	$ 0.10	$ 0.64	$ 1.24	$ 0.07	$ 0.00	$ 0.48	$ -	$ 5.35
1,000-3,299	$ 0.27	$ 1.82	$ 3.67	$ 0.20	$ 1.33	$ 2.58	$ 0.15	$ 0.01	$ 0.57	$ -	$ 10.61
3,300-9,999	$ 0.25	$ 1.67	$ 3.37	$ 0.19	$ 1.22	$ 2.37	$ 0.14	$ 0.00	$ 0.54	$ 0.00	$ 9.76
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.68	$ 10.06	$ 0.13	$ 0.01	$ 1.65	$ 0.01	$ 28.60
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.17	$ 2.48	$ 0.03	$ 0.00	$ 0.49	$ 0.00	$ 7.16
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.15	$ 3.03	$ 0.05	$ 0.01	$ 0.62	$ 0.01	$ 8.59
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.03	$ 0.52	$ 0.01	$ 0.00	$ 0.12	$ 0.00	$ 1.51
Total	$ 1.51	$ 10.04	$ 40.33	$ 1.15	$ 7.16	$ 28.01	$ 0.83	$ 0.05	$ 5.99	$ 0.02	$ 95.09

Exhibit O.11g: Implementation and Monitoring - PV, 3% (ICRSSL, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.35	$ 11.07	$ 0.11	$ 0.01	$ 1.08	$ 0.00	$ 31.97
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.52	$ 12.39	$ 0.13	$ 0.01	$ 0.98	$ -	$ 35.25
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.62	$ 5.05	$ 0.07	$ 0.01	$ 0.62	$ -	$ 14.81
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.19	$ 9.65	$ 0.13	$ 0.02	$ 1.87	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 1.09	$ 8.85	$ 0.12	$ 0.02	$ 1.74	$ 0.00	$ 27.48
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.56	$ 8.35	$ 0.11	$ 0.03	$ 3.84	$ 0.01	$ 28.96
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.06	$ 0.03	$ 0.01	$ 1.12	$ 0.00	$ 7.34
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.52	$ 0.04	$ 0.01	$ 1.48	$ 0.01	$ 8.93
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.43	$ 0.01	$ 0.00	$ 0.27	$ 0.00	$ 1.57
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.63	$ 60.39	$ 0.75	$ 0.12	$ 13.01	$ 0.02	$ 186.23
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 3.58	$ 0.16	$ 1.37	$ 2.52	$ 0.11	$ 0.01	$ 0.89	$ 0.00	$ 10.84
100-499	$ 0.25	$ 2.18	$ 3.97	$ 0.19	$ 1.55	$ 2.82	$ 0.13	$ 0.01	$ 0.80	$ -	$ 11.90
500-999	$ 0.13	$ 0.91	$ 1.66	$ 0.10	$ 0.63	$ 1.15	$ 0.07	$ 0.00	$ 0.53	$ -	$ 5.19
1,000-3,299	$ 0.27	$ 1.82	$ 3.45	$ 0.20	$ 1.32	$ 2.39	$ 0.15	$ 0.01	$ 0.71	$ -	$ 10.32
3,300-9,999	$ 0.25	$ 1.67	$ 3.17	$ 0.19	$ 1.21	$ 2.19	$ 0.14	$ 0.01	$ 0.66	$ 0.00	$ 9.49
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.60	$ 8.92	$ 0.12	$ 0.03	$ 3.11	$ 0.01	$ 28.84
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.15	$ 2.20	$ 0.03	$ 0.01	$ 0.91	$ 0.00	$ 7.28
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.69	$ 0.04	$ 0.01	$ 1.20	$ 0.01	$ 8.82
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.46	$ 0.01	$ 0.00	$ 0.22	$ 0.00	$ 1.55
Total	$ 1.51	$ 10.04	$ 39.28	$ 1.15	$ 6.99	$ 25.33	$ 0.80	$ 0.08	$ 9.03	$ 0.02	$ 94.21
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 3.58	$ 0.16	$ 1.37	$ 2.52	$ 0.11	$ 0.01	$ 0.89	$ 0.00	$ 10.84
100-499	$ 0.25	$ 2.18	$ 3.97	$ 0.19	$ 1.55	$ 2.82	$ 0.13	$ 0.01	$ 0.80	$ -	$ 11.90
500-999	$ 0.13	$ 0.91	$ 1.66	$ 0.10	$ 0.63	$ 1.15	$ 0.07	$ 0.00	$ 0.53	$ -	$ 5.19
1,000-3,299	$ 0.27	$ 1.82	$ 3.45	$ 0.20	$ 1.32	$ 2.39	$ 0.15	$ 0.01	$ 0.71	$ -	$ 10.32
3,300-9,999	$ 0.25	$ 1.67	$ 3.17	$ 0.19	$ 1.21	$ 2.19	$ 0.14	$ 0.01	$ 0.66	$ 0.00	$ 9.49
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.60	$ 8.89	$ 0.12	$ 0.03	$ 3.15	$ 0.01	$ 28.85
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.15	$ 2.19	$ 0.03	$ 0.01	$ 0.92	$ 0.00	$ 7.28
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.68	$ 0.04	$ 0.01	$ 1.22	$ 0.01	$ 8.83
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.46	$ 0.01	$ 0.00	$ 0.23	$ 0.00	$ 1.55
Total	$ 1.51	$ 10.04	$ 39.28	$ 1.15	$ 6.98	$ 25.28	$ 0.80	$ 0.08	$ 9.11	$ 0.02	$ 94.24
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 2.57	$ 0.16	$ 1.39	$ 1.82	$ 0.11	$ 0.01	$ 0.73	$ 0.00	$ 8.99
100-499	$ 0.25	$ 2.18	$ 2.86	$ 0.19	$ 1.57	$ 2.04	$ 0.14	$ 0.01	$ 0.64	$ -	$ 9.87
500-999	$ 0.13	$ 0.91	$ 1.20	$ 0.10	$ 0.64	$ 0.83	$ 0.07	$ 0.00	$ 0.45	$ -	$ 4.34
1,000-3,299	$ 0.27	$ 1.82	$ 2.52	$ 0.20	$ 1.34	$ 1.74	$ 0.15	$ 0.00	$ 0.50	$ -	$ 8.56
3,300-9,999	$ 0.25	$ 1.67	$ 2.32	$ 0.19	$ 1.23	$ 1.59	$ 0.14	$ 0.00	$ 0.48	$ 0.00	$ 7.88
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.71	$ 10.47	$ 0.14	$ 0.01	$ 1.13	$ 0.01	$ 28.51
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.17	$ 2.58	$ 0.03	$ 0.00	$ 0.34	$ 0.00	$ 7.11
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.15	$ 3.14	$ 0.05	$ 0.00	$ 0.42	$ 0.01	$ 8.52
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.03	$ 0.54	$ 0.01	$ 0.00	$ 0.09	$ 0.00	$ 1.49
Total	$ 1.51	$ 10.04	$ 34.91	$ 1.15	$ 7.23	$ 24.75	$ 0.84	$ 0.04	$ 4.78	$ 0.02	$ 85.27

Exhibit O.11h: Implementation and Monitoring - PV, 3% (ICRSSL, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.36	$ 11.16	$ 0.11	$ 0.01	$ 0.99	$ 0.00	$ 31.97
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.53	$ 12.49	$ 0.13	$ 0.01	$ 0.89	$ -	$ 35.27
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.63	$ 5.09	$ 0.07	$ 0.01	$ 0.57	$ -	$ 14.81
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.23	$ 9.95	$ 0.14	$ 0.01	$ 1.53	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 1.13	$ 9.13	$ 0.13	$ 0.01	$ 1.43	$ 0.00	$ 27.48
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.60	$ 8.84	$ 0.12	$ 0.03	$ 3.21	$ 0.01	$ 28.85
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.15	$ 2.18	$ 0.03	$ 0.01	$ 0.94	$ 0.00	$ 7.29
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.67	$ 0.04	$ 0.01	$ 1.24	$ 0.01	$ 8.84
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.45	$ 0.01	$ 0.00	$ 0.23	$ 0.00	$ 1.55
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.78	$ 61.96	$ 0.77	$ 0.10	$ 11.04	$ 0.02	$ 185.98
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 2.83	$ 0.16	$ 1.38	$ 2.00	$ 0.11	$ 0.01	$ 0.82	$ 0.00	$ 9.51
100-499	$ 0.25	$ 2.18	$ 3.15	$ 0.19	$ 1.55	$ 2.24	$ 0.14	$ 0.01	$ 0.74	$ -	$ 10.44
500-999	$ 0.13	$ 0.91	$ 1.32	$ 0.10	$ 0.64	$ 0.91	$ 0.07	$ 0.00	$ 0.49	$ -	$ 4.58
1,000-3,299	$ 0.27	$ 1.82	$ 2.76	$ 0.20	$ 1.33	$ 1.90	$ 0.15	$ 0.01	$ 0.62	$ -	$ 9.07
3,300-9,999	$ 0.25	$ 1.67	$ 2.54	$ 0.19	$ 1.22	$ 1.74	$ 0.14	$ 0.01	$ 0.57	$ 0.00	$ 8.34
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.63	$ 9.38	$ 0.12	$ 0.02	$ 2.53	$ 0.01	$ 28.74
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.16	$ 2.31	$ 0.03	$ 0.01	$ 0.74	$ 0.00	$ 7.23
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.14	$ 2.82	$ 0.04	$ 0.01	$ 0.97	$ 0.01	$ 8.73
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.48	$ 0.01	$ 0.00	$ 0.19	$ 0.00	$ 1.53
Total	$ 1.51	$ 10.04	$ 36.05	$ 1.15	$ 7.07	$ 23.78	$ 0.81	$ 0.07	$ 7.68	$ 0.02	$ 88.17
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 2.83	$ 0.16	$ 1.38	$ 2.00	$ 0.11	$ 0.01	$ 0.82	$ 0.00	$ 9.51
100-499	$ 0.25	$ 2.18	$ 3.15	$ 0.19	$ 1.55	$ 2.24	$ 0.14	$ 0.01	$ 0.74	$ -	$ 10.44
500-999	$ 0.13	$ 0.91	$ 1.32	$ 0.10	$ 0.64	$ 0.91	$ 0.07	$ 0.00	$ 0.49	$ -	$ 4.58
1,000-3,299	$ 0.27	$ 1.82	$ 2.76	$ 0.20	$ 1.33	$ 1.90	$ 0.15	$ 0.01	$ 0.62	$ -	$ 9.07
3,300-9,999	$ 0.25	$ 1.67	$ 2.54	$ 0.19	$ 1.22	$ 1.74	$ 0.14	$ 0.01	$ 0.58	$ 0.00	$ 8.34
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.63	$ 9.35	$ 0.12	$ 0.02	$ 2.56	$ 0.01	$ 28.75
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.16	$ 2.31	$ 0.03	$ 0.01	$ 0.75	$ 0.00	$ 7.23
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.14	$ 2.81	$ 0.04	$ 0.01	$ 0.99	$ 0.01	$ 8.74
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.48	$ 0.01	$ 0.00	$ 0.19	$ 0.00	$ 1.53
Total	$ 1.51	$ 10.04	$ 36.05	$ 1.15	$ 7.07	$ 23.74	$ 0.81	$ 0.07	$ 7.74	$ 0.02	$ 88.19
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 1.99	$ 0.16	$ 1.40	$ 1.41	$ 0.11	$ 0.01	$ 0.70	$ 0.00	$ 7.97
100-499	$ 0.25	$ 2.18	$ 2.22	$ 0.19	$ 1.57	$ 1.58	$ 0.14	$ 0.01	$ 0.61	$ -	$ 8.75
500-999	$ 0.13	$ 0.91	$ 0.94	$ 0.10	$ 0.64	$ 0.64	$ 0.07	$ 0.00	$ 0.43	$ -	$ 3.88
1,000-3,299	$ 0.27	$ 1.82	$ 1.99	$ 0.20	$ 1.34	$ 1.35	$ 0.15	$ 0.00	$ 0.48	$ -	$ 7.61
3,300-9,999	$ 0.25	$ 1.67	$ 1.83	$ 0.19	$ 1.23	$ 1.23	$ 0.14	$ 0.00	$ 0.45	$ 0.00	$ 7.01
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.72	$ 10.61	$ 0.14	$ 0.01	$ 0.95	$ 0.01	$ 28.48
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.18	$ 2.62	$ 0.03	$ 0.00	$ 0.29	$ 0.00	$ 7.10
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.16	$ 3.18	$ 0.05	$ 0.00	$ 0.35	$ 0.01	$ 8.49
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.03	$ 0.54	$ 0.01	$ 0.00	$ 0.08	$ 0.00	$ 1.49
Total	$ 1.51	$ 10.04	$ 32.41	$ 1.15	$ 7.26	$ 23.17	$ 0.84	$ 0.04	$ 4.33	$ 0.02	$ 80.77

Exhibit O.11i: Implementation and Monitoring - PV, 3% (ICRSSL, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.21	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.90	$ 0.00	$ 2.14
100-499	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.02	$ 1.78	$ -	$ 2.05
500-999	$ 0.13	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.02	$ -	$ 1.17
1,000-3,299	$ 0.27	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 11.70	$ -	$ 12.08
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 10.95	$ 0.00	$ 11.30
10,000-49,999	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 14.47	$ 0.01	$ 14.85
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 4.20	$ 0.00	$ 4.30
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.05	$ 5.76	$ 0.01	$ 5.89
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.00	$ 0.00	$ 1.02
Total	$ 1.51	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 52.78	$ 0.02	$ 54.78
Rule Alternative A2											
<100	$ 0.21	$ 1.98	$ 15.99	$ 0.16	$ 1.34	$ 10.99	$ 0.11	$ 0.01	$ 1.17	$ 0.00	$ 31.96
100-499	$ 0.25	$ 2.18	$ 17.59	$ 0.19	$ 1.51	$ 12.31	$ 0.13	$ 0.01	$ 1.07	$ -	$ 35.24
500-999	$ 0.13	$ 0.91	$ 7.30	$ 0.10	$ 0.62	$ 5.02	$ 0.07	$ 0.01	$ 0.66	$ -	$ 14.82
1,000-3,299	$ 0.27	$ 1.82	$ 14.76	$ 0.20	$ 1.16	$ 9.43	$ 0.13	$ 0.02	$ 2.12	$ -	$ 29.92
3,300-9,999	$ 0.25	$ 1.67	$ 13.54	$ 0.19	$ 1.07	$ 8.65	$ 0.12	$ 0.02	$ 1.97	$ 0.00	$ 27.49
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.54	$ 7.97	$ 0.11	$ 0.04	$ 4.33	$ 0.01	$ 29.04
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.13	$ 1.97	$ 0.03	$ 0.01	$ 1.27	$ 0.00	$ 7.38
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.12	$ 2.41	$ 0.04	$ 0.01	$ 1.68	$ 0.01	$ 9.01
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.41	$ 0.01	$ 0.00	$ 0.30	$ 0.00	$ 1.58
Total	$ 1.51	$ 10.04	$ 92.62	$ 1.15	$ 6.51	$ 59.14	$ 0.74	$ 0.13	$ 14.57	$ 0.02	$ 186.42
Rule Alternative A3											
<100	$ 0.21	$ 1.98	$ 4.10	$ 0.16	$ 1.37	$ 2.86	$ 0.11	$ 0.01	$ 0.94	$ 0.00	$ 11.74
100-499	$ 0.25	$ 2.18	$ 4.53	$ 0.19	$ 1.54	$ 3.21	$ 0.13	$ 0.01	$ 0.84	$ -	$ 12.89
500-999	$ 0.13	$ 0.91	$ 1.89	$ 0.10	$ 0.63	$ 1.31	$ 0.07	$ 0.01	$ 0.55	$ -	$ 5.60
1,000-3,299	$ 0.27	$ 1.82	$ 3.92	$ 0.20	$ 1.31	$ 2.71	$ 0.15	$ 0.01	$ 0.79	$ -	$ 11.18
3,300-9,999	$ 0.25	$ 1.67	$ 3.59	$ 0.19	$ 1.20	$ 2.49	$ 0.14	$ 0.01	$ 0.72	$ 0.00	$ 10.27
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.58	$ 8.61	$ 0.11	$ 0.03	$ 3.50	$ 0.01	$ 28.90
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.13	$ 0.03	$ 0.01	$ 1.03	$ 0.00	$ 7.31
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.60	$ 0.04	$ 0.01	$ 1.36	$ 0.01	$ 8.88
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.44	$ 0.01	$ 0.00	$ 0.25	$ 0.00	$ 1.56
Total	$ 1.51	$ 10.04	$ 41.47	$ 1.15	$ 6.93	$ 26.36	$ 0.79	$ 0.09	$ 9.97	$ 0.02	$ 98.33
Rule Alternative A3 UV90-10B											
<100	$ 0.21	$ 1.98	$ 4.10	$ 0.16	$ 1.37	$ 2.86	$ 0.11	$ 0.01	$ 0.94	$ 0.00	$ 11.74
100-499	$ 0.25	$ 2.18	$ 4.53	$ 0.19	$ 1.54	$ 3.21	$ 0.13	$ 0.01	$ 0.84	$ -	$ 12.89
500-999	$ 0.13	$ 0.91	$ 1.89	$ 0.10	$ 0.63	$ 1.31	$ 0.07	$ 0.01	$ 0.55	$ -	$ 5.60
1,000-3,299	$ 0.27	$ 1.82	$ 3.92	$ 0.20	$ 1.31	$ 2.71	$ 0.15	$ 0.01	$ 0.79	$ -	$ 11.18
3,300-9,999	$ 0.25	$ 1.67	$ 3.59	$ 0.19	$ 1.20	$ 2.49	$ 0.14	$ 0.01	$ 0.73	$ 0.00	$ 10.28
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.58	$ 8.57	$ 0.11	$ 0.03	$ 3.56	$ 0.01	$ 28.91
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.14	$ 2.12	$ 0.03	$ 0.01	$ 1.04	$ 0.00	$ 7.32
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.13	$ 2.59	$ 0.04	$ 0.01	$ 1.37	$ 0.01	$ 8.89
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.02	$ 0.44	$ 0.01	$ 0.00	$ 0.25	$ 0.00	$ 1.56
Total	$ 1.51	$ 10.04	$ 41.47	$ 1.15	$ 6.92	$ 26.30	$ 0.79	$ 0.09	$ 10.07	$ 0.02	$ 98.35
Rule Alternative A4											
<100	$ 0.21	$ 1.98	$ 3.08	$ 0.16	$ 1.39	$ 2.19	$ 0.11	$ 0.01	$ 0.76	$ 0.00	$ 9.88
100-499	$ 0.25	$ 2.18	$ 3.42	$ 0.19	$ 1.56	$ 2.44	$ 0.14	$ 0.01	$ 0.67	$ -	$ 10.86
500-999	$ 0.13	$ 0.91	$ 1.43	$ 0.10	$ 0.64	$ 1.00	$ 0.07	$ 0.00	$ 0.46	$ -	$ 4.75
1,000-3,299	$ 0.27	$ 1.82	$ 2.99	$ 0.20	$ 1.34	$ 2.08	$ 0.15	$ 0.00	$ 0.53	$ -	$ 9.39
3,300-9,999	$ 0.25	$ 1.67	$ 2.74	$ 0.19	$ 1.23	$ 1.91	$ 0.14	$ 0.00	$ 0.50	$ 0.00	$ 8.64
10,000-49,999	$ 0.25	$ 0.98	$ 14.64	$ 0.19	$ 0.70	$ 10.32	$ 0.14	$ 0.01	$ 1.32	$ 0.01	$ 28.54
50,000-99,999	$ 0.06	$ 0.24	$ 3.63	$ 0.05	$ 0.17	$ 2.55	$ 0.03	$ 0.00	$ 0.39	$ 0.00	$ 7.13
100,000-999,999	$ 0.07	$ 0.21	$ 4.40	$ 0.06	$ 0.15	$ 3.10	$ 0.05	$ 0.00	$ 0.49	$ 0.01	$ 8.54
1,000,000+	$ 0.01	$ 0.04	$ 0.78	$ 0.01	$ 0.03	$ 0.53	$ 0.01	$ 0.00	$ 0.10	$ 0.00	$ 1.50
Total	$ 1.51	$ 10.04	$ 37.11	$ 1.15	$ 7.20	$ 26.11	$ 0.83	$ 0.05	$ 5.22	$ 0.02	$ 89.25

Exhibit O.12a: Treatment Uncertainty - PV, 3% (ICR)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th Percentile	Mean	95th	5th Percentile	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th Percentile	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 11.34	$ 13.53	$ 15.71	$ 15.74	$ 16.94	$ 18.14	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 27.14	$ 30.53	$ 33.91
100-499	$ 16.99	$ 20.03	$ 23.07	$ 27.05	$ 29.34	$ 31.61	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 44.25	$ 49.62	$ 54.96
500-999	$ 11.57	$ 13.58	$ 15.59	$ 25.88	$ 28.32	$ 30.75	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 37.91	$ 42.40	$ 46.89
1,000-3,299	$ 61.22	$ 74.05	$ 86.76	$ 91.36	$ 100.19	$ 109.00	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 155.45	$ 177.45	$ 199.30
3,300-9,999	$ 188.59	$ 230.66	$ 272.52	$ 131.83	$ 143.15	$ 154.58	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 326.29	$ 380.49	$ 434.59
10,000-49,999	$ 668.80	$ 763.66	$ 858.84	$ 456.35	$ 483.94	$ 511.69	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 1,148.08	$ 1,271.87	$ 1,396.16
50,000-99,999	$ 435.58	$ 499.84	$ 563.81	$ 251.72	$ 266.65	$ 281.84	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 699.01	$ 779.36	$ 859.68
100,000-999,999	$ 1,316.97	$ 1,502.12	$ 1,687.09	$ 872.79	$ 924.40	$ 976.69	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 2,351.52	$ 2,592.01	$ 2,833.01
1,000,000+	$ 588.00	$ 670.07	$ 752.13	$ 496.45	$ 525.45	$ 554.76	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 1,424.60	$ 1,614.89	$ 1,804.49
Total	$ 3,299.05	$ 3,787.55	$ 4,275.53	$ 2,369.18	$ 2,518.39	$ 2,669.05	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 6,214.24	$ 6,938.62	$ 7,662.99
Rule Alternative A2																					
<100	$ 5.30	$ 6.34	$ 7.99	$ 7.30	$ 8.53	$ 10.33	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 12.65	$ 14.93	$ 18.37
100-499	$ 7.85	$ 9.50	$ 11.97	$ 10.56	$ 12.21	$ 14.71	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 18.63	$ 21.96	$ 26.96
500-999	$ 5.38	$ 6.53	$ 8.23	$ 8.05	$ 9.25	$ 11.11	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 13.88	$ 16.29	$ 19.90
1,000-3,299	$ 21.69	$ 26.91	$ 34.48	$ 27.55	$ 31.77	$ 38.56	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 52.11	$ 61.88	$ 76.58
3,300-9,999	$ 61.53	$ 77.04	$ 99.49	$ 46.63	$ 52.89	$ 63.65	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 114.03	$ 136.61	$ 170.63
10,000-49,999	$ 209.04	$ 254.66	$ 324.42	$ 138.73	$ 156.24	$ 186.77	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 370.70	$ 435.16	$ 536.82
50,000-99,999	$ 134.88	$ 166.14	$ 213.26	$ 70.90	$ 80.13	$ 95.53	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 217.50	$ 259.13	$ 322.82
100,000-999,999	$ 397.08	$ 486.86	$ 620.90	$ 228.27	$ 259.30	$ 308.74	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 787.11	$ 911.64	$ 1,098.87
1,000,000+	$ 175.83	$ 215.34	$ 274.30	$ 125.80	$ 143.46	$ 170.86	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 641.78	$ 778.17	$ 942.76
Total	$ 1,018.58	$ 1,249.32	$ 1,595.04	$ 663.79	$ 753.77	$ 900.25	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 2,228.38	$ 2,635.77	$ 3,213.71
Rule Alternative A3																					
<100	$ 3.93	$ 4.97	$ 6.27	$ 4.90	$ 5.92	$ 7.10	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 8.88	$ 10.95	$ 13.43
100-499	$ 5.51	$ 6.98	$ 8.75	$ 6.71	$ 8.09	$ 9.65	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 12.43	$ 15.31	$ 18.68
500-999	$ 3.72	$ 4.72	$ 5.91	$ 4.58	$ 5.54	$ 6.57	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.75	$ 10.76	$ 13.04
1,000-3,299	$ 13.74	$ 17.66	$ 22.21	$ 16.29	$ 19.63	$ 23.41	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 32.90	$ 40.50	$ 49.16
3,300-9,999	$ 37.27	$ 48.32	$ 61.08	$ 31.66	$ 37.52	$ 44.72	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 74.79	$ 92.51	$ 113.28
10,000-49,999	$ 170.72	$ 214.61	$ 271.45	$ 105.03	$ 122.63	$ 145.25	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 298.67	$ 361.51	$ 442.33
50,000-99,999	$ 109.84	$ 139.94	$ 178.68	$ 50.21	$ 59.10	$ 69.76	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 171.76	$ 211.91	$ 262.47
100,000-999,999	$ 316.30	$ 401.50	$ 509.56	$ 156.17	$ 185.14	$ 218.12	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 634.23	$ 752.13	$ 896.91
1,000,000+	$ 137.58	$ 174.83	$ 221.82	$ 86.03	$ 102.34	$ 120.52	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 563.76	$ 696.53	$ 839.94
Total	$ 798.59	$ 1,013.52	$ 1,285.74	$ 461.57	$ 545.92	$ 645.10	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,806.16	$ 2,192.12	$ 2,649.25
Rule Alternative A3 UV90-10B																					
<100	$ 3.93	$ 4.97	$ 6.27	$ 4.90	$ 5.92	$ 7.10	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 8.88	$ 10.95	$ 13.43
100-499	$ 5.51	$ 6.98	$ 8.75	$ 6.71	$ 8.09	$ 9.65	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 12.43	$ 15.31	$ 18.68
500-999	$ 3.72	$ 4.72	$ 5.91	$ 4.58	$ 5.54	$ 6.57	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.75	$ 10.76	$ 13.04
1,000-3,299	$ 13.75	$ 17.67	$ 22.23	$ 16.28	$ 19.63	$ 23.40	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 32.90	$ 40.50	$ 49.17
3,300-9,999	$ 37.90	$ 49.03	$ 61.97	$ 31.92	$ 37.82	$ 45.05	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 75.68	$ 93.52	$ 114.51
10,000-49,999	$ 189.10	$ 237.04	$ 298.86	$ 115.02	$ 134.60	$ 159.67	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 327.05	$ 395.91	$ 484.17
50,000-99,999	$ 123.89	$ 156.83	$ 198.66	$ 58.26	$ 68.99	$ 81.90	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 193.86	$ 238.70	$ 294.58
100,000-999,999	$ 367.77	$ 464.22	$ 585.27	$ 192.39	$ 229.30	$ 272.06	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 721.92	$ 859.00	$ 1,026.56
1,000,000+	$ 165.93	$ 209.87	$ 264.46	$ 107.10	$ 128.04	$ 152.14	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 613.18	$ 757.29	$ 914.20
Total	$ 911.49	$ 1,151.32	$ 1,452.38	$ 537.16	$ 637.93	$ 757.54	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,994.65	$ 2,421.93	$ 2,928.34
Rule Alternative A4																					
<100	$ 2.21	$ 2.91	$ 3.79	$ 2.54	$ 3.00	$ 3.60	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.80	$ 5.97	$ 7.45
100-499	$ 2.95	$ 3.81	$ 4.90	$ 3.34	$ 3.95	$ 4.73	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.50	$ 8.00	$ 9.91
500-999	$ 1.95	$ 2.50	$ 3.20	$ 2.05	$ 2.43	$ 2.90	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.45	$ 5.43	$ 6.66
1,000-3,299	$ 6.43	$ 8.34	$ 10.74	$ 7.84	$ 9.29	$ 11.15	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 17.14	$ 20.83	$ 25.44
3,300-9,999	$ 17.18	$ 22.38	$ 28.98	$ 16.80	$ 20.20	$ 24.55	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 39.84	$ 49.26	$ 61.02
10,000-49,999	$ 68.72	$ 90.85	$ 116.63	$ 48.29	$ 57.36	$ 68.30	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 139.93	$ 172.48	$ 210.56
50,000-99,999	$ 44.01	$ 58.97	$ 76.46	$ 21.85	$ 25.85	$ 30.69	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 77.57	$ 97.69	$ 121.17
100,000-999,999	$ 122.20	$ 162.50	$ 209.47	$ 59.19	$ 70.40	$ 83.54	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 343.15	$ 398.38	$ 462.24
1,000,000+	$ 52.35	$ 69.66	$ 89.85	$ 29.35	$ 35.22	$ 41.91	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 421.85	$ 524.25	$ 629.36
Total	$ 317.98	$ 421.91	$ 544.03	$ 191.23	$ 227.69	$ 271.37	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,055.22	$ 1,282.29	$ 1,533.81

Exhibit O.12b: Treatment Uncertainty - PV, 3% (ICRSSM)

	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
Size Category	5th Percentile	Mean	95th	5th Percentile	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th Percentile	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 11.34	$ 13.53	$ 15.71	$ 15.74	$ 16.94	$ 18.14	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 27.14	$ 30.53	$ 33.91
100-499	$ 16.99	$ 20.03	$ 23.07	$ 27.05	$ 29.34	$ 31.61	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 44.25	$ 49.62	$ 54.96
500-999	$ 11.57	$ 13.58	$ 15.59	$ 25.88	$ 28.32	$ 30.75	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 37.91	$ 42.40	$ 46.89
1,000-3,299	$ 61.22	$ 74.05	$ 86.76	$ 91.36	$ 100.19	$ 109.00	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 155.45	$ 177.45	$ 199.30
3,300-9,999	$ 188.59	$ 230.66	$ 272.52	$ 131.83	$ 143.15	$ 154.58	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 326.29	$ 380.49	$ 434.59
10,000-49,999	$ 668.80	$ 763.66	$ 858.84	$ 456.35	$ 483.94	$ 511.69	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 1,148.08	$ 1,271.87	$ 1,396.16
50,000-99,999	$ 435.58	$ 499.84	$ 563.81	$ 251.72	$ 266.65	$ 281.84	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 699.01	$ 779.36	$ 859.68
100,000-999,999	$ 1,316.97	$ 1,502.12	$ 1,687.09	$ 872.79	$ 924.40	$ 976.69	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 2,351.52	$ 2,592.01	$ 2,833.01
1,000,000+	$ 588.00	$ 670.07	$ 752.13	$ 496.45	$ 525.45	$ 554.76	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 1,424.60	$ 1,614.89	$ 1,804.49
Total	$ 3,299.05	$ 3,787.55	$ 4,275.53	$ 2,369.18	$ 2,518.39	$ 2,669.05	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 6,214.24	$ 6,938.62	$ 7,662.99
Rule Alternative A2																					
<100	$ 4.08	$ 5.20	$ 6.41	$ 5.04	$ 6.08	$ 7.24	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 9.18	$ 11.34	$ 13.71
100-499	$ 5.74	$ 7.29	$ 9.00	$ 7.40	$ 8.89	$ 10.52	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 13.35	$ 16.42	$ 19.79
500-999	$ 3.85	$ 4.89	$ 6.05	$ 5.67	$ 6.83	$ 8.05	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 9.97	$ 12.22	$ 14.65
1,000-3,299	$ 15.63	$ 20.21	$ 25.32	$ 20.28	$ 24.54	$ 28.99	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 38.78	$ 47.95	$ 57.85
3,300-9,999	$ 44.55	$ 58.27	$ 73.49	$ 35.71	$ 42.76	$ 50.05	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 86.13	$ 107.71	$ 131.03
10,000-49,999	$ 156.98	$ 203.02	$ 252.05	$ 105.64	$ 125.75	$ 146.09	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 285.54	$ 353.04	$ 423.77
50,000-99,999	$ 100.70	$ 131.88	$ 165.33	$ 52.07	$ 61.89	$ 71.98	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 164.49	$ 206.64	$ 251.34
100,000-999,999	$ 291.44	$ 378.72	$ 473.02	$ 161.02	$ 191.73	$ 223.45	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 614.22	$ 735.94	$ 865.70
1,000,000+	$ 127.92	$ 166.14	$ 207.42	$ 86.50	$ 103.31	$ 120.75	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 554.57	$ 688.82	$ 825.78
Total	$ 750.89	$ 975.62	$ 1,218.09	$ 479.33	$ 571.78	$ 667.13	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,776.23	$ 2,180.08	$ 2,603.63
Rule Alternative A3																					
<100	$ 2.70	$ 3.64	$ 4.61	$ 3.14	$ 3.88	$ 4.60	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 5.89	$ 7.59	$ 9.27
100-499	$ 3.64	$ 4.85	$ 6.09	$ 4.20	$ 5.21	$ 6.18	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.05	$ 10.30	$ 12.54
500-999	$ 2.42	$ 3.22	$ 4.03	$ 2.69	$ 3.36	$ 4.01	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.57	$ 7.09	$ 8.59
1,000-3,299	$ 8.55	$ 11.46	$ 14.49	$ 9.96	$ 12.45	$ 14.87	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 21.38	$ 27.12	$ 32.89
3,300-9,999	$ 22.56	$ 30.60	$ 39.01	$ 21.06	$ 26.22	$ 31.24	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 49.49	$ 63.49	$ 77.74
10,000-49,999	$ 119.30	$ 157.87	$ 198.09	$ 71.77	$ 87.65	$ 103.07	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 213.99	$ 269.79	$ 326.80
50,000-99,999	$ 76.48	$ 102.62	$ 130.05	$ 32.64	$ 39.98	$ 47.06	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 120.83	$ 155.47	$ 191.14
100,000-999,999	$ 216.57	$ 289.06	$ 364.89	$ 97.42	$ 119.71	$ 141.06	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 475.75	$ 574.25	$ 675.18
1,000,000+	$ 93.28	$ 124.67	$ 157.48	$ 52.80	$ 65.03	$ 76.73	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 486.23	$ 609.07	$ 731.82
Total	$ 545.51	$ 727.99	$ 918.73	$ 295.67	$ 363.49	$ 428.81	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,387.18	$ 1,724.17	$ 2,065.96
Rule Alternative A3 UV90-10B																					
<100	$ 2.70	$ 3.64	$ 4.61	$ 3.14	$ 3.88	$ 4.60	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 5.89	$ 7.59	$ 9.27
100-499	$ 3.64	$ 4.85	$ 6.09	$ 4.20	$ 5.21	$ 6.18	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.05	$ 10.30	$ 12.54
500-999	$ 2.42	$ 3.22	$ 4.03	$ 2.69	$ 3.36	$ 4.01	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.57	$ 7.09	$ 8.59
1,000-3,299	$ 8.56	$ 11.47	$ 14.50	$ 9.95	$ 12.44	$ 14.86	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 21.39	$ 27.12	$ 32.90
3,300-9,999	$ 22.98	$ 31.11	$ 39.61	$ 21.25	$ 26.44	$ 31.49	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 50.10	$ 64.22	$ 78.59
10,000-49,999	$ 130.71	$ 171.73	$ 214.75	$ 78.52	$ 95.79	$ 112.54	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 232.15	$ 291.79	$ 352.92
50,000-99,999	$ 84.96	$ 112.91	$ 142.26	$ 37.88	$ 46.43	$ 54.71	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 134.56	$ 172.20	$ 210.99
100,000-999,999	$ 246.65	$ 326.06	$ 409.22	$ 121.40	$ 149.06	$ 175.84	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 529.81	$ 640.60	$ 754.29
1,000,000+	$ 109.89	$ 145.22	$ 181.99	$ 67.05	$ 82.50	$ 97.51	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 517.09	$ 647.08	$ 777.10
Total	$ 612.52	$ 810.21	$ 1,017.04	$ 346.08	$ 425.10	$ 501.73	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,504.61	$ 1,867.99	$ 2,237.19
Rule Alternative A4																					
<100	$ 1.38	$ 1.90	$ 2.47	$ 1.58	$ 1.95	$ 2.34	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.01	$ 3.91	$ 4.87
100-499	$ 1.84	$ 2.48	$ 3.19	$ 2.08	$ 2.57	$ 3.08	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.13	$ 5.30	$ 6.55
500-999	$ 1.21	$ 1.62	$ 2.08	$ 1.28	$ 1.58	$ 1.89	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.94	$ 3.71	$ 4.52
1,000-3,299	$ 3.96	$ 5.37	$ 6.93	$ 4.90	$ 6.08	$ 7.29	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 11.73	$ 14.66	$ 17.77
3,300-9,999	$ 10.66	$ 14.53	$ 18.82	$ 10.44	$ 13.14	$ 15.96	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 26.97	$ 34.34	$ 42.28
10,000-49,999	$ 37.72	$ 52.00	$ 67.57	$ 28.31	$ 35.05	$ 41.97	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 88.95	$ 111.32	$ 135.17
50,000-99,999	$ 24.17	$ 33.74	$ 44.29	$ 12.86	$ 15.88	$ 18.97	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 48.75	$ 62.50	$ 77.29
100,000-999,999	$ 66.62	$ 92.31	$ 120.51	$ 33.82	$ 41.95	$ 50.23	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 262.21	$ 299.74	$ 339.97
1,000,000+	$ 28.52	$ 39.53	$ 51.63	$ 16.20	$ 20.27	$ 24.41	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 384.88	$ 479.17	$ 573.64
Total	$ 176.07	$ 243.47	$ 317.50	$ 111.48	$ 138.48	$ 166.15	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 833.56	$ 1,014.63	$ 1,202.06

Exhibit O.12c: Treatment Uncertainty - PV, 3% (ICRSSL)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th Percentile	Mean	95th	5th Percentile	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th Percentile	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	11.3	13.5	15.7	$ 15.74	$ 16.94	$ 18.14	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 27.14	$ 30.53	$ 33.91
100-499	17.0	20.0	23.1	$ 27.05	$ 29.34	$ 31.61	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 44.25	$ 49.62	$ 54.96
500-999	11.6	13.6	15.6	$ 25.88	$ 28.32	$ 30.75	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 37.91	$ 42.40	$ 46.89
1,000-3,299	61.2	74.0	86.8	$ 91.36	$ 100.19	$ 109.00	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 155.45	$ 177.45	$ 199.30
3,300-9,999	188.6	230.7	272.5	$ 131.83	$ 143.15	$ 154.58	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 326.29	$ 380.49	$ 434.59
10,000-49,999	668.8	763.7	858.8	$ 456.35	$ 483.94	$ 511.69	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 1,148.08	$ 1,271.87	$ 1,396.16
50,000-99,999	435.6	499.8	563.8	$ 251.72	$ 266.65	$ 281.84	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 699.01	$ 779.36	$ 859.68
100,000-999,999	1,317.0	1,502.1	1,687.1	$ 872.79	$ 924.40	$ 976.69	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 2,351.52	$ 2,592.01	$ 2,833.01
1,000,000+	588.0	670.1	752.1	$ 496.45	$ 525.45	$ 554.76	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 1,424.60	$ 1,614.89	$ 1,804.49
Total	$ 3,299.05	$ 3,787.55	$ 4,275.53	$ 2,369.18	$ 2,518.39	$ 2,669.05	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 6,214.24	$ 6,938.62	$ 7,662.99
Rule Alternative A2																					
<100	3.4	4.7	5.9	$ 4.06	$ 5.20	$ 6.33	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 7.53	$ 9.91	$ 12.31
100-499	4.7	6.4	8.1	$ 5.87	$ 7.56	$ 9.17	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 10.79	$ 14.19	$ 17.55
500-999	3.1	4.2	5.4	$ 4.36	$ 5.70	$ 6.94	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.95	$ 10.45	$ 12.89
1,000-3,299	12.3	17.1	22.1	$ 15.93	$ 20.83	$ 25.42	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 31.10	$ 41.18	$ 51.08
3,300-9,999	34.9	49.2	64.1	$ 29.08	$ 37.39	$ 45.24	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 69.82	$ 93.31	$ 116.78
10,000-49,999	122.4	172.6	222.9	$ 84.26	$ 108.38	$ 130.42	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 229.62	$ 305.29	$ 378.95
50,000-99,999	78.4	112.0	146.2	$ 40.74	$ 52.51	$ 63.17	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 130.81	$ 177.41	$ 223.35
100,000-999,999	224.3	319.0	414.0	$ 121.92	$ 158.77	$ 191.57	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 507.98	$ 643.20	$ 774.79
1,000,000+	98.0	139.4	180.8	$ 64.11	$ 84.22	$ 102.01	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 502.28	$ 642.98	$ 780.44
Total	$ 581.54	$ 824.68	$ 1,069.46	$ 370.33	$ 480.56	$ 580.26	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,497.87	$ 1,937.93	$ 2,368.13
Rule Alternative A3																					
<100	2.0	3.0	3.9	$ 2.26	$ 3.08	$ 3.78	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.27	$ 6.11	$ 7.77
100-499	2.6	3.9	5.1	$ 2.98	$ 4.09	$ 5.03	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.82	$ 8.24	$ 10.41
500-999	1.7	2.6	3.4	$ 1.86	$ 2.57	$ 3.18	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.06	$ 5.65	$ 7.09
1,000-3,299	6.0	9.0	11.8	$ 6.94	$ 9.63	$ 11.91	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 15.83	$ 21.83	$ 27.27
3,300-9,999	15.7	23.7	31.5	$ 15.10	$ 20.96	$ 25.99	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 36.65	$ 51.37	$ 64.95
10,000-49,999	86.5	127.7	166.5	$ 51.72	$ 70.33	$ 85.82	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 161.17	$ 222.34	$ 277.98
50,000-99,999	55.4	83.0	109.3	$ 23.20	$ 31.57	$ 38.52	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 90.34	$ 127.42	$ 161.84
100,000-999,999	156.2	232.6	305.1	$ 68.35	$ 93.18	$ 113.69	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 386.35	$ 491.27	$ 588.00
1,000,000+	67.1	100.1	131.3	$ 36.88	$ 50.34	$ 61.46	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 444.17	$ 569.77	$ 690.38
Total	$ 393.37	$ 585.56	$ 767.90	$ 209.30	$ 285.76	$ 349.38	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,148.67	$ 1,504.00	$ 1,835.70
Rule Alternative A3 UV90-10B																					
<100	2.0	3.0	3.9	$ 2.26	$ 3.08	$ 3.78	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.27	$ 6.11	$ 7.77
100-499	2.6	3.9	5.1	$ 2.98	$ 4.09	$ 5.03	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.82	$ 8.24	$ 10.41
500-999	1.7	2.6	3.4	$ 1.86	$ 2.57	$ 3.18	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.06	$ 5.65	$ 7.09
1,000-3,299	6.0	9.0	11.8	$ 6.94	$ 9.63	$ 11.91	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 15.83	$ 21.83	$ 27.27
3,300-9,999	16.0	24.1	32.0	$ 15.23	$ 21.14	$ 26.19	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 37.09	$ 51.96	$ 65.64
10,000-49,999	94.3	138.2	179.4	$ 56.50	$ 76.69	$ 93.40	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 173.76	$ 239.18	$ 298.46
50,000-99,999	61.2	90.7	118.7	$ 26.87	$ 36.54	$ 44.52	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 99.77	$ 140.11	$ 177.20
100,000-999,999	176.7	260.1	338.6	$ 85.31	$ 115.99	$ 141.22	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 423.79	$ 541.56	$ 649.06
1,000,000+	78.4	115.3	150.0	$ 46.99	$ 64.00	$ 78.02	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 465.52	$ 598.67	$ 725.65
Total	$ 438.99	$ 646.89	$ 842.90	$ 244.93	$ 333.73	$ 407.25	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 1,229.92	$ 1,613.31	$ 1,968.57
Rule Alternative A4																					
<100	0.9	1.4	1.9	$ 1.01	$ 1.41	$ 1.83	$ 0.01	$ 0.01	$ 0.01	$ 0.03	$ 0.04	$ 0.04	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.94	$ 2.83	$ 3.81
100-499	1.2	1.8	2.5	$ 1.33	$ 1.85	$ 2.40	$ 0.05	$ 0.07	$ 0.08	$ 0.16	$ 0.18	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.71	$ 3.88	$ 5.17
500-999	0.8	1.2	1.6	$ 0.82	$ 1.14	$ 1.47	$ 0.16	$ 0.18	$ 0.21	$ 0.30	$ 0.32	$ 0.35	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.04	$ 2.81	$ 3.65
1,000-3,299	2.5	3.8	5.4	$ 3.14	$ 4.39	$ 5.69	$ 1.19	$ 1.39	$ 1.60	$ 1.68	$ 1.81	$ 1.95	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.53	$ 11.44	$ 14.62
3,300-9,999	6.8	10.4	14.7	$ 6.67	$ 9.46	$ 12.44	$ 3.42	$ 4.04	$ 4.67	$ 2.26	$ 2.44	$ 2.62	$ 0.13	$ 0.13	$ 0.13	$ 0.06	$ 0.06	$ 0.06	$ 19.34	$ 26.58	$ 34.60
10,000-49,999	23.1	35.4	50.1	$ 17.73	$ 24.58	$ 31.95	$ 5.77	$ 6.80	$ 7.85	$ 4.14	$ 4.45	$ 4.77	$ 8.71	$ 8.71	$ 8.71	$ 4.30	$ 4.30	$ 4.30	$ 63.72	$ 84.22	$ 107.66
50,000-99,999	14.8	23.0	32.8	$ 8.07	$ 11.17	$ 14.48	$ 4.91	$ 5.84	$ 6.78	$ 2.81	$ 3.03	$ 3.25	$ 2.24	$ 2.24	$ 2.24	$ 1.76	$ 1.76	$ 1.76	$ 34.57	$ 46.98	$ 61.31
100,000-999,999	40.6	62.6	89.0	$ 20.99	$ 29.09	$ 37.87	$ 15.08	$ 17.85	$ 20.64	$ 11.53	$ 12.49	$ 13.44	$ 85.49	$ 85.49	$ 85.49	$ 49.66	$ 49.66	$ 49.66	$ 223.39	$ 257.13	$ 296.05
1,000,000+	17.4	26.8	38.1	$ 9.93	$ 13.82	$ 18.13	$ 299.28	$ 376.79	$ 453.34	$ 14.64	$ 16.35	$ 18.03	$ 17.06	$ 17.06	$ 17.06	$ 9.17	$ 9.17	$ 9.17	$ 367.48	$ 459.97	$ 553.83
Total	$ 108.05	$ 166.27	$ 236.02	$ 69.67	$ 96.89	$ 126.27	$ 329.86	$ 412.96	$ 495.16	$ 37.54	$ 41.12	$ 44.65	$ 113.64	$ 113.64	$ 113.64	$ 64.96	$ 64.96	$ 64.96	$ 723.73	$ 895.85	$ 1,080.70

Exhibit O.13a: State Costs - Present Value 7% (ICR, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.10	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.41	$ 0.000	$ 2.48
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.42	$ 0.000	$ 1.14
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.51	$ 0.002	$ 3.47
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.36	$ 0.003	$ 13.07
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.24	$ 0.000	$ 0.30
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.21	$ -	$ 0.48
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.09	$ -	$ 0.39
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.32	$ -	$ 1.98
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.30	$ 0.000	$ 4.92
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.53	$ 0.000	$ 1.66
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.16	$ 0.000	$ 0.94
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.19	$ 0.002	$ 3.46
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.80
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.08	$ 2.08	$ 0.003	$ 16.93
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.19	$ 0.000	$ 0.24
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.16	$ -	$ 0.42
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.37
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.16	$ -	$ 1.82
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.15	$ 0.000	$ 4.77
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.48	$ 0.000	$ 1.61
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.15	$ 0.000	$ 0.92
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.17	$ 0.002	$ 3.44
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.56	$ 0.003	$ 16.39
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.19	$ 0.000	$ 0.24
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.16	$ -	$ 0.42
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.37
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.16	$ -	$ 1.82
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.15	$ 0.000	$ 4.77
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.49	$ 0.000	$ 1.62
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.15	$ 0.000	$ 0.93
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.18	$ 0.002	$ 3.44
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.58	$ 0.003	$ 16.41
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.13	$ 0.000	$ 0.18
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.37
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.07	$ -	$ 1.71
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.06	$ 0.000	$ 4.68
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.24	$ 0.000	$ 1.36
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.07	$ 0.000	$ 0.85
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.08	$ 0.002	$ 3.35
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.03	$ 0.82	$ 0.003	$ 15.63

Exhibit O.13b: State Costs - Present Value 7% (ICR, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.22	$ 0.000	$ 0.28
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.19	$ -	$ 0.46
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.09	$ -	$ 0.39
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.30	$ -	$ 1.96
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.28	$ 0.000	$ 4.90
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.51	$ 0.000	$ 1.63
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.15	$ 0.000	$ 0.93
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.18	$ 0.002	$ 3.45
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.07	$ 1.95	$ 0.003	$ 16.79
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.17	$ 0.000	$ 0.23
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.14	$ -	$ 0.41
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.37
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.14	$ -	$ 1.79
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.13	$ 0.000	$ 4.75
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.45	$ 0.000	$ 1.58
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.14	$ 0.000	$ 0.91
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.16	$ 0.002	$ 3.43
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.05	$ 1.43	$ 0.003	$ 16.25
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.17	$ 0.000	$ 0.23
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.14	$ -	$ 0.41
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.37
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.14	$ -	$ 1.79
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.13	$ 0.000	$ 4.75
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.46	$ 0.000	$ 1.58
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.14	$ 0.000	$ 0.92
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.16	$ 0.002	$ 3.43
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.05	$ 1.44	$ 0.003	$ 16.27
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.10	$ 0.000	$ 0.15
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.09	$ -	$ 0.35
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.06	$ -	$ 1.71
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.06	$ 0.000	$ 4.68
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.21	$ 0.000	$ 1.33
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.07	$ 0.000	$ 0.84
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.07	$ 0.002	$ 3.34
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.03	$ 0.72	$ 0.003	$ 15.52

Exhibit O.13c: State Costs - Present Value 7% (ICR, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.27	$ 0.000	$ 0.33
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.23	$ -	$ 0.50
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.10	$ -	$ 0.40
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.36	$ -	$ 2.02
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.33	$ 0.000	$ 4.96
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.60	$ 0.000	$ 1.73
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.18	$ 0.000	$ 0.96
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.21	$ 0.002	$ 3.48
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.04	$ 0.000	$ 2.80
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.09	$ 2.32	$ 0.003	$ 17.18
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.20	$ 0.000	$ 0.26
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.17	$ -	$ 0.44
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.08	$ -	$ 0.38
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.18	$ -	$ 1.83
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.16	$ 0.000	$ 4.79
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.54	$ 0.000	$ 1.66
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.16	$ 0.000	$ 0.94
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.19	$ 0.002	$ 3.46
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.80
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.72	$ 0.003	$ 16.55
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.20	$ 0.000	$ 0.26
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.17	$ -	$ 0.44
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.08	$ -	$ 0.38
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.18	$ -	$ 1.83
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.17	$ 0.000	$ 4.79
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.55	$ 0.000	$ 1.68
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.16	$ 0.000	$ 0.94
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.19	$ 0.002	$ 3.46
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.80
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.74	$ 0.003	$ 16.57
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.10	$ 0.000	$ 0.15
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.09	$ -	$ 0.36
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.07	$ -	$ 1.72
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.06	$ 0.000	$ 4.68
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.26	$ 0.000	$ 1.38
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.08	$ 0.000	$ 0.86
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.09	$ 0.002	$ 3.36
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.03	$ 0.83	$ 0.003	$ 15.63

Exhibit O.13d: State Costs - Present Value 7% (ICRSSM, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.17	$ 0.000	$ 0.23
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.15	$ -	$ 0.41
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.37
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.24	$ -	$ 1.89
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.22	$ 0.000	$ 4.84
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.45	$ 0.000	$ 1.57
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.13	$ 0.000	$ 0.91
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.16	$ 0.002	$ 3.43
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.62	$ 0.003	$ 16.45
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.14	$ 0.000	$ 0.20
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.12	$ -	$ 0.38
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.09	$ -	$ 1.74
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.08	$ 0.000	$ 4.70
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.38	$ 0.000	$ 1.50
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.11	$ 0.000	$ 0.89
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.13	$ 0.002	$ 3.40
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.15	$ 0.003	$ 15.96
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.14	$ 0.000	$ 0.20
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.12	$ -	$ 0.38
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.09	$ -	$ 1.74
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.08	$ 0.000	$ 4.70
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.39	$ 0.000	$ 1.51
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.12	$ 0.000	$ 0.89
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.14	$ 0.002	$ 3.40
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.16	$ 0.003	$ 15.98
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.11	$ 0.000	$ 0.17
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.09	$ -	$ 0.35
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.06	$ -	$ 1.70
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 4.67
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.15	$ 0.000	$ 1.27
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.05	$ 0.000	$ 0.82
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.05	$ 0.002	$ 3.32
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.77
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.02	$ 0.63	$ 0.003	$ 15.42

Exhibit O.13e: State Costs - Present Value 7% (ICRSSM, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.16	$ 0.000	$ 0.22
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.14	$ -	$ 0.40
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.21	$ -	$ 1.86
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.19	$ 0.000	$ 4.82
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.40	$ 0.000	$ 1.53
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.12	$ 0.000	$ 0.90
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.14	$ 0.002	$ 3.41
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.05	$ 1.46	$ 0.003	$ 16.29
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.13	$ 0.000	$ 0.19
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.37
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.08	$ -	$ 1.73
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.07	$ 0.000	$ 4.69
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.34	$ 0.000	$ 1.46
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.10	$ 0.000	$ 0.88
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.12	$ 0.002	$ 3.39
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.04	$ 0.003	$ 15.85
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.13	$ 0.000	$ 0.19
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.37
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.08	$ -	$ 1.73
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.07	$ 0.000	$ 4.69
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.35	$ 0.000	$ 1.46
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.10	$ 0.000	$ 0.88
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.12	$ 0.002	$ 3.39
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.05	$ 0.003	$ 15.86
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.11	$ 0.000	$ 0.16
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.09	$ -	$ 0.35
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.05	$ -	$ 1.70
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 4.67
10,000-49,999	$ 1.01				$ 0.10	$ 0.00	$ 0.14	$ 0.000	$ 1.25
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.04	$ 0.000	$ 0.82
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.05	$ 0.002	$ 3.31
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.77
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.02	$ 0.58	$ 0.003	$ 15.38

Exhibit O.13f: State Costs - Present Value 7% (ICRSSM, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.19	$ 0.000	$ 0.25
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.16	$ -	$ 0.43
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.08	$ -	$ 0.38
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.26	$ -	$ 1.91
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.24	$ 0.000	$ 4.86
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.49	$ 0.000	$ 1.62
50,000-99,999	$ 0.70				$ 0.07	$ 0.01	$ 0.15	$ 0.000	$ 0.93
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.17	$ 0.002	$ 3.44
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.76	$ 0.003	$ 16.60
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.15	$ 0.000	$ 0.21
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.12	$ -	$ 0.39
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.10	$ -	$ 1.75
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.09	$ 0.000	$ 4.71
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.42	$ 0.000	$ 1.54
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.12	$ 0.000	$ 0.90
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.15	$ 0.002	$ 3.41
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.05	$ 1.24	$ 0.003	$ 16.06
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.15	$ 0.000	$ 0.21
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.12	$ -	$ 0.39
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.10	$ -	$ 1.75
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.09	$ 0.000	$ 4.71
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.42	$ 0.000	$ 1.55
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.13	$ 0.000	$ 0.91
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.15	$ 0.002	$ 3.42
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.05	$ 1.26	$ 0.003	$ 16.08
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.12	$ 0.000	$ 0.17
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.10	$ -	$ 0.36
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.06	$ -	$ 1.71
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 4.67
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.17	$ 0.000	$ 1.28
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.05	$ 0.000	$ 0.83
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.06	$ 0.002	$ 3.32
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.77
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.02	$ 0.66	$ 0.003	$ 15.46

Exhibit O.13g: State Costs - Present Value 7% (ICRSSL, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.16	$ 0.000	$ 0.21
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.13	$ -	$ 0.40
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.19	$ -	$ 1.85
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.18	$ 0.000	$ 4.80
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.39	$ 0.000	$ 1.52
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.12	$ 0.000	$ 0.90
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.14	$ 0.002	$ 3.41
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.05	$ 1.40	$ 0.003	$ 16.22
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.13	$ 0.000	$ 0.18
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.37
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.07	$ -	$ 1.72
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.07	$ 0.000	$ 4.68
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.32	$ 0.000	$ 1.44
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.10	$ 0.000	$ 0.87
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.11	$ 0.002	$ 3.38
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 0.98	$ 0.003	$ 15.79
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.13	$ 0.000	$ 0.18
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.37
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.07	$ -	$ 1.72
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.07	$ 0.000	$ 4.69
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.32	$ 0.000	$ 1.44
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.10	$ 0.000	$ 0.87
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.11	$ 0.002	$ 3.38
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 0.99	$ 0.003	$ 15.79
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.10	$ 0.000	$ 0.16
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.09	$ -	$ 0.35
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.34
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.05	$ -	$ 1.70
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 4.67
10,000-49,999	$ 1.01				$ 0.10	$ 0.00	$ 0.12	$ 0.000	$ 1.23
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.04	$ 0.000	$ 0.81
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.04	$ 0.002	$ 3.30
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.77
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.02	$ 0.54	$ 0.003	$ 15.33

Exhibit O.13h: State Costs - Present Value 7% (ICRSSL, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.14	$ 0.000	$ 0.20
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.12	$ -	$ 0.38
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.16	$ -	$ 1.81
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.14	$ 0.000	$ 4.77
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.33	$ 0.000	$ 1.45
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.10	$ 0.000	$ 0.88
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.12	$ 0.002	$ 3.38
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.19	$ 0.003	$ 16.01
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.12	$ 0.000	$ 0.18
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.10	$ -	$ 0.36
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.06	$ -	$ 1.71
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.06	$ 0.000	$ 4.68
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.26	$ 0.000	$ 1.38
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.08	$ 0.000	$ 0.86
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.09	$ 0.002	$ 3.36
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.03	$ 0.84	$ 0.003	$ 15.64
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.12	$ 0.000	$ 0.18
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.10	$ -	$ 0.36
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.06	$ -	$ 1.71
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.06	$ 0.000	$ 4.68
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.26	$ 0.000	$ 1.38
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.08	$ 0.000	$ 0.86
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.09	$ 0.002	$ 3.36
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.78
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.03	$ 0.84	$ 0.003	$ 15.65
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.10	$ 0.000	$ 0.16
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.08	$ -	$ 0.34
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.04	$ -	$ 0.34
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.05	$ -	$ 1.70
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 4.66
10,000-49,999	$ 1.01				$ 0.10	$ 0.00	$ 0.10	$ 0.000	$ 1.21
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.03	$ 0.000	$ 0.81
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.03	$ 0.002	$ 3.30
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.77
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.02	$ 0.49	$ 0.003	$ 15.28

Exhibit O.13i: State Costs - Present Value 7% (ICRSSL, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.01	$ 0.27	$ 0.000	$ 0.29
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ 0.01	$ 0.24	$ -	$ 0.26
500-999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ -	$ 0.13
1,000-3,299	$ 0.09	$ -	$ -	$ -	$ -	$ 0.04	$ 1.20	$ -	$ 1.34
3,300-9,999	$ 0.25	$ -	$ -	$ -	$ -	$ 0.04	$ 1.11	$ 0.000	$ 1.40
10,000-49,999	$ 1.01				$ -	$ 0.05	$ 1.49	$ 0.000	$ 2.55
50,000-99,999	$ 0.70				$ -	$ 0.02	$ 0.44	$ 0.000	$ 1.16
100,000-999,999	$ 2.94				$ -	$ 0.02	$ 0.54	$ 0.002	$ 3.50
1,000,000+	$ 2.49				$ -	$ 0.00	$ 0.09	$ 0.000	$ 2.58
Total	$ 7.52	$ -	$ -	$ -	$ -	$ 0.20	$ 5.49	$ 0.003	$ 13.21
Rule Alternative A2									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.17	$ 0.000	$ 0.23
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.01	$ 0.14	$ -	$ 0.41
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.07	$ -	$ 0.37
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.01	$ 0.22	$ -	$ 1.87
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.01	$ 0.20	$ 0.000	$ 4.82
10,000-49,999	$ 1.01				$ 0.10	$ 0.02	$ 0.44	$ 0.000	$ 1.57
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.13	$ 0.000	$ 0.91
100,000-999,999	$ 2.94				$ 0.32	$ 0.01	$ 0.16	$ 0.002	$ 3.42
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.03	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.06	$ 1.56	$ 0.003	$ 16.39
Rule Alternative A3									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.13	$ 0.000	$ 0.19
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.38
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.08	$ -	$ 1.73
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.07	$ 0.000	$ 4.69
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.36	$ 0.000	$ 1.48
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.11	$ 0.000	$ 0.89
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.13	$ 0.002	$ 3.39
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.08	$ 0.003	$ 15.89
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.01	$ 0.13	$ 0.000	$ 0.19
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.11	$ -	$ 0.38
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.06	$ -	$ 0.36
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.08	$ -	$ 1.73
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.07	$ 0.000	$ 4.69
10,000-49,999	$ 1.01				$ 0.10	$ 0.01	$ 0.37	$ 0.000	$ 1.49
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.11	$ 0.000	$ 0.89
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.13	$ 0.002	$ 3.39
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.02	$ 0.000	$ 2.79
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.04	$ 1.09	$ 0.003	$ 15.90
Rule Alternative A4									
<100	$ 0.00	$ 0.02	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.11	$ 0.000	$ 0.17
100-499	$ 0.01	$ 0.11	$ 0.06	$ 0.05	$ 0.02	$ 0.00	$ 0.09	$ -	$ 0.35
500-999	$ 0.02	$ 0.13	$ 0.07	$ 0.06	$ 0.03	$ 0.00	$ 0.05	$ -	$ 0.35
1,000-3,299	$ 0.09	$ 0.70	$ 0.38	$ 0.33	$ 0.14	$ 0.00	$ 0.05	$ -	$ 1.70
3,300-9,999	$ 0.25	$ 1.97	$ 1.07	$ 0.92	$ 0.40	$ 0.00	$ 0.05	$ 0.000	$ 4.67
10,000-49,999	$ 1.01				$ 0.10	$ 0.00	$ 0.14	$ 0.000	$ 1.25
50,000-99,999	$ 0.70				$ 0.07	$ 0.00	$ 0.04	$ 0.000	$ 0.82
100,000-999,999	$ 2.94				$ 0.32	$ 0.00	$ 0.05	$ 0.002	$ 3.31
1,000,000+	$ 2.49				$ 0.27	$ 0.00	$ 0.01	$ 0.000	$ 2.77
Total	$ 7.52	$ 2.93	$ 1.59	$ 1.37	$ 1.36	$ 0.02	$ 0.58	$ 0.003	$ 15.38

Exhibit O.14a: Implementation and Monitoring - PV, 7% (ICR, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.00	$ 0.00	$ 6.31
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 7.84	$ 0.01	$ 8.19
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.33	$ 0.00	$ 2.42
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.23	$ 0.01	$ 3.35
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ 0.00	$ 0.57
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.01	$ 0.02	$ 30.81
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.81	$ 6.29	$ 0.06	$ 0.01	$ 0.93	$ 0.00	$ 23.71
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.91	$ 7.04	$ 0.08	$ 0.01	$ 0.86	$ -	$ 26.11
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.37	$ 2.87	$ 0.04	$ 0.01	$ 0.50	$ -	$ 10.98
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.66	$ 5.09	$ 0.07	$ 0.02	$ 1.74	$ -	$ 22.11
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.61	$ 4.68	$ 0.07	$ 0.02	$ 1.62	$ 0.00	$ 20.31
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.32	$ 4.80	$ 0.06	$ 0.04	$ 2.96	$ 0.01	$ 22.80
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.08	$ 1.23	$ 0.02	$ 0.01	$ 0.88	$ 0.00	$ 5.99
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.07	$ 1.53	$ 0.02	$ 0.01	$ 1.20	$ 0.01	$ 7.42
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.26	$ 0.00	$ 0.00	$ 0.22	$ 0.00	$ 1.30
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 3.87	$ 33.78	$ 0.42	$ 0.13	$ 10.91	$ 0.02	$ 140.73
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 4.70	$ 0.13	$ 0.84	$ 2.27	$ 0.06	$ 0.01	$ 0.71	$ 0.00	$ 10.72
100-499	$ 0.24	$ 1.99	$ 5.19	$ 0.16	$ 0.95	$ 2.54	$ 0.08	$ 0.01	$ 0.65	$ -	$ 11.79
500-999	$ 0.12	$ 0.83	$ 2.16	$ 0.08	$ 0.39	$ 1.03	$ 0.04	$ 0.00	$ 0.40	$ -	$ 5.06
1,000-3,299	$ 0.25	$ 1.66	$ 4.43	$ 0.17	$ 0.77	$ 2.06	$ 0.08	$ 0.01	$ 0.88	$ -	$ 10.32
3,300-9,999	$ 0.23	$ 1.52	$ 4.07	$ 0.16	$ 0.71	$ 1.89	$ 0.08	$ 0.01	$ 0.82	$ 0.00	$ 9.49
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.34	$ 5.04	$ 0.07	$ 0.03	$ 2.69	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.29	$ 0.02	$ 0.01	$ 0.81	$ 0.00	$ 5.98
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.61	$ 0.02	$ 0.01	$ 1.08	$ 0.01	$ 7.39
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.27	$ 0.00	$ 0.00	$ 0.20	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 42.28	$ 1.00	$ 4.18	$ 18.00	$ 0.45	$ 0.10	$ 8.23	$ 0.02	$ 84.83
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 4.70	$ 0.13	$ 0.84	$ 2.27	$ 0.06	$ 0.01	$ 0.71	$ 0.00	$ 10.72
100-499	$ 0.24	$ 1.99	$ 5.19	$ 0.16	$ 0.95	$ 2.54	$ 0.08	$ 0.01	$ 0.65	$ -	$ 11.79
500-999	$ 0.12	$ 0.83	$ 2.16	$ 0.08	$ 0.39	$ 1.03	$ 0.04	$ 0.00	$ 0.40	$ -	$ 5.06
1,000-3,299	$ 0.25	$ 1.66	$ 4.43	$ 0.17	$ 0.77	$ 2.06	$ 0.08	$ 0.01	$ 0.88	$ -	$ 10.32
3,300-9,999	$ 0.23	$ 1.52	$ 4.07	$ 0.16	$ 0.71	$ 1.89	$ 0.08	$ 0.01	$ 0.82	$ 0.00	$ 9.49
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.34	$ 4.99	$ 0.07	$ 0.03	$ 2.75	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.28	$ 0.02	$ 0.01	$ 0.82	$ 0.00	$ 5.98
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.60	$ 0.02	$ 0.01	$ 1.10	$ 0.01	$ 7.40
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.27	$ 0.00	$ 0.00	$ 0.20	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 42.28	$ 1.00	$ 4.17	$ 17.92	$ 0.45	$ 0.10	$ 8.33	$ 0.02	$ 84.84
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 4.09	$ 0.13	$ 0.87	$ 2.04	$ 0.07	$ 0.01	$ 0.49	$ 0.00	$ 9.69
100-499	$ 0.24	$ 1.99	$ 4.52	$ 0.16	$ 0.98	$ 2.28	$ 0.08	$ 0.01	$ 0.43	$ -	$ 10.68
500-999	$ 0.12	$ 0.83	$ 1.89	$ 0.08	$ 0.40	$ 0.93	$ 0.04	$ 0.00	$ 0.29	$ -	$ 4.59
1,000-3,299	$ 0.25	$ 1.66	$ 3.88	$ 0.17	$ 0.84	$ 1.95	$ 0.09	$ 0.00	$ 0.35	$ -	$ 9.20
3,300-9,999	$ 0.23	$ 1.52	$ 3.56	$ 0.16	$ 0.77	$ 1.79	$ 0.08	$ 0.00	$ 0.33	$ 0.00	$ 8.45
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.42	$ 6.27	$ 0.08	$ 0.02	$ 1.33	$ 0.01	$ 22.75
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.11	$ 1.61	$ 0.02	$ 0.00	$ 0.40	$ 0.00	$ 5.91
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 2.00	$ 0.03	$ 0.01	$ 0.52	$ 0.01	$ 7.24
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.34	$ 0.01	$ 0.00	$ 0.10	$ 0.00	$ 1.27
Total	$ 1.42	$ 9.15	$ 39.67	$ 1.00	$ 4.51	$ 19.21	$ 0.50	$ 0.05	$ 4.24	$ 0.02	$ 79.77

Exhibit O.14b: Implementation and Monitoring - PV, 7% (ICR, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.82	$ 6.37	$ 0.06	$ 0.01	$ 0.85	$ 0.00	$ 23.72
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.93	$ 7.13	$ 0.08	$ 0.01	$ 0.79	$ -	$ 26.13
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.38	$ 2.91	$ 0.04	$ 0.01	$ 0.47	$ -	$ 10.98
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.68	$ 5.21	$ 0.07	$ 0.02	$ 1.61	$ -	$ 22.12
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.63	$ 4.79	$ 0.07	$ 0.02	$ 1.50	$ 0.00	$ 20.32
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.33	$ 4.93	$ 0.07	$ 0.03	$ 2.81	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.27	$ 0.02	$ 0.01	$ 0.84	$ 0.00	$ 5.98
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.57	$ 0.02	$ 0.01	$ 1.14	$ 0.01	$ 7.41
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.27	$ 0.00	$ 0.00	$ 0.20	$ 0.00	$ 1.30
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 3.94	$ 34.44	$ 0.43	$ 0.13	$ 10.20	$ 0.02	$ 140.76
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 4.37	$ 0.13	$ 0.85	$ 2.13	$ 0.07	$ 0.01	$ 0.65	$ 0.00	$ 10.20
100-499	$ 0.24	$ 1.99	$ 4.82	$ 0.16	$ 0.96	$ 2.38	$ 0.08	$ 0.01	$ 0.59	$ -	$ 11.22
500-999	$ 0.12	$ 0.83	$ 2.01	$ 0.08	$ 0.39	$ 0.97	$ 0.04	$ 0.00	$ 0.37	$ -	$ 4.82
1,000-3,299	$ 0.25	$ 1.66	$ 4.13	$ 0.17	$ 0.79	$ 1.95	$ 0.08	$ 0.01	$ 0.76	$ -	$ 9.81
3,300-9,999	$ 0.23	$ 1.52	$ 3.79	$ 0.16	$ 0.72	$ 1.79	$ 0.08	$ 0.01	$ 0.70	$ 0.00	$ 9.02
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.35	$ 5.21	$ 0.07	$ 0.03	$ 2.51	$ 0.01	$ 22.78
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.34	$ 0.02	$ 0.01	$ 0.75	$ 0.00	$ 5.97
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.66	$ 0.02	$ 0.01	$ 1.01	$ 0.01	$ 7.37
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.28	$ 0.00	$ 0.00	$ 0.18	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 40.86	$ 1.00	$ 4.25	$ 17.71	$ 0.46	$ 0.09	$ 7.51	$ 0.02	$ 82.48
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 4.37	$ 0.13	$ 0.85	$ 2.13	$ 0.07	$ 0.01	$ 0.65	$ 0.00	$ 10.20
100-499	$ 0.24	$ 1.99	$ 4.82	$ 0.16	$ 0.96	$ 2.38	$ 0.08	$ 0.01	$ 0.59	$ -	$ 11.22
500-999	$ 0.12	$ 0.83	$ 2.01	$ 0.08	$ 0.39	$ 0.97	$ 0.04	$ 0.00	$ 0.37	$ -	$ 4.82
1,000-3,299	$ 0.25	$ 1.66	$ 4.13	$ 0.17	$ 0.79	$ 1.95	$ 0.08	$ 0.01	$ 0.76	$ -	$ 9.81
3,300-9,999	$ 0.23	$ 1.52	$ 3.79	$ 0.16	$ 0.72	$ 1.79	$ 0.08	$ 0.01	$ 0.71	$ 0.00	$ 9.02
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.35	$ 5.16	$ 0.07	$ 0.03	$ 2.56	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.32	$ 0.02	$ 0.01	$ 0.77	$ 0.00	$ 5.97
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.65	$ 0.02	$ 0.01	$ 1.03	$ 0.01	$ 7.38
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.28	$ 0.00	$ 0.00	$ 0.19	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 40.86	$ 1.00	$ 4.24	$ 17.64	$ 0.46	$ 0.09	$ 7.61	$ 0.02	$ 82.49
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 3.78	$ 0.13	$ 0.88	$ 1.92	$ 0.07	$ 0.00	$ 0.37	$ 0.00	$ 9.16
100-499	$ 0.24	$ 1.99	$ 4.18	$ 0.16	$ 0.99	$ 2.13	$ 0.08	$ 0.00	$ 0.37	$ -	$ 10.14
500-999	$ 0.12	$ 0.83	$ 1.75	$ 0.08	$ 0.40	$ 0.87	$ 0.04	$ 0.00	$ 0.27	$ -	$ 4.37
1,000-3,299	$ 0.25	$ 1.66	$ 3.60	$ 0.17	$ 0.84	$ 1.81	$ 0.09	$ 0.00	$ 0.33	$ -	$ 8.76
3,300-9,999	$ 0.23	$ 1.52	$ 3.31	$ 0.16	$ 0.77	$ 1.65	$ 0.08	$ 0.00	$ 0.32	$ 0.00	$ 8.05
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.43	$ 6.40	$ 0.08	$ 0.01	$ 1.19	$ 0.01	$ 22.74
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.11	$ 1.64	$ 0.02	$ 0.00	$ 0.36	$ 0.00	$ 5.90
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 2.04	$ 0.03	$ 0.01	$ 0.46	$ 0.01	$ 7.22
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.35	$ 0.01	$ 0.00	$ 0.09	$ 0.00	$ 1.26
Total	$ 1.42	$ 9.15	$ 38.35	$ 1.00	$ 4.55	$ 18.80	$ 0.51	$ 0.05	$ 3.75	$ 0.02	$ 77.59

Exhibit O.14c: Implementation and Monitoring - PV, 7% (ICR, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.80	$ 6.19	$ 0.06	$ 0.01	$ 1.02	$ 0.00	$ 23.70
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.90	$ 6.94	$ 0.07	$ 0.01	$ 0.95	$ -	$ 26.08
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.37	$ 2.83	$ 0.04	$ 0.01	$ 0.55	$ -	$ 10.98
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.64	$ 4.90	$ 0.07	$ 0.02	$ 1.94	$ -	$ 22.09
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.59	$ 4.50	$ 0.06	$ 0.02	$ 1.80	$ 0.00	$ 20.30
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.30	$ 4.46	$ 0.06	$ 0.04	$ 3.32	$ 0.01	$ 22.81
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.08	$ 1.15	$ 0.02	$ 0.01	$ 0.99	$ 0.00	$ 6.01
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.07	$ 1.43	$ 0.02	$ 0.02	$ 1.35	$ 0.01	$ 7.47
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.24	$ 0.00	$ 0.00	$ 0.24	$ 0.00	$ 1.31
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 3.76	$ 32.64	$ 0.40	$ 0.15	$ 12.17	$ 0.02	$ 140.74
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 5.25	$ 0.13	$ 0.83	$ 2.51	$ 0.06	$ 0.01	$ 0.76	$ 0.00	$ 11.57
100-499	$ 0.24	$ 1.99	$ 5.80	$ 0.16	$ 0.94	$ 2.82	$ 0.08	$ 0.01	$ 0.70	$ -	$ 12.72
500-999	$ 0.12	$ 0.83	$ 2.42	$ 0.08	$ 0.38	$ 1.15	$ 0.04	$ 0.01	$ 0.42	$ -	$ 5.45
1,000-3,299	$ 0.25	$ 1.66	$ 4.94	$ 0.17	$ 0.76	$ 2.27	$ 0.08	$ 0.01	$ 0.97	$ -	$ 11.12
3,300-9,999	$ 0.23	$ 1.52	$ 4.54	$ 0.16	$ 0.70	$ 2.09	$ 0.08	$ 0.01	$ 0.89	$ 0.00	$ 10.22
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.32	$ 4.77	$ 0.06	$ 0.04	$ 2.99	$ 0.01	$ 22.80
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.08	$ 1.22	$ 0.02	$ 0.01	$ 0.89	$ 0.00	$ 5.99
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.07	$ 1.53	$ 0.02	$ 0.01	$ 1.20	$ 0.01	$ 7.43
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.26	$ 0.00	$ 0.00	$ 0.22	$ 0.00	$ 1.30
Total	$ 1.42	$ 9.15	$ 44.68	$ 1.00	$ 4.11	$ 18.62	$ 0.44	$ 0.11	$ 9.05	$ 0.02	$ 88.60
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 5.25	$ 0.13	$ 0.83	$ 2.51	$ 0.06	$ 0.01	$ 0.76	$ 0.00	$ 11.57
100-499	$ 0.24	$ 1.99	$ 5.80	$ 0.16	$ 0.94	$ 2.82	$ 0.08	$ 0.01	$ 0.70	$ -	$ 12.72
500-999	$ 0.12	$ 0.83	$ 2.42	$ 0.08	$ 0.38	$ 1.15	$ 0.04	$ 0.01	$ 0.42	$ -	$ 5.45
1,000-3,299	$ 0.25	$ 1.66	$ 4.94	$ 0.17	$ 0.76	$ 2.27	$ 0.08	$ 0.01	$ 0.97	$ -	$ 11.12
3,300-9,999	$ 0.23	$ 1.52	$ 4.54	$ 0.16	$ 0.70	$ 2.08	$ 0.08	$ 0.01	$ 0.90	$ 0.00	$ 10.22
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.32	$ 4.72	$ 0.06	$ 0.04	$ 3.05	$ 0.01	$ 22.80
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.08	$ 1.21	$ 0.02	$ 0.01	$ 0.91	$ 0.00	$ 5.99
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.07	$ 1.51	$ 0.02	$ 0.01	$ 1.23	$ 0.01	$ 7.43
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.26	$ 0.00	$ 0.00	$ 0.22	$ 0.00	$ 1.30
Total	$ 1.42	$ 9.15	$ 44.68	$ 1.00	$ 4.11	$ 18.53	$ 0.44	$ 0.11	$ 9.17	$ 0.02	$ 88.62
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 4.58	$ 0.13	$ 0.88	$ 2.32	$ 0.07	$ 0.00	$ 0.38	$ 0.00	$ 10.36
100-499	$ 0.24	$ 1.99	$ 5.06	$ 0.16	$ 0.99	$ 2.57	$ 0.08	$ 0.00	$ 0.39	$ -	$ 11.47
500-999	$ 0.12	$ 0.83	$ 2.11	$ 0.08	$ 0.40	$ 1.04	$ 0.04	$ 0.00	$ 0.28	$ -	$ 4.92
1,000-3,299	$ 0.25	$ 1.66	$ 4.33	$ 0.17	$ 0.84	$ 2.18	$ 0.09	$ 0.00	$ 0.36	$ -	$ 9.88
3,300-9,999	$ 0.23	$ 1.52	$ 3.97	$ 0.16	$ 0.77	$ 1.99	$ 0.08	$ 0.00	$ 0.34	$ 0.00	$ 9.08
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.42	$ 6.15	$ 0.08	$ 0.02	$ 1.46	$ 0.01	$ 22.75
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.11	$ 1.57	$ 0.02	$ 0.01	$ 0.44	$ 0.00	$ 5.91
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 1.96	$ 0.03	$ 0.01	$ 0.57	$ 0.01	$ 7.25
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.33	$ 0.00	$ 0.00	$ 0.11	$ 0.00	$ 1.27
Total	$ 1.42	$ 9.15	$ 41.77	$ 1.00	$ 4.51	$ 20.13	$ 0.50	$ 0.05	$ 4.34	$ 0.02	$ 82.88

Exhibit O.14d: Implementation and Monitoring - PV, 7% (ICRSSM, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.85	$ 6.55	$ 0.07	$ 0.01	$ 0.66	$ 0.00	$ 23.75
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.95	$ 7.34	$ 0.08	$ 0.01	$ 0.61	$ -	$ 26.19
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.39	$ 2.99	$ 0.04	$ 0.00	$ 0.37	$ -	$ 10.99
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.72	$ 5.55	$ 0.08	$ 0.02	$ 1.26	$ -	$ 22.15
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.67	$ 5.09	$ 0.07	$ 0.01	$ 1.18	$ 0.00	$ 20.35
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.35	$ 5.22	$ 0.07	$ 0.03	$ 2.50	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.34	$ 0.02	$ 0.01	$ 0.75	$ 0.00	$ 5.97
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.67	$ 0.02	$ 0.01	$ 1.00	$ 0.01	$ 7.37
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.28	$ 0.00	$ 0.00	$ 0.18	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 4.12	$ 36.03	$ 0.45	$ 0.10	$ 8.52	$ 0.02	$ 140.84
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 3.67	$ 0.13	$ 0.86	$ 1.82	$ 0.07	$ 0.01	$ 0.54	$ 0.00	$ 9.10
100-499	$ 0.24	$ 1.99	$ 4.06	$ 0.16	$ 0.97	$ 2.03	$ 0.08	$ 0.01	$ 0.49	$ -	$ 10.02
500-999	$ 0.12	$ 0.83	$ 1.70	$ 0.08	$ 0.40	$ 0.83	$ 0.04	$ 0.00	$ 0.31	$ -	$ 4.32
1,000-3,299	$ 0.25	$ 1.66	$ 3.50	$ 0.17	$ 0.82	$ 1.71	$ 0.09	$ 0.01	$ 0.50	$ -	$ 8.70
3,300-9,999	$ 0.23	$ 1.52	$ 3.21	$ 0.16	$ 0.75	$ 1.57	$ 0.08	$ 0.01	$ 0.46	$ 0.00	$ 8.00
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.38	$ 5.56	$ 0.07	$ 0.03	$ 2.12	$ 0.01	$ 22.77
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.43	$ 0.02	$ 0.01	$ 0.64	$ 0.00	$ 5.95
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.77	$ 0.03	$ 0.01	$ 0.85	$ 0.01	$ 7.33
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.30	$ 0.00	$ 0.00	$ 0.16	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 37.88	$ 1.00	$ 4.38	$ 17.02	$ 0.48	$ 0.07	$ 6.05	$ 0.02	$ 77.47
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 3.67	$ 0.13	$ 0.86	$ 1.82	$ 0.07	$ 0.01	$ 0.54	$ 0.00	$ 9.10
100-499	$ 0.24	$ 1.99	$ 4.06	$ 0.16	$ 0.97	$ 2.03	$ 0.08	$ 0.01	$ 0.49	$ -	$ 10.02
500-999	$ 0.12	$ 0.83	$ 1.70	$ 0.08	$ 0.40	$ 0.83	$ 0.04	$ 0.00	$ 0.31	$ -	$ 4.32
1,000-3,299	$ 0.25	$ 1.66	$ 3.50	$ 0.17	$ 0.82	$ 1.71	$ 0.09	$ 0.01	$ 0.50	$ -	$ 8.70
3,300-9,999	$ 0.23	$ 1.52	$ 3.21	$ 0.16	$ 0.75	$ 1.57	$ 0.08	$ 0.01	$ 0.46	$ 0.00	$ 8.00
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.37	$ 5.53	$ 0.07	$ 0.03	$ 2.15	$ 0.01	$ 22.78
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.42	$ 0.02	$ 0.01	$ 0.64	$ 0.00	$ 5.95
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.77	$ 0.03	$ 0.01	$ 0.86	$ 0.01	$ 7.33
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.30	$ 0.00	$ 0.00	$ 0.16	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 37.88	$ 1.00	$ 4.38	$ 16.98	$ 0.48	$ 0.07	$ 6.11	$ 0.02	$ 77.48
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 2.91	$ 0.13	$ 0.88	$ 1.46	$ 0.07	$ 0.01	$ 0.43	$ 0.00	$ 7.88
100-499	$ 0.24	$ 1.99	$ 3.22	$ 0.16	$ 0.99	$ 1.63	$ 0.08	$ 0.00	$ 0.38	$ -	$ 8.69
500-999	$ 0.12	$ 0.83	$ 1.35	$ 0.08	$ 0.40	$ 0.67	$ 0.04	$ 0.00	$ 0.26	$ -	$ 3.76
1,000-3,299	$ 0.25	$ 1.66	$ 2.80	$ 0.17	$ 0.85	$ 1.39	$ 0.09	$ 0.00	$ 0.30	$ -	$ 7.52
3,300-9,999	$ 0.23	$ 1.52	$ 2.57	$ 0.16	$ 0.78	$ 1.28	$ 0.08	$ 0.00	$ 0.29	$ 0.00	$ 6.91
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.45	$ 6.70	$ 0.09	$ 0.01	$ 0.85	$ 0.01	$ 22.73
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.12	$ 1.72	$ 0.02	$ 0.00	$ 0.26	$ 0.00	$ 5.88
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 2.13	$ 0.03	$ 0.00	$ 0.33	$ 0.01	$ 7.18
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.00	$ 0.07	$ 0.00	$ 1.26
Total	$ 1.42	$ 9.15	$ 34.58	$ 1.00	$ 4.58	$ 17.35	$ 0.51	$ 0.04	$ 3.17	$ 0.02	$ 71.81

Exhibit O.14e: Implementation and Monitoring - PV, 7% (ICRSSM, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.85	$ 6.60	$ 0.07	$ 0.01	$ 0.62	$ 0.00	$ 23.75
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.96	$ 7.39	$ 0.08	$ 0.01	$ 0.56	$ -	$ 26.20
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.39	$ 3.01	$ 0.04	$ 0.00	$ 0.35	$ -	$ 10.99
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.74	$ 5.68	$ 0.08	$ 0.01	$ 1.13	$ -	$ 22.16
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.68	$ 5.21	$ 0.07	$ 0.01	$ 1.05	$ 0.00	$ 20.35
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.37	$ 5.45	$ 0.07	$ 0.03	$ 2.24	$ 0.01	$ 22.78
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.40	$ 0.02	$ 0.01	$ 0.67	$ 0.00	$ 5.95
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.74	$ 0.03	$ 0.01	$ 0.90	$ 0.01	$ 7.34
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.30	$ 0.00	$ 0.00	$ 0.16	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 4.19	$ 36.77	$ 0.46	$ 0.09	$ 7.69	$ 0.02	$ 140.82
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 3.24	$ 0.13	$ 0.87	$ 1.61	$ 0.07	$ 0.01	$ 0.51	$ 0.00	$ 8.43
100-499	$ 0.24	$ 1.99	$ 3.59	$ 0.16	$ 0.98	$ 1.80	$ 0.08	$ 0.01	$ 0.46	$ -	$ 9.29
500-999	$ 0.12	$ 0.83	$ 1.50	$ 0.08	$ 0.40	$ 0.74	$ 0.04	$ 0.00	$ 0.30	$ -	$ 4.01
1,000-3,299	$ 0.25	$ 1.66	$ 3.11	$ 0.17	$ 0.83	$ 1.52	$ 0.09	$ 0.01	$ 0.43	$ -	$ 8.07
3,300-9,999	$ 0.23	$ 1.52	$ 2.85	$ 0.16	$ 0.76	$ 1.40	$ 0.08	$ 0.01	$ 0.40	$ 0.00	$ 7.42
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.39	$ 5.77	$ 0.08	$ 0.02	$ 1.89	$ 0.01	$ 22.77
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.48	$ 0.02	$ 0.01	$ 0.57	$ 0.00	$ 5.94
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.84	$ 0.03	$ 0.01	$ 0.75	$ 0.01	$ 7.30
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.31	$ 0.00	$ 0.00	$ 0.14	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 36.02	$ 1.00	$ 4.43	$ 16.47	$ 0.49	$ 0.07	$ 5.45	$ 0.02	$ 74.50
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 3.24	$ 0.13	$ 0.87	$ 1.61	$ 0.07	$ 0.01	$ 0.51	$ 0.00	$ 8.43
100-499	$ 0.24	$ 1.99	$ 3.59	$ 0.16	$ 0.98	$ 1.80	$ 0.08	$ 0.01	$ 0.46	$ -	$ 9.29
500-999	$ 0.12	$ 0.83	$ 1.50	$ 0.08	$ 0.40	$ 0.74	$ 0.04	$ 0.00	$ 0.30	$ -	$ 4.01
1,000-3,299	$ 0.25	$ 1.66	$ 3.11	$ 0.17	$ 0.83	$ 1.52	$ 0.09	$ 0.01	$ 0.43	$ -	$ 8.07
3,300-9,999	$ 0.23	$ 1.52	$ 2.85	$ 0.16	$ 0.76	$ 1.40	$ 0.08	$ 0.01	$ 0.41	$ 0.00	$ 7.42
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.39	$ 5.74	$ 0.08	$ 0.02	$ 1.92	$ 0.01	$ 22.77
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.47	$ 0.02	$ 0.01	$ 0.58	$ 0.00	$ 5.94
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.83	$ 0.03	$ 0.01	$ 0.76	$ 0.01	$ 7.31
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.31	$ 0.00	$ 0.00	$ 0.14	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 36.02	$ 1.00	$ 4.43	$ 16.43	$ 0.49	$ 0.07	$ 5.50	$ 0.02	$ 74.51
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 2.55	$ 0.13	$ 0.88	$ 1.29	$ 0.07	$ 0.01	$ 0.42	$ 0.00	$ 7.34
100-499	$ 0.24	$ 1.99	$ 2.83	$ 0.16	$ 0.99	$ 1.44	$ 0.08	$ 0.00	$ 0.37	$ -	$ 8.09
500-999	$ 0.12	$ 0.83	$ 1.19	$ 0.08	$ 0.41	$ 0.59	$ 0.04	$ 0.00	$ 0.25	$ -	$ 3.52
1,000-3,299	$ 0.25	$ 1.66	$ 2.48	$ 0.17	$ 0.85	$ 1.23	$ 0.09	$ 0.00	$ 0.29	$ -	$ 7.02
3,300-9,999	$ 0.23	$ 1.52	$ 2.28	$ 0.16	$ 0.78	$ 1.12	$ 0.08	$ 0.00	$ 0.28	$ 0.00	$ 6.46
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.46	$ 6.79	$ 0.09	$ 0.01	$ 0.75	$ 0.01	$ 22.72
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.12	$ 1.74	$ 0.02	$ 0.00	$ 0.23	$ 0.00	$ 5.88
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.11	$ 2.16	$ 0.03	$ 0.00	$ 0.29	$ 0.01	$ 7.17
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.37	$ 0.01	$ 0.00	$ 0.06	$ 0.00	$ 1.26
Total	$ 1.42	$ 9.15	$ 33.06	$ 1.00	$ 4.60	$ 16.72	$ 0.52	$ 0.04	$ 2.94	$ 0.02	$ 69.45

Exhibit O.14f: Implementation and Monitoring - PV, 7% (ICRSSM, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.84	$ 6.49	$ 0.06	$ 0.01	$ 0.72	$ 0.00	$ 23.74
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.94	$ 7.27	$ 0.08	$ 0.01	$ 0.67	$ -	$ 26.17
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.39	$ 2.96	$ 0.04	$ 0.01	$ 0.40	$ -	$ 10.99
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.71	$ 5.43	$ 0.08	$ 0.02	$ 1.39	$ -	$ 22.14
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.65	$ 4.98	$ 0.07	$ 0.02	$ 1.29	$ 0.00	$ 20.34
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.34	$ 5.01	$ 0.07	$ 0.03	$ 2.72	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.29	$ 0.02	$ 0.01	$ 0.81	$ 0.00	$ 5.98
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.60	$ 0.02	$ 0.01	$ 1.09	$ 0.01	$ 7.40
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.27	$ 0.00	$ 0.00	$ 0.20	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 4.05	$ 35.31	$ 0.44	$ 0.11	$ 9.30	$ 0.02	$ 140.84
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 4.04	$ 0.13	$ 0.86	$ 1.99	$ 0.07	$ 0.01	$ 0.57	$ 0.00	$ 9.66
100-499	$ 0.24	$ 1.99	$ 4.46	$ 0.16	$ 0.97	$ 2.23	$ 0.08	$ 0.01	$ 0.51	$ -	$ 10.64
500-999	$ 0.12	$ 0.83	$ 1.86	$ 0.08	$ 0.40	$ 0.91	$ 0.04	$ 0.00	$ 0.33	$ -	$ 4.58
1,000-3,299	$ 0.25	$ 1.66	$ 3.84	$ 0.17	$ 0.81	$ 1.87	$ 0.09	$ 0.01	$ 0.55	$ -	$ 9.24
3,300-9,999	$ 0.23	$ 1.52	$ 3.52	$ 0.16	$ 0.75	$ 1.71	$ 0.08	$ 0.01	$ 0.51	$ 0.00	$ 8.49
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.36	$ 5.38	$ 0.07	$ 0.03	$ 2.31	$ 0.01	$ 22.78
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.38	$ 0.02	$ 0.01	$ 0.69	$ 0.00	$ 5.96
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.72	$ 0.03	$ 0.01	$ 0.93	$ 0.01	$ 7.35
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.29	$ 0.00	$ 0.00	$ 0.17	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 39.45	$ 1.00	$ 4.34	$ 17.49	$ 0.47	$ 0.08	$ 6.56	$ 0.02	$ 79.98
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 4.04	$ 0.13	$ 0.86	$ 1.99	$ 0.07	$ 0.01	$ 0.57	$ 0.00	$ 9.66
100-499	$ 0.24	$ 1.99	$ 4.46	$ 0.16	$ 0.97	$ 2.23	$ 0.08	$ 0.01	$ 0.51	$ -	$ 10.64
500-999	$ 0.12	$ 0.83	$ 1.86	$ 0.08	$ 0.40	$ 0.91	$ 0.04	$ 0.00	$ 0.33	$ -	$ 4.58
1,000-3,299	$ 0.25	$ 1.66	$ 3.84	$ 0.17	$ 0.81	$ 1.87	$ 0.09	$ 0.01	$ 0.55	$ -	$ 9.24
3,300-9,999	$ 0.23	$ 1.52	$ 3.52	$ 0.16	$ 0.75	$ 1.71	$ 0.08	$ 0.01	$ 0.51	$ 0.00	$ 8.49
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.36	$ 5.35	$ 0.07	$ 0.03	$ 2.35	$ 0.01	$ 22.78
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.37	$ 0.02	$ 0.01	$ 0.70	$ 0.00	$ 5.96
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.71	$ 0.03	$ 0.01	$ 0.94	$ 0.01	$ 7.35
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.29	$ 0.00	$ 0.00	$ 0.17	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 39.45	$ 1.00	$ 4.34	$ 17.43	$ 0.47	$ 0.08	$ 6.63	$ 0.02	$ 79.99
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 3.23	$ 0.13	$ 0.88	$ 1.62	$ 0.07	$ 0.01	$ 0.44	$ 0.00	$ 8.37
100-499	$ 0.24	$ 1.99	$ 3.57	$ 0.16	$ 0.99	$ 1.81	$ 0.08	$ 0.00	$ 0.39	$ -	$ 9.23
500-999	$ 0.12	$ 0.83	$ 1.50	$ 0.08	$ 0.40	$ 0.74	$ 0.04	$ 0.00	$ 0.27	$ -	$ 3.99
1,000-3,299	$ 0.25	$ 1.66	$ 3.10	$ 0.17	$ 0.84	$ 1.54	$ 0.09	$ 0.00	$ 0.31	$ -	$ 7.97
3,300-9,999	$ 0.23	$ 1.52	$ 2.84	$ 0.16	$ 0.77	$ 1.42	$ 0.08	$ 0.00	$ 0.30	$ 0.00	$ 7.33
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.45	$ 6.62	$ 0.09	$ 0.01	$ 0.94	$ 0.01	$ 22.73
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.11	$ 1.70	$ 0.02	$ 0.00	$ 0.29	$ 0.00	$ 5.89
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 2.11	$ 0.03	$ 0.00	$ 0.36	$ 0.01	$ 7.19
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.00	$ 0.07	$ 0.00	$ 1.26
Total	$ 1.42	$ 9.15	$ 35.97	$ 1.00	$ 4.57	$ 17.92	$ 0.51	$ 0.04	$ 3.38	$ 0.02	$ 73.97

Exhibit O.14g: Implementation and Monitoring - PV, 7% (ICRSSL, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.86	$ 6.62	$ 0.07	$ 0.01	$ 0.60	$ 0.00	$ 23.76
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.96	$ 7.41	$ 0.08	$ 0.01	$ 0.54	$ -	$ 26.21
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.39	$ 3.02	$ 0.04	$ 0.00	$ 0.34	$ -	$ 10.99
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.75	$ 5.77	$ 0.08	$ 0.01	$ 1.03	$ -	$ 22.17
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.69	$ 5.30	$ 0.07	$ 0.01	$ 0.96	$ 0.00	$ 20.36
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.37	$ 5.50	$ 0.07	$ 0.03	$ 2.19	$ 0.01	$ 22.78
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.41	$ 0.02	$ 0.01	$ 0.66	$ 0.00	$ 5.95
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.76	$ 0.03	$ 0.01	$ 0.87	$ 0.01	$ 7.34
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.30	$ 0.00	$ 0.00	$ 0.16	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 4.23	$ 37.09	$ 0.46	$ 0.09	$ 7.35	$ 0.02	$ 140.84
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 3.02	$ 0.13	$ 0.87	$ 1.51	$ 0.07	$ 0.01	$ 0.49	$ 0.00	$ 8.09
100-499	$ 0.24	$ 1.99	$ 3.35	$ 0.16	$ 0.98	$ 1.68	$ 0.08	$ 0.01	$ 0.44	$ -	$ 8.91
500-999	$ 0.12	$ 0.83	$ 1.40	$ 0.08	$ 0.40	$ 0.69	$ 0.04	$ 0.00	$ 0.29	$ -	$ 3.86
1,000-3,299	$ 0.25	$ 1.66	$ 2.91	$ 0.17	$ 0.83	$ 1.43	$ 0.09	$ 0.00	$ 0.39	$ -	$ 7.74
3,300-9,999	$ 0.23	$ 1.52	$ 2.67	$ 0.16	$ 0.77	$ 1.31	$ 0.08	$ 0.00	$ 0.36	$ 0.00	$ 7.11
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.40	$ 5.87	$ 0.08	$ 0.02	$ 1.77	$ 0.01	$ 22.76
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.51	$ 0.02	$ 0.01	$ 0.53	$ 0.00	$ 5.93
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.87	$ 0.03	$ 0.01	$ 0.71	$ 0.01	$ 7.29
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.32	$ 0.00	$ 0.00	$ 0.13	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 35.08	$ 1.00	$ 4.46	$ 16.18	$ 0.49	$ 0.06	$ 5.12	$ 0.02	$ 72.97
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 3.02	$ 0.13	$ 0.87	$ 1.51	$ 0.07	$ 0.01	$ 0.49	$ 0.00	$ 8.09
100-499	$ 0.24	$ 1.99	$ 3.35	$ 0.16	$ 0.98	$ 1.68	$ 0.08	$ 0.01	$ 0.44	$ -	$ 8.91
500-999	$ 0.12	$ 0.83	$ 1.40	$ 0.08	$ 0.40	$ 0.69	$ 0.04	$ 0.00	$ 0.29	$ -	$ 3.86
1,000-3,299	$ 0.25	$ 1.66	$ 2.91	$ 0.17	$ 0.83	$ 1.43	$ 0.09	$ 0.00	$ 0.39	$ -	$ 7.74
3,300-9,999	$ 0.23	$ 1.52	$ 2.67	$ 0.16	$ 0.77	$ 1.31	$ 0.08	$ 0.00	$ 0.37	$ 0.00	$ 7.12
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.40	$ 5.85	$ 0.08	$ 0.02	$ 1.80	$ 0.01	$ 22.76
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.50	$ 0.02	$ 0.01	$ 0.54	$ 0.00	$ 5.93
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.87	$ 0.03	$ 0.01	$ 0.72	$ 0.01	$ 7.29
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.32	$ 0.00	$ 0.00	$ 0.13	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 35.08	$ 1.00	$ 4.45	$ 16.15	$ 0.49	$ 0.06	$ 5.16	$ 0.02	$ 72.98
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 2.17	$ 0.13	$ 0.88	$ 1.09	$ 0.07	$ 0.00	$ 0.40	$ 0.00	$ 6.74
100-499	$ 0.24	$ 1.99	$ 2.41	$ 0.16	$ 0.99	$ 1.22	$ 0.08	$ 0.00	$ 0.35	$ -	$ 7.44
500-999	$ 0.12	$ 0.83	$ 1.01	$ 0.08	$ 0.41	$ 0.50	$ 0.04	$ 0.00	$ 0.25	$ -	$ 3.24
1,000-3,299	$ 0.25	$ 1.66	$ 2.13	$ 0.17	$ 0.85	$ 1.04	$ 0.09	$ 0.00	$ 0.28	$ -	$ 6.47
3,300-9,999	$ 0.23	$ 1.52	$ 1.95	$ 0.16	$ 0.78	$ 0.95	$ 0.08	$ 0.00	$ 0.26	$ 0.00	$ 5.95
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.47	$ 6.89	$ 0.09	$ 0.01	$ 0.65	$ 0.01	$ 22.72
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.12	$ 1.77	$ 0.02	$ 0.00	$ 0.20	$ 0.00	$ 5.87
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.11	$ 2.19	$ 0.03	$ 0.00	$ 0.25	$ 0.01	$ 7.16
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.37	$ 0.01	$ 0.00	$ 0.05	$ 0.00	$ 1.25
Total	$ 1.42	$ 9.15	$ 31.39	$ 1.00	$ 4.62	$ 16.02	$ 0.52	$ 0.03	$ 2.69	$ 0.02	$ 66.85

Exhibit O.14h: Implementation and Monitoring - PV, 7% (ICRSSL, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.86	$ 6.67	$ 0.07	$ 0.01	$ 0.55	$ 0.00	$ 23.76
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.97	$ 7.47	$ 0.08	$ 0.01	$ 0.49	$ -	$ 26.22
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.40	$ 3.05	$ 0.04	$ 0.00	$ 0.32	$ -	$ 10.99
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.78	$ 5.95	$ 0.08	$ 0.01	$ 0.84	$ -	$ 22.19
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.71	$ 5.46	$ 0.08	$ 0.01	$ 0.79	$ 0.00	$ 20.37
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.39	$ 5.82	$ 0.08	$ 0.02	$ 1.83	$ 0.01	$ 22.76
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.49	$ 0.02	$ 0.01	$ 0.55	$ 0.00	$ 5.93
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.86	$ 0.03	$ 0.01	$ 0.73	$ 0.01	$ 7.29
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.32	$ 0.00	$ 0.00	$ 0.14	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 4.32	$ 38.09	$ 0.48	$ 0.08	$ 6.23	$ 0.02	$ 140.81
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 2.39	$ 0.13	$ 0.87	$ 1.20	$ 0.07	$ 0.01	$ 0.45	$ 0.00	$ 7.12
100-499	$ 0.24	$ 1.99	$ 2.65	$ 0.16	$ 0.98	$ 1.34	$ 0.08	$ 0.01	$ 0.41	$ -	$ 7.84
500-999	$ 0.12	$ 0.83	$ 1.11	$ 0.08	$ 0.40	$ 0.55	$ 0.04	$ 0.00	$ 0.27	$ -	$ 3.42
1,000-3,299	$ 0.25	$ 1.66	$ 2.33	$ 0.17	$ 0.84	$ 1.14	$ 0.09	$ 0.00	$ 0.34	$ -	$ 6.82
3,300-9,999	$ 0.23	$ 1.52	$ 2.14	$ 0.16	$ 0.77	$ 1.04	$ 0.08	$ 0.00	$ 0.32	$ 0.00	$ 6.28
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.42	$ 6.17	$ 0.08	$ 0.02	$ 1.44	$ 0.01	$ 22.75
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.11	$ 1.58	$ 0.02	$ 0.01	$ 0.43	$ 0.00	$ 5.91
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 1.96	$ 0.03	$ 0.01	$ 0.57	$ 0.01	$ 7.25
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.33	$ 0.00	$ 0.00	$ 0.11	$ 0.00	$ 1.27
Total	$ 1.42	$ 9.15	$ 32.36	$ 1.00	$ 4.51	$ 15.31	$ 0.50	$ 0.05	$ 4.35	$ 0.02	$ 68.66
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 2.39	$ 0.13	$ 0.87	$ 1.20	$ 0.07	$ 0.01	$ 0.45	$ 0.00	$ 7.12
100-499	$ 0.24	$ 1.99	$ 2.65	$ 0.16	$ 0.98	$ 1.34	$ 0.08	$ 0.01	$ 0.41	$ -	$ 7.84
500-999	$ 0.12	$ 0.83	$ 1.11	$ 0.08	$ 0.40	$ 0.55	$ 0.04	$ 0.00	$ 0.27	$ -	$ 3.42
1,000-3,299	$ 0.25	$ 1.66	$ 2.33	$ 0.17	$ 0.84	$ 1.14	$ 0.09	$ 0.00	$ 0.34	$ -	$ 6.82
3,300-9,999	$ 0.23	$ 1.52	$ 2.14	$ 0.16	$ 0.77	$ 1.04	$ 0.08	$ 0.00	$ 0.32	$ 0.00	$ 6.28
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.42	$ 6.15	$ 0.08	$ 0.02	$ 1.46	$ 0.01	$ 22.75
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.11	$ 1.58	$ 0.02	$ 0.01	$ 0.44	$ 0.00	$ 5.91
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.10	$ 1.96	$ 0.03	$ 0.01	$ 0.58	$ 0.01	$ 7.25
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.33	$ 0.00	$ 0.00	$ 0.11	$ 0.00	$ 1.27
Total	$ 1.42	$ 9.15	$ 32.36	$ 1.00	$ 4.51	$ 15.28	$ 0.50	$ 0.05	$ 4.38	$ 0.02	$ 68.67
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 1.68	$ 0.13	$ 0.88	$ 0.85	$ 0.07	$ 0.00	$ 0.38	$ 0.00	$ 5.99
100-499	$ 0.24	$ 1.99	$ 1.87	$ 0.16	$ 0.99	$ 0.95	$ 0.08	$ 0.00	$ 0.34	$ -	$ 6.61
500-999	$ 0.12	$ 0.83	$ 0.79	$ 0.08	$ 0.41	$ 0.39	$ 0.04	$ 0.00	$ 0.24	$ -	$ 2.90
1,000-3,299	$ 0.25	$ 1.66	$ 1.68	$ 0.17	$ 0.85	$ 0.81	$ 0.09	$ 0.00	$ 0.26	$ -	$ 5.77
3,300-9,999	$ 0.23	$ 1.52	$ 1.54	$ 0.16	$ 0.78	$ 0.74	$ 0.08	$ 0.00	$ 0.25	$ 0.00	$ 5.32
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.47	$ 6.98	$ 0.09	$ 0.01	$ 0.54	$ 0.01	$ 22.72
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.12	$ 1.79	$ 0.02	$ 0.00	$ 0.17	$ 0.00	$ 5.87
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.11	$ 2.22	$ 0.03	$ 0.00	$ 0.21	$ 0.01	$ 7.15
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.38	$ 0.01	$ 0.00	$ 0.05	$ 0.00	$ 1.25
Total	$ 1.42	$ 9.15	$ 29.29	$ 1.00	$ 4.64	$ 15.09	$ 0.52	$ 0.03	$ 2.43	$ 0.02	$ 63.58

Exhibit O.14i: Implementation and Monitoring - PV, 7% (ICRSSL, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.20	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 1.05	$ 0.00	$ 1.26
100-499	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.98	$ -	$ 1.23
500-999	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.56	$ -	$ 0.69
1,000-3,299	$ 0.25	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.08	$ 6.45	$ -	$ 6.78
3,300-9,999	$ 0.23	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.07	$ 6.04	$ 0.00	$ 6.35
10,000-49,999	$ 0.24	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.10	$ 8.25	$ 0.01	$ 8.59
50,000-99,999	$ 0.06	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.46	$ 0.00	$ 2.55
100,000-999,999	$ 0.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.04	$ 3.39	$ 0.01	$ 3.51
1,000,000+	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.59	$ 0.00	$ 0.60
Total	$ 1.42	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 29.76	$ 0.02	$ 31.56
Rule Alternative A2											
<100	$ 0.20	$ 1.80	$ 13.48	$ 0.13	$ 0.85	$ 6.57	$ 0.07	$ 0.01	$ 0.64	$ 0.00	$ 23.75
100-499	$ 0.24	$ 1.99	$ 14.82	$ 0.16	$ 0.96	$ 7.36	$ 0.08	$ 0.01	$ 0.59	$ -	$ 26.19
500-999	$ 0.12	$ 0.83	$ 6.15	$ 0.08	$ 0.39	$ 3.00	$ 0.04	$ 0.00	$ 0.36	$ -	$ 10.99
1,000-3,299	$ 0.25	$ 1.66	$ 12.44	$ 0.17	$ 0.74	$ 5.64	$ 0.08	$ 0.01	$ 1.17	$ -	$ 22.16
3,300-9,999	$ 0.23	$ 1.52	$ 11.41	$ 0.16	$ 0.68	$ 5.17	$ 0.07	$ 0.01	$ 1.09	$ 0.00	$ 20.35
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.35	$ 5.24	$ 0.07	$ 0.03	$ 2.47	$ 0.01	$ 22.79
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.09	$ 1.34	$ 0.02	$ 0.01	$ 0.74	$ 0.00	$ 5.96
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.08	$ 1.68	$ 0.03	$ 0.01	$ 0.99	$ 0.01	$ 7.37
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.29	$ 0.00	$ 0.00	$ 0.18	$ 0.00	$ 1.29
Total	$ 1.42	$ 9.15	$ 80.03	$ 1.00	$ 4.15	$ 36.30	$ 0.45	$ 0.10	$ 8.23	$ 0.02	$ 140.85
Rule Alternative A3											
<100	$ 0.20	$ 1.80	$ 3.45	$ 0.13	$ 0.87	$ 1.71	$ 0.07	$ 0.01	$ 0.52	$ 0.00	$ 8.75
100-499	$ 0.24	$ 1.99	$ 3.82	$ 0.16	$ 0.97	$ 1.92	$ 0.08	$ 0.01	$ 0.46	$ -	$ 9.64
500-999	$ 0.12	$ 0.83	$ 1.60	$ 0.08	$ 0.40	$ 0.78	$ 0.04	$ 0.00	$ 0.30	$ -	$ 4.16
1,000-3,299	$ 0.25	$ 1.66	$ 3.30	$ 0.17	$ 0.83	$ 1.62	$ 0.09	$ 0.01	$ 0.43	$ -	$ 8.36
3,300-9,999	$ 0.23	$ 1.52	$ 3.03	$ 0.16	$ 0.76	$ 1.49	$ 0.08	$ 0.01	$ 0.40	$ 0.00	$ 7.68
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.38	$ 5.67	$ 0.07	$ 0.02	$ 2.00	$ 0.01	$ 22.77
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.45	$ 0.02	$ 0.01	$ 0.60	$ 0.00	$ 5.94
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.81	$ 0.03	$ 0.01	$ 0.80	$ 0.01	$ 7.31
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.31	$ 0.00	$ 0.00	$ 0.15	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 36.93	$ 1.00	$ 4.42	$ 16.77	$ 0.48	$ 0.07	$ 5.66	$ 0.02	$ 75.91
Rule Alternative A3 UV90-10B											
<100	$ 0.20	$ 1.80	$ 3.45	$ 0.13	$ 0.87	$ 1.71	$ 0.07	$ 0.01	$ 0.52	$ 0.00	$ 8.75
100-499	$ 0.24	$ 1.99	$ 3.82	$ 0.16	$ 0.97	$ 1.92	$ 0.08	$ 0.01	$ 0.46	$ -	$ 9.64
500-999	$ 0.12	$ 0.83	$ 1.60	$ 0.08	$ 0.40	$ 0.78	$ 0.04	$ 0.00	$ 0.30	$ -	$ 4.16
1,000-3,299	$ 0.25	$ 1.66	$ 3.30	$ 0.17	$ 0.83	$ 1.62	$ 0.09	$ 0.01	$ 0.43	$ -	$ 8.36
3,300-9,999	$ 0.23	$ 1.52	$ 3.03	$ 0.16	$ 0.76	$ 1.49	$ 0.08	$ 0.01	$ 0.40	$ 0.00	$ 7.69
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.38	$ 5.64	$ 0.07	$ 0.02	$ 2.03	$ 0.01	$ 22.77
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.10	$ 1.45	$ 0.02	$ 0.01	$ 0.61	$ 0.00	$ 5.94
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.09	$ 1.80	$ 0.03	$ 0.01	$ 0.81	$ 0.01	$ 7.32
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.01	$ 0.31	$ 0.00	$ 0.00	$ 0.15	$ 0.00	$ 1.28
Total	$ 1.42	$ 9.15	$ 36.93	$ 1.00	$ 4.41	$ 16.72	$ 0.48	$ 0.07	$ 5.71	$ 0.02	$ 75.92
Rule Alternative A4											
<100	$ 0.20	$ 1.80	$ 2.60	$ 0.13	$ 0.88	$ 1.31	$ 0.07	$ 0.01	$ 0.42	$ 0.00	$ 7.41
100-499	$ 0.24	$ 1.99	$ 2.88	$ 0.16	$ 0.99	$ 1.46	$ 0.08	$ 0.00	$ 0.37	$ -	$ 8.17
500-999	$ 0.12	$ 0.83	$ 1.21	$ 0.08	$ 0.41	$ 0.60	$ 0.04	$ 0.00	$ 0.25	$ -	$ 3.55
1,000-3,299	$ 0.25	$ 1.66	$ 2.52	$ 0.17	$ 0.85	$ 1.25	$ 0.09	$ 0.00	$ 0.29	$ -	$ 7.08
3,300-9,999	$ 0.23	$ 1.52	$ 2.31	$ 0.16	$ 0.78	$ 1.14	$ 0.08	$ 0.00	$ 0.28	$ 0.00	$ 6.51
10,000-49,999	$ 0.24	$ 0.89	$ 13.31	$ 0.17	$ 0.46	$ 6.79	$ 0.09	$ 0.01	$ 0.75	$ 0.01	$ 22.72
50,000-99,999	$ 0.06	$ 0.23	$ 3.43	$ 0.04	$ 0.12	$ 1.74	$ 0.02	$ 0.00	$ 0.23	$ 0.00	$ 5.88
100,000-999,999	$ 0.07	$ 0.20	$ 4.24	$ 0.06	$ 0.11	$ 2.16	$ 0.03	$ 0.00	$ 0.29	$ 0.01	$ 7.17
1,000,000+	$ 0.01	$ 0.03	$ 0.75	$ 0.01	$ 0.02	$ 0.37	$ 0.01	$ 0.00	$ 0.06	$ 0.00	$ 1.26
Total	$ 1.42	$ 9.15	$ 33.25	$ 1.00	$ 4.60	$ 16.82	$ 0.52	$ 0.04	$ 2.94	$ 0.02	$ 69.74

Exhibit O.15a: Treatment Uncertainty - PV, 7% (ICR)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th Percentile	Mean	95th	5th Percentile	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th Percentile	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 8.38	$ 9.99	$ 11.60	$ 8.69	$ 9.35	$ 10.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 17.10	$ 19.38	$ 21.65
100-499	$ 12.54	$ 14.79	$ 17.04	$ 14.93	$ 16.19	$ 17.44	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 27.60	$ 31.13	$ 34.65
500-999	$ 8.54	$ 10.03	$ 11.51	$ 14.28	$ 15.63	$ 16.97	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 23.11	$ 25.97	$ 28.83
1,000-3,299	$ 45.21	$ 54.68	$ 64.08	$ 50.41	$ 55.29	$ 60.15	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 97.43	$ 112.00	$ 126.48
3,300-9,999	$ 139.28	$ 170.35	$ 201.27	$ 72.75	$ 78.99	$ 85.30	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 215.96	$ 253.84	$ 291.63
10,000-49,999	$ 521.94	$ 595.97	$ 670.25	$ 262.13	$ 277.97	$ 293.91	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 802.19	$ 893.05	$ 984.26
50,000-99,999	$ 352.95	$ 405.02	$ 456.86	$ 148.14	$ 156.93	$ 165.87	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 510.04	$ 571.79	$ 633.45
100,000-999,999	$ 1,086.33	$ 1,239.06	$ 1,391.63	$ 519.72	$ 550.45	$ 581.59	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 1,740.56	$ 1,926.88	$ 2,113.46
1,000,000+	$ 485.02	$ 552.72	$ 620.41	$ 295.62	$ 312.89	$ 330.34	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 1,058.73	$ 1,208.65	$ 1,357.94
Total	$ 2,660.20	$ 3,052.62	$ 3,444.64	$ 1,386.67	$ 1,473.70	$ 1,561.58	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 4,492.72	$ 5,042.69	$ 5,592.34
Rule Alternative A2																					
<100	$ 3.91	$ 4.68	$ 5.90	$ 4.03	$ 4.71	$ 5.70	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 7.98	$ 9.43	$ 11.64
100-499	$ 5.80	$ 7.02	$ 8.84	$ 5.83	$ 6.74	$ 8.12	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 11.76	$ 13.90	$ 17.12
500-999	$ 3.97	$ 4.83	$ 6.08	$ 4.44	$ 5.11	$ 6.13	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.69	$ 10.24	$ 12.56
1,000-3,299	$ 16.02	$ 19.87	$ 25.46	$ 15.20	$ 17.53	$ 21.28	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 33.03	$ 39.43	$ 48.99
3,300-9,999	$ 45.44	$ 56.90	$ 73.48	$ 25.73	$ 29.19	$ 35.12	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 75.11	$ 90.58	$ 113.66
10,000-49,999	$ 163.14	$ 198.74	$ 253.18	$ 79.69	$ 89.74	$ 107.28	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 260.95	$ 307.58	$ 380.56
50,000-99,999	$ 109.29	$ 134.62	$ 172.80	$ 41.73	$ 47.16	$ 56.22	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 159.97	$ 191.61	$ 239.75
100,000-999,999	$ 327.54	$ 401.60	$ 512.16	$ 135.93	$ 154.40	$ 183.85	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 597.98	$ 693.37	$ 836.25
1,000,000+	$ 145.04	$ 177.62	$ 226.26	$ 74.91	$ 85.43	$ 101.74	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 498.04	$ 606.09	$ 735.19
Total	$ 820.15	$ 1,005.87	$ 1,284.17	$ 387.48	$ 440.00	$ 525.44	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,653.49	$ 1,962.24	$ 2,395.72
Rule Alternative A3																					
<100	$ 2.90	$ 3.67	$ 4.63	$ 2.70	$ 3.27	$ 3.92	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 5.64	$ 6.97	$ 8.59
100-499	$ 4.07	$ 5.15	$ 6.46	$ 3.70	$ 4.47	$ 5.33	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.90	$ 9.76	$ 11.96
500-999	$ 2.74	$ 3.48	$ 4.37	$ 2.53	$ 3.06	$ 3.63	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.55	$ 6.85	$ 8.34
1,000-3,299	$ 10.15	$ 13.04	$ 16.40	$ 8.99	$ 10.83	$ 12.92	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 20.94	$ 25.91	$ 31.57
3,300-9,999	$ 27.53	$ 35.69	$ 45.11	$ 17.47	$ 20.70	$ 24.68	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 48.93	$ 60.89	$ 74.85
10,000-49,999	$ 133.23	$ 167.49	$ 211.84	$ 60.33	$ 70.44	$ 83.43	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 211.68	$ 257.03	$ 315.38
50,000-99,999	$ 89.00	$ 113.39	$ 144.78	$ 29.55	$ 34.78	$ 41.06	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 127.50	$ 158.01	$ 196.56
100,000-999,999	$ 260.90	$ 331.19	$ 420.32	$ 93.00	$ 110.25	$ 129.88	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 488.41	$ 578.80	$ 690.45
1,000,000+	$ 113.49	$ 144.21	$ 182.98	$ 51.23	$ 60.94	$ 71.77	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 442.80	$ 548.19	$ 661.93
Total	$ 644.00	$ 817.30	$ 1,036.90	$ 269.49	$ 318.74	$ 376.60	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,359.34	$ 1,652.41	$ 1,999.62
Rule Alternative A3 UV90-10B																					
<100	$ 2.90	$ 3.67	$ 4.63	$ 2.70	$ 3.27	$ 3.92	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 5.64	$ 6.97	$ 8.59
100-499	$ 4.07	$ 5.15	$ 6.46	$ 3.70	$ 4.47	$ 5.33	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.90	$ 9.76	$ 11.96
500-999	$ 2.74	$ 3.48	$ 4.37	$ 2.53	$ 3.06	$ 3.63	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.55	$ 6.85	$ 8.34
1,000-3,299	$ 10.15	$ 13.05	$ 16.41	$ 8.98	$ 10.83	$ 12.91	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 20.95	$ 25.91	$ 31.58
3,300-9,999	$ 27.99	$ 36.21	$ 45.77	$ 17.61	$ 20.87	$ 24.86	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 49.54	$ 61.57	$ 75.69
10,000-49,999	$ 147.58	$ 184.99	$ 233.23	$ 66.07	$ 77.31	$ 91.72	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 231.77	$ 281.41	$ 345.05
50,000-99,999	$ 100.39	$ 127.08	$ 160.97	$ 34.29	$ 40.61	$ 48.20	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 143.63	$ 177.52	$ 219.90
100,000-999,999	$ 303.36	$ 382.92	$ 482.77	$ 114.56	$ 136.54	$ 162.01	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 552.44	$ 656.82	$ 785.01
1,000,000+	$ 136.87	$ 173.12	$ 218.15	$ 63.77	$ 76.25	$ 90.59	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 478.73	$ 592.40	$ 715.92
Total	$ 736.05	$ 929.67	$ 1,172.77	$ 314.22	$ 373.19	$ 443.15	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,496.13	$ 1,819.23	$ 2,202.04
Rule Alternative A4																					
<100	$ 1.63	$ 2.15	$ 2.80	$ 1.40	$ 1.66	$ 1.98	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.06	$ 3.84	$ 4.83
100-499	$ 2.18	$ 2.81	$ 3.62	$ 1.84	$ 2.18	$ 2.61	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 4.15	$ 5.14	$ 6.40
500-999	$ 1.44	$ 1.85	$ 2.36	$ 1.13	$ 1.34	$ 1.60	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.85	$ 3.50	$ 4.31
1,000-3,299	$ 4.75	$ 6.16	$ 7.94	$ 4.32	$ 5.12	$ 6.15	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 10.88	$ 13.31	$ 16.34
3,300-9,999	$ 12.69	$ 16.53	$ 21.40	$ 9.27	$ 11.15	$ 13.55	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 25.89	$ 32.17	$ 40.01
10,000-49,999	$ 53.63	$ 70.90	$ 91.02	$ 27.74	$ 32.95	$ 39.23	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 99.49	$ 122.95	$ 150.35
50,000-99,999	$ 35.66	$ 47.78	$ 61.95	$ 12.86	$ 15.21	$ 18.06	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 57.46	$ 72.83	$ 90.74
100,000-999,999	$ 100.80	$ 134.04	$ 172.79	$ 35.25	$ 41.92	$ 49.74	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 270.56	$ 313.33	$ 362.77
1,000,000+	$ 43.18	$ 57.46	$ 74.12	$ 17.48	$ 20.97	$ 24.95	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 338.74	$ 421.47	$ 506.26
Total	$ 255.95	$ 339.67	$ 438.00	$ 111.28	$ 132.50	$ 157.89	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 813.08	$ 988.55	$ 1,182.01

Exhibit O.15b: Treatment Uncertainty - PV, 7% (ICRSSM)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th Percentile	Mean	95th	5th Percentile	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th Percentile	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 8.38	$ 9.99	$ 11.60	$ 8.69	$ 9.35	$ 10.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 17.10	$ 19.38	$ 21.65
100-499	$ 12.54	$ 14.79	$ 17.04	$ 14.93	$ 16.19	$ 17.44	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 27.60	$ 31.13	$ 34.65
500-999	$ 8.54	$ 10.03	$ 11.51	$ 14.28	$ 15.63	$ 16.97	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 23.11	$ 25.97	$ 28.83
1,000-3,299	$ 45.21	$ 54.68	$ 64.08	$ 50.41	$ 55.29	$ 60.15	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 97.43	$ 112.00	$ 126.48
3,300-9,999	$ 139.28	$ 170.35	$ 201.27	$ 72.75	$ 78.99	$ 85.30	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 215.96	$ 253.84	$ 291.63
10,000-49,999	$ 521.94	$ 595.97	$ 670.25	$ 262.13	$ 277.97	$ 293.91	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 802.19	$ 893.05	$ 984.26
50,000-99,999	$ 352.95	$ 405.02	$ 456.86	$ 148.14	$ 156.93	$ 165.87	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 510.04	$ 571.79	$ 633.45
100,000-999,999	$ 1,086.33	$ 1,239.06	$ 1,391.63	$ 519.72	$ 550.45	$ 581.59	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 1,740.56	$ 1,926.88	$ 2,113.46
1,000,000+	$ 485.02	$ 552.72	$ 620.41	$ 295.62	$ 312.89	$ 330.34	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 1,058.73	$ 1,208.65	$ 1,357.94
Total	$ 2,660.20	$ 3,052.62	$ 3,444.64	$ 1,386.67	$ 1,473.70	$ 1,561.58	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 4,492.72	$ 5,042.69	$ 5,592.34
Rule Alternative A2																					
<100	$ 3.02	$ 3.84	$ 4.73	$ 2.78	$ 3.35	$ 4.00	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 5.83	$ 7.23	$ 8.77
100-499	$ 4.24	$ 5.38	$ 6.65	$ 4.08	$ 4.91	$ 5.80	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.45	$ 10.44	$ 12.62
500-999	$ 2.84	$ 3.61	$ 4.47	$ 3.13	$ 3.77	$ 4.44	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.25	$ 7.69	$ 9.25
1,000-3,299	$ 11.54	$ 14.92	$ 18.70	$ 11.19	$ 13.54	$ 16.00	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 24.54	$ 30.50	$ 36.95
3,300-9,999	$ 32.90	$ 43.04	$ 54.28	$ 19.71	$ 23.59	$ 27.62	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 56.54	$ 71.13	$ 86.96
10,000-49,999	$ 122.51	$ 158.44	$ 196.70	$ 60.68	$ 72.23	$ 83.91	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 201.31	$ 249.77	$ 300.72
50,000-99,999	$ 81.60	$ 106.86	$ 133.97	$ 30.65	$ 36.43	$ 42.36	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 121.19	$ 153.12	$ 187.06
100,000-999,999	$ 240.40	$ 312.40	$ 390.18	$ 95.88	$ 114.17	$ 133.06	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 470.80	$ 563.93	$ 663.48
1,000,000+	$ 105.52	$ 137.04	$ 171.09	$ 51.51	$ 61.52	$ 71.91	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 435.11	$ 541.60	$ 650.19
Total	$ 604.57	$ 785.53	$ 980.76	$ 279.60	$ 333.51	$ 389.10	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,330.02	$ 1,635.41	$ 1,955.99
Rule Alternative A3																					
<100	$ 2.00	$ 2.69	$ 3.41	$ 1.73	$ 2.14	$ 2.54	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.76	$ 4.87	$ 5.98
100-499	$ 2.69	$ 3.58	$ 4.49	$ 2.32	$ 2.87	$ 3.41	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.13	$ 6.60	$ 8.07
500-999	$ 1.79	$ 2.38	$ 2.98	$ 1.48	$ 1.86	$ 2.21	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.56	$ 4.54	$ 5.53
1,000-3,299	$ 6.32	$ 8.46	$ 10.70	$ 5.50	$ 6.87	$ 8.20	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 13.62	$ 17.36	$ 21.15
3,300-9,999	$ 16.66	$ 22.60	$ 28.81	$ 11.62	$ 14.47	$ 17.24	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 32.22	$ 41.56	$ 51.11
10,000-49,999	$ 93.10	$ 123.20	$ 154.59	$ 41.22	$ 50.35	$ 59.21	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 152.45	$ 192.66	$ 233.90
50,000-99,999	$ 61.97	$ 83.15	$ 105.38	$ 19.21	$ 23.53	$ 27.69	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 90.13	$ 116.52	$ 143.80
100,000-999,999	$ 178.65	$ 238.43	$ 300.98	$ 58.01	$ 71.28	$ 84.00	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 371.17	$ 447.09	$ 525.22
1,000,000+	$ 76.94	$ 102.84	$ 129.90	$ 31.44	$ 38.72	$ 45.69	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 386.47	$ 484.60	$ 582.78
Total	$ 440.11	$ 587.34	$ 741.24	$ 172.53	$ 212.09	$ 250.19	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,058.50	$ 1,315.81	$ 1,577.55
Rule Alternative A3 UV90-10B																					
<100	$ 2.00	$ 2.69	$ 3.41	$ 1.73	$ 2.14	$ 2.54	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.76	$ 4.87	$ 5.98
100-499	$ 2.69	$ 3.58	$ 4.49	$ 2.32	$ 2.87	$ 3.41	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.13	$ 6.60	$ 8.07
500-999	$ 1.79	$ 2.38	$ 2.98	$ 1.48	$ 1.86	$ 2.21	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.56	$ 4.54	$ 5.53
1,000-3,299	$ 6.32	$ 8.47	$ 10.71	$ 5.49	$ 6.87	$ 8.20	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 13.62	$ 17.37	$ 21.16
3,300-9,999	$ 16.97	$ 22.97	$ 29.25	$ 11.73	$ 14.59	$ 17.38	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 32.64	$ 42.06	$ 51.70
10,000-49,999	$ 102.01	$ 134.02	$ 167.59	$ 45.10	$ 55.02	$ 64.64	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 165.23	$ 208.14	$ 252.34
50,000-99,999	$ 68.85	$ 91.49	$ 115.27	$ 22.29	$ 27.32	$ 32.20	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 100.09	$ 128.65	$ 158.19
100,000-999,999	$ 203.45	$ 268.96	$ 337.55	$ 72.29	$ 88.76	$ 104.71	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 410.26	$ 495.08	$ 582.50
1,000,000+	$ 90.65	$ 119.79	$ 150.12	$ 39.93	$ 49.12	$ 58.06	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 408.66	$ 511.95	$ 615.37
Total	$ 494.72	$ 654.35	$ 821.36	$ 202.36	$ 248.55	$ 293.35	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,142.94	$ 1,419.27	$ 1,700.83
Rule Alternative A4																					
<100	$ 1.02	$ 1.40	$ 1.82	$ 0.87	$ 1.08	$ 1.29	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.92	$ 2.52	$ 3.16
100-499	$ 1.36	$ 1.83	$ 2.36	$ 1.15	$ 1.42	$ 1.70	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.63	$ 3.40	$ 4.22
500-999	$ 0.89	$ 1.20	$ 1.54	$ 0.71	$ 0.87	$ 1.04	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.88	$ 2.38	$ 2.92
1,000-3,299	$ 2.92	$ 3.97	$ 5.12	$ 2.71	$ 3.35	$ 4.02	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.43	$ 9.35	$ 11.40
3,300-9,999	$ 7.87	$ 10.73	$ 13.90	$ 5.76	$ 7.25	$ 8.81	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 17.57	$ 22.48	$ 27.78
10,000-49,999	$ 29.44	$ 40.58	$ 52.73	$ 16.26	$ 20.13	$ 24.11	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 63.82	$ 79.82	$ 96.94
50,000-99,999	$ 19.59	$ 27.34	$ 35.89	$ 7.57	$ 9.35	$ 11.17	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 36.11	$ 46.52	$ 57.78
100,000-999,999	$ 54.95	$ 76.14	$ 99.41	$ 20.14	$ 24.98	$ 29.91	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 209.61	$ 238.49	$ 269.56
1,000,000+	$ 23.52	$ 32.61	$ 42.59	$ 9.65	$ 12.07	$ 14.53	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 311.26	$ 387.72	$ 464.31
Total	$ 141.57	$ 195.79	$ 255.35	$ 64.81	$ 80.51	$ 96.59	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 652.23	$ 792.67	$ 938.06

Exhibit O.15c: Treatment Uncertainty - PV, 7% (ICRSSL)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th Percentile	Mean	95th	5th Percentile	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th Percentile	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 8.38	$ 9.99	$ 11.60	$ 8.69	$ 9.35	$ 10.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 17.10	$ 19.38	$ 21.65
100-499	$ 12.54	$ 14.79	$ 17.04	$ 14.93	$ 16.19	$ 17.44	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 27.60	$ 31.13	$ 34.65
500-999	$ 8.54	$ 10.03	$ 11.51	$ 14.28	$ 15.63	$ 16.97	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 23.11	$ 25.97	$ 28.83
1,000-3,299	$ 45.21	$ 54.68	$ 64.08	$ 50.41	$ 55.29	$ 60.15	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 97.43	$ 112.00	$ 126.48
3,300-9,999	$ 139.28	$ 170.35	$ 201.27	$ 72.75	$ 78.99	$ 85.30	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 215.96	$ 253.84	$ 291.63
10,000-49,999	$ 521.94	$ 595.97	$ 670.25	$ 262.13	$ 277.97	$ 293.91	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 802.19	$ 893.05	$ 984.26
50,000-99,999	$ 352.95	$ 405.02	$ 456.86	$ 148.14	$ 156.93	$ 165.87	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 510.04	$ 571.79	$ 633.45
100,000-999,999	$ 1,086.33	$ 1,239.06	$ 1,391.63	$ 519.72	$ 550.45	$ 581.59	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 1,740.56	$ 1,926.88	$ 2,113.46
1,000,000+	$ 485.02	$ 552.72	$ 620.41	$ 295.62	$ 312.89	$ 330.34	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 1,058.73	$ 1,208.65	$ 1,357.94
Total	$ 2,660.20	$ 3,052.62	$ 3,444.64	$ 1,386.67	$ 1,473.70	$ 1,561.58	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 4,492.72	$ 5,042.69	$ 5,592.34
Rule Alternative A2																					
<100	$ 2.52	$ 3.44	$ 4.37	$ 2.24	$ 2.87	$ 3.49	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.80	$ 6.34	$ 7.90
100-499	$ 3.48	$ 4.71	$ 5.98	$ 3.24	$ 4.17	$ 5.06	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 6.84	$ 9.03	$ 11.21
500-999	$ 2.31	$ 3.14	$ 3.98	$ 2.41	$ 3.15	$ 3.83	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.00	$ 6.59	$ 8.16
1,000-3,299	$ 9.08	$ 12.66	$ 16.33	$ 8.79	$ 11.49	$ 14.03	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 19.68	$ 26.18	$ 32.61
3,300-9,999	$ 25.75	$ 36.37	$ 47.31	$ 16.05	$ 20.63	$ 24.96	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 45.73	$ 61.50	$ 77.33
10,000-49,999	$ 95.55	$ 134.73	$ 173.95	$ 48.40	$ 62.25	$ 74.91	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 162.07	$ 216.09	$ 268.97
50,000-99,999	$ 63.49	$ 90.78	$ 118.43	$ 23.98	$ 30.91	$ 37.18	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 96.42	$ 131.52	$ 166.33
100,000-999,999	$ 185.01	$ 263.09	$ 341.49	$ 72.60	$ 94.54	$ 114.08	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 392.13	$ 495.00	$ 595.80
1,000,000+	$ 80.85	$ 114.98	$ 149.16	$ 38.17	$ 50.15	$ 60.74	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 397.12	$ 508.17	$ 617.09
Total	$ 468.06	$ 663.89	$ 861.01	$ 215.87	$ 280.17	$ 338.28	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 1,129.79	$ 1,460.43	$ 1,785.40
Rule Alternative A3																					
<100	$ 1.45	$ 2.19	$ 2.90	$ 1.25	$ 1.70	$ 2.09	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.73	$ 3.93	$ 5.03
100-499	$ 1.94	$ 2.88	$ 3.77	$ 1.65	$ 2.26	$ 2.78	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.71	$ 5.29	$ 6.71
500-999	$ 1.29	$ 1.90	$ 2.48	$ 1.03	$ 1.42	$ 1.75	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.59	$ 3.64	$ 4.58
1,000-3,299	$ 4.44	$ 6.64	$ 8.72	$ 3.83	$ 5.32	$ 6.57	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 10.08	$ 13.98	$ 17.55
3,300-9,999	$ 11.59	$ 17.53	$ 23.24	$ 8.33	$ 11.56	$ 14.34	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 23.85	$ 33.59	$ 42.65
10,000-49,999	$ 67.53	$ 99.69	$ 129.96	$ 29.71	$ 40.40	$ 49.29	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 115.36	$ 159.20	$ 199.36
50,000-99,999	$ 44.91	$ 67.24	$ 88.56	$ 13.65	$ 18.58	$ 22.67	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 67.51	$ 95.65	$ 121.96
100,000-999,999	$ 128.87	$ 191.87	$ 251.65	$ 40.70	$ 55.49	$ 67.70	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 304.09	$ 384.72	$ 459.59
1,000,000+	$ 55.38	$ 82.54	$ 108.32	$ 21.96	$ 29.98	$ 36.60	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 355.43	$ 455.56	$ 552.10
Total	$ 317.40	$ 472.48	$ 619.61	$ 122.11	$ 166.70	$ 203.79	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 885.36	$ 1,155.55	$ 1,409.53
Rule Alternative A3 UV90-10B																					
<100	$ 1.45	$ 2.19	$ 2.90	$ 1.25	$ 1.70	$ 2.09	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.73	$ 3.93	$ 5.03
100-499	$ 1.94	$ 2.88	$ 3.77	$ 1.65	$ 2.26	$ 2.78	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 3.71	$ 5.29	$ 6.71
500-999	$ 1.29	$ 1.90	$ 2.48	$ 1.03	$ 1.42	$ 1.75	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.59	$ 3.64	$ 4.58
1,000-3,299	$ 4.45	$ 6.64	$ 8.73	$ 3.83	$ 5.31	$ 6.57	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 10.08	$ 13.99	$ 17.56
3,300-9,999	$ 11.81	$ 17.83	$ 23.60	$ 8.41	$ 11.66	$ 14.45	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 24.15	$ 33.99	$ 43.12
10,000-49,999	$ 73.63	$ 107.86	$ 140.03	$ 32.45	$ 44.05	$ 53.65	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 124.20	$ 171.02	$ 213.78
50,000-99,999	$ 49.58	$ 73.50	$ 96.15	$ 15.81	$ 21.50	$ 26.20	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 74.34	$ 104.84	$ 133.08
100,000-999,999	$ 145.77	$ 214.54	$ 279.31	$ 50.80	$ 69.07	$ 84.09	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 331.09	$ 420.98	$ 503.64
1,000,000+	$ 64.65	$ 95.11	$ 123.75	$ 27.98	$ 38.11	$ 46.46	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 370.72	$ 476.26	$ 577.40
Total	$ 354.57	$ 522.46	$ 680.73	$ 143.20	$ 195.09	$ 238.04	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 943.62	$ 1,233.92	$ 1,504.89
Rule Alternative A4																					
<100	$ 0.65	$ 1.01	$ 1.42	$ 0.56	$ 0.78	$ 1.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.24	$ 1.82	$ 2.47
100-499	$ 0.87	$ 1.32	$ 1.84	$ 0.73	$ 1.02	$ 1.33	$ 0.04	$ 0.05	$ 0.06	$ 0.09	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.73	$ 2.49	$ 3.33
500-999	$ 0.57	$ 0.86	$ 1.20	$ 0.45	$ 0.63	$ 0.81	$ 0.11	$ 0.13	$ 0.15	$ 0.17	$ 0.18	$ 0.19	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.30	$ 1.80	$ 2.35
1,000-3,299	$ 1.86	$ 2.84	$ 3.98	$ 1.73	$ 2.42	$ 3.14	$ 0.88	$ 1.03	$ 1.18	$ 0.93	$ 1.00	$ 1.07	$ -	$ -	$ -	$ -	$ -	$ -	$ 5.40	$ 7.29	$ 9.37
3,300-9,999	$ 5.02	$ 7.72	$ 10.83	$ 3.68	$ 5.22	$ 6.87	$ 2.52	$ 2.99	$ 3.45	$ 1.24	$ 1.35	$ 1.45	$ 0.12	$ 0.12	$ 0.12	$ 0.04	$ 0.04	$ 0.04	$ 12.64	$ 17.43	$ 22.76
10,000-49,999	$ 18.01	$ 27.60	$ 39.08	$ 10.18	$ 14.12	$ 18.35	$ 4.50	$ 5.31	$ 6.12	$ 2.38	$ 2.56	$ 2.74	$ 8.40	$ 8.40	$ 8.40	$ 2.84	$ 2.84	$ 2.84	$ 46.31	$ 60.83	$ 77.54
50,000-99,999	$ 11.98	$ 18.60	$ 26.58	$ 4.75	$ 6.57	$ 8.52	$ 3.97	$ 4.73	$ 5.49	$ 1.65	$ 1.78	$ 1.91	$ 2.16	$ 2.16	$ 2.16	$ 1.16	$ 1.16	$ 1.16	$ 25.68	$ 35.00	$ 45.83
100,000-999,999	$ 33.52	$ 51.60	$ 73.37	$ 12.50	$ 17.32	$ 22.55	$ 12.44	$ 14.72	$ 17.02	$ 6.87	$ 7.44	$ 8.00	$ 82.40	$ 82.40	$ 82.40	$ 32.81	$ 32.81	$ 32.81	$ 180.54	$ 206.29	$ 236.16
1,000,000+	$ 14.35	$ 22.09	$ 31.42	$ 5.91	$ 8.23	$ 10.80	$ 246.87	$ 310.80	$ 373.94	$ 8.72	$ 9.74	$ 10.74	$ 16.44	$ 16.44	$ 16.44	$ 6.06	$ 6.06	$ 6.06	$ 298.36	$ 373.36	$ 449.40
Total	$ 86.84	$ 133.64	$ 189.73	$ 40.49	$ 56.31	$ 73.38	$ 271.35	$ 339.76	$ 407.43	$ 22.06	$ 24.16	$ 26.24	$ 109.53	$ 109.53	$ 109.53	$ 42.93	$ 42.93	$ 42.93	$ 573.18	$ 706.32	$ 849.22

Exhibit O.16a: State Costs - Annualized, 3% (ICR, Mean)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.11	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.14	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.08
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.55	$ 0.0002	$ 1.00
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.03	$ -	$ 0.16
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.03	$ 0.0000	$ 0.37
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.02	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.006	$ 0.21	$ 0.0002	$ 1.21
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.16	$ 0.0002	$ 1.15
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.16	$ 0.0002	$ 1.16
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.09
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.08	$ 0.0002	$ 1.08

Exhibit O.16b: State Costs - Annualized, 3% (ICR, Low)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.03	$ -	$ 0.15
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.03	$ 0.0000	$ 0.37
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.005	$ 0.20	$ 0.0002	$ 1.20
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.15	$ 0.0002	$ 1.14
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.15	$ 0.0002	$ 1.14
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.09
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.07	$ 0.0002	$ 1.07

Exhibit O.16c: State Costs - Annualized, 3% (ICR, High)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.04	$ -	$ 0.16
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.03	$ 0.0000	$ 0.38
10,000-49,999	$ 0.06				$ 0.01	$ 0.002	$ 0.06	$ 0.0000	$ 0.13
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.02	$ 0.0000	$ 0.07
100,000-999,999	$ 0.17				$ 0.03	$ 0.001	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.006	$ 0.24	$ 0.0002	$ 1.24
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.02	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.005	$ 0.17	$ 0.0002	$ 1.17
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.06	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.02	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.005	$ 0.18	$ 0.0002	$ 1.17
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.08	$ 0.0002	$ 1.08

Exhibit O.16d: State Costs - Annualized, 3% (ICRSSM, Mean)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.15
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.16	$ 0.0002	$ 1.16
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.12	$ 0.0002	$ 1.11
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.12	$ 0.0002	$ 1.11
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.000	$ 0.02	$ 0.0000	$ 0.08
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.20
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.06	$ 0.0002	$ 1.06

Exhibit O.16e: State Costs - Annualized, 3% (ICRSSM, Low)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.15	$ 0.0002	$ 1.14
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.11	$ 0.0002	$ 1.10
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.11	$ 0.0002	$ 1.10
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.20
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.06	$ 0.0002	$ 1.05

Exhibit O.16f: State Costs - Annualized, 3% (ICRSSM, High)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.03	$ -	$ 0.15
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.02	$ 0.0000	$ 0.37
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.05	$ 0.0000	$ 0.12
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.22
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.005	$ 0.18	$ 0.0002	$ 1.18
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.13	$ 0.0002	$ 1.12
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.13	$ 0.0002	$ 1.12
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.000	$ 0.02	$ 0.0000	$ 0.09
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.20
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.07	$ 0.0002	$ 1.06

Exhibit O.16g: State Costs - Annualized, 3% (ICRSSL, Mean)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.14	$ 0.0002	$ 1.14
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.10	$ 0.0002	$ 1.09
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.10	$ 0.0002	$ 1.09
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.20
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.001	$ 0.05	$ 0.0002	$ 1.05

Exhibit O.16h: State Costs - Annualized, 3% (ICRSSL, Low)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.02	$ -	$ 0.14
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.12	$ 0.0002	$ 1.12
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.09
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.09	$ 0.0002	$ 1.08
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.10
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.09	$ 0.0002	$ 1.08
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.00	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.20
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.001	$ 0.05	$ 0.0002	$ 1.04

Exhibit O.16i: State Costs - Annualized, 3% (ICRSSL, High)

Size Category	Implementation	E.coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli review Second round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	TOTAL
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.03	$ 0.0000	$ 0.03
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.03
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.13	$ -	$ 0.13
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ 0.003	$ 0.12	$ 0.0000	$ 0.13
10,000-49,999	$ 0.06				$ -	$ 0.004	$ 0.15	$ 0.0000	$ 0.21
50,000-99,999	$ 0.04				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.09
100,000-999,999	$ 0.17				$ -	$ 0.001	$ 0.05	$ 0.0002	$ 0.23
1,000,000+	$ 0.15				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.15
Total	$ 0.44	$ -	$ -	$ -	$ -	$ 0.015	$ 0.56	$ 0.0002	$ 1.01
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.15
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.001	$ 0.02	$ 0.0000	$ 0.36
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.02	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.004	$ 0.16	$ 0.0002	$ 1.15
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.11	$ 0.0002	$ 1.10
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.11
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.06
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.21
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.003	$ 0.11	$ 0.0002	$ 1.10
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.00	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.05	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.13
3,300-9,999	$ 0.01	$ 0.13	$ 0.08	$ 0.08	$ 0.04	$ 0.000	$ 0.01	$ 0.0000	$ 0.35
10,000-49,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
50,000-99,999	$ 0.04				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.05
100,000-999,999	$ 0.17				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.20
1,000,000+	$ 0.15				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.17
Total	$ 0.44	$ 0.19	$ 0.11	$ 0.12	$ 0.12	$ 0.002	$ 0.06	$ 0.0002	$ 1.05

Exhibit O.17a: Implementation & Monitoring - Annualized, 3% (ICR, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.79	$ 0.000	$ 0.81
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.23	$ 0.000	$ 0.24
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.31	$ 0.001	$ 0.32
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.96	$ 0.001	$ 3.07
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.07	$ 0.60	$ 0.01	$ 0.00	$ 0.10	$ 0.000	$ 1.83
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.08	$ 0.68	$ 0.01	$ 0.00	$ 0.09	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.03	$ 0.28	$ 0.00	$ 0.00	$ 0.05	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.06	$ 0.49	$ 0.01	$ 0.00	$ 0.18	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.45	$ 0.01	$ 0.00	$ 0.17	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.42	$ 0.01	$ 0.00	$ 0.30	$ 0.000	$ 1.68
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.09	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.12	$ 0.001	$ 0.53
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.35	$ 3.16	$ 0.04	$ 0.01	$ 1.11	$ 0.001	$ 10.72
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.32	$ 0.01	$ 0.08	$ 0.22	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.83
100-499	$ 0.01	$ 0.13	$ 0.35	$ 0.01	$ 0.09	$ 0.24	$ 0.01	$ 0.00	$ 0.07	$ -	$ 0.91
500-999	$ 0.01	$ 0.05	$ 0.15	$ 0.01	$ 0.04	$ 0.10	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.39
1,000-3,299	$ 0.02	$ 0.10	$ 0.30	$ 0.01	$ 0.07	$ 0.20	$ 0.01	$ 0.00	$ 0.09	$ -	$ 0.80
3,300-9,999	$ 0.01	$ 0.10	$ 0.28	$ 0.01	$ 0.06	$ 0.18	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 0.74
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.44	$ 0.01	$ 0.00	$ 0.27	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.11	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.75	$ 0.07	$ 0.38	$ 1.64	$ 0.04	$ 0.01	$ 0.83	$ 0.001	$ 6.38
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.32	$ 0.01	$ 0.08	$ 0.22	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.83
100-499	$ 0.01	$ 0.13	$ 0.35	$ 0.01	$ 0.09	$ 0.24	$ 0.01	$ 0.00	$ 0.07	$ -	$ 0.91
500-999	$ 0.01	$ 0.05	$ 0.15	$ 0.01	$ 0.04	$ 0.10	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.39
1,000-3,299	$ 0.02	$ 0.10	$ 0.30	$ 0.01	$ 0.07	$ 0.20	$ 0.01	$ 0.00	$ 0.09	$ -	$ 0.80
3,300-9,999	$ 0.01	$ 0.10	$ 0.28	$ 0.01	$ 0.06	$ 0.18	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 0.74
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.44	$ 0.01	$ 0.00	$ 0.28	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.11	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.75	$ 0.07	$ 0.38	$ 1.64	$ 0.04	$ 0.01	$ 0.84	$ 0.001	$ 6.38
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.28	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.75
100-499	$ 0.01	$ 0.13	$ 0.31	$ 0.01	$ 0.09	$ 0.22	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.82
500-999	$ 0.01	$ 0.05	$ 0.13	$ 0.01	$ 0.04	$ 0.09	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.35
1,000-3,299	$ 0.02	$ 0.10	$ 0.26	$ 0.01	$ 0.08	$ 0.19	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.71
3,300-9,999	$ 0.01	$ 0.10	$ 0.24	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.55	$ 0.01	$ 0.00	$ 0.13	$ 0.000	$ 1.65
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.05	$ 0.001	$ 0.50
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.57	$ 0.07	$ 0.41	$ 1.74	$ 0.05	$ 0.00	$ 0.43	$ 0.001	$ 5.92

Exhibit O.17b: Implementation & Monitoring - Annualized, 3% (ICR, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.07	$ 0.61	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 1.83
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.08	$ 0.68	$ 0.01	$ 0.00	$ 0.08	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.03	$ 0.28	$ 0.00	$ 0.00	$ 0.05	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.06	$ 0.50	$ 0.01	$ 0.00	$ 0.17	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.46	$ 0.01	$ 0.00	$ 0.16	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.43	$ 0.01	$ 0.00	$ 0.28	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.11	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.36	$ 3.22	$ 0.04	$ 0.01	$ 1.04	$ 0.001	$ 10.72
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.30	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.79
100-499	$ 0.01	$ 0.13	$ 0.33	$ 0.01	$ 0.09	$ 0.23	$ 0.01	$ 0.00	$ 0.06	$ -	$ 0.86
500-999	$ 0.01	$ 0.05	$ 0.14	$ 0.01	$ 0.04	$ 0.09	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.37
1,000-3,299	$ 0.02	$ 0.10	$ 0.28	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.08	$ -	$ 0.76
3,300-9,999	$ 0.01	$ 0.10	$ 0.26	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.70
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.45	$ 0.01	$ 0.00	$ 0.25	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.65	$ 0.07	$ 0.38	$ 1.61	$ 0.04	$ 0.01	$ 0.76	$ 0.001	$ 6.19
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.30	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.79
100-499	$ 0.01	$ 0.13	$ 0.33	$ 0.01	$ 0.09	$ 0.23	$ 0.01	$ 0.00	$ 0.06	$ -	$ 0.86
500-999	$ 0.01	$ 0.05	$ 0.14	$ 0.01	$ 0.04	$ 0.09	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.37
1,000-3,299	$ 0.02	$ 0.10	$ 0.28	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.08	$ -	$ 0.76
3,300-9,999	$ 0.01	$ 0.10	$ 0.26	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.70
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.45	$ 0.01	$ 0.00	$ 0.26	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.65	$ 0.07	$ 0.38	$ 1.61	$ 0.04	$ 0.01	$ 0.77	$ 0.001	$ 6.19
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.26	$ 0.01	$ 0.08	$ 0.18	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.70
100-499	$ 0.01	$ 0.13	$ 0.29	$ 0.01	$ 0.09	$ 0.20	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.78
500-999	$ 0.01	$ 0.05	$ 0.12	$ 0.01	$ 0.04	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.34
1,000-3,299	$ 0.02	$ 0.10	$ 0.25	$ 0.01	$ 0.08	$ 0.17	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.67
3,300-9,999	$ 0.01	$ 0.10	$ 0.23	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.62
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.56	$ 0.01	$ 0.00	$ 0.12	$ 0.000	$ 1.65
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.05	$ 0.001	$ 0.50
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.48	$ 0.07	$ 0.41	$ 1.70	$ 0.05	$ 0.00	$ 0.38	$ 0.001	$ 5.75

Exhibit O.17c: Implementation & Monitoring - Annualized, 3% (ICR, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.07	$ 0.59	$ 0.01	$ 0.00	$ 0.11	$ 0.000	$ 1.83
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.08	$ 0.67	$ 0.01	$ 0.00	$ 0.10	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.03	$ 0.27	$ 0.00	$ 0.00	$ 0.06	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.06	$ 0.47	$ 0.01	$ 0.00	$ 0.20	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.05	$ 0.43	$ 0.01	$ 0.00	$ 0.19	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.39	$ 0.01	$ 0.00	$ 0.34	$ 0.000	$ 1.68
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.10	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.13	$ 0.001	$ 0.53
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.34	$ 3.06	$ 0.04	$ 0.01	$ 1.24	$ 0.001	$ 10.73
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.36	$ 0.01	$ 0.08	$ 0.24	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 0.90
100-499	$ 0.01	$ 0.13	$ 0.40	$ 0.01	$ 0.09	$ 0.27	$ 0.01	$ 0.00	$ 0.07	$ -	$ 0.98
500-999	$ 0.01	$ 0.05	$ 0.16	$ 0.01	$ 0.03	$ 0.11	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.42
1,000-3,299	$ 0.02	$ 0.10	$ 0.34	$ 0.01	$ 0.07	$ 0.22	$ 0.01	$ 0.00	$ 0.10	$ -	$ 0.87
3,300-9,999	$ 0.01	$ 0.10	$ 0.31	$ 0.01	$ 0.06	$ 0.20	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 0.80
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.42	$ 0.01	$ 0.00	$ 0.30	$ 0.000	$ 1.68
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.09	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.12	$ 0.001	$ 0.53
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.91	$ 0.07	$ 0.37	$ 1.71	$ 0.04	$ 0.01	$ 0.92	$ 0.001	$ 6.69
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.36	$ 0.01	$ 0.08	$ 0.24	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 0.90
100-499	$ 0.01	$ 0.13	$ 0.40	$ 0.01	$ 0.09	$ 0.27	$ 0.01	$ 0.00	$ 0.07	$ -	$ 0.98
500-999	$ 0.01	$ 0.05	$ 0.16	$ 0.01	$ 0.03	$ 0.11	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.42
1,000-3,299	$ 0.02	$ 0.10	$ 0.34	$ 0.01	$ 0.07	$ 0.22	$ 0.01	$ 0.00	$ 0.10	$ -	$ 0.87
3,300-9,999	$ 0.01	$ 0.10	$ 0.31	$ 0.01	$ 0.06	$ 0.20	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 0.80
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.41	$ 0.01	$ 0.00	$ 0.31	$ 0.000	$ 1.68
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.09	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.12	$ 0.001	$ 0.53
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.91	$ 0.07	$ 0.37	$ 1.70	$ 0.04	$ 0.01	$ 0.93	$ 0.001	$ 6.69
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.31	$ 0.01	$ 0.08	$ 0.22	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.80
100-499	$ 0.01	$ 0.13	$ 0.34	$ 0.01	$ 0.09	$ 0.25	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.88
500-999	$ 0.01	$ 0.05	$ 0.14	$ 0.01	$ 0.04	$ 0.10	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.38
1,000-3,299	$ 0.02	$ 0.10	$ 0.29	$ 0.01	$ 0.08	$ 0.21	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.76
3,300-9,999	$ 0.01	$ 0.10	$ 0.27	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.70
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.54	$ 0.01	$ 0.00	$ 0.15	$ 0.000	$ 1.65
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.50
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.71	$ 0.07	$ 0.41	$ 1.83	$ 0.05	$ 0.00	$ 0.44	$ 0.001	$ 6.17

Exhibit O.17d: Implementation & Monitoring - Annualized, 3% (ICRSSM, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.08	$ 0.63	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 1.84
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.09	$ 0.70	$ 0.01	$ 0.00	$ 0.06	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.04	$ 0.29	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.00	$ 0.13	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.49	$ 0.01	$ 0.00	$ 0.12	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.46	$ 0.01	$ 0.00	$ 0.25	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.37	$ 3.37	$ 0.04	$ 0.01	$ 0.87	$ 0.001	$ 10.71
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.25	$ 0.01	$ 0.08	$ 0.17	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.70
100-499	$ 0.01	$ 0.13	$ 0.28	$ 0.01	$ 0.09	$ 0.20	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.77
500-999	$ 0.01	$ 0.05	$ 0.12	$ 0.01	$ 0.04	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.33
1,000-3,299	$ 0.02	$ 0.10	$ 0.24	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.67
3,300-9,999	$ 0.01	$ 0.10	$ 0.22	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.62
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.49	$ 0.01	$ 0.00	$ 0.21	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.45	$ 0.07	$ 0.39	$ 1.54	$ 0.04	$ 0.01	$ 0.61	$ 0.001	$ 5.77
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.25	$ 0.01	$ 0.08	$ 0.17	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.70
100-499	$ 0.01	$ 0.13	$ 0.28	$ 0.01	$ 0.09	$ 0.20	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.77
500-999	$ 0.01	$ 0.05	$ 0.12	$ 0.01	$ 0.04	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.33
1,000-3,299	$ 0.02	$ 0.10	$ 0.24	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.67
3,300-9,999	$ 0.01	$ 0.10	$ 0.22	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.62
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.48	$ 0.01	$ 0.00	$ 0.22	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.45	$ 0.07	$ 0.39	$ 1.54	$ 0.04	$ 0.01	$ 0.62	$ 0.001	$ 5.78
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.20	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.60
100-499	$ 0.01	$ 0.13	$ 0.22	$ 0.01	$ 0.09	$ 0.16	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.66
500-999	$ 0.01	$ 0.05	$ 0.09	$ 0.01	$ 0.04	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.29
1,000-3,299	$ 0.02	$ 0.10	$ 0.19	$ 0.01	$ 0.08	$ 0.13	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.57
3,300-9,999	$ 0.01	$ 0.10	$ 0.18	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.53
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.58	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 1.64
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.03	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.03	$ 0.001	$ 0.49
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.22	$ 0.07	$ 0.41	$ 1.55	$ 0.05	$ 0.00	$ 0.32	$ 0.001	$ 5.29

Exhibit O.17e: Implementation & Monitoring - Annualized, 3% (ICRSSM, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.08	$ 0.63	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 1.84
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.09	$ 0.71	$ 0.01	$ 0.00	$ 0.06	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.04	$ 0.29	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.07	$ 0.54	$ 0.01	$ 0.00	$ 0.12	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.50	$ 0.01	$ 0.00	$ 0.11	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.48	$ 0.01	$ 0.00	$ 0.23	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.38	$ 3.44	$ 0.04	$ 0.01	$ 0.78	$ 0.001	$ 10.70
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.22	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.65
100-499	$ 0.01	$ 0.13	$ 0.24	$ 0.01	$ 0.09	$ 0.17	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.71
500-999	$ 0.01	$ 0.05	$ 0.10	$ 0.01	$ 0.04	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.31
1,000-3,299	$ 0.02	$ 0.10	$ 0.21	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.62
3,300-9,999	$ 0.01	$ 0.10	$ 0.19	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.57
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.50	$ 0.01	$ 0.00	$ 0.19	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.32	$ 0.07	$ 0.40	$ 1.48	$ 0.05	$ 0.00	$ 0.55	$ 0.001	$ 5.53
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.22	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.65
100-499	$ 0.01	$ 0.13	$ 0.24	$ 0.01	$ 0.09	$ 0.17	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.71
500-999	$ 0.01	$ 0.05	$ 0.10	$ 0.01	$ 0.04	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.31
1,000-3,299	$ 0.02	$ 0.10	$ 0.21	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.62
3,300-9,999	$ 0.01	$ 0.10	$ 0.19	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.57
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.50	$ 0.01	$ 0.00	$ 0.19	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.32	$ 0.07	$ 0.40	$ 1.48	$ 0.05	$ 0.00	$ 0.56	$ 0.001	$ 5.54
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.17	$ 0.01	$ 0.08	$ 0.12	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.56
100-499	$ 0.01	$ 0.13	$ 0.19	$ 0.01	$ 0.09	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.62
500-999	$ 0.01	$ 0.05	$ 0.08	$ 0.01	$ 0.04	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.27
1,000-3,299	$ 0.02	$ 0.10	$ 0.17	$ 0.01	$ 0.08	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.53
3,300-9,999	$ 0.01	$ 0.10	$ 0.16	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.49
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.59	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 1.64
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.03	$ 0.001	$ 0.49
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.12	$ 0.07	$ 0.41	$ 1.49	$ 0.05	$ 0.00	$ 0.30	$ 0.001	$ 5.10

Exhibit O.17f: Implementation & Monitoring - Annualized, 3% (ICRSSM, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.08	$ 0.62	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 1.84
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.09	$ 0.70	$ 0.01	$ 0.00	$ 0.07	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.04	$ 0.28	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.06	$ 0.52	$ 0.01	$ 0.00	$ 0.14	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.48	$ 0.01	$ 0.00	$ 0.13	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.44	$ 0.01	$ 0.00	$ 0.27	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.43
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.11	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.36	$ 3.31	$ 0.04	$ 0.01	$ 0.95	$ 0.001	$ 10.72
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.28	$ 0.01	$ 0.08	$ 0.19	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.75
100-499	$ 0.01	$ 0.13	$ 0.30	$ 0.01	$ 0.09	$ 0.21	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.82
500-999	$ 0.01	$ 0.05	$ 0.13	$ 0.01	$ 0.04	$ 0.09	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.35
1,000-3,299	$ 0.02	$ 0.10	$ 0.26	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.06	$ -	$ 0.71
3,300-9,999	$ 0.01	$ 0.10	$ 0.24	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.47	$ 0.01	$ 0.00	$ 0.23	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.55	$ 0.07	$ 0.39	$ 1.59	$ 0.04	$ 0.01	$ 0.66	$ 0.001	$ 5.98
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.28	$ 0.01	$ 0.08	$ 0.19	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.75
100-499	$ 0.01	$ 0.13	$ 0.30	$ 0.01	$ 0.09	$ 0.21	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.82
500-999	$ 0.01	$ 0.05	$ 0.13	$ 0.01	$ 0.04	$ 0.09	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.35
1,000-3,299	$ 0.02	$ 0.10	$ 0.26	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.06	$ -	$ 0.71
3,300-9,999	$ 0.01	$ 0.10	$ 0.24	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.66
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.47	$ 0.01	$ 0.00	$ 0.24	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.55	$ 0.07	$ 0.39	$ 1.58	$ 0.04	$ 0.01	$ 0.67	$ 0.001	$ 5.98
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.22	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.64
100-499	$ 0.01	$ 0.13	$ 0.24	$ 0.01	$ 0.09	$ 0.17	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.71
500-999	$ 0.01	$ 0.05	$ 0.10	$ 0.01	$ 0.04	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.31
1,000-3,299	$ 0.02	$ 0.10	$ 0.21	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.61
3,300-9,999	$ 0.01	$ 0.10	$ 0.19	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.56
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.58	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 1.64
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.03	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.04	$ 0.001	$ 0.49
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.32	$ 0.07	$ 0.41	$ 1.61	$ 0.05	$ 0.00	$ 0.34	$ 0.001	$ 5.46

Exhibit O.17g: Implementation & Monitoring - Annualized, 3% (ICRSSL, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.08	$ 0.64	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 1.84
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.09	$ 0.71	$ 0.01	$ 0.00	$ 0.06	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.04	$ 0.29	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.07	$ 0.55	$ 0.01	$ 0.00	$ 0.11	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.51	$ 0.01	$ 0.00	$ 0.10	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.48	$ 0.01	$ 0.00	$ 0.22	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.38	$ 3.47	$ 0.04	$ 0.01	$ 0.75	$ 0.001	$ 10.69
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.21	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.62
100-499	$ 0.01	$ 0.13	$ 0.23	$ 0.01	$ 0.09	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.68
500-999	$ 0.01	$ 0.05	$ 0.10	$ 0.01	$ 0.04	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.30
1,000-3,299	$ 0.02	$ 0.10	$ 0.20	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.59
3,300-9,999	$ 0.01	$ 0.10	$ 0.18	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.54
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.51	$ 0.01	$ 0.00	$ 0.18	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.26	$ 0.07	$ 0.40	$ 1.45	$ 0.05	$ 0.00	$ 0.52	$ 0.001	$ 5.41
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.21	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.62
100-499	$ 0.01	$ 0.13	$ 0.23	$ 0.01	$ 0.09	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.68
500-999	$ 0.01	$ 0.05	$ 0.10	$ 0.01	$ 0.04	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.30
1,000-3,299	$ 0.02	$ 0.10	$ 0.20	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.59
3,300-9,999	$ 0.01	$ 0.10	$ 0.18	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.55
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.51	$ 0.01	$ 0.00	$ 0.18	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.26	$ 0.07	$ 0.40	$ 1.45	$ 0.05	$ 0.00	$ 0.52	$ 0.001	$ 5.41
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.15	$ 0.01	$ 0.08	$ 0.10	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.52
100-499	$ 0.01	$ 0.13	$ 0.16	$ 0.01	$ 0.09	$ 0.12	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.57
500-999	$ 0.01	$ 0.05	$ 0.07	$ 0.01	$ 0.04	$ 0.05	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.25
1,000-3,299	$ 0.02	$ 0.10	$ 0.14	$ 0.01	$ 0.08	$ 0.10	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.49
3,300-9,999	$ 0.01	$ 0.10	$ 0.13	$ 0.01	$ 0.07	$ 0.09	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.45
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.60	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 1.64
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.02	$ 0.001	$ 0.49
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.00	$ 0.07	$ 0.42	$ 1.42	$ 0.05	$ 0.00	$ 0.27	$ 0.001	$ 4.90

Exhibit O.17h: Implementation & Monitoring - Annualized, 3% (ICRSSL, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.08	$ 0.64	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 1.84
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.09	$ 0.72	$ 0.01	$ 0.00	$ 0.05	$ -	$ 2.03
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.04	$ 0.29	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.07	$ 0.57	$ 0.01	$ 0.00	$ 0.09	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.52	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.51	$ 0.01	$ 0.00	$ 0.18	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.39	$ 3.56	$ 0.04	$ 0.01	$ 0.63	$ 0.001	$ 10.68
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.16	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.55
100-499	$ 0.01	$ 0.13	$ 0.18	$ 0.01	$ 0.09	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.60
500-999	$ 0.01	$ 0.05	$ 0.08	$ 0.01	$ 0.04	$ 0.05	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.26
1,000-3,299	$ 0.02	$ 0.10	$ 0.16	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.52
3,300-9,999	$ 0.01	$ 0.10	$ 0.15	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.48
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.54	$ 0.01	$ 0.00	$ 0.15	$ 0.000	$ 1.65
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.50
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.07	$ 0.07	$ 0.41	$ 1.37	$ 0.05	$ 0.00	$ 0.44	$ 0.001	$ 5.06
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.16	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.55
100-499	$ 0.01	$ 0.13	$ 0.18	$ 0.01	$ 0.09	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.60
500-999	$ 0.01	$ 0.05	$ 0.08	$ 0.01	$ 0.04	$ 0.05	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.26
1,000-3,299	$ 0.02	$ 0.10	$ 0.16	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.52
3,300-9,999	$ 0.01	$ 0.10	$ 0.15	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.48
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.54	$ 0.01	$ 0.00	$ 0.15	$ 0.000	$ 1.65
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.50
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.07	$ 0.07	$ 0.41	$ 1.36	$ 0.05	$ 0.00	$ 0.44	$ 0.001	$ 5.06
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.11	$ 0.01	$ 0.08	$ 0.08	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.46
100-499	$ 0.01	$ 0.13	$ 0.13	$ 0.01	$ 0.09	$ 0.09	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.50
500-999	$ 0.01	$ 0.05	$ 0.05	$ 0.01	$ 0.04	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.22
1,000-3,299	$ 0.02	$ 0.10	$ 0.11	$ 0.01	$ 0.08	$ 0.08	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.44
3,300-9,999	$ 0.01	$ 0.10	$ 0.11	$ 0.01	$ 0.07	$ 0.07	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.40
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.61	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 1.64
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.02	$ 0.001	$ 0.49
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 1.86	$ 0.07	$ 0.42	$ 1.33	$ 0.05	$ 0.00	$ 0.25	$ 0.001	$ 4.64

Exhibit O.17i: Implementation & Monitoring - Annualized, 3% (ICRSSL, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.11	$ 0.000	$ 0.12
100-499	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.10	$ -	$ 0.12
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ -	$ 0.07
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ -	$ 0.69
3,300-9,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.63	$ 0.000	$ 0.65
10,000-49,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.83	$ 0.000	$ 0.85
50,000-99,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.24	$ 0.000	$ 0.25
100,000-999,999	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.33	$ 0.001	$ 0.34
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.06	$ 0.000	$ 0.06
Total	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 3.03	$ 0.001	$ 3.15
Rule Alternative A2											
<100	$ 0.01	$ 0.11	$ 0.92	$ 0.01	$ 0.08	$ 0.63	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 1.84
100-499	$ 0.01	$ 0.13	$ 1.01	$ 0.01	$ 0.09	$ 0.71	$ 0.01	$ 0.00	$ 0.06	$ -	$ 2.02
500-999	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.04	$ 0.29	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.85
1,000-3,299	$ 0.02	$ 0.10	$ 0.85	$ 0.01	$ 0.07	$ 0.54	$ 0.01	$ 0.00	$ 0.12	$ -	$ 1.72
3,300-9,999	$ 0.01	$ 0.10	$ 0.78	$ 0.01	$ 0.06	$ 0.50	$ 0.01	$ 0.00	$ 0.11	$ 0.000	$ 1.58
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.46	$ 0.01	$ 0.00	$ 0.25	$ 0.000	$ 1.67
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.52
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 5.32	$ 0.07	$ 0.37	$ 3.40	$ 0.04	$ 0.01	$ 0.84	$ 0.001	$ 10.71
Rule Alternative A3											
<100	$ 0.01	$ 0.11	$ 0.24	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.67
100-499	$ 0.01	$ 0.13	$ 0.26	$ 0.01	$ 0.09	$ 0.18	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.74
500-999	$ 0.01	$ 0.05	$ 0.11	$ 0.01	$ 0.04	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.32
1,000-3,299	$ 0.02	$ 0.10	$ 0.22	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.64
3,300-9,999	$ 0.01	$ 0.10	$ 0.21	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.59
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.49	$ 0.01	$ 0.00	$ 0.20	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.38	$ 0.07	$ 0.40	$ 1.51	$ 0.05	$ 0.01	$ 0.57	$ 0.001	$ 5.65
Rule Alternative A3 UV90-10B											
<100	$ 0.01	$ 0.11	$ 0.24	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.67
100-499	$ 0.01	$ 0.13	$ 0.26	$ 0.01	$ 0.09	$ 0.18	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.74
500-999	$ 0.01	$ 0.05	$ 0.11	$ 0.01	$ 0.04	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.32
1,000-3,299	$ 0.02	$ 0.10	$ 0.22	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.64
3,300-9,999	$ 0.01	$ 0.10	$ 0.21	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.59
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.03	$ 0.49	$ 0.01	$ 0.00	$ 0.20	$ 0.000	$ 1.66
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.42
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.51
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.38	$ 0.07	$ 0.40	$ 1.51	$ 0.05	$ 0.01	$ 0.58	$ 0.001	$ 5.65
Rule Alternative A4											
<100	$ 0.01	$ 0.11	$ 0.18	$ 0.01	$ 0.08	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.57
100-499	$ 0.01	$ 0.13	$ 0.20	$ 0.01	$ 0.09	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.62
500-999	$ 0.01	$ 0.05	$ 0.08	$ 0.01	$ 0.04	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.27
1,000-3,299	$ 0.02	$ 0.10	$ 0.17	$ 0.01	$ 0.08	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.54
3,300-9,999	$ 0.01	$ 0.10	$ 0.16	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.50
10,000-49,999	$ 0.01	$ 0.06	$ 0.84	$ 0.01	$ 0.04	$ 0.59	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 1.64
50,000-99,999	$ 0.00	$ 0.01	$ 0.21	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.41
100,000-999,999	$ 0.00	$ 0.01	$ 0.25	$ 0.00	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.03	$ 0.001	$ 0.49
1,000,000+	$ 0.00	$ 0.00	$ 0.04	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.09
Total	$ 0.09	$ 0.58	$ 2.13	$ 0.07	$ 0.41	$ 1.50	$ 0.05	$ 0.00	$ 0.30	$ 0.001	$ 5.13

Exhibit O.18a: Treatment Uncertainty - Annualized, 3% (ICR)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 0.65	$ 0.78	$ 0.90	$ 0.90	$ 0.97	$ 1.04	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 1.56	$ 1.75	$ 1.95
100-499	$ 0.98	$ 1.15	$ 1.32	$ 1.55	$ 1.69	$ 1.82	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.54	$ 2.85	$ 3.16
500-999	$ 0.66	$ 0.78	$ 0.90	$ 1.49	$ 1.63	$ 1.77	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.18	$ 2.44	$ 2.69
1,000-3,299	$ 3.52	$ 4.25	$ 4.98	$ 5.25	$ 5.75	$ 6.26	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.93	$ 10.19	$ 11.45
3,300-9,999	$ 10.83	$ 13.25	$ 15.65	$ 7.57	$ 8.22	$ 8.88	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 18.74	$ 21.85	$ 24.96
10,000-49,999	$ 38.41	$ 43.86	$ 49.32	$ 26.21	$ 27.79	$ 29.39	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 65.93	$ 73.04	$ 80.18
50,000-99,999	$ 25.01	$ 28.70	$ 32.38	$ 14.46	$ 15.31	$ 16.19	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 40.14	$ 44.76	$ 49.37
100,000-999,999	$ 75.63	$ 86.26	$ 96.89	$ 50.12	$ 53.09	$ 56.09	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 135.04	$ 148.85	$ 162.69
1,000,000+	$ 33.77	$ 38.48	$ 43.19	$ 28.51	$ 30.18	$ 31.86	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 81.81	$ 92.74	$ 103.63
Total	$ 189.46	$ 217.51	$ 245.53	$ 136.06	$ 144.63	$ 153.28	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 356.87	$ 398.47	$ 440.07
Rule Alternative A2																					
<100	$ 0.30	$ 0.36	$ 0.46	$ 0.42	$ 0.49	$ 0.59	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.73	$ 0.86	$ 1.06
100-499	$ 0.45	$ 0.55	$ 0.69	$ 0.61	$ 0.70	$ 0.84	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.07	$ 1.26	$ 1.55
500-999	$ 0.31	$ 0.38	$ 0.47	$ 0.46	$ 0.53	$ 0.64	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.80	$ 0.94	$ 1.14
1,000-3,299	$ 1.25	$ 1.55	$ 1.98	$ 1.58	$ 1.82	$ 2.21	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.99	$ 3.55	$ 4.40
3,300-9,999	$ 3.53	$ 4.42	$ 5.71	$ 2.68	$ 3.04	$ 3.66	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 6.55	$ 7.85	$ 9.80
10,000-49,999	$ 12.00	$ 14.62	$ 18.63	$ 7.97	$ 8.97	$ 10.73	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 21.29	$ 24.99	$ 30.83
50,000-99,999	$ 7.75	$ 9.54	$ 12.25	$ 4.07	$ 4.60	$ 5.49	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 12.49	$ 14.88	$ 18.54
100,000-999,999	$ 22.80	$ 27.96	$ 35.66	$ 13.11	$ 14.89	$ 17.73	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 45.20	$ 52.35	$ 63.11
1,000,000+	$ 10.10	$ 12.37	$ 15.75	$ 7.22	$ 8.24	$ 9.81	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 36.86	$ 44.69	$ 54.14
Total	$ 58.49	$ 71.75	$ 91.60	$ 38.12	$ 43.29	$ 51.70	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 127.97	$ 151.37	$ 184.56
Rule Alternative A3																					
<100	$ 0.23	$ 0.29	$ 0.36	$ 0.28	$ 0.34	$ 0.41	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.51	$ 0.63	$ 0.77
100-499	$ 0.32	$ 0.40	$ 0.50	$ 0.39	$ 0.46	$ 0.55	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.71	$ 0.88	$ 1.07
500-999	$ 0.21	$ 0.27	$ 0.34	$ 0.26	$ 0.32	$ 0.38	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.50	$ 0.62	$ 0.75
1,000-3,299	$ 0.79	$ 1.01	$ 1.28	$ 0.94	$ 1.13	$ 1.34	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.89	$ 2.33	$ 2.82
3,300-9,999	$ 2.14	$ 2.77	$ 3.51	$ 1.82	$ 2.15	$ 2.57	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.30	$ 5.31	$ 6.51
10,000-49,999	$ 9.80	$ 12.32	$ 15.59	$ 6.03	$ 7.04	$ 8.34	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 17.15	$ 20.76	$ 25.40
50,000-99,999	$ 6.31	$ 8.04	$ 10.26	$ 2.88	$ 3.39	$ 4.01	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 9.86	$ 12.17	$ 15.07
100,000-999,999	$ 18.16	$ 23.06	$ 29.26	$ 8.97	$ 10.63	$ 12.53	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 36.42	$ 43.19	$ 51.51
1,000,000+	$ 7.90	$ 10.04	$ 12.74	$ 4.94	$ 5.88	$ 6.92	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 32.38	$ 40.00	$ 48.24
Total	$ 45.86	$ 58.20	$ 73.84	$ 26.51	$ 31.35	$ 37.05	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 103.72	$ 125.89	$ 152.14
Rule Alternative A3 UV90-10B																					
<100	$ 0.23	$ 0.29	$ 0.36	$ 0.28	$ 0.34	$ 0.41	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.51	$ 0.63	$ 0.77
100-499	$ 0.32	$ 0.40	$ 0.50	$ 0.39	$ 0.46	$ 0.55	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.71	$ 0.88	$ 1.07
500-999	$ 0.21	$ 0.27	$ 0.34	$ 0.26	$ 0.32	$ 0.38	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.50	$ 0.62	$ 0.75
1,000-3,299	$ 0.79	$ 1.01	$ 1.28	$ 0.93	$ 1.13	$ 1.34	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.89	$ 2.33	$ 2.82
3,300-9,999	$ 2.18	$ 2.82	$ 3.56	$ 1.83	$ 2.17	$ 2.59	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.35	$ 5.37	$ 6.58
10,000-49,999	$ 10.86	$ 13.61	$ 17.16	$ 6.61	$ 7.73	$ 9.17	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 18.78	$ 22.74	$ 27.80
50,000-99,999	$ 7.11	$ 9.01	$ 11.41	$ 3.35	$ 3.96	$ 4.70	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 11.13	$ 13.71	$ 16.92
100,000-999,999	$ 21.12	$ 26.66	$ 33.61	$ 11.05	$ 13.17	$ 15.62	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 41.46	$ 49.33	$ 58.95
1,000,000+	$ 9.53	$ 12.05	$ 15.19	$ 6.15	$ 7.35	$ 8.74	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 35.21	$ 43.49	$ 52.50
Total	$ 52.34	$ 66.12	$ 83.41	$ 30.85	$ 36.64	$ 43.50	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 114.55	$ 139.09	$ 168.17
Rule Alternative A4																					
<100	$ 0.13	$ 0.17	$ 0.22	$ 0.15	$ 0.17	$ 0.21	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.28	$ 0.34	$ 0.43
100-499	$ 0.17	$ 0.22	$ 0.28	$ 0.19	$ 0.23	$ 0.27	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.37	$ 0.46	$ 0.57
500-999	$ 0.11	$ 0.14	$ 0.18	$ 0.12	$ 0.14	$ 0.17	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.26	$ 0.31	$ 0.38
1,000-3,299	$ 0.37	$ 0.48	$ 0.62	$ 0.45	$ 0.53	$ 0.64	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.98	$ 1.20	$ 1.46
3,300-9,999	$ 0.99	$ 1.28	$ 1.66	$ 0.96	$ 1.16	$ 1.41	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.29	$ 2.83	$ 3.50
10,000-49,999	$ 3.95	$ 5.22	$ 6.70	$ 2.77	$ 3.29	$ 3.92	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 8.04	$ 9.91	$ 12.09
50,000-99,999	$ 2.53	$ 3.39	$ 4.39	$ 1.25	$ 1.48	$ 1.76	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 4.45	$ 5.61	$ 6.96
100,000-999,999	$ 7.02	$ 9.33	$ 12.03	$ 3.40	$ 4.04	$ 4.80	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 19.71	$ 22.88	$ 26.55
1,000,000+	$ 3.01	$ 4.00	$ 5.16	$ 1.69	$ 2.02	$ 2.41	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 24.23	$ 30.11	$ 36.14
Total	$ 18.26	$ 24.23	$ 31.24	$ 10.98	$ 13.08	$ 15.58	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 60.60	$ 73.64	$ 88.08

Exhibit O.18b: Treatment Uncertainty - Annualized, 3% (ICRSSM)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 0.65	$ 0.78	$ 0.90	$ 0.90	$ 0.97	$ 1.04	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 1.56	$ 1.75	$ 1.95
100-499	$ 0.98	$ 1.15	$ 1.32	$ 1.55	$ 1.69	$ 1.82	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.54	$ 2.85	$ 3.16
500-999	$ 0.66	$ 0.78	$ 0.90	$ 1.49	$ 1.63	$ 1.77	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.18	$ 2.44	$ 2.69
1,000-3,299	$ 3.52	$ 4.25	$ 4.98	$ 5.25	$ 5.75	$ 6.26	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.93	$ 10.19	$ 11.45
3,300-9,999	$ 10.83	$ 13.25	$ 15.65	$ 7.57	$ 8.22	$ 8.88	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 18.74	$ 21.85	$ 24.96
10,000-49,999	$ 38.41	$ 43.86	$ 49.32	$ 26.21	$ 27.79	$ 29.39	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 65.93	$ 73.04	$ 80.18
50,000-99,999	$ 25.01	$ 28.70	$ 32.38	$ 14.46	$ 15.31	$ 16.19	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 40.14	$ 44.76	$ 49.37
100,000-999,999	$ 75.63	$ 86.26	$ 96.89	$ 50.12	$ 53.09	$ 56.09	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 135.04	$ 148.85	$ 162.69
1,000,000+	$ 33.77	$ 38.48	$ 43.19	$ 28.51	$ 30.18	$ 31.86	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 81.81	$ 92.74	$ 103.63
Total	$ 189.46	$ 217.51	$ 245.53	$ 136.06	$ 144.63	$ 153.28	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 356.87	$ 398.47	$ 440.07
Rule Alternative A2																					
<100	$ 0.23	$ 0.30	$ 0.37	$ 0.29	$ 0.35	$ 0.42	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.53	$ 0.65	$ 0.79
100-499	$ 0.33	$ 0.42	$ 0.52	$ 0.42	$ 0.51	$ 0.60	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.77	$ 0.94	$ 1.14
500-999	$ 0.22	$ 0.28	$ 0.35	$ 0.33	$ 0.39	$ 0.46	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.57	$ 0.70	$ 0.84
1,000-3,299	$ 0.90	$ 1.16	$ 1.45	$ 1.16	$ 1.41	$ 1.67	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.23	$ 2.75	$ 3.32
3,300-9,999	$ 2.56	$ 3.35	$ 4.22	$ 2.05	$ 2.46	$ 2.87	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.95	$ 6.19	$ 7.52
10,000-49,999	$ 9.02	$ 11.66	$ 14.47	$ 6.07	$ 7.22	$ 8.39	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 16.40	$ 20.27	$ 24.34
50,000-99,999	$ 5.78	$ 7.57	$ 9.49	$ 2.99	$ 3.55	$ 4.13	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 9.45	$ 11.87	$ 14.43
100,000-999,999	$ 16.74	$ 21.75	$ 27.16	$ 9.25	$ 11.01	$ 12.83	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 35.27	$ 42.26	$ 49.72
1,000,000+	$ 7.35	$ 9.54	$ 11.91	$ 4.97	$ 5.93	$ 6.93	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 31.85	$ 39.56	$ 47.42
Total	$ 43.12	$ 56.03	$ 69.95	$ 27.53	$ 32.84	$ 38.31	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 102.00	$ 125.20	$ 149.52
Rule Alternative A3																					
<100	$ 0.16	$ 0.21	$ 0.26	$ 0.18	$ 0.22	$ 0.26	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.34	$ 0.44	$ 0.53
100-499	$ 0.21	$ 0.28	$ 0.35	$ 0.24	$ 0.30	$ 0.35	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 0.59	$ 0.72
500-999	$ 0.14	$ 0.18	$ 0.23	$ 0.15	$ 0.19	$ 0.23	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.32	$ 0.41	$ 0.49
1,000-3,299	$ 0.49	$ 0.66	$ 0.83	$ 0.57	$ 0.71	$ 0.85	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.23	$ 1.56	$ 1.89
3,300-9,999	$ 1.30	$ 1.76	$ 2.24	$ 1.21	$ 1.51	$ 1.79	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.84	$ 3.65	$ 4.46
10,000-49,999	$ 6.85	$ 9.07	$ 11.38	$ 4.12	$ 5.03	$ 5.92	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 12.29	$ 15.49	$ 18.77
50,000-99,999	$ 4.39	$ 5.89	$ 7.47	$ 1.87	$ 2.30	$ 2.70	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 6.94	$ 8.93	$ 10.98
100,000-999,999	$ 12.44	$ 16.60	$ 20.95	$ 5.59	$ 6.87	$ 8.10	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 27.32	$ 32.98	$ 38.77
1,000,000+	$ 5.36	$ 7.16	$ 9.04	$ 3.03	$ 3.73	$ 4.41	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 27.92	$ 34.98	$ 42.03
Total	$ 31.33	$ 41.81	$ 52.76	$ 16.98	$ 20.87	$ 24.63	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 79.66	$ 99.02	$ 118.64
Rule Alternative A3 UV90-10B																					
<100	$ 0.16	$ 0.21	$ 0.26	$ 0.18	$ 0.22	$ 0.26	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.34	$ 0.44	$ 0.53
100-499	$ 0.21	$ 0.28	$ 0.35	$ 0.24	$ 0.30	$ 0.35	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 0.59	$ 0.72
500-999	$ 0.14	$ 0.18	$ 0.23	$ 0.15	$ 0.19	$ 0.23	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.32	$ 0.41	$ 0.49
1,000-3,299	$ 0.49	$ 0.66	$ 0.83	$ 0.57	$ 0.71	$ 0.85	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.23	$ 1.56	$ 1.89
3,300-9,999	$ 1.32	$ 1.79	$ 2.27	$ 1.22	$ 1.52	$ 1.81	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.88	$ 3.69	$ 4.51
10,000-49,999	$ 7.51	$ 9.86	$ 12.33	$ 4.51	$ 5.50	$ 6.46	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 13.33	$ 16.76	$ 20.27
50,000-99,999	$ 4.88	$ 6.48	$ 8.17	$ 2.18	$ 2.67	$ 3.14	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 7.73	$ 9.89	$ 12.12
100,000-999,999	$ 14.16	$ 18.72	$ 23.50	$ 6.97	$ 8.56	$ 10.10	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 30.43	$ 36.79	$ 43.32
1,000,000+	$ 6.31	$ 8.34	$ 10.45	$ 3.85	$ 4.74	$ 5.60	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 29.70	$ 37.16	$ 44.63
Total	$ 35.18	$ 46.53	$ 58.41	$ 19.87	$ 24.41	$ 28.81	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 86.41	$ 107.27	$ 128.48
Rule Alternative A4																					
<100	$ 0.08	$ 0.11	$ 0.14	$ 0.09	$ 0.11	$ 0.13	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.17	$ 0.22	$ 0.28
100-499	$ 0.11	$ 0.14	$ 0.18	$ 0.12	$ 0.15	$ 0.18	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.24	$ 0.30	$ 0.38
500-999	$ 0.07	$ 0.09	$ 0.12	$ 0.07	$ 0.09	$ 0.11	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.17	$ 0.21	$ 0.26
1,000-3,299	$ 0.23	$ 0.31	$ 0.40	$ 0.28	$ 0.35	$ 0.42	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.67	$ 0.84	$ 1.02
3,300-9,999	$ 0.61	$ 0.83	$ 1.08	$ 0.60	$ 0.75	$ 0.92	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.55	$ 1.97	$ 2.43
10,000-49,999	$ 2.17	$ 2.99	$ 3.88	$ 1.63	$ 2.01	$ 2.41	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 5.11	$ 6.39	$ 7.76
50,000-99,999	$ 1.39	$ 1.94	$ 2.54	$ 0.74	$ 0.91	$ 1.09	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 2.80	$ 3.59	$ 4.44
100,000-999,999	$ 3.83	$ 5.30	$ 6.92	$ 1.94	$ 2.41	$ 2.88	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 15.06	$ 17.21	$ 19.52
1,000,000+	$ 1.64	$ 2.27	$ 2.96	$ 0.93	$ 1.16	$ 1.40	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 22.10	$ 27.52	$ 32.94
Total	$ 10.11	$ 13.98	$ 18.23	$ 6.40	$ 7.95	$ 9.54	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 47.87	$ 58.27	$ 69.03

Exhibit O.18c: Treatment Uncertainty - Annualized, 3% (ICRSSL)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 0.65	$ 0.78	$ 0.90	$ 0.90	$ 0.97	$ 1.04	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 1.56	$ 1.75	$ 1.95
100-499	$ 0.98	$ 1.15	$ 1.32	$ 1.55	$ 1.69	$ 1.82	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.54	$ 2.85	$ 3.16
500-999	$ 0.66	$ 0.78	$ 0.90	$ 1.49	$ 1.63	$ 1.77	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.18	$ 2.44	$ 2.69
1,000-3,299	$ 3.52	$ 4.25	$ 4.98	$ 5.25	$ 5.75	$ 6.26	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.93	$ 10.19	$ 11.45
3,300-9,999	$ 10.83	$ 13.25	$ 15.65	$ 7.57	$ 8.22	$ 8.88	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 18.74	$ 21.85	$ 24.96
10,000-49,999	$ 38.41	$ 43.86	$ 49.32	$ 26.21	$ 27.79	$ 29.39	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 65.93	$ 73.04	$ 80.18
50,000-99,999	$ 25.01	$ 28.70	$ 32.38	$ 14.46	$ 15.31	$ 16.19	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 40.14	$ 44.76	$ 49.37
100,000-999,999	$ 75.63	$ 86.26	$ 96.89	$ 50.12	$ 53.09	$ 56.09	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 135.04	$ 148.85	$ 162.69
1,000,000+	$ 33.77	$ 38.48	$ 43.19	$ 28.51	$ 30.18	$ 31.86	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 81.81	$ 92.74	$ 103.63
Total	$ 189.46	$ 217.51	$ 245.53	$ 136.06	$ 144.63	$ 153.28	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 356.87	$ 398.47	$ 440.07
Rule Alternative A2																					
<100	$ 0.20	$ 0.27	$ 0.34	$ 0.23	$ 0.30	$ 0.36	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.43	$ 0.57	$ 0.71
100-499	$ 0.27	$ 0.37	$ 0.47	$ 0.34	$ 0.43	$ 0.53	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.62	$ 0.81	$ 1.01
500-999	$ 0.18	$ 0.24	$ 0.31	$ 0.25	$ 0.33	$ 0.40	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 0.60	$ 0.74
1,000-3,299	$ 0.71	$ 0.98	$ 1.27	$ 0.91	$ 1.20	$ 1.46	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.79	$ 2.36	$ 2.93
3,300-9,999	$ 2.00	$ 2.83	$ 3.68	$ 1.67	$ 2.15	$ 2.60	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.01	$ 5.36	$ 6.71
10,000-49,999	$ 7.03	$ 9.91	$ 12.80	$ 4.84	$ 6.22	$ 7.49	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 13.19	$ 17.53	$ 21.76
50,000-99,999	$ 4.50	$ 6.43	$ 8.39	$ 2.34	$ 3.02	$ 3.63	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 7.51	$ 10.19	$ 12.83
100,000-999,999	$ 12.88	$ 18.32	$ 23.77	$ 7.00	$ 9.12	$ 11.00	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 29.17	$ 36.94	$ 44.49
1,000,000+	$ 5.63	$ 8.01	$ 10.38	$ 3.68	$ 4.84	$ 5.86	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 28.84	$ 36.93	$ 44.82
Total	$ 33.40	$ 47.36	$ 61.42	$ 21.27	$ 27.60	$ 33.32	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 86.02	$ 111.29	$ 136.00
Rule Alternative A3																					
<100	$ 0.11	$ 0.17	$ 0.23	$ 0.13	$ 0.18	$ 0.22	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.25	$ 0.35	$ 0.45
100-499	$ 0.15	$ 0.22	$ 0.29	$ 0.17	$ 0.24	$ 0.29	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.33	$ 0.47	$ 0.60
500-999	$ 0.10	$ 0.15	$ 0.19	$ 0.11	$ 0.15	$ 0.18	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23	$ 0.32	$ 0.41
1,000-3,299	$ 0.35	$ 0.52	$ 0.68	$ 0.40	$ 0.55	$ 0.68	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.91	$ 1.25	$ 1.57
3,300-9,999	$ 0.90	$ 1.36	$ 1.81	$ 0.87	$ 1.20	$ 1.49	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.10	$ 2.95	$ 3.73
10,000-49,999	$ 4.97	$ 7.34	$ 9.56	$ 2.97	$ 4.04	$ 4.93	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 9.26	$ 12.77	$ 15.96
50,000-99,999	$ 3.18	$ 4.77	$ 6.28	$ 1.33	$ 1.81	$ 2.21	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 5.19	$ 7.32	$ 9.29
100,000-999,999	$ 8.97	$ 13.36	$ 17.52	$ 3.93	$ 5.35	$ 6.53	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 22.19	$ 28.21	$ 33.77
1,000,000+	$ 3.86	$ 5.75	$ 7.54	$ 2.12	$ 2.89	$ 3.53	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 25.51	$ 32.72	$ 39.65
Total	$ 22.59	$ 33.63	$ 44.10	$ 12.02	$ 16.41	$ 20.06	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 65.97	$ 86.37	$ 105.42
Rule Alternative A3 UV90-10B																					
<100	$ 0.11	$ 0.17	$ 0.23	$ 0.13	$ 0.18	$ 0.22	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.25	$ 0.35	$ 0.45
100-499	$ 0.15	$ 0.22	$ 0.29	$ 0.17	$ 0.24	$ 0.29	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.33	$ 0.47	$ 0.60
500-999	$ 0.10	$ 0.15	$ 0.19	$ 0.11	$ 0.15	$ 0.18	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23	$ 0.32	$ 0.41
1,000-3,299	$ 0.35	$ 0.52	$ 0.68	$ 0.40	$ 0.55	$ 0.68	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.91	$ 1.25	$ 1.57
3,300-9,999	$ 0.92	$ 1.39	$ 1.84	$ 0.87	$ 1.21	$ 1.50	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.13	$ 2.98	$ 3.77
10,000-49,999	$ 5.42	$ 7.94	$ 10.30	$ 3.24	$ 4.40	$ 5.36	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 9.98	$ 13.74	$ 17.14
50,000-99,999	$ 3.51	$ 5.21	$ 6.81	$ 1.54	$ 2.10	$ 2.56	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 5.73	$ 8.05	$ 10.18
100,000-999,999	$ 10.15	$ 14.94	$ 19.45	$ 4.90	$ 6.66	$ 8.11	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 24.34	$ 31.10	$ 37.27
1,000,000+	$ 4.50	$ 6.62	$ 8.62	$ 2.70	$ 3.68	$ 4.48	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 26.73	$ 34.38	$ 41.67
Total	$ 25.21	$ 37.15	$ 48.41	$ 14.07	$ 19.17	$ 23.39	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 70.63	$ 92.65	$ 113.05
Rule Alternative A4																					
<100	$ 0.05	$ 0.08	$ 0.11	$ 0.06	$ 0.08	$ 0.10	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.11	$ 0.16	$ 0.22
100-499	$ 0.07	$ 0.10	$ 0.14	$ 0.08	$ 0.11	$ 0.14	$ 0.00	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.16	$ 0.22	$ 0.30
500-999	$ 0.04	$ 0.07	$ 0.09	$ 0.05	$ 0.07	$ 0.08	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.12	$ 0.16	$ 0.21
1,000-3,299	$ 0.14	$ 0.22	$ 0.31	$ 0.18	$ 0.25	$ 0.33	$ 0.07	$ 0.08	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.49	$ 0.66	$ 0.84
3,300-9,999	$ 0.39	$ 0.60	$ 0.84	$ 0.38	$ 0.54	$ 0.71	$ 0.20	$ 0.23	$ 0.27	$ 0.13	$ 0.14	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.11	$ 1.53	$ 1.99
10,000-49,999	$ 1.33	$ 2.03	$ 2.88	$ 1.02	$ 1.41	$ 1.84	$ 0.33	$ 0.39	$ 0.45	$ 0.24	$ 0.26	$ 0.27	$ 0.50	$ 0.50	$ 0.50	$ 0.25	$ 0.25	$ 0.25	$ 3.66	$ 4.84	$ 6.18
50,000-99,999	$ 0.85	$ 1.32	$ 1.88	$ 0.46	$ 0.64	$ 0.83	$ 0.28	$ 0.34	$ 0.39	$ 0.16	$ 0.17	$ 0.19	$ 0.13	$ 0.13	$ 0.13	$ 0.10	$ 0.10	$ 0.10	$ 1.99	$ 2.70	$ 3.52
100,000-999,999	$ 2.33	$ 3.59	$ 5.11	$ 1.21	$ 1.67	$ 2.17	$ 0.87	$ 1.02	$ 1.19	$ 0.66	$ 0.72	$ 0.77	$ 4.91	$ 4.91	$ 4.91	$ 2.85	$ 2.85	$ 2.85	$ 12.83	$ 14.77	$ 17.00
1,000,000+	$ 1.00	$ 1.54	$ 2.19	$ 0.57	$ 0.79	$ 1.04	$ 17.19	$ 21.64	$ 26.03	$ 0.84	$ 0.94	$ 1.04	$ 0.98	$ 0.98	$ 0.98	$ 0.53	$ 0.53	$ 0.53	$ 21.10	$ 26.42	$ 31.81
Total	$ 6.21	$ 9.55	$ 13.55	$ 4.00	$ 5.56	$ 7.25	$ 18.94	$ 23.72	$ 28.44	$ 2.16	$ 2.36	$ 2.56	$ 6.53	$ 6.53	$ 6.53	$ 3.73	$ 3.73	$ 3.73	$ 41.56	$ 51.45	$ 62.06

Exhibit O.19a: State Costs - Annualized, 7% (ICR, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	0.004	$ 0.09	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	0.004	$ 0.12	$ 0.0000	$ 0.21
50,000-99,999	$ 0.06				$ -	0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	0.002	$ 0.04	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	0.017	$ 0.46	$ 0.0003	$ 1.12
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	0.001	$ 0.02	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	0.001	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	0.001	$ 0.03	$ -	$ 0.17
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	0.001	$ 0.03	$ 0.0000	$ 0.42
10,000-49,999	$ 0.09				$ 0.01	0.002	$ 0.05	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	0.001	$ 0.02	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	0.007	$ 0.18	$ 0.0003	$ 1.45
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	0.001	$ 0.01	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	0.001	$ 0.01	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	0.000	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	0.002	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	0.001	$ 0.01	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	0.005	$ 0.13	$ 0.0003	$ 1.41
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	0.001	$ 0.01	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	0.001	$ 0.01	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	0.000	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	0.002	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	0.001	$ 0.02	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	0.005	$ 0.14	$ 0.0003	$ 1.41
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	0.001	$ 0.02	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	0.000	$ 0.01	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	0.003	$ 0.07	$ 0.0003	$ 1.34

Exhibit O.19b: State Costs - Annualized, 7% (ICR, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.03	$ -	$ 0.17
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.02	$ 0.0000	$ 0.42
10,000-49,999	$ 0.09				$ 0.01	$ 0.002	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.001	$ 0.02	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.006	$ 0.17	$ 0.0003	$ 1.44
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.12	$ 0.0003	$ 1.39
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.12	$ 0.0003	$ 1.40
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.11
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.06	$ 0.0003	$ 1.33

Exhibit O.19c: State Costs - Annualized, 7% (ICR, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.03
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.03	$ -	$ 0.17
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.03	$ 0.0000	$ 0.43
10,000-49,999	$ 0.09				$ 0.01	$ 0.002	$ 0.05	$ 0.0000	$ 0.15
50,000-99,999	$ 0.06				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.001	$ 0.02	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.007	$ 0.20	$ 0.0003	$ 1.47
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.002	$ 0.05	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.001	$ 0.02	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.005	$ 0.15	$ 0.0003	$ 1.42
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.002	$ 0.05	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.001	$ 0.02	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.005	$ 0.15	$ 0.0003	$ 1.42
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.07	$ 0.0003	$ 1.34

Exhibit O.19d: State Costs - Annualized, 7% (ICRSSM, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.02	$ 0.0000	$ 0.42
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.005	$ 0.14	$ 0.0003	$ 1.41
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.10	$ 0.0003	$ 1.37
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.10	$ 0.0003	$ 1.37
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.00	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.11
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.28
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.05	$ 0.0003	$ 1.32

Exhibit O.19e: State Costs - Annualized, 7% (ICRSSM, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.02	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.005	$ 0.13	$ 0.0003	$ 1.40
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.09	$ 0.0003	$ 1.36
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.09	$ 0.0003	$ 1.36
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.00	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.11
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.28
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.05	$ 0.0003	$ 1.32

Exhibit O.19f: State Costs - Annualized, 7% (ICRSSM, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ -	$ 0.04
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.02	$ 0.0000	$ 0.42
10,000-49,999	$ 0.09				$ 0.01	$ 0.002	$ 0.04	$ 0.0000	$ 0.14
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.001	$ 0.01	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.006	$ 0.15	$ 0.0003	$ 1.42
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.11	$ 0.0003	$ 1.38
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.11	$ 0.0003	$ 1.38
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.01	$ 0.0000	$ 0.11
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.06	$ 0.0003	$ 1.33

Exhibit O.19g: State Costs - Annualized, 7% (ICRSSL, Mean)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.02	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.12	$ 0.0003	$ 1.39
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.08	$ 0.0003	$ 1.35
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.08	$ 0.0003	$ 1.36
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.00	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.11
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.28
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.05	$ 0.0003	$ 1.32

Exhibit O.19h: State Costs - Annualized, 7% (ICRSSL, Low)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.01	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.004	$ 0.10	$ 0.0003	$ 1.37
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.07	$ 0.0003	$ 1.34
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.02	$ 0.0000	$ 0.12
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.07	$ 0.0003	$ 1.34
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.00	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.10
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.28
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.04	$ 0.0003	$ 1.31

Exhibit O.19i: State Costs - Annualized, 7% (ICRSSL, High)

Size Category	Implementation	E. coli Monitoring Review Initial Monitoring	Crypto Monitoring Review Initial Monitoring	E.coli Monitoring Review Second Round	Crypto Monitoring Review Second Round	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I
Rule Alternative A1									
<100	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ 0.0000	$ 0.02
100-499	$ 0.00	$ -	$ -	$ -	$ -	$ 0.001	$ 0.02	$ -	$ 0.02
500-999	$ 0.00	$ -	$ -	$ -	$ -	$ 0.000	$ 0.01	$ -	$ 0.01
1,000-3,299	$ 0.01	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ -	$ 0.11
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ 0.004	$ 0.10	$ 0.0000	$ 0.12
10,000-49,999	$ 0.09				$ -	$ 0.004	$ 0.13	$ 0.0000	$ 0.22
50,000-99,999	$ 0.06				$ -	$ 0.001	$ 0.04	$ 0.0000	$ 0.10
100,000-999,999	$ 0.25				$ -	$ 0.002	$ 0.05	$ 0.0002	$ 0.30
1,000,000+	$ 0.21				$ -	$ 0.000	$ 0.01	$ 0.0000	$ 0.22
Total	$ 0.64	$ -	$ -	$ -	$ -	$ 0.017	$ 0.47	$ 0.0003	$ 1.13
Rule Alternative A2									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.001	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.001	$ 0.02	$ -	$ 0.16
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.001	$ 0.02	$ 0.0000	$ 0.41
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.04	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.005	$ 0.13	$ 0.0003	$ 1.41
Rule Alternative A3									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.09	$ 0.0003	$ 1.36
Rule Alternative A3 UV90-10B									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.02
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.01	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.01	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.001	$ 0.03	$ 0.0000	$ 0.13
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.08
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.01	$ 0.0002	$ 0.29
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.003	$ 0.09	$ 0.0003	$ 1.36
Rule Alternative A4									
<100	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ 0.0000	$ 0.01
100-499	$ 0.00	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.000	$ 0.01	$ -	$ 0.03
500-999	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.000	$ 0.00	$ -	$ 0.03
1,000-3,299	$ 0.01	$ 0.06	$ 0.03	$ 0.03	$ 0.01	$ 0.000	$ 0.00	$ -	$ 0.15
3,300-9,999	$ 0.02	$ 0.17	$ 0.09	$ 0.08	$ 0.03	$ 0.000	$ 0.00	$ 0.0000	$ 0.40
10,000-49,999	$ 0.09				$ 0.01	$ 0.000	$ 0.01	$ 0.0000	$ 0.11
50,000-99,999	$ 0.06				$ 0.01	$ 0.000	$ 0.00	$ 0.0000	$ 0.07
100,000-999,999	$ 0.25				$ 0.03	$ 0.000	$ 0.00	$ 0.0002	$ 0.28
1,000,000+	$ 0.21				$ 0.02	$ 0.000	$ 0.00	$ 0.0000	$ 0.24
Total	$ 0.64	$ 0.25	$ 0.14	$ 0.12	$ 0.12	$ 0.002	$ 0.05	$ 0.0003	$ 1.32

Exhibit O.20a: Implementation & Monitoring - Annualized, 7% (ICR, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.67	$ 0.001	$ 0.70
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.20	$ 0.000	$ 0.21
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.28	$ 0.001	$ 0.29
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.49	$ 0.002	$ 2.64
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.54	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 2.03
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.60	$ 0.01	$ 0.00	$ 0.07	$ -	$ 2.24
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.25	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.44	$ 0.01	$ 0.00	$ 0.15	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.05	$ 0.40	$ 0.01	$ 0.00	$ 0.14	$ 0.000	$ 1.74
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.41	$ 0.01	$ 0.00	$ 0.25	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.64
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.33	$ 2.90	$ 0.04	$ 0.01	$ 0.94	$ 0.002	$ 12.08
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.40	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.92
100-499	$ 0.02	$ 0.17	$ 0.44	$ 0.01	$ 0.08	$ 0.22	$ 0.01	$ 0.00	$ 0.06	$ -	$ 1.01
500-999	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.03	$ 0.09	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.43
1,000-3,299	$ 0.02	$ 0.14	$ 0.38	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.08	$ -	$ 0.89
3,300-9,999	$ 0.02	$ 0.13	$ 0.35	$ 0.01	$ 0.06	$ 0.16	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.81
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.43	$ 0.01	$ 0.00	$ 0.23	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.63	$ 0.09	$ 0.36	$ 1.54	$ 0.04	$ 0.01	$ 0.71	$ 0.002	$ 7.28
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.40	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.92
100-499	$ 0.02	$ 0.17	$ 0.44	$ 0.01	$ 0.08	$ 0.22	$ 0.01	$ 0.00	$ 0.06	$ -	$ 1.01
500-999	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.03	$ 0.09	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.43
1,000-3,299	$ 0.02	$ 0.14	$ 0.38	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.08	$ -	$ 0.89
3,300-9,999	$ 0.02	$ 0.13	$ 0.35	$ 0.01	$ 0.06	$ 0.16	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.81
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.43	$ 0.01	$ 0.00	$ 0.24	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.63	$ 0.09	$ 0.36	$ 1.54	$ 0.04	$ 0.01	$ 0.71	$ 0.002	$ 7.28
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.35	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.83
100-499	$ 0.02	$ 0.17	$ 0.39	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.92
500-999	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.03	$ 0.08	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.39
1,000-3,299	$ 0.02	$ 0.14	$ 0.33	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.79
3,300-9,999	$ 0.02	$ 0.13	$ 0.31	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.73
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.54	$ 0.01	$ 0.00	$ 0.11	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.03	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.04	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.40	$ 0.09	$ 0.39	$ 1.65	$ 0.04	$ 0.00	$ 0.36	$ 0.002	$ 6.85

Exhibit O.20b: Implementation & Monitoring - Annualized, 7% (ICR, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.55	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.61	$ 0.01	$ 0.00	$ 0.07	$ -	$ 2.24
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.25	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.45	$ 0.01	$ 0.00	$ 0.14	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.05	$ 0.41	$ 0.01	$ 0.00	$ 0.13	$ 0.000	$ 1.74
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.42	$ 0.01	$ 0.00	$ 0.24	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.64
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.34	$ 2.96	$ 0.04	$ 0.01	$ 0.88	$ 0.002	$ 12.08
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.37	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.87
100-499	$ 0.02	$ 0.17	$ 0.41	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.96
500-999	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.03	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.41
1,000-3,299	$ 0.02	$ 0.14	$ 0.35	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.07	$ -	$ 0.84
3,300-9,999	$ 0.02	$ 0.13	$ 0.33	$ 0.01	$ 0.06	$ 0.15	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.77
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.45	$ 0.01	$ 0.00	$ 0.22	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.51	$ 0.09	$ 0.36	$ 1.52	$ 0.04	$ 0.01	$ 0.64	$ 0.002	$ 7.08
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.37	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.87
100-499	$ 0.02	$ 0.17	$ 0.41	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.96
500-999	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.03	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.41
1,000-3,299	$ 0.02	$ 0.14	$ 0.35	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.07	$ -	$ 0.84
3,300-9,999	$ 0.02	$ 0.13	$ 0.33	$ 0.01	$ 0.06	$ 0.15	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 0.77
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.44	$ 0.01	$ 0.00	$ 0.22	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.51	$ 0.09	$ 0.36	$ 1.51	$ 0.04	$ 0.01	$ 0.65	$ 0.002	$ 7.08
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.32	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.79
100-499	$ 0.02	$ 0.17	$ 0.36	$ 0.01	$ 0.08	$ 0.18	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.87
500-999	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.03	$ 0.07	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.37
1,000-3,299	$ 0.02	$ 0.14	$ 0.31	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.75
3,300-9,999	$ 0.02	$ 0.13	$ 0.28	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.69
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.55	$ 0.01	$ 0.00	$ 0.10	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.03	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.04	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.29	$ 0.09	$ 0.39	$ 1.61	$ 0.04	$ 0.00	$ 0.32	$ 0.002	$ 6.66

Exhibit O.20c: Implementation & Monitoring - Annualized, 7% (ICR, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 2.03
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.60	$ 0.01	$ 0.00	$ 0.08	$ -	$ 2.24
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.24	$ 0.00	$ 0.00	$ 0.05	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.05	$ 0.42	$ 0.01	$ 0.00	$ 0.17	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.05	$ 0.39	$ 0.01	$ 0.00	$ 0.15	$ 0.000	$ 1.74
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.38	$ 0.01	$ 0.00	$ 0.29	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.09	$ 0.000	$ 0.52
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.12	$ 0.001	$ 0.64
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.32	$ 2.80	$ 0.03	$ 0.01	$ 1.04	$ 0.002	$ 12.08
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.45	$ 0.01	$ 0.07	$ 0.22	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.99
100-499	$ 0.02	$ 0.17	$ 0.50	$ 0.01	$ 0.08	$ 0.24	$ 0.01	$ 0.00	$ 0.06	$ -	$ 1.09
500-999	$ 0.01	$ 0.07	$ 0.21	$ 0.01	$ 0.03	$ 0.10	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.47
1,000-3,299	$ 0.02	$ 0.14	$ 0.42	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.08	$ -	$ 0.95
3,300-9,999	$ 0.02	$ 0.13	$ 0.39	$ 0.01	$ 0.06	$ 0.18	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 0.88
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.41	$ 0.01	$ 0.00	$ 0.26	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.10	$ 0.001	$ 0.64
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.83	$ 0.09	$ 0.35	$ 1.60	$ 0.04	$ 0.01	$ 0.78	$ 0.002	$ 7.60
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.45	$ 0.01	$ 0.07	$ 0.22	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 0.99
100-499	$ 0.02	$ 0.17	$ 0.50	$ 0.01	$ 0.08	$ 0.24	$ 0.01	$ 0.00	$ 0.06	$ -	$ 1.09
500-999	$ 0.01	$ 0.07	$ 0.21	$ 0.01	$ 0.03	$ 0.10	$ 0.00	$ 0.00	$ 0.04	$ -	$ 0.47
1,000-3,299	$ 0.02	$ 0.14	$ 0.42	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.08	$ -	$ 0.95
3,300-9,999	$ 0.02	$ 0.13	$ 0.39	$ 0.01	$ 0.06	$ 0.18	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 0.88
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.40	$ 0.01	$ 0.00	$ 0.26	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.10	$ 0.00	$ 0.00	$ 0.08	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.11	$ 0.001	$ 0.64
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.83	$ 0.09	$ 0.35	$ 1.59	$ 0.04	$ 0.01	$ 0.79	$ 0.002	$ 7.60
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.39	$ 0.01	$ 0.08	$ 0.20	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.89
100-499	$ 0.02	$ 0.17	$ 0.43	$ 0.01	$ 0.08	$ 0.22	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.98
500-999	$ 0.01	$ 0.07	$ 0.18	$ 0.01	$ 0.03	$ 0.09	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.42
1,000-3,299	$ 0.02	$ 0.14	$ 0.37	$ 0.01	$ 0.07	$ 0.19	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.85
3,300-9,999	$ 0.02	$ 0.13	$ 0.34	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.78
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.53	$ 0.01	$ 0.00	$ 0.13	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.05	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.58	$ 0.09	$ 0.39	$ 1.73	$ 0.04	$ 0.00	$ 0.37	$ 0.002	$ 7.11

Exhibit O.20d: Implementation & Monitoring - Annualized, 7% (ICRSSM, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.56	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.63	$ 0.01	$ 0.00	$ 0.05	$ -	$ 2.25
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.26	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.48	$ 0.01	$ 0.00	$ 0.11	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.06	$ 0.44	$ 0.01	$ 0.00	$ 0.10	$ 0.000	$ 1.75
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.45	$ 0.01	$ 0.00	$ 0.21	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.35	$ 3.09	$ 0.04	$ 0.01	$ 0.73	$ 0.002	$ 12.09
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.32	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.78
100-499	$ 0.02	$ 0.17	$ 0.35	$ 0.01	$ 0.08	$ 0.17	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.86
500-999	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.03	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.37
1,000-3,299	$ 0.02	$ 0.14	$ 0.30	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.75
3,300-9,999	$ 0.02	$ 0.13	$ 0.28	$ 0.01	$ 0.06	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.69
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.48	$ 0.01	$ 0.00	$ 0.18	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.25	$ 0.09	$ 0.38	$ 1.46	$ 0.04	$ 0.01	$ 0.52	$ 0.002	$ 6.65
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.32	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.78
100-499	$ 0.02	$ 0.17	$ 0.35	$ 0.01	$ 0.08	$ 0.17	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.86
500-999	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.03	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.37
1,000-3,299	$ 0.02	$ 0.14	$ 0.30	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.75
3,300-9,999	$ 0.02	$ 0.13	$ 0.28	$ 0.01	$ 0.06	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.69
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.47	$ 0.01	$ 0.00	$ 0.18	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.25	$ 0.09	$ 0.38	$ 1.46	$ 0.04	$ 0.01	$ 0.52	$ 0.002	$ 6.65
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.25	$ 0.01	$ 0.08	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.68
100-499	$ 0.02	$ 0.17	$ 0.28	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.75
500-999	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.03	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.32
1,000-3,299	$ 0.02	$ 0.14	$ 0.24	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.65
3,300-9,999	$ 0.02	$ 0.13	$ 0.22	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.02	$ 0.000	$ 0.59
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.58	$ 0.01	$ 0.00	$ 0.07	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.50
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.03	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.97	$ 0.09	$ 0.39	$ 1.49	$ 0.04	$ 0.00	$ 0.27	$ 0.002	$ 6.16

Exhibit O.20e: Implementation & Monitoring - Annualized, 7% (ICRSSM, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.57	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.63	$ 0.01	$ 0.00	$ 0.05	$ -	$ 2.25
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.26	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.49	$ 0.01	$ 0.00	$ 0.10	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.06	$ 0.45	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 1.75
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.47	$ 0.01	$ 0.00	$ 0.19	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.36	$ 3.16	$ 0.04	$ 0.01	$ 0.66	$ 0.002	$ 12.08
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.28	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.72
100-499	$ 0.02	$ 0.17	$ 0.31	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.80
500-999	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.03	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.34
1,000-3,299	$ 0.02	$ 0.14	$ 0.27	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.69
3,300-9,999	$ 0.02	$ 0.13	$ 0.24	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.64
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.49	$ 0.01	$ 0.00	$ 0.16	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.09	$ 0.09	$ 0.38	$ 1.41	$ 0.04	$ 0.01	$ 0.47	$ 0.002	$ 6.39
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.28	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.72
100-499	$ 0.02	$ 0.17	$ 0.31	$ 0.01	$ 0.08	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.80
500-999	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.03	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.34
1,000-3,299	$ 0.02	$ 0.14	$ 0.27	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.69
3,300-9,999	$ 0.02	$ 0.13	$ 0.24	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.64
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.49	$ 0.01	$ 0.00	$ 0.16	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.09	$ 0.09	$ 0.38	$ 1.41	$ 0.04	$ 0.01	$ 0.47	$ 0.002	$ 6.39
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.22	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.63
100-499	$ 0.02	$ 0.17	$ 0.24	$ 0.01	$ 0.08	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.69
500-999	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.03	$ 0.05	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.30
1,000-3,299	$ 0.02	$ 0.14	$ 0.21	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.02	$ -	$ 0.60
3,300-9,999	$ 0.02	$ 0.13	$ 0.20	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.00	$ 0.02	$ 0.000	$ 0.55
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.58	$ 0.01	$ 0.00	$ 0.06	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.50
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.19	$ 0.00	$ 0.00	$ 0.02	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.84	$ 0.09	$ 0.39	$ 1.43	$ 0.04	$ 0.00	$ 0.25	$ 0.002	$ 5.96

Exhibit O.20f: Implementation & Monitoring - Annualized, 7% (ICRSSM, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.56	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.62	$ 0.01	$ 0.00	$ 0.06	$ -	$ 2.25
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.25	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.47	$ 0.01	$ 0.00	$ 0.12	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.06	$ 0.43	$ 0.01	$ 0.00	$ 0.11	$ 0.000	$ 1.75
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.43	$ 0.01	$ 0.00	$ 0.23	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.11	$ 0.00	$ 0.00	$ 0.07	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.09	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.35	$ 3.03	$ 0.04	$ 0.01	$ 0.80	$ 0.002	$ 12.09
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.35	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.83
100-499	$ 0.02	$ 0.17	$ 0.38	$ 0.01	$ 0.08	$ 0.19	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.91
500-999	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.03	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.39
1,000-3,299	$ 0.02	$ 0.14	$ 0.33	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.79
3,300-9,999	$ 0.02	$ 0.13	$ 0.30	$ 0.01	$ 0.06	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.73
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.46	$ 0.01	$ 0.00	$ 0.20	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.39	$ 0.09	$ 0.37	$ 1.50	$ 0.04	$ 0.01	$ 0.56	$ 0.002	$ 6.86
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.35	$ 0.01	$ 0.07	$ 0.17	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 0.83
100-499	$ 0.02	$ 0.17	$ 0.38	$ 0.01	$ 0.08	$ 0.19	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.91
500-999	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.03	$ 0.08	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.39
1,000-3,299	$ 0.02	$ 0.14	$ 0.33	$ 0.01	$ 0.07	$ 0.16	$ 0.01	$ 0.00	$ 0.05	$ -	$ 0.79
3,300-9,999	$ 0.02	$ 0.13	$ 0.30	$ 0.01	$ 0.06	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.73
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.46	$ 0.01	$ 0.00	$ 0.20	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.39	$ 0.09	$ 0.37	$ 1.50	$ 0.04	$ 0.01	$ 0.57	$ 0.002	$ 6.86
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.28	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.72
100-499	$ 0.02	$ 0.17	$ 0.31	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.79
500-999	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.03	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.34
1,000-3,299	$ 0.02	$ 0.14	$ 0.27	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.68
3,300-9,999	$ 0.02	$ 0.13	$ 0.24	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.63
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.57	$ 0.01	$ 0.00	$ 0.08	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.18	$ 0.00	$ 0.00	$ 0.03	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.09	$ 0.09	$ 0.39	$ 1.54	$ 0.04	$ 0.00	$ 0.29	$ 0.002	$ 6.35

Exhibit O.20g: Implementation & Monitoring - Annualized, 7% (ICRSSL, Mean)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.57	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.64	$ 0.01	$ 0.00	$ 0.05	$ -	$ 2.25
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.26	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.50	$ 0.01	$ 0.00	$ 0.09	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.06	$ 0.45	$ 0.01	$ 0.00	$ 0.08	$ 0.000	$ 1.75
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.47	$ 0.01	$ 0.00	$ 0.19	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.36	$ 3.18	$ 0.04	$ 0.01	$ 0.63	$ 0.002	$ 12.09
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.26	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.69
100-499	$ 0.02	$ 0.17	$ 0.29	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.76
500-999	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.03	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.33
1,000-3,299	$ 0.02	$ 0.14	$ 0.25	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.66
3,300-9,999	$ 0.02	$ 0.13	$ 0.23	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.61
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.50	$ 0.01	$ 0.00	$ 0.15	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.01	$ 0.09	$ 0.38	$ 1.39	$ 0.04	$ 0.01	$ 0.44	$ 0.002	$ 6.26
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.26	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.69
100-499	$ 0.02	$ 0.17	$ 0.29	$ 0.01	$ 0.08	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.76
500-999	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.03	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.33
1,000-3,299	$ 0.02	$ 0.14	$ 0.25	$ 0.01	$ 0.07	$ 0.12	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.66
3,300-9,999	$ 0.02	$ 0.13	$ 0.23	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.61
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.50	$ 0.01	$ 0.00	$ 0.15	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.01	$ 0.09	$ 0.38	$ 1.39	$ 0.04	$ 0.01	$ 0.44	$ 0.002	$ 6.26
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.19	$ 0.01	$ 0.08	$ 0.09	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.58
100-499	$ 0.02	$ 0.17	$ 0.21	$ 0.01	$ 0.09	$ 0.10	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.64
500-999	$ 0.01	$ 0.07	$ 0.09	$ 0.01	$ 0.03	$ 0.04	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.28
1,000-3,299	$ 0.02	$ 0.14	$ 0.18	$ 0.01	$ 0.07	$ 0.09	$ 0.01	$ 0.00	$ 0.02	$ -	$ 0.55
3,300-9,999	$ 0.02	$ 0.13	$ 0.17	$ 0.01	$ 0.07	$ 0.08	$ 0.01	$ 0.00	$ 0.02	$ 0.000	$ 0.51
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.59	$ 0.01	$ 0.00	$ 0.06	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.50
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.19	$ 0.00	$ 0.00	$ 0.02	$ 0.001	$ 0.61
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.69	$ 0.09	$ 0.40	$ 1.37	$ 0.04	$ 0.00	$ 0.23	$ 0.002	$ 5.74

Exhibit O.20h: Implementation & Monitoring - Annualized, 7% (ICRSSL, Low)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.57	$ 0.01	$ 0.00	$ 0.05	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.64	$ 0.01	$ 0.00	$ 0.04	$ -	$ 2.25
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.26	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.07	$ 0.51	$ 0.01	$ 0.00	$ 0.07	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.06	$ 0.47	$ 0.01	$ 0.00	$ 0.07	$ 0.000	$ 1.75
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.50	$ 0.01	$ 0.00	$ 0.16	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.13	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.06	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.37	$ 3.27	$ 0.04	$ 0.01	$ 0.53	$ 0.002	$ 12.08
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.21	$ 0.01	$ 0.08	$ 0.10	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.61
100-499	$ 0.02	$ 0.17	$ 0.23	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.67
500-999	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.03	$ 0.05	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.29
1,000-3,299	$ 0.02	$ 0.14	$ 0.20	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.59
3,300-9,999	$ 0.02	$ 0.13	$ 0.18	$ 0.01	$ 0.07	$ 0.09	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.53	$ 0.01	$ 0.00	$ 0.12	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.05	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.78	$ 0.09	$ 0.39	$ 1.31	$ 0.04	$ 0.00	$ 0.37	$ 0.002	$ 5.89
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.21	$ 0.01	$ 0.08	$ 0.10	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.61
100-499	$ 0.02	$ 0.17	$ 0.23	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.67
500-999	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.03	$ 0.05	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.29
1,000-3,299	$ 0.02	$ 0.14	$ 0.20	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.59
3,300-9,999	$ 0.02	$ 0.13	$ 0.18	$ 0.01	$ 0.07	$ 0.09	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.53	$ 0.01	$ 0.00	$ 0.13	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.04	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.17	$ 0.00	$ 0.00	$ 0.05	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.78	$ 0.09	$ 0.39	$ 1.31	$ 0.04	$ 0.00	$ 0.38	$ 0.002	$ 5.89
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.14	$ 0.01	$ 0.08	$ 0.07	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.51
100-499	$ 0.02	$ 0.17	$ 0.16	$ 0.01	$ 0.09	$ 0.08	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.57
500-999	$ 0.01	$ 0.07	$ 0.07	$ 0.01	$ 0.03	$ 0.03	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.25
1,000-3,299	$ 0.02	$ 0.14	$ 0.14	$ 0.01	$ 0.07	$ 0.07	$ 0.01	$ 0.00	$ 0.02	$ -	$ 0.50
3,300-9,999	$ 0.02	$ 0.13	$ 0.13	$ 0.01	$ 0.07	$ 0.06	$ 0.01	$ 0.00	$ 0.02	$ 0.000	$ 0.46
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.60	$ 0.01	$ 0.00	$ 0.05	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.50
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.19	$ 0.00	$ 0.00	$ 0.02	$ 0.001	$ 0.61
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.00	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.51	$ 0.09	$ 0.40	$ 1.29	$ 0.04	$ 0.00	$ 0.21	$ 0.002	$ 5.46

Exhibit O.20i: Implementation & Monitoring - Annualized, 7% (ICRSSL, High)

Size Category	Implementation	Initial E. coli Monitoring	Initial Crypto Monitoring	Initial Monitoring Reporting	Second Round E. coli Monitoring	Second Round Crypto Monitoring	Second Round Monitoring Reporting	Benchmarking	Technology Reporting	Uncovered Finished Water Reservoir Reporting	Total
	A	B	C	D	E	F	G	H	I	J	K
Rule Alternative A1											
<100	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.09	$ 0.000	$ 0.11
100-499	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.08	$ -	$ 0.11
500-999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ -	$ 0.06
1,000-3,299	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.55	$ -	$ 0.58
3,300-9,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.52	$ 0.000	$ 0.54
10,000-49,999	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.01	$ 0.71	$ 0.001	$ 0.74
50,000-99,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.21	$ 0.000	$ 0.22
100,000-999,999	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.29	$ 0.001	$ 0.30
1,000,000+	$ 0.00	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.00	$ 0.05	$ 0.000	$ 0.05
Total	$ 0.12	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.03	$ 2.55	$ 0.002	$ 2.71
Rule Alternative A2											
<100	$ 0.02	$ 0.15	$ 1.16	$ 0.01	$ 0.07	$ 0.56	$ 0.01	$ 0.00	$ 0.06	$ 0.000	$ 2.04
100-499	$ 0.02	$ 0.17	$ 1.27	$ 0.01	$ 0.08	$ 0.63	$ 0.01	$ 0.00	$ 0.05	$ -	$ 2.25
500-999	$ 0.01	$ 0.07	$ 0.53	$ 0.01	$ 0.03	$ 0.26	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.94
1,000-3,299	$ 0.02	$ 0.14	$ 1.07	$ 0.01	$ 0.06	$ 0.48	$ 0.01	$ 0.00	$ 0.10	$ -	$ 1.90
3,300-9,999	$ 0.02	$ 0.13	$ 0.98	$ 0.01	$ 0.06	$ 0.44	$ 0.01	$ 0.00	$ 0.09	$ 0.000	$ 1.75
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.45	$ 0.01	$ 0.00	$ 0.21	$ 0.001	$ 1.96
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.06	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.14	$ 0.00	$ 0.00	$ 0.08	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.02	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 6.87	$ 0.09	$ 0.36	$ 3.12	$ 0.04	$ 0.01	$ 0.71	$ 0.002	$ 12.09
Rule Alternative A3											
<100	$ 0.02	$ 0.15	$ 0.30	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.75
100-499	$ 0.02	$ 0.17	$ 0.33	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.83
500-999	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.03	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.36
1,000-3,299	$ 0.02	$ 0.14	$ 0.28	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.72
3,300-9,999	$ 0.02	$ 0.13	$ 0.26	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.66
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.49	$ 0.01	$ 0.00	$ 0.17	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.16	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.17	$ 0.09	$ 0.38	$ 1.44	$ 0.04	$ 0.01	$ 0.49	$ 0.002	$ 6.51
Rule Alternative A3 UV90-10B											
<100	$ 0.02	$ 0.15	$ 0.30	$ 0.01	$ 0.07	$ 0.15	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.75
100-499	$ 0.02	$ 0.17	$ 0.33	$ 0.01	$ 0.08	$ 0.16	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.83
500-999	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.03	$ 0.07	$ 0.00	$ 0.00	$ 0.03	$ -	$ 0.36
1,000-3,299	$ 0.02	$ 0.14	$ 0.28	$ 0.01	$ 0.07	$ 0.14	$ 0.01	$ 0.00	$ 0.04	$ -	$ 0.72
3,300-9,999	$ 0.02	$ 0.13	$ 0.26	$ 0.01	$ 0.07	$ 0.13	$ 0.01	$ 0.00	$ 0.03	$ 0.000	$ 0.66
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.03	$ 0.48	$ 0.01	$ 0.00	$ 0.17	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.12	$ 0.00	$ 0.00	$ 0.05	$ 0.000	$ 0.51
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.07	$ 0.001	$ 0.63
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 3.17	$ 0.09	$ 0.38	$ 1.44	$ 0.04	$ 0.01	$ 0.49	$ 0.002	$ 6.51
Rule Alternative A4											
<100	$ 0.02	$ 0.15	$ 0.22	$ 0.01	$ 0.08	$ 0.11	$ 0.01	$ 0.00	$ 0.04	$ 0.000	$ 0.64
100-499	$ 0.02	$ 0.17	$ 0.25	$ 0.01	$ 0.08	$ 0.13	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.70
500-999	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.03	$ 0.05	$ 0.00	$ 0.00	$ 0.02	$ -	$ 0.30
1,000-3,299	$ 0.02	$ 0.14	$ 0.22	$ 0.01	$ 0.07	$ 0.11	$ 0.01	$ 0.00	$ 0.03	$ -	$ 0.61
3,300-9,999	$ 0.02	$ 0.13	$ 0.20	$ 0.01	$ 0.07	$ 0.10	$ 0.01	$ 0.00	$ 0.02	$ 0.000	$ 0.56
10,000-49,999	$ 0.02	$ 0.08	$ 1.14	$ 0.01	$ 0.04	$ 0.58	$ 0.01	$ 0.00	$ 0.06	$ 0.001	$ 1.95
50,000-99,999	$ 0.01	$ 0.02	$ 0.29	$ 0.00	$ 0.01	$ 0.15	$ 0.00	$ 0.00	$ 0.02	$ 0.000	$ 0.50
100,000-999,999	$ 0.01	$ 0.02	$ 0.36	$ 0.01	$ 0.01	$ 0.19	$ 0.00	$ 0.00	$ 0.02	$ 0.001	$ 0.62
1,000,000+	$ 0.00	$ 0.00	$ 0.06	$ 0.00	$ 0.00	$ 0.03	$ 0.00	$ 0.00	$ 0.01	$ 0.000	$ 0.11
Total	$ 0.12	$ 0.79	$ 2.85	$ 0.09	$ 0.39	$ 1.44	$ 0.04	$ 0.00	$ 0.25	$ 0.002	$ 5.98

Exhibit O.21a: Treatment Uncertainty - Annualized, 7% (ICR)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 0.72	$ 0.86	$ 1.00	$ 0.75	$ 0.80	$ 0.86	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 1.47	$ 1.66	$ 1.86
100-499	$ 1.08	$ 1.27	$ 1.46	$ 1.28	$ 1.39	$ 1.50	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.37	$ 2.67	$ 2.97
500-999	$ 0.73	$ 0.86	$ 0.99	$ 1.23	$ 1.34	$ 1.46	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.98	$ 2.23	$ 2.47
1,000-3,299	$ 3.88	$ 4.69	$ 5.50	$ 4.33	$ 4.74	$ 5.16	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.36	$ 9.61	$ 10.85
3,300-9,999	$ 11.95	$ 14.62	$ 17.27	$ 6.24	$ 6.78	$ 7.32	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 18.53	$ 21.78	$ 25.02
10,000-49,999	$ 44.79	$ 51.14	$ 57.51	$ 22.49	$ 23.85	$ 25.22	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 68.84	$ 76.63	$ 84.46
50,000-99,999	$ 30.29	$ 34.76	$ 39.20	$ 12.71	$ 13.47	$ 14.23	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 43.77	$ 49.07	$ 54.36
100,000-999,999	$ 93.22	$ 106.32	$ 119.42	$ 44.60	$ 47.23	$ 49.91	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 149.36	$ 165.35	$ 181.36
1,000,000+	$ 41.62	$ 47.43	$ 53.24	$ 25.37	$ 26.85	$ 28.35	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 90.85	$ 103.72	$ 116.53
Total	$ 228.27	$ 261.95	$ 295.59	$ 118.99	$ 126.46	$ 134.00	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 385.52	$ 432.72	$ 479.88
Rule Alternative A2																					
<100	$ 0.34	$ 0.40	$ 0.51	$ 0.35	$ 0.40	$ 0.49	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.68	$ 0.81	$ 1.00
100-499	$ 0.50	$ 0.60	$ 0.76	$ 0.50	$ 0.58	$ 0.70	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.01	$ 1.19	$ 1.47
500-999	$ 0.34	$ 0.41	$ 0.52	$ 0.38	$ 0.44	$ 0.53	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.75	$ 0.88	$ 1.08
1,000-3,299	$ 1.37	$ 1.71	$ 2.19	$ 1.30	$ 1.50	$ 1.83	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.83	$ 3.38	$ 4.20
3,300-9,999	$ 3.90	$ 4.88	$ 6.31	$ 2.21	$ 2.50	$ 3.01	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 6.44	$ 7.77	$ 9.75
10,000-49,999	$ 14.00	$ 17.05	$ 21.73	$ 6.84	$ 7.70	$ 9.21	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 22.39	$ 26.39	$ 32.66
50,000-99,999	$ 9.38	$ 11.55	$ 14.83	$ 3.58	$ 4.05	$ 4.82	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 13.73	$ 16.44	$ 20.57
100,000-999,999	$ 28.11	$ 34.46	$ 43.95	$ 11.66	$ 13.25	$ 15.78	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 51.31	$ 59.50	$ 71.76
1,000,000+	$ 12.45	$ 15.24	$ 19.42	$ 6.43	$ 7.33	$ 8.73	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 42.74	$ 52.01	$ 63.09
Total	$ 70.38	$ 86.31	$ 110.20	$ 33.25	$ 37.76	$ 45.09	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 141.89	$ 168.38	$ 205.58
Rule Alternative A3																					
<100	$ 0.25	$ 0.31	$ 0.40	$ 0.23	$ 0.28	$ 0.34	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.48	$ 0.60	$ 0.74
100-499	$ 0.35	$ 0.44	$ 0.55	$ 0.32	$ 0.38	$ 0.46	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.68	$ 0.84	$ 1.03
500-999	$ 0.24	$ 0.30	$ 0.37	$ 0.22	$ 0.26	$ 0.31	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.48	$ 0.59	$ 0.72
1,000-3,299	$ 0.87	$ 1.12	$ 1.41	$ 0.77	$ 0.93	$ 1.11	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.80	$ 2.22	$ 2.71
3,300-9,999	$ 2.36	$ 3.06	$ 3.87	$ 1.50	$ 1.78	$ 2.12	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.20	$ 5.22	$ 6.42
10,000-49,999	$ 11.43	$ 14.37	$ 18.18	$ 5.18	$ 6.04	$ 7.16	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 18.16	$ 22.06	$ 27.06
50,000-99,999	$ 7.64	$ 9.73	$ 12.42	$ 2.54	$ 2.98	$ 3.52	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 10.94	$ 13.56	$ 16.87
100,000-999,999	$ 22.39	$ 28.42	$ 36.07	$ 7.98	$ 9.46	$ 11.15	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 41.91	$ 49.67	$ 59.25
1,000,000+	$ 9.74	$ 12.37	$ 15.70	$ 4.40	$ 5.23	$ 6.16	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 38.00	$ 47.04	$ 56.80
Total	$ 55.26	$ 70.13	$ 88.98	$ 23.13	$ 27.35	$ 32.32	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 116.65	$ 141.79	$ 171.59
Rule Alternative A3 UV90-10B																					
<100	$ 0.25	$ 0.31	$ 0.40	$ 0.23	$ 0.28	$ 0.34	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.48	$ 0.60	$ 0.74
100-499	$ 0.35	$ 0.44	$ 0.55	$ 0.32	$ 0.38	$ 0.46	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.68	$ 0.84	$ 1.03
500-999	$ 0.24	$ 0.30	$ 0.37	$ 0.22	$ 0.26	$ 0.31	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.48	$ 0.59	$ 0.72
1,000-3,299	$ 0.87	$ 1.12	$ 1.41	$ 0.77	$ 0.93	$ 1.11	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.80	$ 2.22	$ 2.71
3,300-9,999	$ 2.40	$ 3.11	$ 3.93	$ 1.51	$ 1.79	$ 2.13	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.25	$ 5.28	$ 6.50
10,000-49,999	$ 12.66	$ 15.87	$ 20.01	$ 5.67	$ 6.63	$ 7.87	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 19.89	$ 24.15	$ 29.61
50,000-99,999	$ 8.61	$ 10.91	$ 13.81	$ 2.94	$ 3.48	$ 4.14	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 12.32	$ 15.23	$ 18.87
100,000-999,999	$ 26.03	$ 32.86	$ 41.43	$ 9.83	$ 11.72	$ 13.90	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 47.41	$ 56.36	$ 67.36
1,000,000+	$ 11.74	$ 14.86	$ 18.72	$ 5.47	$ 6.54	$ 7.77	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 41.08	$ 50.83	$ 61.43
Total	$ 63.16	$ 79.78	$ 100.64	$ 26.96	$ 32.02	$ 38.03	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 128.38	$ 156.11	$ 188.96
Rule Alternative A4																					
<100	$ 0.14	$ 0.18	$ 0.24	$ 0.12	$ 0.14	$ 0.17	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.26	$ 0.33	$ 0.41
100-499	$ 0.19	$ 0.24	$ 0.31	$ 0.16	$ 0.19	$ 0.22	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.36	$ 0.44	$ 0.55
500-999	$ 0.12	$ 0.16	$ 0.20	$ 0.10	$ 0.11	$ 0.14	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.24	$ 0.30	$ 0.37
1,000-3,299	$ 0.41	$ 0.53	$ 0.68	$ 0.37	$ 0.44	$ 0.53	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.93	$ 1.14	$ 1.40
3,300-9,999	$ 1.09	$ 1.42	$ 1.84	$ 0.80	$ 0.96	$ 1.16	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.22	$ 2.76	$ 3.43
10,000-49,999	$ 4.60	$ 6.08	$ 7.81	$ 2.38	$ 2.83	$ 3.37	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 8.54	$ 10.55	$ 12.90
50,000-99,999	$ 3.06	$ 4.10	$ 5.32	$ 1.10	$ 1.31	$ 1.55	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 4.93	$ 6.25	$ 7.79
100,000-999,999	$ 8.65	$ 11.50	$ 14.83	$ 3.02	$ 3.60	$ 4.27	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 23.22	$ 26.89	$ 31.13
1,000,000+	$ 3.71	$ 4.93	$ 6.36	$ 1.50	$ 1.80	$ 2.14	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 29.07	$ 36.17	$ 43.44
Total	$ 21.96	$ 29.15	$ 37.58	$ 9.55	$ 11.37	$ 13.55	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 69.77	$ 84.83	$ 101.43

Exhibit O.21b: Treatment Uncertainty - Annualized, 7% (ICRSSM)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 0.72	$ 0.86	$ 1.00	$ 0.75	$ 0.80	$ 0.86	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 1.47	$ 1.66	$ 1.86
100-499	$ 1.08	$ 1.27	$ 1.46	$ 1.28	$ 1.39	$ 1.50	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.37	$ 2.67	$ 2.97
500-999	$ 0.73	$ 0.86	$ 0.99	$ 1.23	$ 1.34	$ 1.46	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.98	$ 2.23	$ 2.47
1,000-3,299	$ 3.88	$ 4.69	$ 5.50	$ 4.33	$ 4.74	$ 5.16	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.36	$ 9.61	$ 10.85
3,300-9,999	$ 11.95	$ 14.62	$ 17.27	$ 6.24	$ 6.78	$ 7.32	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 18.53	$ 21.78	$ 25.02
10,000-49,999	$ 44.79	$ 51.14	$ 57.51	$ 22.49	$ 23.85	$ 25.22	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 68.84	$ 76.63	$ 84.46
50,000-99,999	$ 30.29	$ 34.76	$ 39.20	$ 12.71	$ 13.47	$ 14.23	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 43.77	$ 49.07	$ 54.36
100,000-999,999	$ 93.22	$ 106.32	$ 119.42	$ 44.60	$ 47.23	$ 49.91	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 149.36	$ 165.35	$ 181.36
1,000,000+	$ 41.62	$ 47.43	$ 53.24	$ 25.37	$ 26.85	$ 28.35	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 90.85	$ 103.72	$ 116.53
Total	$ 228.27	$ 261.95	$ 295.59	$ 118.99	$ 126.46	$ 134.00	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 385.52	$ 432.72	$ 479.88
Rule Alternative A2																					
<100	$ 0.26	$ 0.33	$ 0.41	$ 0.24	$ 0.29	$ 0.34	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.50	$ 0.62	$ 0.75
100-499	$ 0.36	$ 0.46	$ 0.57	$ 0.35	$ 0.42	$ 0.50	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.72	$ 0.90	$ 1.08
500-999	$ 0.24	$ 0.31	$ 0.38	$ 0.27	$ 0.32	$ 0.38	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.54	$ 0.66	$ 0.79
1,000-3,299	$ 0.99	$ 1.28	$ 1.60	$ 0.96	$ 1.16	$ 1.37	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.11	$ 2.62	$ 3.17
3,300-9,999	$ 2.82	$ 3.69	$ 4.66	$ 1.69	$ 2.02	$ 2.37	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 4.85	$ 6.10	$ 7.46
10,000-49,999	$ 10.51	$ 13.60	$ 16.88	$ 5.21	$ 6.20	$ 7.20	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 17.27	$ 21.43	$ 25.81
50,000-99,999	$ 7.00	$ 9.17	$ 11.50	$ 2.63	$ 3.13	$ 3.63	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 10.40	$ 13.14	$ 16.05
100,000-999,999	$ 20.63	$ 26.81	$ 33.48	$ 8.23	$ 9.80	$ 11.42	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 40.40	$ 48.39	$ 56.93
1,000,000+	$ 9.05	$ 11.76	$ 14.68	$ 4.42	$ 5.28	$ 6.17	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 37.34	$ 46.48	$ 55.79
Total	$ 51.88	$ 67.41	$ 84.16	$ 23.99	$ 28.62	$ 33.39	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 114.13	$ 140.34	$ 167.84
Rule Alternative A3																					
<100	$ 0.17	$ 0.23	$ 0.29	$ 0.15	$ 0.18	$ 0.22	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.32	$ 0.42	$ 0.51
100-499	$ 0.23	$ 0.31	$ 0.39	$ 0.20	$ 0.25	$ 0.29	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.44	$ 0.57	$ 0.69
500-999	$ 0.15	$ 0.20	$ 0.26	$ 0.13	$ 0.16	$ 0.19	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.31	$ 0.39	$ 0.47
1,000-3,299	$ 0.54	$ 0.73	$ 0.92	$ 0.47	$ 0.59	$ 0.70	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.17	$ 1.49	$ 1.82
3,300-9,999	$ 1.43	$ 1.94	$ 2.47	$ 1.00	$ 1.24	$ 1.48	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.76	$ 3.57	$ 4.39
10,000-49,999	$ 7.99	$ 10.57	$ 13.27	$ 3.54	$ 4.32	$ 5.08	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 13.08	$ 16.53	$ 20.07
50,000-99,999	$ 5.32	$ 7.14	$ 9.04	$ 1.65	$ 2.02	$ 2.38	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 7.73	$ 10.00	$ 12.34
100,000-999,999	$ 15.33	$ 20.46	$ 25.83	$ 4.98	$ 6.12	$ 7.21	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 31.85	$ 38.36	$ 45.07
1,000,000+	$ 6.60	$ 8.82	$ 11.15	$ 2.70	$ 3.32	$ 3.92	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 33.16	$ 41.58	$ 50.01
Total	$ 37.77	$ 50.40	$ 63.61	$ 14.81	$ 18.20	$ 21.47	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 90.83	$ 112.91	$ 135.37
Rule Alternative A3 UV90-10B																					
<100	$ 0.17	$ 0.23	$ 0.29	$ 0.15	$ 0.18	$ 0.22	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.32	$ 0.42	$ 0.51
100-499	$ 0.23	$ 0.31	$ 0.39	$ 0.20	$ 0.25	$ 0.29	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.44	$ 0.57	$ 0.69
500-999	$ 0.15	$ 0.20	$ 0.26	$ 0.13	$ 0.16	$ 0.19	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.31	$ 0.39	$ 0.47
1,000-3,299	$ 0.54	$ 0.73	$ 0.92	$ 0.47	$ 0.59	$ 0.70	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.17	$ 1.49	$ 1.82
3,300-9,999	$ 1.46	$ 1.97	$ 2.51	$ 1.01	$ 1.25	$ 1.49	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.80	$ 3.61	$ 4.44
10,000-49,999	$ 8.75	$ 11.50	$ 14.38	$ 3.87	$ 4.72	$ 5.55	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 14.18	$ 17.86	$ 21.65
50,000-99,999	$ 5.91	$ 7.85	$ 9.89	$ 1.91	$ 2.34	$ 2.76	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 8.59	$ 11.04	$ 13.57
100,000-999,999	$ 17.46	$ 23.08	$ 28.97	$ 6.20	$ 7.62	$ 8.99	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 35.20	$ 42.48	$ 49.98
1,000,000+	$ 7.78	$ 10.28	$ 12.88	$ 3.43	$ 4.22	$ 4.98	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 35.07	$ 43.93	$ 52.80
Total	$ 42.45	$ 56.15	$ 70.48	$ 17.37	$ 21.33	$ 25.17	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 98.08	$ 121.79	$ 145.95
Rule Alternative A4																					
<100	$ 0.09	$ 0.12	$ 0.16	$ 0.07	$ 0.09	$ 0.11	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.16	$ 0.22	$ 0.27
100-499	$ 0.12	$ 0.16	$ 0.20	$ 0.10	$ 0.12	$ 0.15	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.23	$ 0.29	$ 0.36
500-999	$ 0.08	$ 0.10	$ 0.13	$ 0.06	$ 0.07	$ 0.09	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.16	$ 0.20	$ 0.25
1,000-3,299	$ 0.25	$ 0.34	$ 0.44	$ 0.23	$ 0.29	$ 0.35	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.64	$ 0.80	$ 0.98
3,300-9,999	$ 0.68	$ 0.92	$ 1.19	$ 0.49	$ 0.62	$ 0.76	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.51	$ 1.93	$ 2.38
10,000-49,999	$ 2.53	$ 3.48	$ 4.52	$ 1.40	$ 1.73	$ 2.07	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 5.48	$ 6.85	$ 8.32
50,000-99,999	$ 1.68	$ 2.35	$ 3.08	$ 0.65	$ 0.80	$ 0.96	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 3.10	$ 3.99	$ 4.96
100,000-999,999	$ 4.72	$ 6.53	$ 8.53	$ 1.73	$ 2.14	$ 2.57	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 17.99	$ 20.46	$ 23.13
1,000,000+	$ 2.02	$ 2.80	$ 3.65	$ 0.83	$ 1.04	$ 1.25	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 26.71	$ 33.27	$ 39.84
Total	$ 12.15	$ 16.80	$ 21.91	$ 5.56	$ 6.91	$ 8.29	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 55.97	$ 68.02	$ 80.50

Exhibit O.21c: Treatment Uncertainty - Annualized, 7% (ICRSSL)

Size Category	Filtered Treatment Capital			Filtered Treatment O&M			Unfiltered Treatment Capital			Unfiltered Treatment O&M			Uncovered Reservoirs Capital			Uncovered Reservoirs O&M			Total		
	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th	5th	Mean	95th
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Rule Alternative A1																					
<100	$ 0.72	$ 0.86	$ 1.00	$ 0.75	$ 0.80	$ 0.86	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 1.47	$ 1.66	$ 1.86
100-499	$ 1.08	$ 1.27	$ 1.46	$ 1.28	$ 1.39	$ 1.50	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 2.37	$ 2.67	$ 2.97
500-999	$ 0.73	$ 0.86	$ 0.99	$ 1.23	$ 1.34	$ 1.46	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.98	$ 2.23	$ 2.47
1,000-3,299	$ 3.88	$ 4.69	$ 5.50	$ 4.33	$ 4.74	$ 5.16	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 8.36	$ 9.61	$ 10.85
3,300-9,999	$ 11.95	$ 14.62	$ 17.27	$ 6.24	$ 6.78	$ 7.32	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 18.53	$ 21.78	$ 25.02
10,000-49,999	$ 44.79	$ 51.14	$ 57.51	$ 22.49	$ 23.85	$ 25.22	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 68.84	$ 76.63	$ 84.46
50,000-99,999	$ 30.29	$ 34.76	$ 39.20	$ 12.71	$ 13.47	$ 14.23	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 43.77	$ 49.07	$ 54.36
100,000-999,999	$ 93.22	$ 106.32	$ 119.42	$ 44.60	$ 47.23	$ 49.91	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 149.36	$ 165.35	$ 181.36
1,000,000+	$ 41.62	$ 47.43	$ 53.24	$ 25.37	$ 26.85	$ 28.35	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 90.85	$ 103.72	$ 116.53
Total	$ 228.27	$ 261.95	$ 295.59	$ 118.99	$ 126.46	$ 134.00	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 385.52	$ 432.72	$ 479.88
Rule Alternative A2																					
<100	$ 0.22	$ 0.29	$ 0.38	$ 0.19	$ 0.25	$ 0.30	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.41	$ 0.54	$ 0.68
100-499	$ 0.30	$ 0.40	$ 0.51	$ 0.28	$ 0.36	$ 0.43	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.59	$ 0.78	$ 0.96
500-999	$ 0.20	$ 0.27	$ 0.34	$ 0.21	$ 0.27	$ 0.33	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.43	$ 0.57	$ 0.70
1,000-3,299	$ 0.78	$ 1.09	$ 1.40	$ 0.75	$ 0.99	$ 1.20	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 1.69	$ 2.25	$ 2.80
3,300-9,999	$ 2.21	$ 3.12	$ 4.06	$ 1.38	$ 1.77	$ 2.14	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 3.92	$ 5.28	$ 6.64
10,000-49,999	$ 8.20	$ 11.56	$ 14.93	$ 4.15	$ 5.34	$ 6.43	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 13.91	$ 18.54	$ 23.08
50,000-99,999	$ 5.45	$ 7.79	$ 10.16	$ 2.06	$ 2.65	$ 3.19	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 8.27	$ 11.29	$ 14.27
100,000-999,999	$ 15.88	$ 22.58	$ 29.30	$ 6.23	$ 8.11	$ 9.79	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 33.65	$ 42.48	$ 51.13
1,000,000+	$ 6.94	$ 9.87	$ 12.80	$ 3.28	$ 4.30	$ 5.21	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 34.08	$ 43.61	$ 52.95
Total	$ 40.16	$ 56.97	$ 73.88	$ 18.52	$ 24.04	$ 29.03	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 96.95	$ 125.32	$ 153.21
Rule Alternative A3																					
<100	$ 0.12	$ 0.19	$ 0.25	$ 0.11	$ 0.15	$ 0.18	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.23	$ 0.34	$ 0.43
100-499	$ 0.17	$ 0.25	$ 0.32	$ 0.14	$ 0.19	$ 0.24	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.32	$ 0.45	$ 0.58
500-999	$ 0.11	$ 0.16	$ 0.21	$ 0.09	$ 0.12	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.22	$ 0.31	$ 0.39
1,000-3,299	$ 0.38	$ 0.57	$ 0.75	$ 0.33	$ 0.46	$ 0.56	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.87	$ 1.20	$ 1.51
3,300-9,999	$ 0.99	$ 1.50	$ 1.99	$ 0.71	$ 0.99	$ 1.23	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.05	$ 2.88	$ 3.66
10,000-49,999	$ 5.79	$ 8.55	$ 11.15	$ 2.55	$ 3.47	$ 4.23	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 9.90	$ 13.66	$ 17.11
50,000-99,999	$ 3.85	$ 5.77	$ 7.60	$ 1.17	$ 1.59	$ 1.95	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 5.79	$ 8.21	$ 10.47
100,000-999,999	$ 11.06	$ 16.46	$ 21.59	$ 3.49	$ 4.76	$ 5.81	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 26.09	$ 33.01	$ 39.44
1,000,000+	$ 4.75	$ 7.08	$ 9.29	$ 1.88	$ 2.57	$ 3.14	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 30.50	$ 39.09	$ 47.38
Total	$ 27.24	$ 40.54	$ 53.17	$ 10.48	$ 14.30	$ 17.49	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 75.97	$ 99.16	$ 120.95
Rule Alternative A3 UV90-10B																					
<100	$ 0.12	$ 0.19	$ 0.25	$ 0.11	$ 0.15	$ 0.18	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.23	$ 0.34	$ 0.43
100-499	$ 0.17	$ 0.25	$ 0.32	$ 0.14	$ 0.19	$ 0.24	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.32	$ 0.45	$ 0.58
500-999	$ 0.11	$ 0.16	$ 0.21	$ 0.09	$ 0.12	$ 0.15	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.22	$ 0.31	$ 0.39
1,000-3,299	$ 0.38	$ 0.57	$ 0.75	$ 0.33	$ 0.46	$ 0.56	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.87	$ 1.20	$ 1.51
3,300-9,999	$ 1.01	$ 1.53	$ 2.03	$ 0.72	$ 1.00	$ 1.24	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 2.07	$ 2.92	$ 3.70
10,000-49,999	$ 6.32	$ 9.26	$ 12.02	$ 2.78	$ 3.78	$ 4.60	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 10.66	$ 14.68	$ 18.34
50,000-99,999	$ 4.25	$ 6.31	$ 8.25	$ 1.36	$ 1.85	$ 2.25	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 6.38	$ 9.00	$ 11.42
100,000-999,999	$ 12.51	$ 18.41	$ 23.97	$ 4.36	$ 5.93	$ 7.22	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 28.41	$ 36.12	$ 43.22
1,000,000+	$ 5.55	$ 8.16	$ 10.62	$ 2.40	$ 3.27	$ 3.99	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 31.81	$ 40.87	$ 49.55
Total	$ 30.43	$ 44.83	$ 58.41	$ 12.29	$ 16.74	$ 20.43	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 80.97	$ 105.88	$ 129.14
Rule Alternative A4																					
<100	$ 0.06	$ 0.09	$ 0.12	$ 0.05	$ 0.07	$ 0.09	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.11	$ 0.16	$ 0.21
100-499	$ 0.07	$ 0.11	$ 0.16	$ 0.06	$ 0.09	$ 0.11	$ 0.00	$ 0.00	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.15	$ 0.21	$ 0.29
500-999	$ 0.05	$ 0.07	$ 0.10	$ 0.04	$ 0.05	$ 0.07	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.11	$ 0.15	$ 0.20
1,000-3,299	$ 0.16	$ 0.24	$ 0.34	$ 0.15	$ 0.21	$ 0.27	$ 0.08	$ 0.09	$ 0.10	$ 0.08	$ 0.09	$ 0.09	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.46	$ 0.63	$ 0.80
3,300-9,999	$ 0.43	$ 0.66	$ 0.93	$ 0.32	$ 0.45	$ 0.59	$ 0.22	$ 0.26	$ 0.30	$ 0.11	$ 0.12	$ 0.12	$ 0.01	$ 0.01	$ 0.01	$ 0.00	$ 0.00	$ 0.00	$ 1.08	$ 1.50	$ 1.95
10,000-49,999	$ 1.55	$ 2.37	$ 3.35	$ 0.87	$ 1.21	$ 1.57	$ 0.39	$ 0.46	$ 0.53	$ 0.20	$ 0.22	$ 0.24	$ 0.72	$ 0.72	$ 0.72	$ 0.24	$ 0.24	$ 0.24	$ 3.97	$ 5.22	$ 6.65
50,000-99,999	$ 1.03	$ 1.60	$ 2.28	$ 0.41	$ 0.56	$ 0.73	$ 0.34	$ 0.41	$ 0.47	$ 0.14	$ 0.15	$ 0.16	$ 0.19	$ 0.19	$ 0.19	$ 0.10	$ 0.10	$ 0.10	$ 2.20	$ 3.00	$ 3.93
100,000-999,999	$ 2.88	$ 4.43	$ 6.30	$ 1.07	$ 1.49	$ 1.94	$ 1.07	$ 1.26	$ 1.46	$ 0.59	$ 0.64	$ 0.69	$ 7.07	$ 7.07	$ 7.07	$ 2.82	$ 2.82	$ 2.82	$ 15.49	$ 17.70	$ 20.27
1,000,000+	$ 1.23	$ 1.90	$ 2.70	$ 0.51	$ 0.71	$ 0.93	$ 21.18	$ 26.67	$ 32.09	$ 0.75	$ 0.84	$ 0.92	$ 1.41	$ 1.41	$ 1.41	$ 0.52	$ 0.52	$ 0.52	$ 25.60	$ 32.04	$ 38.56
Total	$ 7.45	$ 11.47	$ 16.28	$ 3.47	$ 4.83	$ 6.30	$ 23.28	$ 29.16	$ 34.96	$ 1.89	$ 2.07	$ 2.25	$ 9.40	$ 9.40	$ 9.40	$ 3.68	$ 3.68	$ 3.68	$ 49.19	$ 60.61	$ 72.87

Appendix P
Sensitivity Analyses for Cost of Illness Values

P.1 Introduction and Summary

Chapter 5 and Appendices K and L of this Economic Analysis (EA) describe the approach and calculations used to determine dollar values for reductions in nonfatal cases of cryptosporidiosis. That approach uses two point estimates, the Traditional and Enhanced, for the cost of illness (COI) and relies on single point values for the key inputs. This appendix tests the sensitivity of the results to alternative values for two of the key underlying inputs to the Enhanced COI. The first input is the value of nonmarket time. The second is the percentage productivity loss that may accompany an illness, which is applied to the time that someone is ill but is at least partly productive. These days are assumed to be the difference between the duration of the entire illness less the "days lost" due to the illness. For each of these two inputs to the Enhanced COI, low and high estimates are selected, and the effects of using those different values on the net benefits and the selection of the Preferred Alternative are presented. It should be noted that the Low COI value used in this sensitivity analysis is very roughly about two-thirds the value used for the Enhanced COI, and thus is also (very roughly) about twice the value used for the Traditional COI.

The overall result of using the Low Value for Cost-of-Illness (COI) is that Alternative A4 becomes somewhat more competitive alternative relative to the Preferred Alternative (A3), although not as strongly so as when using the Traditional COI. Alternative A4 does not excel under every condition, and the competitiveness of Alternative 4 is undercut somewhat given that there exist unquantified benefits. The Preferred Alternative continues to meet all threshold criteria, even when the Low Value for COI is used.

The overall result of using the High Value for COI is that Alternative A3 continues to be the strongest alternative across all the relevant considerations. The consideration of these two alternative values for the Enhanced COI strengthens the basis for selecting A3 as the Preferred Alternative. The sensitivity analysis shows Alternative A3 to be robust in the face of a range of alternative values.

P.2 Alternative Values for the Dollar Value of Nonmarket Work and Leisure Time Losses and the Percent Decrease in Productivity

As discussed previously in Appendix L, the estimate for the Enhanced COI includes values for both lost time and lost productivity. While the determination of the value of lost market work time appears relatively straightforward, the valuation of nonmarket work and leisure losses is subject to two major sources of uncertainty: (1) individuals may value these losses at a rate significantly higher or lower than the post-tax median wage; and (2) the reported amount of time lost may include some time spent on activities that represent an incomplete loss of utility; e.g., some of this time may be spent reading rather than coping with a bout of diarrhea. There would be, of course, some offsetting utility losses from the discomfort and stress of being sick. The values used in the sensitivity analysis test the effect of each of these sources of uncertainty on the value of lost nonmarket work and leisure time.

The survey question used to determine the percentage decrease in productivity refers to productivity while performing normal activities. While this rate of decrease appears consistent with the findings from studies of other illnesses, it is possible that the decrease in the productivity of nonmarket

work and leisure time may be greater or less than this estimate. The values used in these two components of the sensitivity analysis are discussed in more detail below.

P.2.1 Dollar Value of Nonmarket Work and Leisure Time Losses

The sensitivity analysis of the dollar value of nonmarket work and leisure time losses uses a high value of 150 percent of the Enhanced COI for nonmarket work and leisure time loss, and a low value of 50 percent of the Enhanced COI. These bounds represent the effect of (1) assuming that all nonmarket work and leisure time lost is valued at a rate higher than under the Enhanced COI and (2) assuming that some of the nonmarket work and leisure time lost is an incomplete loss of utility.

The Enhanced COI for the value of nonmarket work and leisure time is based on median post-tax wages. This estimate reflects the assumption that the opportunity cost of nonmarket work and leisure time is, at a minimum, the wages foregone. In other words, an individual who chooses to engage in activities other than market work does so because, at the margin, the utility (productivity plus any additional enjoyment) from nonmarket work or leisure is greater than the utility gained from market work. Therefore, that individual must value a marginal hour of his or her nonmarket work and leisure time at a rate at least equal to the marginal net wage per hour he or she could have earned in the job market. For many individuals, the median post-tax wage may understate the value of nonmarket work and leisure time.[1]

This assumption is consistent with the fact that many workers demand a rate higher than their hourly wage to work additional hours. Hence the high value used in the sensitivity analysis is derived from information on overtime pay. The Fair Labor Standards Act states that workers covered by its provisions must be paid at a rate not less than one and one-half times their regular pay for work over 40 hours in 1 work week unless specifically exempted (U.S. Department of Labor undated). Applying this "time-and-a-half" standard to the recommended value of $12.46 per hour for nonmarket work and leisure time leads to a high value of $18.69 per hour.

The low value for nonmarket work and leisure time reflects the fact that individuals may gain some utility from the activities they pursue while ill, hence the loss is not complete. The question used to determine time losses refers to changes in normal activities; however, in some cases the activities that replace the normal activities may have some positive value. For example, during the period reported as lost time, an individual may substitute reading a book for playing golf, in a case where golf would have been the preferred activity if that person were well. The reading time presumably has some positive value to that individual that is less than the value of golfing. Other portions of the time reported as lost, e.g., that spent coping with a bout of diarrhea, may have close to zero value and hence represent a relatively complete loss of utility. Thus, while the loss for time spent in the latter condition (a bout of diarrhea) may be complete (i.e., equal to the post-tax wage rate) the loss in the former case (reading rather than golfing) would be partial (i.e., equal to some fraction of the post-tax wage rate). The total amount of lost nonmarket work and leisure time thus may include both some time that is a total loss and some that is a partial loss, so that the average loss would be less than the Enhanced COI (i.e., than the post-tax wage rate).

Only limited research is available that is applicable to determining this fractional value. Perhaps the most relevant available research is that which focuses on the value of travel time in the context of

[1] Median wage data is used instead of data on marginal rates due to difficulties in determining the latter. It is unclear whether this approach under- or overstates the actual value of time trade-offs at the margin.

recreational demand studies. These revealed preference studies use information on the costs associated with the recreational use of different sites to estimate willingness to pay for various types of recreational experiences, and the time spent traveling to alternate sites is one part of these costs. These studies typically value time spent traveling to a recreation site at a fixed fraction of the individual's wage rate; this represents the disutility associated with travel.[2]

The precise fraction of the wage rate used to value travel time costs has ranged from zero to one in published empirical studies. Recently, it has become somewhat standard practice to use one-third the individual's wage rate as a proxy for the value of travel time, although there is no strong theoretical basis for this assumption (Shaw and Feather 1999). Rather than assuming a particular value for time costs, a few researchers have estimated the value of time empirically. For example, McConnell and Strand (1981) find that the value of travel time is approximately 60 percent of the wage rate, while some of Larson's work implies that the value of travel time is approximately 16 percent of the wage rate (Larson 1993).

The use of one-third the wage rate in travel cost recreation studies appears to have its origin within the transportation economics literature, and in particular from early reviews conducted by Beesley (1965) and Cesario (1976). More recent reviews have provided limited support for this assumption. Bruzelius (1979) finds that individuals value in-vehicle time for work trips at 20 to 30 percent of the wage rate, while reviews by Small (1992) and Waters (1992) have suggested that the consensus value is near 50 percent of the wage rate.

Unfortunately, these studies are focused on a particular type of time use, i.e., for travel. The resulting estimates are therefore not necessarily applicable to the types of time losses associated with cryptosporidiosis, which may affect a variety of leisure and nonmarket work activities. However, they suggest that 50 percent of the wage rate is within the range of reasonable estimates for activities (such as travel) that have both enjoyable and unenjoyable aspects. Applying this 50-percent reduction standard to the Enhanced COI of $12.46 per hour for nonmarket work and leisure time leads to a low value of $6.23 per hour.

The use of 50 percent of the wage rate is also consistent with the common practice in the human capital literature of valuing nonmarket work time at the market rate for domestic workers[3]. This literature uses replacement costs as a measure of the productivity of nonmarket work, rather than focusing on the opportunity costs (or utility loss) for the individual who chooses to engage in nonmarket work. The median weekly earnings of private household workers in the service industry were $276 per week in 2002, about 45 percent of the median weekly earnings of $609 for all workers (U.S. Census Bureau Table 641). Private household workers include childcare workers, cleaners, and servants.

Exhibit P.1 summarizes the estimates used for the sensitivity analysis of the value of nonmarket work and leisure time.

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[2] Travel cost studies are focused on the costs (or negative impacts) associated with traveling longer distances. They assume that travel time has some positive effects (or utility); otherwise, time costs would be valued at the full wage rate (i.e., as a complete loss).

[3] A pioneering example of this approach is Rice 1966; a more recent example is Thamer et al. 1998.

Exhibit P.1: Sensitivity Analysis Values for Nonmarket Work and Leisure Time

Time Loss Category	Low Estimate	Enhanced COI	High Estimate
Nonmarket Work and Leisure Time	$6.23 per hour	$12.46 per hour	$18.69 per hour

Source: See discussion in preceding text.

P.2.2 Percent Decrease in Productivity

For the Enhanced COI, the value of time losses assumes that time spent in normal activities while ill is 30 percent less productive than it would be in the absence of illness. This estimate of 30 percent appears reasonable based on review of other studies valuing productivity losses due to illness. Exhibit P.5 reports the results of several recent studies. The first column describes the illness addressed and cites the source of the estimate, the second provides the estimated percentage of productivity lost due to the respective illness, and the final column notes the type of question used to used obtain the productivity loss estimate.

Exhibit P.2: Examples Of Productivity Losses Due To Illness

Condition	Percent Loss in Productivity	Source of Estimate
Allergic Rhinitis (Crystal-Peters et al. 2000)	25 percent	A prior study estimating productivity losses from hay fever (McMenamin 1994).
Influenza (Keech et al. 1998)	35-73 percent	Survey participants were asked to rank their effectiveness on a scale of 1-10, from totally ineffective to fully effective.
Depression (Kessler et al. 1999)	40 percent	Survey participants were asked to rate the amount of work they did on less productive days from zero (no work) to 100 (full days work).
Asthma (Ungar et al., 2000)	19-45 percent	Asthma patients surveyed were asked for times that breathing problems were enough to interfere with usual daytime activities, “At what level did you function on a scale from 1 to 100 percent?”

The Harrington et al. estimate of approximately 30 percent is within the range of the estimates reported in these studies, which range from a low of 19 percent to a high (in one case) of 73 percent. Some of these studies focus on lost work time, while others look more broadly at effectiveness across a number of daily activities. Studies of other, potentially more severe illnesses (e.g., cancer and heart disease) generally report greater productivity losses (for example, see Hartunian et al. 1981).

The close correlation between symptomatic effects and treatment of giardiasis and cryptosporidiosis along with the support for the estimated productivity decrease gathered from the literature review, suggest that it is most appropriate to use a narrow range of low to high values for the sensitivity analysis. Exhibit P.6 provides the values used; the low value is based on the smallest loss from

Exhibit P.5 (rounded), while the high value is set conservatively at 10 percent points above the Enhanced COI, since only one estimate from the above cited studies is significantly above this level.

Exhibit P.3: Sensitivity Analysis Values for Productivity Losses

	Low Estimate	Enhanced COI	High Estimate
Percent Decrease in Productivity	20 percent	30 percent	40 percent

Sources: See text discussion.

P.3 Sensitivity Analysis

P.3.1 Summary of Sensitivity Bounds

In summary, based on the discussion in section P.2, the alternative values for the sensitivity analysis for nonfatal COI derive from alternative estimates for two variables.

Exhibit P.4: Summary of Values Varied in Sensitivity Analysis, 2003

	Low Estimate	Enhanced COI	High Estimate
Nonmarket Work and Leisure Time	$6.23 per hour	$12.46 per hour	$18.62 per hour
Percentage Decrease in Productivity	20 percent	30 percent	40 percent

P.3.2 Cost of Illness, Year 2003 (Base Year)

The different values for nonmarket work and leisure time result in a recalculation of the weighted average value of time, as shown in Exhibit P.5.

Exhibit P.5: Weighted Average Value of Time, 2003

Time Loss Category		Hours Per Day	Per Hour Value	Per Day Value
		A	B	C = A x B
Low COI	Market Work Time	3.4	$20.82	**$70.79**
	Nonmarket Work Time	2.3	$6.23	**$14.33**
	Nonmarket Leisure Time	10.3	$6.23	**$64.17**
	Caregiver Day	Sum of weighted lost market work, nonmarket work, and leisure days		**$149.29**
Enhanced COI	Market Work Time	3.4	$20.82	**$70.79**
	Nonmarket Work Time	2.3	$12.46	**$28.66**
	Nonmarket Leisure Time	10.3	$12.46	**$128.34**
	Caregiver Day	Sum of weighted lost market work, nonmarket work, and leisure days		**$227.79**
High COI	Market Work Time	3.5	$20.82	**$70.79**
	Nonmarket Work Time	2.3	$18.69	**$42.99**
	Nonmarket Leisure Time	10.3	$18.69	**$192.51**
	Caregiver Day	Sum of weighted lost market work, nonmarket work, and leisure days		**$306.29**

Note: Rounded data are shown here, but full precision was used in all calculations.
Source: Enhanced COI: Exhibit L.9, Low and High COI: Exhibit P.4

The derivation of the total loss per case in the year 2003 (the Base Year) is shown in Exhibit P.6, where the value of illnesses per day are multiplied by the number of days of illness. The overall impact on the total COI for an illness is shown. The Low COI value is 63 percent of the Enhanced COI, and the High COI value is 145 percent of the Enhanced COI estimate.

Exhibit P.6: Total Loss per Case (Year 2003), Low, Enhanced, and High COI

Loss Category	Days Lost	Value Per Day			Total Loss Per Case		
		Low COI	Enhanced COI	High COI	Low COI	Enhanced COI	High COI
	A	B	C	D	E=A x B	F=A x C	G=A x D
Total					**$526.95**	**$844.24**	**$1,227.99**
Direct Medical Costs	NA	NA	NA	NA	**$106.91**	**$106.91**	**$106.91**
Lost Time Subtotal					**$420.04**	**$737.33**	**$1,121.08**
Lost Market Work Days	1.697	$70.79	$70.79	$70.79	$120.13	$120.13	$120.13
Lost Nonmarket Work Days	1.697	$14.33	$28.66	$42.99	$24.32	$48.64	$72.95
Lost Caregiver Days	0.270	$149.29	$227.79	$306.29	$40.31	$61.50	$82.70
Lost Leisure Time	1.697	$64.17	$128.34	$192.51	$108.90	$217.79	$326.69
Lost Leisure Productivity	4.233	$64.17 x 20%	$128.34 x 30%	$192.51 x 40%	$54.33	$162.98	$325.96
Lost Productivity at Work	4.233	($70.79 + $14.33) x 20%	($70.79 + $28.66) x 30%	($70.79 + $42.99) x 40%	$72.06	$126.29	$192.65

Note: Detail may not calculate to totals due to independent rounding.
Source: Exhibits L.10, P.4, and P.5**.**

P.3.3 Year-By-Year Estimates for Low, Enhanced, and High Costs of Illness

Using data presented in Appendix C and Exhibit C.12, the data presented in Exhibit P.8 are adjusted to reflect increases in the value of time each year to 2029. Using the data from 2003 as the base year, the lost time portion of the cost of illness is adjusted to reflect the annual percent change in income (the real GDP per capita). In the benefits model, the cases avoided in each year are valued as shown in Exhibit P.9 (using unrounded data).

Exhibit P.7: Yearly Total Loss Per Case, Low, Enhanced, and High COI

year	income change	Low COI	Enhanced COI	High COI	Direct Med Costs	Low COI	Enhanced COI	High COI
		(1 + A) * previous year						
	A	B	C	D	E	F = B + E	G = C + E	H = D + E
2003	Base	$420.04	$737.33	$1,121.08	$106.91	$526.95	$844.24	$1,227.99
2004	2.3%	$429.73	$754.34	$1,146.95	$106.91	$536.64	$861.25	$1,253.86
2005	3.9%	$446.52	$783.82	$1,191.76	$106.91	$553.43	$890.73	$1,298.67
2006	3.3%	$461.37	$809.88	$1,231.39	$106.91	$568.28	$916.79	$1,338.30
2007	2.3%	$472.18	$828.85	$1,260.24	$106.91	$579.09	$935.76	$1,367.15
2008	1.9%	$480.94	$844.23	$1,283.62	$106.91	$587.85	$951.14	$1,390.53
2009	2.0%	$490.37	$860.79	$1,308.79	$106.91	$597.28	$967.70	$1,415.70
2010	2.0%	$500.02	$877.73	$1,334.56	$106.91	$606.93	$984.64	$1,441.47
2011	1.8%	$508.89	$893.29	$1,358.21	$106.91	$615.80	$1,000.20	$1,465.12
2012	1.7%	$517.39	$908.22	$1,380.91	$106.91	$624.30	$1,015.13	$1,487.82
2013	1.7%	$526.04	$923.39	$1,403.98	$106.91	$632.95	$1,030.30	$1,510.89
2014	1.7%	$534.83	$938.83	$1,427.45	$106.91	$641.74	$1,045.74	$1,534.36
2015	1.7%	$543.79	$954.55	$1,451.35	$106.91	$650.70	$1,061.46	$1,558.26
2016	1.7%	$552.91	$970.57	$1,475.71	$106.91	$659.82	$1,077.48	$1,582.62
2017	1.7%	$562.21	$986.89	$1,500.53	$106.91	$669.12	$1,093.80	$1,607.44
2018	1.7%	$571.70	$1,003.55	$1,525.85	$106.91	$678.61	$1,110.46	$1,632.76
2019	1.7%	$581.38	$1,020.55	$1,551.70	$106.91	$688.29	$1,127.46	$1,658.61
2020	1.7%	$591.27	$1,037.91	$1,578.10	$106.91	$698.18	$1,144.82	$1,685.01
2021	1.7%	$601.35	$1,055.60	$1,605.00	$106.91	$708.26	$1,162.51	$1,711.91
2022	1.7%	$611.61	$1,073.60	$1,632.36	$106.91	$718.52	$1,180.51	$1,739.27
2023	1.7%	$622.03	$1,091.91	$1,660.20	$106.91	$728.94	$1,198.82	$1,767.11
2024	1.7%	$632.65	$1,110.54	$1,688.53	$106.91	$739.56	$1,217.45	$1,795.44
2025	1.7%	$643.45	$1,129.50	$1,717.36	$106.91	$750.36	$1,236.41	$1,824.27
2026	1.7%	$654.45	$1,148.81	$1,746.71	$106.91	$761.36	$1,255.72	$1,853.62
2027	1.7%	$665.65	$1,168.48	$1,776.62	$106.91	$772.56	$1,275.39	$1,883.53

Note: Full precision is used in model calculations. Rounded data are shown here.
The Traditional COI only includes valuation for medical costs and lost work time (including some portion of unpaid household production). The Enhanced COI also factors in valuations for lost personal time (non-work time) such as child care and homemaking (to the extent not covered by the traditional COI), time with family, and recreation, and lost productivity at work on days when workers are ill but go to work anyway.
Source: Exhibits L.11 and P.8.

P.3.4 Annualized Values

Using these COI values in the sensitivity analysis requires several steps. First, the values are applied to the cases of illness avoided each year. Those year-to-year amounts are discounted to present values (2003$) and then annualized over 25 years. The results are shown below in Exhibit P.8.

Exhibit P.8: Annualized Value of Illnesses Avoided, by COI Value, Data Set, and Regulatory Alternative

Data Set	Regulatory Alternative	COI Value		
		Low	Enhanced	High
Annualized Value (3 percent, 25 years)				
ICR	A1	$ 456	$ 748	$ 1,102
	A2	$ 449	$ 737	$ 1,086
	A3- Preferred	$ 444	$ 729	$ 1,074
	A4	$ 416	$ 683	$ 1,007
ICRSSL	A1	$ 135	$ 221	$ 326
	A2	$ 115	$ 189	$ 279
	A3- Preferred	$ 107	$ 175	$ 258
	A4	$ 92	$ 150	$ 222
ICRSSM	A1	$ 236	$ 388	$ 572
	A2	$ 219	$ 360	$ 530
	A3- Preferred	$ 210	$ 345	$ 507
	A4	$ 185	$ 303	$ 446
Annualized Value (7 percent, 25 years)				
ICR	A1	$ 367	$ 603	$ 887
	A2	$ 362	$ 594	$ 874
	A3- Preferred	$ 358	$ 587	$ 865
	A4	$ 336	$ 551	$ 811
ICRSSL	A1	$ 109	$ 178	$ 262
	A2	$ 93	$ 153	$ 225
	A3- Preferred	$ 86	$ 141	$ 208
	A4	$ 74	$ 121	$ 179
ICRSSM	A1	$ 191	$ 313	$ 460
	A2	$ 177	$ 290	$ 427
	A3- Preferred	$ 169	$ 278	$ 409
	A4	$ 149	$ 244	$ 360

The impact of these Low and High values on the level of annualized *total* benefits is also proportional, but the overall spread of values is narrower. This is because total benefits include benefits from avoided fatalities, which are unaffected by the High and Low values for COI. The results are shown in Exhibit P.9.

Exhibit P.9: Annualized Value of Illnesses and Deaths Avoided, by COI Value, Data Set, and Regulatory Alternative

Data Set	Regulatory Alternative	COI Value			Percent Difference from Enhanced COI	
		Low	Enhanced	High	Low	High
Annualized Value (3 percent, 25 years)						
ICR	A1	$ 1,602	$ 1,895	$ 2,249	85%	119%
	A2	$ 1,583	$ 1,871	$ 2,220	85%	119%
	A3- Preferred	$ 1,568	$ 1,853	$ 2,198	85%	119%
	A4	$ 1,486	$ 1,753	$ 2,077	85%	118%
ICRSSL	A1	$ 472	$ 558	$ 663	85%	119%
	A2	$ 415	$ 489	$ 579	85%	118%
	A3- Preferred	$ 390	$ 458	$ 541	85%	118%
	A4	$ 346	$ 405	$ 476	85%	118%
ICRSSM	A1	$ 829	$ 981	$ 1,165	85%	119%
	A2	$ 779	$ 919	$ 1,089	85%	119%
	A3- Preferred	$ 751	$ 886	$ 1,049	85%	118%
	A4	$ 677	$ 796	$ 939	85%	118%
Annualized Value (7 percent, 25 years)						
ICR	A1	$ 1,299	$ 1,534	$ 1,819	85%	119%
	A2	$ 1,283	$ 1,515	$ 1,795	85%	119%
	A3- Preferred	$ 1,272	$ 1,501	$ 1,778	85%	118%
	A4	$ 1,206	$ 1,421	$ 1,681	85%	118%
ICRSSL	A1	$ 382	$ 452	$ 536	85%	119%
	A2	$ 337	$ 396	$ 468	85%	118%
	A3- Preferred	$ 316	$ 371	$ 438	85%	118%
	A4	$ 281	$ 328	$ 386	86%	117%
ICRSSM	A1	$ 672	$ 794	$ 942	85%	119%
	A2	$ 631	$ 744	$ 881	85%	118%
	A3- Preferred	$ 609	$ 718	$ 849	85%	118%
	A4	$ 550	$ 645	$ 760	85%	118%

P.3.5 Sensitivity of Results to Alternative COI Values

Net Benefits

The previous section reports the results of using alternative values for the COI on the amount, or level, of total benefits. The results follow expected patterns: lower estimates for these key variables yield lower overall benefits, and higher estimates for those variables produce higher estimates of total benefits. The following sections are more meaningful in that they test whether the use of alternative measures of COI would produce different conclusions. That is, do the Regulatory Alternatives still meet economic threshold criteria? What do comparisons between alternatives reveal? The following sections largely follow the pattern of comparisons and tests developed in Chapter 8, Net Benefits.

The first threshold test is whether the Regulatory Alternatives continue to be likely to have positive net benefits. Exhibit P.10 compares the mean net benefits computed using each of the three COI estimates with the maximum net benefits shown in bold. Alternatives A2, A3 (the Preferred Alternative), and A4 all have positive net benefits under all circumstances. Alternative A1 has consistently positive net benefits, except when using the ICRSSL data set and a 7 percent discount rate.

Exhibit P.10: Mean Net Benefits for Low, Enhanced, and High Values for COI

Data Set	Regulatory Alternative	COI Value		
		Low	Enhanced	High
Annualized Value (3 percent, 25 years)				
ICR	A1	$ 1,210	$ 1,502	$ 1,856
	A2	$ 1,430	$ 1,718	$ 2,067
	A3- Preferred	**$ 1,445**	**$ 1,730**	**$ 2,075**
	A4	$ 1,416	$ 1,683	$ 2,006
ICRSSL	A1	$ 79	$ 166	$ 271
	A2	$ 302	**$ 376**	**$ 466**
	A3- Preferred	**$ 307**	$ 375	$ 458
	A4	$ 299	$ 357	$ 429
ICRSSM	A1	$ 437	$ 589	$ 772
	A2	$ 652	**$ 792**	**$ 963**
	A3- Preferred	**$ 656**	$ 790	$ 953
	A4	$ 623	$ 741	$ 885
Annualized Value (7 percent, 25 years)				
ICR	A1	$ 875	$ 1,111	$ 1,395
	A2	$ 1,114	$ 1,346	$ 1,627
	A3- Preferred	**$ 1,134**	**$ 1,364**	**$ 1,641**
	A4	$ 1,126	$ 1,341	$ 1,601
ICRSSL	A1	$ -41	$ 28	$ 113
	A2	$ 211	$ 270	$ 343
	A3- Preferred	$ 222	**$ 278**	**$ 344**
	A4	**$ 226**	$ 274	$ 331
ICRSSM	A1	$ 249	$ 371	$ 518
	A2	$ 490	$ 604	$ 740
	A3- Preferred	**$ 501**	**$ 610**	**$ 741**
	A4	$ 487	$ 583	$ 698

Maximum Net Benefits

Identifying the maximum net benefits among the regulatory alternatives is a first step in a comparative analysis of regulatory alternatives. Considering the combinations of occurrence data sets, low and high COI values, and discount rates, the Preferred Regulatory Alternative (A3) had the maximum net benefits of the alternatives for over half of the combinations. However, the differences are often slight among the three regulatory alternatives (A2, A3, and A4) (Exhibit P.10). When evaluating the difference between alternatives, the range is never more than 11 percent for all of the combinations.

Incremental Net Benefits

The patterns of incremental benefits discussed in this appendix are based on the Enhanced COI. Exhibit P.11 below, shows the patterns derived from using the Low and High values for COI. Rule alternatives can also be compared on the basis of their incremental net benefits. Generally, the goal of an incremental analysis is to identify the last regulatory option with positive net incremental benefits. However, the usefulness of this analysis is limited because many benefits from the rule are nonquantified and not monetized. Using either the Low or High COI estimates, the Preferred Alternative has equivalent or superior performance to using the Enhanced COI. The sensitivity of mean benefit estimates in this analysis is further illustrated by the ranking analysis presented in section P.3.5.

Exhibit P.11: Incremental Net Benefits, by Alternative and Data Set - Enhanced COI

Data Set	Regulatory Alternative	Annual Costs	Annual Benefits Based On:			Incremental Costs[1]	Incremental Benefits Based On:			Incremental Net Benefits Based On:		
			Low COI	Enhanced COI	High COI		Low COI	Enhanced COI	High COI	Low COI	Enhanced COI	High COI
		A	B			C	D			E = D - C		
3 Percent Discount Rate												
ICR	A4	$70	$ 1,486	$ 1,753	$ 2,077	$70	$ 1,486	$ 1,753	$ 2,077	$ 1,416	$ 1,683	$ 2,006
	A3- Preferred	$123	$ 1,568	$ 1,853	$ 2,198	$53	$ 82	$ 100	$ 122	**$ 29**	**$ 47**	**$ 69**
	A2	$153	$ 1,583	$ 1,871	$ 2,220	$30	$ 14	$ 18	$ 21	$ (16)	$ (12)	$ (9)
	A1	$392	$ 1,602	$ 1,895	$ 2,249	$239	$ 19	$ 24	$ 29	$ (220)	$ (216)	$ (210)
ICRSSL	A4	$47	$ 346	$ 405	$ 476	$47	$ 346	$ 405	$ 476	$ 299	$ 357	$ 429
	A3- Preferred	$83	$ 390	$ 458	$ 541	$35	$ 44	$ 53	$ 65	**$ 8**	$ 18	$ 29
	A2	$113	$ 415	$ 489	$ 579	$30	$ 25	$ 31	$ 38	$ (5)	**$ 1**	**$ 8**
	A1	$392	$ 472	$ 558	$ 663	$280	$ 57	$ 69	$ 84	$ (223)	$ (210)	$ (195)
ICRSSM	A4	$54	$ 677	$ 796	$ 939	$54	$ 677	$ 796	$ 939	$ 623	$ 741	$ 885
	A3- Preferred	$96	$ 751	$ 886	$ 1,049	$41	$ 74	$ 90	$ 110	**$ 33**	$ 49	$ 68
	A2	$127	$ 779	$ 919	$ 1,089	$31	$ 27	$ 33	$ 41	$ (4)	**$ 2**	**$ 9**
	A1	$392	$ 829	$ 981	$ 1,165	$266	$ 51	$ 62	$ 75	$ (215)	$ (204)	$ (190)
7 Percent Discount Rate												
ICR	A4	$80	$ 1,206	$ 1,421	$ 1,681	$80	$ 1,206	$ 1,421	$ 1,681	$ 1,126	$ 1,341	$ 1,601
	A3- Preferred	$137	$ 1,272	$ 1,501	$ 1,778	$57	$ 66	$ 80	$ 98	**$ 9**	**$ 23**	**$ 40**
	A2	$169	$ 1,283	$ 1,515	$ 1,795	$31	$ 12	$ 14	$ 17	$ (20)	$ (17)	$ (14)
	A1	$423	$ 1,299	$ 1,534	$ 1,819	$255	$ 16	$ 19	$ 23	$ (239)	$ (236)	$ (231)
ICRSSL	A4	$55	$ 281	$ 328	$ 386	$55	$ 281	$ 328	$ 386	**$ 226**	$ 274	$ 331
	A3- Preferred	$94	$ 316	$ 371	$ 438	$39	$ 35	$ 43	$ 52	$ (4)	**$ 4**	$ 13
	A2	$126	$ 337	$ 396	$ 468	$32	$ 20	$ 25	$ 30	$ (12)	$ (7)	**$ (2)**
	A1	$423	$ 382	$ 452	$ 536	$298	$ 46	$ 56	$ 68	$ (252)	$ (242)	$ (230)
ICRSSM	A4	$62	$ 550	$ 645	$ 760	$62	$ 550	$ 645	$ 760	$ 487	$ 583	$ 698
	A3- Preferred	$108	$ 609	$ 718	$ 849	$45	$ 60	$ 73	$ 88	**$ 14**	**$ 27**	$ 43
	A2	$141	$ 631	$ 744	$ 881	$33	$ 22	$ 27	$ 33	$ (11)	$ (6)	**$ (0)**
	A1	$423	$ 672	$ 794	$ 942	$283	$ 41	$ 50	$ 60	$ (242)	$ (233)	$ (222)

Ranking of Alternative by Net Benefits

In Chapter 8, the sensitivity of the ranking of each of the regulatory alternatives in terms of net benefits is shown (Exhibits 8.15 and 8.16). Those exhibits show the sensitivity of those rankings to alternative benefit estimates. They demonstrate how unquantified benefits, if they could be quantified and included, might alter the conclusions reached about the relative preference of regulatory alternatives. These exhibits hold the number of illness and deaths due to cryptosporidiosis constant.

Exhibits P.12 and P.13 show the Enhance COI graph (Exhibit 8.15) with the Low and High COIs noted with dashed lines. The "1" on the x-axis represents the Enhanced COI. The Low and High dashed lines are the ratio of total benefits calculated with the Low COI and High COI to the Enhanced (these ratios expressed as percentages are also presented in Exhibit P.9). The preferred Alternative A3 still has the highest net benefits under most occurrence and discount scenarios and Low COI.

Cost Effectiveness–Traditional Approach

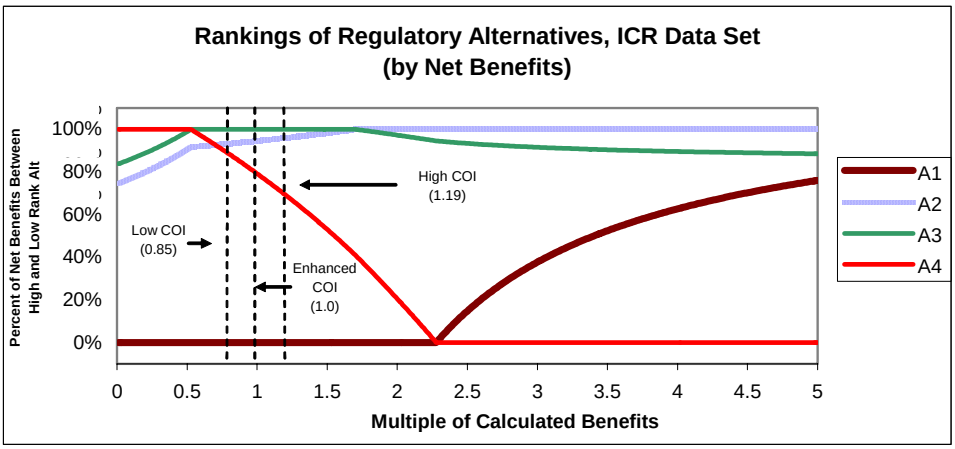
In Chapter 8, Exhibit 8.17 compares the range of costs for the mean benefit levels of each alternative. Below, Exhibits P.14a and P.14b repeat that exhibit, but adds two lines into each graph that reflect use of the Low and High COI values in the calculation of benefits. Note that the curves only shift horizontally relative to the curves derived from the Enhanced COI (that is, benefits change, but costs are constant in this sensitivity analysis). As a result, the conclusion for all three values for the COI is the same as for the Enhanced COI: all alternatives are cost-effective. No regulatory alternative provides more benefits at the same or lower cost than another, and no alternative can achieve lower costs for the same or greater level of benefits than another.

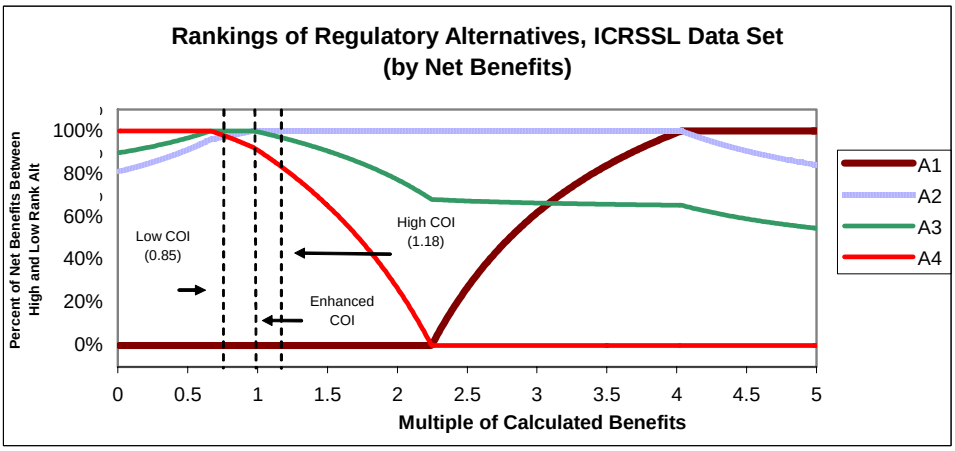
Cost Per Illness Avoided and Cost Per Death Avoided

Exhibit P.8 presents the COI avoided using three values for COI. These are in 2003$, are unadjusted for future real income growth, and are not weighted by when in time the illnesses are avoided. In Chapter 8, the Enhanced COI was compared against the values in Exhibit 8.18, which are the costs that each regulatory alternative imposes to avoid each illness. Similarly, we can compare the values in Exhibit 8.18 to the Low and High COI values.

In summary, the results when using the Low COI are exactly the same as when using the Enhanced COI: all alternatives pass this test, except when estimates for Alternative A1 are derived from distributions based on the ICRSSL data set. Comparing the values in Exhibit 8.17 against the High COI value of $1,071.81 shows that in only one case, A1 based on the ICRSSL distribution at a 3-percent discount rate, does the cost of avoiding an illness exceed the High COI value. Remember that this test is very conservative and counts both the illnesses and deaths avoided.

Exhibit P.12
Comparison of Regulatory Alternatives Ranked by Net Benefits, With Low, Enhanced, and High COI Values, 3 Percent Cost





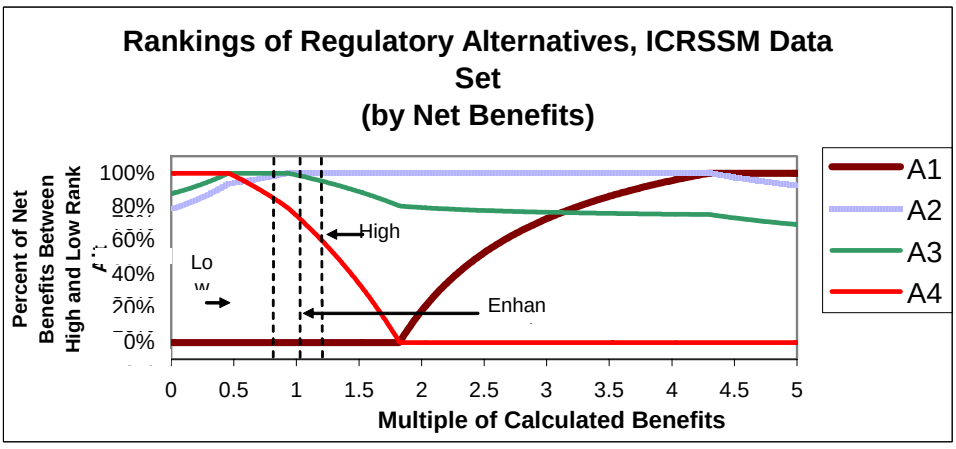
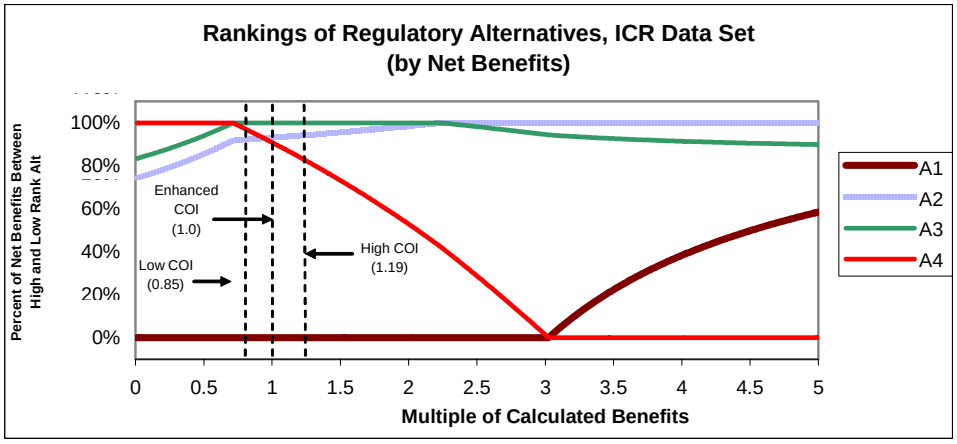
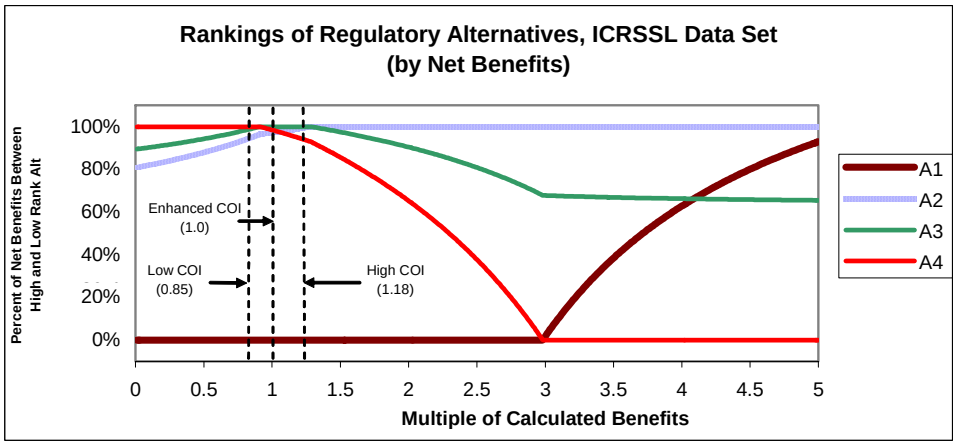


Exhibit P.13
Comparison of Regulatory Alternatives Ranked by Net Benefits, With Low, Enhanced, and High COI Values, 7 Percent Cost





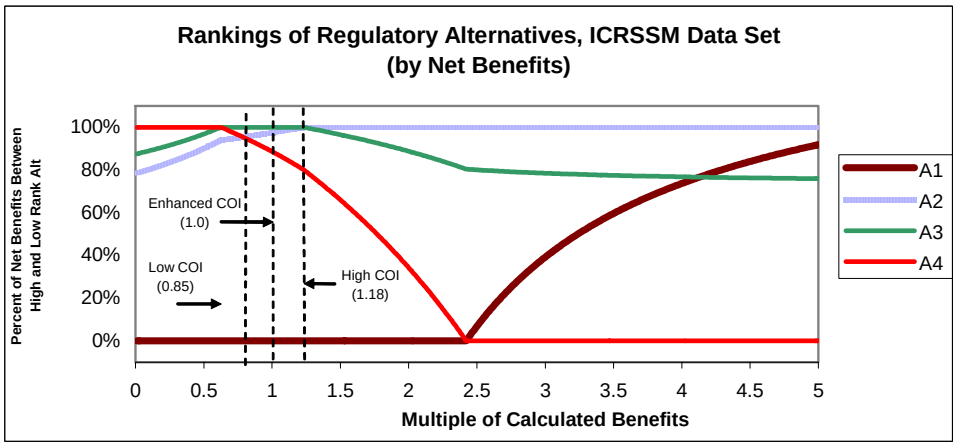


Exhibit P.14a: Range of Costs at Mean Benefit Level, By Low, Enhanced, and High COI Values, All Regulatory Alternatives

3 Percent Discount Rate

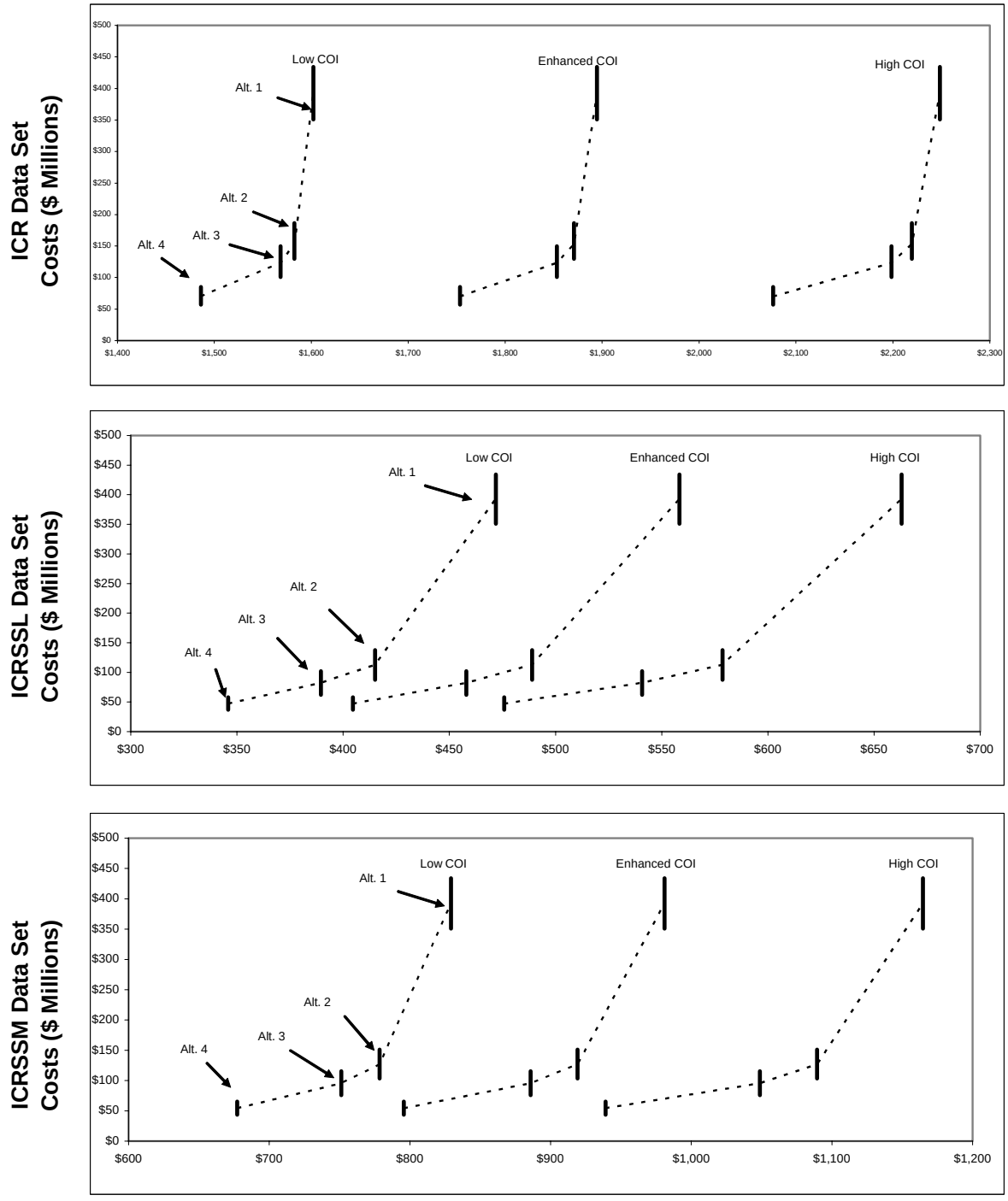
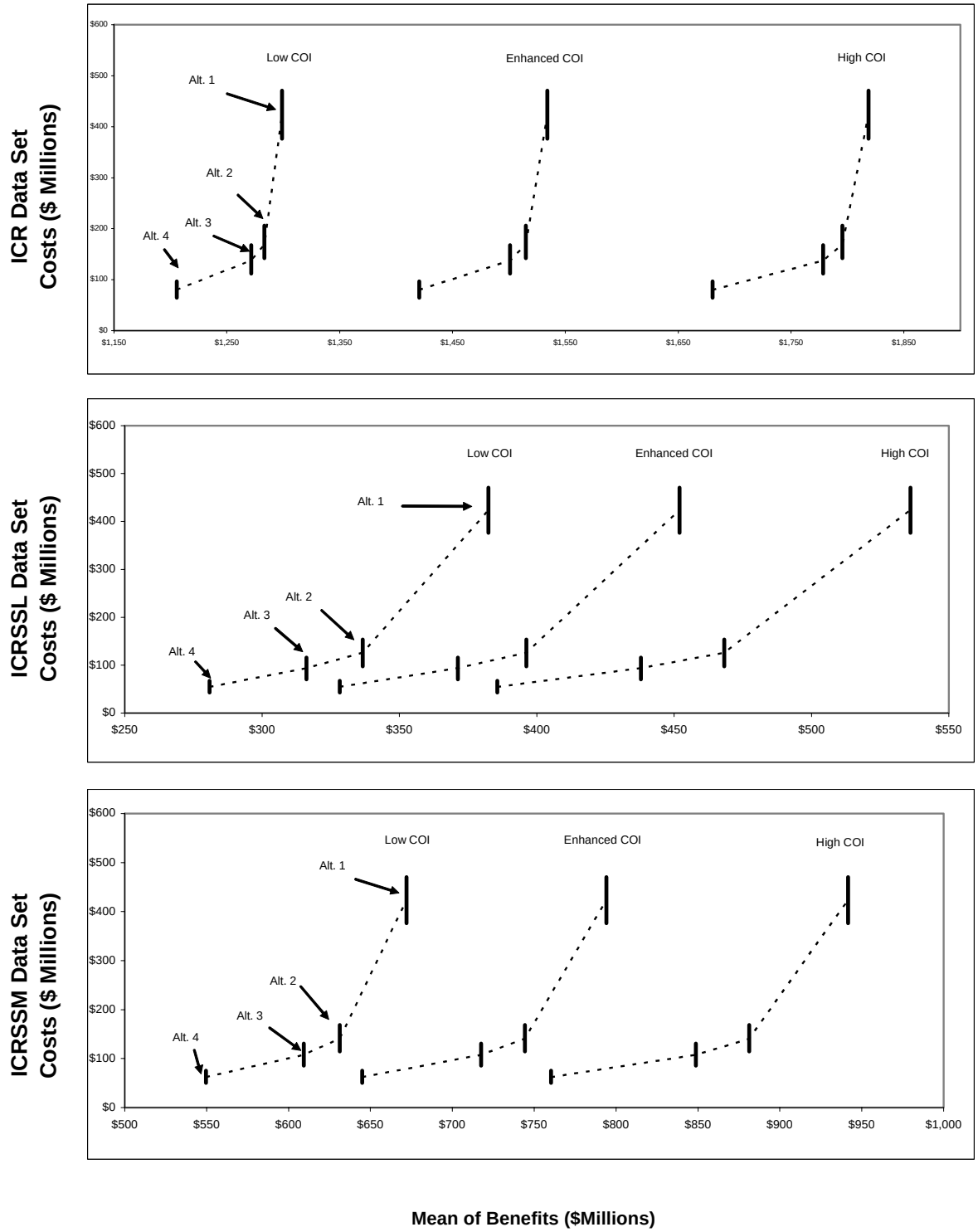


Exhibit P.14b: Range of Costs at Mean Benefit Level, By Low, Enhanced, and High COI Values, All Regulatory Alternatives

7 Percent Discount Rate



Summary of Sensitivity Analysis

The Preferred Alternative passes threshold economic criteria whether using the Low, Enhanced, or High Estimate for COI.

- The Preferred Alternative (A3) has positive net benefits (Exhibit P.10). (In fact, this is also true for Alternatives A2 and A4, and true for Alternative A1 under 11 of the 12 possible combinations of COI, data set, and discount rate.) Again, this conclusion is especially strong because the quantified benefit estimates are underestimated since they do not include the value of the unquantified benefits.

- The Preferred Alternative (A3) is cost-effective: no other alternative achieves greater net benefits at the same cost or the same benefits (this is true for all the alternatives) (Exhibit P.4).

- The Preferred Alternative (A3) is cost-effective based on comparing the cost of the rule to either the number of illnesses or deaths avoided (and this is still true for Alternatives 2 and 4).

The Preferred Alternative is the superior alternative across a wide variety of measures, including when considering alternative values for the COI.

- Under most conditions (in 7 of 12 combinations), the Preferred Alternative shows the highest net benefits at the mean (Exhibit P.6).

- The Preferred Alternative, and perhaps Alternative A2, appear to be especially good bargains. The other alternatives have either significantly fewer benefits for similar costs or greater benefits, but at dramatically higher costs (Exhibit P.4).

- In the analysis of incremental benefits, the Preferred Alternative bounds the optimal level of zero incremental net benefits (Exhibit P.11), in all six of the Low COI conditions and in three of the six High COI conditions. No other alternative has better performance across both the Low and High COI estimates.

The Preferred Alternative is the superior alternative when benefits are near the average values estimated, at levels near the benefits based on the Low COI, and at levels nearly as high as the High COI.

- The net benefits of the Preferred Alternative are most often highest near the mean value of benefits and over much of the range reflecting uncertainty in benefits estimates (Exhibits P.12 and P.13). Near the benefits levels corresponding to the Low COI, Alternative A4 under some conditions nears a break point relative to A3. Up to levels nearly as high as those corresponding to the High COI, A3 remains the highest ranked alternative.

This sensitivity analysis shows that the selection of the Preferred Alternative appears justified, even when alternative values for the COI are considered.

Exhibit Q.1: Flowchart of LT2 Cost Model

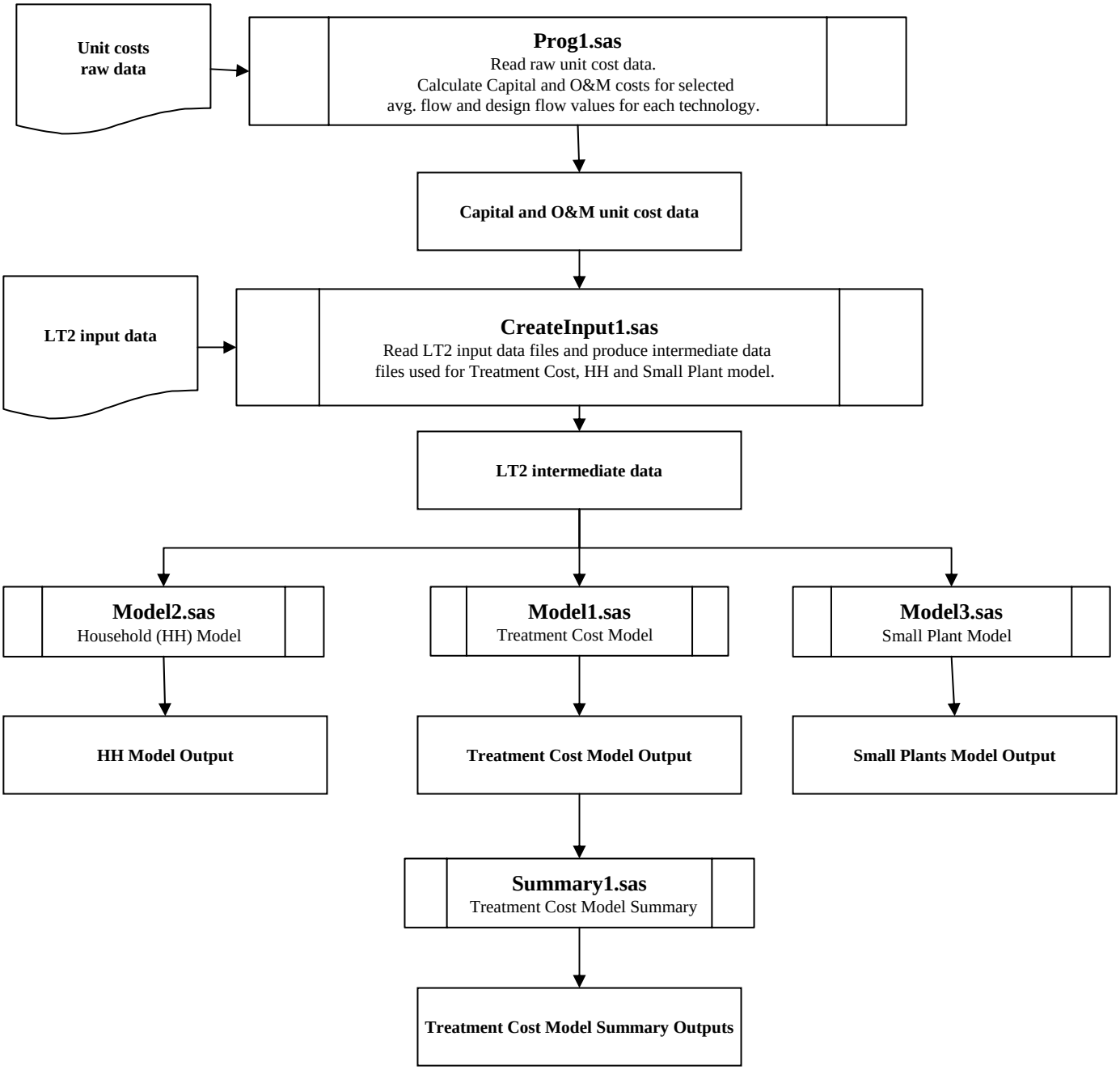


Exhibit Q.2a: Flowchart of prog1.sas

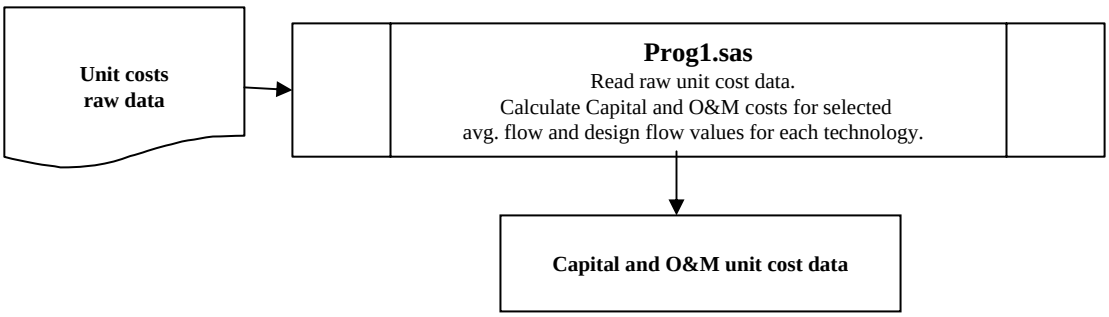


Exhibit Q.2b: Input/Output Files for prog1.sas

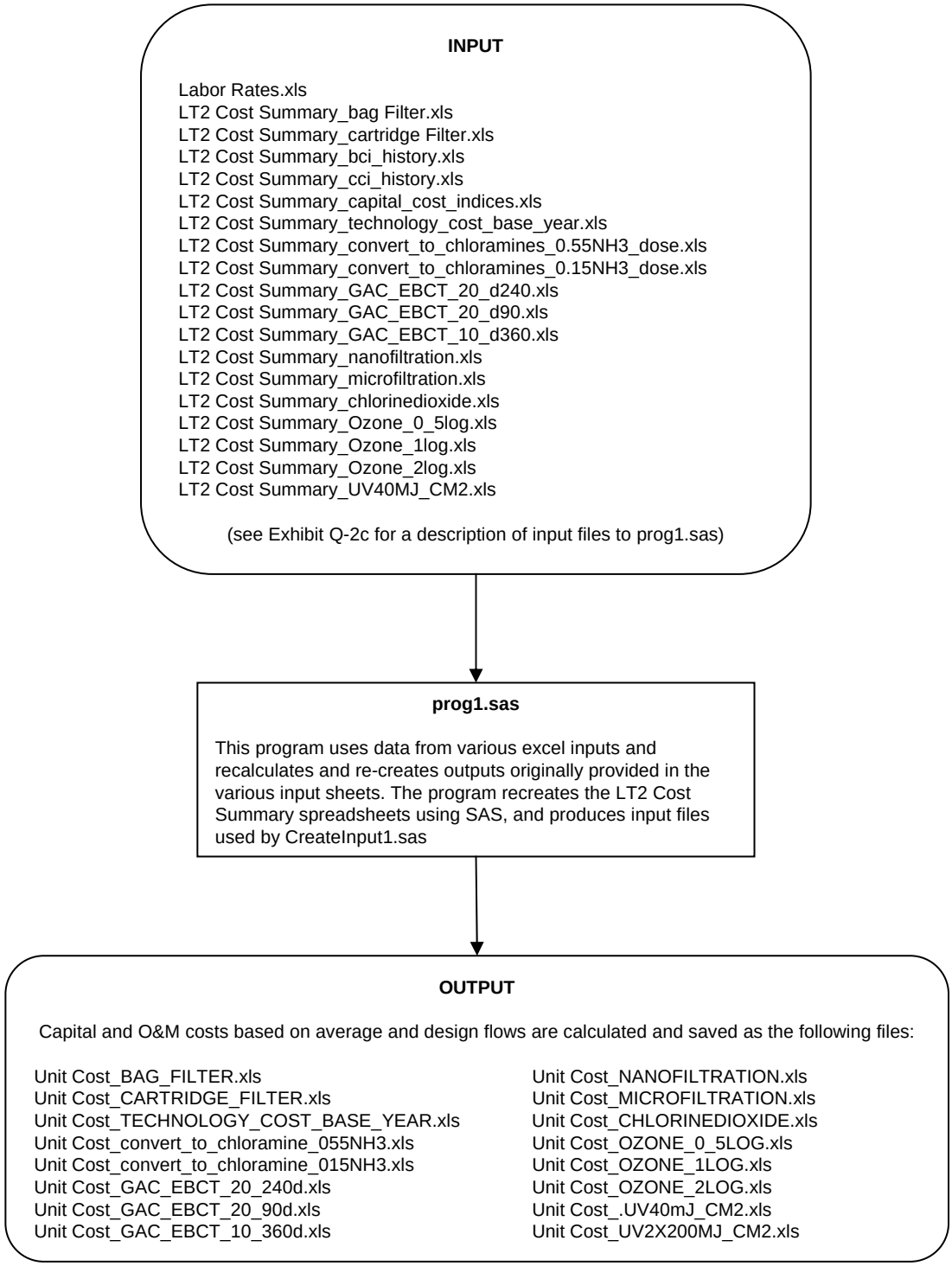


Exhibit Q.2c:
Description of Inputs to prog1.sas

Name of Input File	Description of Input File
Labor Rates.xls	Provides technical and managerial labor rates corresponding to average and design flow for the nine size categories.
LT2 Cost Summary_bag Filter.xls	Provides useful life and costs associated with bag filters corresponding to design and average flows.
LT2 Cost Summary_cartridge Filter.xls	Provides useful life and costs associated with cartridge filters corresponding to design and average flows.
LT2 Cost Summary_bci_history.xls	Provides monthly and annual BCI from 1915-2003.
LT2 Cost Summary_cci_history.xls	Provides monthly and annual CCI from 1915-2002. Only January CCI provided for 2003.
LT2 Cost Summary_capital_cost_indices.xls	Provides capital cost indices – month (annual), year (2003)
LT2 Cost Summary_technology_cost_base_year.xls	Provides month and year that costs were developed in for nine technologies
LT2 Cost Summary_convert_to_chloramines_0.55NH3_dose.xls	Provides useful life and equations to figure out system chemical feed and various costs based on parameter values and average and design flow provided in spreadsheet.
LT2 Cost Summary_convert_to_chloramines_0.15NH3_dose.xls	Provides useful life and equations to figure out system chemical feed and various costs based on parameter values and average and design flow provided in spreadsheet.
LT2 Cost Summary_GAC_EBCT_20_d240.xls	Provides useful life, operator training, and number of GAC contactors in use corresponding to average and design flow.
LT2 Cost Summary_GAC_EBCT_20_d90.xls	Provides useful life, operator training, and number of GAC contactors in use corresponding to average and design flow.
LT2 Cost Summary_GAC_EBCT_10_d360.xls	Provides useful life, operator training, and number of GAC contactors in use corresponding to average and design flow.
LT2 Cost Summary_nanofiltration.xls	Provides useful life and various parameter values corresponding to average and design flow.
LT2 Cost Summary_microfiltration.xls	Provides useful life and various parameter values corresponding to average and design flow.
LT2 Cost Summary_chlorinedioxide.xls	Provides useful life and various parameter values corresponding to average and design flow.
LT2 Cost Summary_Ozone_0_5log.xls	Provides average and maximum dose transferred, useful life, and various parameter values corresponding to average and design flow.
LT2 Cost Summary_Ozone_1log.xls	Provides average and maximum dose transferred, useful life, and various parameter values corresponding to average and design flow.
LT2 Cost Summary_Ozone_2log.xls	Provides average and maximum dose transferred, useful life, and various parameter values corresponding to average and design flow.
LT2 Cost Summary_UV40MJ_CM2.xls	Provides number and size of reactors, and equations to figure out number of reactors, footprint, electrical costs, and various other costs based on parameter values and average and design flow provided in spreadsheet.

Exhibit Q.3a:
Flow Chart of CreateInput1.sas

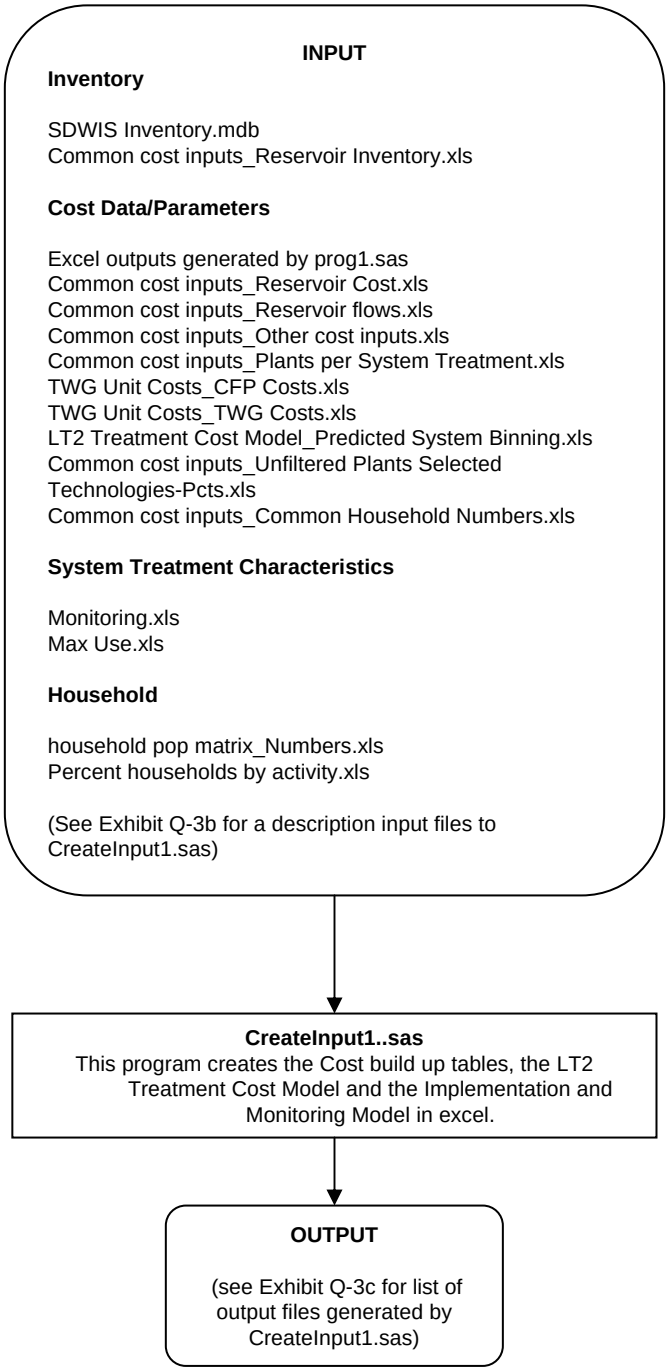


Exhibit Q.3b:
Description of Inputs to Create Input1.sas

Name of Input File	Description of Input File
Inventory	
SDWIS Inventory.mdb	Access DB providing system and population inventory, size categories, sellers with linked populations, purchasers with largest end seller, and purchasers to link to sellers.
Common cost inputs_Reservoir Inventory.xls	Provides PWSID, utility name, suface area, average depth, volume for utilities in: CA, NY MD, WA, PR, OR, and NJ.
Cost Data/Parameters	
Excel outputs generated by prog1.sas	See Exhibit Q-1a
Common cost inputs_Reservoir Cost.xls	Provides size, capital and O&M cost for chlorine, and size and capital costs for covers.
Common cost inputs_Reservoir flows.xls	Provides costs for RS1-RS14 for design and average flows.
Common cost inputs_Other cost inputs.xls	Provides value of value, source, and spreadsheet source for labor rates, projection period, bounds on capital and O&M costs, people per household, and discount rates.
Common cost inputs_Plants per System Treatment.xls	Provides LT2 and Stage 2 plants per system for filtered and unfiltered CWS, TNCWS, and NTNCWS for the nine system categories.
TWG Unit Costs_CFP Costs.xls	Provides capital and O&M costs for combined filter performance for the nine size categories.
TWG Unit Costs_TWG Costs.xls	Provides capital and O&M costs for secondary filters, in-bank filtration, and watershed control corresponding to average and design flow.
LT2 Treatment Cost Model_Predicted System Binning.xls	Provides system binning results for 0.5-2.5 log removal for options A1-A4, ICR, ICRSSM, and ICRSSL.
Common cost inputs_Unfiltered Plants Selected Technologies-Pcts.xls	Provides technology selection for unfiltered systems.
Common cost inputs_Common Household Numbers.xls	Provides public and private discount rates, and household usage rates for CWSs in the nine system size categories.
System Treatment Characteristics	
Monitoring.xls	Provides implementation, monitoring, and benchmarking costs for CWS, TNCWS, and NTNCWS, all occurrence distributions and regulatory alternatives, and for both UV90-10 and UV90-10B sensitivities.
Max Use.xls	Provides log credit and maximum use percentage for various technologies for the nine size categories.
Household	
household pop matrix_Numbers.xls	Query of CWS Retail Population by Linked Population, from SDWIS 2003 inventory.mdb. Provides population for filtered and unfiltered systems in the 9 population categories.
Percent households by activity.xls	Provides percent of total households by activity: implementation, monitoring, and benchmarking. This is provided for CWSs, all occurrence distributions, for the preferred alternative, and for both UV90-10 and UV90-10B sensitivities.

Exhibit Q.3c:
Description of Outputs generated by CreateInput1.sas

Name of Output File	Description of Output File
Plant Information	
Filtered	
No_of_Plants_by_Tech - Filtered.xls	Provides the number of filtered plants by technology and credit for both sensitivities and all occurrence distributions, alternatives, for CWSs, NTNCWSs, and TNCWSs.
Unfiltered	
LT2 Treatment Cost Model_Unfiltered Cost.xls	Costs for public and private plants by the nine population categories.
No_of_Plants_by_Tech - Unfiltered.xls	Technology Forecast for Unfiltered - Provides the number of unfiltered plants by size category complying with O3 - 2log and UV - 3log
Compliance Forecast	
LT2 Treatment Cost Model_Compliance Forecast.xls	Provides number of CWS, NTNCWS, and TNCWS plants for the nine population categories.
Binning	
LT2 Treatment Cost Model_PercentPlantsSelectTechs.xls	For the nine population categories - percent of plants from CWSs selecting various technologies, and percent of plants in 2-log bin and 3-log bin.
Binning and Technology Selection_Relative Cost.xls	Provides relative cost, log credit, maximum use percentage, treatment bin, percent selecting, and cumulative sum for CWSs receiving credit/not receiving credit in the nine population categories, for various technologies and both sensitivities.
Discount Rates	
LT2 Treatment Cost Model_Small Plant Discount Rates.xls	Provides plants per system and weighted discount rates for CWS, NTNCWS, and TNCWS for the nine population categories.

Exhibit Q.3c: (cont'd)
Description of Outputs generated by CreateInput1.sas

Name of Output File	Description of Output File
System Information	
LT2 Treatment Cost Model_Uncovered Reservoirs.xls	Provides number of reservoirs, capital and O&M costs for cover, Cl2, UV for the nine population categories.
LT2 Treatment Cost Model_Predicted System Binning.xls	Provides predicted percent of systems receiving 0.5-2.5 log removal for all source water distributions and alternatives.
Baseline	
popsum_Treatment Baseline.xls	Provides percent with membranes before and after Stage 2, and for LT2, the number of plants per system, number of systems, population, number of plants, population per plant, number of households, and average and design flows per system and per plant. This is provided for filtered and unfiltered CWS, NTNCWS, TNCWS, for the nine population categories.
popsum_Household Cost Baseline.xls	Provides percent with membranes before and after Stage 2, and for LT2, the number of plants per system, number of systems, population, number of plants, population per plant, number of households, and average and design flows per system and per plant. This is provided for filtered and unfiltered, public and private, CWS, NTNCWS, TNCWS, for the nine population categories.
popsum_Imp and Monitoring Baseline.xls	Provides percent with membranes before and after Stage 2, and for LT2, the number of plants per system, number of systems pre-Stage 2, population, number of households. This is provided for filtered and unfiltered, CWS, NTNCWS, TNCWS, for the nine population categories.

Exhibit Q.3c: (cont'd)
Description of Outputs generated by CreateInput1.sas

Name of Output File	Description of Output File
Unit Costs	
LT2 Treatment Cost Model_Unit Costs-CWS.xls	Provides capital and O&M costs for CWSs for a number of technologies for the nine population categories.
LT2 Treatment Cost Model_Unit Costs-NTNCWS.xls	Provides capital and O&M costs for NTNCWSs for a number of technologies for the nine population categories.
LT2 Treatment Cost Model_Unit Costs-TNCWS.xls	Provides capital and O&M costs for TNCWSs for a number of technologies for the nine population categories.
LT2 Treatment Cost Model_Unit Costs Unfiltered-CWS.xls	Provides capital and O&M costs for O3 2-log and UV 3-log CWSs by the nine population categories.
Households and Household Costs	
Filtered	
LT2 Treatment Cost Model_Household Affected - Filtered.xls	Provides number of HH receiving filtered water per category and per plant for the different occurrence distributions for the nine population categories. Number of HH affected are provided for the different technologies, and the number of HH unaffected is also provided.
LT2 Treatment Cost Model_Household Costs - Filtered.xls	Provides average daily flow, discount rate, and household usage rate for various technologies used by public and private systems, filtered, sorted by the nine population categories.
Unfiltered	
LT2 Treatment Cost Model_Household Affected - Unfiltered.xls	Provides number of HH receiving unfiltered water per category and per plant for the different occurrence distributions for the nine population categories. Number of HH affected are provided for the different technologies, and the number of HH unaffected is also provided.
LT2 Treatment Cost Model_Household Costs - Unfiltered.xls	Provides average daily flow, discount rate, and household usage rate for O3 2-log removal and UV 3-log removal used by public and private systems, unfiltered, sorted by the nine population categories.
Filtered & Unfiltered	
Household linking exercise_Unlinked HHs from Linked Pcts.xls	Number of households served by filtered and unfilted systems, by the nine population categories.
Annualized Costs	
LT2 Treatment Cost Model_Household Costs Uncovered Res.xls	Provides annualized costs by household, by system, total annualized costs, total number of households, number of plants per system, for CWSs, for the nine population categories.
LT2 Implementation and Monitoring Model_Tech Rep & Benchmarking.xls	Provides percent of total households, annualized cost per household, and annualized cost per system for benchmarking and technology reporting for CWSs, all occurrence distributions, UV90-10 sensitivity, preferred alternative for the nine population categories.
LT2 Implementation and Monitoring Model_Imp & Monitoring HH Costs.xls	Provides percent of total households, annualized cost per household, and annualized cost per system for e-coli and crypto monitoring for CWSs, all occurrence distributions, UV90-10 sensitivity, preferred alternative for the nine population categories.

Exhibit Q.4: Flowchart of Model 1.sas (Treatment Cost Model)

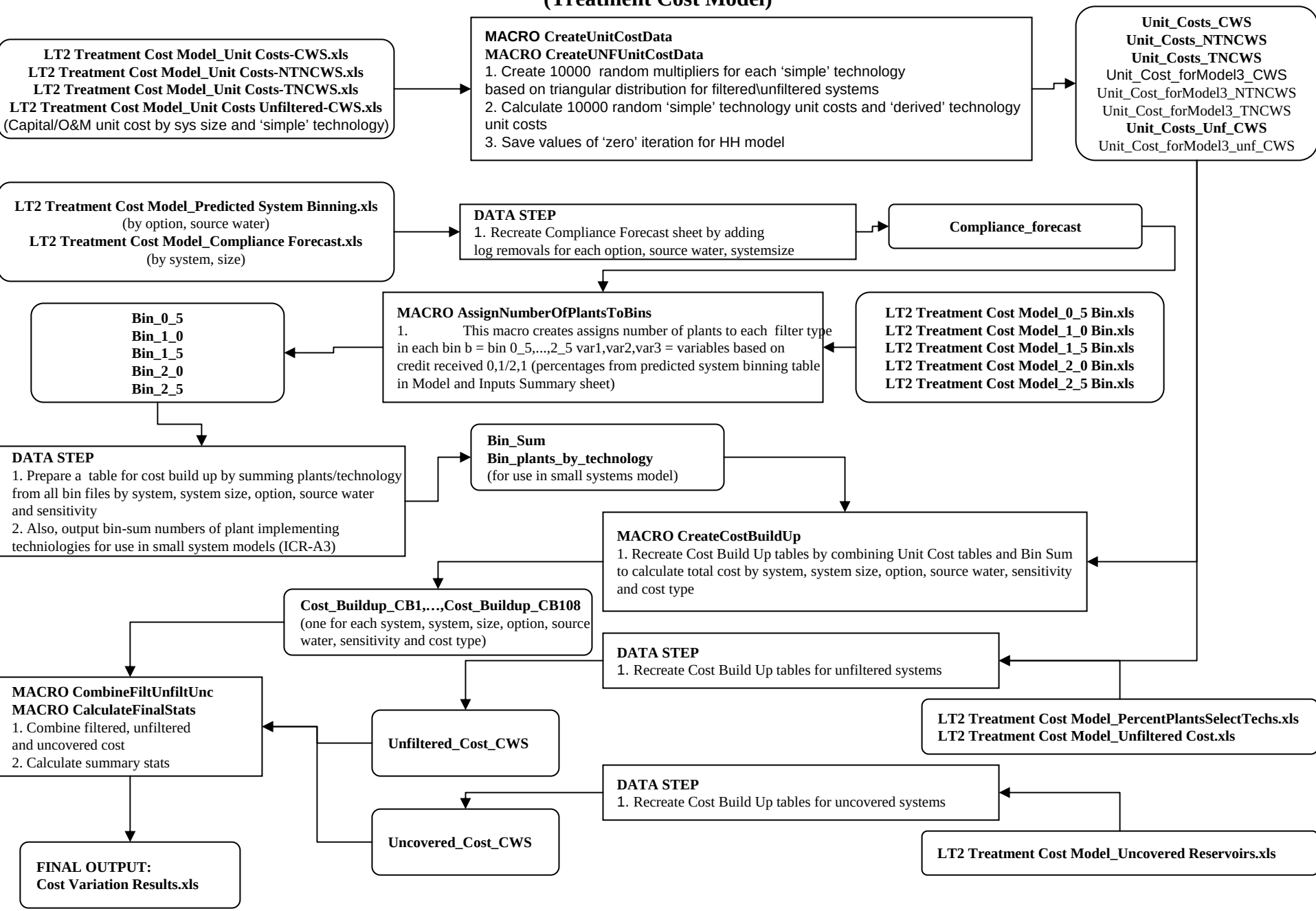


Exhibit Q.5: Flowchart of Model 2.sas (Household Model)

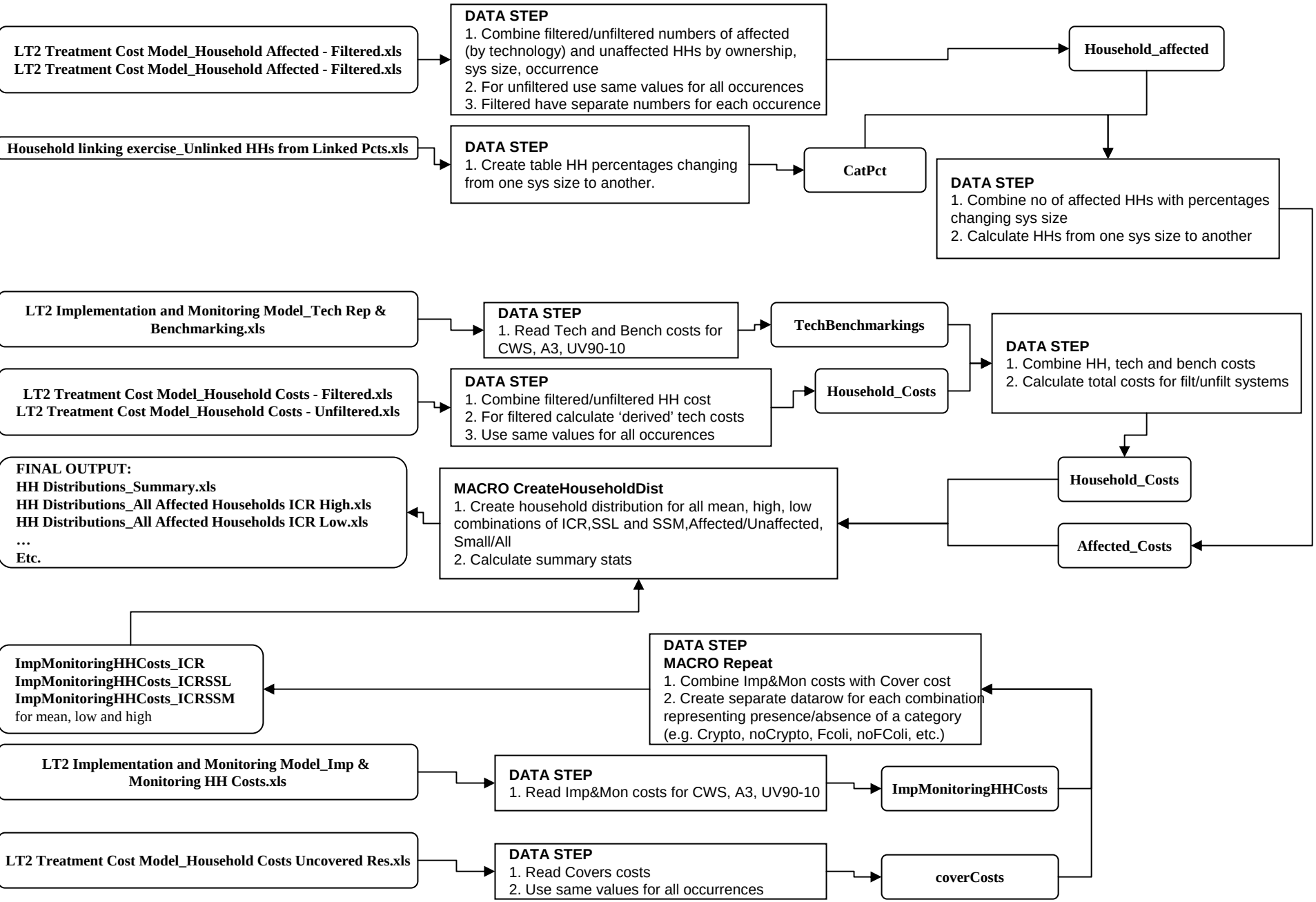


Exhibit Q.6: Flowchart of Model 3.sas (Small Plant Model)

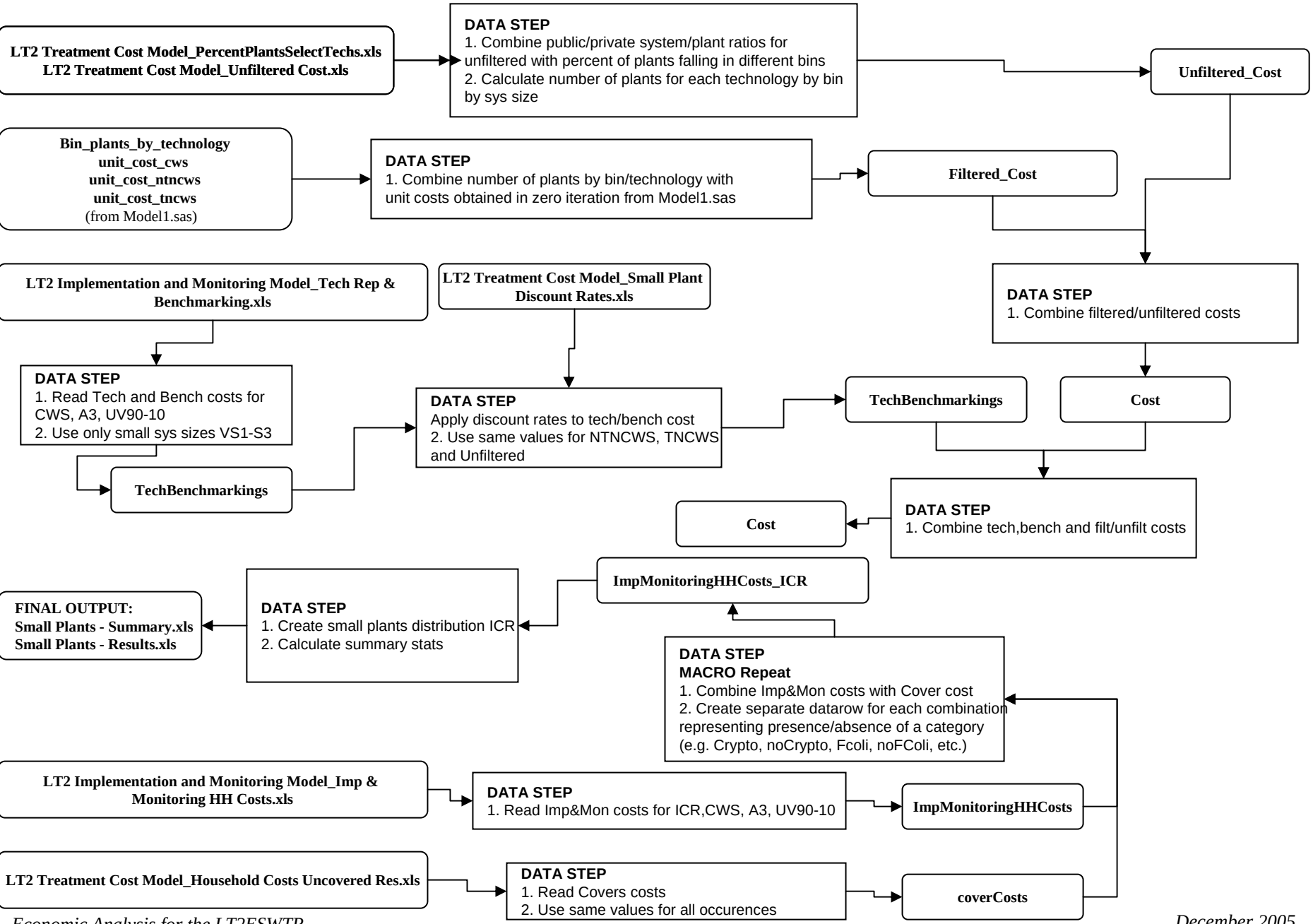
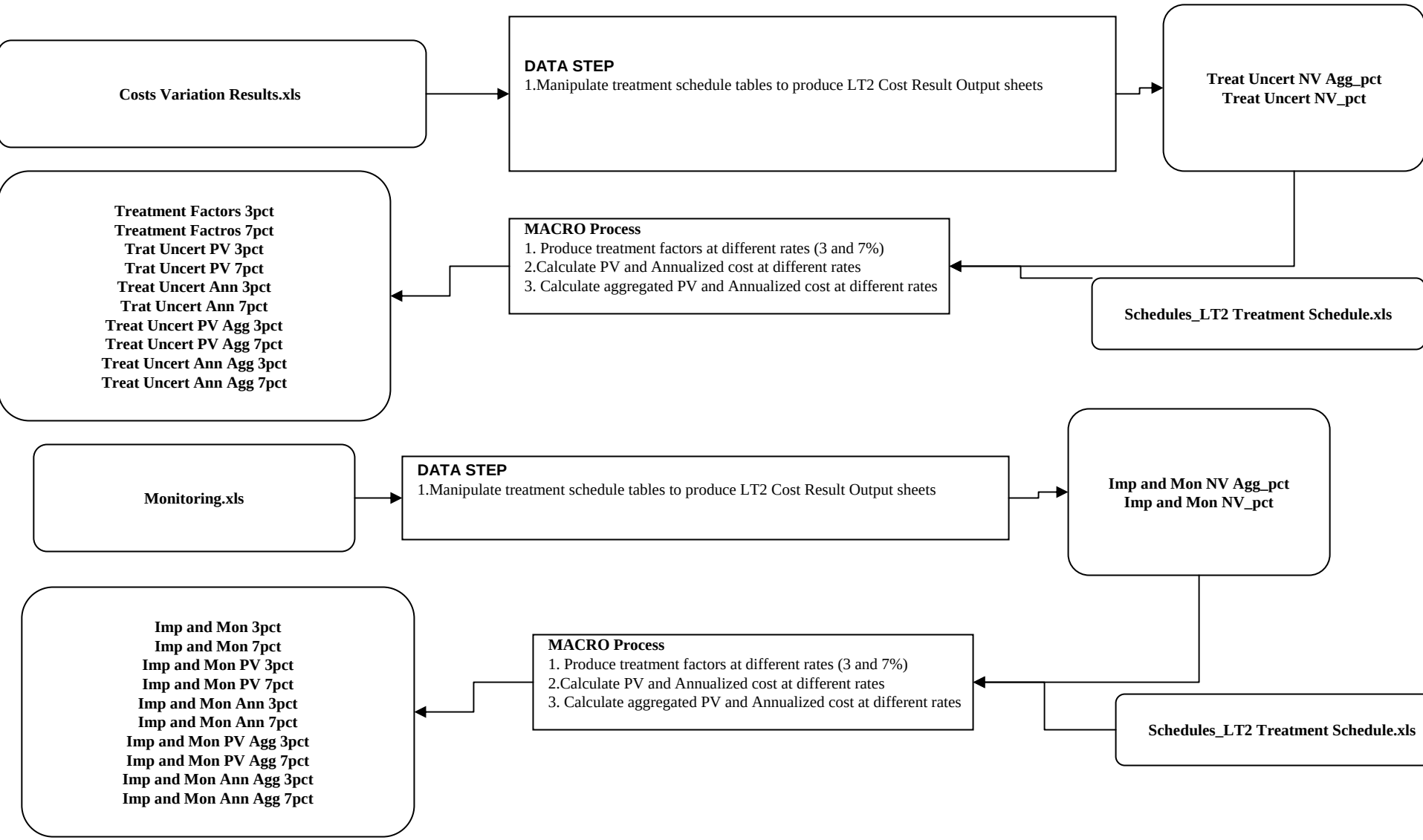


Exhibit Q.7: Flowchart of Summary1.sas



Appendix R
Sensitivity Analysis for AIDS-Related Mortality Rate

R.1 Introduction and Summary

A key input to the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) risk assessment model is the rate of mortality associated with cryptosporidiosis. This is discussed in section 5.2.3 (Dose Response Assessment). The mortality rate as used in this analysis is, given a case of cryptosporidiosis, the probability of a fatality from that illness. As discussed in section 5.2.3, the risk assessment model uses different mortality rates for those with AIDS and the general populations.

Cryptosporidiosis is considered nonfatal in healthy adults, so the mortality rate in the general, non-AIDS, population represents deaths for those with other conditions or diseases that hinder recovery from cryptosporidiosis. The mortality rate used for the general population is the mortality rate associated with the 1993 Milwaukee *Cryptosporidium* outbreak for those without AIDS. This rate is used as an estimate of the mortality rate for future cryptosporidiosis cases because no significant treatments that would likely lessen mortality have been developed since 1993.

Data from the 1993 Milwaukee cryptosporidiosis outbreak are also used to develop the mortality rate for people with AIDS. However, for those with AIDS, new treatments have become available since the Milwaukee outbreak that greatly prolong life. As a result of the advent of highly active anti-retroviral therapy (HAART) in 1995, the rate of death for those with AIDS from all causes has declined dramatically. The Dose-Response Assessment includes a factor to reflect the apparent lessened mortality among persons with AIDS. Data from the Centers for Disease Control and Prevention (CDC) for 1993 and 2001[1] suggest that, among those with AIDS, the death rate for all reasons in 2001 was only 18.4 percent of the rate in 1993, the year of the Milwaukee outbreak. To reflect the probable improved ability of those with AIDS to survive cryptosporidiosis, the mortality rate for those with AIDS during the Milwaukee outbreak was adjusted by this factor and applied to each year of the 25-year analysis without change (that is, without allowing for further changes in mortality rates). This no-trend approach is considered a reasonable best estimate, given the difficulty of predicting future trends in AIDS-related mortality, including the lack of cryptosporidiosis-specific information.

This appendix presents the latest AIDS-related mortality data available from the CDC, summarizes the history of AIDS-related mortality, provides information regarding the factors that may affect future AIDS-related mortality. It also discusses the potential impact on the LT2ESWTR benefits analysis results of using other mortality rates (arbitrarily bounded) to reflect at least some of the range of possible values that could occur in future years. However, it does not discuss other related assumptions, such as the constant ratio of persons living with AIDS to the general population used in the model and the mortality rates for the general population.

The review of the confounding factors that influence the future mortality of those with AIDS gave no definite direction of future change (that the rate will definitely increase or definitely decrease).

[1] The 2001 estimate of deaths of persons with AIDS and the population of persons living with AIDS used in this EA are from the 2002 HIV/AIDS Surveillance Report "Cases of HIV Infections and AIDS in the United States" (Vol. 14).

The bounding analysis, presented below in section R.5, assessed the impact on LT2ESWTR benefits due to the AIDS-related mortality rate either increasing or decreasing. This analysis was done by arbitrarily doubling and halving the 2001 rate used in the economic analysis (EA) and, as in the EA analysis, assuming a constant mortality rate over the period of the analysis.

The results of the bounding analysis indicate that using the ICR data set at a 3 percent discount rate and an ECOI, either doubling or halving the AIDS-related mortality rate would result in mean total benefits 52 percent higher or 28 percent lower (respectively), and imply no change in the conclusion of the EA or selection of the Preferred Alternative. The result of using the ICRSSL data set at a 7 percent discount rate and a TCOI would result in benefits 74 percent higher or 39 percent lower (respectively). In this case, the Preferred Alternative runs a close second to Alternative 2 (if the AIDS mortality rate is doubled) or Alternative 4 (if the rate is halved). In summary, given the likelihood that increases in the AIDS mortality rate are at least as likely as decreases, and that unquantified benefits exist, the conclusions of the EA and the selection of the Preferred Alternative are not challenged.

R.2 Latest CDC Data and Their Impact on the AIDS Mortality Adjustment Factor

The adjustment factor for AIDS-related mortality used in the dose response assessment is computed from both death and population data. The AIDS-related mortality data currently available include estimates from both 2001 and 2002. Although CDC has tried to adjust the initial 2002 estimate for potential delays in reporting, CDC has commonly revised estimates higher in subsequent years (for example, revised data for 1999 increased by 50 percent). Second, the 2001 data more closely match the 2000 Census data used in the mortality rate calculations. The EA uses 2001 data on the number of AIDS deaths as cited in CDC's 2002 HIV/AIDS Surveillance Report "Cases of HIV Infections and AIDS in the United States". Using the CDC's estimate for 2002 would reduce the AIDS-related mortality rate by 2.2 percent but would not have changed the conclusions of the EA or the selection of the Preferred Alternative.

Exhibit R.1: Mortality Rate Factors Using Latest CDC Data

	1991	2001	2002
AIDS Deaths	45,733	17,402	16,371
Persons Living with AIDS	173,772	359,141	384,906
Mortality Rate (per 100,000)	26,318	4,845	4,253
Mortality Rate as a Percent of 1993		18.4%	16.2%

Source: CDC's Cases of HIV Infections and AIDS in the United States.
2001 and 2002: HIV/AIDS Surveillance Report, Vol. 14
1991: From 2001 end-of-year HIV/AIDS Surveillance Report, Vol. 13, No. 2

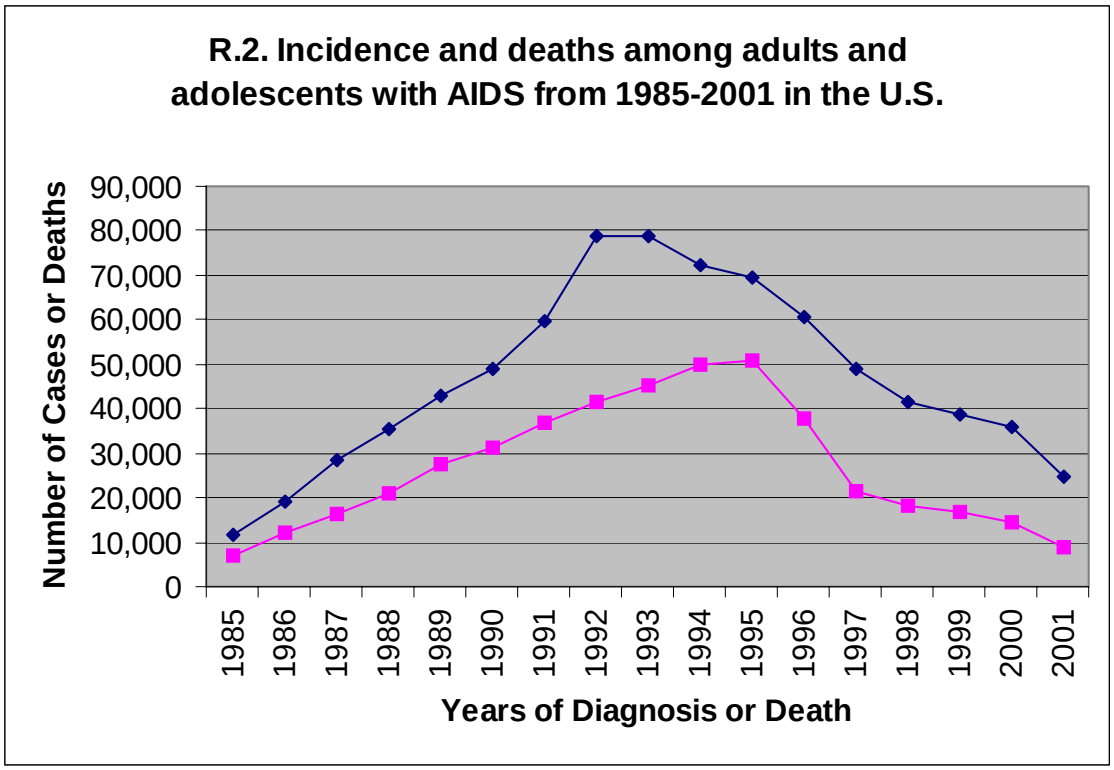
R.3 History of AIDS-Related Mortality Rates

Over roughly the past decade, the AIDS-related mortality rate has been declining. This decline has resulted from both a decrease in the number of AIDS-related deaths and an increase in the number of people living with AIDS. However, the decline in AIDS-related deaths has slowed in recent years.

Decline in AIDS-Related Deaths Due to Use of HAART

Data show that AIDS-related deaths declined as people with AIDS began using HAART, which became available in 1995 and appears to be successful in significantly prolonging the lives of persons with AIDS. Since the introduction of HAART, treatment has become available to almost all people in the United States with known cases of AIDS (Boyle 2002). The result, at least in the short term, is a reduction in the numbers of deaths of persons with AIDS (Exhibit R.2). With the availability of the treatment now nearly universal in the United States, the reduction in the number of deaths is slowing after the steep declines seen in 1996 and the first half of 1997. This observation derives from Karon et al. (2001), who adjusted their data for delayed reporting and characterized the quarterly mortality rate during 1998 and 1999 as "approximately constant." (Their study did not include 2000-2002 data.)

Exhibit R.2: Incidence and Deaths Among Adults and Adolescents in the United States with AIDS, 1985-2001



Source: CDC HIV/AIDS Surveillance Report 2001 (Vol. 13, No. 2, Table 21)

The initial estimates for 2002 appear to show a continued slight decline. However, in previous reports from the CDC (HIV/AIDS Surveillance Reports), early results have been revised upward in later reports as additional data became available. Whether the number of deaths has continued its slight decline or leveled off cannot be determined reliably from the available data.

Declining New AIDS Cases; Increases in Number of People Living With AIDS

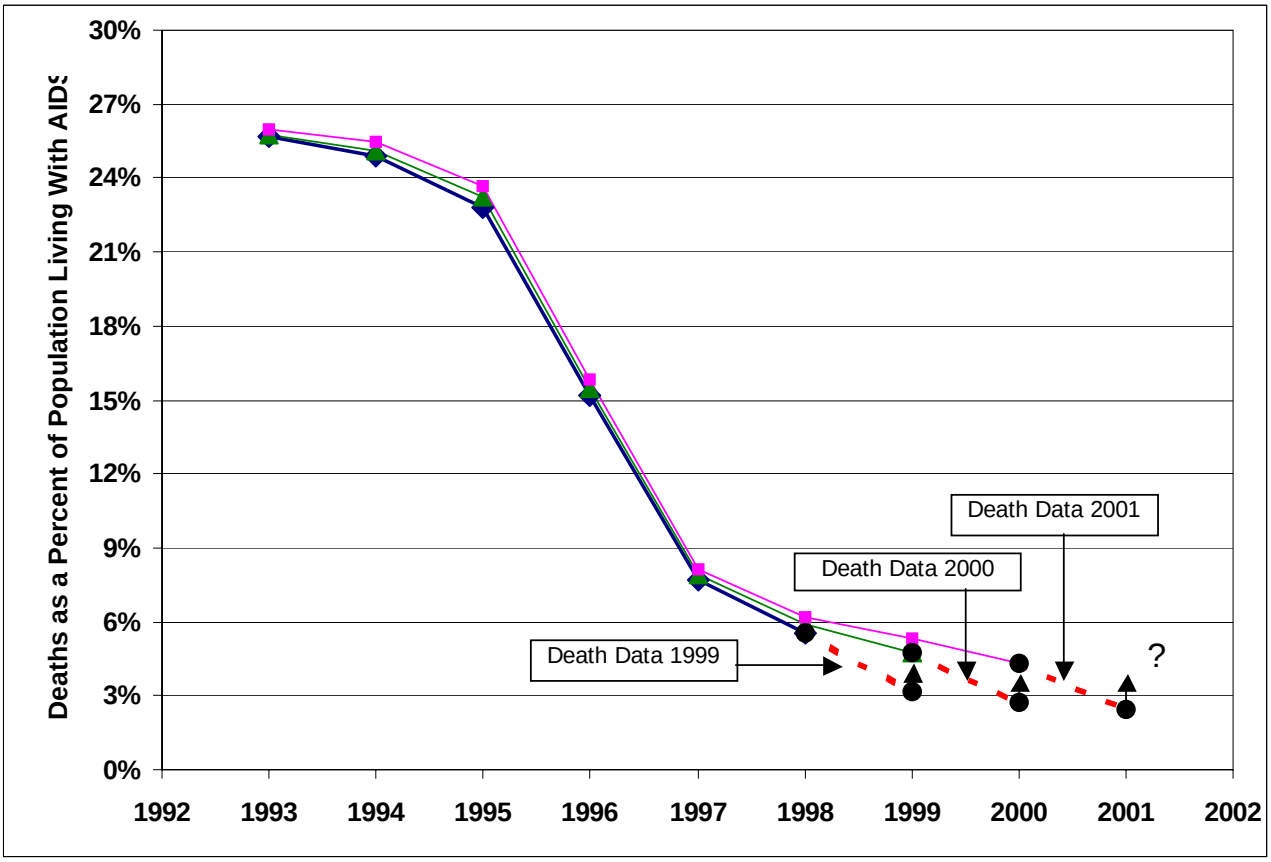
In addition to the decline in AIDS-related deaths, new cases of AIDS also declined because of HIV treatments; but more people are living with AIDS. Exhibit R.2 shows the trend in new cases (incidence) of AIDS being reported. The number of new cases is most directly affected by the effectiveness of treatments, including HAART, that prevent the shift from HIV infection to clinical cases of AIDS. Those declines have also leveled off and there appears to be only a 2-3 percent decline from 1998 to 1999. CDC characterizes the trend in the number of new AIDS cases as appearing "to be leveling" (http://www.cdc.gov/nchstp/od/news/At-a-Glance.pdf) and Karon et al. (2001) described it as "relatively constant."

The population of persons living with AIDS has continued to grow as new cases are identified and fewer people die from the disease and its complications. The annual increase from 2000 to 2001 was 7 percent and the total number of persons living with AIDS is estimated at 359,316 in 2001 (CDC, 2002).

Overall Effect on AIDS Mortality Rates

Data show that the overall AIDS mortality rate continues to decline, but that the decline has slowed (Exhibit R.3). The mortality rates used in the EA benefits model are computed from both death and population data. Because the underlying data on deaths have been revised in the end-of-year Surveillance Reports, the mortality rates based on these data are also shown. However, because the 2002 estimate will likely be revised in subsequent years, the apparent drop in AIDS mortality from 2001 to 2002 may be less indicative of the historical trend than the differences between the revised data for 2000 and 2001.

Exhibit R.3: AIDS-Related Death Rates, 1993 to 2001



Source: Derived from CDC end-of-year HIV/AIDS Surveillance Reports for 1999-2001 (data on deaths), and the supplement to the 1999 report (data on persons living with AIDS).

R.4 Factors Affecting Mortality in the Future

Statistical Shift Over Time

Several factors affect the mortality rate of persons with AIDS. One (identified earlier) is that life-prolonging treatments are widely available and used. However, the rapid decline in mortality rates that accompanied their introduction may be temporary. HAART is not considered a cure for AIDS. If the only effect is increased longevity, but with a similar pattern of eventual disease, those who are now less susceptible would become susceptible again in the future. In such a case, the mortality rate could conceivably climb to near historical levels. The reason it would be unlikely to fully reach historical levels is that the longer the increased longevity, the more likely it is that deaths would occur for reasons other than AIDS. This reasoning suggests that, with all other influences equal (which they are not), the mortality rate would lessen for a period roughly corresponding to increased longevity, then increase to some new level. Many other factors are also important, however.

Drug Resistance

History supports a view that infectious disease mortality initially drops considerably upon the introduction of successful treatment, but after a lag the mortality rate stabilizes or slightly increases as drug resistance and other factors counteract the benefit of treatment. The treatment of tuberculosis (TB) after World War II with streptomycin had immediate success, but within a few months drug resistance began to show. Physicians were able to develop additional antibiotics, and TB was treated using a multiple drug regimen (NJMS 1996). The mortality rate for tuberculosis in industrialized countries had been declining slowly until the mid-1980s, when the mortality rate stabilized and more recently has increased slightly (NJMS 1996). Some similar patterns are beginning to be identified with AIDS.

Drug resistance to AIDS therapies is, in fact, increasing. If a patient develops a drug-resistant strain of HIV, treatment becomes difficult. If new regimens cannot be developed for this individual, the disease will proceed as it did prior to treatment, and result in AIDS-related death. Forty-nine percent of individuals with HIV have drug-resistant strains (Brown 2001). Among those HIV individuals who have not started treatment, 20 percent have a strain resistant to at least one drug, an increase from 3 to 5 percent of new cases several years ago (Brown 2001). Because the therapies for HIV and AIDS are essentially the same, this suggests that those who progress from HIV to AIDS are increasingly likely to have drug-resistant strains. As the proportion of persons with drug-resistant strains increases within the population of those living with AIDS, this would be an upward influence on the AIDS mortality rate.

Side Effects Leading to Cessation of Treatment

Another factor that may affect mortality is the cessation of therapy due to intolerable side effects. Over time, the side effects from drug therapy (such as diarrhea, peripheral neuropathy, severe rash, jaundice, pancreatitis, kidney stones, and others) become too painful or uncomfortable for many people to bear (Highleyman 2000, NYSDHAI 2002, Griffiths 2002). The number of patients that will drop treatment in the coming years due to side effects is therefore likely to increase (NYSDHAI 2002). Studies show that relapse is rapid after cessation of therapy; among those tested who had no detectable virus in their system, the time to relapse to pre-treatment levels of virus in the blood ranged from 4 to 31 days, with most relapsing within 2 to 3 weeks after ceasing therapy (Marble 2000, Medscape 2002). Even for those patients who had been treated for over 2 years, relapse occurred promptly after cessation of therapy (Medscape 2002). If a treatment regimen cannot be developed that reduces side effects to

tolerable levels, some patients will likely quit treatment, and their mortality rate from various sources, including cryptosporidiosis, would increase. Over time, as more people with AIDS develop these intolerable side effects and cease treatment, the overall AIDS mortality rate would also increase.

Mortality from Side Effects

The previous factors that may affect mortality would increase the mortality rate, and are assumed to have a parallel effect on deaths from cryptosporidiosis in persons with AIDS. There is one factor, however, that may increase mortality among persons with AIDS, but not the mortality from cryptosporidiosis. Among the side effects of HAART are fat redistribution, elevated triglycerides, and potential insulin resistance (Louie et al. 2002, Highleyman 2000). These side effects may increase cardiovascular morbidity, and thus the mortality rate among AIDS patients may rise in the future even with successful therapy. However, mortality from non-AIDS or immunological difficulties would not be considered relevant to a mortality rate due to infection by *Cryptosporidium*.

New Therapies

New therapies for persons with AIDS may be developed sometime before 2029 (the extent of the period of analysis in this EA). Therapies that extend life would create a new statistical time shift similar to that which occurred in 1996 and 1997, as described at the beginning of R.4. These therapies could be more effective than current ones against drug-resistant strains, could be more easily tolerated, or could provide benefits longer than current therapies. Extensive research is being conducted on HIV vaccines and therapies, which include integrase inhibitors, fusion inhibitors, gene therapies, and pseudovirion and other vaccines. The likelihood of new therapies being developed and the possible time line for their use is difficult to foresee.

R.5 Sensitivity Analysis

This section presents the impact of using alternative estimates for the AIDS mortality adjustment factor. This is a generic sensitivity analysis that examines the impact on the benefits estimates of using factors above and below the estimates used in the EA analysis. The changes in AIDS mortality rates do not produce a one-to-one change in estimates in benefits because other factors (such as the populations served by filtered and unfiltered systems, the mortality rate for the general population, income growth and income elasticity, and the cost of illness) also contribute to the estimate of benefits.

The discussion in section R.4 of the factors that may affect AIDS-related mortality in the future does not lead to a single conclusion. It suggests that there exist factors that could easily raise the mortality rate substantially higher than the rates seen in 2001 and projected for 2002, but new treatment breakthroughs could substantially lower the rate in future years. Benefits from the LT2ESWTR are projected to begin in 2009 and the analysis makes projections through 2029. Considering the length of the period of analysis and the lack of projections available regarding mortality rates, this section uses both higher and lower values to assess the possible impact of alternative AIDS mortality rates.

Whatever does happen to these rates in the future, it is unlikely that they will remain constant from 2001 through 2029. For the purposes of this analysis, however, two stable "no-trend" values are used. The first is double the rate used in the EA; the second is half of that used in the EA. These differences have impacts on the estimate of total benefits (Exhibit R.4).

Exhibit R.4: Percent Change in Estimated Total Benefits Using Double and Half the AIDS-Related Mortality Rate

Percent Change in Annual Value of Total Benefits	Lower Confidence Bound	Mean	Upper Confidence Bound
Using Double the AIDS-Related Mortality Rate– ICR 3% ECOI	+35%	+52%	+61%
Using Double the AIDS-Related Mortality Rate– ICRSSL 7% TCOI	+57%	+74%	+78%
Using Half the AIDS-Related Mortality Rate– ICR 3% ECOI	-21%	-28%	-30%
Using Half the AIDS-Related Mortality Rate– ICRSSL 7% TCOI	-30%	-39%	-40%

Source: Risk Assessment Model.
Note: The ICR 3% ECOI and ICRSSL 7% TCOI span the range of possible values.

These impacts on the level of total benefits are, however, not significant enough to reverse the general conclusion of benefits exceeding costs. Benefits so greatly exceed costs–by factors of 3 to 15 fold (Exhibit 8.20)–that benefit estimates 39 percent lower (mean, half the AIDS mortality value, ICRSSL, 7 percent, TCOI) would not alter that conclusion.

Further, these larger differences do not significantly change the relative rankings of the alternatives or the choice of the Preferred Alternative. Again, comparing the results of Exhibit R.4 to those in Exhibits P.12 and P.13 is helpful. A 52 percent increase or a 28 percent decrease in benefits (mean, ICR, 3 percent, ECOI) holds steady the Preferred Alternative's status as the alternative with the highest net benefits. Using the ICRSSL data set at 7 percent discount rate and a TCOI, however, the Preferred Alternative goes from being top ranked to a close second to Alternative A2 (at double the AIDS mortality value) or to Alternative A4 (at half the AIDS mortality value). In summary, given that increases in the AIDS mortality rate are deemed as likely as decreases, the conclusions of the EA and the selection of the Preferred Alternative are not challenged.

In conclusion, the projection of AIDS-related mortality rate is uncertain. If the factors identified as exerting an upward influence on the AIDS-related mortality rate continue, the decline observed in this rate over the past several years will soon bottom out, and AIDS-related mortality will begin to increase. Less certain is the possibility or timing of new therapies that could lessen the threat from this disease, but substantial resources are devoted to this outcome. Mortality rates ranging from above to somewhat below current estimates do not contradict the selection of the Preferred Alternative. Mortality rates that are substantially lower would support careful consideration of other alternatives and perhaps more careful enumeration of other benefits not now quantified.

Appendix S
Analysis of Individual Risk by Initial Bin

S.1 Introduction

Under each regulatory alternative, systems are assigned an initial "bin" based on source water monitoring. This appendix groups population based on these bins and analyzes the distribution of individual risk for each of these bins. The conclusions are presented in two ways:

- Tabular information on the percent of the population that face annual risks of illness within selected ranges (Exhibit S.1). Additional tables show the data in several different forms (Exhibits S.2 through S.4).

- Cumulative distribution graphs that show the distribution of individual risk based on Pre-LT2ESWTR conditions, the distribution based on the minimal compliance with the LT2ESWTR, and based on the projected actual compliance with the rule (Exhibits S.5 through S.12). These graphs are similar to Exhibit 5.12, where the full distributions of risks are presented. The graphs in this appendix give additional insight as to the distribution of risks within each bin before and after the rule.

The remainder of the appendix includes the following additional documentation:

- A discussion and graph of the relationship among Modeled True, Measured, and Binning concentrations of *Cryptosporidium* that is useful for understanding the derivation of the tables and graphs in this appendix.

- A discussion of the steps involved in computing the data for this appendix, with accompanying graphs that show the step-by-step process for a sample data set and regulatory alternative. This and the previous sections also serve as a good illustrations of how rule alternatives reduce risk.

Key assumptions in the analysis are the following:

- Only community water systems (CWS) that filter water are considered in this analysis.

- The "bins" used in this analysis are those in which systems are **initially classified**. An initial bin contains all those systems whose source water places them in a bin. This includes those who are able to receive credits to reflect their current treatment in place and, therefore, lower requirements for additional treatment. For example, systems in the 1-log bin have to install treatment of 0.0, 0.5, or 1.0 log. It also includes systems who are projected to install treatment, but who would choose treatments that achieve greater than that required by their bin requirement.

- Variability from drinking water ingestion is not included.

- Data are based on means and thus excludes uncertainty.

S.2 Percent of Population Within Selected Ranges of Annual Individual Risk

Exhibits S.1 through S.4 show the percent of populations facing risk levels in different forms, all based on initial bin classifications and are of CWS only. Although the underlying data are the same, they are presented in different formats to help easily answer question of different forms.

- Exhibit S.1 shows the percent of populations facing annual individual risk within exclusive selected ranges. It divides the total population into five levels of risk and shows the percent of the population within each level. This table uses *global percentages* and, therefore, data add both across and up to totals. This table is useful to answer questions about the proportion of the total population, such as, "What portion of the population in "no action" bins are estimated to have risks between 10^{-3}or and 10^{-4}?" and "What percent of the population is in the 1.0 log bin for alternative A4?"

- Exhibit S.2 shows the percent of the total population facing risks at and above four levels—from 10^{-5}or greater to 10^{-2} or greater annual risk of illness. These are cumulative of the numbers in Exhibit S.1 and are still in the form of *global percentages*. The individual cell data can be summed up to column totals, but columns are to be compared, not summed. This table is useful to answer questions that focus on individual risk levels that might be of interest, and to identify what percent of the population face risks greater than that level, such as, "What portion of the total population in "no action" bins are estimated to have risks above 10^{-3}?"

- Exhibit S.3 uses the data in Exhibit S.2, but expresses individual cell data as a percentage of the total in its column. These *local percentages* add vertically. This table is useful to answer questions about the percent composition of alternatives , such as, "What portion of the population under alternative A3 facing risks of 10^{-3} or greater are in the 'no action' bin?" (For example, Exhibit S.2 tells us that 2.04 percent of the total population are in this group, and Exhibit S.2 tells us that they represent 71.84 percent of all those facing risks of 10^{-3} or greater.)

- Exhibit S.4 shows the percentage of the population within a bin that exceed a specified risk level. The data derive from Exhibit S.2 (the percent of all those who are in that bin exceeding a risk level) divided by the percentage of the total population in that bin (the first three columns). The first three columns add to 100 percent, but the other data are to be read individually and do not sum in any direction. This table is useful to answer questions such as, "What portion of the population in "no action" bins are estimated to have annual individual risks above 10^{-3}?"

Exhibit S.1: Percent of Total Population Within Levels of Individual Annual Risk of Illness for Filtered Systems, by Data Set, by Risk Level, by Alternative, by Initial Bin

Initial Bin	ICR																							
	1.00E-05 or Lower				1.00E-05 to 1.00E-04				1.00E-04 to 1.00E-03				1.00E-03 to 1.00E-02				1.00E-02 or greater				Total			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	93.86%	47.19%	42.10%	26.34%	5.14%	33.06%	32.88%	32.77%	0.91%	18.41%	21.73%	30.19%	0.09%	1.35%	3.26%	10.13%	0.00%	0.00%	0.04%	0.58%	100.00%	100.00%	100.00%	100.00%
0.0 log		18.94%	19.72%	19.82%		21.11%	26.24%	27.36%		9.23%	16.53%	19.07%		0.58%	2.14%	3.05%		0.00%	0.01%	0.03%		49.85%	64.64%	69.32%
0.5 log		4.57%		3.81%		6.68%		3.45%		7.55%		9.98%		0.67%		5.93%		0.00%		0.24%		19.47%		23.41%
1.0 log			18.56%	2.71%			3.94%	1.96%			4.50%	1.14%			1.06%	1.15%			0.03%	0.31%			28.09%	7.27%
1.5 log		19.78%				2.56%				1.00%				0.07%				0.00%				23.41%		
2.0 log	93.86%		2.83%		5.14%		1.34%		0.91%		0.19%		0.09%		0.01%		0.00%		0.00%		100.00%		4.37%	
2.5 log		3.89%	0.99%			2.72%	1.36%			0.62%	0.50%			0.04%	0.05%			0.00%	0.00%			7.27%	2.90%	

Initial Bin	ICRSSL																							
	1.00E-05 or Lower				1.00E-05 to 1.00E-04				1.00E-04 to 1.00E-03				1.00E-03 to 1.00E-02				1.00E-02 or greater				Total			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	97.25%	25.34%	21.07%	9.59%	2.61%	33.10%	32.26%	32.64%	0.13%	36.50%	38.66%	44.78%	0.00%	5.05%	7.93%	12.75%	0.00%	0.01%	0.07%	0.23%	100.00%	100.00%	100.00%	100.00%
0.0 log		6.37%	6.82%	6.86%		23.77%	29.42%	30.43%		22.71%	35.08%	38.06%		2.87%	7.25%	8.93%		0.01%	0.06%	0.11%		55.72%	78.63%	84.38%
0.5 log		5.73%		2.48%		7.64%		2.10%		13.15%		6.65%		2.14%		3.78%		0.00%		0.12%		28.67%		15.12%
1.0 log			13.89%	0.25%			2.71%	0.12%			3.57%	0.08%			0.69%	0.05%			0.01%	0.01%			20.87%	0.50%
1.5 log		12.89%				1.56%				0.63%				0.04%				0.00%				15.12%		
2.0 log	97.25%		0.33%		2.61%		0.11%		0.13%		0.02%		0.00%		0.00%		0.00%		0.00%		100.00%		0.46%	
2.5 log		0.36%	0.03%			0.13%	0.02%			0.01%	0.00%			0.00%	0.00%			0.00%	0.00%			0.50%	0.05%	

Initial Bin	ICRSSM																							
	1.00E-05 or Lower				1.00E-05 to 1.00E-04				1.00E-04 to 1.00E-03				1.00E-03 to 1.00E-02				1.00E-02 or greater				Total			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	95.60%	30.98%	26.27%	13.10%	4.01%	32.64%	32.00%	31.55%	0.38%	31.64%	33.87%	40.31%	0.01%	4.72%	7.76%	14.48%	0.00%	0.01%	0.10%	0.56%	100.00%	100.00%	100.00%	100.00%
0.0 log		9.02%	9.39%	9.43%		23.35%	27.91%	28.73%		19.09%	29.51%	32.23%		2.37%	6.46%	8.22%		0.01%	0.07%	0.14%		53.85%	73.34%	78.75%
0.5 log		5.00%		3.00%		6.18%		2.35%		11.48%		7.86%		2.25%		6.01%		0.01%		0.37%		24.90%		19.58%
1.0 log			15.96%	0.67%			3.45%	0.46%			4.26%	0.22%			1.30%	0.26%			0.03%	0.06%			24.99%	1.67%
1.5 log		16.02%				2.47%				0.99%				0.11%				0.00%				19.58%		
2.0 log	95.60%		0.80%		4.01%		0.48%		0.38%		0.07%		0.01%		0.01%		0.00%		0.00%		100.00%		1.36%	
2.5 log		0.94%	0.12%			0.64%	0.15%			0.09%	0.03%			0.00%	0.00%			0.00%	0.00%			1.67%	0.31%	

Exhibit S.2: Percent of Total Population Exceeding Levels of Individual Annual Risk for Filtered Systems, by Data Set, by Risk Level, by Alternative, by Initial Bin

Initial Bin	ICR															
	1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	6.15%	52.82%	57.90%	73.66%	1.00%	19.76%	25.02%	40.90%	0.09%	1.35%	3.30%	10.70%	0.00%	0.00%	0.04%	0.58%
0.0 log		30.92%	44.92%	49.50%		9.81%	18.69%	22.14%		0.58%	2.16%	3.07%		0.00%	0.01%	0.03%
0.5 log		14.90%		19.60%		8.22%		16.16%		0.67%		6.17%		0.00%		0.24%
1.0 log			9.53%	4.56%			5.59%	2.60%			1.09%	1.46%			0.03%	0.31%
1.5 log		3.63%				1.07%				0.07%				0.00%		
2.0 log	6.15%		1.54%		1.00%		0.20%		0.09%		0.01%		0.00%		0.00%	
2.5 log		3.38%	1.91%			0.66%	0.55%			0.04%	0.05%			0.00%	0.00%	

Initial Bin	ICRSSL															
	1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	2.75%	74.66%	78.93%	90.41%	0.13%	41.56%	46.67%	57.77%	0.00%	5.06%	8.01%	12.99%	0.00%	0.01%	0.07%	0.23%
0.0 log		49.35%	71.80%	77.52%		25.58%	42.39%	47.09%		2.88%	7.31%	9.04%		0.01%	0.06%	0.11%
0.5 log		22.93%		12.63%		15.29%		10.54%		2.14%		3.89%		0.00%		0.12%
1.0 log			6.98%	0.26%			4.27%	0.14%			0.70%	0.06%			0.01%	0.01%
1.5 log		2.23%				0.68%				0.04%				0.00%		
2.0 log	2.75%		0.13%		0.13%		0.02%		0.00%		0.00%		0.00%		0.00%	
2.5 log		0.15%	0.02%			0.01%	0.00%			0.00%	0.00%			0.00%	0.00%	

Initial Bin	ICRSSM															
	1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	4.40%	69.02%	73.73%	86.90%	0.39%	36.38%	41.73%	55.36%	0.01%	4.74%	7.86%	15.05%	0.00%	0.01%	0.10%	0.56%
0.0 log		44.82%	63.95%	69.32%		21.47%	36.03%	40.59%		2.38%	6.53%	8.35%		0.01%	0.07%	0.14%
0.5 log		19.90%		16.59%		13.73%		14.24%		2.25%		6.38%		0.01%		0.37%
1.0 log			9.04%	1.00%			5.58%	0.53%			1.33%	0.31%			0.03%	0.06%
1.5 log		3.56%				1.10%				0.11%				0.00%		
2.0 log	4.40%		0.56%		0.39%		0.08%		0.01%		0.01%		0.00%		0.00%	
2.5 log		0.73%	0.19%			0.09%	0.03%			0.00%	0.00%			0.00%	0.00%	

Exhibit S.3: Initial Bin Distribution of Population Within an Alternative for Filtered Systems, by Data Set, by Risk Level

Initial Bin	ICR															
	1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%	100.00%
0.0 log		58.53%	77.58%	67.20%		49.65%	74.68%	54.15%		42.77%	65.42%	28.71%		-	33.33%	4.33%
0.5 log		28.20%		26.61%		41.61%		39.50%		49.44%		57.67%		-		42.29%
1.0 log			16.46%	6.19%			22.34%	6.35%			33.00%	13.62%			66.67%	53.38%
1.5 log		6.87%				5.40%				4.89%				-		
2.0 log	100.00%		2.66%		100.00%		0.80%		100.00%		0.21%		100.00%		0.00%	
2.5 log		6.40%	3.29%			3.34%	2.18%			2.89%	1.36%			-	0.00%	

Initial Bin	ICRSSL															
	1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%	100.00%	100.00%
0.0 log		66.10%	90.97%	85.74%		61.56%	90.83%	81.53%		56.82%	91.32%	69.57%		62.50%	87.67%	46.98%
0.5 log		30.72%		13.97%		36.79%		18.24%		42.37%		29.96%		25.00%		49.57%
1.0 log			8.84%	0.28%			9.14%	0.24%			8.68%	0.46%			12.33%	3.45%
1.5 log		2.99%				1.62%				0.81%				12.50%		
2.0 log	100.00%		0.16%		100.00%		0.03%		100.00%		0.00%		-		0.00%	
2.5 log		0.19%	0.03%			0.03%	0.00%			0.00%	0.00%			0.00%	0.00%	

Initial Bin	ICRSSM															
	1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%	100.00%	100.00%
0.0 log		64.95%	86.73%	79.77%		59.02%	86.35%	73.32%		50.21%	83.03%	55.51%		64.29%	67.35%	24.11%
0.5 log		28.83%		19.09%		37.73%		25.72%		47.51%		42.40%		35.71%		65.78%
1.0 log			12.26%	1.14%			13.38%	0.96%			16.90%	2.09%			32.65%	10.11%
1.5 log		5.16%				3.01%				2.26%				0.00%		
2.0 log	100.00%		0.76%		100.00%		0.19%		100.00%		0.08%		-		0.00%	
2.5 log		1.06%	0.25%			0.24%	0.08%			0.02%	0.00%			0.00%	0.00%	

Exhibit S.4: Percent of Population Within a Bin Exceeding Levels of Individual Annual Risk for Filtered Systems, by Data Set, by Risk Level, by Alternative, by Initial Bin

Initial Bin	ICR																			
	Bin Percent of Total Population				Percent of Bin Population Exceeding Risk Level															
					1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	100.00%	100.00%	100.00%	100.00%																
0.0 log		49.85%	64.64%	69.32%		62.01%	69.50%	71.41%		19.68%	28.91%	31.94%		1.16%	3.34%	4.43%		0.00%	0.02%	0.04%
0.5 log		19.47%		23.41%		76.51%		83.74%		42.22%		69.01%		3.43%		26.37%		0.00%		1.04%
1.0 log			28.09%	7.27%			33.93%	62.68%			19.90%	35.71%			3.87%	20.06%			0.09%	4.24%
1.5 log		23.41%				15.49%				4.55%				0.28%				0.00%		
2.0 log	100.00%		4.37%		6.15%		35.28%		1.00%		4.60%		0.09%		0.16%		0.00%		0.00%	
2.5 log		7.27%	2.90%			46.47%	65.80%			9.08%	18.81%			0.54%	1.55%			0.00%	0.00%	

Initial Bin	ICRSSL																			
	Bin Percent of Total Population				Percent of Bin Population Exceeding Risk Level															
					1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	100.00%	100.00%	100.00%	100.00%																
0.0 log		55.72%	78.63%	84.38%		88.57%	91.32%	91.87%		45.91%	53.91%	55.81%		5.16%	9.30%	10.71%		0.01%	0.08%	0.13%
0.5 log		28.67%		15.12%		80.00%		83.57%		53.34%		69.70%		7.48%		25.74%		0.01%		0.76%
1.0 log			20.87%	0.50%			33.44%	50.79%			20.44%	26.98%			3.33%	11.90%			0.04%	1.59%
1.5 log		15.12%				14.76%				4.47%				0.27%				0.01%		
2.0 log	100.00%		0.46%		2.75%		27.47%		0.13%		3.30%		0.00%		0.00%		0.00%		0.00%	
2.5 log		0.50%	0.05%			28.77%	48.98%			2.38%	0.00%			0.00%	0.00%			0.00%	0.00%	

Initial Bin	ICRSSM																			
	Bin Percent of Total Population				Percent of Bin Population Exceeding Risk Level															
					1.00E-05 or greater				1.00E-04 or greater				1.00E-03 or greater				1.00E-02 or greater			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
Total	100.00%	100.00%	100.00%	100.00%																
0.0 log		53.85%	73.34%	78.75%		83.24%	87.19%	88.03%		39.87%	49.13%	51.54%		4.42%	8.90%	10.61%		0.02%	0.09%	0.17%
0.5 log		24.90%		19.58%		79.92%		84.70%		55.12%		72.71%		9.04%		32.58%		0.02%		1.89%
1.0 log			24.99%	1.67%			36.16%	59.62%			22.34%	31.88%			5.31%	18.81%			0.13%	3.42%
1.5 log		19.58%				18.19%				5.60%				0.55%				0.00%		
2.0 log	100.00%		1.36%		4.40%		41.25%		0.39%		5.74%		0.01%		0.44%		0.00%		0.00%	
2.5 log		1.67%	0.31%			43.68%	60.84%			5.21%	11.00%			0.06%	0.00%			0.00%	0.00%	

S.3 Graphs of the Cumulative Distribution of Annual Individual Risk by Bin

The graphs of the distributions of individual risk for people served by all filtered systems are shown in the Economic Analysis in Exhibit 5.12. The graphs below are analogous, but only include CWS systems. The axes have been switched so that the cumulative percent is shown on the X axis and the variability from drinking water ingestion has been removed. There are separate charts for each rule alternative and each of two data sets, the ICR and ICRSSL (twelve graphs in all, Exhibits S.5 through S.16). On each graph, vertical dashed lines separate the initial bins. Within each bin, the following three distributions are shown:

- the distribution of risk based on finished water occurrence, Pre-LT2 (after considering treatment in place and the effects of credits)
- the distribution of risk based on the treatment required by that rule alternative and that bin (again taking into account the credits earned by some systems)
- the distribution of risk actually achieved, reflecting that many systems are expected to achieve more treatment than the minimum required

Note that within a bin, each distribution is sorted independently, and therefore, a particular system may appear at different points in each of the distributions. Also note that the distributions based on finished water occurrence overlap, that is, some individuals in a lower bin have a higher risk than some in higher bins. This is due to misclassification of systems during the sampling process and to the differences in treatment in place between systems.

The differences between the alternatives can be seen at particular risk levels. For example, from Exhibit S.2, we see that at a risk of $1x10^{-4}$ risk level (that is, a 1 in 1,000 chance of becoming ill in a year), Alternative A3 leaves 25.02 percent of the total population at or above this risk overall (ICR data). Exhibit S.2 also shows that of those 25.02 percent exposed to the $1x10^{-4}$ risk level, 18.69 percent are in the No Action bin and 5.59 percent are in the 1 log bin. Exhibit S.7 shows the distribution of that 25.02, 18.69, and 5.59 percent. It is the portion of the distributions above the 10^{-4} line. Interestingly, there are not significantly higher spikes in higher bins because of the additional treatment used under Alternative A3. (Note that adding in the variability from drinking water ingestion would slightly heighten any spikes, reflecting those that drink more than the average amount of water.)

For another example, Exhibit S.8 and Exhibit S.2 show that for Alternative A4, 40.9 percent of the population is over a $1x10^{-4}$ risk level and is mostly in the No Action (22 percent of the population) and 0.5 log bins (16 percent). Over 16 percent of the population faces risks of $1x10^{-4}$ or greater and is in the 0.5 log bin. A significant spike also exists in the 1 log bin. At the higher level of $1x10^{-2}$ risk level (that is, a 1 in 100 annual chance of becoming ill), Alternative A3 has almost no population above this level, but Alternative A4 has about 0.6 percent facing these risks.

Using the ICRSSL rather than the ICR data set, the percentages of population above a selected risk level is generally higher at individual risk levels of $1x10^{-4}$ and $1x10^{-3}$ (probably because fewer systems provide additional treatment) and about the same at $1x10^{-2}$. Only at very high risk levels (such as $1x10^{-1}$) do fewer people face these risks (probably because of the lower estimated occurrence) than estimated under the ICR data set.

Exhibit S.5

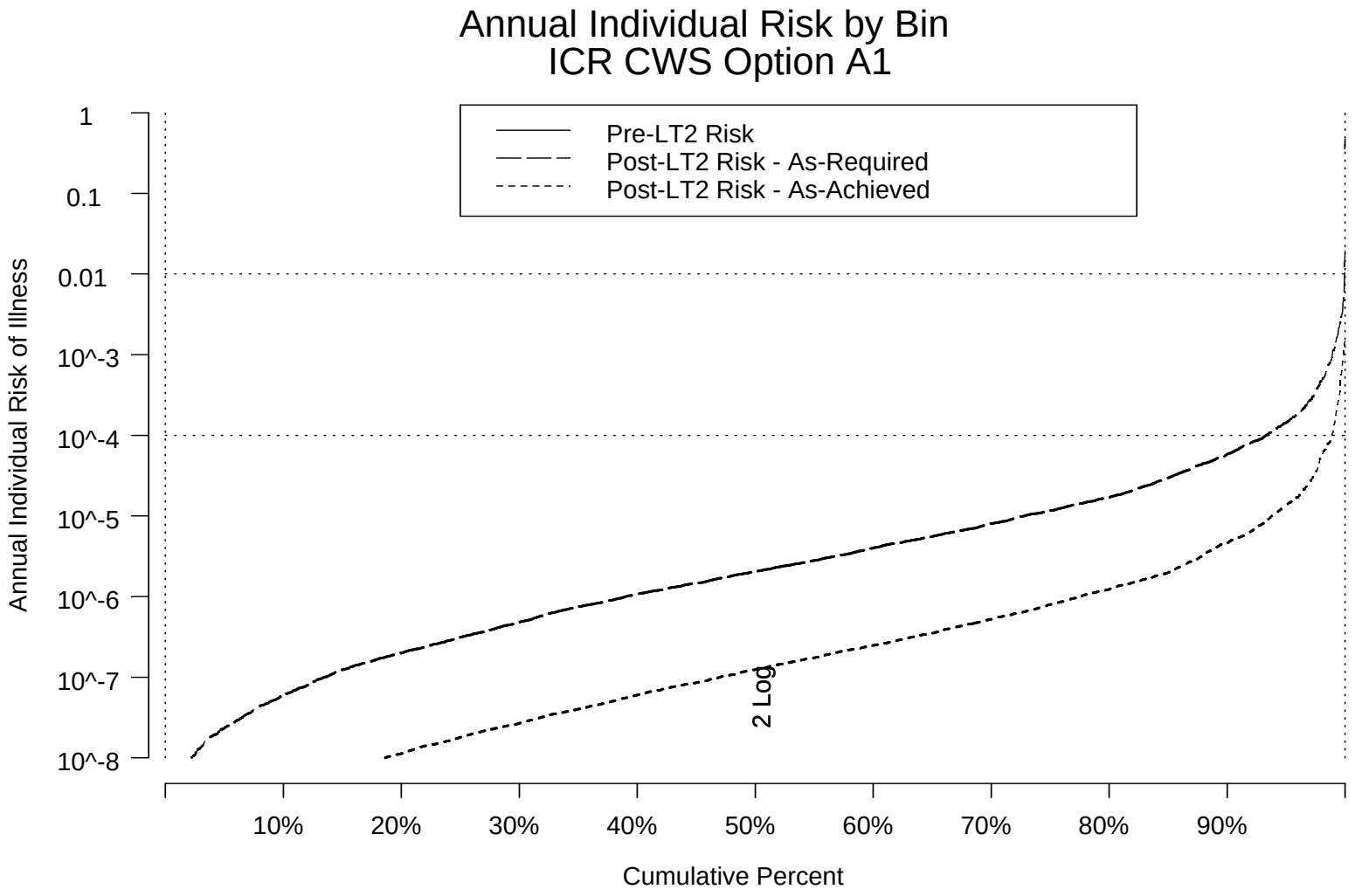

Annual Individual Risk by Bin
ICR CWS Option A1
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
2 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.6

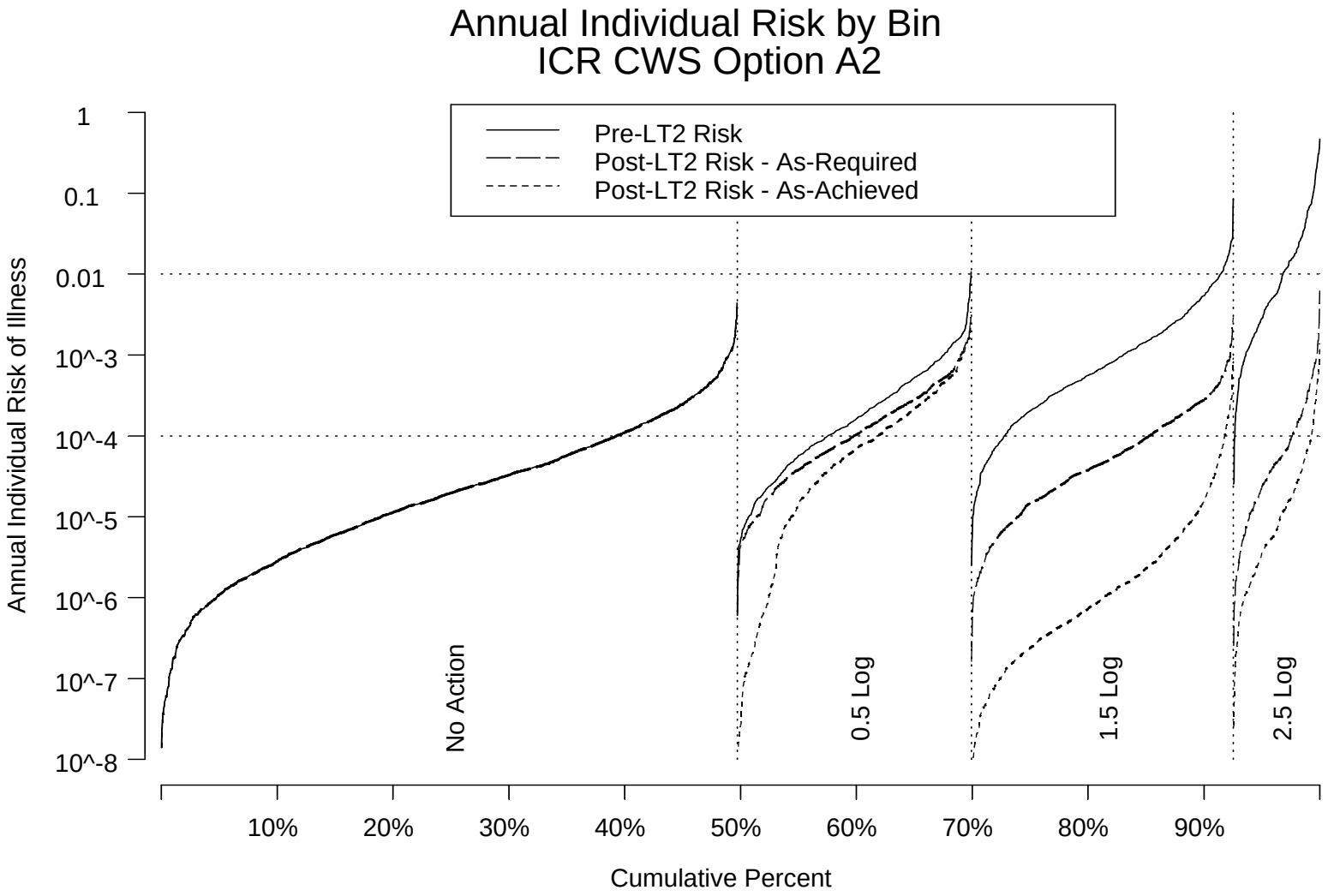

Annual Individual Risk by Bin
ICR CWS Option A2
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
0.5 Log
1.5 Log
2.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.7

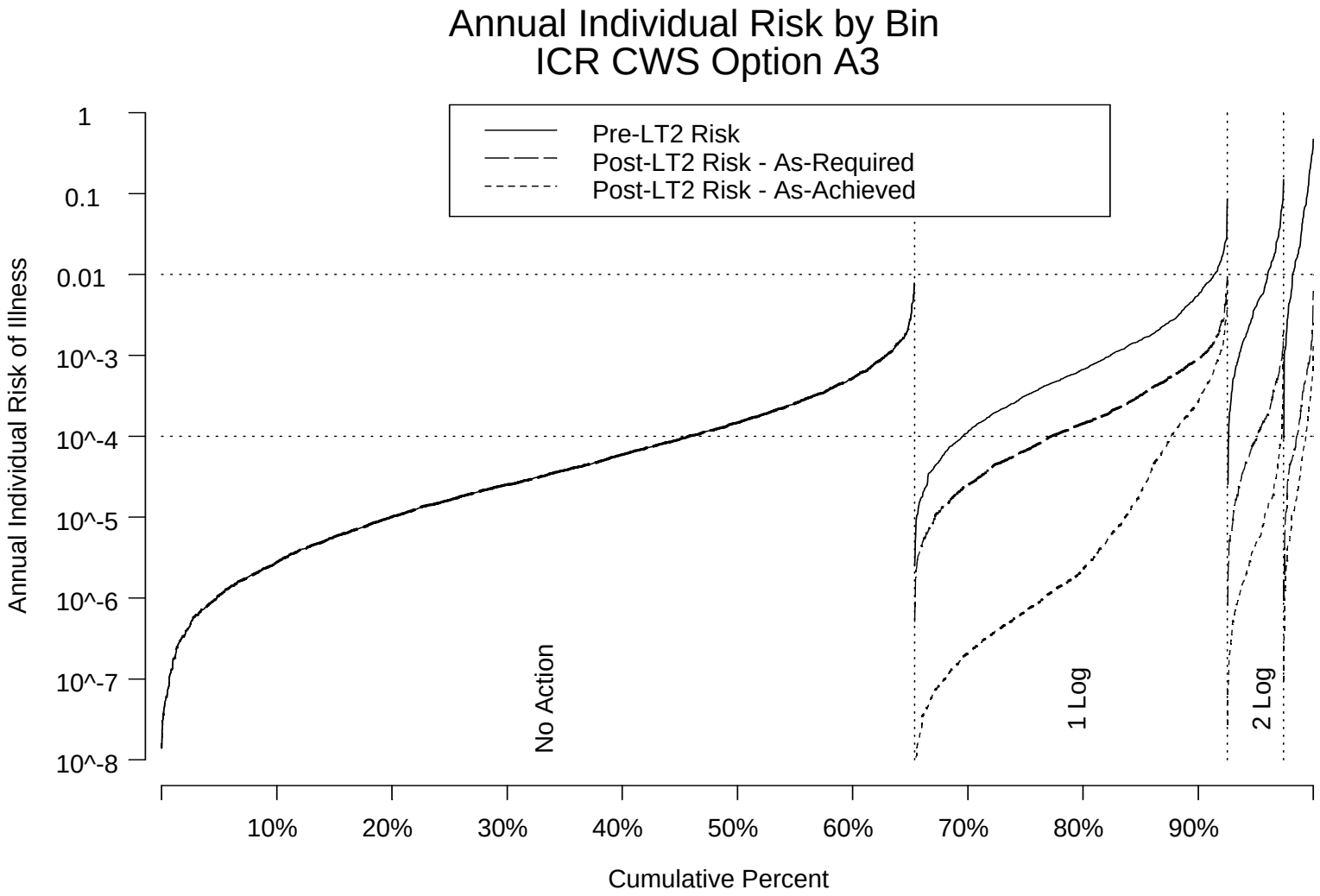

Annual Individual Risk by Bin
ICR CWS Option A3
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
1 Log
2 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.8

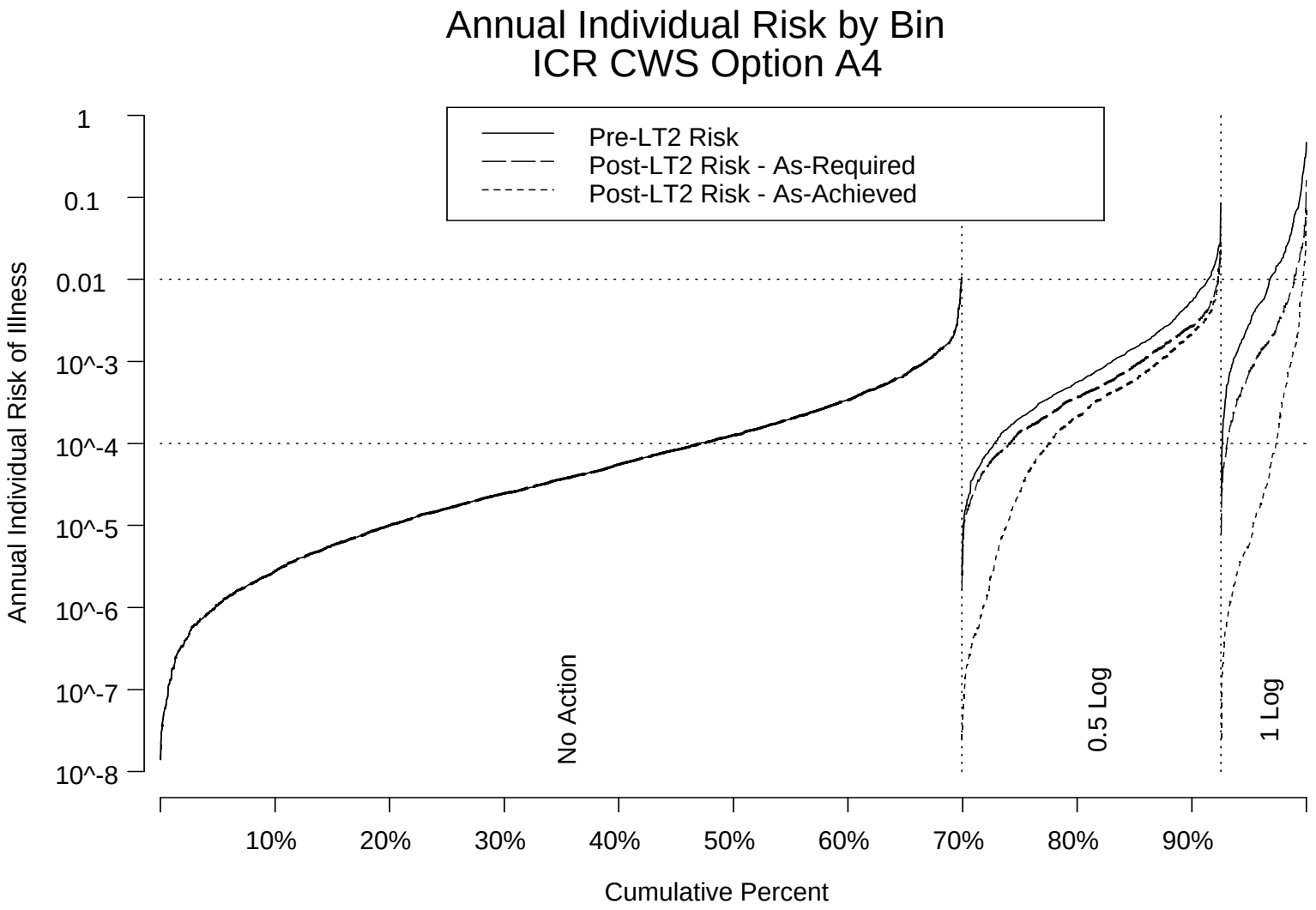

Annual Individual Risk by Bin
ICR CWS Option A4
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
0.5 Log
1 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.9

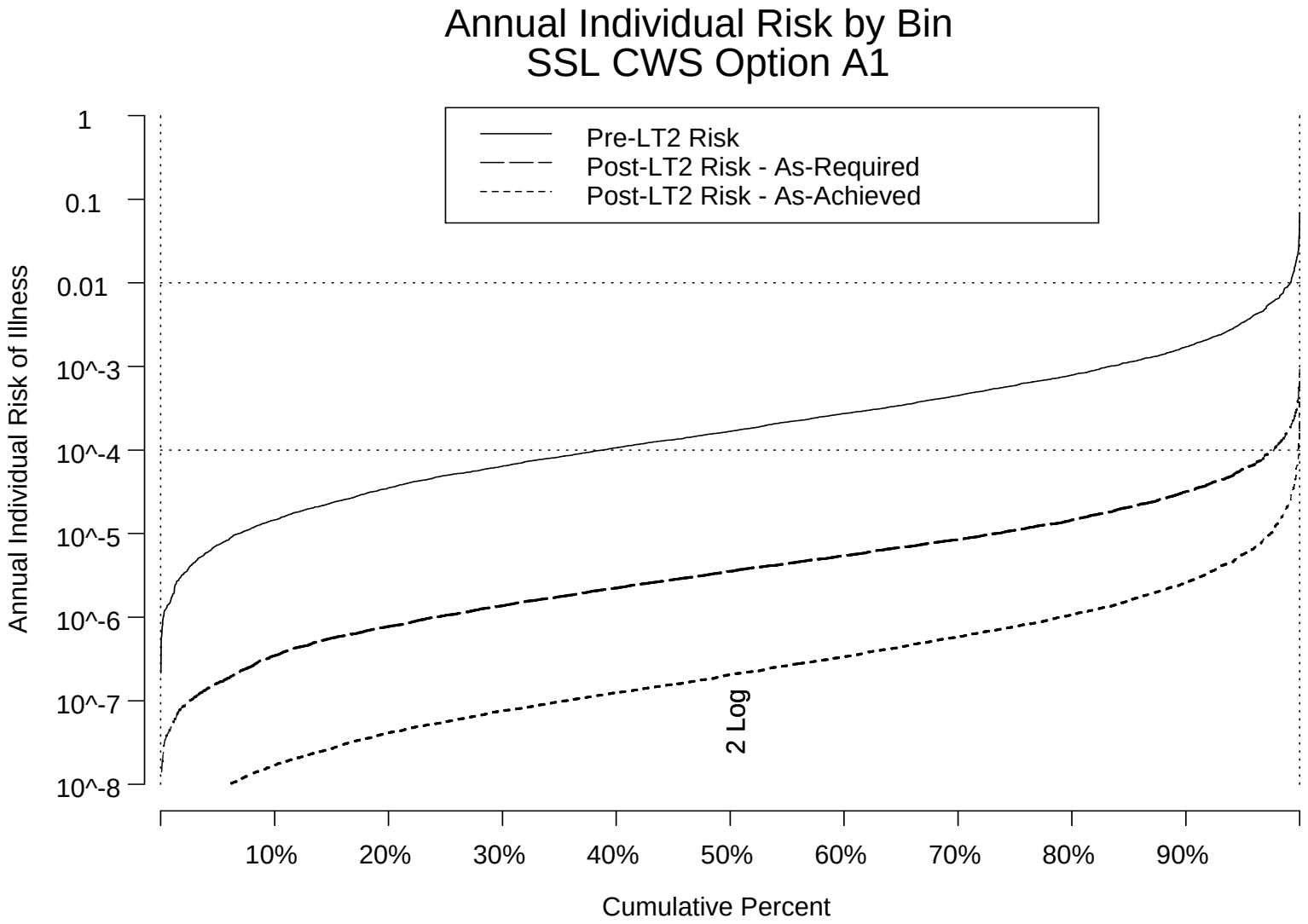

Annual Individual Risk by Bin
SSL CWS Option A1
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
2 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.10

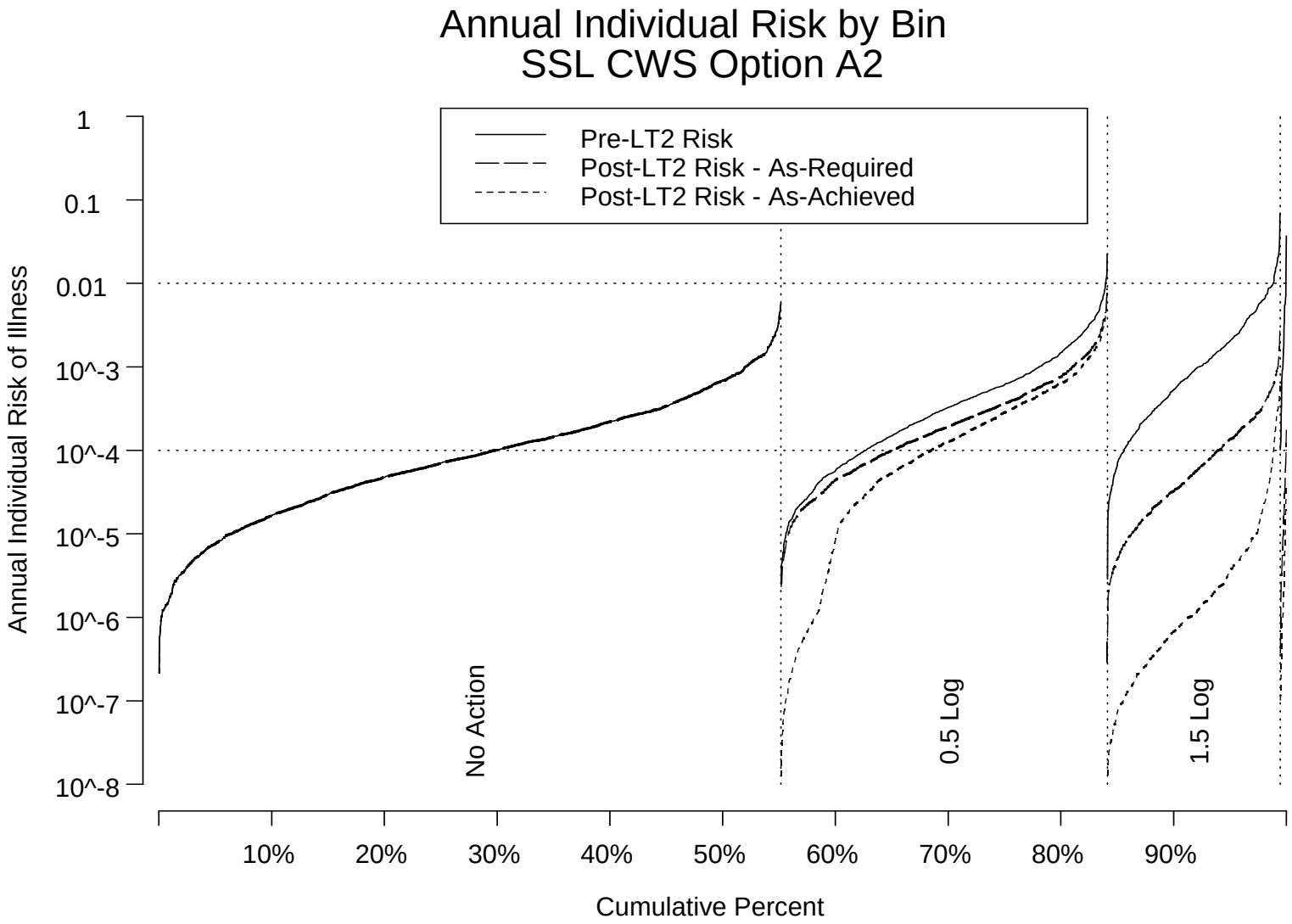

Annual Individual Risk by Bin
SSL CWS Option A2
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
0.5 Log
1.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.11

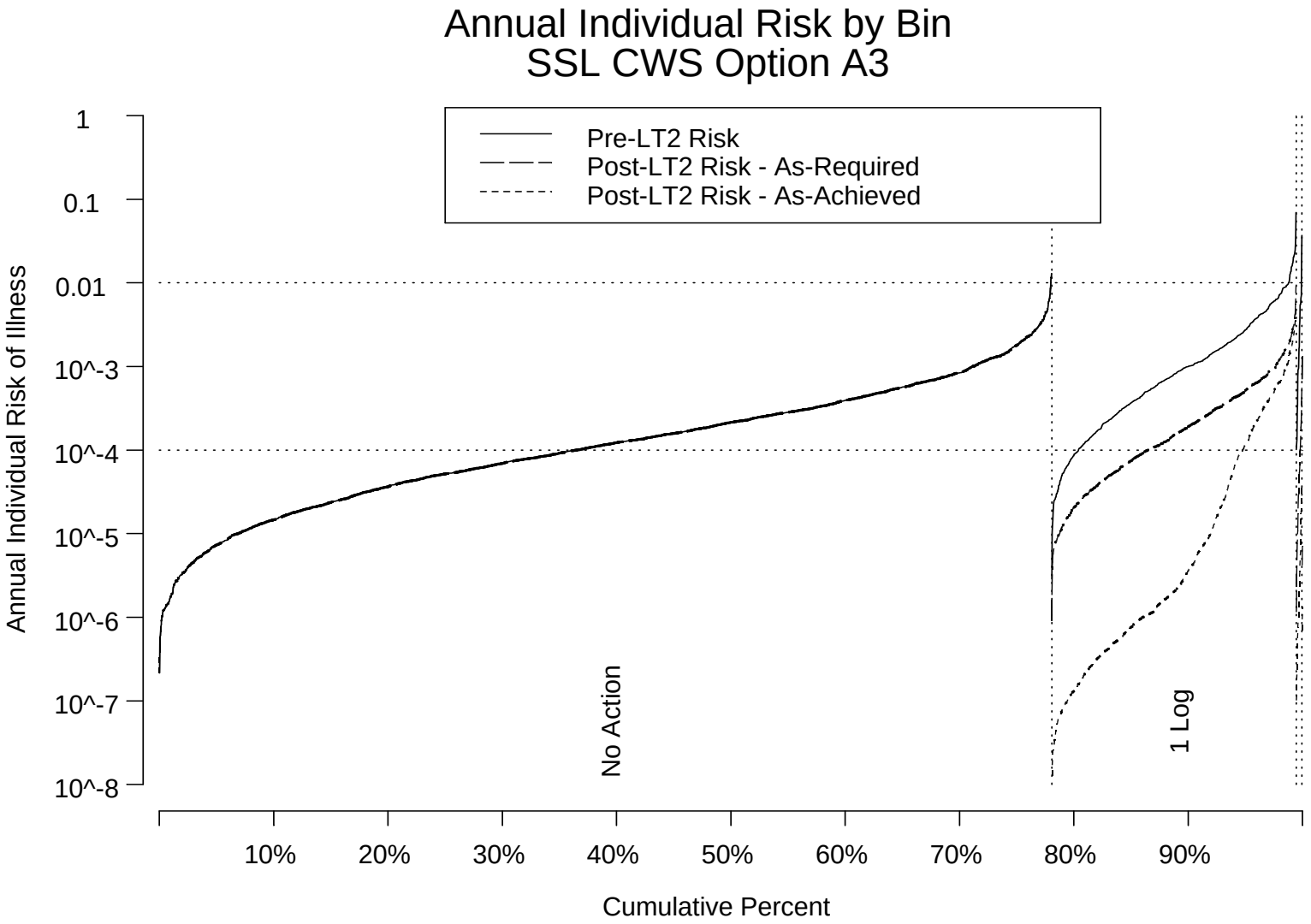

Annual Individual Risk by Bin
SSL CWS Option A3
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
1 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.12

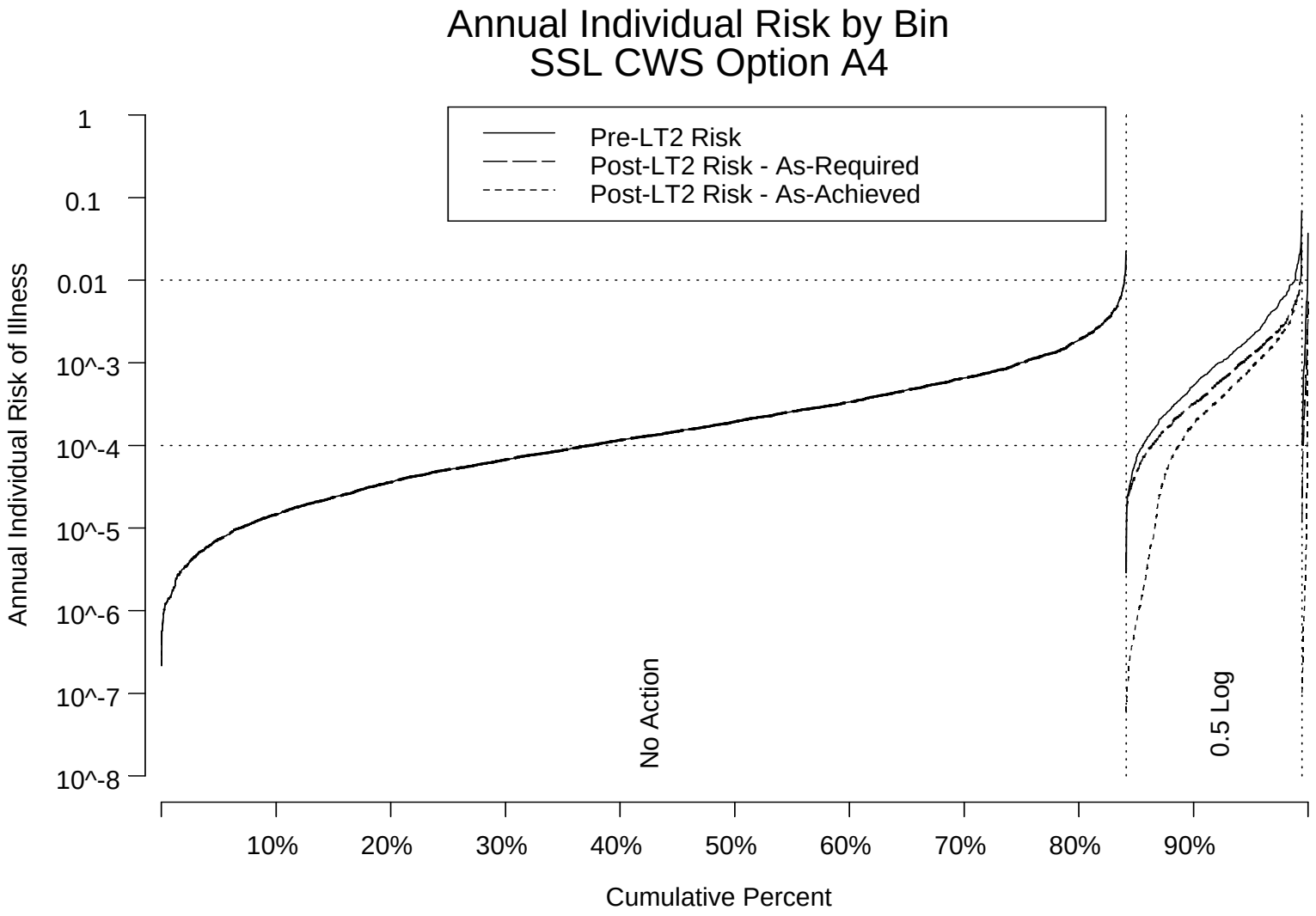

Annual Individual Risk by Bin
SSL CWS Option A4
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
0.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.13

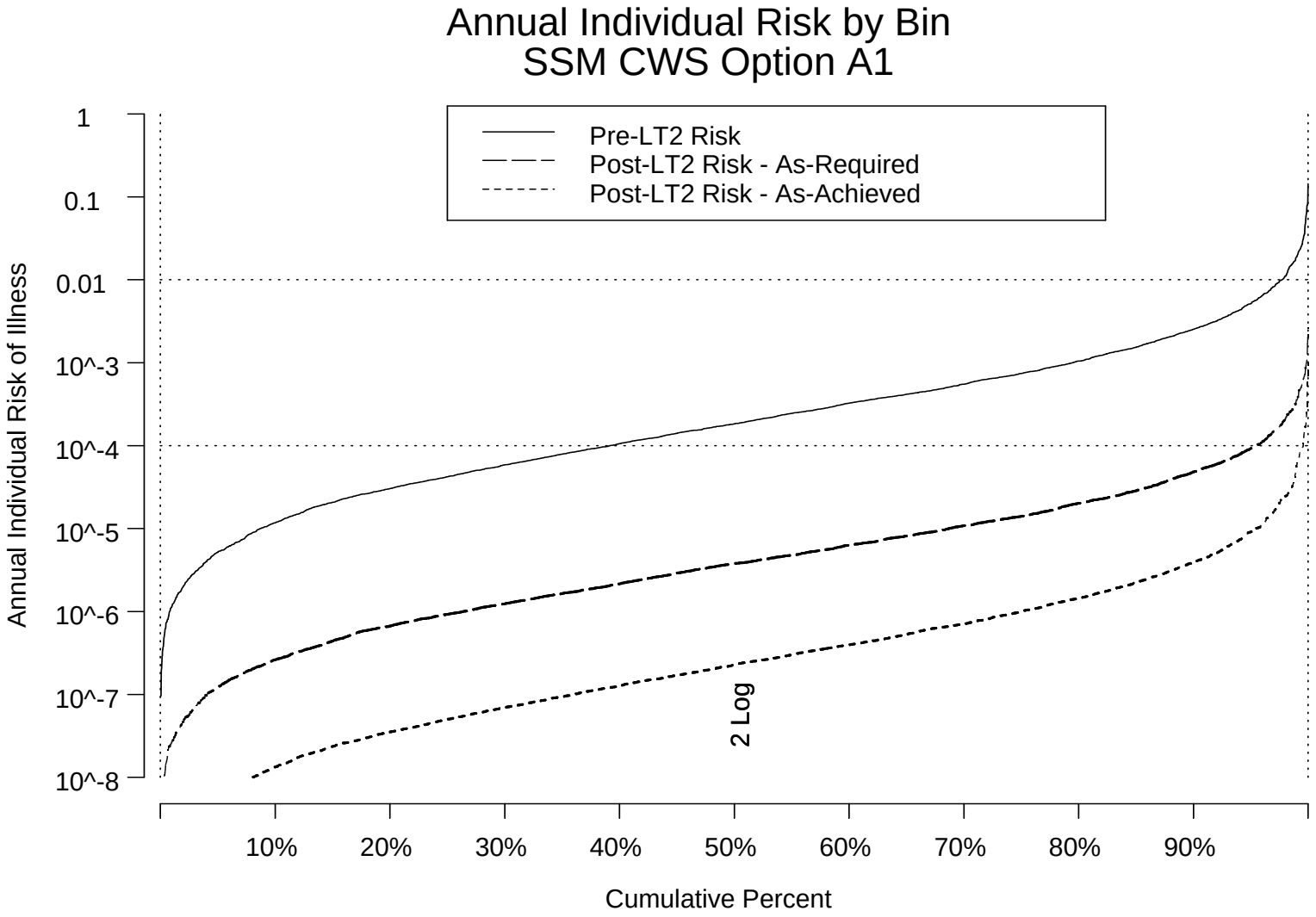

Annual Individual Risk by Bin
SSM CWS Option A1
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
2 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.14

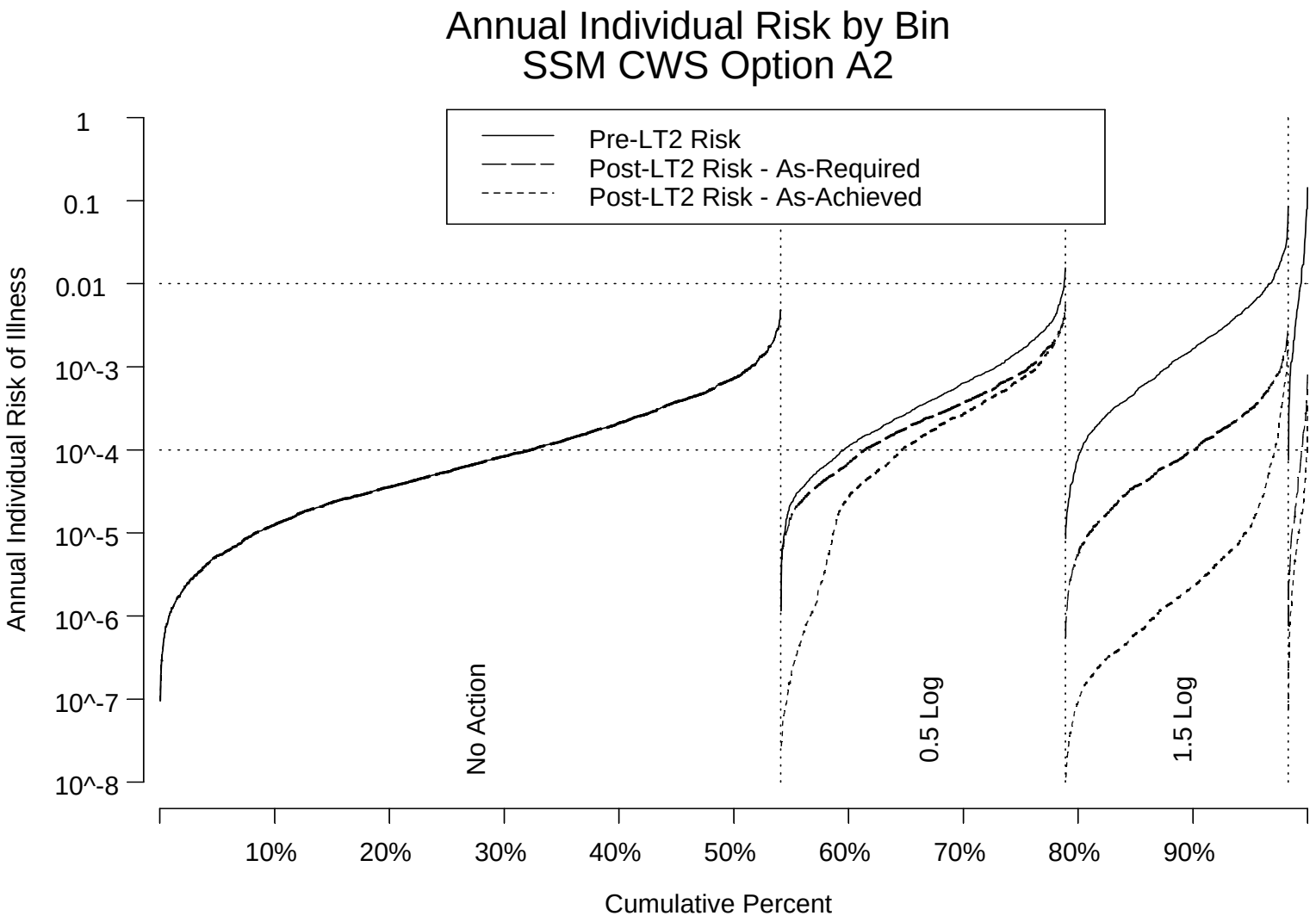

Annual Individual Risk by Bin
SSM CWS Option A2
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
0.5 Log
1.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.15

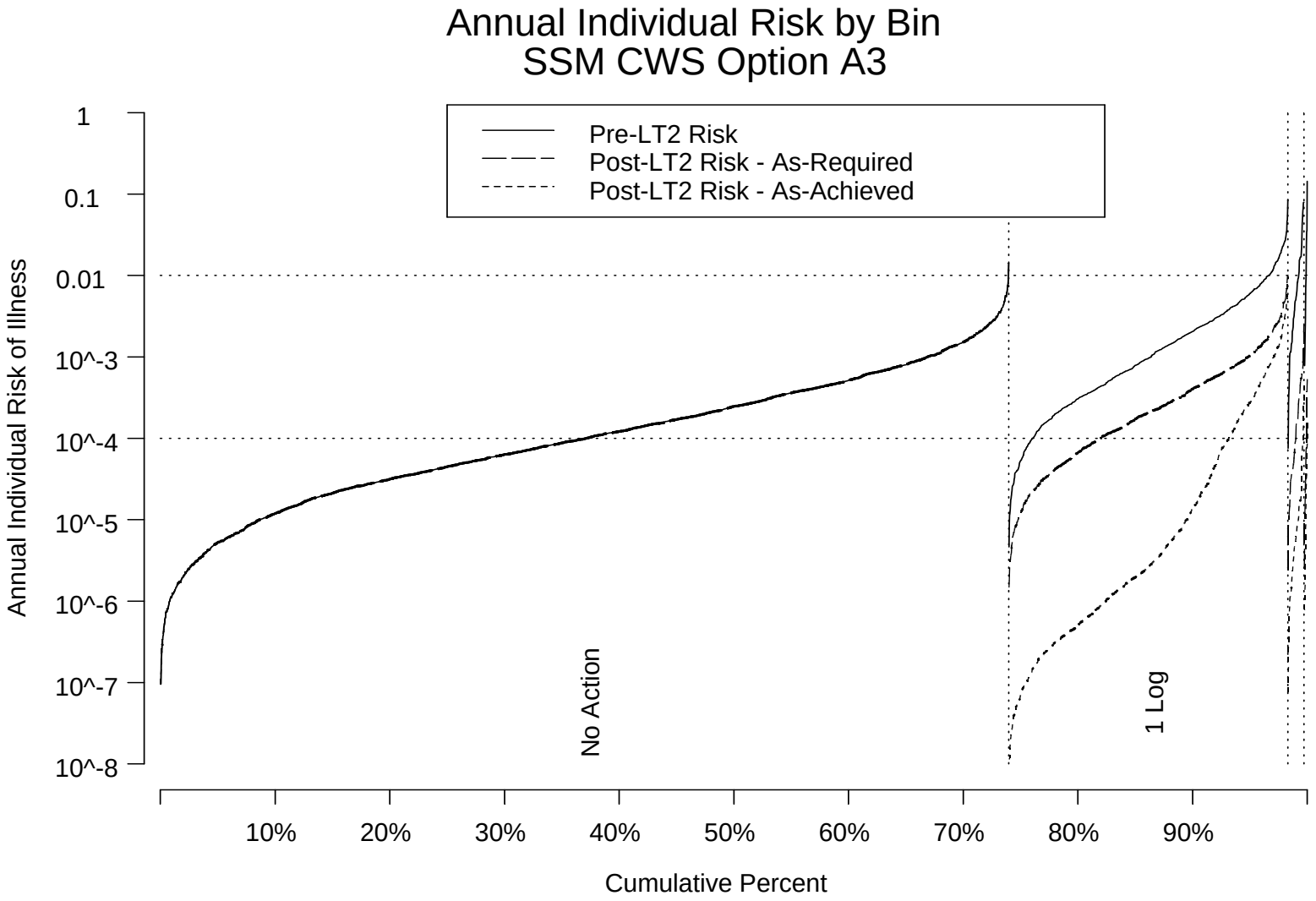
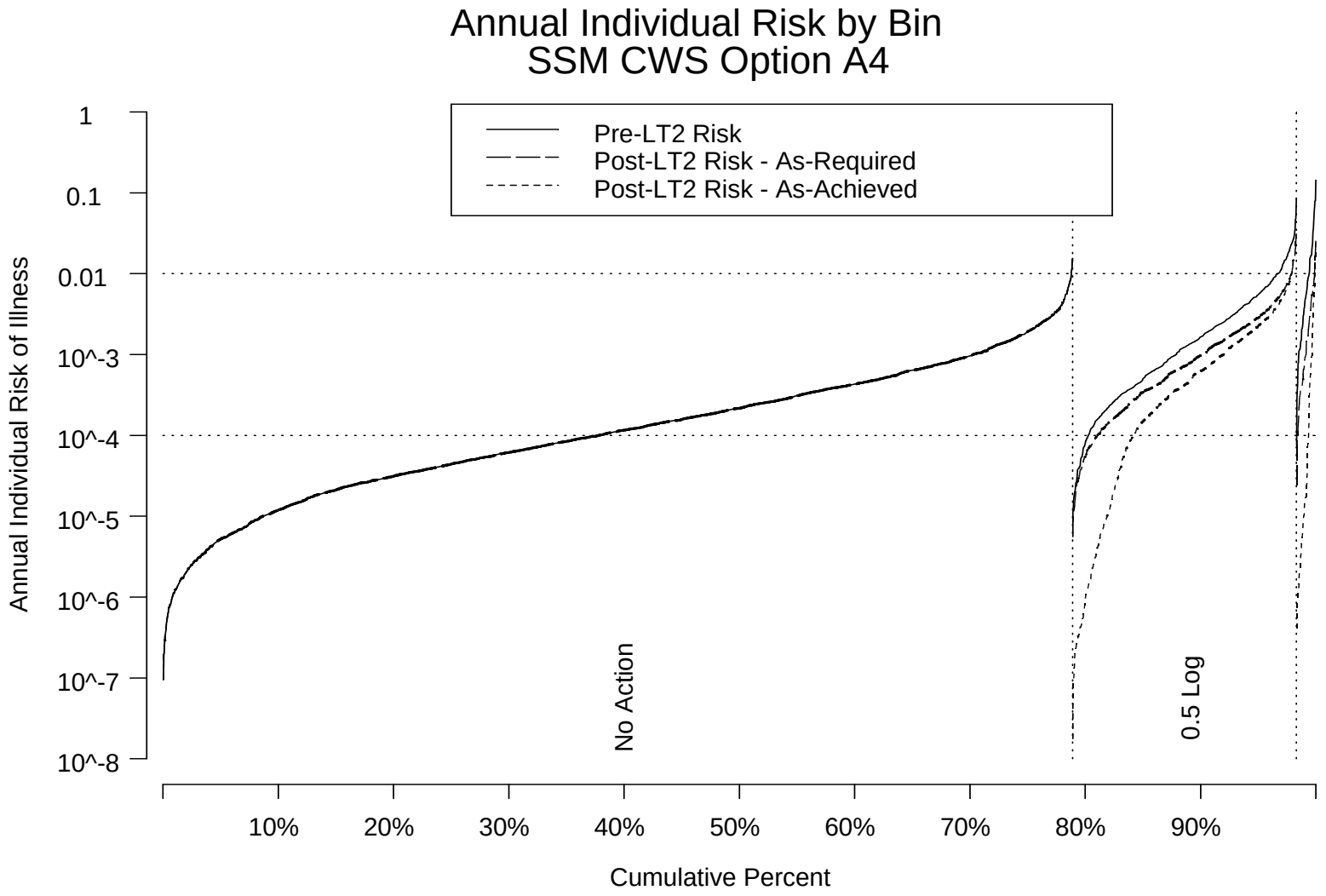

Annual Individual Risk by Bin
SSM CWS Option A3
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
1 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.16

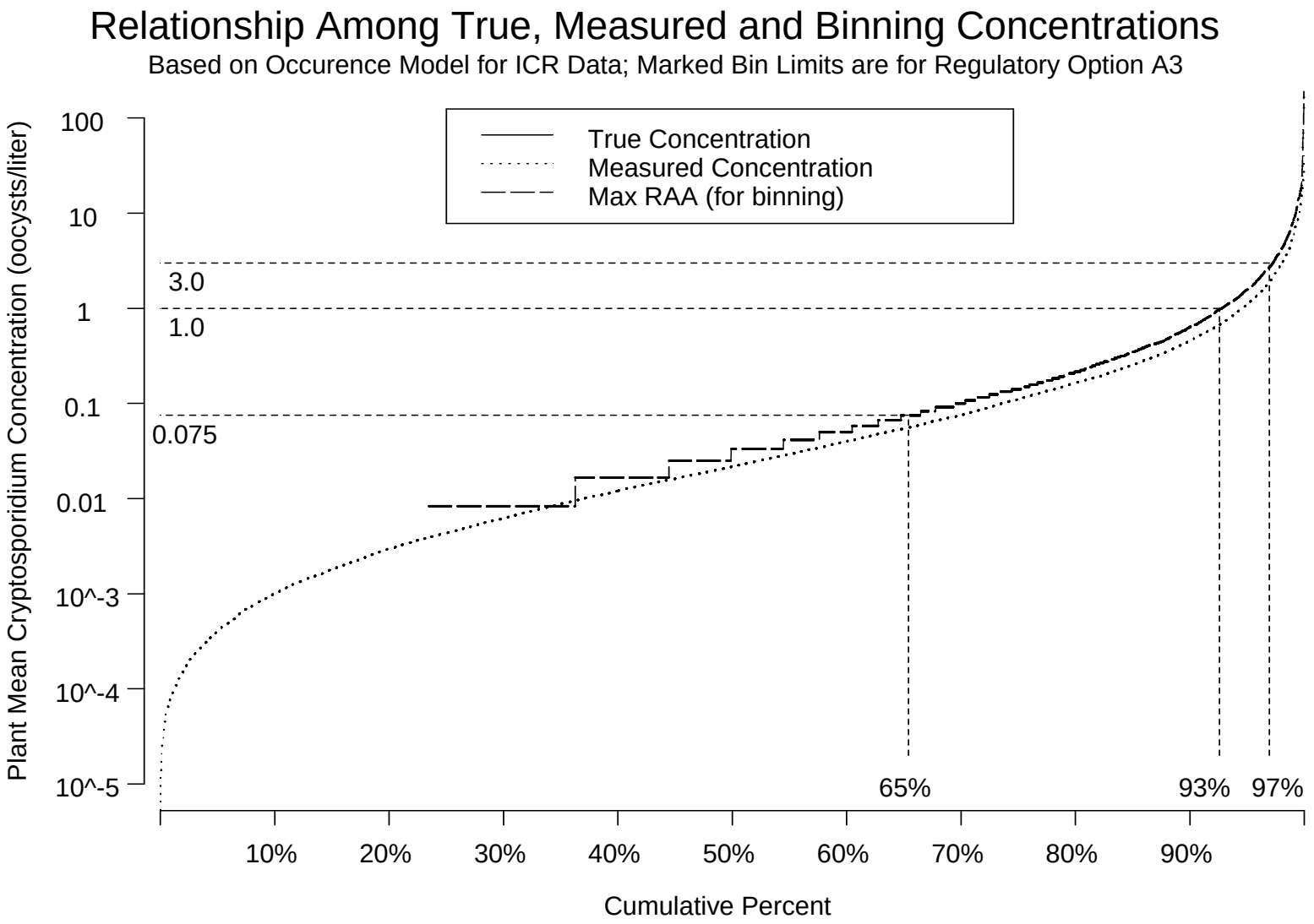

Annual Individual Risk by Bin
SSM CWS Option A4
Pre-LT2 Risk
Post-LT2 Risk - As-Required
Post-LT2 Risk - As-Achieved
Annual Individual Risk of Illness
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
No Action
0.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

S.4 Relationship Among the Modeled True, Measured, and Binning Concentrations of *Cryptosporidium*

The data throughout this Economic Analysis uses data on the concentration of *Cryptosporidium*, but in three different ways. Exhibit S.17 shows those differences graphically using the ICR data set and alternative A3. Data from one of three occurrence data sets ICR, ICRSSL, or ICRSSM) are used by a model to model a "true" distribution. This distribution of occurrence means would, when measured under the analytical laboratory protocols produced a distribution of means, labeled as "measured concentrations" in Exhibit S.17. Binning assignments are made using a particular computation from these concentrations–the highest annual running average from 2 years of monthly data. That computation actually produces the step function shown in Exhibit S.17 as MaxRAA.

Part of the point of this distinction is that the model and the results in this appendix derive their estimates of risk using the "true concentration" estimated distributions, after taking into account any treatment in a system required by being binned by the MaxRAA.

Exhibit S.17


Relationship Among True, Measured and Binning Concentrations
Based on Occurence Model for ICR Data; Marked Bin Limits are for Regulatory Option A3
True Concentration
Measured Concentration
Max RAA (for binning)
Plant Mean Cryptosporidium Concentration (oocysts/liter)
100
10
1
0.1
0.01
10^-3
10^-4
10^-5
3.0
1.0
0.075
65%
93%
97%
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

S.5 Development of Estimates of Risk Distributions by Regulatory Alternative Bin

Developing estimates of risk distributions by regulatory alternative bin requires several steps. The following series of graphs (Exhibits S.18 through S.24, and S.6) illustrate each of those steps, and they are described below. These graphs are for filtered CWS systems only. These graphs do not include the variability related to ingestion, and therefore are not exactly comparable to the graphs used in the Economic Analysis (Exhibits 5.12 and C.11). Those graphs show somewhat steeper peaks due to accounting for the above average ingestion levels by some individuals. The sequence of eight graphs is repeated for each regulatory alternative.

1. **Modeled Cryptosporidium Source Water Distribution by Bin**
   In this step, the graph (Exhibit S.18) shows the overall source water occurrence distribution (the dashed line) of system means. It also shows how that distribution divides up into distributions by bin. Note that the distributions for each bin are not merely cut segments of the overall distribution, but overlap somewhat, reflecting the misclassification inherent in the monitoring, testing, and Maximum Running Annual Average (Max RAA) calculation that place systems into bins.

2. **Pre-LT2 Finished Water By Bin, Modeled Points**
   In this step, the graph (Exhibit S.19) repeats the distributions of source water by bin, and adds the pre-LT2 finished water concentration for each of the simulation points. The mass of data points reflects the percentages of small and large systems, the modeled treatment effectiveness based on the appropriate treatment distribution (including variability), and the effect of treatment credits. Each estimated data point only corresponds vertically to its original placement in the overall distribution curve by bin (the lines above).

3. **Pre-LT2 Finished Water by Bin, Distribution Curve**
   This graph (Exhibit S.20) resorts all the individual simulation estimates from the bottom of the graph for Step 2 (Exhibit S.19) into a single distribution curve for each bin. (The points on the finished water curve now do not correspond vertically to the source water curve because they have been resorted in order of
   concentration.)

4. **Post-LT2 Finished Water, Required Reduction, Modeled Points**
   This graph (Exhibit S.21) repeats the finished water distributions derived in Exhibit S.16, and adds for each of those simulated points, the Post-LT2 *required* log reduction. Thus, in the No Action bins, all points are exactly along the finished water curve. For an action bin, there may be several lines, reflecting that some systems must meet the stated bin requirement (such as 1 log), but others may be entitled to a half log or 1 log credit. In some cases, that may mean some systems in action bins will require no additional treatment and lie along the original finished water distribution line.

5. **Post-LT2 Finished Water, Required Reduction, Distribution Curve**
   This graph (Exhibit S.22) takes the individual points shown in the graph for Step 4 (Exhibit S.21) and resorts them into distributions. It shows two distributions by bin: the distribution of Pre-LT2 finished water and the minimum improvement required by that rule alternative.

6. **Post-LT2 Finished Water, Achieved Reduction, Modeled Points**
   This graph (Exhibit S.23) again shows the Pre-LT2 finished water distribution derived in Exhibit S.20 and shown in Exhibits S.21 and S.22. Analogous with Exhibit S.21, this graph shows the simulation points based on the *achieved* log reductions. Because the Decision Tree includes

many technologies that achieve different log reductions, there can be multiple lines. For example, for "systems" in a 1 log bin, they may achieve 0.0 log reduction (because they are entitled to a 1 log credit and need no further treatment), a half-log reduction (because they are entitled to a 0.5 log credit and choose a technology that achieves only a half log of treatment), or any degree of treatment up to 3.0 logs.

7. **All Finished Water Distributions by Bin**
This graph (Exhibit S.24) includes the distributions from the graph from Step 5 (finished water and "required", Exhibit S.22), and adds the resorted distribution of "as achieved" from the graph for Step 6 (Exhibit S.23). In this one graph, each bin shows the finished water occurrence, the required improvement, and the improvement achieved.

8. **Annual Individual Risk by Bin**
Exhibit S.6 takes the distributions from the graph for Step 7 and computes the distributions in terms of annual individual risk of illness. As expected, the same general shapes of the curves from Exhibit S.24 are seen. Again, these graphs do not include the variability related to ingestion, and therefore are not exactly comparable to the graphs used in the Economic Analysis (Exhibits 5.12 and C.11). Those graphs show somewhat steeper peaks due to accounting for the above average ingestion levels by some individuals.

Exhibit S.18

Modeled Cryptosporidium Source Water Distribution by Bin
ICR CWS Option A2

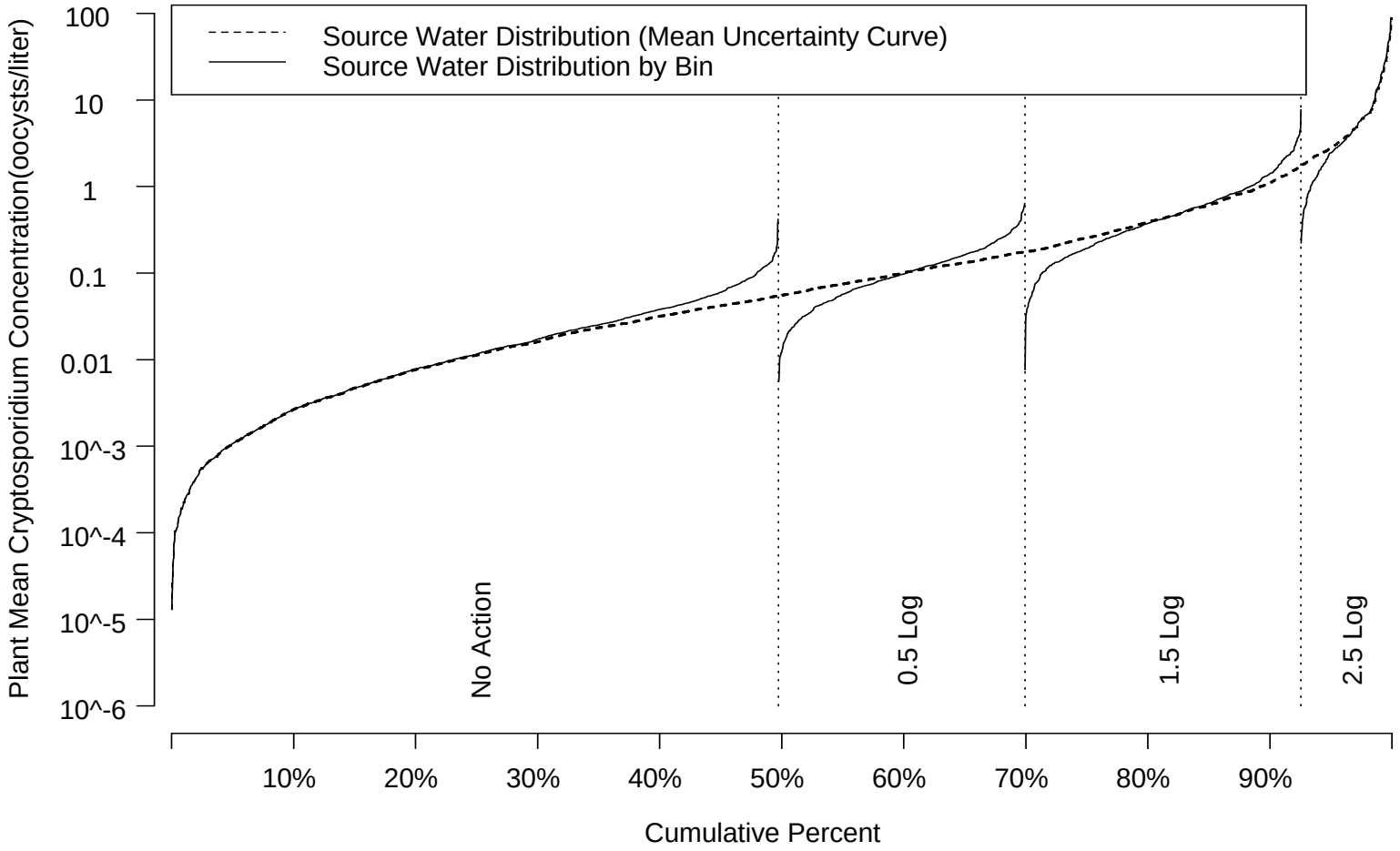


Exhibit S.19

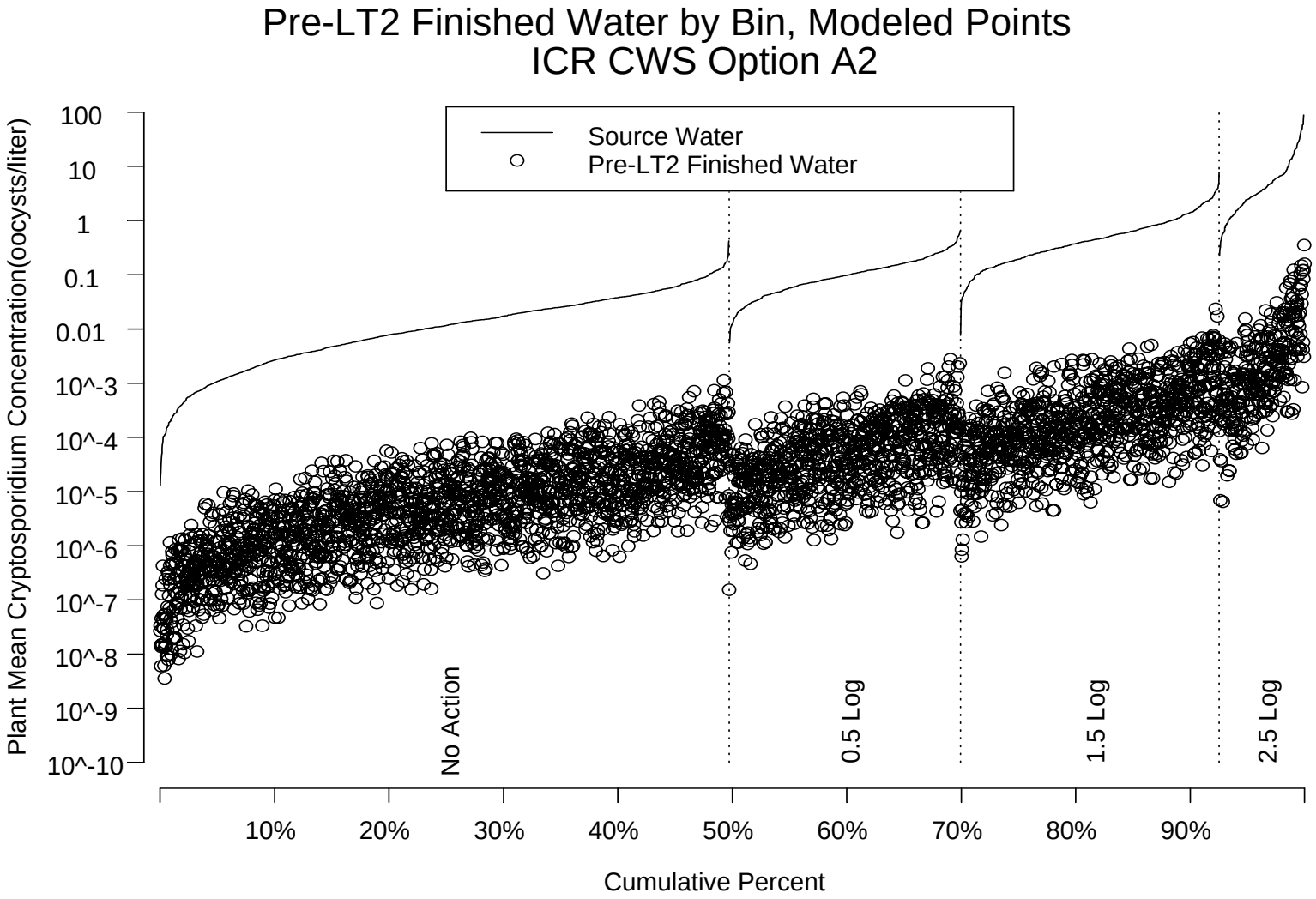

Pre-LT2 Finished Water by Bin, Modeled Points
ICR CWS Option A2
Source Water
Pre-LT2 Finished Water
Plant Mean Cryptosporidium Concentration(oocysts/liter)
100
10
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
10^-9
10^-10
No Action
0.5 Log
1.5 Log
2.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.20

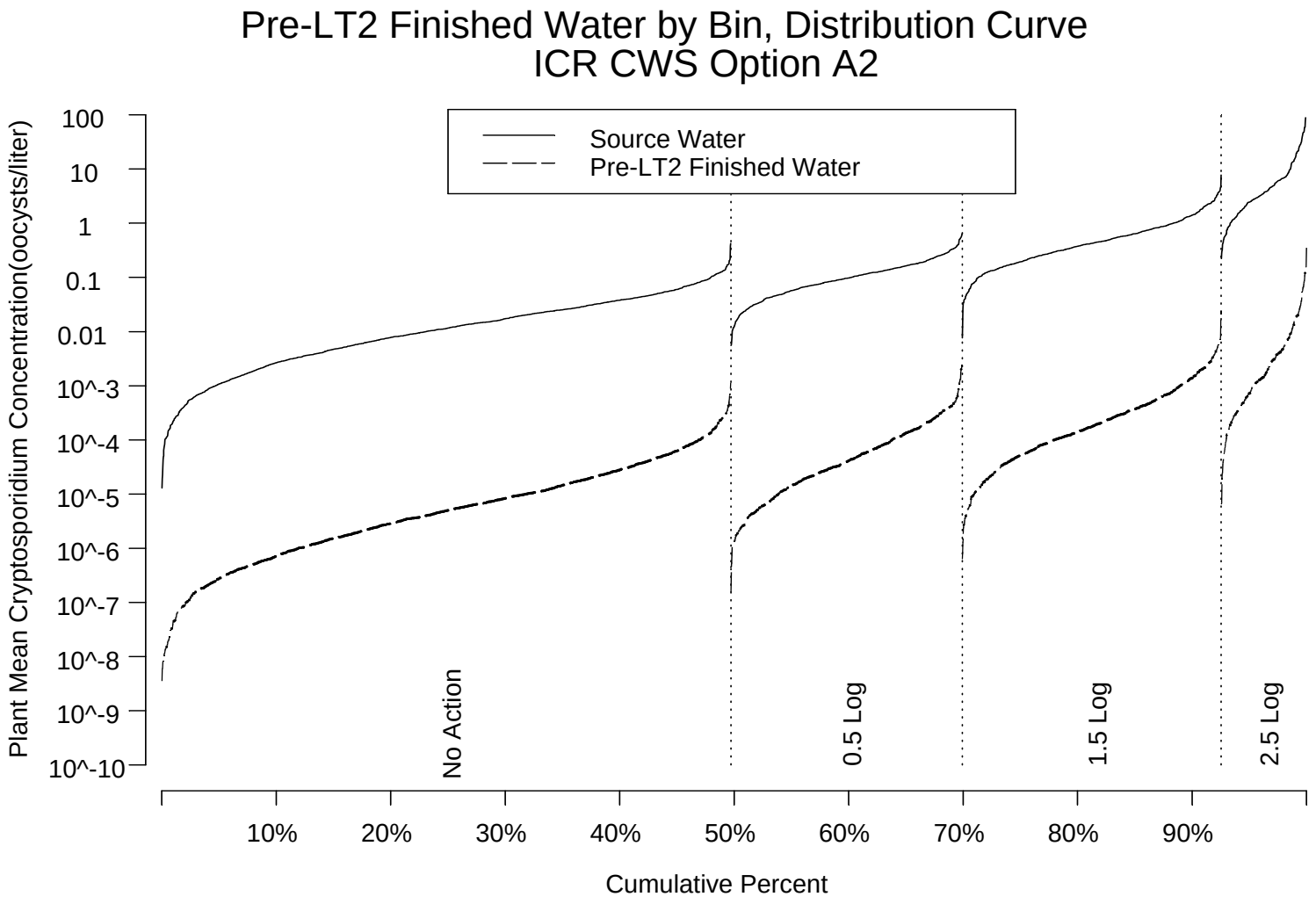

Pre-LT2 Finished Water by Bin, Distribution Curve
ICR CWS Option A2
Source Water
Pre-LT2 Finished Water
Plant Mean Cryptosporidium Concentration(oocysts/liter)
100
10
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
10^-9
10^-10
No Action
0.5 Log
1.5 Log
2.5 Log
10%
20%
30%
40%
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.21

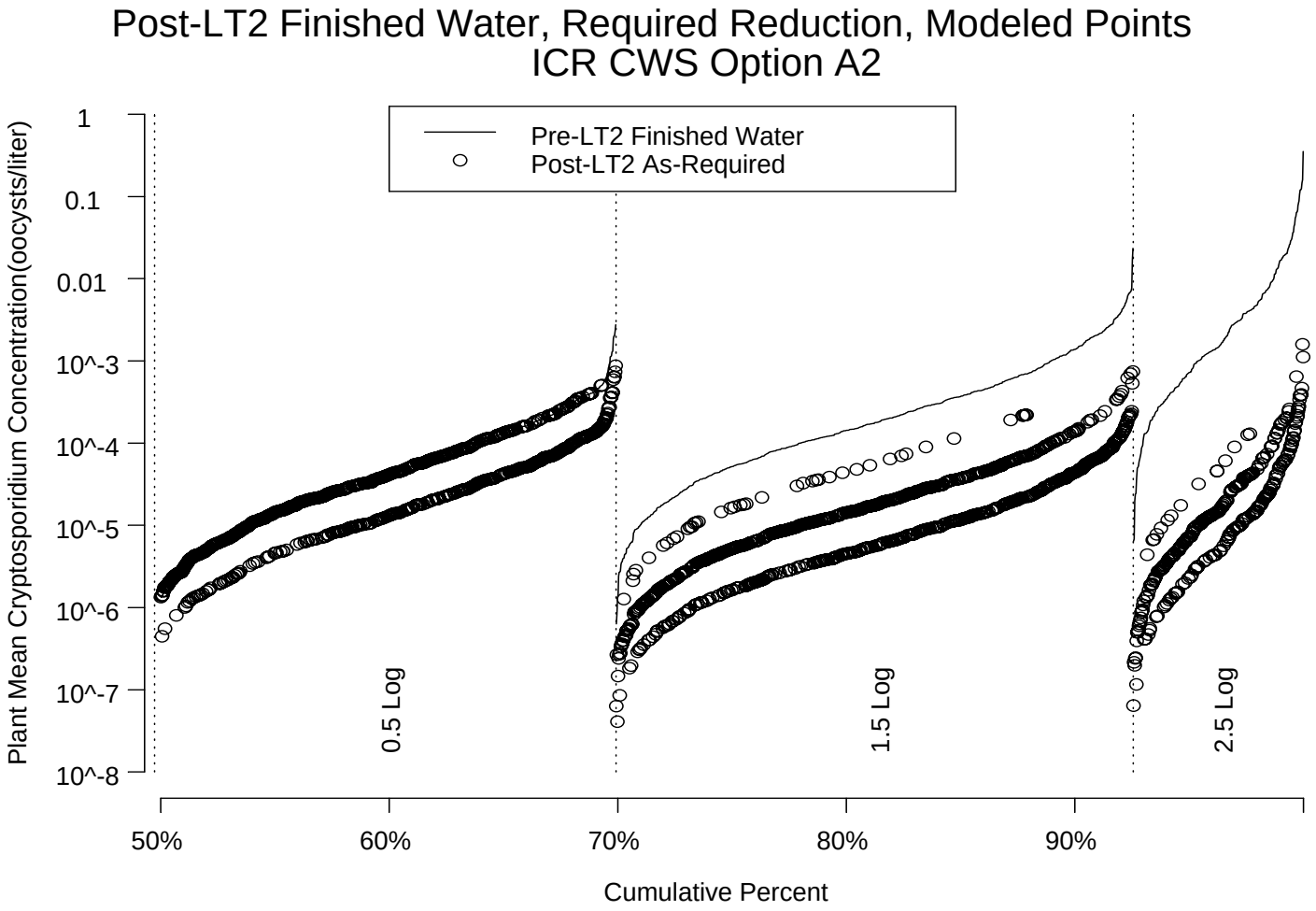

Post-LT2 Finished Water, Required Reduction, Modeled Points
ICR CWS Option A2
Pre-LT2 Finished Water
Post-LT2 As-Required
Plant Mean Cryptosporidium Concentration(oocysts/liter)
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0.5 Log
1.5 Log
2.5 Log
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.22

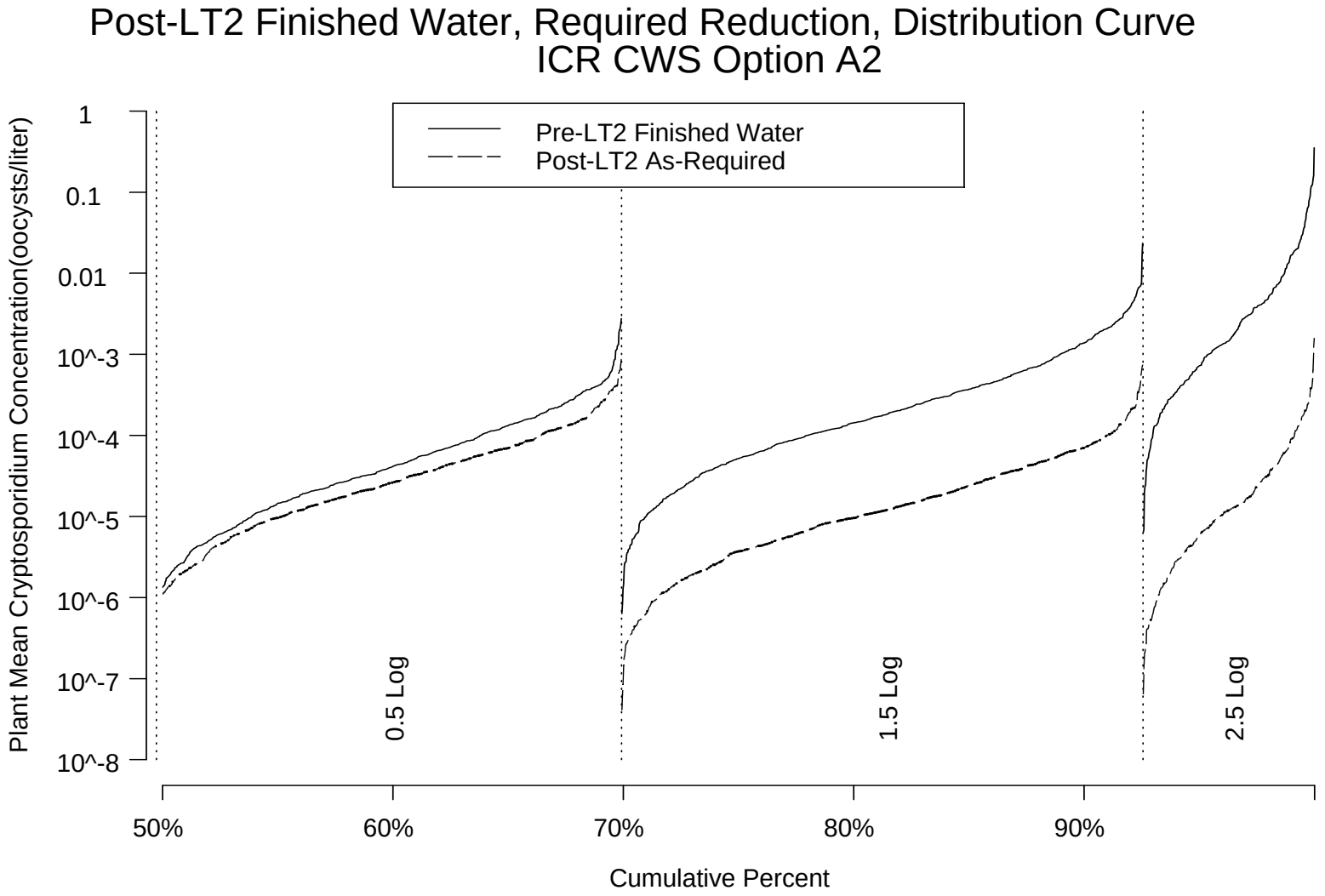

Post-LT2 Finished Water, Required Reduction, Distribution Curve
ICR CWS Option A2
Pre-LT2 Finished Water
Post-LT2 As-Required
Plant Mean Cryptosporidium Concentration(oocysts/liter)
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0.5 Log
1.5 Log
2.5 Log
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.23

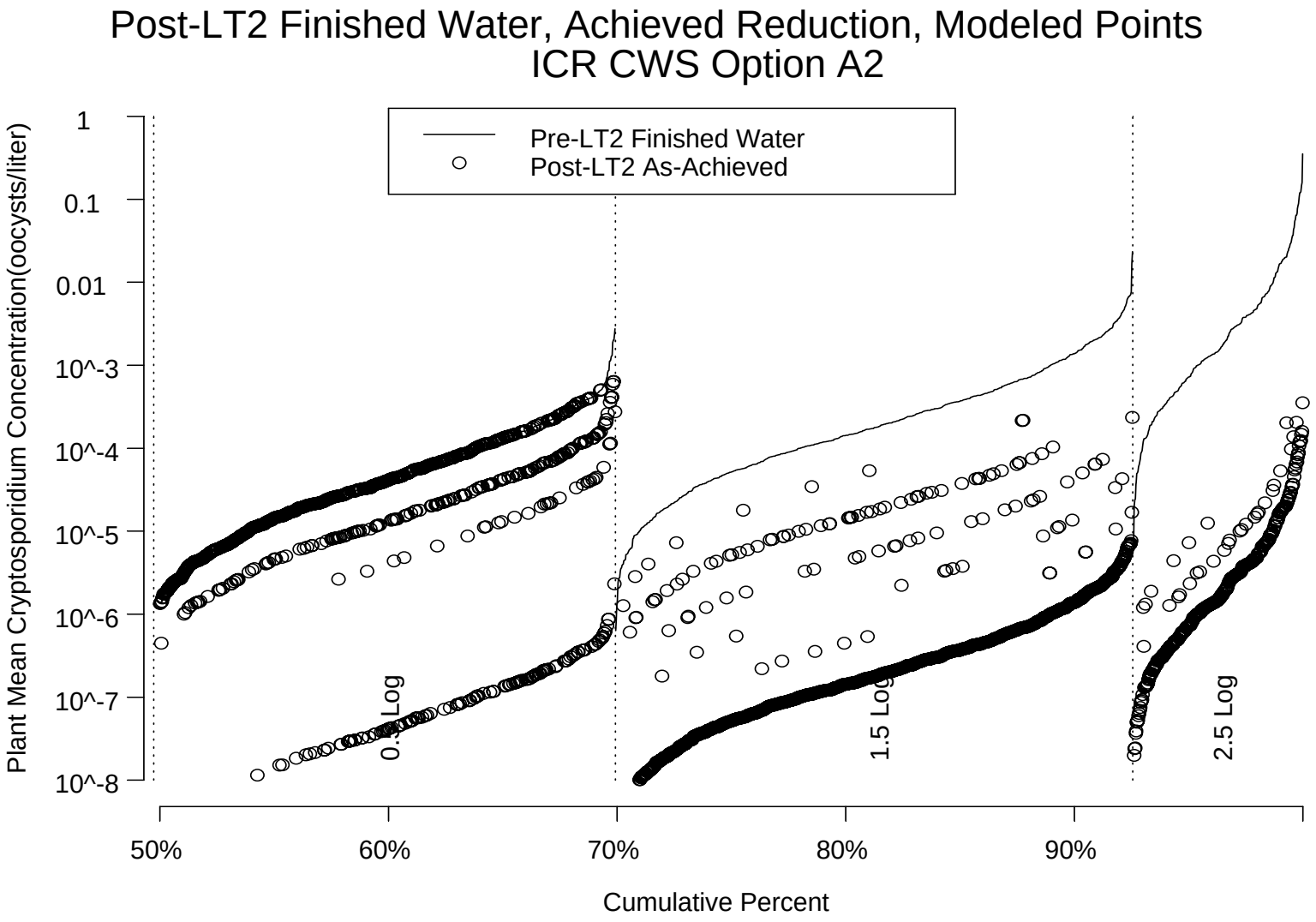
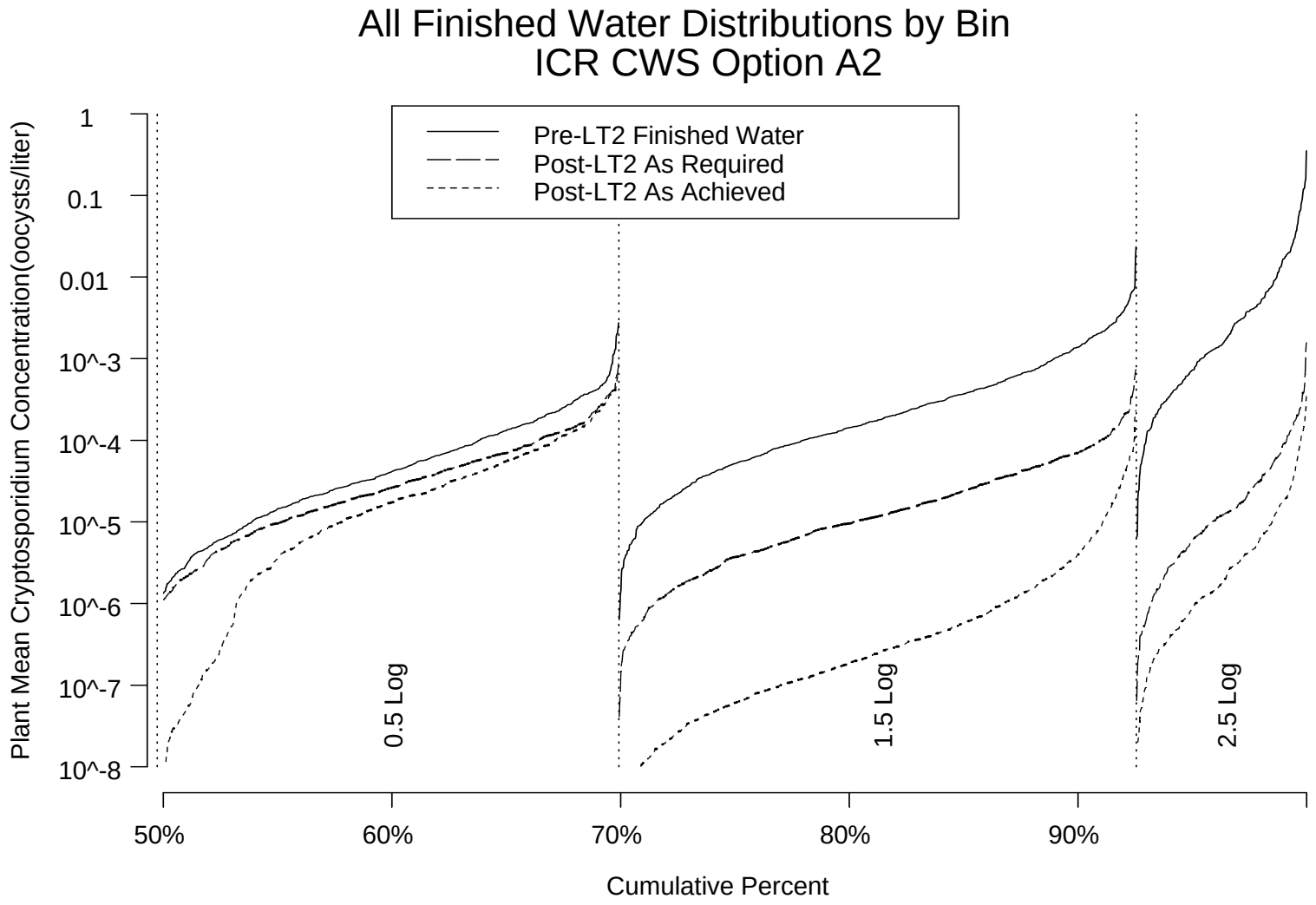

Post-LT2 Finished Water, Achieved Reduction, Modeled Points
ICR CWS Option A2
Pre-LT2 Finished Water
Post-LT2 As-Achieved
Plant Mean Cryptosporidium Concentration(oocysts/liter)
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0.5 Log
1.5 Log
2.5 Log
50%
60%
70%
80%
90%
Cumulative Percent

Exhibit S.24

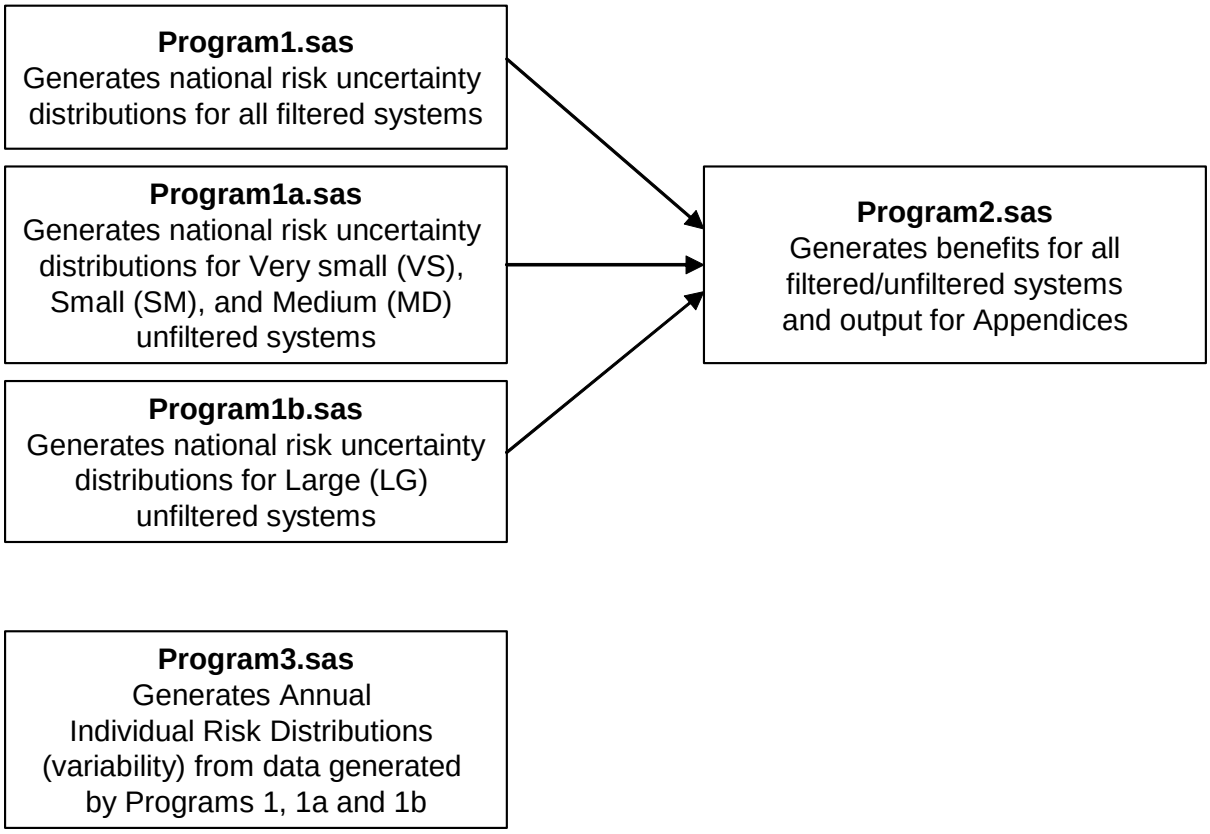

All Finished Water Distributions by Bin
ICR CWS Option A2
Pre-LT2 Finished Water
Post-LT2 As Required
Post-LT2 As Achieved
Plant Mean Cryptosporidium Concentration(oocysts/liter)
1
0.1
0.01
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0.5 Log
1.5 Log
2.5 Log
50%
60%
70%
80%
90%
Cumulative Percent

Appendix T
Risk Assessment Model—Program and Data Files

T.1 Summary

This appendix describes the program and data files used in the LT2ESWTR risk assessment model. It is meant to be used in conjunction with running the SAS Risk and Benefits model, provided on CD. It describes the general progression of the programs, the inputs to the model (constants and distributions), macros used in the intermediate steps, and the Excel output files. The chapter and appendix exhibits containing the model outputs are also noted at the relevant steps.

Running the SAS Risk and Benefits Model



Excel Outputs

VSL_Stats.xls

Mean of Yearly Values for a Statistical Life (simulation results) Appendix C

ICR_NomBenefits_a3_enhan.xls,
ICR_NomBenefits_a3_trad.xls

Nominal Benefits for ICR, A3 (Enhanced and Traditional COI) Appendix C

CasesAvoid_BenefitAnn_3_enhan.xls (Exhibit C4a),
CasesAvoid_BenefitAnn_3_trad.xls (Exhibit C4b),
CasesAvoid_BenefitAnn_7_enhan.xls (Exhibit C5a),
CasesAvoid_BenefitAnn_7_trad.xls (Exhibit C5b),

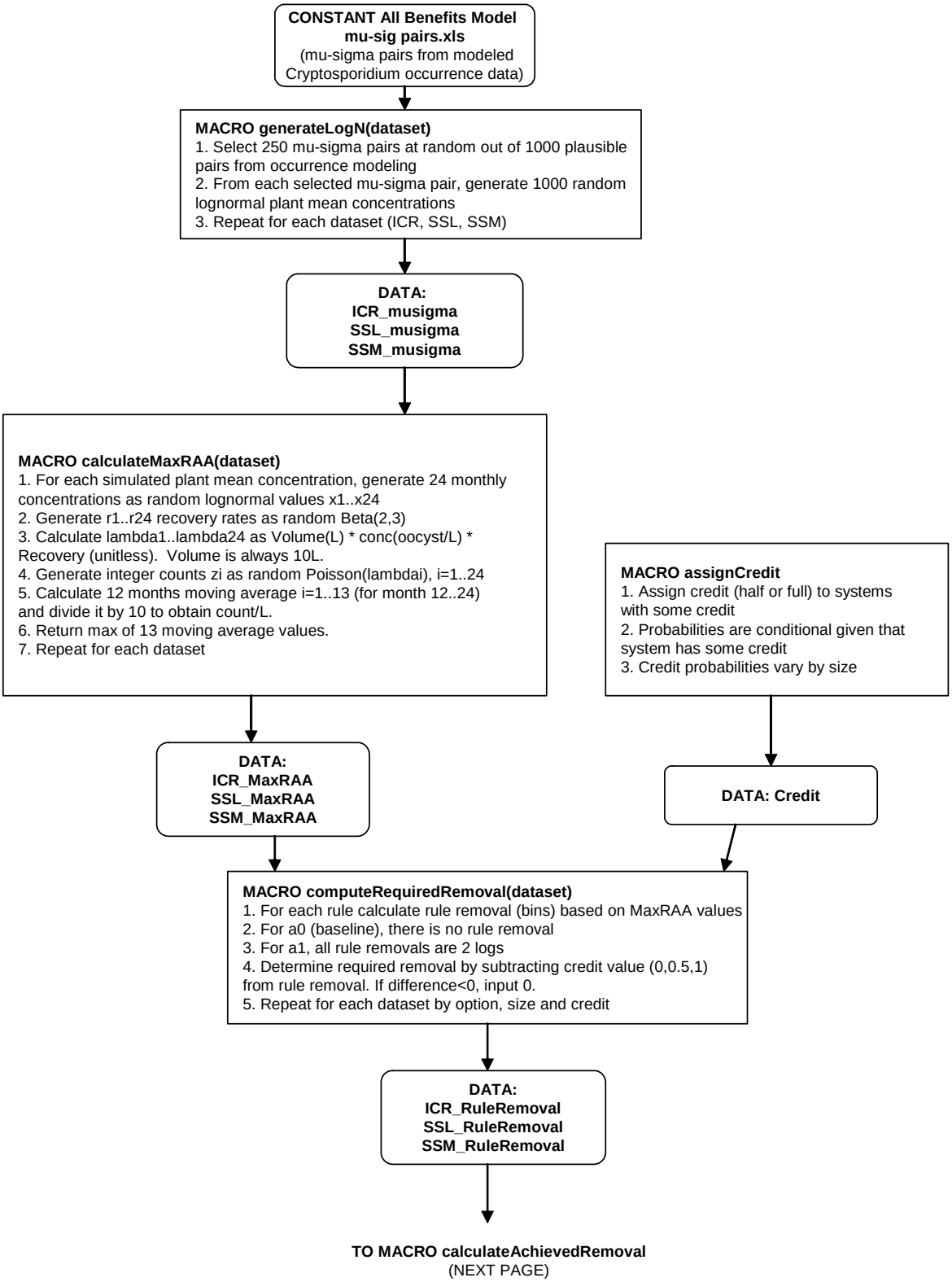
CasesAvoid_BenefitAnn_filt_3_enhan.xls (Exhibit C6a),
CasesAvoid_BenefitAnn_filt_3_trad.xls (Exhibit C6b),
CasesAvoid_BenefitAnn_filt_7_enhan.xls (Exhibit C8a),
CasesAvoid_BenefitAnn_filt_7_trad.xls (Exhibit C8b),
CasesAvoid_BenefitAnn_unfilt_3_enhan.xls (Exhibit C7a),
CasesAvoid_BenefitAnn_unfilt_3_trad.xls (Exhibit C7b),
CasesAvoid_BenefitAnn_unfilt_7_enhan.xls (Exhibit C9a),
CasesAvoid_BenefitAnn_unfilt_7_trad.xls (Exhibit C9b)

Cases Avoided-Benefits Annualized tables for 3% and 7% discount rate, All/filtered/unfiltered systems and enhanced/traditional COI
Appendix C

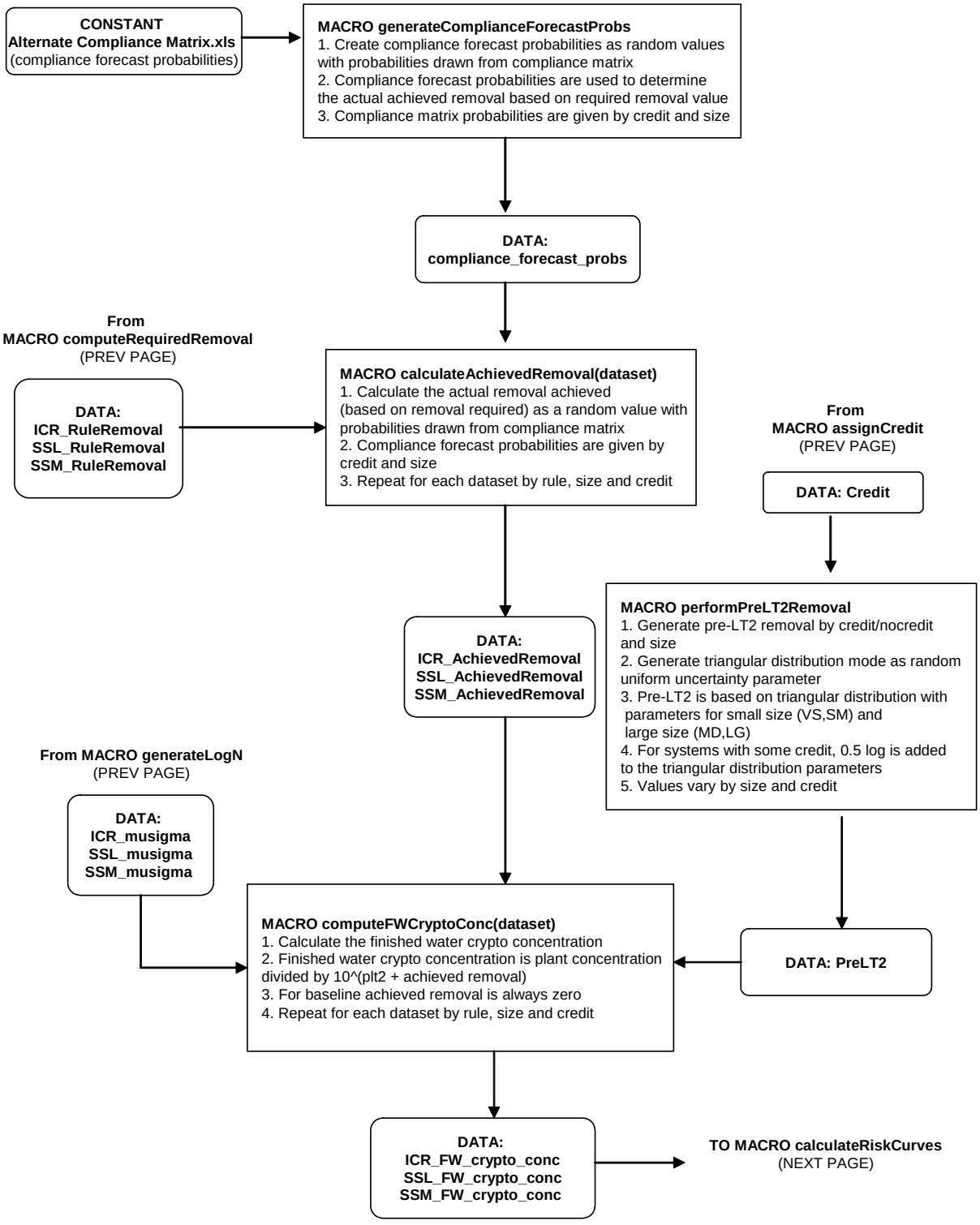
PV_Benefits_3_enhan.xls,
PV_Benefits_3_trad,
PV_Benefits_7_enhan.xls,
PV_Benefits_7_trad.xls,

Present Value summary statistic tables for 3% and 7% discount rates, all systems, and enhanced/traditional COI
Appendix O

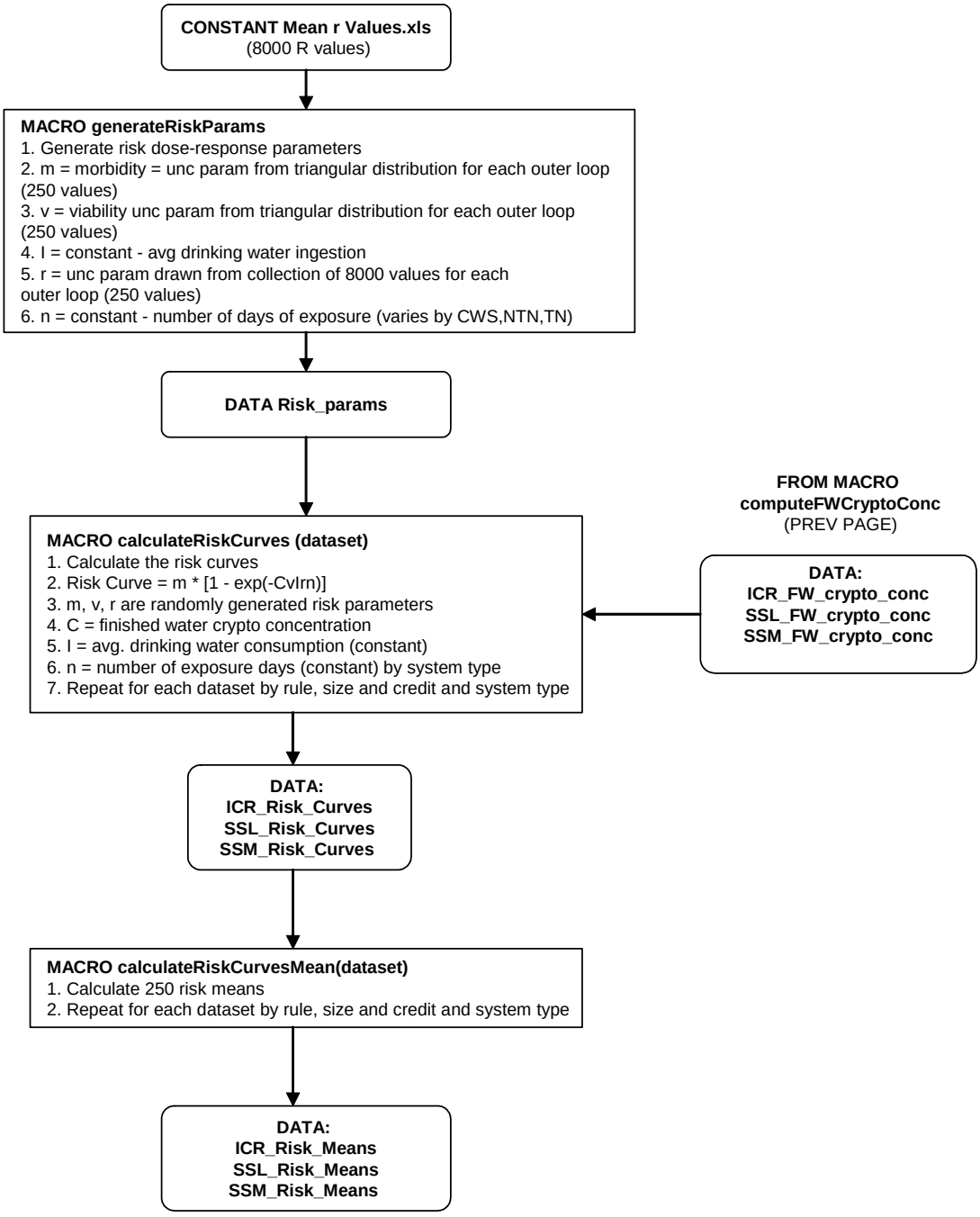
Program1.sas – Calculating Risk Uncertainty Distributions for Filtered Systems



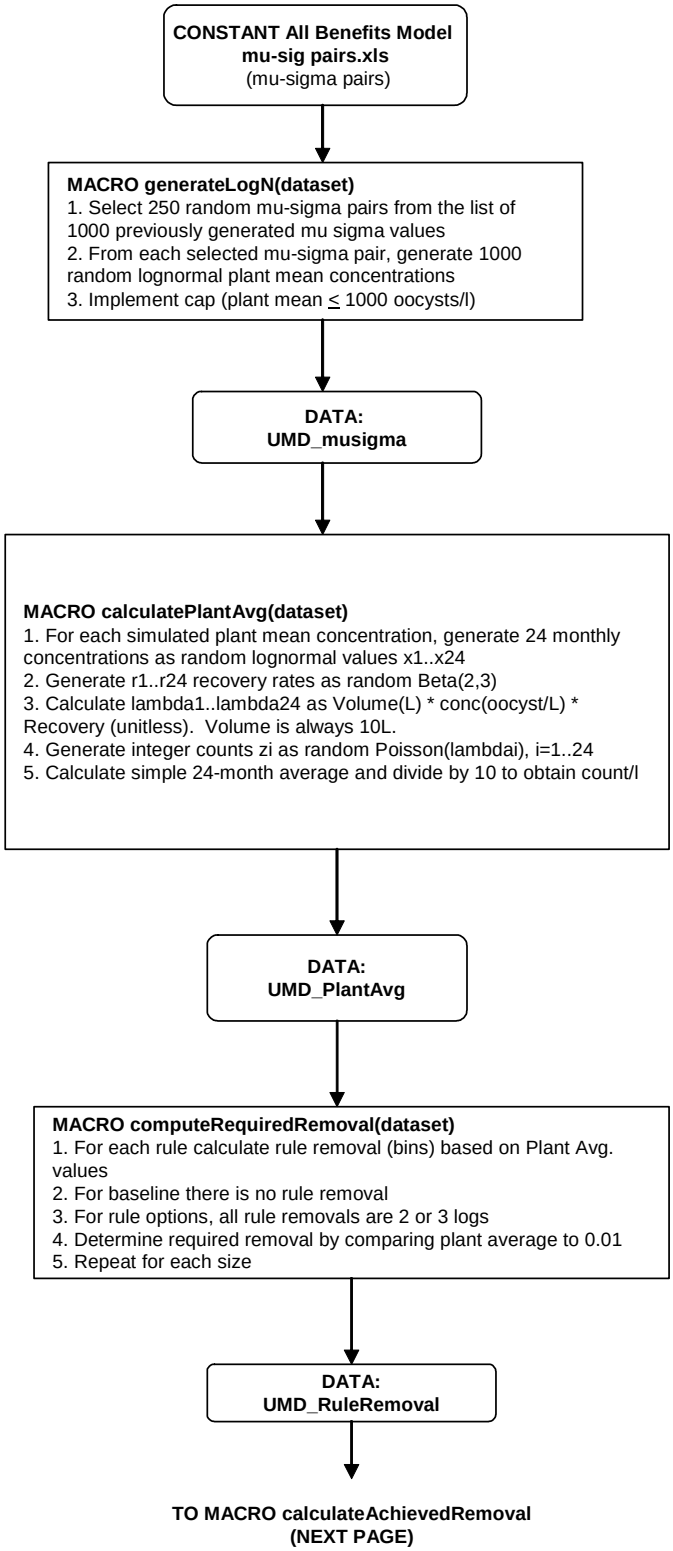
Program1.sas – Calculate Risk Uncertainty Distributions for Filtered Systems



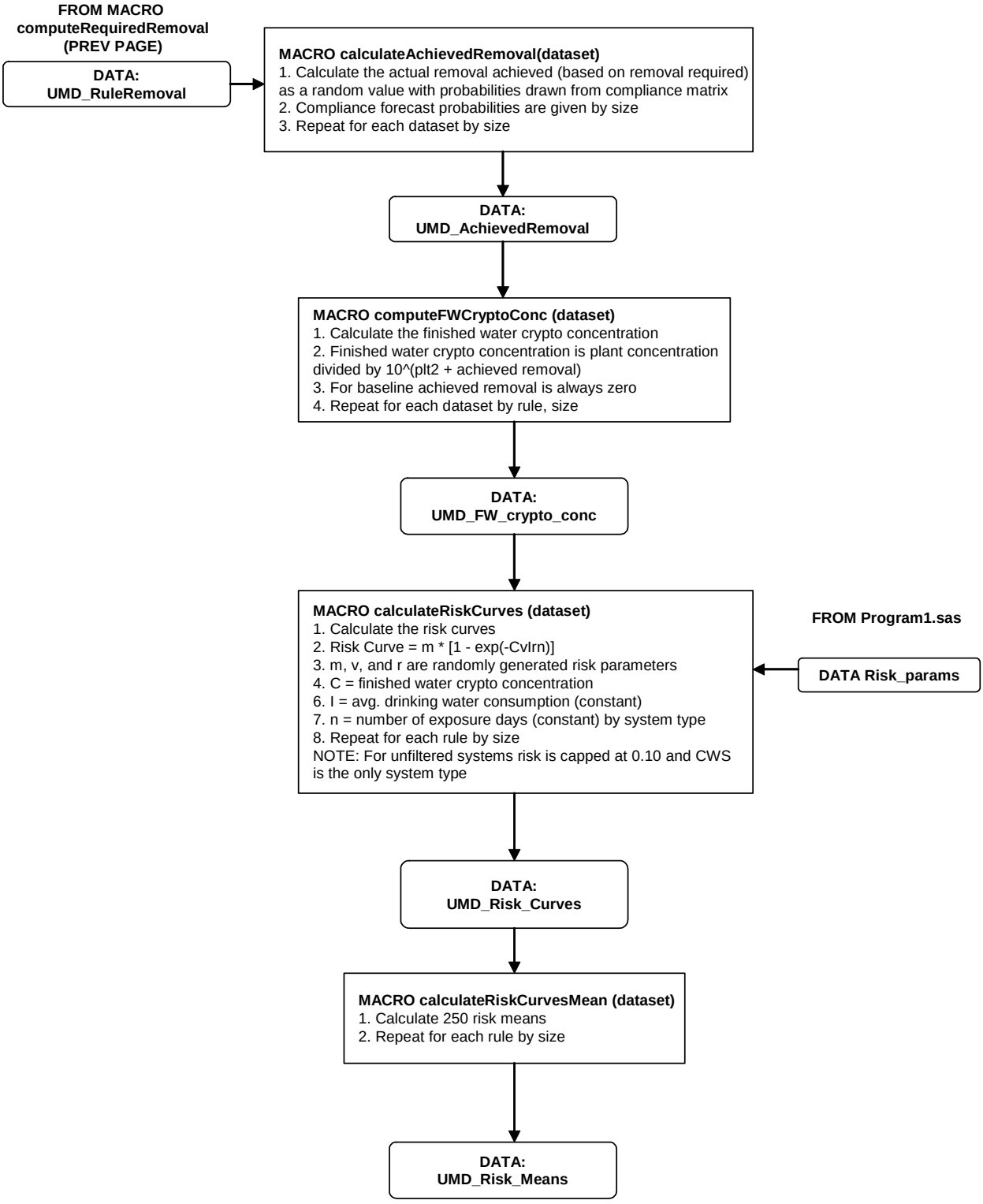
Program1.sas – Calculate Risk Uncertainty Distributions for Filtered Systems



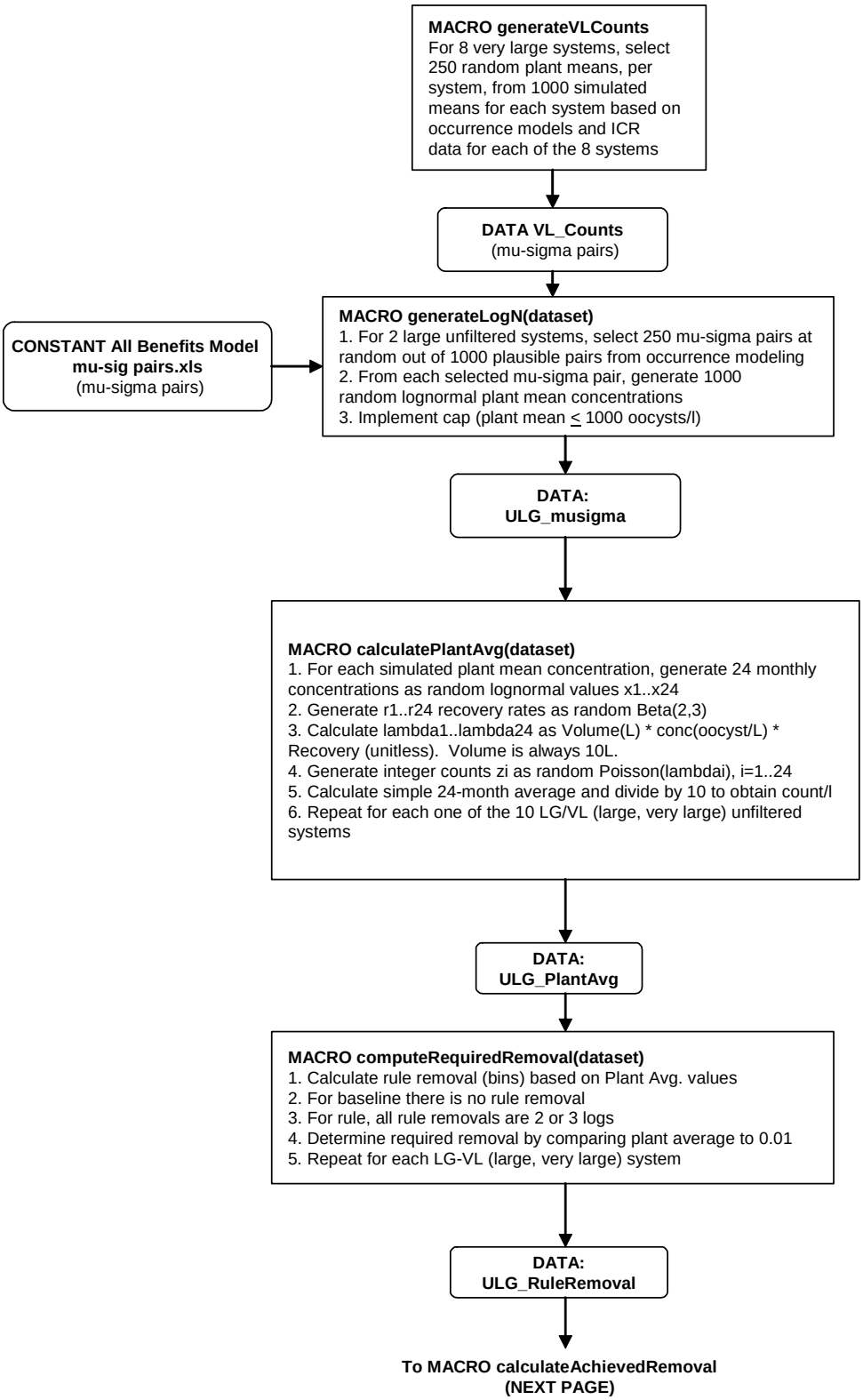
Program1a.sas – Calculate Risk Uncertainty Distributions for VS (very small), SM (small), and MD medium) Unfiltered Systems (using MD as an example)



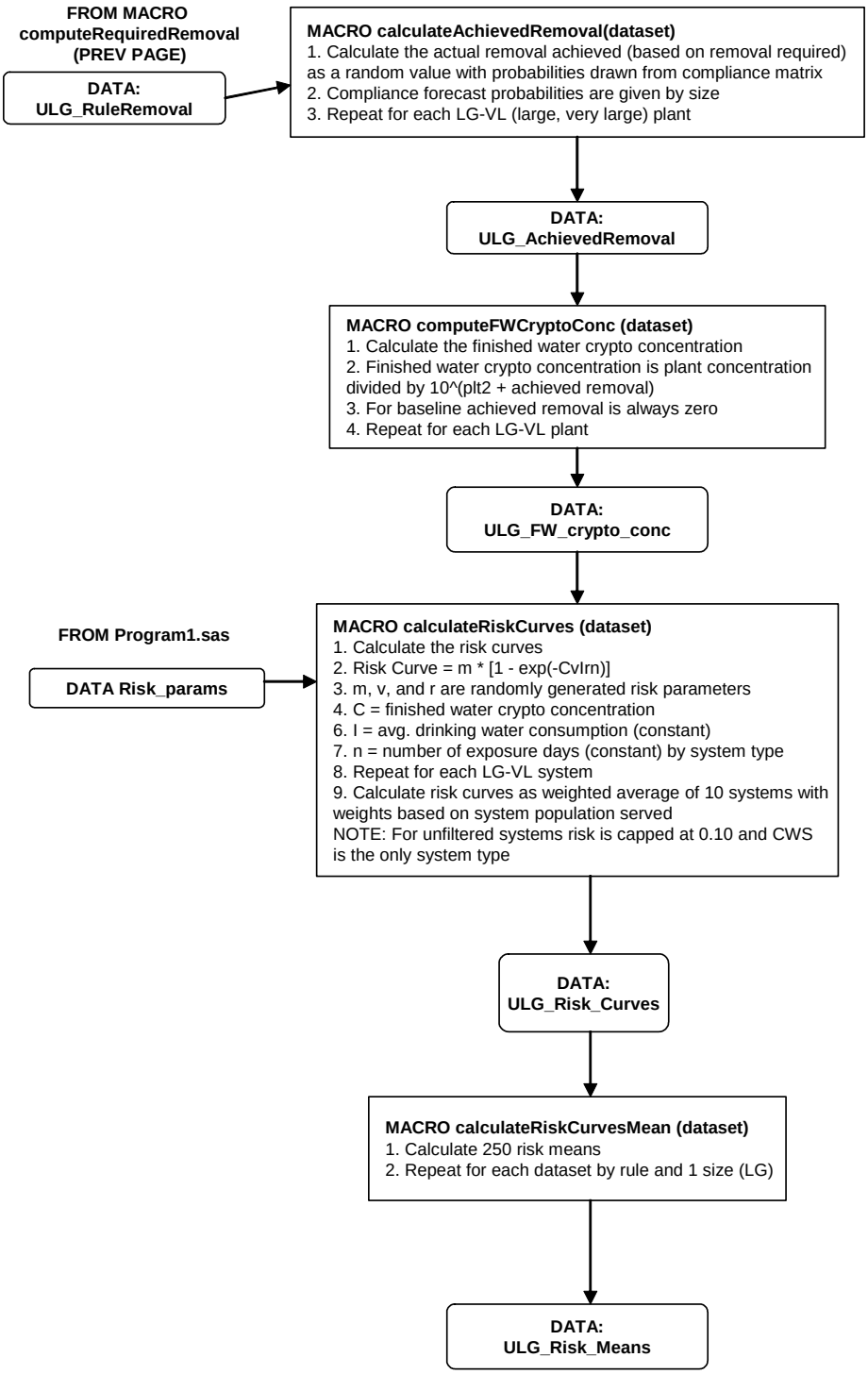
Program1a.sas – Calculate Risk Uncertainty Distributions for VS (very small), SM (small), and MD (medium) Unfiltered Systems (using MD as an example)



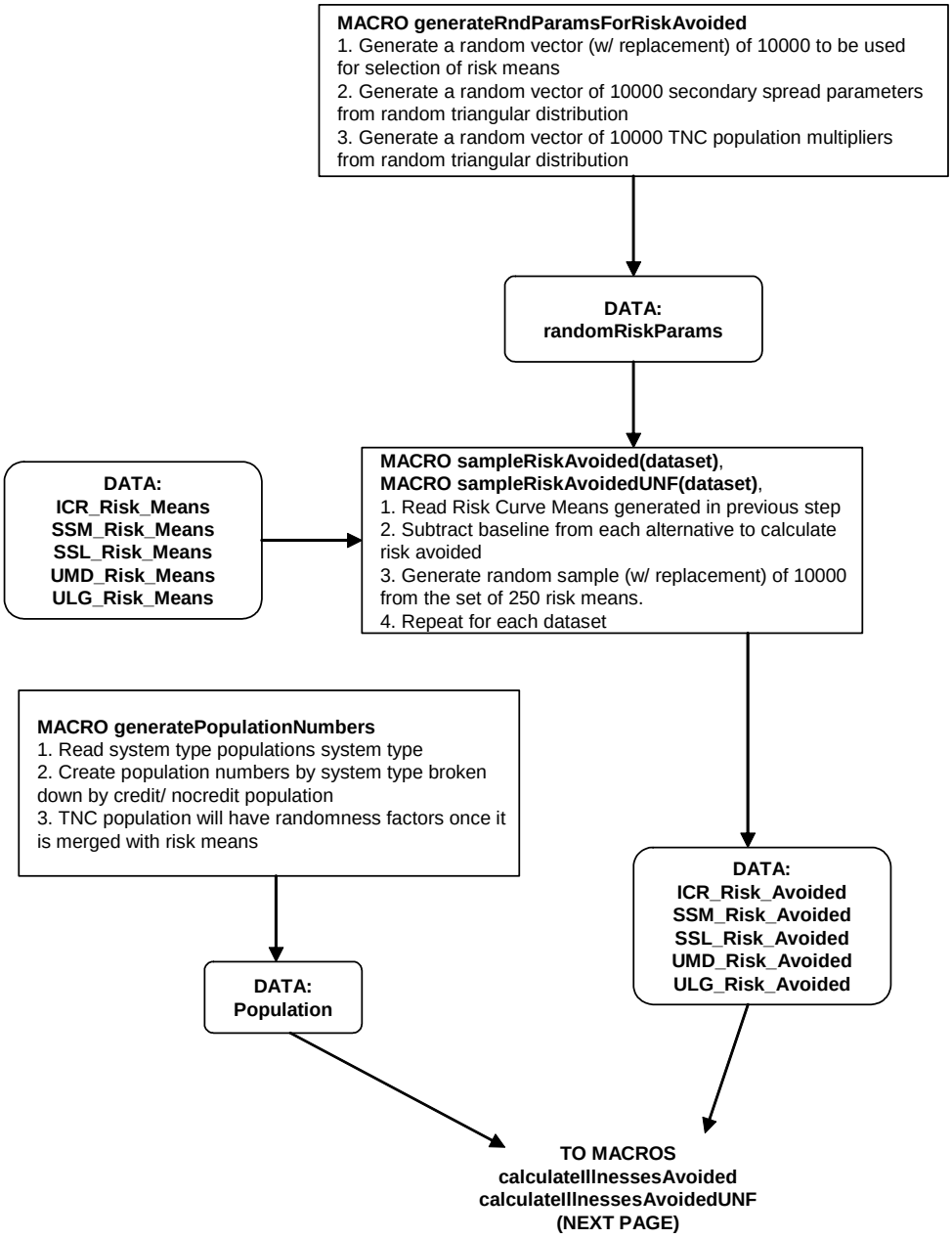
Program1b.sas – Calculate Risk Uncertainty Distribution for LG (large) Unfiltered Systems



Program1b.sas – Calculate Risk Uncertainty Distributions for LG Unfiltered Systems (cont)



Program2.sas - Generates benefits for filtered/unfiltered systems and output for Appendices



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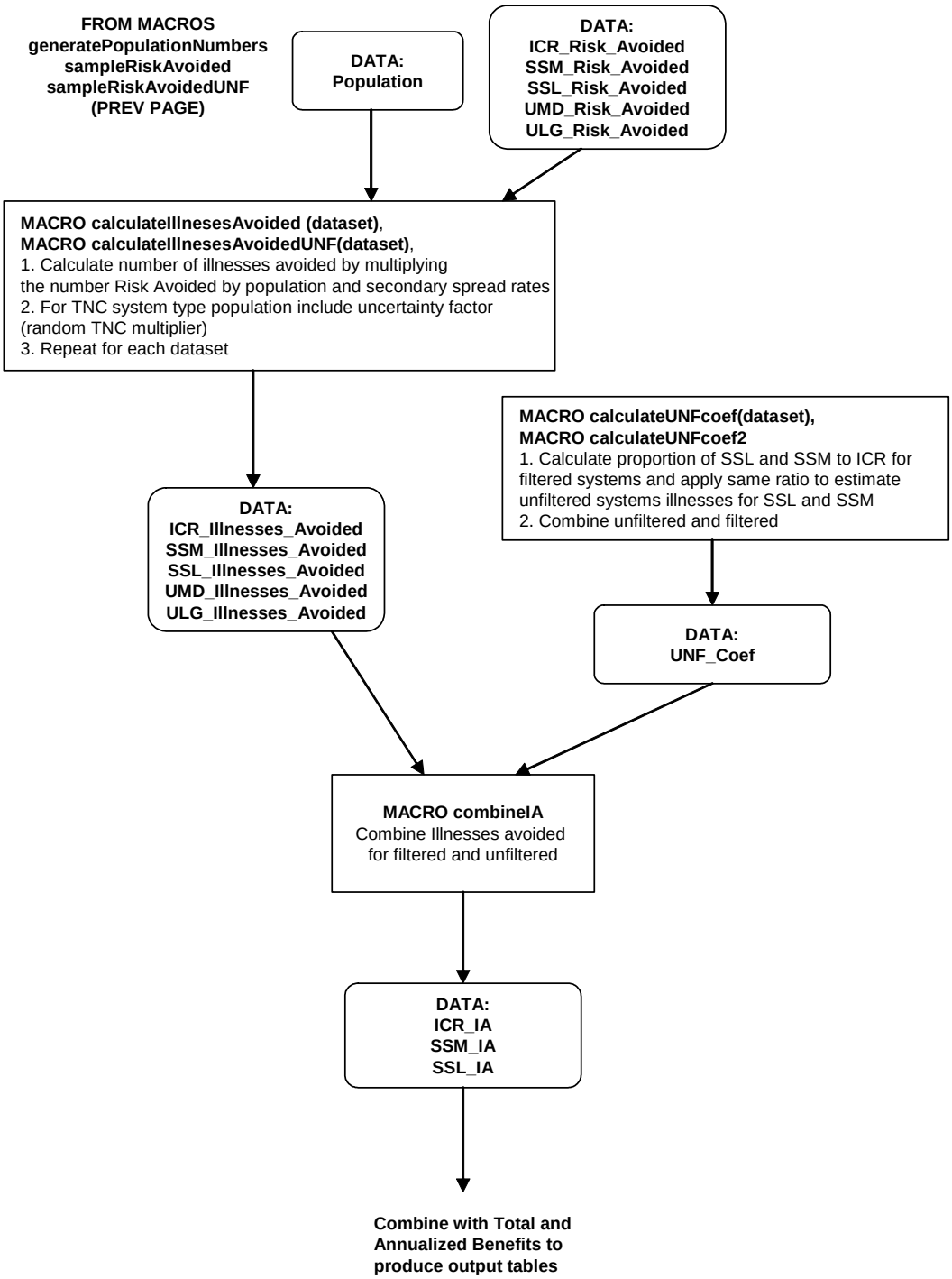

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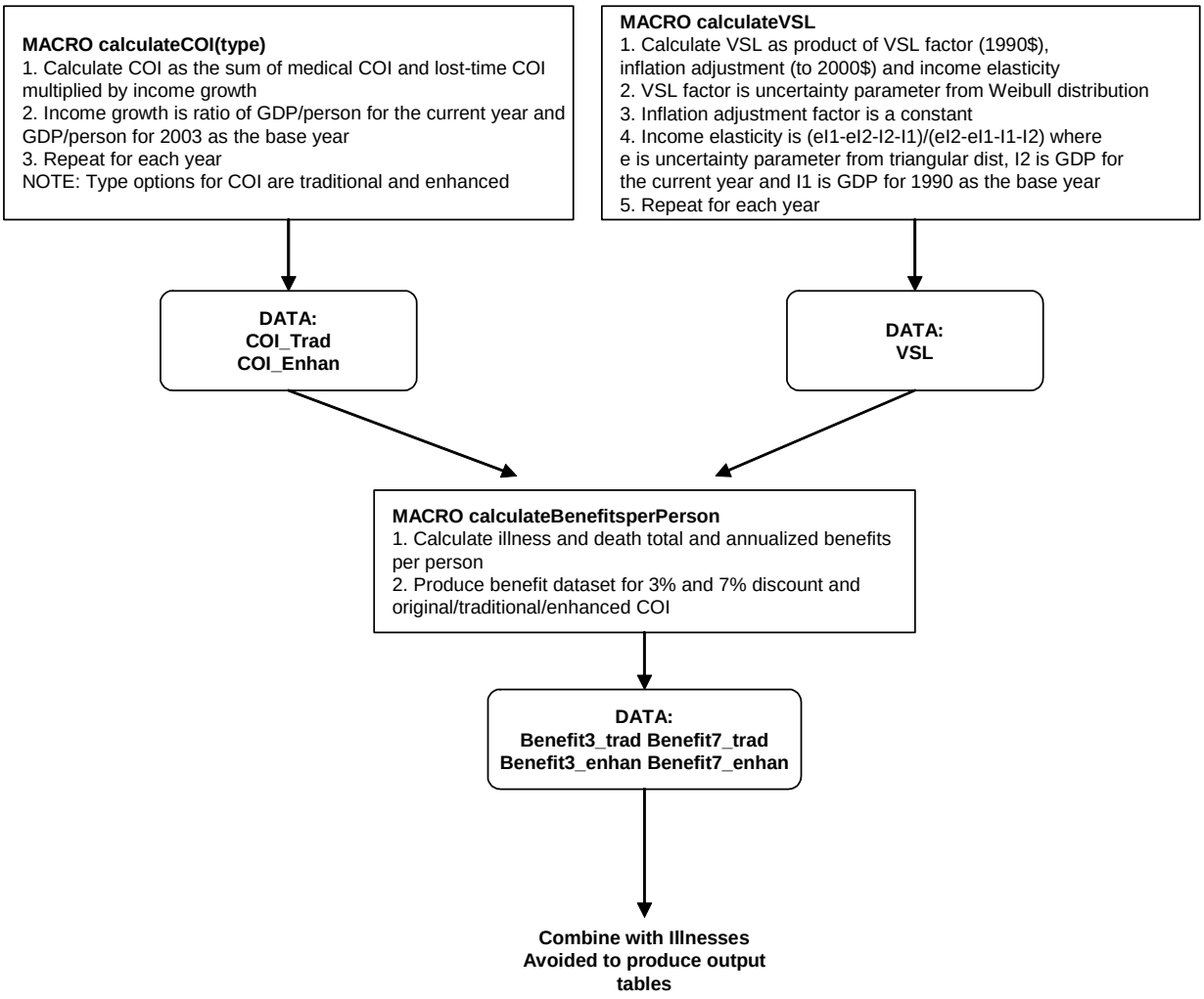

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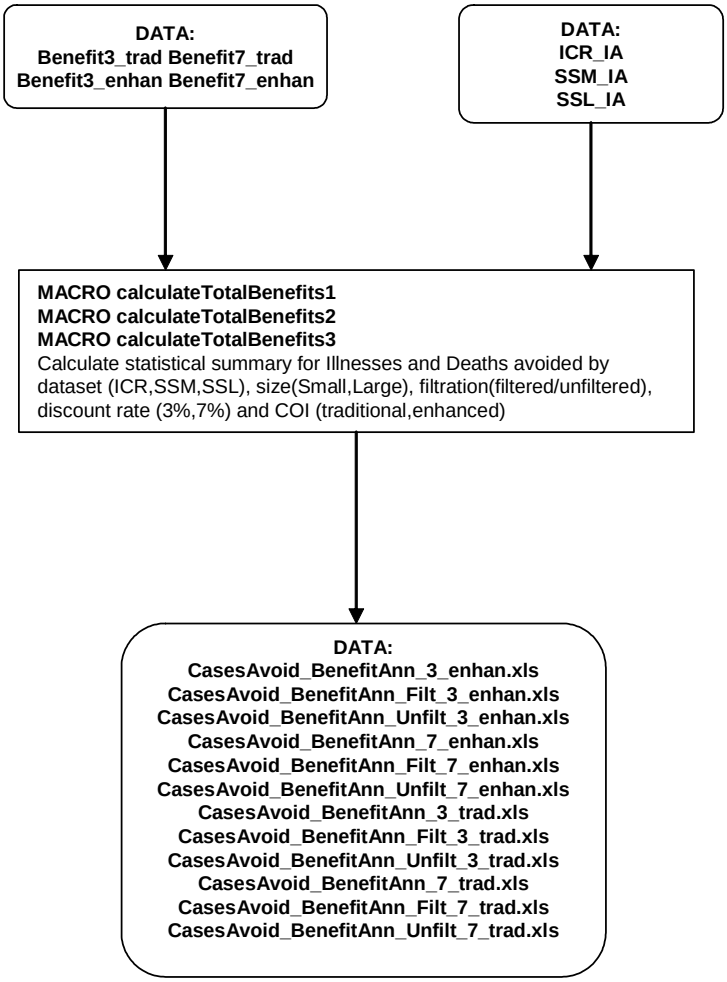

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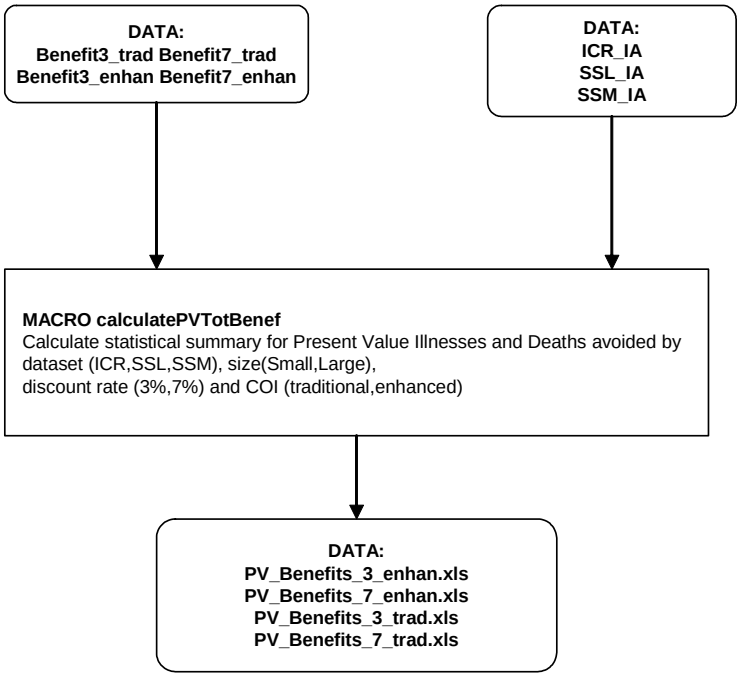
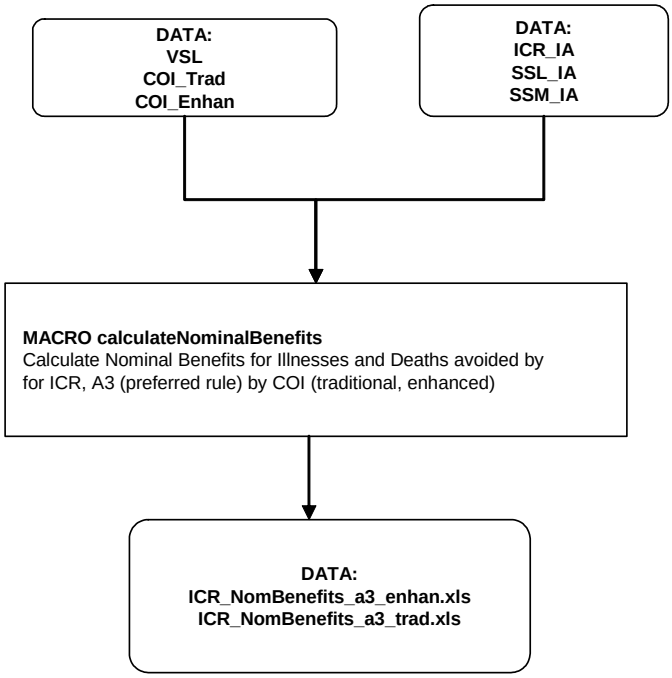
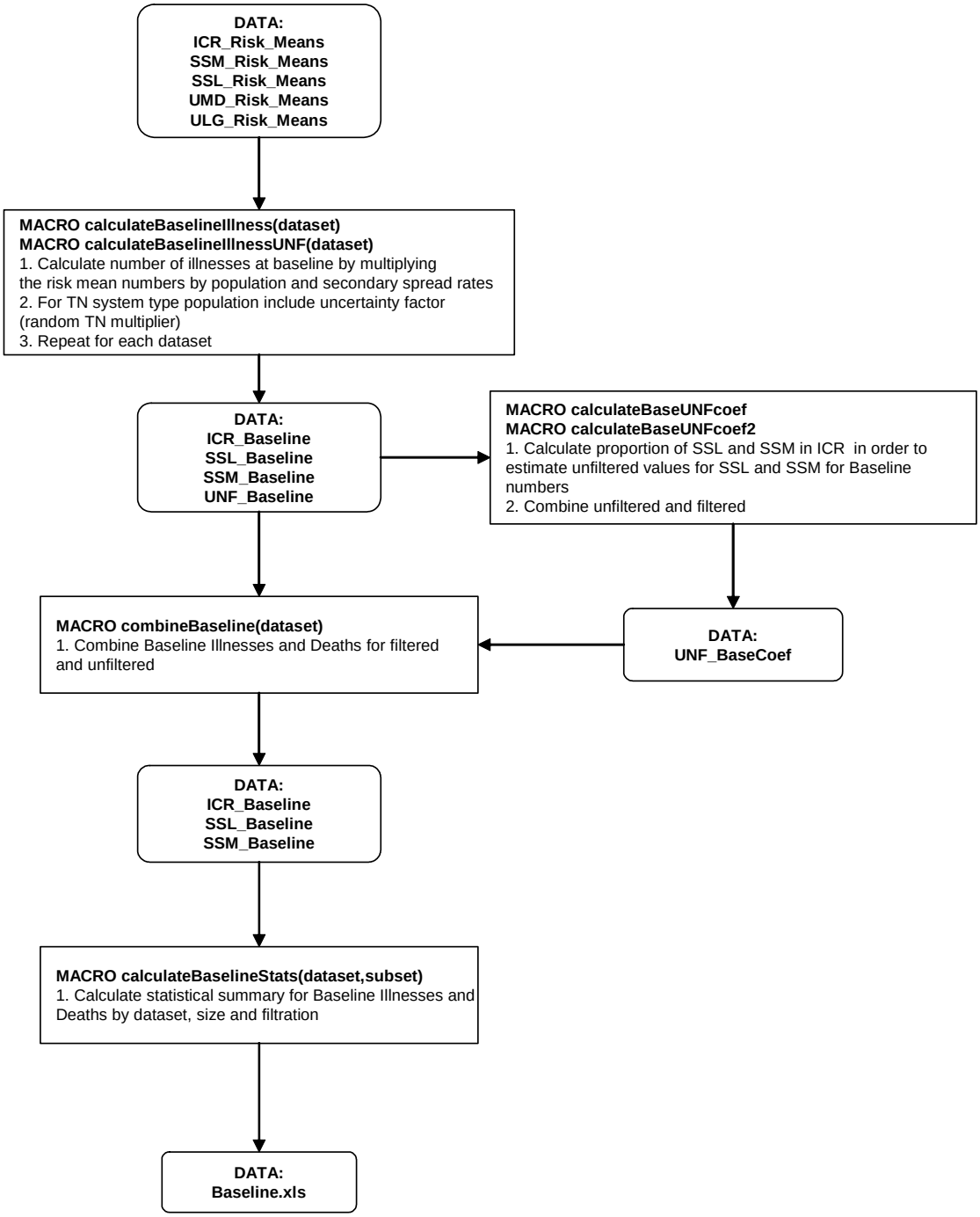


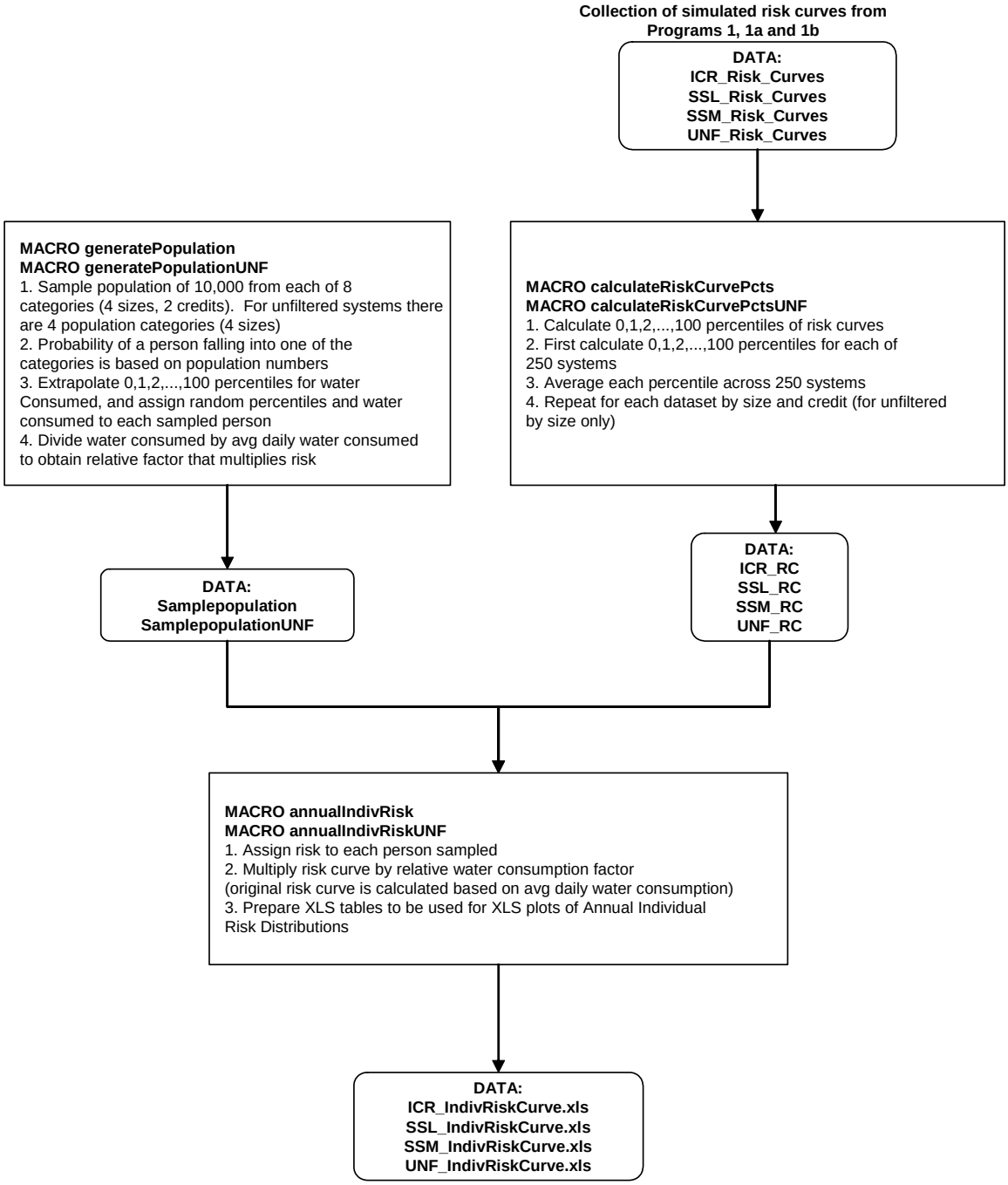
Program2.sas - Generates benefits for filtered/unfiltered systems and output for Appendices (Produce Nominal Benefits for Exhibits O.7.d, O.7e)



Program2.sas - Generates benefits for filtered/unfiltered systems and output for Appendices (Produce Baseline Illnesses/Deaths for Exhibit C3)



Program3.sas - Generates data for Annual Individual Risk Distributions



Appendix U
Cost Effectiveness Analysis Using a Quality-Adjusted Life Years Approach

U.1 Introduction

This Appendix provides a description and results of an experimental approach to developing a cost effectiveness analysis (CEA) for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) using quality-adjusted life years (QALYs). A previous regulatory impact analysis for the Final Clean Air Interstate Rule (CAIR, Appendix G, 2005) also explored using QALYs. Significant language from that EPA report is used in this Appendix, even though not always directly cited.

U.1.1 Cost-Effectiveness Analysis

Health-based CEA and has been used to analyze numerous health interventions but have not been widely adopted as tools to analyze environmental policies. The Office of Management and Budget (OMB) has issued Circular A-4 guidance on regulatory analyses, requiring federal agencies to

> … prepare a CEA for all major rulemakings for which the primary benefits are improved public health and safety to the extent that a valid effectiveness measure can be developed to represent expected health and safety outcomes.[1]

Environmental quality improvements may have multiple health and ecological benefits, making application of CEA more difficult and less straightforward. For the LT2ESWTR, CEA can provide a framework for analysis: nonhealth benefits are few, and all of the quantified benefits come from health effects. Therefore, EPA is including in the LT2ESWTR Economic Analysis (EA) a preliminary and experimental application of one type of CEA—a quality-adjusted life years (QALYs) approach.

Analyses of environmental regulations have typically used benefit-cost analysis (BCA) to characterize impacts on social welfare. BCA allows for aggregation of the benefits of reducing mortality and morbidity risks with other monetized benefits of increasing water quality. One of the great advantages of the benefit-cost paradigm is that a wide range of quantifiable benefits can be compared to costs to evaluate the economic efficiency of particular actions. However, an alternative paradigm such as CEA has also been used. CEA involves estimation of the costs per unit of benefit (e.g., lives or life years saved) and may incorporate preference-based measures of effectiveness, such as QALYs.

CEA has been used for comparing programs that have similar goals, for example, alternative medical interventions or treatments that can save a life or cure a disease. Specifically, QALY-based CEA has been widely adopted within the health economics literature (Neumann, 2003; Gold et al., 1996) and in the analysis of public health interventions (US FDA, 2004). In addition, the World Health Organization has adopted the use of disability-adjusted life years, a variant on QALYs, to assess the global burden of disease due to different causes, including environmental pollution (Murray et al., 2002; de Hollander et al., 1999). Also, the U.S. Public Health Service Panel on Cost Effectiveness in Health and Medicine recommended using QALYs when evaluating medical and public health programs that primarily reduce both mortality and morbidity (Gold et al., 1996).

[1] Office of Management and Budget Circular A-4, September 17, 2003, page 9.

U.1.2 QALY Methodology

When using a QALY rating system, health quality ranges from 0 to 1, where 1 may represent full health, 0 death, and some number in between (e.g., 0.8) an impaired condition. QALYs assume that duration and quality of life are interchangeable, or "equivalent", so that 1 year spent in perfect health is equivalent to 2 years spent with quality of life half that of perfect health. QALYs can be used to evaluate environmental rules under certain circumstances, although some very strong assumptions (detailed below) apply.

The application of QALYs is predicated on the assumptions embedded in the QALY analytical framework. As noted in the QALY literature, QALYs are consistent with the utility theory that underlies most of economics only if one imposes several restrictive assumptions, including independence between longevity and quality of life in the utility function, risk neutrality with respect to years of life (which implies that the utility function is linear), and constant proportionality in trade-offs between quality and quantity of life (Pliskin, Shepard, and Weinstein, 1980; Bleichrodt, Wakker, and Johannesson, 1996). To the extent that these assumptions do not represent actual preferences, the QALY approach will not provide results that are consistent with a benefit-cost analysis based on the Kaldor-Hicks criterion.[2]

Even if the assumptions are reasonably consistent with reality, there are no guarantees that the option with the highest QALY per dollar cost will satisfy the Kaldor-Hicks criterion (i.e., generate a potential Pareto improvement [Garber and Phelps, 1997]), because QALYs represent an average valuation of health states rather than the sum of societal willingness to pay (WTP).
However, benefit-cost analysis based on WTP is not without potentially troubling underlying structures as well because it incorporates ability to pay (and thus the potential for equity concerns) and the notion of consumer sovereignty (which emphasizes wealth effects). Exhibit U.1 compares the two approaches across a number of parameters. For the most part, WTP allows parameters to be determined empirically, while the QALY approach imposes some conditions *a priori*.

Exhibit U.1: Comparison of QALY and WTP Approaches

Parameter	QALY	WTP
Risk aversion	Risk neutral	Empirically determined
Relation of duration and quality	Independent	Empirically determined
Proportionality of duration/ quality trade-off	Constant	Variable
Treatment of time/age in utility function	Unit linear in time	Empirically determined
Preferences	Community/Individual	Individual
Source of preference data	Stated	Revealed and stated
Treatment of income and prices	Not explicitly considered	Constrains choices

[2] The Kaldor-Hicks efficiency criterion requires that the "winners" in a particular case be potentially able to compensate the "losers" such that total societal welfare improves. In this case, it is sufficient that total benefits exceed total costs of the regulation. This is also known as a potential Pareto improvement, because gains could be allocated such that at least one person in society would be better off while no one would be worse off.

It is important to note that the methods outlined in the following analysis provide estimates of the total number of life years gained in a population, regardless of the quality of those life years, or equivalently, assuming that all life years gained are in perfect health. In some CEAs (Cohen, Hammitt, and Levy, 2003; Coyle et al., 2003), analysts have adjusted the number of life years gained to reflect the fact that 1) the general public is not in perfect health and thus "healthy" life years are less than total life years gained and 2) those affected by pollution may be in a worse health state than the general population and therefore will not gain as many "healthy" life years adjusted for quality, from a pollution reduction.

Such adjustments would raise a number of serious ethical issues. Proponents of QALYs have promoted the nondiscriminatory nature of QALYs in evaluating improvements in quality of life (e.g., an improvement from a score of 0.2 to 0.4 is equivalent to an improvement from 0.8 to 1.0), so the starting health status does not affect the evaluation of interventions that improve quality of life. However, for life-extending interventions, the gains in QALYs will be directly proportional to the baseline health state (e.g., an individual with a 30-year life expectancy and a starting health status of 0.5 will gain exactly half the QALYs of an individual with the same life expectancy and a starting health status of 1.0 for a similar life-extending intervention). This is troubling because it imposes an additional penalty for those already suffering from disabling conditions. Brock (2002) notes that "the problem of disability discrimination represents a deep and unresolved problem for resource prioritization."

OMB (2003) has recognized this issue in its Circular A-4 guidance, which includes the following statement.

> When CEA is performed in specific rulemaking contexts, you should be prepared to make appropriate adjustments to ensure fair treatment of all segments of the population. Fairness is important in the choice and execution of effectiveness measures. For example, if QALYs are used to evaluate a lifesaving rule aimed at a population that happens to experience a high rate of disability (i.e., where the rule is not designed to affect the disability), the number of life years saved should not necessarily be diminished simply because the rule saves the lives of people with life-shortening disabilities. Both analytic simplicity and fairness suggest that the estimated number of life years saved for the disabled population should be based on average life expectancy information for the relevant age cohorts. More generally, when numeric adjustments are made for life expectancy or quality of life, analysts should prefer use of population averages rather than information derived from subgroups dominated by a particular demographic or income group. (p. 13)

Because of the fairness concerns discussed above, this analysis does not reduce the number of life years gained to reflect any differences in underlying health status; rather, it assumes that all direct gains in life years resulting from mortality risk reductions will be assigned a weight of 1.0. This estimate has been combined with the QALYs saved from avoided cases of non-fatal morbidity to yield a total life years saved from avoided cases, and the resulting effectiveness measure has been called "MILYs" (Morbidity Inclusive Life Years) in the regulatory impact analysis for the Final CAIR Rule (2005). The MILYs approach will be employed in this analysis as well.

U.1.3 Concerns about the use of QALYs to evaluate environmental regulation

EPA is still evaluating the appropriate methods for application of CEA to environmental regulations. To summarize, benefit-cost analysis has been the preferred method of choosing among regulatory alternatives in terms of economic efficiency for environmental regulations. Most

environmental regulations have multiple categories of benefits, and environmental economists have preferred to aggregate results in terms of monetary net benefits. QALY-based analyses also have not been as accepted in the environmental economics literature because of concerns about the theoretical consistency of QALYs with individual preferences (Hammitt, 2002), treatment of benefits other than human health, and a number of other factors (Freeman, Hammitt, and De Civita, 2002). Concerns with the standard QALY methodology include consistency of CEA indices across multiple contexts; the treatment of people with fewer years to live (the elderly); fairness to people with preexisting conditions that may lead to reduced life expectancy and reduced quality of life; and how the analysis should best account for nonhealth benefits.

Some concerns have also been raised in the literature with regard to applying the QALY decrement to acute health impacts, such as cryptosporidiosis. Bala and Zarkin (2000) suggest that QALYs are not appropriate for valuing acute symptoms, because of problems with both measuring utility for acute health states and applying QALYs in a linear fashion to very short duration health states (i.e., if a year with asthma symptoms is equivalent to 0.7 year without asthma symptoms, then 1 day without asthma symptoms is equivalent to 0.0019 QALY gained). They indicate that using QALYs to value acute morbid states may "vastly underestimate the societal value of interventions for acute conditions." In the RIA for the Final Clean Air Interstate Rule (CAIR, 2005), EPA states that

> Johnson and Lievense (2000) suggest using conjoint analysis to get healthy-utility time equivalences that can be compared across acute effects, but it is not clear how these can be combined with QALYs for chronic effects and loss of life expectancy. There is also a class of effects that EPA has traditionally treated as acute, such as hospital admissions, which may also result in a loss of quality of life for a period of time following the effect. For example, life after asthma hospitalization has been estimated with a utility weight of 0.93 (Bell et al., 2001; Kerridge, Glasziou, and Hillman, 1995). To address the issues of incorporating acute morbidity and nonhealth benefits, OMB suggests that agencies "subtract the monetary estimate of the ancillary benefits from the gross cost estimate to yield an estimated net cost.

In the CAIR analysis, EPA did not apply the QALY decrement to acute morbidity effects, but followed the "net cost" approach in their illustrative QALY exercise, specifically in netting out the benefits of health improvements other than reduced mortality and chronic morbidity. The issue of linearity is still uncertain, and is among the issues that the NAS/ IOM panel on CEA is considering.

As an illustration of one of the major issues in ensuring consistency across CEAs conducted in multiple contexts, it is useful to examine the degree of variability across QALY calibration methodologies. A study by Erik Nord examined differences in the health-state scores that would result by application of a wide range of multi-attribute utility instruments. As will be discussed later, one of these instruments, the Quality-of-Well Being scale (QWB), was used by FDA in the Regulatory Impact Analysis (RIA) of recent bioterrorism rules and served as the basis for the QALY scores used in this analysis. The results of the Nord study are summarized in Exhibit U.2 below (see Nord 1999 for further details).

One interpretation of the data in Exhibit U.2 is that the variability in QALY estimates across methods suggests that great care must be taken when comparing the results of CEAs that apply different QALY scoring systems. An alternative view is that the scoring systems may themselves be ideally suited to specific types of effects, and therefore comparisons across scales are meaningless (e.g., some argue the QWB is best for acute effects because it specifically addresses symptoms, while other techniques may be better suited for injuries, life-threatening chronic conditions, and chronic conditions where severity may vary over time). There are likely other interpretations of these results as well. The main point is that

comparisons to other CEAs must make explicit consideration of standardization issues such as the use of QALY estimation methods.

Exhibit U.2: Health-State Scores According to Rules of Thumb and Different Multi-Attribute Utility Instruments

Instrument	Problem Level		
	Severe	Considerable	Moderate
Rules of Thumb	.65 - .85	.90 - .94	.98 - .995
QWB	.45 - .55	.65 - .70	<.80
HUM1	.10 - .20	.30 - .40	<.85
HUM2	.40	.70	.90 - .94
EuroQol	.20	.60	.70
York EuroQol (TTO)	.20 - .25	.40 - .50	.80
IHQL (3D)	.50 - .70	.75 - .85	.89 - .93
IHQL (complex)	.70 - .75	.80 - .90	.90 - .94
15 D	.77	.86	.91 - .93
Rosser-Kind	.68	.94	.97 - .98

Source: Nord (1999). Note that the estimates in this table represent health-state scores, rather than QALY decrements from a baseline health state.

Some concerns with QALY applications may be addressed by The Institute of Medicine (IOM) (a member institution of the National Academies of Science (NAS)), which has established the Committee to Evaluate Measures of Health Benefits for Environmental, Health, and Safety Regulation to assess the scientific validity, ethical implications, and practical utility of a wide range of effectiveness measures used or proposed in CEA[3]. This committee is expected to produce a report by the end of 2005; however, it is not clear that members will necessarily reach a consensus on how to contend with the problems associated with applying the QALY methodology to environmental regulations. In the interim, however, agencies are expected to provide CEAs for rules covered by Circular A-4 requirements.

Therefore, the LT2ESWTR EA includes the following QALY-based analysis to illustrate one potential approach for conducting a CEA. This is an experimental application, and EPA is still evaluating the appropriate methods for applying CEA to environmental regulations with multiple outcomes. The methodology presented in this section is not intended to stand as precedent for either future water quality regulations or other EPA regulations: the appropriateness of QALY-based CEA should be evaluated on a case-by-case basis.

[3] National Academies of Science, Institute of Medicine website is found on http://www.iom.edu/project.asp?id=19739. Their report on QALYs and other cost effectiveness measures is due out at the end of 2005.

The remainder of this Appendix provides the step-by-step development of a QALY-based measure of the cost-effectiveness of the LT2ESWTR, including the following steps:

- Development of the QALY denominator. This includes determination of an appropriate QALY decrement and its application to cases of morbidity, calculation of life years saved from avoided cases of mortality, and integration of morbidity and mortality cases into a total life years saved denominator.

- Development of the annualized cost numerator. Costs are the regulatory costs net of costs appropriate to subtract from the numerator.

- Finally, the numerator and denominator are integrated to yield a dollars-per-MILY ratio.

U.2 Methods

The first step in the development of a "dollars-per-MILY" ratio for this CEA is to determine the QALY decrement per case of cryptosporidiosis to be used in the denominator. A QALY decrement is the amount by which a person's years of life can be considered as reduced by the loss of quality of life due to illness. EPA reviewed the health literature to determine an appropriate measure of a QALY decrement, as described further in Section 2.1.1.1 of this Appendix.

The QALY decrement is used to derive the quality-adjusted life years saved due to reduction in morbidity from cases of cryptosporidiosis contracted through drinking contaminated water (Section 2.1.1.2). These QALYs are added to the life years saved by reducing premature mortality due to such cases of cryptosporidiosis. The total life years saved from morbidity and mortality comprise the denominator in the dollars-per-MILY measure of this CEA.

The numerator of the dollars-per-MILY measure is the cost of the regulation minus certain costs associated with the illness that will be avoided after implementation of the regulation. Subtracting costs from the numerator is appropriate when the costs are not considered by participants (elicitees) in the QALY elicitation process. These costs and the resulting net cost numerator are described in Section 2.2 of this Appendix.

The following three sections describe how the denominator (QALY units) and the numerator (dollar units) are derived and used to calculate the cost effectiveness of the regulatory alternatives as a net cost per MILY.

U.2.1 The CEA Denominator: Deriving QALYs

In addition to directly measuring the quantity of life gained, measured by life years, it may also be informative to measure gains in the quality of life. Reductions in drinking water contamination from *Cryptosporidium* will reduce the incidence of cryptosporidiosis, avoiding a decrease in quality of life due to illness. To capture these important benefits in the measure of effectiveness, they must first be converted into a life year equivalent so that they can be combined with the direct gains in life expectancy.

The QALY calculation requires three elements:[4]

- the estimated change in incidence of the health condition
- the duration of the health condition
- the quality of life decrement due to the condition

The first element is derived using the health impact function approach. The second element is based on the medical literature for each health condition. The third element is derived by one of three methods, as described in Section 2.1.1.1 below.

U.2.1.1 Equivalent life years saved from avoided cases of non-fatal morbidity

U.2.1.1.1 Determining the QALY decrement

There are three methods by which effectiveness is quantified in a QALY-based cost-effectiveness analysis: "direct elicitation," "standardized questionnaire," and "database research." The first involves primary research, where subjects in a survey setting are asked to express preferences for specific health states expressed on the 0 to 1 interval, where 0 represents death and 1 represents perfect health. Most of these studies apply either a time-tradeoff, standard gamble, or rating scale elicitation technique; sometimes multiple methods are applied. The more rigorous time-tradeoff and standard gamble techniques are typically considered to yield more reliable estimates than the rating scale technique (Gold, Stevenson, and Fryback, 2002). The "direct elicitation" method can be administered to samples of patients with a given condition, to the general population (known as "community" samples), or to expert panels.

The second method, "standardized questionnaire," also involves some primary survey work, but is simpler to implement than the direct elicitation approaches. This method involves administering a standardized set of questions that evaluate multiple aspects of an individual's health, including mobility, degree of pain, and ability to provide care to oneself, and then using the answers to generate a QALY score on the 0 to 1 scale. The QALY score is estimated using a formula for translating specific combinations of questionnaire answers that is generated through prior calibration work. The formula is questionnaire specific. This method can also be administered to different types of samples. Because of its ease of use, many applications of this technique are conducted as an integral part of clinical trials for specific treatment regimens. This facilitates calculating cost-effectiveness of various treatments of the patient populations that are the subjects of the clinical trial. Occasionally, the standardized questionnaire method is applied by study authors themselves, relying on their own expert judgment.

The third and simplest method, "database research," was adopted by EPA for use in this CEA, using values from existing literature and requires no new primary research. Several databases have been developed to facilitate these literature searches; the most extensive is the Cost-Effectiveness Analysis database developed by researchers at Harvard University School of Public Health.[5] As noted below, EPA

[4] In some QALY calculations, two other elements are required: the quality of life weight with the health condition and the quality of life weight without the health condition (i.e., the baseline health state). These elements would be derived from the medical cost-effectiveness and cost-utility literature. In this CEA, however, these are immaterial because there is no discounting of benefits for differing baselines of health in the population: the health gain is assumed the same for all individuals.

[5] The Harvard CEA database is available online at the following URL:http://www.hcra.harvard.edu/pdf/preferencescores.pdf. The current version of the database includes citations with publication dates through 1997.

used this database, supplemented by broader literature searches, to identify studies that include QALY scores for the health effects of cryptosporidiosis.

Using existing literature requires some care in documenting the technique used to conduct the study, the nature of the sample, and the match between the severity and duration of the health effect studied and the health effect linked to drinking water contamination. The preferred source of quality of life weights are those based on community preferences, rather than patient or clinician ratings (Gold et al., 1996). Several methods are used to estimate quality of life weights. These include the rating scale, standard gamble, time trade-off, and person trade-off approaches (Gold, Stevenson, and Fryback, 2002). Only the standard gamble approach is completely consistent with utility theory. However, the time trade-off method has also been widely applied in eliciting community preferences (Gold, Stevenson, and Fryback, 2002).

EPA has not yet developed formal guidance for the development of cost-effectiveness analyses to support and evaluate regulatory actions. As noted elsewhere, EPA and other agencies are awaiting the completion of the deliberations of an NAS Institute of Medicine panel that is reviewing application of cost-effectiveness analysis to regulatory actions before developing it's own specific guidance. As a result, for this economic analysis, EPA sought to rely on available literature for general guidance in selecting the most appropriate studies to apply. In general, the recommendations adopted for this analysis are consistent with recommendations made by the Panel on Cost-Effectiveness in Health and Medicine, a group of 13 nongovernment scientists and scholars with expertise in cost-effectiveness analysis that was convened by the U.S. Public Health Service in 1993 (Gold et al., 1996). That panel developed recommendations for methods to use in "Reference Case" CEA's in an effort to improve consistency across applications of CEA in the public health and medicine fields.

Relying heavily on the recommendations in Gold et al. (1996), the criteria used to select the highest-quality studies are the following:

1. Where available, reliance on studies administered to community-based samples. These samples best match the attributes of the general population that is exposed to and potentially at risk of health consequences from drinking water contaminants. Where community-based studies are not available, preference is for patient samples, followed by expert panels and author judgment (Gold et al., 1996).

2. Where available, reliance on directly administered time-trade-off or standard gamble studies over studies that administer a standardized questionnaire (Gold, Stevenson, and Fryback, 2002). In some cases, however, direct method studies have very small sample sizes or other major methodological shortcomings. In these cases, usage of judgment to select a study that provides the most reliable estimate, or looking for consistency of results across several studies.

3. Selection of studies with the best match of health effect to the health endpoint of interest. In cases where the match is not good because of differences in severity or duration of effect, for example, preference is for use of studies providing sufficient documentation to adjust the estimates to better match the severity and duration of interest. Note that Gold et al. (1996) discuss the need for clarifying the health effect of interest, and implicitly recommend that analysts seek a good match in health effect definition. This criterion is derived from the health benefits guidance for benefit valuation in EPA Guidelines for Preparing Economic Analyses (USEPA 2000, p. 64).

EPA did not discover any patient-based or community-based QALY estimates of the quality of life decrement associated with contracting cryptosporidiosis. There are a number of CEAs, however, that

estimate the impact of the illness using QALY scores for gastrointestinal symptoms or severe pain. These include two analyses by the Food and Drug Administration (2004 and 1998), an internal draft study by U.S. EPA (Boutin et al., 1998), and a journal article by Havelaar et al. (2000). In addition, EPA identified QALY scores associated with one of the symptoms of cryptosporidiosis, vomiting, in studies that looked at the marginal effect of emesis associated with chemotherapy.

Boutin *et al.* used a decrement derived from a year of severe pain, 0.0233 (Torrance *et al.*, 1992), and assumed that patients with mild cryptosporidiosis suffer that level of discomfort for one day, while patients with moderate and severe cryptosporidiosis are in pain for two weeks. Assuming that 88 percent of cases are mild, 11 percent are moderate, and 1 percent are severe, the estimates of Boutin *et al.* imply an overall QALY loss of 0.002 per case. Since this estimate is based on a definition of severe pain rather than the specific symptoms of cryptosporidiosis, it is not as likely to be as sensitive to the impacts of *acute* effects as the Quality of Well-Being scale used by the FDA.

Havelaar *et al.* (2000) conducted a cost-effectiveness analysis of the risks and benefits of disinfecting drinking water with ozonation. Disinfection may cause some cases of renal cell cancer, but without disinfection, a certain number of individuals are likely to contract cryptosporidiosis. The authors model the effect of cryptosporidiosis on quality of life in the immunocompetent population by using a disability-adjusted life year (DALY) for diarrhea. This score, taken from the Global Burden of Disease study, is generated using the time trade-off method and a panel of experts. The authors also estimate a more severe DALY in order to model the effect of cryptosporidiosis on the quality of life of immunocompromised AIDS patients.

DALYs and QALYs use an inverse scale, so a DALY is in some ways analogous to the QALY decrement. The DALYs used by Havelaar *et al.* therefore suggest a decrement of 0.054 for the duration of cryptosporidiosis in the immunocompetent population and 0.16 for AIDS patients. The authors assume a median duration of 0.016 years and a mortality risk of 0.004 for the immunocompetent population, versus 0.13 years and a risk of 0.28 for AIDS patients. These scores and durations suggest an overall annual QALY loss of 0.001 per case.[6] However, an estimate based solely on a score for diarrhea may underestimate the quality of life impact associated with cryptosporidiosis, whose symptoms also include vomiting, fever, weight loss and dehydration. The Havalaar *et al.* estimate does not reflect the full range of cryptosporidiosis symptoms considered in the FDA estimates, for example.

Additionally, some peer-reviewed studies have examined the QALY decrements associated with chemotherapy, which often causes side effects, some of which are similar to the symptoms of cryptosporidiosis. Grunberg *et al.* (1996) surveyed 30 cancer patients using a visual analog scale and found that the nausea and vomiting caused by chemotherapy had a utility decrement of 0.52. Grunberg *et al.*(2002) used the standard gamble approach in 10 individuals without cancer and found that the vomiting associated with chemotherapy had a utility decrement of 0.315. These studies suggest that this particular symptom of cryptosporidiosis has a large effect on quality-of life. While there are many differences in the specific symptoms and baseline health of individuals evaluated in these studies of chemotherapy, in our view the results of these studies lend further credibility and support to the relatively large quality of life decrements found by FDA for temporary cases of cryptosporidiosis.

Therefore, based upon review of the health-related literature, the QALY decrements from the Regulatory Impact Analysis (RIA) of recent bioterrorism rules, promulgated by the Food and Drug Administration, (21 CFR Parts 1 and 11, 2004) appear to represent the best available estimates of utility

[6] This calculation assumes that AIDS patients comprise 0.0001 percent of the general population (see the following web sites: www.census.gov/popest/national/NA-EST2004-01.html and www.cdc.gov/hiv/stats/2003SurveillanceReport.pdf, Table 5, accessed February 3, 2005).

loss due to cryptosporidiosis. The decrements developed in the FDA RIA are applicable because the descriptions of the severity of the cases in the FDA analysis are similar to the severity descriptions in the LT2ESWTR benefit-cost analysis (see Exhibit U.3). The slight differences are due to the difference in data sources–the FDA did not research and employ the data from the Milwaukee outbreak of cryptosporidiosis because it was a drinking water event only (not directly related to food processing or distribution). In addition, the cost-of-illness estimates used by the FDA correspond reasonably well to those used in Chapter 6 of the LT2ESWTR Economic Analysis (EA) benefit-cost analysis. The estimates of duration from the FDA bioterror analysis differ somewhat from the EPA estimates.

Exhibit U.3: COMPARISON OF CRYPTOSPORIDIOSIS SYMPTOM DESCRIPTIONS

	Days Impaired	Days Lost*	Medical Cost**	Description
LT2ESWTR EA benefit-cost analysis				
Mild	4.7	1.3	$3.28	Did not seek medical care.
Moderate	9.4	3.8	$90.56	Doctor or emergency room visit.
Severe	34.0	5.6	$9,405.84	Hospitalization.
FDA Bioterror RIA (2004)				
Mild	7.5	na	$39***	Did not seek medical care. Confinement to the bed, chair, or couch most of the day. Sick or upset stomach, vomiting or loose bowel movement, with or without chills, or aching all over; inability to drive or ride in a car or use public transportation without help; and limited social activity, though able to perform self-care activities.
Moderate	7.5	na	$39***	Doctor visit. Confinement to the bed, chair, or couch most of the day. Sick or upset stomach, vomiting or loose bowel movement, with or without chills, or aching all over; inability to drive or ride in a car or use public transportation without help; and limited social activity, though able to perform self-care activities.
Severe	33.5	na	$9,618.83	Hospitalization. Sick or upset stomach, vomiting or loose bowel movement, with or without chills, or aching all over; inability to drive or ride in a car or use public transportation without help; and limited social activity, though able to perform self-care activities.

Notes:

*The category "Days Impaired" includes all days when infection with cryptosporidiosis diminishes an individual's quality of life. The category "Days Lost" is a subset of "Days Impaired" and represents all days when an individual is unable to engage in productive activity (paid work, house work, or school work).

**The bioterror RIA does not explicitly report the medical costs associated with a severe case of cryptosporidiosis. For this reason, the exhibit presents the medical costs reported in the FDA's preliminary juice RIA (1998), in 2004 dollars (adjusted using the CPI inflation calculator: www.bls.gov/cpi/home.htm, accessed February 7, 2004

*** Average cost per day is the same between mild and moderate cases, although in moderate cases one feels unwell for a longer time than in mild cases.

The QALY estimates in the bioterrorism rule use a system called the QWB scale to correlate symptoms and functional ability with disutility in order to generate quality of life estimates. Each disutility score quantifies loss of function (mobility, ability to do other physical activity, and ability to engage in social activities) and severity of symptoms (upset stomach, pain in chest, vomiting, headache, etc.). The final disutility score is the sum of the functional scores and the symptom/problem score. In this system, 0 equals perfect health and 1 equals death.

The Quality of Well-Being Scale is used to generate a quality-of-life score by combining the impact of functional limitations with the impact of symptoms on quality of life, ultimately weighted by the duration of time with those symptoms.[7] Because of its focus on specific symptoms in addition to functional limitations, the Quality of Well-Being Scale is considered by some observers to be well-suited for analysis of acute effects.[8]

The QWB Scale also allows for summation of life-year equivalents from non-fatal morbidity cases avoided across the population. This morbidity-avoidance index can be summed with life years saved from avoided mortality to yield the index referred to in this CEA and in the RIA for the Final Clean Air Interstate Rule (CAIR, 2005) as MILYs.

In the bioterror rule analysis, the FDA used its own internal expertise to assign symptoms and descriptions of functional ability to patients with gastrointestinal illness.[9] Experts completed the QWB based on their knowledge of the symptoms and functional limitations of cryptosporidiosis patients. This expert judgement process produced QWB-derived QALY decrements of 0.49 for mild and moderate cases and 0.52 for severe cases (Exhibit U.4).

[7] This scoring system is described in more detail in McDowell and Newell (1996), pp. 483-491.
[8] According to McDowell and Newell (1996), writing in their summary and critique of a broad range of QALY scales, the "QWB is ... distinctive in its inclusion of symptoms; this seems to improve its sensitivity to minor deviations from complete well-being. It may therefore be ideal for evaluating policies in well populations with minor levels of morbidity" (p. 489).
[9] FDA economists developed the QALY scores in consultation with a FDA epidemiologist/clinician.

Exhibit U.4 Derivation of Quality of Life Index for Foodborne Illness by Severity Level

Severity of Illness	Symptom/Functional Loss Category Adjustment (from QWB Scale)				QALY Decrement
	Symptom	Mobility	Physical	Social	
	A	B	C	D	E
					-(A+B+C+D)
Mild	-0.29	-0.062	-0.077	-0.061	0.49
Moderate	-0.29	-0.062	-0.077	-0.061	0.49
Severe	-0.29	-0.090	-0.077	-0.061	0.52

Abbreviations: QOL= Quality of life

Source: Table 6, FDA Bioterrorism Final Rule 2004, p.71622

The QALY decrement derived in Exhibit U.4 represents the difference in quality of life from baseline for each day of illness. The decrements are then combined with estimates of the duration by severity level to produce an equivalent-days unit.[10] For example, if 4 days of illness are experienced at a quality-of-life decrement equal to 0.5, then the cost in equivalent-days is estimated as 2 days, regardless of the age of the individual. In the LT2ESWTR EA analysis, the values per illness are as follows.

Mild:	4.7	days of illness x 0.49 decrement	=	2.303 equivalent-days
Moderate:	9.4	days of illness x 0.49 decrement	=	4.606 equivalent-days
Severe:	34	days of illness x 0.52 decrement	=	17.68 equivalent-days
Relapses:	2	days of illness x 0.49 decrement	=	0.98 equivalent-days

The EA assumes that 88 percent of cases are mild; 11 percent of cases are moderate; and 1 percent of cases are severe. The EA also assumes that 21 percent of infected individuals have a mild-to-moderate relapse that lasts 2 days. Weighting these equivalent-days by the percentage of cases yields the following:

Mild:	88% x 2.303	equivalent-days =	2.03 equivalent-days
Moderate:	11% x 4.606	equivalent-days =	0.51 equivalent-days
Severe:	1% x 17.68	equivalent-days =	0.18 equivalent-days
Relapses (Mild to Moderate):	21% x 0.98	equivalent-days =	0.21 equivalent-days

Combining these assumptions with the FDA decrements, EPA estimates that the QALY loss associated with an episode of cryptosporidiosis is equivalent to 0.008 of a year (QALY decrement, weighted by frequency of severity level and duration):

Mild + Moderate + Severe + Relapses = 2.93 equivalent-days = 0.008 QALYs

[10] Again, these values are predicated on the assumptions of constant proportionality in trade-offs between quality and quantity of life, risk neutrality with respect to years of life, and independence between duration and quality of life as mentioned in Section 1.0 of this document.

The QALY decrement, then, is a weighted average of the decrease in quality of life and duration of symptoms for all cases of cryptosporidiosis contracted from drinking water converted into an equivalent loss of quality-adjusted life years, in this case 2.93 days or 0.008 QALYs. This does not mean that a person is sick for 2.93 days (as shown above, durations for all severity levels are longer than 2.93 days), but that the expected value loss, on average, for a case of cryptosporidiosis is equivalent to 2.93 days of perfect health.

The estimated loss of 0.008 QALYs per case, based upon the EA estimates of duration and the FDA bioterror estimates for quality of life decrements, serves as a reasonable estimate of the central tendency of this measure. Sensitivity of the overall results to the use of this estimate could be considered around this value. A low estimate could be derived from the EPA Office of Research and Development data and assumptions (Boutin et al, 1998), yielding a value of 0.002 QALYs. A high estimate could be derived, using the same FDA quality of life decrements with the FDA's case duration assumptions, yielding a loss per case of 0.024 QALYs. There is no additional information that could guide estimating a probability or frequency distribution using these bounds, and hence it would be difficult to conduct a reasonable uncertainty analysis. As a result, the primary analysis presented below uses only the estimate of central tendency, the QALY decrement of 0.008.

The next section of this Appendix applies the QALY decrement to all estimated cases of cryptosporidiosis morbidity that the LT2ESWTR will prevent.

U.2.1.1.2 Applying the QALY decrement to cases of non-fatal morbidity

When using QALYs, discounting of the QALY decrement is necessary only if participants in the QALY elicitation process considered years gained in the future to be of equal value to those gained in the present. Whether a QALY decrement has embedded discounting is unclear in the literature, and may vary with the method of elicitation used. For example, QALY decrements based upon the time-trade off method of elicitation "…implicitly assume that additional years of life are valued equally, that is, there is no discounting of health years" (Boardman et al, 1996). However, the issue is unclear in the case of the QWB-derived decrement used in this CEA. The NAS/IOM panel on CEA conduct is currently considering this and other issues, on which it may (or may not) reach consensus by publication if its report, expected in late 2005.

Standard economic theory suggests that benefits occurring in future years should be discounted relative to benefits occurring in the present. In Circular A-4, OMB presents the following discussion.

> When future benefits or costs are health-related, some have questioned whether discounting is appropriate, since the rationale for discounting money may not appear to apply to health. It is true that lives saved today cannot be invested in a bank to save more lives in the future. But the resources that would have been used to save those lives can be invested to earn a higher payoff in future lives saved. People have been observed to prefer health gains that occur immediately to identical health gains that occur in the future. Also, if future health gains are not discounted while future costs are, then the following perverse result occurs: an attractive investment today in future health improvement can always be made more attractive by delaying the investment. For such reasons, there is a professional consensus that future health effects, including both benefits and costs, should be discounted at the same rate. This consensus applies to both BCA and CEA. (p. 34)

OMB and EPA guidance documents suggest discount rates of 3 and 7 percent. A 3 percent discount rate reflects the accepted "social rate of time preference" and is consistent with

recommendations of both the U.S. Public Health Service Panel on Cost Effectiveness in Health and Medicine (Gold et al., 1996) and the NAS panel on CEA (Gold et al., 1996). To examine the impact of the choice of discount rate, EPA also calculates all values of this CEA using a 7 percent rate, consistent with an "opportunity cost of capital" concept to reflect the time value of resources directed to meet regulatory requirements. Further discussion of this topic appears in Chapter 7 of Gold et al. (1996) and in Chapter 6 of the EPA Guidelines for Economic Analysis.

The CEA numerator presented in Section 2.2 is expressed in discounted and annualized costs at 3 percent and 7 percent, as are the number of non-fatal morbidity cases and mortalities used in the denominator. Regardless of whether elicitees performed any discounting of years saved in development of the decrement presented for this CEA, discounting does not affect our estimates of the QALY loss associated with a typical case of cryptosporidiosis, because estimated durations are short, substantially less than 1 year. If the illness duration were more significant, particularly if more than 1 year, a discount rate would need to be applied to the period of illness. Because implementation and monitoring costs occur before any health benefits begin and the costs to install technology are assumed in the analysis to be incurred the year before benefits accrue, the overall CEA results are sensitive to the discount rate used.

Hence, the cases of cryptosporidiosis have been annualized at 3 percent and 7 percent. To calculate the number of QALYs saved by each regulatory alternative, the annualized estimate of cryptosporidiosis cases under pre-regulation conditions is taken from Exhibit 8.3 of the LT2ESWTR EA and multiplied by the QALY decrement to yield a total estimated number of QALYs due to morbidity:

0.008 QALYs x (annualized cryptosporidiosis cases of morbidity).

These calculations are performed for each alternative and *Cryptosporidium* occurrence data set, using each dose response model (low, medium, and high) and annualized cases discounted at 3 percent and 7 percent. Exhibit U.5 presents the estimated annualized mean number of cases.

Exhibit U.5a: QALYs for Non-Fatal Morbidity Cases Based on Medium Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	Non-Fatal Morbidity Cases		QALYs	
		3%	7%	3%	7%
		A	B	C = A * 0.008	D = B * 0.008
ICR	A1	658,780	560,498	5,270	4,484
	A2	649,201	552,389	5,194	4,419
	A3 - Preferrred	642,126	546,423	5,137	4,371
	A4	601,750	512,270	4,814	4,098
ICRSSL	A1	194,741	165,630	1,558	1,325
	A2	166,714	141,908	1,334	1,135
	A3 - Preferrred	154,145	131,303	1,233	1,050
	A4	132,558	113,007	1,060	904
ICRSSM	A1	341,783	290,702	2,734	2,326
	A2	316,828	269,580	2,535	2,157
	A3 - Preferrred	303,361	258,221	2,427	2,066
	A4	266,958	227,366	2,136	1,819

Note: All values are annualized

Source: Columns A, B - Exhibit C.10

Exhibit U.5b: QALYs for Non-Fatal Morbidity Cases of Cryptosporidiosis Based on Low Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	Non-Fatal Morbidity Cases		QALYs	
		3%	7%	3%	7%
		A	B	C = A * 0.008	D = B * 0.008
ICR	A1	245,589	208,901	1,965	1,671
	A2	241,564	205,494	1,933	1,644
	A3 - Preferrred	238,695	203,075	1,910	1,625
	A4	221,812	188,787	1,774	1,510
ICRSSL	A1	77,307	65,731	618	526
	A2	64,960	55,279	520	442
	A3 - Preferrred	59,661	50,807	477	406
	A4	50,778	43,279	406	346
ICRSSM	A1	134,839	114,659	1,079	917
	A2	124,084	105,554	993	844
	A3 - Preferrred	117,955	100,382	944	803
	A4	102,604	87,369	821	699

Note: All values are annualized

Source: Columns A, B - Exhibit C.10

Exhibit U.5c: QALYs for Non-Fatal Morbidity Cases of Cryptosporidiosis Based on High Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	Non-Fatal Morbidity Cases		QALYs	
		3%	7%	3%	7%
		A	B	C = A * 0.008	D = B * 0.008
ICR	A1	999,560	850,540	7,996	6,804
	A2	983,721	837,129	7,870	6,697
	A3 - Preferrred	972,018	827,261	7,776	6,618
	A4	907,507	772,687	7,260	6,181
ICRSSL	A1	315,339	268,210	2,523	2,146
	A2	269,379	229,306	2,155	1,834
	A3 - Preferrred	248,909	212,036	1,991	1,696
	A4	213,987	182,436	1,712	1,459
ICRSSM	A1	536,374	456,240	4,291	3,650
	A2	495,701	421,812	3,966	3,374
	A3 - Preferrred	474,103	403,596	3,793	3,229
	A4	415,625	354,028	3,325	2,832

Note: All values are annualized

Source: Columns A, B - Exhibit C.10

U.2.1.2 Life years saved from avoided cases of premature mortality

The denominator combines QALYs for morbidity with life years saved from avoided premature mortality. The QALY equivalent due to mortality is simply the expected value of years an average individual would have lived if the cryptosporidiosis had been avoided, aggregated across the population.

First, United States census data (2000) are used to calculate the percentage of population in each 1-year cohort for ages under 1 through 100. Percentages for persons aged 100 and older are grouped together in the "100 years" cohort.

Next, the net present value (NPV) and annualized number of deaths due to cryptosporidiosis for the United States population as a whole, using 3 percent and 7 percent discount rates, are taken from Exhibit 8.3 of the LT2ESWTR EA. Discounting death and illness occurrences is appropriate for the denominator because, as OMB states, the survey process used to elicit QALY scores from individuals "implicitly assumes that the fraction of remaining lifespan an individual would give up for an improvement in health-related quality of life does not depend on the remaining lifespan" (OMB, 2003).

Data available from the Milwaukee cryptosporidiosis outbreak did not differentiate mortality by age. Inquiries with the study authors yielded no further information on which to base allocation of the incidence across the population age cohorts. Hence, annualized mortality is allocated across the 101 age cohorts according to the percentage of population in each, as shown in Exhibits U.6a–d (shown at the end of this Appendix because of their length). Life expectancy for each cohort, provided by the National Vital Statistics Reports[11], is multiplied by the number of annualized cases avoided in each cohort to determine the total annualized life years saved within each cohort. The sum for all cohorts is the total life years saved across the population for the 25-year period:

$$\sum_i ((\text{Yrs. life expectancy})_i \times (\text{annualized cases in cohort})_i)$$

for $i = 1$ to 101.

This calculation is performed for each alternative in each *Cryptosporidium* occurrence data set using each dose response model. Using the medium dose-response model, a 3 percent discount rate, and the ICR data set, the annualized life years saved for fatal cases of Cryptosporidiosis was highest for the most stringent alternative (A1 was approximately 6,200) and lowest for the least stringent alternative (A4 was approximately 5,800). The other two *Cryptosporidium* occurrence data sets have lower estimates for life years saved but exhibit the same pattern, as does the same comparison using the low and high dose response models, and each such combination using a 7 percent discount rate. The complete results are shown in Exhibits U.6a–d for the medium model and the summarized results are shown in Exhibit U.7 for the low, medium, and high dose response models.

[11] National Vital Statistics Reports, Vol. 51, No. 3, December 29, 2002, "Life table for the total population: United States, 2000."

Exhibit U.7a: Life Years Saved for Fatal Cases of Cryptosporidiosis Based on Medium Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	Annualized Life-Years Saved (years) 3% A	7% B
ICR	A1	6,202	5,283
	A2	6,132	5,224
	A3 - Preferrred	6,081	5,180
	A4	5,787	4,932
ICRSSL	A1	1,828	1,557
	A2	1,624	1,384
	A3 - Preferrred	1,533	1,307
	A4	1,376	1,174
ICRSSM	A1	3,209	2,733
	A2	3,028	2,580
	A3 - Preferrred	2,930	2,497
	A4	2,666	2,273

Note: All values are discounted and annualized over the 25 year period of analysis.

Sources: Columns A,B - Exhibits U.6 a - d, Columns K - P

Exhibit U.7b: Life Years Saved for Fatal Cases of Cryptosporidiosis Based on Low Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	Annualized Life-Years 3% A	7% B
ICR	A1	2,290	1,950
	A2	45	1,925
	A3 - Preferrred	2,240	1,907
	A4	2,117	1,804
ICRSSL	A1	718	611
	A2	628	535
	A3 - Preferrred	590	503
	A4	525	448
ICRSSM	A1	1,253	1,067
	A2	1,175	1,001
	A3 - Preferrred	1,131	963
	A4	1,019	869

Note: All values are discounted and annualized over the 25 year period of analysis.

Sources: Columns A,B - Exhibits U.6 e - h, Columns K - P

Exhibit U.7c: Life Years Saved for Fatal Cases of Cryptosporidiosis Based on High Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	Annualized Life-Years 3% A	Annualized Life-Years 7% B
ICR	A1	9,407	8,014
	A2	143	7,917
	A3 - Preferrred	9,207	7,845
	A4	8,738	7,448
ICRSSL	A1	2,957	2,518
	A2	2,623	2,235
	A3 - Preferrred	2,474	2,110
	A4	2,220	1,894
ICRSSM	A1	4,266	3,654
	A2	4,062	3,479
	A3 - Preferrred	3,960	3,392
	A4	3,659	3,134

Note: All values are discounted and annualized over the 25 year period of analysis.

Sources: Columns A,B - Exhibits U.6 i - l, Columns K - P

U.2.1.3 Annualized MILYs saved from avoided cases of premature mortality and non-fatal morbidity

As mentioned in Section 1.2 of this Appendix, MILYs is a QALY index that combines mortality and morbidity benefits in a single cost-effectiveness measure, with an approach that explicitly values all life years saved at the value of full health (equal to 1.0). MILYs (Exhibit U.8, columns E and F) are calculated as follows (all values are annualized):

MILYs = (QALYs for non-fatal morbidity cases) + (life years saved from mortality cases).

Estimates of the mean MILYs saved are shown in Exhibit U.8 for the low, medium, and high dose-response models. Based on the medium dose-response model, using a 3 percent discount rate and the ICR *Cryptosporidium* occurrence data set, the combined life years saved (for avoided mortalities) and quality-adjusted life year equivalents saved (for avoided non-fatal morbidity) is highest in the most stringent alternative (A1 is approximately 11,500 years) and lowest in the least stringent alternative (A4 is approximately 10,600). The ICRSSL and ICRSSM data sets exhibit the same pattern, as does this comparison for each model using a 7 percent discount rate.

Exhibit U.8a: MILYs for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	QALYs Saved from Avoided Non-Fatal Morbidity		Life-Years Saved from Avoided Mortality		MILYs	
		3%	7%	3%	7%	3%	7%
		A	B	C	D	E	F
		–	–	–	–	A + C	B + D
ICR	A1	5,270	4,484	6,202	5,283	11,472	9,767
	A2	5,194	4,419	6,132	5,224	11,326	9,643
	A3 - Preferrred	5,137	4,371	6,081	5,180	11,218	9,552
	A4	4,814	4,098	5,787	4,932	10,601	9,030
ICRSSL	A1	1,558	1,325	1,828	1,557	3,386	2,882
	A2	1,334	1,135	1,624	1,384	2,958	2,520
	A3 - Preferrred	1,233	1,050	1,533	1,307	2,766	2,358
	A4	1,060	904	1,376	1,174	2,437	2,078
ICRSSM	A1	2,734	2,326	3,209	2,733	5,944	5,059
	A2	2,535	2,157	3,028	2,580	5,563	4,736
	A3 - Preferrred	2,427	2,066	2,930	2,497	5,357	4,563
	A4	2,136	1,819	2,666	2,273	4,801	4,092

Abbreviations: QALYs = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B: Exhibits U.5, Columns C, D; Columns C,D: Exhibits U.7 a, Columns A, B

Exhibit U.8b: MILYs for Non-Fatal Morbidity and Mortality Based on Low Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	QALYs Saved from Avoided Non-Fatal Morbidity		Life-Years Saved from Avoided Mortality		MILYs	
		3%	7%	3%	7%	3%	7%
		A	B	C	D	E	F
		–	–	–	–	A + C	B + D
ICR	A1	1,965	1,671	2,290	1,950	4,254	3,621
	A2	1,933	1,644	45	1,925	1,977	3,569
	A3 - Preferrred	1,910	1,625	2,240	1,907	4,149	3,532
	A4	1,774	1,510	2,117	1,804	3,891	3,314
ICRSSL	A1	618	526	718	611	1,336	1,137
	A2	520	442	628	535	1,148	977
	A3 - Preferrred	477	406	590	503	1,067	909
	A4	406	346	525	448	931	794
ICRSSM	A1	1,079	917	1,253	1,067	2,332	1,984
	A2	993	844	1,175	1,001	2,168	1,845
	A3 - Preferrred	944	803	1,131	963	2,074	1,766
	A4	821	699	1,019	869	1,840	1,568

Abbreviations: QALYs = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B: Exhibits U.5, Columns C, D; Columns C,D: Exhibits U.7 b, Columns A, B

Exhibit U.8c: MILYs for Non-Fatal Morbidity and Mortality Based on High Estimate Dose Response Model, by Rule Alternative, by Data Set

Data Set	Rule Alternative	QALYs Saved from Avoided Non-Fatal Morbidity		Life-Years Saved from Avoided Mortality		MILYs	
		3%	7%	3%	7%	3%	7%
		A	B	C	D	E	F
		–	–	–	–	A + C	B + D
ICR	A1	7,996	6,804	9,407	8,014	17,404	14,818
	A2	7,870	6,697	143	7,917	8,013	14,614
	A3 - Preferrred	7,776	6,618	9,207	7,845	16,983	14,463
	A4	7,260	6,181	8,738	7,448	15,998	13,630
ICRSSL	A1	2,523	2,146	2,957	2,518	5,480	4,664
	A2	2,155	1,834	2,623	2,235	4,778	4,070
	A3 - Preferrred	1,991	1,696	2,474	2,110	4,465	3,806
	A4	1,712	1,459	2,220	1,894	3,932	3,354
ICRSSM	A1	4,291	3,650	4,266	3,654	8,557	7,304
	A2	3,966	3,374	4,062	3,479	8,028	6,854
	A3 - Preferrred	3,793	3,229	3,960	3,392	7,753	6,620
	A4	3,325	2,832	3,659	3,134	6,984	5,967

Abbreviations: QALYs = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B: Exhibits U.5, Columns C, D; Columns C,D: Exhibits U.7 c, Columns A, B

U.2.2 The CEA Numerator: Deriving Net Cost

U.2.2.1 Identifying costs to be subtracted from regulatory costs

The numerator in any cost-effectiveness calculation is an estimate of the relevant costs to achieve the change in health state characterized by the effectiveness measure. For environmental decision-making, regulatory costs of particular options are the appropriate starting point for defining the numerator in a cost-effectiveness assessment of environmental improvement options. In cases where the benefits of environmental improvement include the prevention of a broad range of health, ecological, and other welfare effects, it is necessary to separate health from other costs since only net health costs are relevant for comparison to a purely health-based effectiveness measure. The major benefits, and the only quantified benefits, of this rule are health improvements, so no subtraction of costs attributable to other goals is necessary here.

In medical cost-effectiveness applications, net costs of disease treatment are included in the numerator for those interventions involving treatment. In the environmental protection context, the handling of disease treatment costs depends on the scope of the effectiveness measure. If the QALY score reflects a health state after treatment is administered, then the costs of treatment necessary to achieve that health state must be subtracted from the regulatory costs to yield the net cost of avoiding a QALY decrement. In the context of the LT2ESWTR, costs may be incurred to prevent occurrences of cryptosporidiosis and the associated decrease in quality of life (QALY decrement) and medical treatment costs to avoid further symptoms or disability (e.g., dehydration). Therefore, the net cost to avoid a QALY decrement in this case is the regulatory costs minus the medical treatment costs.

There are additional issues that concern the estimation of "net costs" for a given option. For example, a key question in the cost-effectiveness literature is the treatment of productivity losses associated with incidence of a health effect. In 1997, the Panel on Cost-Effectiveness in Health and Medicine published, in the journal Health Economics,[12] a paper supporting that lost paid work time that is a loss to the individual (e.g., lost market compensation, lost ability to complete uncompensated work, and lost leisure time) might best be assumed to be reflected in a full and complete QALY score. In other words, elicitees, or experts assessing quality of life for patients, are likely to have considered these effects in the quality of life score they report.

However, there is still some debate about whether the costs borne by society or the individual that are related to lost paid work time are fully considered in the elicitation process, and whether these costs should be subtracted from the CEA numerator. In this CEA, the lost paid work time is subtracted in the numerator from regulatory costs. This is consistent with the approach used in Appendix G of the CAIR and reflects continuing uncertainty about the appropriate treatment of costs borne by society and individuals; some may interpret this as an implicit assumption that elicitees did not consider these costs in participating in the QWB survey. This decision is consistent with the one other EPA rule (CAIR) that has included a full QALY-based CEA. Whether lost paid work time is fully accounted for in the QALY decrement is another issue that may be addressed by the NAS/IOM panel on CEA.

In addition to medical costs, certain other costs are also appropriate to subtract from regulatory costs in the numerator to make it consistent with the denominator. In the case of the QALY decrement selected for use in this CEA, elicitees were not asked to consider lost caregiver time or reduced

[12] See Milton C. Weinstein, Joanna E. Siegel, Alan M. Garber, Joseph Lipscomb, Bryan R. Luce, Willard G. Manning, Jr., and George W. Torrance, Productivity Costs, Time Costs and Health-related Quality of Life: A Response to the Erasmus Group, Health Economics, 6:505-510, 1997.

productivity while at work (different than a complete absence from work). Thus the QALY decrement likely did not account for these costs, and they are appropriate to subtract in the numerator from regulatory costs. Weinstein et al. support the inclusion of reduced productivity while at work in the costs subtracted from the cost of regulation in the numerator (Weinstein, 1997). In this CEA, reduced productivity while at work is included only in the approach based upon the Enhanced Cost of Illness approach (ECOI).

The individual costs that compose cost-of-illness in Ch. 5 of the EA are shown in Exhibit U.9 (columns A and B) at their base year values. The individual costs defined here as appropriate to subtract from the numerator are shown as the "Cost Adjustment" in columns C and D and include certain lost time and medical costs, based upon both the ECOI and Traditional Cost of Illness approach (TCOI). The resulting mean cost adjustment per case is $414.84 (based upon the ECOI) and $250.02 (based upon the TCOI), inclusive of lost time and medical costs, in 2003$. Section 2.2.2 of this Appendix further describes the application of these costs.

Exhibit U.9: Cost Adjustment Per Case, Year 2003$

Loss Category:	ECOI from Ch. 5 of the EA	TCOI from Ch. 5 of the EA	CEA Cost Adjustment Per Case (ECOI)	CEA Cost Adjustment Per Case (TCOI)
	A	B	C	D
Total	$ 844.24	$ 274.34	$ 414.84	$ 250.02
Direct Medical Costs[1]	$ 106.91	$ 106.91	$ 106.91	$ 106.91
Lost Time Subtotal	$ 737.33	$ 167.43	$ 307.93	$ 143.11
Lost Paid Work Days	$ 120.13	$ 120.13	$ 120.13	$ 120.13
Lost Unpaid Work Days	$ 48.64	$ 24.32	-	-
Lost Leisure Time	$ 217.79	-	-	-
Lost Caregiver Days	$ 61.50	$ 22.98	$ 61.50	$ 22.98
Lost Leisure Productivity[2]	$ 162.98	-	-	-
Lost Work Productivity[3]	$ 126.29	-	$ 126.29	-

Abbreviations:
ECOI = Enhanced Cost of Illness
TCOI = Traditional Cost of Illness
CEA = Cost Effectiveness Analysis

Footnotes:
1. "Direct Medical Costs" are taken from Chapter 5, and are derived in Appendices K and L of the LT2ESWTR EA.
2. (Leisure*30%)
3. (SumofWork*30%)

Sources: Columns A,B - Exhibit L.10

U.2.2.2 Calculating costs by year to be subtracted from regulatory costs

As described in more detail in the EA, the value of lost time can increase or decrease over time, depending on the change in real income. Income growth means that the lost time portion of the cost adjustment to the numerator per case of illness would increase. Using the changes in income growth

shown in Ch. 5 of the EA (Exhibit 5.21) and derived in Appendix C of the LT2ESWTR, the net income lost due to illness, and therefore the CEA cost numerator adjustment, is increased over the 25-year period of analysis. As explained in Ch. 5 of the EA (See **"***Total Morbidity Cost of Illness"* in Section 5.3.1.1), benefits derived from avoided medical costs are not adjusted for changes in income over time, because medical costs do not necessarily have a direct or indirect link with income.

The cost adjustment per case is calculated for each year using the following equation:

$$\text{Yearly Cost Adjustment Per Case} = [(B + 1)_i \times (\text{Previous Year Lost Time Costs})_i] + \$106.91$$

Where B is the real income increase factor,
i = year 1 to 25,
Lost Time Costs = Lost Time portion of Cost Adjustment and
$106.91 = Medical Cost portion of the Cost Adjustment.

Each year's calculated Lost Time Costs are then added to the medical costs estimate to yield a total cost adjustment per case that is specific to each year. Exhibit U.10 shows the results of these calculations.

Exhibit U.10: Cost Adjustment per Case, Real Dollars Adjusted Annually for Income Growth[1]

Year	%Change in Income (Real GDP per Capita) (*B*)	Lost Time w/Growth Factor (ECOI)	Lost Time w/Growth Factor (TCOI)	Direct Medical Costs[2]	Cost Adjustment (ECOI)	Cost Adjustment (TCOI)
A	B	C	D	E	F	G
–	–	(1+*B*) * Prior Year's Lost Time		–	C + E	D + E
2005	Base Year	$ 307.93	$ 143.11	$106.91	$ 414.84	$ 250.02
2006	3.3%	$ 318.16	$ 147.87	$106.91	$ 425.07	$ 254.78
2007	2.3%	$ 325.62	$ 151.34	$106.91	$ 432.53	$ 258.25
2008	1.9%	$ 331.66	$ 154.14	$106.91	$ 438.57	$ 261.05
2009	2.0%	$ 338.16	$ 157.17	$106.91	$ 445.07	$ 264.08
2010	2.0%	$ 344.82	$ 160.26	$106.91	$ 451.73	$ 267.17
2011	1.8%	$ 350.93	$ 163.10	$106.91	$ 457.84	$ 270.01
2012	1.7%	$ 356.80	$ 165.83	$106.91	$ 463.71	$ 272.74
2013	1.7%	$ 362.76	$ 168.60	$106.91	$ 469.67	$ 275.51
2014	1.7%	$ 368.82	$ 171.42	$106.91	$ 475.73	$ 278.33
2015	1.7%	$ 375.00	$ 174.29	$106.91	$ 481.91	$ 281.20
2016	1.7%	$ 381.29	$ 177.21	$106.91	$ 488.20	$ 284.12
2017	1.7%	$ 387.70	$ 180.19	$106.91	$ 494.61	$ 287.10
2018	1.7%	$ 394.25	$ 183.23	$106.91	$ 501.16	$ 290.14
2019	1.7%	$ 400.93	$ 186.34	$106.91	$ 507.84	$ 293.25
2020	1.7%	$ 407.75	$ 189.51	$106.91	$ 514.66	$ 296.42
2021	1.7%	$ 414.70	$ 192.74	$106.91	$ 521.61	$ 299.65
2022	1.7%	$ 421.77	$ 196.02	$106.91	$ 528.68	$ 302.93
2023	1.7%	$ 428.96	$ 199.37	$106.91	$ 535.87	$ 306.28
2024	1.7%	$ 436.28	$ 202.77	$106.91	$ 543.19	$ 309.68
2025	1.7%	$ 443.73	$ 206.23	$106.91	$ 550.64	$ 313.14
2026	1.7%	$ 451.31	$ 209.75	$106.91	$ 558.22	$ 316.66
2027	1.7%	$ 459.04	$ 213.35	$106.91	$ 565.95	$ 320.26
2028	1.7%	$ 466.90	$ 217.00	$106.91	$ 573.81	$ 323.91
2029	1.7%	$ 474.92	$ 220.73	$106.91	$ 581.83	$ 327.64
				NPV 3%	$8,475.51	$4,935.54
				NPV 7%	$5,529.77	$3,236.89
				Annualized 3%	$486.73	$283.44
				Annualized 7%	$474.51	$277.76

Footnotes:

1. Annual income growth factor applies to "Lost Time," the value of which increases as income increases; the income growth factor is not applied to medical costs. 2. "Direct Medical Costs" are also shown in Exhibit 9 of this Appendix and in Chapter 5 of the LT2ESWTR EA, and are derived in Appendices K and L of the EA.

Sources: Columns B, E - Exhibit L.11
Column C - "Base year" is from Exhibit U.9

U.2.2.3 Deriving total cost adjustment to regulatory costs based upon cases

Having identified which costs to subtract from the numerator and determined what these costs are per year, the next step multiplies this cost adjustment by the total cases per year. This yields a Total Cost Adjustment for morbidity and mortality that will be subtracted from regulation costs in the numerator to provide a net cost numerator. In Exhibits U.11a–c, the cost adjustments are increased for real income increases each year and multiplied by the cases of morbidity and mortality for the three *Cryptosporidium* occurrence data sets during the 25-year period of analysis.

First, the number of illnesses and deaths each year are taken from Exhibit 8.3 of the LT2ESWTR EA, and multiplied by the cost adjustment per case based upon the ECOI and TCOI approaches:

$$\text{Total Cost Adjustment} = (\text{Cases}_{i,c,n} \times \text{Cost Adjustment}_i)$$

for i = year 1 to 25,
c = *Cryptosporidium* occurrence data set, and
n = regulatory alternative.

Next, the NPV and the annualized value of the cost adjustment (based upon the ECOI and TCOI) are calculated based on the low, medium, and high dose-response models for each alternative and each *Cryptosporidium* occurrence data set at a discount rate of 3 percent and 7 percent (12 combinations for each model). The results indicate that, using a 3 percent discount rate, the ECOI approach, and the ICR data set, the highest mean Total Cost Adjustment is $337 million (Alternative 1) and the lowest is $308 million (Alternative 4). Alternative A1 is the most stringent alternative and reduces risk to the largest extent; therefore, it has the highest cost adjustment, which reflects its achievement in avoided lost time and medical costs. The other *Cryptosporidium* occurrence data sets (ICRSSM and ICRSSL) show the same pattern of high/low cost adjustment values, as does the same comparison using the 7 percent discount rate.

Exhibit U.11a: ICR Cost Adjustment for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model, Alternatives A1 – A2

Alternative	Year	Mortality All Systems	Morbidity All Systems	Cost Adjustment per Case (ECOI)	Cost Adjustment per Case (TCOI)	Cost Adjustment for Mortality (ECOI)	Cost Adjustment for Mortality (TCOI)	Cost Adjustment for Morbidity (ECOI)	Cost Adjustment for Morbidity (TCOI)	Cost Adjustment for Morbidity & Mortality (ECOI)	Cost Adjustment for Morbidity & Mortality (TCOI)
				($)		($Millions)					
		A	B	C	D	E	F	G	H	I	J
		–	–	–	–	(A * C)/10^6	(A * D)/10^6	(B * C)/10^6	(B * D)/10^6	E + G	F + H
A1	2005	-	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	-	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	-	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	-	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	18	82,534	$ 445	$ 264	$ 0.00810	$ 0.00481	$ 36.73	$ 21.80	$ 36.74	$ 21.80
	2010	56	254,453	$ 452	$ 267	$ 0.02523	$ 0.01492	$ 114.94	$ 67.98	$ 114.97	$ 68.00
	2011	114	519,716	$ 458	$ 270	$ 0.05203	$ 0.03069	$ 237.95	$ 140.33	$ 238.00	$ 140.36
	2012	156	718,906	$ 464	$ 273	$ 0.07242	$ 0.04259	$ 333.36	$ 196.07	$ 333.43	$ 196.11
	2013	199	920,857	$ 470	$ 276	$ 0.09354	$ 0.05487	$ 432.50	$ 253.70	$ 432.59	$ 253.76
	2014	205	953,780	$ 476	$ 278	$ 0.09754	$ 0.05706	$ 453.74	$ 265.46	$ 453.84	$ 265.52
	2015	209	978,652	$ 482	$ 281	$ 0.10091	$ 0.05888	$ 471.62	$ 275.19	$ 471.72	$ 275.25
	2016	210	984,303	$ 488	$ 284	$ 0.10271	$ 0.05978	$ 480.54	$ 279.66	$ 480.64	$ 279.72
	2017	211	989,954	$ 495	$ 287	$ 0.10455	$ 0.06069	$ 489.64	$ 284.22	$ 489.75	$ 284.28
	2018	211	989,954	$ 501	$ 290	$ 0.10593	$ 0.06133	$ 496.12	$ 287.23	$ 496.23	$ 287.29
	2019	211	989,954	$ 508	$ 293	$ 0.10734	$ 0.06198	$ 502.73	$ 290.30	$ 502.84	$ 290.36
	2020	211	989,954	$ 515	$ 296	$ 0.10879	$ 0.06266	$ 509.49	$ 293.44	$ 509.60	$ 293.50
	2021	211	989,954	$ 522	$ 300	$ 0.11025	$ 0.06334	$ 516.37	$ 296.64	$ 516.48	$ 296.70
	2022	211	989,954	$ 529	$ 303	$ 0.11175	$ 0.06403	$ 523.37	$ 299.89	$ 523.48	$ 299.95
	2023	211	989,954	$ 536	$ 306	$ 0.11327	$ 0.06474	$ 530.49	$ 303.20	$ 530.60	$ 303.26
	2024	211	989,954	$ 543	$ 310	$ 0.11482	$ 0.06546	$ 537.73	$ 306.57	$ 537.85	$ 306.63
	2025	211	989,954	$ 551	$ 313	$ 0.11639	$ 0.06619	$ 545.11	$ 309.99	$ 545.22	$ 310.06
	2026	211	989,954	$ 558	$ 317	$ 0.11799	$ 0.06693	$ 552.61	$ 313.48	$ 552.73	$ 313.55
	2027	211	989,954	$ 566	$ 320	$ 0.11963	$ 0.06769	$ 560.26	$ 317.04	$ 560.38	$ 317.11
	2028	211	989,954	$ 574	$ 324	$ 0.12129	$ 0.06847	$ 568.04	$ 320.65	$ 568.17	$ 320.72
	2029	211	989,954	$ 582	$ 328	$ 0.12299	$ 0.06925	$ 575.99	$ 324.35	$ 576.11	$ 324.42
									NPV 3%	$ 5,874	$ 3,387
									NPV 7%	$ 3,296	$ 1,906
									Annualizd 3%	$ 337	$ 194
									Annualizd 7%	$ 283	$ 164
A2	2005	0	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	0	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	0	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	0	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	18	81,486	$ 445	$ 264	$ 0.00802	$ 0.00476	$ 36.27	$ 21.52	$ 36.28	$ 21.52
	2010	55	251,137	$ 452	$ 267	$ 0.02498	$ 0.01477	$ 113.45	$ 67.10	$ 113.47	$ 67.11
	2011	113	512,812	$ 458	$ 270	$ 0.05151	$ 0.03038	$ 234.79	$ 138.46	$ 234.84	$ 138.50
	2012	155	709,048	$ 464	$ 273	$ 0.07166	$ 0.04215	$ 328.79	$ 193.38	$ 328.86	$ 193.43
	2013	197	907,972	$ 470	$ 276	$ 0.09254	$ 0.05428	$ 426.45	$ 250.15	$ 426.54	$ 250.21
	2014	203	940,065	$ 476	$ 278	$ 0.09646	$ 0.05643	$ 447.22	$ 261.64	$ 447.32	$ 261.70
	2015	207	964,309	$ 482	$ 281	$ 0.09977	$ 0.05822	$ 464.71	$ 271.16	$ 464.81	$ 271.22
	2016	208	969,817	$ 488	$ 284	$ 0.10154	$ 0.05909	$ 473.46	$ 275.54	$ 473.57	$ 275.60
	2017	209	975,326	$ 495	$ 287	$ 0.10335	$ 0.05999	$ 482.41	$ 280.02	$ 482.51	$ 280.08
	2018	209	975,326	$ 501	$ 290	$ 0.10472	$ 0.06063	$ 488.79	$ 282.98	$ 488.90	$ 283.04
	2019	209	975,326	$ 508	$ 293	$ 0.10611	$ 0.06127	$ 495.31	$ 286.01	$ 495.41	$ 286.07
	2020	209	975,326	$ 515	$ 296	$ 0.10754	$ 0.06194	$ 501.96	$ 289.10	$ 502.07	$ 289.16
	2021	209	975,326	$ 522	$ 300	$ 0.10899	$ 0.06261	$ 508.74	$ 292.25	$ 508.85	$ 292.32
	2022	209	975,326	$ 529	$ 303	$ 0.11047	$ 0.06330	$ 515.63	$ 295.46	$ 515.74	$ 295.52
	2023	209	975,326	$ 536	$ 306	$ 0.11197	$ 0.06400	$ 522.65	$ 298.72	$ 522.76	$ 298.78
	2024	209	975,326	$ 543	$ 310	$ 0.11350	$ 0.06471	$ 529.79	$ 302.04	$ 529.90	$ 302.10
	2025	209	975,326	$ 551	$ 313	$ 0.11506	$ 0.06543	$ 537.05	$ 305.41	$ 537.17	$ 305.48
	2026	209	975,326	$ 558	$ 317	$ 0.11664	$ 0.06617	$ 544.45	$ 308.85	$ 544.57	$ 308.92
	2027	209	975,326	$ 566	$ 320	$ 0.11826	$ 0.06692	$ 551.99	$ 312.35	$ 552.10	$ 312.42
	2028	209	975,326	$ 574	$ 324	$ 0.11990	$ 0.06768	$ 559.65	$ 315.92	$ 559.77	$ 315.98
	2029	209	975,326	$ 582	$ 328	$ 0.12158	$ 0.06846	$ 567.48	$ 319.55	$ 567.60	$ 319.62
									NPV 3%	$ 5,789	$ 3,337
									NPV 7%	$ 3,248	$ 1,878
									Annualizd 3%	$ 332	$ 192
									Annualizd 7%	$ 279	$ 161

Sources: Columns A, B - Exhibit C.10
Columns C, D - Exhibit U.10, Columns F, G

Exhibit U.11a: ICR Cost Adjustment for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model, Alternatives A3 – A4

Alternative	Year	Mortality All Systems	Morbidity All Systems	Cost Adjustment per Case (ECOI)	Cost Adjustment per Case (TCOI)	Cost Adjustment for Mortality (ECOI)	Cost Adjustment for Mortality (TCOI)	Cost Adjustment for Morbidity (ECOI)	Cost Adjustment for Morbidity (TCOI)	Cost Adjustment for Morbidity & Mortality (ECOI)	Cost Adjustment for Morbidity & Mortality (TCOI)
				($)		($Millions)					
		A	B	C	D	E	F	G	H	I	J
		–	–	–	–	(A * C)/10^6	(A * D)/10^6	(B * C)/10^6	(B * D)/10^5	E + G	F + H
A3	2005	0	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	0	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	0	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	0	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	18	80,758	$ 445	$ 264	$ 0.00797	$ 0.00473	$ 36	$ 21	$ 36	$ 21
	2010	55	248,841	$ 452	$ 267	$ 0.02481	$ 0.01467	$ 112	$ 66	$ 112	$ 66
	2011	112	508,045	$ 458	$ 270	$ 0.05115	$ 0.03016	$ 233	$ 137	$ 233	$ 137
	2012	153	702,169	$ 464	$ 273	$ 0.07113	$ 0.04184	$ 326	$ 192	$ 326	$ 192
	2013	196	898,834	$ 470	$ 276	$ 0.09182	$ 0.05386	$ 422	$ 248	$ 422	$ 248
	2014	201	930,191	$ 476	$ 278	$ 0.09568	$ 0.05598	$ 443	$ 259	$ 443	$ 259
	2015	205	953,727	$ 482	$ 281	$ 0.09892	$ 0.05772	$ 460	$ 268	$ 460	$ 268
	2016	206	959,044	$ 488	$ 284	$ 0.10067	$ 0.05859	$ 468	$ 272	$ 468	$ 273
	2017	207	964,360	$ 495	$ 287	$ 0.10245	$ 0.05947	$ 477	$ 277	$ 477	$ 277
	2018	207	964,360	$ 501	$ 290	$ 0.10381	$ 0.06010	$ 483	$ 280	$ 483	$ 280
	2019	207	964,360	$ 508	$ 293	$ 0.10519	$ 0.06074	$ 490	$ 283	$ 490	$ 283
	2020	207	964,360	$ 515	$ 296	$ 0.10661	$ 0.06140	$ 496	$ 286	$ 496	$ 286
	2021	207	964,360	$ 522	$ 300	$ 0.10805	$ 0.06207	$ 503	$ 289	$ 503	$ 289
	2022	207	964,360	$ 529	$ 303	$ 0.10951	$ 0.06275	$ 510	$ 292	$ 510	$ 292
	2023	207	964,360	$ 536	$ 306	$ 0.11100	$ 0.06344	$ 517	$ 295	$ 517	$ 295
	2024	207	964,360	$ 543	$ 310	$ 0.11252	$ 0.06415	$ 524	$ 299	$ 524	$ 299
	2025	207	964,360	$ 551	$ 313	$ 0.11406	$ 0.06486	$ 531	$ 302	$ 531	$ 302
	2026	207	964,360	$ 558	$ 317	$ 0.11563	$ 0.06559	$ 538	$ 305	$ 538	$ 305
	2027	207	964,360	$ 566	$ 320	$ 0.11723	$ 0.06634	$ 546	$ 309	$ 546	$ 309
	2028	207	964,360	$ 574	$ 324	$ 0.11886	$ 0.06709	$ 553	$ 312	$ 553	$ 312
	2029	207	964,360	$ 582	$ 328	$ 0.12052	$ 0.06787	$ 561	$ 316	$ 561	$ 316
									NPV 3%	$ 5,725	$ 3,301
									NPV 7%	$ 3,213	$ 1,858
									Annualizd 3%	$ 329	$ 190
									Annualizd 7%	$ 276	$ 159
A4	2005	0	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	0	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	0	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	0	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	17	76,362	$ 445	$ 264	$ 0.00765	$ 0.00454	$ 33.99	$ 20.17	$ 33.99	$ 20.17
	2010	53	234,991	$ 452	$ 267	$ 0.02377	$ 0.01406	$ 106.15	$ 62.78	$ 106.18	$ 62.80
	2011	107	479,288	$ 458	$ 270	$ 0.04897	$ 0.02888	$ 219.44	$ 129.41	$ 219.49	$ 129.44
	2012	147	661,110	$ 464	$ 273	$ 0.06798	$ 0.03998	$ 306.56	$ 180.31	$ 306.63	$ 180.35
	2013	187	845,012	$ 470	$ 276	$ 0.08764	$ 0.05141	$ 396.88	$ 232.81	$ 396.96	$ 232.86
	2014	192	872,787	$ 476	$ 278	$ 0.09116	$ 0.05333	$ 415.21	$ 242.92	$ 415.30	$ 242.97
	2015	195	893,336	$ 482	$ 281	$ 0.09411	$ 0.05491	$ 430.51	$ 251.20	$ 430.60	$ 251.26
	2016	196	897,918	$ 488	$ 284	$ 0.09573	$ 0.05571	$ 438.36	$ 255.12	$ 438.46	$ 255.17
	2017	197	902,500	$ 495	$ 287	$ 0.09739	$ 0.05653	$ 446.39	$ 259.11	$ 446.49	$ 259.17
	2018	197	902,500	$ 501	$ 290	$ 0.09868	$ 0.05713	$ 452.29	$ 261.85	$ 452.39	$ 261.91
	2019	197	902,500	$ 508	$ 293	$ 0.09999	$ 0.05774	$ 458.32	$ 264.65	$ 458.42	$ 264.71
	2020	197	902,500	$ 515	$ 296	$ 0.10134	$ 0.05836	$ 464.48	$ 267.52	$ 464.58	$ 267.57
	2021	197	902,500	$ 522	$ 300	$ 0.10271	$ 0.05900	$ 470.75	$ 270.43	$ 470.85	$ 270.49
	2022	197	902,500	$ 529	$ 303	$ 0.10410	$ 0.05965	$ 477.13	$ 273.40	$ 477.24	$ 273.46
	2023	197	902,500	$ 536	$ 306	$ 0.10551	$ 0.06031	$ 483.62	$ 276.41	$ 483.73	$ 276.47
	2024	197	902,500	$ 543	$ 310	$ 0.10695	$ 0.06098	$ 490.23	$ 279.48	$ 490.34	$ 279.54
	2025	197	902,500	$ 551	$ 313	$ 0.10842	$ 0.06166	$ 496.95	$ 282.61	$ 497.06	$ 282.67
	2026	197	902,500	$ 558	$ 317	$ 0.10991	$ 0.06235	$ 503.80	$ 285.79	$ 503.91	$ 285.85
	2027	197	902,500	$ 566	$ 320	$ 0.11144	$ 0.06306	$ 510.77	$ 289.03	$ 510.88	$ 289.09
	2028	197	902,500	$ 574	$ 324	$ 0.11298	$ 0.06378	$ 517.86	$ 292.33	$ 517.98	$ 292.39
	2029	197	902,500	$ 582	$ 328	$ 0.11456	$ 0.06451	$ 525.10	$ 295.69	$ 525.22	$ 295.76
									NPV 3%	$ 5,365	$ 3,093
									NPV 7%	$ 3,012	$ 1,741
									Annualizd 3%	$ 308	$ 178
									Annualizd 7%	$ 258	$ 149

Sources: Columns A, B - Exhibit C.10
Columns C, D - Exhibit U.10, Columns F, G

Exhibit U.11b: ICRSSL Cost Adjustment for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model, Alternatives A1 - A2

Alternative	Year	Mortality All Systems	Morbidity All Systems	Cost Adjustment per Case (ECOI)	Cost Adjustment per Case (TCOI)	Cost Adjustment for Mortality (ECOI)	Cost Adjustment for Mortality (TCOI)	Cost Adjustment for Morbidity (ECOI)	Cost Adjustment for Morbidity (TCOI)	Cost Adjustment for Morbidity & Mortality (ECOI)	Cost Adjustment for Morbidity & Mortality (TCOI)
				($)		($Millions)					
		A	B	C	D	E	F	G	H	I	J
		–	–	–	–	(A * C)/10^6	(A * D)/10^6	(B * C)/10^6	(B * D)/10^6	E + G	F + H
A1	2005	-	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	-	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	-	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	-	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	5	24,233	$ 445	$ 264	$ 0.00237	$ 0.00141	$ 10.79	$ 6.40	$ 10.79	$ 6.40
	2010	16	74,762	$ 452	$ 267	$ 0.00740	$ 0.00438	$ 33.77	$ 19.97	$ 33.78	$ 19.98
	2011	33	152,778	$ 458	$ 270	$ 0.01526	$ 0.00900	$ 69.95	$ 41.25	$ 69.96	$ 41.26
	2012	46	211,626	$ 464	$ 273	$ 0.02127	$ 0.01251	$ 98.13	$ 57.72	$ 98.15	$ 57.73
	2013	59	271,415	$ 470	$ 276	$ 0.02750	$ 0.01613	$ 127.48	$ 74.78	$ 127.50	$ 74.79
	2014	60	281,547	$ 476	$ 278	$ 0.02872	$ 0.01680	$ 133.94	$ 78.36	$ 133.97	$ 78.38
	2015	62	289,367	$ 482	$ 281	$ 0.02975	$ 0.01736	$ 139.45	$ 81.37	$ 139.48	$ 81.39
	2016	62	291,179	$ 488	$ 284	$ 0.03030	$ 0.01763	$ 142.15	$ 82.73	$ 142.18	$ 82.75
	2017	62	292,992	$ 495	$ 287	$ 0.03085	$ 0.01791	$ 144.92	$ 84.12	$ 144.95	$ 84.14
	2018	62	292,992	$ 501	$ 290	$ 0.03126	$ 0.01810	$ 146.83	$ 85.01	$ 146.87	$ 85.03
	2019	62	292,992	$ 508	$ 293	$ 0.03168	$ 0.01829	$ 148.79	$ 85.92	$ 148.82	$ 85.94
	2020	62	292,992	$ 515	$ 296	$ 0.03210	$ 0.01849	$ 150.79	$ 86.85	$ 150.82	$ 86.87
	2021	62	292,992	$ 522	$ 300	$ 0.03253	$ 0.01869	$ 152.83	$ 87.79	$ 152.86	$ 87.81
	2022	62	292,992	$ 529	$ 303	$ 0.03298	$ 0.01890	$ 154.90	$ 88.76	$ 154.93	$ 88.78
	2023	62	292,992	$ 536	$ 306	$ 0.03342	$ 0.01910	$ 157.01	$ 89.74	$ 157.04	$ 89.76
	2024	62	292,992	$ 543	$ 310	$ 0.03388	$ 0.01932	$ 159.15	$ 90.73	$ 159.18	$ 90.75
	2025	62	292,992	$ 551	$ 313	$ 0.03435	$ 0.01953	$ 161.33	$ 91.75	$ 161.37	$ 91.77
	2026	62	292,992	$ 558	$ 317	$ 0.03482	$ 0.01975	$ 163.55	$ 92.78	$ 163.59	$ 92.80
	2027	62	292,992	$ 566	$ 320	$ 0.03530	$ 0.01998	$ 165.82	$ 93.83	$ 165.85	$ 93.85
	2028	62	292,992	$ 574	$ 324	$ 0.03579	$ 0.02020	$ 168.12	$ 94.90	$ 168.16	$ 94.92
	2029	62	292,992	$ 582	$ 328	$ 0.03629	$ 0.02044	$ 170.47	$ 96.00	$ 170.51	$ 96.02
									NPV 3%	$ 1,737	$ 1,001
									NPV 7%	$ 974	$ 563
									Annualizd 3%	$ 100	$ 57
									Annualizd 7%	$ 84	$ 48
A2	2005	0	0	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	0	0	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	0	0	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	0	0	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	5	21182	$ 445	$ 264	$ 0.00215	$ 0.00128	$ 9.43	$ 5.59	$ 9.43	$ 5.59
	2010	15	65105	$ 452	$ 267	$ 0.00668	$ 0.00395	$ 29.41	$ 17.39	$ 29.42	$ 17.40
	2011	30	132662	$ 458	$ 270	$ 0.01374	$ 0.00810	$ 60.74	$ 35.82	$ 60.75	$ 35.83
	2012	41	182871	$ 464	$ 273	$ 0.01906	$ 0.01121	$ 84.80	$ 49.88	$ 84.82	$ 49.89
	2013	52	233795	$ 470	$ 276	$ 0.02458	$ 0.01442	$ 109.81	$ 64.41	$ 109.83	$ 64.43
	2014	54	241462	$ 476	$ 278	$ 0.02556	$ 0.01495	$ 114.87	$ 67.21	$ 114.90	$ 67.22
	2015	55	247392	$ 482	$ 281	$ 0.02641	$ 0.01541	$ 119.22	$ 69.57	$ 119.25	$ 69.58
	2016	55	248773	$ 488	$ 284	$ 0.02687	$ 0.01564	$ 121.45	$ 70.68	$ 121.48	$ 70.70
	2017	55	250153	$ 495	$ 287	$ 0.02734	$ 0.01587	$ 123.73	$ 71.82	$ 123.76	$ 71.84
	2018	55	250153	$ 501	$ 290	$ 0.02771	$ 0.01604	$ 125.37	$ 72.58	$ 125.39	$ 72.60
	2019	55	250153	$ 508	$ 293	$ 0.02808	$ 0.01621	$ 127.04	$ 73.36	$ 127.06	$ 73.37
	2020	55	250153	$ 515	$ 296	$ 0.02845	$ 0.01639	$ 128.74	$ 74.15	$ 128.77	$ 74.17
	2021	55	250153	$ 522	$ 300	$ 0.02884	$ 0.01657	$ 130.48	$ 74.96	$ 130.51	$ 74.97
	2022	55	250153	$ 529	$ 303	$ 0.02923	$ 0.01675	$ 132.25	$ 75.78	$ 132.28	$ 75.80
	2023	55	250153	$ 536	$ 306	$ 0.02963	$ 0.01693	$ 134.05	$ 76.62	$ 134.08	$ 76.63
	2024	55	250153	$ 543	$ 310	$ 0.03003	$ 0.01712	$ 135.88	$ 77.47	$ 135.91	$ 77.48
	2025	55	250153	$ 551	$ 313	$ 0.03044	$ 0.01731	$ 137.74	$ 78.33	$ 137.77	$ 78.35
	2026	55	250153	$ 558	$ 317	$ 0.03086	$ 0.01751	$ 139.64	$ 79.21	$ 139.67	$ 79.23
	2027	55	250153	$ 566	$ 320	$ 0.03129	$ 0.01771	$ 141.57	$ 80.11	$ 141.61	$ 80.13
	2028	55	250153	$ 574	$ 324	$ 0.03172	$ 0.01791	$ 143.54	$ 81.03	$ 143.57	$ 81.04
	2029	55	250153	$ 582	$ 328	$ 0.03217	$ 0.01811	$ 145.55	$ 81.96	$ 145.58	$ 81.98
									NPV 3%	$ 1,486	$ 857
									NPV 7%	$ 834	$ 482
									Annualizd 3%	$ 85	$ 49
									Annualizd 7%	$ 72	$ 41

Sources: Columns A, B - Exhibit C.10
Columns C, D - Exhibit U.10, Columns F, G

Exhibit U.11b: ICRSSL Cost Adjustment for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model, Alternatives A3 - A4

Alternative	Year	Mortality All Systems	Morbidity All Systems	Cost Adjustment per Case (ECOI)	Cost Adjustment per Case (TCOI)	Cost Adjustment for Mortality (ECOI)	Cost Adjustment for Mortality (TCOI)	Cost Adjustment for Morbidity (ECOI)	Cost Adjustment for Morbidity (TCOI)	Cost Adjustment for Morbidity & Mortality (ECOI)	Cost Adjustment for Morbidity & Mortality (TCOI)
				($)		($Millions)					
		A	B	C	D	E	F	G	H	I	J
		–	–	–	–	(A * C)/10^6	(A * D)/10^6	(B * C)/10^6	(B * D)/10^6	E + G	F + H
A3	2005	0	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	0	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	0	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	0	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	5	19,882	$ 445	$ 264	$ 0.00205	$ 0.00122	$ 9	$ 5	$ 9	$ 5
	2010	14	60,990	$ 452	$ 267	$ 0.00637	$ 0.00377	$ 28	$ 16	$ 28	$ 16
	2011	29	124,094	$ 458	$ 270	$ 0.01309	$ 0.00772	$ 57	$ 34	$ 57	$ 34
	2012	39	170,508	$ 464	$ 273	$ 0.01812	$ 0.01065	$ 79	$ 47	$ 79	$ 47
	2013	50	217,423	$ 470	$ 276	$ 0.02331	$ 0.01367	$ 102	$ 60	$ 102	$ 60
	2014	51	223,805	$ 476	$ 278	$ 0.02417	$ 0.01414	$ 106	$ 62	$ 106	$ 62
	2015	52	228,575	$ 482	$ 281	$ 0.02491	$ 0.01453	$ 110	$ 64	$ 110	$ 64
	2016	52	229,653	$ 488	$ 284	$ 0.02533	$ 0.01474	$ 112	$ 65	$ 112	$ 65
	2017	52	230,730	$ 495	$ 287	$ 0.02575	$ 0.01495	$ 114	$ 66	$ 114	$ 66
	2018	52	230,730	$ 501	$ 290	$ 0.02610	$ 0.01511	$ 116	$ 67	$ 116	$ 67
	2019	52	230,730	$ 508	$ 293	$ 0.02644	$ 0.01527	$ 117	$ 68	$ 117	$ 68
	2020	52	230,730	$ 515	$ 296	$ 0.02680	$ 0.01543	$ 119	$ 68	$ 119	$ 68
	2021	52	230,730	$ 522	$ 300	$ 0.02716	$ 0.01560	$ 120	$ 69	$ 120	$ 69
	2022	52	230,730	$ 529	$ 303	$ 0.02753	$ 0.01577	$ 122	$ 70	$ 122	$ 70
	2023	52	230,730	$ 536	$ 306	$ 0.02790	$ 0.01595	$ 124	$ 71	$ 124	$ 71
	2024	52	230,730	$ 543	$ 310	$ 0.02828	$ 0.01612	$ 125	$ 71	$ 125	$ 71
	2025	52	230,730	$ 551	$ 313	$ 0.02867	$ 0.01631	$ 127	$ 72	$ 127	$ 72
	2026	52	230,730	$ 558	$ 317	$ 0.02907	$ 0.01649	$ 129	$ 73	$ 129	$ 73
	2027	52	230,730	$ 566	$ 320	$ 0.02947	$ 0.01668	$ 131	$ 74	$ 131	$ 74
	2028	52	230,730	$ 574	$ 324	$ 0.02988	$ 0.01687	$ 132	$ 75	$ 132	$ 75
	2029	52	230,730	$ 582	$ 328	$ 0.03030	$ 0.01706	$ 134	$ 76	$ 134	$ 76
									NPV 3%	$ 1,374	$ 792
									NPV 7%	$ 772	$ 446
									Annualizd 3%	$ 79	$ 45
									Annualizd 7%	$ 66	$ 38
A4	2005	-	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	-	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	-	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	-	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	4	17,483	$ 445	$ 264	$ 0.00188	$ 0.00111	$ 7.78	$ 4.62	$ 7.78	$ 4.62
	2010	13	53,396	$ 452	$ 267	$ 0.00580	$ 0.00343	$ 24.12	$ 14.27	$ 24.13	$ 14.27
	2011	26	108,270	$ 458	$ 270	$ 0.01189	$ 0.00701	$ 49.57	$ 29.23	$ 49.58	$ 29.24
	2012	35	147,966	$ 464	$ 273	$ 0.01639	$ 0.00964	$ 68.61	$ 40.36	$ 68.63	$ 40.37
	2013	45	188,077	$ 470	$ 276	$ 0.02103	$ 0.01233	$ 88.33	$ 51.82	$ 88.35	$ 51.83
	2014	46	192,689	$ 476	$ 278	$ 0.02172	$ 0.01271	$ 91.67	$ 53.63	$ 91.69	$ 53.64
	2015	46	196,237	$ 482	$ 281	$ 0.02233	$ 0.01303	$ 94.57	$ 55.18	$ 94.59	$ 55.19
	2016	46	197,065	$ 488	$ 284	$ 0.02269	$ 0.01321	$ 96.21	$ 55.99	$ 96.23	$ 56.00
	2017	47	197,892	$ 495	$ 287	$ 0.02307	$ 0.01339	$ 97.88	$ 56.82	$ 97.90	$ 56.83
	2018	47	197,892	$ 501	$ 290	$ 0.02337	$ 0.01353	$ 99.18	$ 57.42	$ 99.20	$ 57.43
	2019	47	197,892	$ 508	$ 293	$ 0.02368	$ 0.01368	$ 100.50	$ 58.03	$ 100.52	$ 58.04
	2020	47	197,892	$ 515	$ 296	$ 0.02400	$ 0.01382	$ 101.85	$ 58.66	$ 101.87	$ 58.67
	2021	47	197,892	$ 522	$ 300	$ 0.02433	$ 0.01397	$ 103.22	$ 59.30	$ 103.25	$ 59.31
	2022	47	197,892	$ 529	$ 303	$ 0.02466	$ 0.01413	$ 104.62	$ 59.95	$ 104.65	$ 59.96
	2023	47	197,892	$ 536	$ 306	$ 0.02499	$ 0.01428	$ 106.04	$ 60.61	$ 106.07	$ 60.62
	2024	47	197,892	$ 543	$ 310	$ 0.02533	$ 0.01444	$ 107.49	$ 61.28	$ 107.52	$ 61.30
	2025	47	197,892	$ 551	$ 313	$ 0.02568	$ 0.01460	$ 108.97	$ 61.97	$ 108.99	$ 61.98
	2026	47	197,892	$ 558	$ 317	$ 0.02603	$ 0.01477	$ 110.47	$ 62.67	$ 110.49	$ 62.68
	2027	47	197,892	$ 566	$ 320	$ 0.02639	$ 0.01494	$ 112.00	$ 63.38	$ 112.02	$ 63.39
	2028	47	197,892	$ 574	$ 324	$ 0.02676	$ 0.01511	$ 113.55	$ 64.10	$ 113.58	$ 64.11
	2029	47	197,892	$ 582	$ 328	$ 0.02713	$ 0.01528	$ 115.14	$ 64.84	$ 115.17	$ 64.85
									NPV 3%	$ 1,181	$ 681
									NPV 7%	$ 664	$ 384
									Annualizd 3%	$ 68	$ 39
									Annualizd 7%	$ 57	$ 33

Sources: Columns A, B - Exhibit C.10
Columns C, D - Exhibit U.10, Columns F, G

Exhibit U.11c: ICRSSM Cost Adjustment for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model, Alternatives A1 - A2

Alternative	Year	Mortality All Systems	Morbidity All Systems	Cost Adjustment per Case (ECOI)	Cost Adjustment per Case (TCOI)	Cost Adjustment for Mortality (ECOI)	Cost Adjustment for Mortality (TCOI)	Cost Adjustment for Morbidity (ECOI)	Cost Adjustment for Morbidity (TCOI)	Cost Adjustment for Morbidity & Mortality (ECOI)	Cost Adjustment for Morbidity & Mortality (TCOI)
				($)		($Millions)					
		A	B	C	D	E	F	G	H	I	J
		–	–	–	–	(A * C)/10^6	(A * D)/10^6	(B * C)/10^6	(B * D)/10^6	E + G	F + H
A1	2005	-	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	-	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	-	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	-	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	9	42,547	$ 445	$ 264	$ 0.00417	$ 0.00247	$ 18.94	$ 11.24	$ 18.94	$ 11.24
	2010	29	131,271	$ 452	$ 267	$ 0.01299	$ 0.00768	$ 59.30	$ 35.07	$ 59.31	$ 35.08
	2011	59	268,270	$ 458	$ 270	$ 0.02681	$ 0.01581	$ 122.83	$ 72.44	$ 122.85	$ 72.45
	2012	81	371,590	$ 464	$ 273	$ 0.03736	$ 0.02197	$ 172.31	$ 101.35	$ 172.35	$ 101.37
	2013	103	476,517	$ 470	$ 276	$ 0.04830	$ 0.02833	$ 223.80	$ 131.28	$ 223.85	$ 131.31
	2014	106	494,253	$ 476	$ 278	$ 0.05042	$ 0.02950	$ 235.13	$ 137.56	$ 235.18	$ 137.59
	2015	108	507,869	$ 482	$ 281	$ 0.05223	$ 0.03048	$ 244.75	$ 142.81	$ 244.80	$ 142.84
	2016	109	511,009	$ 488	$ 284	$ 0.05318	$ 0.03095	$ 249.47	$ 145.19	$ 249.53	$ 145.22
	2017	109	514,150	$ 495	$ 287	$ 0.05415	$ 0.03143	$ 254.31	$ 147.61	$ 254.36	$ 147.64
	2018	109	514,150	$ 501	$ 290	$ 0.05487	$ 0.03177	$ 257.67	$ 149.18	$ 257.72	$ 149.21
	2019	109	514,150	$ 508	$ 293	$ 0.05560	$ 0.03211	$ 261.10	$ 150.77	$ 261.16	$ 150.80
	2020	109	514,150	$ 515	$ 296	$ 0.05635	$ 0.03245	$ 264.61	$ 152.40	$ 264.67	$ 152.43
	2021	109	514,150	$ 522	$ 300	$ 0.05711	$ 0.03281	$ 268.18	$ 154.06	$ 268.24	$ 154.10
	2022	109	514,150	$ 529	$ 303	$ 0.05788	$ 0.03317	$ 271.82	$ 155.75	$ 271.88	$ 155.79
	2023	109	514,150	$ 536	$ 306	$ 0.05867	$ 0.03353	$ 275.52	$ 157.47	$ 275.58	$ 157.50
	2024	109	514,150	$ 543	$ 310	$ 0.05947	$ 0.03391	$ 279.28	$ 159.22	$ 279.34	$ 159.25
	2025	109	514,150	$ 551	$ 313	$ 0.06029	$ 0.03428	$ 283.11	$ 161.00	$ 283.17	$ 161.03
	2026	109	514,150	$ 558	$ 317	$ 0.06112	$ 0.03467	$ 287.01	$ 162.81	$ 287.07	$ 162.85
	2027	109	514,150	$ 566	$ 320	$ 0.06196	$ 0.03506	$ 290.98	$ 164.66	$ 291.04	$ 164.69
	2028	109	514,150	$ 574	$ 324	$ 0.06282	$ 0.03546	$ 295.02	$ 166.54	$ 295.09	$ 166.57
	2029	109	514,150	$ 582	$ 328	$ 0.06370	$ 0.03587	$ 299.15	$ 168.46	$ 299.21	$ 168.49
									NPV 3%	$ 3,048	$ 1,757
									NPV 7%	$ 1,710	$ 988
									Annualizd 3%	$ 175	$ 101
									Annualizd 7%	$ 147	$ 85
A2	2005	-	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	-	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	-	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	-	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	9	39,828	$ 445	$ 264	$ 0.00397	$ 0.00236	$ 17.73	$ 10.52	$ 17.73	$ 10.52
	2010	27	122,669	$ 452	$ 267	$ 0.01235	$ 0.00730	$ 55.41	$ 32.77	$ 55.43	$ 32.78
	2011	56	250,355	$ 458	$ 270	$ 0.02545	$ 0.01501	$ 114.62	$ 67.60	$ 114.65	$ 67.61
	2012	76	345,985	$ 464	$ 273	$ 0.03539	$ 0.02082	$ 160.44	$ 94.36	$ 160.47	$ 94.38
	2013	97	443,021	$ 470	$ 276	$ 0.04569	$ 0.02680	$ 208.07	$ 122.06	$ 208.12	$ 122.08
	2014	100	458,565	$ 476	$ 278	$ 0.04761	$ 0.02786	$ 218.15	$ 127.63	$ 218.20	$ 127.66
	2015	102	470,498	$ 482	$ 281	$ 0.04925	$ 0.02874	$ 226.74	$ 132.30	$ 226.79	$ 132.33
	2016	103	473,253	$ 488	$ 284	$ 0.05013	$ 0.02918	$ 231.04	$ 134.46	$ 231.09	$ 134.49
	2017	103	476,008	$ 495	$ 287	$ 0.05103	$ 0.02962	$ 235.44	$ 136.66	$ 235.49	$ 136.69
	2018	103	476,008	$ 501	$ 290	$ 0.05171	$ 0.02994	$ 238.55	$ 138.11	$ 238.61	$ 138.14
	2019	103	476,008	$ 508	$ 293	$ 0.05240	$ 0.03026	$ 241.73	$ 139.59	$ 241.79	$ 139.62
	2020	103	476,008	$ 515	$ 296	$ 0.05310	$ 0.03058	$ 244.98	$ 141.10	$ 245.03	$ 141.13
	2021	103	476,008	$ 522	$ 300	$ 0.05382	$ 0.03092	$ 248.29	$ 142.63	$ 248.34	$ 142.67
	2022	103	476,008	$ 529	$ 303	$ 0.05455	$ 0.03126	$ 251.65	$ 144.20	$ 251.71	$ 144.23
	2023	103	476,008	$ 536	$ 306	$ 0.05529	$ 0.03160	$ 255.08	$ 145.79	$ 255.13	$ 145.82
	2024	103	476,008	$ 543	$ 310	$ 0.05604	$ 0.03195	$ 258.56	$ 147.41	$ 258.62	$ 147.44
	2025	103	476,008	$ 551	$ 313	$ 0.05681	$ 0.03231	$ 262.11	$ 149.06	$ 262.16	$ 149.09
	2026	103	476,008	$ 558	$ 317	$ 0.05759	$ 0.03267	$ 265.72	$ 150.73	$ 265.78	$ 150.77
	2027	103	476,008	$ 566	$ 320	$ 0.05839	$ 0.03304	$ 269.40	$ 152.44	$ 269.45	$ 152.48
	2028	103	476,008	$ 574	$ 324	$ 0.05920	$ 0.03342	$ 273.14	$ 154.18	$ 273.20	$ 154.22
	2029	103	476,008	$ 582	$ 328	$ 0.06003	$ 0.03380	$ 276.96	$ 155.96	$ 277.02	$ 155.99
									NPV 3%	$ 2,825	$ 1,629
									NPV 7%	$ 1,585	$ 917
									Annualizd 3%	$ 162	$ 94
									Annualizd 7%	$ 136	$ 79

Sources: Columns A, B - Exhibit C.10
Columns C, D - Exhibit U.10, Columns F, G

Exhibit U.11c: ICRSSM Cost Adjustment for Non-Fatal Morbidity and Mortality Based on Medium Estimate Dose Response Model , Alternatives A3 - A4

Alternative	Year	Mortality All Systems	Morbidity All Systems	Cost Adjustment per Case (ECOI)	Cost Adjustment per Case (TCOI)	Cost Adjustment for Mortality (ECOI)	Cost Adjustment for Mortality (TCOI)	Cost Adjustment for Morbidity (ECOI)	Cost Adjustment for Morbidity (TCOI)	Cost Adjustment for Morbidity & Mortality (ECOI)	Cost Adjustment for Morbidity & Mortality (TCOI)
				($)		($Millions)					
		A	B	C	D	E	F	G	H	I	J
		–	–	–	–	(A * C)/10^6	(A * D)/10^6	(B * C)/10^6	(B * D)/10^6	E + G	F + H
A3	2005	0	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	0	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	0	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	0	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	9	38,441	$ 445	$ 264	$ 0.00387	$ 0.00229	$ 17	$ 10	$ 17	$ 10
	2010	27	118,283	$ 452	$ 267	$ 0.01202	$ 0.00711	$ 53	$ 32	$ 53	$ 32
	2011	54	241,227	$ 458	$ 270	$ 0.02476	$ 0.01460	$ 110	$ 65	$ 110	$ 65
	2012	74	332,806	$ 464	$ 273	$ 0.03438	$ 0.02022	$ 154	$ 91	$ 154	$ 91
	2013	94	425,542	$ 470	$ 276	$ 0.04434	$ 0.02601	$ 200	$ 117	$ 200	$ 117
	2014	97	439,694	$ 476	$ 278	$ 0.04613	$ 0.02699	$ 209	$ 122	$ 209	$ 122
	2015	99	450,341	$ 482	$ 281	$ 0.04765	$ 0.02780	$ 217	$ 127	$ 217	$ 127
	2016	99	452,755	$ 488	$ 284	$ 0.04848	$ 0.02821	$ 221	$ 129	$ 221	$ 129
	2017	100	455,170	$ 495	$ 287	$ 0.04933	$ 0.02863	$ 225	$ 131	$ 225	$ 131
	2018	100	455,170	$ 501	$ 290	$ 0.04998	$ 0.02893	$ 228	$ 132	$ 228	$ 132
	2019	100	455,170	$ 508	$ 293	$ 0.05064	$ 0.02924	$ 231	$ 133	$ 231	$ 134
	2020	100	455,170	$ 515	$ 296	$ 0.05132	$ 0.02956	$ 234	$ 135	$ 234	$ 135
	2021	100	455,170	$ 522	$ 300	$ 0.05202	$ 0.02988	$ 237	$ 136	$ 237	$ 136
	2022	100	455,170	$ 529	$ 303	$ 0.05272	$ 0.03021	$ 241	$ 138	$ 241	$ 138
	2023	100	455,170	$ 536	$ 306	$ 0.05344	$ 0.03054	$ 244	$ 139	$ 244	$ 139
	2024	100	455,170	$ 543	$ 310	$ 0.05417	$ 0.03088	$ 247	$ 141	$ 247	$ 141
	2025	100	455,170	$ 551	$ 313	$ 0.05491	$ 0.03123	$ 251	$ 143	$ 251	$ 143
	2026	100	455,170	$ 558	$ 317	$ 0.05567	$ 0.03158	$ 254	$ 144	$ 254	$ 144
	2027	100	455,170	$ 566	$ 320	$ 0.05644	$ 0.03194	$ 258	$ 146	$ 258	$ 146
	2028	100	455,170	$ 574	$ 324	$ 0.05722	$ 0.03230	$ 261	$ 147	$ 261	$ 147
	2029	100	455,170	$ 582	$ 328	$ 0.05802	$ 0.03267	$ 265	$ 149	$ 265	$ 149
									NPV 3%	$ 2,705	$ 1,559
									NPV 7%	$ 1,518	$ 878
									Annualizd 3%	$ 155	$ 90
									Annualizd 7%	$ 130	$ 75
A4	2005	-	-	$ 415	$ 250	$ -	$ -	$ -	$ -	$ -	$ -
	2006	-	-	$ 425	$ 255	$ -	$ -	$ -	$ -	$ -	$ -
	2007	-	-	$ 433	$ 258	$ -	$ -	$ -	$ -	$ -	$ -
	2008	-	-	$ 439	$ 261	$ -	$ -	$ -	$ -	$ -	$ -
	2009	8	34,388	$ 445	$ 264	$ 0.00357	$ 0.00212	$ 15.31	$ 9.08	$ 15.31	$ 9.08
	2010	24	105,457	$ 452	$ 267	$ 0.01106	$ 0.00654	$ 47.64	$ 28.17	$ 47.65	$ 28.18
	2011	50	214,515	$ 458	$ 270	$ 0.02274	$ 0.01341	$ 98.21	$ 57.92	$ 98.24	$ 57.93
	2012	68	294,778	$ 464	$ 273	$ 0.03146	$ 0.01850	$ 136.69	$ 80.40	$ 136.72	$ 80.42
	2013	86	376,047	$ 470	$ 276	$ 0.04049	$ 0.02375	$ 176.62	$ 103.60	$ 176.66	$ 103.63
	2014	88	387,231	$ 476	$ 278	$ 0.04200	$ 0.02457	$ 184.22	$ 107.78	$ 184.26	$ 107.80
	2015	90	395,819	$ 482	$ 281	$ 0.04330	$ 0.02526	$ 190.75	$ 111.30	$ 190.79	$ 111.33
	2016	90	397,809	$ 488	$ 284	$ 0.04404	$ 0.02563	$ 194.21	$ 113.03	$ 194.25	$ 113.05
	2017	91	399,799	$ 495	$ 287	$ 0.04479	$ 0.02600	$ 197.75	$ 114.78	$ 197.79	$ 114.81
	2018	91	399,799	$ 501	$ 290	$ 0.04539	$ 0.02628	$ 200.36	$ 116.00	$ 200.41	$ 116.02
	2019	91	399,799	$ 508	$ 293	$ 0.04599	$ 0.02656	$ 203.03	$ 117.24	$ 203.08	$ 117.27
	2020	91	399,799	$ 515	$ 296	$ 0.04661	$ 0.02684	$ 205.76	$ 118.51	$ 205.81	$ 118.53
	2021	91	399,799	$ 522	$ 300	$ 0.04724	$ 0.02714	$ 208.54	$ 119.80	$ 208.59	$ 119.83
	2022	91	399,799	$ 529	$ 303	$ 0.04788	$ 0.02743	$ 211.36	$ 121.11	$ 211.41	$ 121.14
	2023	91	399,799	$ 536	$ 306	$ 0.04853	$ 0.02774	$ 214.24	$ 122.45	$ 214.29	$ 122.48
	2024	91	399,799	$ 543	$ 310	$ 0.04919	$ 0.02805	$ 217.17	$ 123.81	$ 217.22	$ 123.84
	2025	91	399,799	$ 551	$ 313	$ 0.04987	$ 0.02836	$ 220.14	$ 125.19	$ 220.19	$ 125.22
	2026	91	399,799	$ 558	$ 317	$ 0.05055	$ 0.02868	$ 223.18	$ 126.60	$ 223.23	$ 126.63
	2027	91	399,799	$ 566	$ 320	$ 0.05125	$ 0.02900	$ 226.27	$ 128.04	$ 226.32	$ 128.07
	2028	91	399,799	$ 574	$ 324	$ 0.05197	$ 0.02933	$ 229.41	$ 129.50	$ 229.46	$ 129.53
	2029	91	399,799	$ 582	$ 328	$ 0.05269	$ 0.02967	$ 232.62	$ 130.99	$ 232.67	$ 131.02
									NPV 3%	$ 2,380	$ 1,372
									NPV 7%	$ 1,337	$ 773
									Annualizd 3%	$ 137	$ 79
									Annualizd 7%	$ 115	$ 66

Sources: Columns A, B - Exhibit C.10
Columns C, D - Exhibit U.10, Columns F, G

U.2.2.4 Calculating the net cost numerator

The annualized mean Total Cost Adjustments for each regulatory alternative and *Cryptosporidium* occurrence data set are determined in Section 2.2 of this Appendix. As explained previously, these are the appropriate costs to subtract from the annualized regulatory cost to yield an annualized net cost numerator for the CEA ratio. Exhibits U.12a-b subtract these Total Cost Adjustments from the regulatory costs for each alternative, at 3 percent and 7 percent discount rates, respectively:

$$\text{Net Annualized Cost} = \text{Annualized } C_n - \text{Total Annualized Cost Adjustment}_{c,n}$$

where C = total regulatory compliance cost,
n = regulatory alternative, and
c = *Cryptosporidium* occurrence data set.

Using a 3 percent discount rate, the ECOI approach, and the ICR *Cryptosporidium* occurrence data set, the lowest mean Net Cost is associated with the least stringent alternative (A4 = $<238> million) and the highest with the most stringent (A1 = $55 million) (Exhibit U.12a). The other *Cryptosporidium* occurrence data sets (ICRSSM and ICRSSL) show the same pattern of net cost values, as does the same comparison using the 7 percent discount rate. Results using a discount rate of 7 percent are shown in Exhibit U.12b.

Exhibit U.12a: Net Cost Based on Medium Estimate Dose Response Model, by Rule Alternative, by Data Set, 3% Discount Rate

Data Set	Rule Alternative	Cost	Cost Adjustment (ECOI)	Cost Adjustment (TCOI)	Net Cost (ECOI)	Net Cost (TCOI)
		(Million $)				
		A	B	C	D	E
		–	–	–	A - B	A - C
ICR	A1	$ 392	$ 337	$ 194	$ 55	$ 198
	A2	$ 153	$ 332	$ 192	$ (179)	$ (39)
	A3 - Preferrred	$ 123	$ 329	$ 190	$ (206)	$ (66)
	A4	$ 70	$ 308	$ 178	$ (238)	$ (107)
ICRSSL	A1	$ 392	$ 100	$ 57	$ 293	$ 335
	A2	$ 113	$ 85	$ 49	$ 28	$ 64
	A3 - Preferrred	$ 83	$ 79	$ 45	$ 4	$ 37
	A4	$ 47	$ 68	$ 39	$ (21)	$ 8
ICRSSM	A1	$ 392	$ 175	$ 101	$ 217	$ 291
	A2	$ 127	$ 162	$ 94	$ (35)	$ 33
	A3 - Preferrred	$ 96	$ 155	$ 90	$ (60)	$ 6
	A4	$ 54	$ 137	$ 79	$ (82)	$ (24)

Abbreviation: ECOI = Enhanced Cost of Illness, TCOI = Traditional Cost of Illness
Note: All values are discounted and annualized
Sources: Column A - Exhibit 8.11, Column I
Columns B, C - Exhibits U.11 a - c, Columns I, J

Exhibit U.12b: Net Cost Based on Medium Estimate Dose Response Model, by Rule Alternative, by Data Set, 7% Discount Rate

Data Set	Rule Alternative	Cost	Cost Adjustment (ECOI)	Cost Adjustment (TCOI)	Net Cost (ECOI)	Net Cost (TCOI)
		(Million $)				
		A	B	C	D	E
		–	–	–	A - B	A - C
ICR	A1	$ 423	$ 283	$ 164	$ 141	$ 260
	A2	$ 169	$ 279	$ 161	$ (110)	$ 8
	A3 - Preferrred	$ 137	$ 276	$ 159	$ (138)	$ (22)
	A4	$ 80	$ 258	$ 149	$ (179)	$ (70)
ICRSSL	A1	$ 423	$ 84	$ 48	$ 340	$ 375
	A2	$ 126	$ 72	$ 41	$ 54	$ 84
	A3 - Preferrred	$ 94	$ 66	$ 38	$ 27	$ 55
	A4	$ 55	$ 57	$ 33	$ (2)	$ 22
ICRSSM	A1	$ 423	$ 147	$ 85	$ 277	$ 339
	A2	$ 141	$ 136	$ 79	$ 5	$ 62
	A3 - Preferrred	$ 108	$ 130	$ 75	$ (22)	$ 33
	A4	$ 62	$ 115	$ 66	$ (52)	$ (4)

Abbreviation: ECOI = Enhanced Cost of Illness, TCOI = Traditional Cost of Illness

Note: All values are discounted and annualized

Sources: Column A - Exhibit 8.11, Column L

Columns B, C - Exhibits U.11 a - c, Columns I, J

U.2.3 The CEA Ratio

The CEA ratio describes the average cost per MILY saved by each regulatory alternative. In Exhibits U.13a-f, the net cost estimates developed in Section 2.2 (for each dose response model, regulatory alternative, and *Cryptosporidium* occurrence data set) are divided by the MILYs saved (by each alternative within each data set).

Many of the CEA ratios have negative costs per MILY saved, which is a normal result of monetized benefits exceeding costs (OMB, 2003). The lowest cost per MILY is always associated with the least stringent alternative and the highest with the most stringent alternative. For example, using the medium dose-response model, the ICR *Cryptosporidium* occurrence data set, the ECOI approach, and a 3 percent discount rate, A1 (the least stringent alternative) is approximately $5,000 per MILY and A4 (the most stringent alternative) is approximately <$22,000> per MILY (shown as "cost saving" in Exhibit U.13a).

An ***incremental*** *CEA* provides further information in the form of how much additional benefit is gained per unit cost expended from one alternative to the next. Although the U.S. Public Health Service Panel on Cost Effectiveness in Health and Medicine did not recommend a cost-effectiveness threshold for generalized use, it may be useful to identify cost thresholds that some have used in comparing life saving or quality-of-life-improving interventions. The Harvard Cost Utility Analysis database presents a median cost-utility ratio of $31,000 per QALY (or MILY) (2002$) for respiratory and cardiovascular

interventions, while Tengs et al. (1995) report a median cost per life-year saved for life-saving interventions of $48,000 (1993$). The health economics literature often uses either $50,000 or $100,000 per QALY (or MILY) as a threshold with ratios less than these values considered *prima facie* cost effective. However, it is important to recognize that these thresholds are arbitrary values, often derived by reference to the cost per QALY (or MILY) for interventions that public health specialists agree are justified. In general, EPA recommends that decisions as to whether a specific control strategy is justified should be based on a complete comparison of benefits and costs.

In this CEA, the incremental gain (in MILYs) of the first alternative (in a series of increasingly stringent alternatives) is equivalent to the CEA ratio and captures the large amount of benefits achieved by having a rule. The differences between the rule alternatives are quite narrow by comparison. In comparing the incremental gain per expenditure for the remaining three alternatives in Exhibits U.14a-b, the Preferred Alternative is the only one that is lower (better than) a *prima facie* threshold of $50,000 per MILY, and this occurs only for the ICRSSM data set. Using the ICR data set, the incremental ratio for the Preferred Alternative is also close to the threshold at about $52,000. Assuming a threshold of $100,000, several other combinations (of data sets, discount rates, and cost adjustment approaches) are close, but the Preferred Alternative is lower (better) under each combination except for the ICRSSL data set using a 7 percent discount rate.

An additional analysis that can be performed is a breakeven analysis, which calculates the maximum rule cost that would break even with these *prima facie* thresholds. This analysis uses the same thresholds described above of $50,000 and $100,000 per MILY, and uses the MILYs calculated in Section 2.1.3 of this Appendix (using a 3 percent discount rate as an example). Under all 24 options except one, the rule costs are lower (in most cases much lower) than these thresholds. One option—Alternative A1 under the ICRSSL data set—does not break even with a $50,000 per MILY threshold (Exhibits U.15a-b).

Exhibit U.13a: Cost Effectiveness Analysis, by Rule Alternative Based on Medium Estimate Dose Response Model, by Data Set, 3% Discount

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Dollars per MILY (ECOI) ($) D $A * 10^6/C$	Dollars per MILY (TCOI) ($) E $B * 10^6/C$
ICR	A1	$ 55	$ 198	11,472	$ 4,789	$ 17,241
	A2	$ (179)	$ (39)	11,326	cost saving	cost saving
	A3 - Preferred	$ (206)	$ (66)	11,218	cost saving	cost saving
	A4	$ (238)	$ (107)	10,601	cost saving	cost saving
ICRSSL	A1	$ 293	$ 335	3,386	$ 86,424	$ 98,897
	A2	$ 28	$ 64	2,958	$ 9,299	$ 21,518
	A3 - Preferred	$ 4	$ 37	2,766	$ 1,342	$ 13,420
	A4	$ (21)	$ 8	2,437	cost saving	$ 3,291
ICRSSM	A1	$ 217	$ 291	5,944	$ 36,566	$ 49,037
	A2	$ (35)	$ 33	5,563	cost saving	$ 5,981
	A3 - Preferred	$ (60)	$ 6	5,357	cost saving	$ 1,138
	A4	$ (82)	$ (24)	4,801	cost saving	cost saving

Abbreviations: QALY = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B - Exhibits U.12 a - b, Columns D, E; Column C - Exhibit U.8 a-c, Columns E, F

Exhibit U.13b: Cost Effectiveness Analysis, by Rule Alternative Based on Low Estimate Dose Response Model, by Data Set, 3% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Dollars per MILY (ECOI) ($) D $A * 10^6/C$	Dollars per MILY (TCOI) ($) E $B * 10^6/C$
ICR	A1	$ 267	$ 320	4,254	$ 62,646	$ 75,165
	A2	$ 29	$ 82	1,977	$ 14,836	$ 41,327
	A3 - Preferred	$ 1	$ 53	4,149	$ 226	$ 12,701
	A4	$ (43)	$ 5	3,891	cost saving	$ 1,260
ICRSSL	A1	$ 353	$ 370	1,336	$ 263,970	$ 276,517
	A2	$ 80	$ 94	1,148	$ 69,348	$ 81,618
	A3 - Preferred	$ 52	$ 65	1,067	$ 48,806	$ 60,927
	A4	$ 21	$ 32	931	$ 22,705	$ 34,520
ICRSSM	A1	$ 323	$ 353	2,332	$ 138,642	$ 151,183
	A2	$ 63	$ 90	2,168	$ 29,183	$ 41,597
	A3 - Preferred	$ 35	$ 61	2,074	$ 16,993	$ 29,323
	A4	$ 2	$ 24	1,840	$ 995	$ 13,084

Abbreviations: QALY = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B - Exhibits U.12 a - b, Columns D, E; Column C - Exhibit U.8 a-c, Columns E, F

Exhibit U.13c: Cost Effectiveness Analysis, by Rule Alternative Based on High Estimate Dose Response Model, by Data Set, 3% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Dollars per MILY (ECOI) ($) D $A * 10^6/C$	Dollars per MILY (TCOI) ($) E $B * 10^6/C$
ICR	A1	$ (120)	$ 97	17,404	cost saving	$ 5,585
	A2	$ (351)	$ (137)	8,013	cost saving	cost saving
	A3 - Preferred	$ (375)	$ (164)	16,983	cost saving	cost saving
	A4	$ (394)	$ (197)	15,998	cost saving	cost saving
ICRSSL	A1	$ 231	$ 299	5,480	$ 42,135	$ 54,616
	A2	$ (25)	$ 33	4,778	cost saving	$ 6,980
	A3 - Preferred	$ (45)	$ 9	4,465	cost saving	$ 2,050
	A4	$ (62)	$ (16)	3,932	cost saving	cost saving
ICRSSM	A1	$ 118	$ 234	8,557	$ 13,753	$ 27,346
	A2	$ (127)	$ (20)	8,028	cost saving	cost saving
	A3 - Preferred	$ (147)	$ (44)	7,753	cost saving	cost saving
	A4	$ (158)	$ (68)	6,984	cost saving	cost saving

Abbreviations: QALY = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B - Exhibits U.12 a - b, Columns D, E; Column C - Exhibit U.8 a-c, Columns E, F

Exhibit U.13d: Cost Effectiveness Analysis, by Rule Alternative Based on Medium Estimate Dose Response Model, by Data Set, 7% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Dollars per MILY (ECOI) ($) D A * 10^6/C	Dollars per MILY (TCOI) ($) E B * 10^6/C
ICR	A1	$ 141	$ 260	9,767	$ 14,392	$ 26,608
	A2	$ (110)	$ 8	9,643	cost saving	$ 795
	A3 - Preferred	$ (138)	$ (22)	9,552	cost saving	cost saving
	A4	$ (179)	$ (70)	9,030	cost saving	cost saving
ICRSSL	A1	$ 340	$ 375	2,882	$ 117,942	$ 130,177
	A2	$ 54	$ 84	2,520	$ 21,479	$ 33,465
	A3 - Preferred	$ 27	$ 55	2,358	$ 11,648	$ 23,496
	A4	$ (2)	$ 22	2,078	cost saving	$ 10,406
ICRSSM	A1	$ 277	$ 339	5,059	$ 54,711	$ 66,945
	A2	$ 5	$ 62	4,736	$ 996	$ 13,112
	A3 - Preferred	$ (22)	$ 33	4,563	cost saving	$ 7,127
	A4	$ (52)	$ (4)	4,092	cost saving	cost saving

Abbreviations: QALY = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B - Exhibits U.12 a - b, Columns D, E; Column C - Exhibit U.8 a-c, Columns E, F

Exhibit U.13e: Cost Effectiveness Analysis, by Rule Alternative Based on Low Estimate Dose Response Model, by Data Set, 7% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Dollars per MILY (ECOI) ($) D $A * 10^6/C$	Dollars per MILY (TCOI) ($) E $B * 10^6/C$
ICR	A1	$ 318	$ 362	3,621	$ 87,814	$ 100,095
	A2	$ 65	$ 109	3,569	$ 18,248	$ 30,505
	A3 - Preferred	$ 35	$ 78	3,532	$ 9,887	$ 22,125
	A4	$ (15)	$ 25	3,314	cost saving	$ 7,501
ICRSSL	A1	$ 390	$ 404	1,137	$ 343,263	$ 355,572
	A2	$ 98	$ 110	977	$ 100,080	$ 112,117
	A3 - Preferred	$ 68	$ 79	909	$ 74,863	$ 86,753
	A4	$ 33	$ 42	794	$ 41,241	$ 52,831
ICRSSM	A1	$ 366	$ 390	1,984	$ 184,254	$ 196,557
	A2	$ 87	$ 110	1,845	$ 47,410	$ 59,587
	A3 - Preferred	$ 57	$ 79	1,766	$ 32,383	$ 44,478
	A4	$ 18	$ 37	1,568	$ 11,705	$ 23,564

Abbreviations: QALY = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B - Exhibits U.12 a - b, Columns D, E; Column C - Exhibit U.8 a-c, Columns E, F

Exhibit U.13f: Cost Effectiveness Analysis, by Rule Alternative Based on High Estimate Dose Response Model, by Data Set, 7% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Dollars per MILY (ECOI) ($) D $A * 10^6/C$	Dollars per MILY (TCOI) ($) E $B * 10^6/C$
ICR	A1	$ (6)	$ 175	14,818	cost saving	$ 11,827
	A2	$ (254)	$ (75)	14,614	cost saving	cost saving
	A3 - Preferred	$ (280)	$ (104)	14,463	cost saving	cost saving
	A4	$ (310)	$ (145)	13,630	cost saving	cost saving
ICRSSL	A1	$ 288	$ 345	4,664	$ 61,780	$ 74,023
	A2	$ 10	$ 59	4,070	$ 2,463	$ 14,454
	A3 - Preferred	$ (13)	$ 32	3,806	cost saving	$ 8,369
	A4	$ (37)	$ 1	3,354	cost saving	$ 412
ICRSSM	A1	$ 193	$ 290	7,304	$ 26,455	$ 39,752
	A2	$ (72)	$ 18	6,854	cost saving	$ 2,581
	A3 - Preferred	$ (96)	$ (10)	6,620	cost saving	cost saving
	A4	$ (116)	$ (41)	5,967	cost saving	cost saving

Abbreviations: QALY = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Columns A,B - Exhibits U.12 a - b, Columns D, E; Column C - Exhibit U.8 a-c, Columns E, F

Exhibit U.14a: Incremental Cost Effectiveness Analysis Based on Medium Estimate Dose Response Model, by Data Set, Rule Alternative, 3% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Incremental Net Cost (ECOI) (Million $) D $A_n - A_{(n-1)}$	Incremental Net Cost (TCOI) (Million $) E $B_n - B_{(n-1)}$	Incremental MILYs (Years) F $C_n - C_{(n-1)}$	Incremental Dollars per MILY (ECOI) ($) G D/F	Incremental Dollars per MILY (TCOI) ($) H E/F
ICR	A4	$ (238)	$ (107)	10,601	$ (238)	$ (107)	10,601	$ (22,422)	$ (10,116)
	A3 - Preferred	$ (206)	$ (66)	11,218	$ 32	$ 41	616	$ 52,030	$ 66,265
	A2	$ (179)	$ (39)	11,326	$ 26	$ 28	108	$ 242,932	$ 257,185
	A1	$ 55	$ 198	11,472	$ 234	$ 236	146	$ 1,602,251	$ 1,616,480
ICRSSL	A4	$ (21)	$ 8	2,437	$ (21)	$ 8	2,437	$ (8,497)	$ 3,291
	A3 - Preferred	$ 4	$ 37	2,766	$ 24	$ 29	330	$ 74,084	$ 88,307
	A2	$ 28	$ 64	2,958	$ 24	$ 27	192	$ 124,004	$ 138,252
	A1	$ 293	$ 335	3,386	$ 265	$ 271	428	$ 619,373	$ 633,603
ICRSSM	A4	$ (82)	$ (24)	4,801	$ (82)	$ (24)	4,801	$ (17,142)	$ (5,089)
	A3 - Preferred	$ (60)	$ 6	5,357	$ 23	$ 31	556	$ 40,707	$ 54,930
	A2	$ (35)	$ 33	5,563	$ 24	$ 27	206	$ 117,939	$ 132,189
	A1	$ 217	$ 291	5,944	$ 253	$ 258	381	$ 663,170	$ 677,400

Exhibit U.14b: Incremental Cost Effectiveness Analysis Based on Medium Estimate Dose Response Model, by Data Set, Rule Alternative, 7% Discount Rate

Data Set	Rule Alternative	Net Cost (ECOI) (Million $) A –	Net Cost (TCOI) (Million $) B –	MILYs (Years) C –	Incremental Net Cost (ECOI) (Million $) D $A_n - A_{(n-1)}$	Incremental Net Cost (TCOI) (Million $) E $B_n - B_{(n-1)}$	Incremental MILYs (Years) F $C_n - C_{(n-1)}$	Incremental Dollars per MILY (ECOI) ($) G D/F	Incremental Dollars per MILY (TCOI) ($) H E/F
ICR	A4	$ (179)	$ (70)	9,030	$ (179)	$ (70)	9,030	$ (19,768)	$ (7,697)
	A3 - Preferred	$ (138)	$ (22)	9,552	$ 40	$ 47	521	$ 77,091	$ 91,067
	A2	$ (110)	$ 8	9,643	$ 28	$ 30	91	$ 311,969	$ 325,966
	A1	$ 141	$ 260	9,767	$ 250	$ 252	124	$ 2,022,858	$ 2,036,829
ICRSSL	A4	$ (2)	$ 22	2,078	$ (2)	$ 22	2,078	$ (1,158)	$ 10,406
	A3 - Preferred	$ 27	$ 55	2,358	$ 30	$ 34	279	$ 106,923	$ 120,887
	A2	$ 54	$ 84	2,520	$ 27	$ 29	162	$ 164,628	$ 178,621
	A1	$ 340	$ 375	2,882	$ 286	$ 291	362	$ 788,755	$ 802,728
ICRSSM	A4	$ (52)	$ (4)	4,092	$ (52)	$ (4)	4,092	$ (12,775)	$ (952)
	A3 - Preferred	$ (22)	$ 33	4,563	$ 30	$ 36	471	$ 63,328	$ 77,292
	A2	$ 5	$ 62	4,736	$ 27	$ 30	173	$ 156,582	$ 170,577
	A1	$ 277	$ 339	5,059	$ 272	$ 276	323	$ 843,310	$ 857,283

Abbreviations: MILYs = Morbidity Inclusive Life Years

Notes: 1) The formula for incremental cost per MILY in columns F and G is different than shown for the first incremental value, which is just the value itself. For example, the incremental cost of A4 in the ICR dataset is the cost per MILY, or <$19,768>.

2) All values are discounted and annualized

Sources: Columns A,B - Exhibits V.12 a - b, Columns D, E
Column C - Exhibit V.8, Columns E, F

Exhibit U.15a: Breakeven Analysis for Rule Net Cost Based on Medium Estimate Dose Response Model, Assuming $50,000 Threshold, by Data Set, by Rule Alternative, 3% Discount Rate

Data Set	Rule Alternative	MILYs (years) (3%)	Breakeven Value Assuming $50,000/MILY Threshold	Net Cost (ECOI)	Net Cost (TCOI)
			(Million $)		
		A	B	C	D
		-	$50,000*E/10^6	-	-
ICR	A1	11,472	574	55	198
	A2	11,326	566	(179)	(39)
	A3 - Preferrred	11,218	561	(206)	(66)
	A4	10,601	530	(238)	(107)
ICRSSL	A1	3,386	169	293	335
	A2	2,958	148	28	64
	A3 - Preferrred	2,766	138	4	37
	A4	2,437	122	(21)	8
ICRSSM	A1	5,944	297	217	291
	A2	5,563	278	(35)	33
	A3 - Preferrred	5,357	268	(60)	6
	A4	4,801	240	(82)	(24)

Exhibit U.15b: Breakeven Analysis for Rule Net Cost Based on Medium Estimate Dose Response Model, Assuming $100,000 Threshold, by Data Set, by Rule Alternative, 3% Discount Rate

Data Set	Rule Alternative	MILYs (years) (3%)	Breakeven Value Assuming $50,000/MILY Threshold	Net Cost (ECOI)	Net Cost (TCOI)
			(Million $)		
		A	B	C	D
		-	$100,000*E/10^6	-	-
ICR	A1	11,472	1,147	55	198
	A2	11,326	1,133	(179)	(39)
	A3 - Preferrred	11,218	1,122	(206)	(66)
	A4	10,601	1,060	(238)	(107)
ICRSSL	A1	3,386	339	293	335
	A2	2,958	296	28	64
	A3 - Preferrred	2,766	277	4	37
	A4	2,437	244	(21)	8
ICRSSM	A1	5,944	594	217	291
	A2	5,563	556	(35)	33
	A3 - Preferrred	5,357	536	(60)	6
	A4	4,801	480	(82)	(24)

Abbreviations: QALYs = Quality Adjusted Life Years, MILYs = Morbidity Inclusive Life Years

Note: All values are discounted and annualized

Sources: Column A: Exhibit V.8, Columns E
Columns C,D: Exhibits V.6 a - d: Columns K - P

U.3 Conclusions

As expected, those CEA ratios representing the most protective alternatives have the highest cost per MILY. In 20 out of 36 possible combinations of discount rates, cost adjustments and *Cryptosporidium* occurrence data sets, alternatives A2, A3, and A4 could be described as cost effective without considering a *prima facie* threshold of cost per QALY (or MILY). In those cases the costs are negative—the savings for medical care and lost time are larger than the regulatory costs. The cost per MILY for the Preferred Alternative using the medium dose-response model is considerably lower than all three thresholds described in Section 2.3 of this Appendix (for every combination of discount rate, cost adjustments, and *Cryptosporidium* occurrence data set) (Exhibit U.13).

The *incremental* analysis shows that the Preferred Alternative is the only one (of alternatives A1, A2, and A3) that costs less than the *prima facie* threshold of $50,000/MILY (not considering alternative A4, for the reasons described in Section 2.3) (Exhibits U.14a-b). Using a *prima facie* threshold of $100,000/MILY, the Preferred Alternative (A3) is cost effective in 10 of the 12 possible combinations (of discount rate, cost adjustments, and *Cryptosporidium* occurrence data set), but neither of the other alternatives (A1 or A2) is lower in any combination.

A *breakeven* analysis was also performed (Exhibits U.15a-b). The analysis shows the maximum (net) values that the rule could cost and still break even with a $50,000/MILY or $100,000/MILY *prima facie* threshold. In 46 of 48 possible combinations (of *Cryptosporidium* occurrence data set, COI approach, and discount rate), the Net Cost estimates are below these thresholds (the exception being alternative A1 under the ICRSSL data set).

In the health field, where QALYs were originally developed, a common usage for CEA measures is as an entry in a "league table" that ranks the relative cost-effectiveness of multiple interventions. The main difficulty in constructing such a table is ensuring consistency of methodology in all the values being compared. The variation in QALY decrements renders comparisons across rulemakings difficult to the extent that disparate QALY decrements are used, as discussed in Section 1.0 of this document. The NAS/IOM panel, as described in Section 1.0, will attempt to provide recommendations on the conduct of CEA for regulatory health interventions across the Federal government in its report, expected in late 2005. Presently it would be difficult to provide entirely consistent comparisons to other health and medical interventions as part of the EA for this rule.[13]

To summarize, while QALYs are used extensively in the economic evaluation of medical interventions (Gold et al., 1996), they have not been widely used in evaluating environmental health regulations. A number of specific issues arise with the use of QALYs in evaluating environmental programs that affect a broad and heterogeneous population and that provide both health and nonhealth benefits. The U.S. Public Health Service report on cost-effectiveness in health and medicine notes the following:

> For decisions that involve greater diversity in interventions and the people to whom they apply, cost-effectiveness ratios continue to provide essential information, but that information must, to a greater degree, be evaluated in light of circumstances and values that cannot be included in the analysis. Individuals in the population will differ widely in their health and disability before the intervention, or in age, wealth, or other characteristics, raising questions about how society values gains for the more and less

[13] For more detail on the use of CEA results, see Chapter 10 in, "Prevention Effectiveness: A Guide to Decision Analysis and Economic Evaluation." Second Edition. Anne C. Haddix, Steven M. Teutsch, and Phaedra S. Corso, editors. New York: Oxford University Press, 2003.

> healthy, for young and old, for rich and poor, and so on. The assumption that all QALYs are of equal value is less likely to be reasonable in this context. (Gold et al., 1996, p. 11)

Use of QALYs as a measure of effectiveness for environmental regulations is still developing, and while this analysis provides one framework for using QALYs to evaluate environmental regulations, there are clearly many issues, both scientific and ethical, that need to be addressed with additional research. The IOM panel evaluating QALYs and other effectiveness measures will attempt to develop criteria for choosing among the measures that will potentially be useful in regulatory impact analysis; make recommendations regarding measures appropriate for assessing the health benefits of regulatory interventions; and propose criteria for identifying regulations for which CEA is appropriate and informative. However, it remains uncertain when consensus on the applicability of the QALY approach to environmental regulations, and the appropriate methodology for doing so, will be reached.

Exhibit U.6a: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A1, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
TOTAL	281,421,906	1.00	141.2	41.6	73.1	120.3	35.4	62.2		6,202	1,828	3,209	5,283	1,557	2,733
–	–	(B / 281,421,906)	C * 141.2	C * 41.6	C * 73.1	C * 120.3	C * 35.4	C * 62.2	–	D * J	E * J	F * J	G * J	H * J	I * J
Under 1 year	3,805,648	0.0135	1.91	0.56	0.99	1.63	0.48	0.84	76.9	146.8	43.3	76.0	125.1	36.9	64.7
1 year	3,820,582	0.0136	1.92	0.57	0.99	1.63	0.48	0.84	76.4	146.5	43.2	75.8	124.8	36.8	64.5
2 years	3,790,446	0.0135	1.90	0.56	0.98	1.62	0.48	0.84	75.4	143.4	42.3	74.2	122.2	36.0	63.2
3 years	3,832,799	0.0136	1.92	0.57	1.00	1.64	0.48	0.85	74.5	143.3	42.2	74.1	122.0	36.0	63.1
4 years	3,926,323	0.0140	1.97	0.58	1.02	1.68	0.49	0.87	73.5	144.8	42.7	74.9	123.3	36.3	63.8
5 years	3,965,103	0.0141	1.99	0.59	1.03	1.69	0.50	0.88	72.5	144.2	42.5	74.6	122.9	36.2	63.6
6 years	4,019,705	0.0143	2.02	0.59	1.04	1.72	0.51	0.89	71.5	144.2	42.5	74.6	122.8	36.2	63.6
7 years	4,118,147	0.0146	2.07	0.61	1.07	1.76	0.52	0.91	70.5	145.7	42.9	75.4	124.1	36.6	64.2
8 years	4,179,230	0.0149	2.10	0.62	1.09	1.79	0.53	0.92	69.5	145.7	43.0	75.4	124.1	36.6	64.2
9 years	4,267,320	0.0152	2.14	0.63	1.11	1.82	0.54	0.94	68.6	146.9	43.3	76.0	125.1	36.9	64.7
10 years	4,274,056	0.0152	2.14	0.63	1.11	1.83	0.54	0.95	67.6	145.0	42.7	75.0	123.5	36.4	63.9
11 years	4,115,093	0.0146	2.06	0.61	1.07	1.76	0.52	0.91	66.6	137.5	40.5	71.2	117.1	34.5	60.6
12 years	4,075,842	0.0145	2.05	0.60	1.06	1.74	0.51	0.90	65.6	134.2	39.5	69.4	114.3	33.7	59.1
13 years	4,010,850	0.0143	2.01	0.59	1.04	1.71	0.51	0.89	64.6	130.0	38.3	67.3	110.7	32.6	57.3
14 years	4,052,231	0.0144	2.03	0.60	1.05	1.73	0.51	0.90	63.6	129.3	38.1	66.9	110.2	32.5	57.0
15 years	4,019,404	0.0143	2.02	0.59	1.04	1.72	0.51	0.89	62.6	126.3	37.2	65.3	107.5	31.7	55.6
16 years	3,975,021	0.0141	1.99	0.59	1.03	1.70	0.50	0.88	61.7	123.1	36.3	63.7	104.8	30.9	54.2
17 years	4,046,012	0.0144	2.03	0.60	1.05	1.73	0.51	0.89	60.7	123.2	36.3	63.8	105.0	30.9	54.3
18 years	4,051,598	0.0144	2.03	0.60	1.05	1.73	0.51	0.90	59.7	121.4	35.8	62.8	103.4	30.5	53.5
19 years	4,127,855	0.0147	2.07	0.61	1.07	1.76	0.52	0.91	58.8	121.8	35.9	63.0	103.7	30.6	53.7
20 years	4,049,448	0.0144	2.03	0.60	1.05	1.73	0.51	0.90	57.8	117.4	34.6	60.8	100.0	29.5	51.8
21 years	3,841,082	0.0136	1.93	0.57	1.00	1.64	0.48	0.85	56.9	109.7	32.3	56.8	93.4	27.5	48.3
22 years	3,758,648	0.0134	1.89	0.56	0.98	1.61	0.47	0.83	55.9	105.4	31.1	54.6	89.8	26.5	46.5
23 years	3,673,582	0.0131	1.84	0.54	0.95	1.57	0.46	0.81	55.0	101.4	29.9	52.5	86.4	25.4	44.7
24 years	3,641,241	0.0129	1.83	0.54	0.95	1.56	0.46	0.81	54.0	98.7	29.1	51.1	84.0	24.8	43.5
25 years	3,744,539	0.0133	1.88	0.55	0.97	1.60	0.47	0.83	53.1	99.8	29.4	51.6	85.0	25.0	44.0

Exhibit U.6a: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A1, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
26 years	3,619,660	0.0129	1.82	0.54	0.94	1.55	0.46	0.80	52.1	94.6	27.9	49.0	80.6	23.8	41.7
27 years	3,789,800	0.0135	1.90	0.56	0.98	1.62	0.48	0.84	51.2	97.4	28.7	50.4	82.9	24.4	42.9
28 years	3,984,812	0.0142	2.00	0.59	1.03	1.70	0.50	0.88	50.2	100.4	29.6	51.9	85.5	25.2	44.2
29 years	4,242,525	0.0151	2.13	0.63	1.10	1.81	0.53	0.94	49.3	104.9	30.9	54.3	89.4	26.3	46.2
30 years	4,289,970	0.0152	2.15	0.63	1.11	1.83	0.54	0.95	48.3	104.0	30.6	53.8	88.6	26.1	45.8
31 years	4,011,575	0.0143	2.01	0.59	1.04	1.71	0.51	0.89	47.4	95.4	28.1	49.4	81.3	23.9	42.0
32 years	3,994,121	0.0142	2.00	0.59	1.04	1.71	0.50	0.88	46.5	93.2	27.5	48.2	79.4	23.4	41.1
33 years	4,026,573	0.0143	2.02	0.60	1.05	1.72	0.51	0.89	45.5	91.9	27.1	47.6	78.3	23.1	40.5
34 years	4,188,149	0.0149	2.10	0.62	1.09	1.79	0.53	0.93	44.6	93.7	27.6	48.5	79.8	23.5	41.3
35 years	4,516,118	0.0160	2.27	0.67	1.17	1.93	0.57	1.00	43.6	98.8	29.1	51.1	84.2	24.8	43.5
36 years	4,511,168	0.0160	2.26	0.67	1.17	1.93	0.57	1.00	42.7	96.7	28.5	50.0	82.3	24.3	42.6
37 years	4,517,060	0.0161	2.27	0.67	1.17	1.93	0.57	1.00	41.7	94.5	27.9	48.9	80.5	23.7	41.7
38 years	4,553,814	0.0162	2.28	0.67	1.18	1.95	0.57	1.01	40.8	93.2	27.5	48.2	79.4	23.4	41.1
39 years	4,608,504	0.0164	2.31	0.68	1.20	1.97	0.58	1.02	39.9	92.3	27.2	47.7	78.6	23.2	40.7
40 years	4,711,434	0.0167	2.36	0.70	1.22	2.01	0.59	1.04	38.9	92.0	27.1	47.6	78.3	23.1	40.5
41 years	4,466,676	0.0159	2.24	0.66	1.16	1.91	0.56	0.99	38.0	85.2	25.1	44.1	72.5	21.4	37.5
42 years	4,547,220	0.0162	2.28	0.67	1.18	1.94	0.57	1.01	37.1	84.6	25.0	43.8	72.1	21.2	37.3
43 years	4,407,870	0.0157	2.21	0.65	1.14	1.88	0.56	0.97	36.2	80.1	23.6	41.4	68.2	20.1	35.3
44 years	4,308,663	0.0153	2.16	0.64	1.12	1.84	0.54	0.95	35.3	76.3	22.5	39.5	65.0	19.2	33.6
45 years	4,341,460	0.0154	2.18	0.64	1.13	1.86	0.55	0.96	34.4	74.9	22.1	38.8	63.8	18.8	33.0
46 years	4,087,563	0.0145	2.05	0.60	1.06	1.75	0.51	0.90	33.5	68.7	20.3	35.6	58.5	17.2	30.3
47 years	4,019,692	0.0143	2.02	0.59	1.04	1.72	0.51	0.89	32.6	65.8	19.4	34.0	56.0	16.5	29.0
48 years	3,885,145	0.0138	1.95	0.57	1.01	1.66	0.49	0.86	31.7	61.8	18.2	32.0	52.6	15.5	27.2
49 years	3,758,544	0.0134	1.89	0.56	0.98	1.61	0.47	0.83	30.8	58.1	17.1	30.1	49.5	14.6	25.6
50 years	3,808,515	0.0135	1.91	0.56	0.99	1.63	0.48	0.84	30.0	57.3	16.9	29.7	48.8	14.4	25.3

Exhibit U.6a: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A1, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
51 years	3,616,997	0.0129	1.81	0.53	0.94	1.55	0.46	0.80	29.1	52.8	15.6	27.3	45.0	13.3	23.3
52 years	3,707,436	0.0132	1.86	0.55	0.96	1.58	0.47	0.82	28.2	52.5	15.5	27.1	44.7	13.2	23.1
53 years	3,635,040	0.0129	1.82	0.54	0.94	1.55	0.46	0.80	27.4	50.0	14.7	25.9	42.6	12.5	22.0
54 years	2,817,560	0.0100	1.41	0.42	0.73	1.20	0.35	0.62	26.5	37.5	11.0	19.4	31.9	9.4	16.5
55 years	2,850,600	0.0101	1.43	0.42	0.74	1.22	0.36	0.63	25.7	36.8	10.8	19.0	31.3	9.2	16.2
56 years	2,837,452	0.0101	1.42	0.42	0.74	1.21	0.36	0.63	24.8	35.3	10.4	18.3	30.1	8.9	15.6
57 years	2,864,020	0.0102	1.44	0.42	0.74	1.22	0.36	0.63	24.0	34.5	10.2	17.8	29.4	8.7	15.2
58 years	2,540,152	0.0090	1.27	0.38	0.66	1.09	0.32	0.56	23.2	29.6	8.7	15.3	25.2	7.4	13.0
59 years	2,377,013	0.0084	1.19	0.35	0.62	1.02	0.30	0.53	22.4	26.7	7.9	13.8	22.8	6.7	11.8
60 years	2,319,944	0.0082	1.16	0.34	0.60	0.99	0.29	0.51	21.6	25.1	7.4	13.0	21.4	6.3	11.1
61 years	2,221,227	0.0079	1.11	0.33	0.58	0.95	0.28	0.49	20.9	23.3	6.9	12.1	19.8	5.8	10.3
62 years	2,171,072	0.0077	1.09	0.32	0.56	0.93	0.27	0.48	20.1	21.9	6.5	11.3	18.7	5.5	9.6
63 years	2,053,151	0.0073	1.03	0.30	0.53	0.88	0.26	0.45	19.3	19.9	5.9	10.3	16.9	5.0	8.8
64 years	2,040,053	0.0072	1.02	0.30	0.53	0.87	0.26	0.45	18.6	19.0	5.6	9.9	16.2	4.8	8.4
65 years	2,029,911	0.0072	1.02	0.30	0.53	0.87	0.26	0.45	17.9	18.2	5.4	9.4	15.5	4.6	8.0
66 years	1,860,320	0.0066	0.93	0.28	0.48	0.80	0.23	0.41	17.2	16.1	4.7	8.3	13.7	4.0	7.1
67 years	1,896,451	0.0067	0.95	0.28	0.49	0.81	0.24	0.42	16.4	15.6	4.6	8.1	13.3	3.9	6.9
68 years	1,864,515	0.0066	0.94	0.28	0.48	0.80	0.23	0.41	15.8	14.8	4.4	7.6	12.6	3.7	6.5
69 years	1,882,348	0.0067	0.94	0.28	0.49	0.80	0.24	0.42	15.1	14.3	4.2	7.4	12.1	3.6	6.3
70 years	1,875,175	0.0067	0.94	0.28	0.49	0.80	0.24	0.41	14.4	13.5	4.0	7.0	11.5	3.4	6.0
71 years	1,788,269	0.0064	0.90	0.26	0.46	0.76	0.23	0.40	13.8	12.4	3.7	6.4	10.5	3.1	5.5
72 years	1,791,696	0.0064	0.90	0.27	0.47	0.77	0.23	0.40	13.1	11.8	3.5	6.1	10.0	3.0	5.2
73 years	1,725,168	0.0061	0.87	0.26	0.45	0.74	0.22	0.38	12.5	10.8	3.2	5.6	9.2	2.7	4.8
74 years	1,677,133	0.0060	0.84	0.25	0.44	0.72	0.21	0.37	11.9	10.0	3.0	5.2	8.5	2.5	4.4
75 years	1,651,641	0.0059	0.83	0.24	0.43	0.71	0.21	0.37	11.3	9.4	2.8	4.8	8.0	2.4	4.1

Exhibit U.6a: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A1, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
76 years	1,556,567	0.0055	0.78	0.23	0.40	0.67	0.20	0.34	10.7	8.4	2.5	4.3	7.1	2.1	3.7
77 years	1,460,781	0.0052	0.73	0.22	0.38	0.62	0.18	0.32	10.2	7.5	2.2	3.9	6.4	1.9	3.3
78 years	1,431,916	0.0051	0.72	0.21	0.37	0.61	0.18	0.32	9.6	6.9	2.0	3.6	5.9	1.7	3.0
79 years	1,314,908	0.0047	0.66	0.19	0.34	0.56	0.17	0.29	9.1	6.0	1.8	3.1	5.1	1.5	2.6
80 years	1,207,365	0.0043	0.61	0.18	0.31	0.52	0.15	0.27	8.6	5.2	1.5	2.7	4.4	1.3	2.3
81 years	1,072,048	0.0038	0.54	0.16	0.28	0.46	0.14	0.24	8.1	4.4	1.3	2.3	3.7	1.1	1.9
82 years	981,562	0.0035	0.49	0.15	0.25	0.42	0.12	0.22	7.6	3.7	1.1	1.9	3.2	0.9	1.6
83 years	883,063	0.0031	0.44	0.13	0.23	0.38	0.11	0.20	7.2	3.2	0.9	1.7	2.7	0.8	1.4
84 years	801,329	0.0028	0.40	0.12	0.21	0.34	0.10	0.18	6.7	2.7	0.8	1.4	2.3	0.7	1.2
85 years	730,194	0.0026	0.37	0.11	0.19	0.31	0.09	0.16	6.3	2.3	0.7	1.2	2.0	0.6	1.0
86 years	635,154	0.0023	0.32	0.09	0.16	0.27	0.08	0.14	6.0	1.9	0.6	1.0	1.6	0.5	0.8
87 years	557,330	0.0020	0.28	0.08	0.14	0.24	0.07	0.12	5.6	1.6	0.5	0.8	1.3	0.4	0.7
88 years	465,481	0.0017	0.23	0.07	0.12	0.20	0.06	0.10	5.3	1.2	0.4	0.6	1.1	0.3	0.5
89 years	401,659	0.0014	0.20	0.06	0.10	0.17	0.05	0.09	5.0	1.0	0.3	0.5	0.9	0.3	0.4
90 years	327,904	0.0012	0.16	0.05	0.09	0.14	0.04	0.07	4.7	0.8	0.2	0.4	0.7	0.2	0.3
91 years	266,386	0.0009	0.13	0.04	0.07	0.11	0.03	0.06	4.4	0.6	0.2	0.3	0.5	0.1	0.3
92 years	218,217	0.0008	0.11	0.03	0.06	0.09	0.03	0.05	4.1	0.4	0.1	0.2	0.4	0.1	0.2
93 years	169,066	0.0006	0.08	0.03	0.04	0.07	0.02	0.04	3.9	0.3	0.1	0.2	0.3	0.1	0.1
94 years	130,958	0.0005	0.07	0.02	0.03	0.06	0.02	0.03	3.7	0.2	0.1	0.1	0.2	0.1	0.1
95 years	98,095	0.0003	0.05	0.01	0.03	0.04	0.01	0.02	3.5	0.2	0.1	0.1	0.1	0.0	0.1
96 years	72,680	0.0003	0.04	0.01	0.02	0.03	0.01	0.02	3.3	0.1	0.0	0.1	0.1	0.0	0.1
97 years	52,844	0.0002	0.03	0.01	0.01	0.02	0.01	0.01	3.1	0.1	0.0	0.0	0.1	0.0	0.0
98 years	36,003	0.0001	0.02	0.01	0.01	0.02	0.00	0.01	2.9	0.1	0.0	0.0	0.0	0.0	0.0
99 years	27,162	0.0001	0.01	0.00	0.01	0.01	0.00	0.01	2.7	0.0	0.0	0.0	0.0	0.0	0.0
>=100 years	50,454	0.0002	0.03	0.01	0.01	0.02	0.01	0.01	2.6	0.1	0.0	0.0	0.1	0.0	0.0

Sources: Colums A,B - U.S. Census (2000), Summary File 2
Columns D - I, Row titled "Total Across Intervals", from Exhibit C.10
Column J - National Vital Statistics Reports, Vol. 51, No. 3, December 29, 2002, "Life table for the total population: United States, 2000"

Exhibit U.6b: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A2, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
TOTAL	281,421,906	1.00	139.6	37.0	68.9	118.9	31.5	58.7		6,132.2	1,624.5	3,028.0	5224	1384	2580
–	–	(B / 281,421,906)	C * 139.6	C * 37.	C * 68.9	C * 118.9	C * 31.5	C * 58.7	–	D * J	E * J	F * J	G * J	H * J	I * J
Under 1 year	3,805,648	0.0135	1.89	0.50	0.93	1.61	0.43	0.79	76.9	145.2	38.5	71.7	123.7	32.8	61.1
1 year	3,820,582	0.0136	1.90	0.50	0.94	1.61	0.43	0.80	76.4	144.8	38.4	71.5	123.4	32.7	60.9
2 years	3,790,446	0.0135	1.88	0.50	0.93	1.60	0.42	0.79	75.4	141.8	37.6	70.0	120.8	32.0	59.6
3 years	3,832,799	0.0136	1.90	0.50	0.94	1.62	0.43	0.80	74.5	141.7	37.5	70.0	120.7	32.0	59.6
4 years	3,926,323	0.0140	1.95	0.52	0.96	1.66	0.44	0.82	73.5	143.2	37.9	70.7	122.0	32.3	60.2
5 years	3,965,103	0.0141	1.97	0.52	0.97	1.68	0.44	0.83	72.5	142.6	37.8	70.4	121.5	32.2	60.0
6 years	4,019,705	0.0143	1.99	0.53	0.98	1.70	0.45	0.84	71.5	142.6	37.8	70.4	121.5	32.2	60.0
7 years	4,118,147	0.0146	2.04	0.54	1.01	1.74	0.46	0.86	70.5	144.0	38.2	71.1	122.7	32.5	60.6
8 years	4,179,230	0.0149	2.07	0.55	1.02	1.77	0.47	0.87	69.5	144.1	38.2	71.2	122.8	32.5	60.6
9 years	4,267,320	0.0152	2.12	0.56	1.05	1.80	0.48	0.89	68.6	145.2	38.5	71.7	123.7	32.8	61.1
10 years	4,274,056	0.0152	2.12	0.56	1.05	1.81	0.48	0.89	67.6	143.3	38.0	70.8	122.1	32.4	60.3
11 years	4,115,093	0.0146	2.04	0.54	1.01	1.74	0.46	0.86	66.6	136.0	36.0	67.1	115.8	30.7	57.2
12 years	4,075,842	0.0145	2.02	0.54	1.00	1.72	0.46	0.85	65.6	132.7	35.1	65.5	113.0	29.9	55.8
13 years	4,010,850	0.0143	1.99	0.53	0.98	1.70	0.45	0.84	64.6	128.5	34.1	63.5	109.5	29.0	54.1
14 years	4,052,231	0.0144	2.01	0.53	0.99	1.71	0.45	0.85	63.6	127.9	33.9	63.1	108.9	28.9	53.8
15 years	4,019,404	0.0143	1.99	0.53	0.98	1.70	0.45	0.84	62.6	124.8	33.1	61.6	106.3	28.2	52.5
16 years	3,975,021	0.0141	1.97	0.52	0.97	1.68	0.45	0.83	61.7	121.7	32.2	60.1	103.7	27.5	51.2
17 years	4,046,012	0.0144	2.01	0.53	0.99	1.71	0.45	0.84	60.7	121.8	32.3	60.2	103.8	27.5	51.3
18 years	4,051,598	0.0144	2.01	0.53	0.99	1.71	0.45	0.85	59.7	120.0	31.8	59.3	102.2	27.1	50.5
19 years	4,127,855	0.0147	2.05	0.54	1.01	1.74	0.46	0.86	58.8	120.4	31.9	59.5	102.6	27.2	50.7
20 years	4,049,448	0.0144	2.01	0.53	0.99	1.71	0.45	0.85	57.8	116.1	30.8	57.3	98.9	26.2	48.8
21 years	3,841,082	0.0136	1.91	0.50	0.94	1.62	0.43	0.80	56.9	108.4	28.7	53.5	92.4	24.5	45.6
22 years	3,758,648	0.0134	1.86	0.49	0.92	1.59	0.42	0.78	55.9	104.2	27.6	51.5	88.8	23.5	43.8
23 years	3,673,582	0.0131	1.82	0.48	0.90	1.55	0.41	0.77	55.0	100.2	26.6	49.5	85.4	22.6	42.2
24 years	3,641,241	0.0129	1.81	0.48	0.89	1.54	0.41	0.76	54.0	97.6	25.8	48.2	83.1	22.0	41.0
25 years	3,744,539	0.0133	1.86	0.49	0.92	1.58	0.42	0.78	53.1	98.6	26.1	48.7	84.0	22.3	41.5

Exhibit U.6b: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A2, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
26 years	3,619,660	0.0129	1.80	0.48	0.89	1.53	0.41	0.76	52.1	93.6	24.8	46.2	79.7	21.1	39.4
27 years	3,789,800	0.0135	1.88	0.50	0.93	1.60	0.42	0.79	51.2	96.3	25.5	47.5	82.0	21.7	40.5
28 years	3,984,812	0.0142	1.98	0.52	0.98	1.68	0.45	0.83	50.2	99.2	26.3	49.0	84.5	22.4	41.7
29 years	4,242,525	0.0151	2.10	0.56	1.04	1.79	0.48	0.89	49.3	103.8	27.5	51.2	88.4	23.4	43.7
30 years	4,289,970	0.0152	2.13	0.56	1.05	1.81	0.48	0.90	48.3	102.8	27.2	50.8	87.6	23.2	43.2
31 years	4,011,575	0.0143	1.99	0.53	0.98	1.70	0.45	0.84	47.4	94.3	25.0	46.6	80.4	21.3	39.7
32 years	3,994,121	0.0142	1.98	0.52	0.98	1.69	0.45	0.83	46.5	92.1	24.4	45.5	78.5	20.8	38.8
33 years	4,026,573	0.0143	2.00	0.53	0.99	1.70	0.45	0.84	45.5	90.9	24.1	44.9	77.4	20.5	38.2
34 years	4,188,149	0.0149	2.08	0.55	1.03	1.77	0.47	0.87	44.6	92.7	24.5	45.8	78.9	20.9	39.0
35 years	4,516,118	0.0160	2.24	0.59	1.11	1.91	0.51	0.94	43.6	97.7	25.9	48.2	83.2	22.1	41.1
36 years	4,511,168	0.0160	2.24	0.59	1.11	1.91	0.51	0.94	42.7	95.6	25.3	47.2	81.4	21.6	40.2
37 years	4,517,060	0.0161	2.24	0.59	1.11	1.91	0.51	0.94	41.7	93.5	24.8	46.1	79.6	21.1	39.3
38 years	4,553,814	0.0162	2.26	0.60	1.12	1.92	0.51	0.95	40.8	92.2	24.4	45.5	78.5	20.8	38.8
39 years	4,608,504	0.0164	2.29	0.61	1.13	1.95	0.52	0.96	39.9	91.2	24.2	45.0	77.7	20.6	38.4
40 years	4,711,434	0.0167	2.34	0.62	1.15	1.99	0.53	0.98	38.9	90.9	24.1	44.9	77.5	20.5	38.2
41 years	4,466,676	0.0159	2.22	0.59	1.09	1.89	0.50	0.93	38.0	84.2	22.3	41.6	71.7	19.0	35.4
42 years	4,547,220	0.0162	2.26	0.60	1.11	1.92	0.51	0.95	37.1	83.7	22.2	41.3	71.3	18.9	35.2
43 years	4,407,870	0.0157	2.19	0.58	1.08	1.86	0.49	0.92	36.2	79.2	21.0	39.1	67.4	17.9	33.3
44 years	4,308,663	0.0153	2.14	0.57	1.06	1.82	0.48	0.90	35.3	75.5	20.0	37.3	64.3	17.0	31.7
45 years	4,341,460	0.0154	2.15	0.57	1.06	1.83	0.49	0.91	34.4	74.1	19.6	36.6	63.1	16.7	31.2
46 years	4,087,563	0.0145	2.03	0.54	1.00	1.73	0.46	0.85	33.5	67.9	18.0	33.5	57.9	15.3	28.6
47 years	4,019,692	0.0143	1.99	0.53	0.98	1.70	0.45	0.84	32.6	65.0	17.2	32.1	55.4	14.7	27.3
48 years	3,885,145	0.0138	1.93	0.51	0.95	1.64	0.44	0.81	31.7	61.1	16.2	30.2	52.1	13.8	25.7
49 years	3,758,544	0.0134	1.86	0.49	0.92	1.59	0.42	0.78	30.8	57.4	15.2	28.4	48.9	13.0	24.2
50 years	3,808,515	0.0135	1.89	0.50	0.93	1.61	0.43	0.79	30.0	56.7	15.0	28.0	48.3	12.8	23.8

Exhibit U.6b: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A2, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
51 years	3,616,997	0.0129	1.79	0.48	0.89	1.53	0.41	0.75	29.1	52.2	13.8	25.8	44.5	11.8	22.0
52 years	3,707,436	0.0132	1.84	0.49	0.91	1.57	0.42	0.77	28.2	51.9	13.7	25.6	44.2	11.7	21.8
53 years	3,635,040	0.0129	1.80	0.48	0.89	1.54	0.41	0.76	27.4	49.4	13.1	24.4	42.1	11.2	20.8
54 years	2,817,560	0.0100	1.40	0.37	0.69	1.19	0.32	0.59	26.5	37.0	9.8	18.3	31.6	8.4	15.6
55 years	2,850,600	0.0101	1.41	0.37	0.70	1.20	0.32	0.59	25.7	36.3	9.6	17.9	31.0	8.2	15.3
56 years	2,837,452	0.0101	1.41	0.37	0.70	1.20	0.32	0.59	24.8	34.9	9.2	17.2	29.7	7.9	14.7
57 years	2,864,020	0.0102	1.42	0.38	0.70	1.21	0.32	0.60	24.0	34.1	9.0	16.8	29.1	7.7	14.3
58 years	2,540,152	0.0090	1.26	0.33	0.62	1.07	0.28	0.53	23.2	29.2	7.7	14.4	24.9	6.6	12.3
59 years	2,377,013	0.0084	1.18	0.31	0.58	1.00	0.27	0.50	22.4	26.4	7.0	13.0	22.5	6.0	11.1
60 years	2,319,944	0.0082	1.15	0.30	0.57	0.98	0.26	0.48	21.6	24.9	6.6	12.3	21.2	5.6	10.5
61 years	2,221,227	0.0079	1.10	0.29	0.54	0.94	0.25	0.46	20.9	23.0	6.1	11.4	19.6	5.2	9.7
62 years	2,171,072	0.0077	1.08	0.29	0.53	0.92	0.24	0.45	20.1	21.7	5.7	10.7	18.4	4.9	9.1
63 years	2,053,151	0.0073	1.02	0.27	0.50	0.87	0.23	0.43	19.3	19.7	5.2	9.7	16.7	4.4	8.3
64 years	2,040,053	0.0072	1.01	0.27	0.50	0.86	0.23	0.43	18.6	18.8	5.0	9.3	16.0	4.2	7.9
65 years	2,029,911	0.0072	1.01	0.27	0.50	0.86	0.23	0.42	17.9	18.0	4.8	8.9	15.4	4.1	7.6
66 years	1,860,320	0.0066	0.92	0.24	0.46	0.79	0.21	0.39	17.2	15.9	4.2	7.8	13.5	3.6	6.7
67 years	1,896,451	0.0067	0.94	0.25	0.46	0.80	0.21	0.40	16.4	15.4	4.1	7.6	13.1	3.5	6.5
68 years	1,864,515	0.0066	0.93	0.25	0.46	0.79	0.21	0.39	15.8	14.6	3.9	7.2	12.5	3.3	6.1
69 years	1,882,348	0.0067	0.93	0.25	0.46	0.80	0.21	0.39	15.1	14.1	3.7	7.0	12.0	3.2	5.9
70 years	1,875,175	0.0067	0.93	0.25	0.46	0.79	0.21	0.39	14.4	13.4	3.5	6.6	11.4	3.0	5.6
71 years	1,788,269	0.0064	0.89	0.24	0.44	0.76	0.20	0.37	13.8	12.2	3.2	6.0	10.4	2.8	5.2
72 years	1,791,696	0.0064	0.89	0.24	0.44	0.76	0.20	0.37	13.1	11.6	3.1	5.8	9.9	2.6	4.9
73 years	1,725,168	0.0061	0.86	0.23	0.42	0.73	0.19	0.36	12.5	10.7	2.8	5.3	9.1	2.4	4.5
74 years	1,677,133	0.0060	0.83	0.22	0.41	0.71	0.19	0.35	11.9	9.9	2.6	4.9	8.4	2.2	4.2
75 years	1,651,641	0.0059	0.82	0.22	0.40	0.70	0.18	0.34	11.3	9.3	2.5	4.6	7.9	2.1	3.9

Exhibit U.6b: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A2, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
76 years	1,556,567	0.0055	0.77	0.20	0.38	0.66	0.17	0.32	10.7	8.3	2.2	4.1	7.0	1.9	3.5
77 years	1,460,781	0.0052	0.72	0.19	0.36	0.62	0.16	0.30	10.2	7.4	2.0	3.7	6.3	1.7	3.1
78 years	1,431,916	0.0051	0.71	0.19	0.35	0.61	0.16	0.30	9.6	6.8	1.8	3.4	5.8	1.5	2.9
79 years	1,314,908	0.0047	0.65	0.17	0.32	0.56	0.15	0.27	9.1	5.9	1.6	2.9	5.1	1.3	2.5
80 years	1,207,365	0.0043	0.60	0.16	0.30	0.51	0.14	0.25	8.6	5.2	1.4	2.5	4.4	1.2	2.2
81 years	1,072,048	0.0038	0.53	0.14	0.26	0.45	0.12	0.22	8.1	4.3	1.1	2.1	3.7	1.0	1.8
82 years	981,562	0.0035	0.49	0.13	0.24	0.41	0.11	0.20	7.6	3.7	1.0	1.8	3.2	0.8	1.6
83 years	883,063	0.0031	0.44	0.12	0.22	0.37	0.10	0.18	7.2	3.2	0.8	1.6	2.7	0.7	1.3
84 years	801,329	0.0028	0.40	0.11	0.20	0.34	0.09	0.17	6.7	2.7	0.7	1.3	2.3	0.6	1.1
85 years	730,194	0.0026	0.36	0.10	0.18	0.31	0.08	0.15	6.3	2.3	0.6	1.1	1.9	0.5	1.0
86 years	635,154	0.0023	0.32	0.08	0.16	0.27	0.07	0.13	6.0	1.9	0.5	0.9	1.6	0.4	0.8
87 years	557,330	0.0020	0.28	0.07	0.14	0.24	0.06	0.12	5.6	1.5	0.4	0.8	1.3	0.3	0.7
88 years	465,481	0.0017	0.23	0.06	0.11	0.20	0.05	0.10	5.3	1.2	0.3	0.6	1.0	0.3	0.5
89 years	401,659	0.0014	0.20	0.05	0.10	0.17	0.04	0.08	5.0	1.0	0.3	0.5	0.8	0.2	0.4
90 years	327,904	0.0012	0.16	0.04	0.08	0.14	0.04	0.07	4.7	0.8	0.2	0.4	0.7	0.2	0.3
91 years	266,386	0.0009	0.13	0.04	0.07	0.11	0.03	0.06	4.4	0.6	0.2	0.3	0.5	0.1	0.2
92 years	218,217	0.0008	0.11	0.03	0.05	0.09	0.02	0.05	4.1	0.4	0.1	0.2	0.4	0.1	0.2
93 years	169,066	0.0006	0.08	0.02	0.04	0.07	0.02	0.04	3.9	0.3	0.1	0.2	0.3	0.1	0.1
94 years	130,958	0.0005	0.06	0.02	0.03	0.06	0.01	0.03	3.7	0.2	0.1	0.1	0.2	0.1	0.1
95 years	98,095	0.0003	0.05	0.01	0.02	0.04	0.01	0.02	3.5	0.2	0.0	0.1	0.1	0.0	0.1
96 years	72,680	0.0003	0.04	0.01	0.02	0.03	0.01	0.02	3.3	0.1	0.0	0.1	0.1	0.0	0.1
97 years	52,844	0.0002	0.03	0.01	0.01	0.02	0.01	0.01	3.1	0.1	0.0	0.0	0.1	0.0	0.0
98 years	36,003	0.0001	0.02	0.00	0.01	0.02	0.00	0.01	2.9	0.1	0.0	0.0	0.0	0.0	0.0
99 years	27,162	0.0001	0.01	0.00	0.01	0.01	0.00	0.01	2.7	0.0	0.0	0.0	0.0	0.0	0.0
>=100 years	50,454	0.0002	0.03	0.01	0.01	0.02	0.01	0.01	2.6	0.1	0.0	0.0	0.1	0.0	0.0

Sources: Colums A,B - U.S. Census (2000), Summary File 2
Columns D - I, Row titled "Total Across Intervals", from Exhibit C.10
Column J - National Vital Statistics Reports, Vol. 51, No. 3, December 29, 2002, "Life table for the total population: United States, 2000"

Exhibit U.6c: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A3, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
TOTAL	281,421,906	1.00	138.5	34.9	66.7	118.0	29.8	56.9		6,080.8	1,533.1	2,930.1	5180	1307	2497
–	–	(B / 281,421,906)	C * 138.5	C * 34.9	C * 66.7	C * 118.	C * 29.8	C * 56.9	–	D * J	E * J	F * J	G * J	H * J	I * J
Under 1 year	3,805,648	0.0135	1.87	0.47	0.90	1.60	0.40	0.77	76.9	144.0	36.3	69.4	122.7	31.0	59.1
1 year	3,820,582	0.0136	1.88	0.47	0.91	1.60	0.40	0.77	76.4	143.6	36.2	69.2	122.3	30.9	59.0
2 years	3,790,446	0.0135	1.86	0.47	0.90	1.59	0.40	0.77	75.4	140.6	35.4	67.8	119.8	30.2	57.7
3 years	3,832,799	0.0136	1.89	0.48	0.91	1.61	0.41	0.77	74.5	140.5	35.4	67.7	119.7	30.2	57.7
4 years	3,926,323	0.0140	1.93	0.49	0.93	1.65	0.42	0.79	73.5	142.0	35.8	68.4	121.0	30.5	58.3
5 years	3,965,103	0.0141	1.95	0.49	0.94	1.66	0.42	0.80	72.5	141.4	35.7	68.1	120.5	30.4	58.1
6 years	4,019,705	0.0143	1.98	0.50	0.95	1.68	0.43	0.81	71.5	141.4	35.6	68.1	120.5	30.4	58.1
7 years	4,118,147	0.0146	2.03	0.51	0.98	1.73	0.44	0.83	70.5	142.8	36.0	68.8	121.7	30.7	58.7
8 years	4,179,230	0.0149	2.06	0.52	0.99	1.75	0.44	0.84	69.5	142.9	36.0	68.9	121.7	30.7	58.7
9 years	4,267,320	0.0152	2.10	0.53	1.01	1.79	0.45	0.86	68.6	144.0	36.3	69.4	122.7	31.0	59.1
10 years	4,274,056	0.0152	2.10	0.53	1.01	1.79	0.45	0.86	67.6	142.1	35.8	68.5	121.1	30.6	58.4
11 years	4,115,093	0.0146	2.02	0.51	0.98	1.72	0.44	0.83	66.6	134.8	34.0	65.0	114.9	29.0	55.4
12 years	4,075,842	0.0145	2.01	0.51	0.97	1.71	0.43	0.82	65.6	131.5	33.2	63.4	112.1	28.3	54.0
13 years	4,010,850	0.0143	1.97	0.50	0.95	1.68	0.42	0.81	64.6	127.5	32.1	61.4	108.6	27.4	52.3
14 years	4,052,231	0.0144	1.99	0.50	0.96	1.70	0.43	0.82	63.6	126.8	32.0	61.1	108.0	27.3	52.1
15 years	4,019,404	0.0143	1.98	0.50	0.95	1.68	0.43	0.81	62.6	123.8	31.2	59.6	105.5	26.6	50.8
16 years	3,975,021	0.0141	1.96	0.49	0.94	1.67	0.42	0.80	61.7	120.7	30.4	58.1	102.8	25.9	49.5
17 years	4,046,012	0.0144	1.99	0.50	0.96	1.70	0.43	0.82	60.7	120.8	30.5	58.2	102.9	26.0	49.6
18 years	4,051,598	0.0144	1.99	0.50	0.96	1.70	0.43	0.82	59.7	119.0	30.0	57.3	101.4	25.6	48.9
19 years	4,127,855	0.0147	2.03	0.51	0.98	1.73	0.44	0.83	58.8	119.4	30.1	57.5	101.7	25.7	49.0
20 years	4,049,448	0.0144	1.99	0.50	0.96	1.70	0.43	0.82	57.8	115.1	29.0	55.5	98.1	24.8	47.3
21 years	3,841,082	0.0136	1.89	0.48	0.91	1.61	0.41	0.78	56.9	107.5	27.1	51.8	91.6	23.1	44.2
22 years	3,758,648	0.0134	1.85	0.47	0.89	1.58	0.40	0.76	55.9	103.4	26.1	49.8	88.1	22.2	42.4
23 years	3,673,582	0.0131	1.81	0.46	0.87	1.54	0.39	0.74	55.0	99.4	25.1	47.9	84.7	21.4	40.8
24 years	3,641,241	0.0129	1.79	0.45	0.86	1.53	0.39	0.74	54.0	96.7	24.4	46.6	82.4	20.8	39.7
25 years	3,744,539	0.0133	1.84	0.46	0.89	1.57	0.40	0.76	53.1	97.8	24.7	47.1	83.3	21.0	40.2

Exhibit U.6c: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A3, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
26 years	3,619,660	0.0129	1.78	0.45	0.86	1.52	0.38	0.73	52.1	92.8	23.4	44.7	79.0	19.9	38.1
27 years	3,789,800	0.0135	1.86	0.47	0.90	1.59	0.40	0.77	51.2	95.5	24.1	46.0	81.3	20.5	39.2
28 years	3,984,812	0.0142	1.96	0.49	0.94	1.67	0.42	0.81	50.2	98.4	24.8	47.4	83.8	21.2	40.4
29 years	4,242,525	0.0151	2.09	0.53	1.01	1.78	0.45	0.86	49.3	102.9	25.9	49.6	87.7	22.1	42.3
30 years	4,289,970	0.0152	2.11	0.53	1.02	1.80	0.45	0.87	48.3	101.9	25.7	49.1	86.8	21.9	41.9
31 years	4,011,575	0.0143	1.97	0.50	0.95	1.68	0.42	0.81	47.4	93.5	23.6	45.1	79.7	20.1	38.4
32 years	3,994,121	0.0142	1.96	0.50	0.95	1.67	0.42	0.81	46.5	91.4	23.0	44.0	77.8	19.6	37.5
33 years	4,026,573	0.0143	1.98	0.50	0.95	1.69	0.43	0.81	45.5	90.1	22.7	43.4	76.8	19.4	37.0
34 years	4,188,149	0.0149	2.06	0.52	0.99	1.76	0.44	0.85	44.6	91.9	23.2	44.3	78.3	19.8	37.7
35 years	4,516,118	0.0160	2.22	0.56	1.07	1.89	0.48	0.91	43.6	96.9	24.4	46.7	82.5	20.8	39.8
36 years	4,511,168	0.0160	2.22	0.56	1.07	1.89	0.48	0.91	42.7	94.8	23.9	45.7	80.7	20.4	38.9
37 years	4,517,060	0.0161	2.22	0.56	1.07	1.89	0.48	0.91	41.7	92.7	23.4	44.7	78.9	19.9	38.1
38 years	4,553,814	0.0162	2.24	0.56	1.08	1.91	0.48	0.92	40.8	91.4	23.0	44.0	77.9	19.7	37.5
39 years	4,608,504	0.0164	2.27	0.57	1.09	1.93	0.49	0.93	39.9	90.5	22.8	43.6	77.1	19.4	37.1
40 years	4,711,434	0.0167	2.32	0.58	1.12	1.97	0.50	0.95	38.9	90.2	22.7	43.4	76.8	19.4	37.0
41 years	4,466,676	0.0159	2.20	0.55	1.06	1.87	0.47	0.90	38.0	83.5	21.1	40.2	71.1	18.0	34.3
42 years	4,547,220	0.0162	2.24	0.56	1.08	1.91	0.48	0.92	37.1	83.0	20.9	40.0	70.7	17.8	34.1
43 years	4,407,870	0.0157	2.17	0.55	1.04	1.85	0.47	0.89	36.2	78.5	19.8	37.8	66.9	16.9	32.2
44 years	4,308,663	0.0153	2.12	0.53	1.02	1.81	0.46	0.87	35.3	74.8	18.9	36.1	63.7	16.1	30.7
45 years	4,341,460	0.0154	2.14	0.54	1.03	1.82	0.46	0.88	34.4	73.5	18.5	35.4	62.6	15.8	30.2
46 years	4,087,563	0.0145	2.01	0.51	0.97	1.71	0.43	0.83	33.5	67.4	17.0	32.5	57.4	14.5	27.7
47 years	4,019,692	0.0143	1.98	0.50	0.95	1.68	0.43	0.81	32.6	64.5	16.3	31.1	54.9	13.9	26.5
48 years	3,885,145	0.0138	1.91	0.48	0.92	1.63	0.41	0.78	31.7	60.6	15.3	29.2	51.6	13.0	24.9
49 years	3,758,544	0.0134	1.85	0.47	0.89	1.58	0.40	0.76	30.8	57.0	14.4	27.4	48.5	12.2	23.4
50 years	3,808,515	0.0135	1.87	0.47	0.90	1.60	0.40	0.77	30.0	56.2	14.2	27.1	47.9	12.1	23.1

Exhibit U.6c: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A3, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
51 years	3,616,997	0.0129	1.78	0.45	0.86	1.52	0.38	0.73	29.1	51.8	13.1	25.0	44.1	11.1	21.3
52 years	3,707,436	0.0132	1.82	0.46	0.88	1.55	0.39	0.75	28.2	51.4	13.0	24.8	43.8	11.1	21.1
53 years	3,635,040	0.0129	1.79	0.45	0.86	1.52	0.38	0.73	27.4	49.0	12.4	23.6	41.7	10.5	20.1
54 years	2,817,560	0.0100	1.39	0.35	0.67	1.18	0.30	0.57	26.5	36.7	9.3	17.7	31.3	7.9	15.1
55 years	2,850,600	0.0101	1.40	0.35	0.68	1.19	0.30	0.58	25.7	36.0	9.1	17.4	30.7	7.7	14.8
56 years	2,837,452	0.0101	1.40	0.35	0.67	1.19	0.30	0.57	24.8	34.6	8.7	16.7	29.5	7.4	14.2
57 years	2,864,020	0.0102	1.41	0.36	0.68	1.20	0.30	0.58	24.0	33.8	8.5	16.3	28.8	7.3	13.9
58 years	2,540,152	0.0090	1.25	0.32	0.60	1.06	0.27	0.51	23.2	29.0	7.3	14.0	24.7	6.2	11.9
59 years	2,377,013	0.0084	1.17	0.29	0.56	1.00	0.25	0.48	22.4	26.2	6.6	12.6	22.3	5.6	10.8
60 years	2,319,944	0.0082	1.14	0.29	0.55	0.97	0.25	0.47	21.6	24.7	6.2	11.9	21.0	5.3	10.1
61 years	2,221,227	0.0079	1.09	0.28	0.53	0.93	0.23	0.45	20.9	22.8	5.8	11.0	19.5	4.9	9.4
62 years	2,171,072	0.0077	1.07	0.27	0.51	0.91	0.23	0.44	20.1	21.5	5.4	10.3	18.3	4.6	8.8
63 years	2,053,151	0.0073	1.01	0.25	0.49	0.86	0.22	0.41	19.3	19.5	4.9	9.4	16.6	4.2	8.0
64 years	2,040,053	0.0072	1.00	0.25	0.48	0.86	0.22	0.41	18.6	18.7	4.7	9.0	15.9	4.0	7.7
65 years	2,029,911	0.0072	1.00	0.25	0.48	0.85	0.21	0.41	17.9	17.9	4.5	8.6	15.2	3.8	7.3
66 years	1,860,320	0.0066	0.92	0.23	0.44	0.78	0.20	0.38	17.2	15.7	4.0	7.6	13.4	3.4	6.5
67 years	1,896,451	0.0067	0.93	0.24	0.45	0.79	0.20	0.38	16.4	15.3	3.9	7.4	13.0	3.3	6.3
68 years	1,864,515	0.0066	0.92	0.23	0.44	0.78	0.20	0.38	15.8	14.5	3.7	7.0	12.3	3.1	6.0
69 years	1,882,348	0.0067	0.93	0.23	0.45	0.79	0.20	0.38	15.1	14.0	3.5	6.7	11.9	3.0	5.7
70 years	1,875,175	0.0067	0.92	0.23	0.44	0.79	0.20	0.38	14.4	13.3	3.3	6.4	11.3	2.9	5.5
71 years	1,788,269	0.0064	0.88	0.22	0.42	0.75	0.19	0.36	13.8	12.1	3.1	5.9	10.3	2.6	5.0
72 years	1,791,696	0.0064	0.88	0.22	0.42	0.75	0.19	0.36	13.1	11.5	2.9	5.6	9.8	2.5	4.7
73 years	1,725,168	0.0061	0.85	0.21	0.41	0.72	0.18	0.35	12.5	10.6	2.7	5.1	9.0	2.3	4.4
74 years	1,677,133	0.0060	0.83	0.21	0.40	0.70	0.18	0.34	11.9	9.8	2.5	4.7	8.4	2.1	4.0
75 years	1,651,641	0.0059	0.81	0.20	0.39	0.69	0.17	0.33	11.3	9.2	2.3	4.4	7.8	2.0	3.8

Exhibit U.6c: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A3, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
76 years	1,556,567	0.0055	0.77	0.19	0.37	0.65	0.16	0.31	10.7	8.2	2.1	3.9	7.0	1.8	3.4
77 years	1,460,781	0.0052	0.72	0.18	0.35	0.61	0.15	0.30	10.2	7.3	1.8	3.5	6.2	1.6	3.0
78 years	1,431,916	0.0051	0.70	0.18	0.34	0.60	0.15	0.29	9.6	6.8	1.7	3.3	5.8	1.5	2.8
79 years	1,314,908	0.0047	0.65	0.16	0.31	0.55	0.14	0.27	9.1	5.9	1.5	2.8	5.0	1.3	2.4
80 years	1,207,365	0.0043	0.59	0.15	0.29	0.51	0.13	0.24	8.6	5.1	1.3	2.5	4.4	1.1	2.1
81 years	1,072,048	0.0038	0.53	0.13	0.25	0.45	0.11	0.22	8.1	4.3	1.1	2.1	3.6	0.9	1.8
82 years	981,562	0.0035	0.48	0.12	0.23	0.41	0.10	0.20	7.6	3.7	0.9	1.8	3.1	0.8	1.5
83 years	883,063	0.0031	0.43	0.11	0.21	0.37	0.09	0.18	7.2	3.1	0.8	1.5	2.7	0.7	1.3
84 years	801,329	0.0028	0.39	0.10	0.19	0.34	0.08	0.16	6.7	2.6	0.7	1.3	2.3	0.6	1.1
85 years	730,194	0.0026	0.36	0.09	0.17	0.31	0.08	0.15	6.3	2.3	0.6	1.1	1.9	0.5	0.9
86 years	635,154	0.0023	0.31	0.08	0.15	0.27	0.07	0.13	6.0	1.9	0.5	0.9	1.6	0.4	0.8
87 years	557,330	0.0020	0.27	0.07	0.13	0.23	0.06	0.11	5.6	1.5	0.4	0.7	1.3	0.3	0.6
88 years	465,481	0.0017	0.23	0.06	0.11	0.20	0.05	0.09	5.3	1.2	0.3	0.6	1.0	0.3	0.5
89 years	401,659	0.0014	0.20	0.05	0.10	0.17	0.04	0.08	5.0	1.0	0.2	0.5	0.8	0.2	0.4
90 years	327,904	0.0012	0.16	0.04	0.08	0.14	0.03	0.07	4.7	0.8	0.2	0.4	0.6	0.2	0.3
91 years	266,386	0.0009	0.13	0.03	0.06	0.11	0.03	0.05	4.4	0.6	0.1	0.3	0.5	0.1	0.2
92 years	218,217	0.0008	0.11	0.03	0.05	0.09	0.02	0.04	4.1	0.4	0.1	0.2	0.4	0.1	0.2
93 years	169,066	0.0006	0.08	0.02	0.04	0.07	0.02	0.03	3.9	0.3	0.1	0.2	0.3	0.1	0.1
94 years	130,958	0.0005	0.06	0.02	0.03	0.05	0.01	0.03	3.7	0.2	0.1	0.1	0.2	0.1	0.1
95 years	98,095	0.0003	0.05	0.01	0.02	0.04	0.01	0.02	3.5	0.2	0.0	0.1	0.1	0.0	0.1
96 years	72,680	0.0003	0.04	0.01	0.02	0.03	0.01	0.01	3.3	0.1	0.0	0.1	0.1	0.0	0.0
97 years	52,844	0.0002	0.03	0.01	0.01	0.02	0.01	0.01	3.1	0.1	0.0	0.0	0.1	0.0	0.0
98 years	36,003	0.0001	0.02	0.00	0.01	0.02	0.00	0.01	2.9	0.1	0.0	0.0	0.0	0.0	0.0
99 years	27,162	0.0001	0.01	0.00	0.01	0.01	0.00	0.01	2.7	0.0	0.0	0.0	0.0	0.0	0.0
>=100 years	50,454	0.0002	0.02	0.01	0.01	0.02	0.01	0.01	2.6	0.1	0.0	0.0	0.1	0.0	0.0

Sources: Colums A,B - U.S. Census (2000), Summary File 2
Columns D - I, Row titled "Total Across Intervals", from Exhibit C.10
Column J - National Vital Statistics Reports, Vol. 51, No. 3, December 29, 2002, "Life table for the total population: United States, 2000"

Exhibit U.6d: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A4, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
TOTAL	281,421,906	1.00	131.8	31.3	60.7	112.3	26.7	51.7		5,787.3	1,376.2	2,665.5	4932	1174	2273
–	–	B / (281,421,906)	C * 131.8	C * 31.3	C * 60.7	C * 112.3	C * 26.7	C * 51.7	–	D * J	E * J	F * J	G * J	H * J	I * J
Under 1 year	3,805,648	0.0135	1.78	0.42	0.82	1.52	0.36	0.70	76.9	137.0	32.6	63.1	116.8	27.8	53.8
1 year	3,820,582	0.0136	1.79	0.43	0.82	1.52	0.36	0.70	76.4	136.7	32.5	62.9	116.5	27.7	53.7
2 years	3,790,446	0.0135	1.77	0.42	0.82	1.51	0.36	0.70	75.4	133.8	31.8	61.6	114.0	27.2	52.6
3 years	3,832,799	0.0136	1.79	0.43	0.83	1.53	0.36	0.70	74.5	133.7	31.8	61.6	113.9	27.1	52.5
4 years	3,926,323	0.0140	1.84	0.44	0.85	1.57	0.37	0.72	73.5	135.1	32.1	62.2	115.2	27.4	53.1
5 years	3,965,103	0.0141	1.86	0.44	0.86	1.58	0.38	0.73	72.5	134.6	32.0	62.0	114.7	27.3	52.9
6 years	4,019,705	0.0143	1.88	0.45	0.87	1.60	0.38	0.74	71.5	134.6	32.0	62.0	114.7	27.3	52.8
7 years	4,118,147	0.0146	1.93	0.46	0.89	1.64	0.39	0.76	70.5	135.9	32.3	62.6	115.9	27.6	53.4
8 years	4,179,230	0.0149	1.96	0.47	0.90	1.67	0.40	0.77	69.5	136.0	32.3	62.6	115.9	27.6	53.4
9 years	4,267,320	0.0152	2.00	0.48	0.92	1.70	0.41	0.78	68.6	137.1	32.6	63.1	116.8	27.8	53.8
10 years	4,274,056	0.0152	2.00	0.48	0.92	1.71	0.41	0.79	67.6	135.3	32.2	62.3	115.3	27.4	53.1
11 years	4,115,093	0.0146	1.93	0.46	0.89	1.64	0.39	0.76	66.6	128.3	30.5	59.1	109.4	26.0	50.4
12 years	4,075,842	0.0145	1.91	0.45	0.88	1.63	0.39	0.75	65.6	125.2	29.8	57.7	106.7	25.4	49.2
13 years	4,010,850	0.0143	1.88	0.45	0.86	1.60	0.38	0.74	64.6	121.3	28.8	55.9	103.4	24.6	47.6
14 years	4,052,231	0.0144	1.90	0.45	0.87	1.62	0.38	0.75	63.6	120.7	28.7	55.6	102.8	24.5	47.4
15 years	4,019,404	0.0143	1.88	0.45	0.87	1.60	0.38	0.74	62.6	117.8	28.0	54.3	100.4	23.9	46.3
16 years	3,975,021	0.0141	1.86	0.44	0.86	1.59	0.38	0.73	61.7	114.8	27.3	52.9	97.9	23.3	45.1
17 years	4,046,012	0.0144	1.89	0.45	0.87	1.61	0.38	0.74	60.7	115.0	27.3	53.0	98.0	23.3	45.2
18 years	4,051,598	0.0144	1.90	0.45	0.87	1.62	0.38	0.74	59.7	113.3	26.9	52.2	96.5	23.0	44.5
19 years	4,127,855	0.0147	1.93	0.46	0.89	1.65	0.39	0.76	58.8	113.6	27.0	52.3	96.9	23.1	44.6
20 years	4,049,448	0.0144	1.90	0.45	0.87	1.62	0.38	0.74	57.8	109.6	26.1	50.5	93.4	22.2	43.0
21 years	3,841,082	0.0136	1.80	0.43	0.83	1.53	0.36	0.71	56.9	102.3	24.3	47.1	87.2	20.8	40.2
22 years	3,758,648	0.0134	1.76	0.42	0.81	1.50	0.36	0.69	55.9	98.4	23.4	45.3	83.8	20.0	38.6
23 years	3,673,582	0.0131	1.72	0.41	0.79	1.47	0.35	0.68	55.0	94.6	22.5	43.6	80.6	19.2	37.2
24 years	3,641,241	0.0129	1.70	0.41	0.79	1.45	0.35	0.67	54.0	92.1	21.9	42.4	78.5	18.7	36.2
25 years	3,744,539	0.0133	1.75	0.42	0.81	1.49	0.36	0.69	53.1	93.1	22.1	42.9	79.3	18.9	36.6

Exhibit U.6d: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A4, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
26 years	3,619,660	0.0129	1.69	0.40	0.78	1.44	0.34	0.67	52.1	88.3	21.0	40.7	75.3	17.9	34.7
27 years	3,789,800	0.0135	1.77	0.42	0.82	1.51	0.36	0.70	51.2	90.9	21.6	41.8	77.4	18.4	35.7
28 years	3,984,812	0.0142	1.87	0.44	0.86	1.59	0.38	0.73	50.2	93.7	22.3	43.1	79.8	19.0	36.8
29 years	4,242,525	0.0151	1.99	0.47	0.91	1.69	0.40	0.78	49.3	97.9	23.3	45.1	83.5	19.9	38.5
30 years	4,289,970	0.0152	2.01	0.48	0.93	1.71	0.41	0.79	48.3	97.0	23.1	44.7	82.7	19.7	38.1
31 years	4,011,575	0.0143	1.88	0.45	0.87	1.60	0.38	0.74	47.4	89.0	21.2	41.0	75.9	18.1	35.0
32 years	3,994,121	0.0142	1.87	0.44	0.86	1.59	0.38	0.73	46.5	87.0	20.7	40.1	74.1	17.6	34.1
33 years	4,026,573	0.0143	1.89	0.45	0.87	1.61	0.38	0.74	45.5	85.8	20.4	39.5	73.1	17.4	33.7
34 years	4,188,149	0.0149	1.96	0.47	0.90	1.67	0.40	0.77	44.6	87.5	20.8	40.3	74.5	17.7	34.3
35 years	4,516,118	0.0160	2.11	0.50	0.97	1.80	0.43	0.83	43.6	92.2	21.9	42.5	78.6	18.7	36.2
36 years	4,511,168	0.0160	2.11	0.50	0.97	1.80	0.43	0.83	42.7	90.2	21.4	41.5	76.9	18.3	35.4
37 years	4,517,060	0.0161	2.12	0.50	0.97	1.80	0.43	0.83	41.7	88.2	21.0	40.6	75.2	17.9	34.6
38 years	4,553,814	0.0162	2.13	0.51	0.98	1.82	0.43	0.84	40.8	87.0	20.7	40.1	74.1	17.7	34.2
39 years	4,608,504	0.0164	2.16	0.51	0.99	1.84	0.44	0.85	39.9	86.1	20.5	39.7	73.4	17.5	33.8
40 years	4,711,434	0.0167	2.21	0.52	1.02	1.88	0.45	0.87	38.9	85.8	20.4	39.5	73.1	17.4	33.7
41 years	4,466,676	0.0159	2.09	0.50	0.96	1.78	0.42	0.82	38.0	79.5	18.9	36.6	67.7	16.1	31.2
42 years	4,547,220	0.0162	2.13	0.51	0.98	1.81	0.43	0.84	37.1	79.0	18.8	36.4	67.3	16.0	31.0
43 years	4,407,870	0.0157	2.06	0.49	0.95	1.76	0.42	0.81	36.2	74.7	17.8	34.4	63.7	15.2	29.3
44 years	4,308,663	0.0153	2.02	0.48	0.93	1.72	0.41	0.79	35.3	71.2	16.9	32.8	60.7	14.4	28.0
45 years	4,341,460	0.0154	2.03	0.48	0.94	1.73	0.41	0.80	34.4	69.9	16.6	32.2	59.6	14.2	27.5
46 years	4,087,563	0.0145	1.91	0.46	0.88	1.63	0.39	0.75	33.5	64.1	15.2	29.5	54.6	13.0	25.2
47 years	4,019,692	0.0143	1.88	0.45	0.87	1.60	0.38	0.74	32.6	61.4	14.6	28.3	52.3	12.4	24.1
48 years	3,885,145	0.0138	1.82	0.43	0.84	1.55	0.37	0.71	31.7	57.7	13.7	26.6	49.1	11.7	22.6
49 years	3,758,544	0.0134	1.76	0.42	0.81	1.50	0.36	0.69	30.8	54.2	12.9	25.0	46.2	11.0	21.3
50 years	3,808,515	0.0135	1.78	0.42	0.82	1.52	0.36	0.70	30.0	53.5	12.7	24.6	45.6	10.9	21.0

Exhibit U.6d: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A4, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
51 years	3,616,997	0.0129	1.69	0.40	0.78	1.44	0.34	0.67	29.1	49.3	11.7	22.7	42.0	10.0	19.4
52 years	3,707,436	0.0132	1.74	0.41	0.80	1.48	0.35	0.68	28.2	49.0	11.6	22.5	41.7	9.9	19.2
53 years	3,635,040	0.0129	1.70	0.40	0.78	1.45	0.35	0.67	27.4	46.6	11.1	21.5	39.7	9.5	18.3
54 years	2,817,560	0.0100	1.32	0.31	0.61	1.12	0.27	0.52	26.5	35.0	8.3	16.1	29.8	7.1	13.7
55 years	2,850,600	0.0101	1.33	0.32	0.61	1.14	0.27	0.52	25.7	34.3	8.2	15.8	29.2	7.0	13.5
56 years	2,837,452	0.0101	1.33	0.32	0.61	1.13	0.27	0.52	24.8	32.9	7.8	15.2	28.1	6.7	12.9
57 years	2,864,020	0.0102	1.34	0.32	0.62	1.14	0.27	0.53	24.0	32.2	7.7	14.8	27.4	6.5	12.6
58 years	2,540,152	0.0090	1.19	0.28	0.55	1.01	0.24	0.47	23.2	27.6	6.6	12.7	23.5	5.6	10.8
59 years	2,377,013	0.0084	1.11	0.26	0.51	0.95	0.23	0.44	22.4	24.9	5.9	11.5	21.2	5.1	9.8
60 years	2,319,944	0.0082	1.09	0.26	0.50	0.93	0.22	0.43	21.6	23.5	5.6	10.8	20.0	4.8	9.2
61 years	2,221,227	0.0079	1.04	0.25	0.48	0.89	0.21	0.41	20.9	21.7	5.2	10.0	18.5	4.4	8.5
62 years	2,171,072	0.0077	1.02	0.24	0.47	0.87	0.21	0.40	20.1	20.4	4.9	9.4	17.4	4.1	8.0
63 years	2,053,151	0.0073	0.96	0.23	0.44	0.82	0.20	0.38	19.3	18.6	4.4	8.5	15.8	3.8	7.3
64 years	2,040,053	0.0072	0.96	0.23	0.44	0.81	0.19	0.38	18.6	17.8	4.2	8.2	15.1	3.6	7.0
65 years	2,029,911	0.0072	0.95	0.23	0.44	0.81	0.19	0.37	17.9	17.0	4.0	7.8	14.5	3.5	6.7
66 years	1,860,320	0.0066	0.87	0.21	0.40	0.74	0.18	0.34	17.2	15.0	3.6	6.9	12.8	3.0	5.9
67 years	1,896,451	0.0067	0.89	0.21	0.41	0.76	0.18	0.35	16.4	14.6	3.5	6.7	12.4	3.0	5.7
68 years	1,864,515	0.0066	0.87	0.21	0.40	0.74	0.18	0.34	15.8	13.8	3.3	6.4	11.8	2.8	5.4
69 years	1,882,348	0.0067	0.88	0.21	0.41	0.75	0.18	0.35	15.1	13.3	3.2	6.1	11.3	2.7	5.2
70 years	1,875,175	0.0067	0.88	0.21	0.40	0.75	0.18	0.34	14.4	12.6	3.0	5.8	10.8	2.6	5.0
71 years	1,788,269	0.0064	0.84	0.20	0.39	0.71	0.17	0.33	13.8	11.6	2.7	5.3	9.8	2.3	4.5
72 years	1,791,696	0.0064	0.84	0.20	0.39	0.71	0.17	0.33	13.1	11.0	2.6	5.1	9.4	2.2	4.3
73 years	1,725,168	0.0061	0.81	0.19	0.37	0.69	0.16	0.32	12.5	10.1	2.4	4.7	8.6	2.0	4.0
74 years	1,677,133	0.0060	0.79	0.19	0.36	0.67	0.16	0.31	11.9	9.3	2.2	4.3	8.0	1.9	3.7
75 years	1,651,641	0.0059	0.77	0.18	0.36	0.66	0.16	0.30	11.3	8.7	2.1	4.0	7.4	1.8	3.4

Exhibit U.6d: Annualized Life-Years Saved Based on Medium Estimate Dose Response Model, Alternative A4, by Data Set

Age Group	U.S. Population	% Population (Percent)	Annualized Deaths Avoided, 3% Discount			Annualized Deaths Avoided, 7% Discount			Life Expectancy (years)	Annualized Life-Years Saved, 3% Discount (years)			Annualized Life-Years Saved, 7% Discount (years)		
			ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM		ICR	ICRSSL	ICRSSM	ICR	ICRSSL	ICRSSM
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
76 years	1,556,567	0.0055	0.73	0.17	0.34	0.62	0.15	0.29	10.7	7.8	1.9	3.6	6.6	1.6	3.1
77 years	1,460,781	0.0052	0.68	0.16	0.32	0.58	0.14	0.27	10.2	7.0	1.7	3.2	5.9	1.4	2.7
78 years	1,431,916	0.0051	0.67	0.16	0.31	0.57	0.14	0.26	9.6	6.4	1.5	3.0	5.5	1.3	2.5
79 years	1,314,908	0.0047	0.62	0.15	0.28	0.52	0.12	0.24	9.1	5.6	1.3	2.6	4.8	1.1	2.2
80 years	1,207,365	0.0043	0.57	0.13	0.26	0.48	0.11	0.22	8.6	4.9	1.2	2.2	4.1	1.0	1.9
81 years	1,072,048	0.0038	0.50	0.12	0.23	0.43	0.10	0.20	8.1	4.1	1.0	1.9	3.5	0.8	1.6
82 years	981,562	0.0035	0.46	0.11	0.21	0.39	0.09	0.18	7.6	3.5	0.8	1.6	3.0	0.7	1.4
83 years	883,063	0.0031	0.41	0.10	0.19	0.35	0.08	0.16	7.2	3.0	0.7	1.4	2.5	0.6	1.2
84 years	801,329	0.0028	0.38	0.09	0.17	0.32	0.08	0.15	6.7	2.5	0.6	1.2	2.1	0.5	1.0
85 years	730,194	0.0026	0.34	0.08	0.16	0.29	0.07	0.13	6.3	2.2	0.5	1.0	1.8	0.4	0.8
86 years	635,154	0.0023	0.30	0.07	0.14	0.25	0.06	0.12	6.0	1.8	0.4	0.8	1.5	0.4	0.7
87 years	557,330	0.0020	0.26	0.06	0.12	0.22	0.05	0.10	5.6	1.5	0.3	0.7	1.2	0.3	0.6
88 years	465,481	0.0017	0.22	0.05	0.10	0.19	0.04	0.09	5.3	1.2	0.3	0.5	1.0	0.2	0.5
89 years	401,659	0.0014	0.19	0.04	0.09	0.16	0.04	0.07	5.0	0.9	0.2	0.4	0.8	0.2	0.4
90 years	327,904	0.0012	0.15	0.04	0.07	0.13	0.03	0.06	4.7	0.7	0.2	0.3	0.6	0.1	0.3
91 years	266,386	0.0009	0.12	0.03	0.06	0.11	0.03	0.05	4.4	0.5	0.1	0.3	0.5	0.1	0.2
92 years	218,217	0.0008	0.10	0.02	0.05	0.09	0.02	0.04	4.1	0.4	0.1	0.2	0.4	0.1	0.2
93 years	169,066	0.0006	0.08	0.02	0.04	0.07	0.02	0.03	3.9	0.3	0.1	0.1	0.3	0.1	0.1
94 years	130,958	0.0005	0.06	0.01	0.03	0.05	0.01	0.02	3.7	0.2	0.1	0.1	0.2	0.0	0.1
95 years	98,095	0.0003	0.05	0.01	0.02	0.04	0.01	0.02	3.5	0.2	0.0	0.1	0.1	0.0	0.1
96 years	72,680	0.0003	0.03	0.01	0.02	0.03	0.01	0.01	3.3	0.1	0.0	0.1	0.1	0.0	0.0
97 years	52,844	0.0002	0.02	0.01	0.01	0.02	0.01	0.01	3.1	0.1	0.0	0.0	0.1	0.0	0.0
98 years	36,003	0.0001	0.02	0.00	0.01	0.01	0.00	0.01	2.9	0.0	0.0	0.0	0.0	0.0	0.0
99 years	27,162	0.0001	0.01	0.00	0.01	0.01	0.00	0.00	2.7	0.0	0.0	0.0	0.0	0.0	0.0
>=100 years	50,454	0.0002	0.02	0.01	0.01	0.02	0.00	0.01	2.6	0.1	0.0	0.0	0.1	0.0	0.0