

Water Distribution Center Bill of Materials – August 2014

Water Distribution Center Bill of Materials: Second System				
			Delivered System	\$ 10,308 Plus 500-gallon bladders @ about \$750 each.
Revision: 01 August 2014			Budget goal	\$ 12,000 Roddenberry award line item
	Puralytics total in bright yellow below		Delta	\$ (1,692) So close to perfect when water bladders added.
	\$ 8,141		Annual Supplies	\$ 1,744 for post-transition budget
			Power and Light	\$ 85 Budget goal \$3000. Evaluating multiple options. All will apparently work, so will consider the best options when we see the deployment circumstances.
Blue Optional				
<u>Category</u>	<u>Item</u>	<u>Source</u>	<u>Cost</u>	<u>Notes</u>
Source Water Delivery System				The purpose of this source water pre-treatment is to draw water in from an open body of water, and filter out turbidity and particulates to acceptable levels for supply to the next treatment section. In regions with high turbidity, the filters may fill up quickly and other alternatives may be required. In regions with TDS higher than 500, a TDS reduction system would be required. Mounting the components so they can be serviced and protected from elements still must be considered.
	1 Submersible Suction Pump - Rule Industries Slimline 500GPH	1 inch NPT	\$ 98	http://www.westmarine.com/buy/rule-industries--slim-line-submersible-pump-kit--8756488
	2 Submersible Suction Pump - Rule Industries Charge&Flow Portable Pump 280 GPH	1 inch NPT	\$ 100	http://www.westmarine.com/buy/rule-industries--charge-n-flow-portable-pump-kit--11015385
	3 Battery, 12v, Marine grade AGM.	32 amp, 24 pounds, to run the submersible pump #1	\$ 150	http://www.westmarine.com/buy/--dual-purpose-agm-batteries--P015020290
	4 Manual pump for submersible pump failure	10GPM, 1.5 inch ports - need adapters	\$ 88	http://www.westmarine.com/buy/bosworth--guzzler-manual-bilge-pumps-400-and-500--P011_330_003_003
	5 Sediment filter	1 inch NPT	\$ 41	https://www.grainger.com/product/RON-VIK-Line-Strainer-6UJL4?searchQuery=6ujl4
	6 Rusco Spin Down Filter - 250 Mesh, 61 micron in-line fine-sand filter and 140/104.	1 inch, total of two pairs, so four filters	\$ 243	http://www.freshwatersystems.com/showproduct.aspx?ProductID=780&SEName=rusco-spin-down-filter-pe-screen-t-style-1
	Lakos Twist II Clean 200 mesh sediment filter	get 2, 1-inch @ \$69	\$ 138	https://www.cleanwaterstore.com/mm5/merchant.mvc?Session_ID=a685ea2784e2e5cd3228c2757c021cfa&Screen=PROD&Store_Code=cleanwat&Product_Code=FS001440#tab=tab1
	7 Pump mating adapter: female hose to female pump, so male-male 1' NPT	might need as many as four @ \$9	\$ 36	http://www.grainger.com/product/Nipple-1VG5?s_pp=false
	8 Tie wraps (100, 12-inch)		\$ 8	http://www.amazon.com/Joy-Fish-Heavy-Nylon-Cable/dp/B005OK7P3G/ref=hn_ni_t?ie=UTF8&pisc=1&smid=A1A17GZA8NEZAX
	9 bouy marker	red	\$ 37	http://www.amazon.com/Pentair-R181086-Oval-Float-White/dp/B0002KQFGQ/ref=sr_1_18?s=sporting-goods&ie=UTF8&qid=1395126673&sr=1-18&keywords=buoy
	10 1/4 rope for bouy	100 feet	\$ 9	http://www.amazon.com/Promar-4-Inch-Diameter-Poly-100-Foot/dp/B003OC1ZAA/ref=sr_1_1?s=sporting-goods&ie=UTF8&qid=1404198840&sr=1-1&keywords=1+4+rope

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	11	Source water contaminated feed bladder	ReadyContainment, black, 500 gallon		http://readycontainment.com/products/bladder-tanks/water-bladders/
Pre-Treatment					This is required for all Shield deployments for drinking water.
	1	Shield Pre-treatment	Final configuration	\$ 2,136	Feed Tank to Shield: 1. Treatment Pump 2. Hosing 3. CPC Fittings 4. C-clamps 5. Filter Housings (6x) 6. Housing Brackets (3x) 7. Housing Connectors (3x) 8. Filters (16x) 9. 1 cu.ft. Cation Resin 10. 1 cu.ft. Anion Resin 11. Refillable Resin Cartridges (16x)
	2	Shield transport	Normal Puralytics cardboard shipping box	\$ 25	
	3	Water Test Kit	Assembled by Colin	\$ 179	
Shield					PCO cannisters will be an annual consumable along with the UV-lamp and quartz sleeve. Ozone cartridges projected to be closer to a six month replacement cycle. The system should be constrained off the ground adjacent to the pre-treatment, perhaps on the Pelican cases, and secured. Long term use of the Shield and pre-treatment should be in a constructed building mounted to a wall.
	1	Puralytics Shield	Puralytics: Gen II	\$ 5,800	This is the Puralytics discounted partner price
Post-Treatment and Storage					Challenge - controls and/or mechanism to monitor water level / Shield Water production - Manual vs Automated
	1	ground riser stakes (8)		\$ 16	http://www.amazon.com/MSR-06619-GroundHog-Stake-Kit/dp/B0006ZC5KLG/ref=ih_ni_t?ie=UTF8&psc=1&smid=ATVPDKIKX0DER
	3	Yellow caution tape		\$ -	http://www.amazon.com/Empire-Level-71-1001-1000-Foot-Barricade/dp/B00IDZEETO/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395113652&sr=1-1&keywords=yellow+caution+tape
	4	Shurflo Distribution Pump (Pump #3) to tap for customer filling.		\$ 71	http://www.amazon.com/SHURflo-4008-101-E65-Revolution-Water-Pump/dp/B002XM5G70/ref=cm_cr_pr_product_top
	5	ReadyContainment 500gal clean water bladder	Blue cover, Israeli material supplier, European water standard, 2-inch camlock low on the side for draining, plus additional stacked fitting for garden hose (universal) tap		
	6	Tap from bladder for distribution			
Distribution Center					All of the electrical equipment above is designed to operate inside a facility that protects it from the environment - heat, moisture, dust, etc. A fully enclosed tent would be sufficient for a short duration, for long duration a constructed facility with components mounted to the wall is required.
	1	Coleman 12x10 domed shelter w screen walls. Center height 100 inches, about 8 feet.	Coleman	\$ 165	http://www.amazon.com/Coleman-Hex-Instant-Screened-Shelter/dp/B00339C3FA/ref=sr_1_18?s=sporting-goods&ie=UTF8&qid=1396838428&sr=1-18&keywords=shelter+tent

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	2	Off Deep Woods Insect Repellent	2 large spray cans	\$ 28	https://www.grainger.com/product/4HK65?cm_sp=HIO-_-HMDL-_-BTM_TPSELL&cm_vc=A2CTSZ4
	3	Sandbag anchors (15)		\$ 15	http://www.amazon.com/Polypropylene-Olive-Drab-Sandbag-Pieces/dp/B000P1S9GQ/ref=sr_1_1?s=hi&ie=UTF8&qid=1395110703&sr=1-1&keywords=sandbags
	4	Table for Shield (36" square)		\$ -	http://www.amazon.com/Office-Star-Products-Folding-36-Inch/dp/B0012H2L3E/ref=pd_sim_sbs_indust_1?ie=UTF8&refRID=073SC3Z0GR1YTV0C5Y9J
	5	Warning signs		\$ -	http://www.mysafetysign.com/freepdf/free-safety-signs-pdf-download.aspx
	6	Guidance signs		\$ -	http://www.mysafetysign.com/Safety-Signs/Non-Potable-Water-Signs/Potable-Water-Sign/SAF-SKU-S-2846.aspx
	7	Crowd guidance wire and posts		\$ -	local acquisition
	8	Water distribution bags (1 gallon)	Ziplock SmartZip Heavy Duty Freezer 1-gallon bags, 10/box, 12 boxes, so 120 bags total. Need 5 packs of ten @ \$52 each, so 600 bags for \$260; 43 cents each.	\$ 260	http://www.amazon.com/Ziploc-Smart-Slider-Freezer-Gallon/dp/B00GFYZK0K/ref=sr_1_21?s=hpc&ie=UTF8&qid=1404195560&sr=1-21&keywords=ziploc+slider+gallon
	9	PA megaphone	50 watt, two @ 32	\$ 81	http://www.harborfreight.com/megaphone-with-safety-siren-95271.html
	10	Sharpies, colored			http://www.amazon.com/Sharpie-Chart-Markers-Bullet-Colors/dp/B00FZYR8R4/ref=sr_1_8?s=industrial&ie=UTF8&qid=1395115815&sr=1-8&keywords=sharpie
	11	Blank paper			http://www.amazon.com/HP-Everyday-Brightness-Smooth-200010/dp/B0050MRBDC/ref=sr_1_13?s=office-products&ie=UTF8&qid=1395116110&sr=1-13&keywords=copy+paper
	12	Plastic sheet holders		\$ -	http://www.amazon.com/Avery-Economy-Clear-Protectors-75091/dp/B00006IC89/ref=sr_1_1?s=office-products&ie=UTF8&qid=1395116293&sr=1-1&keywords=plastic+sleeves
	13	Duct tape	three-pack	\$ 9	http://www.amazon.com/5038-3-PK-DUCTape-1-87-Inches-60-Yards/dp/B002KQ6682/ref=sr_1_1?s=hi&ie=UTF8&qid=1404333619&sr=1-1&keywords=duct+tape
	14	Metal clips		\$ -	http://www.amazon.com/pc-Heavy-Duty-Spring-Clamps/dp/B0009T65P6/ref=sr_1_7?s=industrial&ie=UTF8&qid=1395116511&sr=1-7&keywords=metal+spring+clips
	15	Easel		\$ -	http://www.amazon.com/Displays2go-Lightweight-Portable-64-5-Inch-EAS3BLK/dp/B00CEQ5T86/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395116624&sr=1-1&keywords=easel
	16	Chalkboard		\$ -	http://www.amazon.com/Dooley-Framed-Chalk-Inches-2436CH/dp/B006Y0GAT0/ref=sr_1_14?s=office-products&ie=UTF8&qid=1395116688&sr=1-14&keywords=chalkboard
	17	Chalk		\$ -	http://www.amazon.com/Crayola-510816-Assorted-Colors-Sticks/dp/B004E2OY0C/ref=sr_1_7?s=office-products&ie=UTF8&qid=1395116760&sr=1-7&keywords=chalk
	18	Pushpins (100)		\$ -	http://www.amazon.com/Crayola-510816-Assorted-Colors-Sticks/dp/B004E2OY0C/ref=sr_1_7?s=office-products&ie=UTF8&qid=1395116760&sr=1-7&keywords=chalk
	20	Rolling duffie	29-inch, 8 pocket, red (4) and blue (4) @ \$43 each, need 8, so \$344 plus shipping	\$ 375	http://www.amazon.com/Olympia-Luggage-Pocket-Rolling-Duffel/dp/B001TK2XD2/ref=pd_sbs_a_4?ie=UTF8&refRID=0HRRY6M1Q1BGAY4MTAV0

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Tools				Tools for installing the system. Additional analytical tools would be required for long term use to be able to measure and monitor water quality over time.
	1	Hex set		\$ - http://www.amazon.com/Fuller-Tool-130-8030-30-Piece-Metric/dp/B000BDDG8O/ref=sr_1_6?s=industrial&ie=UTF8&qid=1395108313&sr=1-6&keywords=hex+wrench+set
	2	Screwdriver set		\$ 5 http://www.amazon.com/Craftsman-17-Piece-Screwdriver-Set-31794/dp/B007C6LHXY/ref=sr_1_2?s=industrial&ie=UTF8&qid=1395108394&sr=1-2&keywords=screwdriver+set
	3	Metal snips		\$ 5 http://www.amazon.com/Fiskars-5792-Shop-Hardware-Multipurpose/dp/B006V8777O/ref=pd_cp_hi_2
	4	Hammer		\$ 5 http://www.amazon.com/Stanley-51-621-16-Ounce-Fiberglass-Hammer/dp/B000VSMJCS/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395109231&sr=1-1&keywords=hammer
	5	Pliers set	five-piece	\$ 18 http://www.amazon.com/Stanley-84-058-4-Piece-Pliers-Set/dp/B000NIK8JW/ref=ih_ni_t?ie=UTF8&pvc=1&smid=ATVPDKIKX0DER
	5	Multitool - Surge		\$ - http://www.amazon.com/Leatherman-Surge-Multitool-Black-Sheath/dp/B001GH0GP0/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395109353&sr=1-1&keywords=leatherman+surge
	6	Hacksaw		\$ - http://www.amazon.com/80965-12-Inch-Tension-Hacksaw-Frame/dp/B00002N5KS/ref=sr_1_26?s=industrial&ie=UTF8&qid=1395109489&sr=1-26&keywords=hacksaw
	7	Woodsaw		\$ - http://www.amazon.com/Stanley-20-045-15-Inch-Fat-Hand/dp/B00005A1JN/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395109542&sr=1-1&keywords=wood+saw
	8	Sharpies		\$ - http://www.amazon.com/Staples-Advantage-125328-Sharpie-Marker/dp/B0006P29E2W/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395107910&sr=1-1&keywords=sharpie
	9	Wirecutters/strippers		\$ - http://www.amazon.com/Irwin-Industrial-Tools-2078309-Stripper/dp/B000JNNWQ2/ref=sr_1_7?s=industrial&ie=UTF8&qid=1395107845&sr=1-7&keywords=wire+cutters
	10	Vise-grips (set of 3)		\$ - http://www.amazon.com/Irwin-2077703-10-Inch-Straight-multi-tool/dp/B0007SXIYA/ref=sr_1_9?s=industrial&ie=UTF8&qid=1395107767&sr=1-9&keywords=industrial+vise+grips
	11	Wrecking bar		\$ - http://www.amazon.com/Stanley-55-101-14-Inch-FatMax-Wrecking/dp/B0009UFJA2/ref=sr_1_8?s=industrial&ie=UTF8&qid=1395107694&sr=1-8&keywords=industrial+pry+bar
	12	Extension cord (industrial, 50-foot)	get two @ \$25	\$ 50 http://www.amazon.com/Yellow-Jacket-2884-Heavy-Duty-Contractor/dp/B0009ON12G/ref=sr_1_3?s=hi&ie=UTF8&qid=1395107614&sr=1-3&keywords=industrial+extension+cord+yellow
	13	Stapler		\$ - http://www.amazon.com/Stanley-TR250-SharpShooter-Heavy-Duty-Staple/dp/B000BR2ERO/ref=sr_1_1?s=industrial&ie=UTF8&qid=1395103882&sr=1-1&keywords=industrial+stapler
	14	Drywall screws		\$ - http://www.amazon.com/Grip-Rite-158CDWS1-8-Inch-Coarse-Drywall/dp/B00004YV15/ref=sr_1_1?s=hi&ie=UTF8&qid=1395107387&sr=1-1&keywords=drywall+screws
	15	Power strip, small	get 3 @ \$20, so \$60	\$ 60 http://www.amazon.com/Simran-SM-60-Universal-110V-250V-Protection/dp/B003UHYDY0/ref=pd_sim_e_1?ie=UTF8&refRID=0829RZ28AQ1BHV04SRY
	16	Power strip, large	get 2 @ \$28, so \$56	\$ 56 http://www.amazon.com/gp/product/B00362E6V0/ref=s9_cxsh_co_g23_i2?pf_rd_m=ATVPDKIKX0DER&pf_rd_s=lef-t-3&pf_rd_r=0W1YB6KRE106340D9JA8&pf_rd_t=3201&pf_rd_p=1280661842&pf_rd_i=typ01

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Transportation Cost				To be determined
Total Cost - Delivered System			Total	\$ 10,308 Actual total
Additional Items				
Annual Maintenance and Supplies				
	1	Replacement Parts	Puralytics	\$ 1,464 1 years of replacement filters, lamps, and catalyst
	2	Ion-exchange salt	Sourced Locally	\$ 200 \$20 for a 50 lb bag of regen salts (NaCl); 5 lbs consumed per regen; Regen frequency dependent on water quality; ~\$200/yr @ 1000 gpd
	3	Spigots (2)	Local Puralytics referral	\$ -
	4	couplers (4)	Local Puralytics referral	\$ 80
			Total	\$ 1,744 Maintenance and supplies
Power and Light				
	1	Yamaha EF2000iS generator	Likely two needed @ \$990 each	\$ - http://www.amazon.com/Yamaha-EF2000iS-4-Stroke-Generator-Compliant/dp/B002RWK9N2/ref=sr_1_1?s=hi&ie=UTF8&qid=1395127845&sr=1-1&keywords=honda+generator
	2	Maddox Defense, Solar Stik, others...	Power sources from multiple possibilities	Alex has the options listed.
	3	Gasoline transport cans		\$ - http://www.amazon.com/No-Spill-1405-2-Gallon-Poly-Compliant/dp/B000W72GBC/ref=pd_sim_lg_14?ie=UTF8&refRID=0FKN2908FAPY21DVR722
	5	Hanging LED lanterns	Supernova	\$ 30 http://www.amazon.com/Supernova-300-Lumens-Bright-Lantern/dp/B00CCRXCXCH2/ref=ih_ni_t?ie=UTF8&psc=1&smid=A31HTCZ6S4K6C7
	6	Area LED light		\$ 30 http://www.amazon.com/Energizer-Folding-Lantern-Fusion-Technology/dp/B00B0EZWCG/ref=pd_sim_hi_1?ie=UTF8&refRID=142G77MEC56EXV1NY9JH
	7	Batteries D-cell	12-pack	\$ 15 http://www.amazon.com/DURACELL-PROCELL-Professional-Alkaline-Battery/dp/B00009V2QW/ref=sr_1_1?s=hi&ie=UTF8&qid=1404334377&sr=1-1&keywords=d-cell+batteries
	8	Batteries - AA	24-pack	\$ 10 http://www.amazon.com/Duracell-Procell-AA-Pack-PC1500BKD09/dp/B00009V2QX/ref=ih_ni_t?ie=UTF8&psc=1&smid=A1EALKCELCYUZN
			Total Power and Light	\$ 85 Actual Power and Light