

## APPENDIX B

## CHEMICAL AND RADIOLOGICAL INVENTORIES FOR THE CEMRC

The current inventories of chemicals and radiological materials at the Carlsbad Environmental Monitoring and Research Center (CEMRC) are provided in Tables B-1 and B-2, respectively. These tables were provided by Joel Webb, Director of the CEMRC, New Mexico State University (Webb 2002).

Table B-1. Onsite CEMRC Chemical Inventory

Chemical Name	Amount	Units	SARA Limit
Acetic Acid, Glacial	5,400	mL	NA <sup>a</sup>
Acetone	38	L	NA
AA Modifier Solution	100	mL	NA
AccuStandard mixed anion standard for IC	125	mL	NA
Acetic Acid, solution	1,000	mL	NA
Acetonitrile	4,000	mL	NA
Acetylene	100	cu.ft.	NA
Acid Spill Cleanup Kit (Hazorb)	1	kit	NA
Acid Spill Emergency Cleanup Kit	3	kit	NA
Aerosol - OT	1	L	NA
AG 1-X4 50-100 Chloride Resin	800	g	NA
AG 1-X8 100-200 Mesh Resin	2,000	g	NA
AG 1-X8 50-100 Mesh Resin	900	g	NA
AG 50W-X8 100-200 Hydrogen Resin	3,000	g	NA
AG MP 50	700	g	NA
Alcojet Detergent/Tabs	698	oz	NA
Alumina, activated	850	g	NA
Aluminum Nitrate	2,100	g	NA
Ammonium Acetate	2,200	g	NA
Ammonium Chloride	1,300	g	NA
Ammonium Chloride Solution	300	mL	NA
Ammonium Citrate	100	g	NA
Ammonium hydrogenoxalate, hemihydrate	400	g	NA
Ammonium Hydroxide	48	L	NA
Ammonium Iodide	1,000	g	NA
Ammonium Nitrate	500	g	NA
Ammonium Oxalate	600	g	NA
Ammonium Oxalate Solution	2,000	mL	NA
Ammonium Thiocyanate	1,700	g	NA
Ammonium Thiocyanate Solution	150	mL	NA
Argon, refrig. Liquid	7,000	cu.ft.	NA
Ascorbic Acid (L-Ascorbic)	600	g	NA

**Table B-1. Onsite CEMRC Chemical Inventory (continued)**

Chemical Name	Amount	Units	SARA Limit
Ascorbic Acid solution (L-Ascorbic)	100	mL	NA
Barium Carrier solution	25	mL	NA
Barium Nitrate	400	g	NA
Beckman diffusion pump oil	500	mL	NA
Beckman direct drive vacuum pump oil	3	L	NA
Beckman Spinkote	60	mL	NA
Bio-Rex MSZ 501(D) 25-35 mixed bed	400	g	NA
Bonded Lubricant Coating, IEC	1	oz	NA
Boric Acid	2,750	g	NA
Boric Acid solution	2,000	mL	NA
Boric Acid, crystalline	1,200	g	NA
Bromine Monochloride Solution	625	mL	NA
Bromocresol Green	5	g	NA
Bromocresol Purple	200	mL	NA
Calcium Chloride Anhydrous	400	g	NA
Calcium Chloride Dihydrate	4,500	g	NA
Calcium Chloride Dihydrate (Solution)	1,075	mL	NA
Calcium Fluoride	400	g	NA
Calcium Hydroxide	800	g	NA
Calcium Hypochlorite	250	g	NA
Calcium Nitrate Tetrahydrate	1,700	g	NA
Calcium Phosphate Dibasic	500	g	NA
Calcium Phosphate Tribasic	1,000	g	NA
Carbon suspension	1,000	mL	NA
Carbon tetrachloride	200	mL	NA
Carbon, activated	500	g	NA
Caustic Spill Kit (Vermiculite)	2,000	g	NA
Ceric Ammonium Nitrate	400	g	NA
Cerium carrier solution	30	mL	NA
Cerium Nitrate Hexahydrate	75	g	NA
Chloramine T Trihydrate	225	g	NA
Citra-Nox Detergent	2	L	NA
Citric Acid	500	g	NA
Cobalt Nitrate Hexahydrate	100	g	NA
Collodion, Flexible	20	mL	NA
Conductivity Calibration Solution, 1413 uS, Oakton	1	L	NA
Conductivity/TDS Calibration Solution, 7000 uS	4.2	L	NA
Conductivity/TDS standard, 1413 uS, Orion	300	mL	NA
Contact Cleaner (Hi-Line)	60	oz	NA
CRC 2-26	30	oz	NA
Creatinine	100	g	NA
Desi Pak (Dessicant)	2,800	g	NA

**Table B-1. Onsite CEMRC Chemical Inventory (continued)**

Chemical Name	Amount	Units	SARA Limit
Dextrose	500	g	NA
Diaminopropionic Acid (DAP)	2	g	NA
Dichloromethane (Methylene chloride)	1,000	mL	NA
Drierite	55	lbs	NA
EDTA	500	g	NA
EDTA solution	300		NA
Eichrom Diphonix Cation Exchange Resin, 50-100 mesh	400	g	NA
Eichrom Sr Resin	50	g	NA
Eichrom TEVA Resin	70	g	NA
Eichrom TRU Resin	180	g	NA
Eichrom UTEVA Resin	100	g	NA
Electroplating solution for Am, Cm	500	mL	NA
Electroplating solution for U, Pu, Th	1	L	NA
EluGen Cartridge (EGC-KOH), Potassium Hydroxide	1	L	NA
Epoxy Thinner	3	gal	NA
Ethylene glycol	2.5	gal	NA
Fe solution	50	mL	NA
Ferric Chloride Hexahydrate	250	g	NA
Ferric Nitrate	500	g	NA
Ferrous Chloride Tetrahydrate	250	g	NA
Ferrous sulfate solution	75	mL	NA
Fluorescein, Laser Grade	500	mg	NA
Formic Acid	400	mL	NA
Glycerol	500	mL	NA
Hazorb for Acids (Lab Safety Neutralizing Sorbent)	1,500	g	NA
Hazorb for Caustics (Lab Safety Neutralizing Sorbent)	1,000	g	NA
Hazorb Universal Sorbent (Lab Safety)	2	kit(s)	NA
HEDPA	500	g	NA
Helium, compressed	360	L	NA
Hg Absorb (Part of Mercury Cleanup System)	2,000	g	NA
Hippuric Acid	100	g	NA
Hydraulic Fluid, Carver	500	mL	NA
Hydrochloric Acid (concentrated)	95	L	189 L
Hydrochloric Acid (dilute)	27	L	189 L
Hydrochloric Acid Solution	1	L	189 L
Hydrofluoric Acid	9.1	L	37.8 L
Hydrogen peroxide solution	4.4	L	378 L
Hydroquinone	0.5	Kg	170 Kg
Hydroxylamine Hydrochloride	100	g	NA
Hydroxylamine Hydrochloride, 50% in H2O	50	mL	NA
Hydroxylamine, 5 wt % in H2O	100	mL	NA
Hydroxylamine, 50 wt % in H2O	100	mL	NA

**Table B-1. Onsite CEMRC Chemical Inventory (continued)**

Chemical Name	Amount	Units	SARA Limit
Iron (II) chloride, anhydrous	50	g	NA
Iron (see Fe Solution, Carrier)	50		NA
Isoamyl Acetate	200		NA
Isopropyl Alcohol	5,050	mL	NA
Isopropyl Alcohol (Consumer grade)	250	mL	NA
L-/±Cysteine	50		NA
Lactic Acid	500	mL	378 L
Lanthanum carrier solution	50		NA
Lanthanum oxide	600	g	NA
Lead Nitrate	500	g	NA
Lead Standard, Orion	475	mL	NA
Liqui-Nox (soap)	2,030	mL	NA
Lithium Chloride	95	g	NA
Magnesium Chloride Hexahydrate	3,809	g	NA
Magnesium Nitrate	25	g	NA
Magnesium Oxide (Heavy Powder)	3	kg	NA
Magnesium perchlorate	265	g	NA
Magnesium Sulfate Anhydrous	500	g	NA
Magox 95 WG	12	Kg	NA
Manganous Chloride Tetrahydrate	500	g	NA
Manometer Fluid	1,296	mL	NA
Mercurous Chloride	0.1	Kg	170 Kg
Mercury	4	unit(s)	NA
Mercury Check Swabs	6	swab	NA
Mercury Cleanup System (Lab Safety)	2	kit	NA
Mercury Indicator Powder (Part of Mercury Cleanup System)	1,000	g	NA
Methanesulfonic Acid (g)	500	g	NA
Methanesulfonic Acid (mL)	833	mL	NA
Methanol	26	L	NA
Methyl Red	10	g	NA
Methylene Blue	10	g	NA
Molecular Sieve	2,500	g	NA
Molybdovanadate	500	mL	NA
Neodymium carrier solution	40	mL	NA
Nitric Acid (concentrated, reagent,)	93	L	302 L
Nitric Acid (dilute)	25	L	302 L
Nitric Acid (fuming)	2.5	L	302 L
Nitrogen, Gas	351	L	NA
Nitrogen, Liquid	2,120	lbs	NA
Octanol (Octyl alcohol)	4,000	mL	NA
Oil, Edwards	5,500	mL	NA
Optiphase HiSafe 3	7,000	mL	NA

**Table B-1. Onsite CEMRC Chemical Inventory (continued)**

Chemical Name	Amount	Units	SARA Limit
Optiphase Supermix	5	L	NA
Optiphase Trisafe	4,000	mL	NA
O-Tolidine	25	g	NA
Oxalic Acid Dihydrate	1,400	g	NA
Oxalic Acid Solution	1,000	mL	NA
P-10 Gas	600	cu.ft.	NA
PAH Mixture EPA Method 525	1	mL	NA
Pepsin	100	g	NA
Perchloric Acid	12.5	L	NA
pH Ag/AgCl Reference Electrode Filling Solution, Orion	420	mL	NA
pH buffer 10.00, Oakton	8	L	NA
pH buffer 10.01, Orion	1,475	mL	NA
pH buffer 12.45, Oakton	1,000	mL	NA
pH buffer 2.00, Fisher	800	mL	NA
pH buffer 4.00, Oakton	4,000	mL	NA
pH buffer 4.01, Orion	1,575	mL	NA
pH buffer 7.00, Oakton	10	L	NA
pH buffer 7.00, Orion	1,475	mL	NA
pH Electrode Storage Solution	550	mL	NA
pH LAZAR PHR-146 Filling Solution	60	mL	NA
pH, Orion pHuture Sure-flow solution	60	mL	NA
Phenolphthalein solution	400	mL	NA
Phenolphthalein, Certified ACS	100	g	NA
Phenolphthalein, Reagent ACS	100	g	NA
Phenylbutazone	25	g	NA
Phosphoric Acid	14.5	L	NA
Phosphoric Acid, HPLC Grade	500	mL	NA
Portland Cement	94	lb	NA
Potassium Bromate	900	g	NA
Potassium Bromide	250	g	NA
Potassium Chloride	15.5	Kg	NA
Potassium Chloride Solution	1,000	mL	NA
Potassium Hydrogen Phthalate	100	g	NA
Potassium Iodide, granular	100	g	NA
Potassium Oxalate Monohydrate	200	g	NA
Potassium Permanganate	450	g	NA
Potassium Permanganate solution	2,575	mL	NA
Potassium Persulfate	2,000	g	NA
Potassium Persulfate Solution	530	mL	NA
Potassium Sulfate	1,200	g	NA
QD Contact Cleaner (CRC)	30	oz	NA
Quinhydrone	50	g	NA

**Table B-1. Onsite CEMRC Chemical Inventory (continued)**

Chemical Name	Amount	Units	SARA Limit
Radiacwash	6	L	NA
Reagent Alcohol	24	L	NA
Reillex HPQ Polymer, 4-Ethenylpyridinium-1-methyl chloride, polymer	200	g	NA
Safranin 0	20	g	NA
Safranine solution	5	mL	NA
Santovac 5 diffusion pump fluid	100	mL	NA
Silicon Dioxide	2	Kg	NA
Silicon Grease, Eppendorf	50	mL	NA
Silicone Emulsion	500	mL	NA
Silver Chloride	25	g	NA
Silver Nitrate	20	g	NA
Soap Solution, Gilibrator	2	oz	NA
Soda Lime	400	g	NA
Sodium Acetate Trihydrate Reagent	100	g	NA
Sodium Acetate Trihydrate Solution	750	mL	NA
Sodium Bicarbonate (Reagent Grade)	6,750	g	NA
Sodium Bicarbonate Baking Soda	32	lb	NA
Sodium Bicarbonate Solution	1,350	mL	NA
Sodium Bisulfate	500	g	NA
Sodium Bisulfite	500	g	NA
Sodium Borohydride	100	g	NA
Sodium Bromide	500	g	NA
Sodium Carbonate	2,850	g	NA
Sodium Carbonate Solution	250	mL	NA
Sodium Chlorate, reagent grade	500	g	NA
Sodium Chloride	44.9	Kg	NA
Sodium Chlorite	30	g	NA
Sodium Chromate	500	g	NA
Sodium Citrate Dihydrate	306	g	NA
Sodium Fluoride	100	g	NA
Sodium Formaldehydesulfoxylate Dihydrate	10	g	NA
Sodium Hydrosulfite	100	g	NA
Sodium Hydroxide	17.5	Kg	NA
Sodium Hydroxide Solution	3,000	mL	NA
Sodium Hydroxide Solution (10.0N)	2,000	mL	NA
Sodium Hypochlorite Solution	1	L	NA
Sodium Iodide	100	g	NA
Sodium Metaphosphate Reagent	400	g	NA
Sodium Metaphosphate Solution	600	mL	NA
Sodium meta-silicate nonahydrate	500	g	NA
Sodium Nitrate	250	g	NA
Sodium Nitrite	1,800	g	NA

**Table B-1. Onsite CEMRC Chemical Inventory (continued)**

<b>Chemical Name</b>	<b>Amount</b>	<b>Units</b>	<b>SARA Limit</b>
Sodium Oxalate	100	g	NA
Sodium Phosphate dibasic	300	g	NA
Sodium Phosphate monobasic	750	g	NA
Sodium Phosphate tribasic	500	g	NA
Sodium Sulfate, anhydrous	5,600	g	NA
Sodium Sulfite	500	g	NA
Sodium Sulfite (Solution)	100	mL	NA
Sodium Tetraborate Decahydrate	4,500	g	NA
Sparkleen (soap)	4	lbs	NA
Stannous Chloride	225	g	NA
Strontium Nitrate	300	g	NA
Sulfamic Acid	200	g	NA
Sulfate Standard, Orion	475	mL	NA
Sulfuric Acid	20	L	189 L
Sulfuric Acid, 1 N standardized solution	4	L	189 L
Tellurium Oxide	10	g	NA
Thioacetamide	80	g	NA
Titanium Chloride solution	800	mL	NA
Titanium Oxide	500	g	NA
Triton-X-100 Surfactant	30	mL	NA
Tween 20	90	mL	NA
Ultrasonic, Fisher (soap)	5	oz	NA
Uranium Oxide	5	g	NA
Urea	500	g	NA
Xylenol Orange	10	g	NA
Yttrium Nitrate Hexahydrate	50	g	NA
Zinc Chloride	500	g	NA
Zinc Oxide	500	g	NA

a. NA = Not applicable.

**Table B-2. Onsite CEMRC Radioactive Materials Inventory (as of January 25, 2002)**

<b>Isotope</b>	<b>Current Activity (nCi)</b>
Americium-241	12,800
Americium-243	18.0
Antimony-125	0.114
Barium-133	2,880
Cadmium-109	4,960
Carbon-14	64.5
Cerium-139	32.1
Cesium-137	12,600
Cobalt-57	993
Cobalt-60	12,100
Curium-244	103
Europium-152	24,400
Gadolinium-148	49.6
Hydrogen-3	272
Iron-55	356
Lead-210	5,240
Manganese-54	4.10
Mercury-203	2.20
Nickel-63	25.6
Polonium-209	11.3
Polonium-210	3.58
Potassium-40	200
Plutonium-238	3,410
Plutonium-239	1,050
Plutonium-242	15.6
Radium-226	175
Ruthenium-106	2.47
Strontium-85	28.6
Strontium-89	0.0000177
Strontium-90	588
Technetium-99	13.1
Tellurium-123m	0.0181
Thorium-228	0.0987
Thorium-229	4.66
Thorium-230	299
Thorium-234	0.0319
Tin-113	43.2
Uranium-232	10.4
Uranium-234	0.624
Uranium-235	135
Uranium-236	10.7
Uranium-238	15,500
Yttrium-88	121
Zinc-65	16.8



**REFERENCES**

Webb, J., 2002. Personal communication from J. Webb (Carlsbad Environmental Research and Monitoring Center), to P. Daling (PNNL/Battelle), January 25.

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