MEETING MINUTES

Sustainable Lab Practices Working Group
NIH Environmental Management System (NEMS)
Wednesday, May 21, 2008
1:30 – 2:30 pm

Meeting Objective(s):

- Provide update on the status of the NEMS
- Identify top chemicals for priority reduction efforts
- Collect comments on uses and alternatives identified for selected priority chemicals
- Determine communication options for selected priority chemicals

Attendees:

Daniel Appella (NIDDK)
Terry Leland (ORF)
John Mlade (Perkins and Will)
Nancy Neale (NHLBI)
Kristen Peters (Booz Allen)
Barbara Ploplis (NIDCD)
John Prom (ORF)
Linda Thompson (Booz Allen)
William Trenkle (NIDDK)
Roger Weidner (ORF)
Patricia Williams (NIMH)
Delores Wilson (ORS)
Don Wilson (ORF)

Minutes:

NEMS Update

Terry Leland provided an update on the current activities of the NIH Environmental Management System (NEMS). Current activities include the following:

- Three institutes have started pilot programs for Go Greener Teams: The Children's Inn, NIDDK, and NIDCD.

- NIH received an Energy Award for an outreach program that meters the energy used at NIH buildings. This information will be incorporated into the existing GIS database so that each building's energy use will be available.

- Booz Allen is assisting Ms. Leland in developing a Green Office Energy Audit kit. Additional development assistance will be provided by the Fellowship Program.

- The NEMS Sustainable Office Practices Working Group is currently focusing on green procurement. Staples has been selected as a HHS sole source and their website will make it difficult to purchase items that are not green. Staples will also be able to provide reporting for all ICs; these reports can be further broken down by branch and group. Don Wilson suggested inviting Staples in to do a Green Hour on their new environmental initiatives.

NIH Target Chemicals Ranking

Don Wilson provided an overview on the status of targeting and prioritizing specific NIH laboratory chemical waste streams for reduction efforts. The data was collected over two years from the chemical waste data received at Building 21. No procurement data was available. The group used a set of risk-based criteria to rank the chemicals, including (1) quantity of waste generation (15 points); (2) direct risk to human health and safety during research, facility support, and on-site waste management activities: generation, handling, storage, transportation, recycling, treatment, and disposal (55 points); (3) waste subject to specific reduction mandates in statutes, regulations, executive orders, and agency plans (15 points); and (4) availability and feasibility of reduction methods (15 points). It was noted that some laboratories were closed in CY06, with massive amounts of chemicals disposed of, so that some of these waste amounts are misleading. (In particular, there was a cleanout of Building 8 in 2006.)

NIH created a master list of NIH Target Chemicals Ranking (Attachment 1), which Booz Allen reviewed and created an abbreviated list that focused on the top scorers in each of the categories listed above (Attachment 2). These chemicals were then researched for possible uses and green alternatives.

The group reviewed the abbreviated list and provided comments. Comments on specific chemicals and alternatives are provided in the table below.

Chemical	Comments
Ethidium Bromide	• Ethidium bromide is almost always an aqueous solution, so the amount collected is misleading. • CYBR Green is not a good replacement because it is actually more toxic. • Gel Red is a better alternative, but it can't be used in cloning. • Envision works well as a replacement, and you also don't need to use a stain with it.
CFC	• Building 10 still has some fluorescent light ballasts. • Ozone-depleting substances (ODS) must be coming from other sources than labs, although some aerosols do still have it. There really isn't a lot of opportunity to reduce these.
Chromium and compounds	• Most chemists have switched to base baths instead of using chromic acids. • Some biology groups are still using chromic washes, unless they use disposable glassware. • Chemists may use chromic compounds, but only in stoichiometric amounts.
Picric acid	• Picric acid has no substitute, but chemists try not to use it because of its explosive nature.

Chemical	Comments
	• Biologists still use it in staining.
Acetonitrile	• Acetonitrile has a unique polarity that is used in HPLC, with no known good alternatives. • Fractions cannot be used over. • Acetonitrile is also used in the synthesis of oligonucleotides, even though that is being contracted out some. • Supercritical CO_2 is not a suitable substitute for anything
Methanol	• Ethanol is a good substitute for methanol, but it's not used much in actuality. However, in HPLC chromatography, methanol and ethanol create a large difference in purification. The chemists are usually picking the best solvent system for purification and identification, so can't easily substitute solvents. • Methanol used for electrophoresis gel. • Methanol stains might be able to replace protein gels, and can be reused, but eventually must be thrown out. • The chemists only ordered 200 L of methanol last year.
Dichloromethane	• Supercritical CO_2 is not a suitable substitute for anything. • MTBE is not a good substitute for dichloromethane. • Lactate esters are not a good substitute for dichloromethane because of their reactivity. (Perhaps they are a substitute for dichloromethane when it was used as a deicer.)

In addition, general comments were collected and included:

- Most of the lead compounds probably came from Building 8, but there are known substitutes.
- The chemists do try to minimize metallic waste.
- Some chemicals missing from the master list that should be added:
    - Phosphoric acid used in cage washing. While it is being neutralized, the phosphate salts are still being dumped down the drain.
    - Perchloric acid
    - Trichloroacetic acid, although trifluoroacetic acid is probably used more.
    - Ethanol
- The bulk of the waste stream must be coming from biologists and animal care, except for the cleanout of Building 8. There were several metal compounds from the 1960s used in organic synthesis that will drop off the list next year.
- It would be great if we could incorporate this waste data with the GIS database to focus on which laboratories the waste came from. If possible, add location of waste to matrix.
- The concern for these wastes is cost-driven due to their high waste disposal costs.
- We need to reach out to the safety officers and lab managers to find other groups to contribute to the matrix. Mimi Frieman runs the H&S Meetings of IC safety managers and the matrix could be presented to this group for comment. Don Wilson and Terry Leland will contact Ms. Frieman.
- Pesticides listed on the matrix are probably used for mite control in animal care.

The main issue is that the type and amount of chemical waste generated by chemical labs ebbs and flows. Focused attention in needed on the labs that are doing routine

processes (e.g., sterilization, cage washing, electrophoresis) or that are producing consistent amounts of the same chemicals.

A pilot project for inventorying chemicals is underway, but data is not available real time. The goal would be to share the inventory between labs and minimize waste. At the moment, only 10 volunteer labs are using the Vertere system, but if there is funding in the future, it would be offered campus-wide. Once communications materials on the target chemicals is available, these volunteer labs may be helpful in determining the best deployment options.

Mr. Wilson inquired about how labs are procuring the chemicals and suggested that NIH could leverage its buying power to request green alternatives from the chemical vendors. The main source of chemical procurement for the chemists is Sigma-Aldrich. Fisher Scientific doesn't provide quality ingredients, has delayed time schedules, and costs more. Since Fisher Scientific is the HHS strategic sourcing contractor, NIH could investigate whether they could market and provide chemical alternatives.

The group discussed the usefulness of MIT's "Green" Alternatives Wizard available at http://web.mit.edu/environment/academic/wizard/greenChemWiz5.html. One chemist commented that the database is really just "proof of concept" systems, using the popular topic of green chemistry to get published. The nature of the chemists' work is exploratory, so the chemicals being used are changed frequently. Only when there is a recurring procedure can they then look for a greener alternative. However, there might be some good information on the website, and it was suggested to perhaps place a link to it on the NEMS website.

Action Items:

Action Item	Responsible Person(s)	Due Date
1. Provide comments on abbreviated list of NIH Target Chemicals	Dan Appella	Friday, May 23
2. Contact Mimi Freiman to solicit Safety Officers and Lab Managers for additional feedback on abbreviated list of NIH Target Chemicals	Terry Leland, Don Wilson	Wednesday, June 11
3. Research possible biological uses and alternatives of NIH Target Chemicals on abbreviated list	Linda Thompson	Monday, June 16

Next Meeting:

The next meeting is scheduled for Wednesday, June 18 from 1:30 to 2:30 PM and will continue to focus on the chemical priority list and the new manual issuance on mercury use.

MEETING MINUTES

Sustainable Lab Practices Working Group
NIH Environmental Management System (NEMS)
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ATTACHMENT 1

NIH TARGET CHEMICALS RANKING

CASN	Chemical Name	Waste Code	Quantity Generated CY07 (Kg) (15pts)		Health and Safety Risk on Waste Management N F P A 704 (55pts)					Mandated Regulatory Reduction (15 pts)						Reduction Feasibility Methods (15pts)	Total Points
			Wt/Kg	Pts	H	F	R	nsc20	Pts	rcra	ods	dhhs	np2	npep	Pts	ALT	POINTS
75-05-8	Acetonitrile	U003,D001	3532.7	15	2	3	0	10	26	3		3	3		9		50
67-66-3	Chloroform	U044,D022	986.5	15	2	0	0	20	38	3		3	3		9		62
75-09-2	Dichloromethane	U080	1095.5	15	2	1	0	15	31	3		3	3		9		55
68-12-2	N,N-Dimethylformamide	D001	632.5	10	3	2	0	10	26	3		3	3		9		45
872-50-4	N,-Methyl-2-pyrrolidone		269.6	10	2	2	0	10	24			3	3		6		40
110-54-3	n-Hexane	D001	873.2	10	1	3	0	10	24	3		3	3		9		43
7439-92-1	Lead	D008	993	10	3	0	0	20	40	3		3	3	3	12		62
	Lead Compounds																
546-67-8	Lead Tetraacetate	D008	0.7	1	3	0	0	20	40	3		3	3	3	12		53
301-04-2	Lead Acetate	U144,D008	1.5	1	3	1	0	20	41	3		3	3	3	12		54
14720-63-	Lead Borate	D008	0.5	1	3	0	0	20	40	3		3	3	3	12		53
598-63-0	Lead Carbonate	D008	0.5	1	3	0	0	20	40	3		3	3	3	12		53
512-26-5	Lead Citrate	D008	0.7	1	2	0	0	20	38	3		3	3	3	12		51
1335-32-6	Lead Subacetate	U146,D008	0.5	1	3	1	0	20	41	3		3	3	3	12		54
1309-60-0	Lead Dioxide	D008,D001	1.1	1	2	0	0	20	38	3		3	3	3	12		51
10099-74-	Lead Nitrate	D001,D008	0.1	1	1	0	0	20	36	3		3	3	3	12		49
1317-36-8	Lead Oxide, yellow	D008,D001	0.5	1	3	0	0	20	40	3		3	3	3	12		53
1314-41-6	Lead Oxide, Red	D001,D008	2.5	1	3	1	1	20	43	3		3	3	3	12		56
592-87-0	Lead Thiocyanate	D008	0.3	1	1	1	1	20	40	3		3	3	3	12		53
7758-95-4	Lead Chloride	D008	0.5	1	3	0	0	20	40	3		3	3	3	12		53
67-56-1	Methanol	U154,D001	5656.3	15	1	3	0	15	33	3		3	3		9		57
1239-45-8	Ethidium Bromide		201.1	10	3	1	0	20	41						0	15	66
75-21-8	Ethylene Oxide	U115,	42.9	5	3	4	3	10	34	3		3	3		9		48
7664-39-3	Hydrogen Fluoride	U134	4.7	1	3	0	2	20	43			3			3		47
10035-10-	Hydrogen Bromide		0	1	3	0	0	20	40						0		41
108-95-2	Phenol	U188	518.1	10	3	2	0	15	34	3		3	3		9		53
127-18-4	Tetrachloroethylene	U210,D039	0.37	1	3	0	0	5	14	3		3	3		9		24
108-38-3	m-Xylene	U239,D001	2548.6	15	2	3	0	10	26	3		3	3		9		50
1330-20-7	Xylene (mixed isomers)	U239	85.9	5	2	3	0	10	26	3		3	3		9		40
88-89-1	Picric Acid	D001	7	1	2	4	4	20	52	3		3			6	15	74
7440-47-3	Chromium	D007	0.03	1	2	1	0	10	22	3		3	3		9	15	47
	Chromium Compounds																
10025-73-	Chromium chloride	D007	1.1	1	1	0	0	10	19	3		3	3		9	15	44

NIH TARGET CHEMICALS RANKING

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			Wt/Kg	Pts	H	F	R	nsc20	Pts	rcra	ods	dhhs	np2	npep	Pts	ALT	POINTS
7738-94-5	Chromic acid	D007,D001	8.4	1	3	0	1	15	33	3		3	3		9	15	58
13007-92-	Chromium Hexacarbonyl	D007	0.05	1	0	0	0	10	17	3		3	3		9	15	42
14977-61-	Chromium oxychloride	D007,D001	0.5	1	3	0	1	10	24	3		3	3		9	15	49
10141-00-	Chromium potassium sulfate	D007	1.6	1	1	0	0	10	19	3		3	3		9	15	44
7789-00-6	Potassium Chromate	D007,D001	0.02	1	3	0	1	10	24	3		3	3		9	15	49
778-50-9	Potassium Dichromate	D007,D001	6.7	1	3	1	1	10	26	3		3	3		9	15	51
20039-37-	Pyridinium Dichromate	D007,D001	0.3	1	2	0	1	10	22	3		3	3		9	15	47
11/3/7775	Sodium Chromate	D007,D001	0.5	1	3	0	0	10	22	3		3	3		9	15	47
10588-01-	Sodium Dichromate	D007,D001	6.8	1	4	0	1	10	26	3		3	3		9	15	51
7439-97-6	Mercury	D009	216.5	10	3	0	0	20	40	3		3	3	3	12	15	77
	Mercury Compounds																
1600-27-7	Mercuric acetate	D009	2.9	1	2	0	0	20	38	3		3	3	3	12	15	66
7789-47-1	Mercuric Bromide	D009	0.1	1	3	0	0	20	40	3		3	3	3	12	15	68
7487-94-7	Mercuric Chloride	D009	3.5	1	3	0	0	20	40	3		3	3	3	12	15	68
7783-39-3	Mercury fluoride	D009	0.1	1	3	0	0	20	40	3		3	3	3	12	15	68
7774-29-0	Mercury iodide	D009	0.5	1	3	0	0	20	40	3		3	3	3	12	15	68
15829-53-	Mercury Oxide	D009	0.02	1	3	0	0	20	40	3		3	3	3	12	15	68
21908-53-	Mercuric Oxide	D009	0.2	1	3	0	0	20	40	3		3	3	3	12	15	68
55-68-5	Mercury phenyl nitrate	D009	0.1	1	3	0	0	20	40	3		3	3	3	12	15	68
10112-91-	Mercurous Chloride	D009	0.01	1	3	0	0	20	40	3		3	3	3	12	15	68
13444-75-	Mercurous chromate	D009	0.1	1	3	0	0	20	40	3		3	3	3	12	15	68
592-04-1	Mercuric Cyanide	D009	0.8	1	3	0	0	20	40	3		3	3	3	12	15	68
10045-94-0	Mercuric Nitrate	D009	0.01	1	3	0	1	20	41	3		3	3	3	12	15	69
7783-35-9	Mercuric sulfate	D009	0.5	1	3	0	1	20	41	3		3	3	3	12	15	69
1344-48-5	Mercuric Sulfide (Red)	D009	0.02	1	4	0	0	20	41	3		3	3	3	12	15	69
592-85-8	Mercuric Thiocyanate	D009	0.02	1	3	0	0	20	40	3		3	3	3	12	15	68
62-38-4	Phenylmercuric acetate	P092	0.9	1	3	1	0	20	41	3		3	3	3	12	15	69
100-56-1	Phenylmercuric chloride	D009	0.3	1	3	1	0	20	41	3		3	3	3	12	15	69
138-85-2	p-hydroxymercuri-benzoate	D009	0.02	1	2	0	0	20	38	3		3	3	3	12	15	66
7783-33-7	Potassium mercuric iodide	D009	0.5	1	3	0	0	20	40	3		3	3	3	12	15	68
54-64-8	Thimerosal	D009	0.4	1	3	1	1	20	43	3		3	3	3	12	15	71

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			Wt/Kg	Pts	H	F	R	nsc20	Pts	rcra	ods	dhhs	np2	npep	Pts	ALT	POINTS
1746-01-6	Dioxins/Furans and Dioxin Compounds	D001	0.0002	1	3	3	2	20	48	3		3		3	9	15	73
1912-24-9	Atrazine		0.36	1	3	0	1	5	16			3	3		6		23
56-55-3	Benz(a) Anthracene	U018	0.03	1	2	1	0	10	22	3			3		6		29
50-32-8	Benzo(a) Pyrene	U022	0.03	1	2	0	0	10	21	3			3		6		28
7440-43-9	Cadmium	D006	0.03	1	3	0	0	10	22	3		3	3	3	12		35
	Cadmium Compounds																
543-90-8	Cadmium acetate	D006	0.85	1	3	1	0	10	24	3		3	3	3	12		37
7789-42-6	Cadmium bromide	D006	1.1	1	0	0	0	10	17	3		3	3	3	12		30
10108-64-	Cadmium chloride	D006	1.03	1	3	1	0	10	24	3		3	3	3	12		37
7790-80-9	Cadmium Iodide	D006	0.28	1	2	0	0	10	21	3		3	3	3	12		34
30-67-6	Cadmium powder	D006	0.1	1	3	0	0	10	22	3		3	3	3	12		35
10325-94-	Cadmium Nitrate	D006,D001	0.1	1	3	0	1	10	24	3		3	3	3	12		37
10124-36-	Cadmium sulfate	D006	2.4	1	3	0	0	10	22	3		3	3	3	12		35
57-74-9	Chlordane	U036,D020	0	1	4	0	0	20	41	3		3	3		9		51
218-01-9	Chrysene	U050	0.1	1	2	1	1	10	24	3			3		6		31
7440-50-8	Copper		0.75	1	2	0	0	10	21			3	3		6		28
206-44-0	Fluoranthene	U120	0.01	1	2	0	0	10	21	3			3		6		28
91-20-3	Naphthalene	U165	3.71	1	2	2	0	10	24	3		3	3	3	12		37
56-35-9	Tributyltin oxide		0.19	1	2	1	1	5	16				3		3		20
688-73-3	Tributyltin hydride		0.1	1	2	1	1	5	16				3		3		20
120-82-1	1,2,4-Trichlorobenzene		0.01	1	2	1	0	10	22	3				3	6		29
95-94-3	1,2,4,5- Tetrachlorobenzene	U207	0.01	1	1	1	0	15	29	3				3	6		36
95-95-4	2,4,5-Trichlorophenol	F027,D041	0.1	1	3	1	1	20	43	3		3		3	9		53
101-55-3	4-Bromophenyl phenyl ether	U030	0	1	2	1	0	0	5	3				3	6		12
83-32-9	Acenaphthene		0.2	1	2	1	0	10	22					3	3		26
208-96-8	Acenaphthylene		0.2	1	2	1	0	10	22					3	3		26
120-12-7	Anthracene		0.3	1	1	0	1	0	3			3		3	6		10
191-24-2	Benzo(g,h,i)perylene		0	1	1	0	0	10	19			3		3	6		26
132-64-9	Dibenzofuran		0.01	1	2	1	0	10	22			3		3	6		29
959-98-8	Endosulfan, alpha	P050	0	1	3	0	0	10	22	3				3	6		29

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			Wt/Kg	Pts	H	F	R	nsc20	Pts	rcra	ods	dhhs	np2	npep	Pts	ALT	POINTS
33213-65-	Endosulfan, beta	P050	0	1	3	0	0	10	22	3				3	6		29
86-73-7	Fluorene	P056	0.005	1	1	1	0	0	3	3				3	6		10
76-44-8	Heptachlor	P059,D031	0	1	2	0	0	10	21	3		3		3	9		31
118-74-1	Hexachlorobenzene	U127,D032	0	1	3	1	0	10	24	3		3		3	9		34
87-68-3	Hexachlorobutadiene	U128,D033	0.01	1	2	1	1	10	24	3		3		3	9		34
58-89-9	Hexachlorocyclohexane		0	1	3	0	0	10	22			3		3	6		29
67-72-1	Heaxachloroethane	U131	0.01	1	1	0	0	0	2	3		3		3	9		12
72-43-5	Methoxychlor	U247, P014	0	1	1	0	0	20	36	3		3		3	9	15	61
40487-42-	Pendimethalin	D001	0	1	2	0	1	0	5			3		3	6		12
608-93-5	Pentachlorobenzene	U183	0	1	3	0	0	10	22	3		3		3	9		32
82-68-8	Pentachloronitrobenzene (Quintozene)	U185	0	1	2	1	0	10	22	3				3	6		29
87-86-5	Pentachlorophenol	F027,D037	3.06	1	3	0	0	10	22	3		3		3	9		32
85-01-8	Phenanthrene		0.21	1	2	1	0	10	22			3		3	6		29
1336-36-3	Polychlorinated biphenyls (PCBs)		0.15	1	2	1	0	20	40	3		3		3	9	15	65
129-0-0	Pyrene		0.05	1	2	1	0	10	22					3	3		26
1582-09-8	Trifluralin		0	1	2	1	0	0	5			3		3	6		12
75-69-4	Trichlorofluoromethane (CFC-11)	U121	0.4	1	1	0	1	20	38	3	3	3	3		12	15	66
75-71-8	Dichlorodifluoromethane (CFC-12)	U075	15.9	1	2	0	0	20	38	3	3	3	3		12	15	66
76-13-1	1,1,2-Trichlorotrifluoroethane (CFC-113)		10.2	1	2	0	0	20	38		3		3		6	15	60
56-23-5	Carbon Tetrachloride	U211,D019	49.2	5	3	0	1	20	41	3	3	3	3		12		58
71-55-6	1,1,1-Trichloroethane	U226	46.1	5	3	1	1	20	43	3	3	3	3		12		60
7440-22-4	Silver	D011	94.9	5	1	0	0	20	36	3		3	3		9		50
	Silver Compounds																
563-63-3	Silver acetate	D011	0.4	1	1	0	0	20	36	3		3	3		9		46
532-31-0	Silver Benzoate	D011	0.8	1	2	0	0	20	38	3		3	3		9		48
7785-23-1	Silver Bromide	D011	1.4	1	2	0	0	20	38	3		3	3		9		48
534-16-7	Silver carbonate	D011	0.14	1	1	0	0	20	36	3		3	3		9		46

NIH TARGET CHEMICALS RANKING

CASN	Chemical Name	Waste Code	Quantity Generated CY07 (Kg) (15pts)		Health and Safety Risk on Waste Management N F P A 704 (55pts)					Mandated Regulatory Reduction (15 pts)						Reduction Feasibility Methods (15pts)	Total Points
			Wt/Kg	Pts	H	F	R	nsc20	Pts	rcra	ods	dhhs	np2	npep	Pts	ALT	POINTS
7783-90-6	Silver chloride	D011	4.1	1	2	0	0	20	38	3		3	3		9		48
3315-16-0	Silver cyanate	D011	0.25	1	1	0	0	20	36	3		3	3		9		46
22199-08-	Silver sulfadiazine	D011	0.1	1	1	0	0	20	36	3		3	3		9		46
7775-41-9	Silver fluoride	D011	0.02	1	2	0	0	20	38	3		3	3		9		48
7783-97-3	Silver iodate	D011,D001	0.05	1	2	1	0	20	40	3		3	3		9		50
7783-96-2	Silver iodide	D011	0.01	1	1	0	1	20	38	3		3	3		9		48
128-00-7	Silver lactate	D011	0.08	1	1	0	0	20	36	3		3	3		9		46
2386-52-8	Silver methanesulfonate	D011	0.05	1	0	0	0	20	34	3		3	3		9		44
20667-12-	Silver oxide	D011,D001	1.14	1	2	0	1	20	40	3		3	3		9		50
7783-93-9	Silver perchlorate	D011,D001	0.01	1	2	0	2	20	41	3		3	3		9		51
14242-05-	Silver perchlorate hydrate	D011,D001	0.02	1	2	0	2	20	41	3		3	3		9		51
7761-88-8	Silver nitrate	D011	9.03	1	2	0	0	20	38	3		3	3		9		48
7783-99-5	Silver nitrite	D011	0.07	1	2	1	0	20	40	3		3	3		9		50
10294-26-	Silver sulfate	D011	0.21	1	2	0	0	20	38	3		3	3		9		48
14104-20-	Silver tetrafluoroborate	D011	0.1	1	3	0	1	20	41	3		3	3		9		51
2923-28-6	Silver trifluoromethane sulfonate	D011	0.04	1	2	1	1	20	41	3		3	3		9		51
2966-50-9	Silver trifluoroacetate	D011	0.07	1	2	0	0	20	38	3		3	3		9		48
13497-94-	Silver vanadate	D011	0.04	1	2	1	0	20	40	3		3	3		9		50
7440-38-2	Arsenic	D004	0.005	1	3	0	0	20	40	3		3	3		9		50
	Arsenic Compounds																
98-50-0	4-Arsanilic acid	D004	0.2	1	3	0	0	20	40	3		3	3		9		50
1303-28-2	Arsenic Oxide	P011,D004	0.2	1	3	0	0	20	40	3		3	3		9		50
1327-53-3	Arsenic Trioxide	P012,D004	2.04	1	3	0	1	20	41	3		3	3		9		51
138608-19-	Arsenazo III sodium salt	D004	0.001	1	3	0	0	20	40	3		3	3		9		50
75-60-5	Cacodylic acid	D004 U136	1.2	1	3	1	1	20	43	3		3	3		9		53
124-65-2	Sodium cacodylate	D004	4.6	1	2	0	1	20	40	3		3	3		9		50
637-03-6	Phenylarsine oxide	D004	0.61	1	3	0	0	20	40	3		3	3		9		50
7784-41-0	Potassium arsenate	D004	1.21	1	2	0	0	20	38	3		3	3		9		48
7778-43-0	Sodium arsenate	D004	1.63	1	2	0	0	20	38	3		3	3		9		48
7784-46-5	Sodium arsenite	D004	3.31	1	3	0	0	20	40	3		3	3		9		50

NIH TARGET CHEMICALS RANKING

CASN	Chemical Name	Waste Code	Quantity Generated CY07 (Kg) (15pts)		Health and Safety Risk on Waste Management N F P A 704 (55pts)					Mandated Regulatory Reduction (15 pts)						Reduction Feasibility Methods (15pts)	Total Points
			Wt/Kg	Pts	H	F	R	nsc20	Pts	rcra	ods	dhhs	np2	npep	Pts	ALT	POINTS
7440-39-3	Barium	D005	0	1	3	0	0	10	22	3		3	3		9		32
	Barium Compounds																
543-80-6	Barium acetate	D005	1.8	1	3	0	0	10	22	3		3	3		9		32
513-77-9	Barium carbonate	D005	3.5	1	2	0	0	10	21	3		3	3		9		31
10361-37-	Barium chloride	D005	2.3	1	3	0	0	10	22	3		3	3		9		32
13845-17-	Barium Dithionate Dihydrate	D005	0.5	1	3	0	0	10	22	3		3	3		9		32
17194-00-	Barium Hydroxide	D005	3.1	1	3	0	0	10	22	3		3	3		9		32
13718-50-	Barium Iodide	D005	0.03	1	2	0	0	10	21	3		3	3		9		31
10022-31-	Barium Nitrate	D005,D001	2	1	1	0	0	10	19	3		3	3		9		29
516-02-9	Barium Oxalate	D005	0.5	1	1	0	0	10	19	3		3	3		9		29
1304-28-5	Barium Oxide	D005	1.5	1	3	0	2	10	26	3		3	3		9		36
13718-58-	Barium Periodate	D005	0.5	1	1	0	0	10	19	3		3	3		9		29
13762-83-	Barium Phosphate	D005	1.2	1	1	0	0	10	19	3		3	3		9		29
7727-43-7	Barium Sulfate	D005	1.8	1	0	0	0	10	17	3		3	3		9		27
5908-81-6	Barium Tartrate	D005	1.2	1	1	0	0	10	19	3		3	3		9		29
7782-49-2	Selenium	D010	0.15	1	2	0	0	10	21	3		3	3		9		31
	Selenium Compounds																
8/4/7446	Selenium dioxide	D010,U204	0.34	1	3	0	0	10	22	3		3	3		9		32
20405-64-	Copper selenide	D010	0.09	1	2	0	0	10	21	3		3	3		9		31
1666-13-3	Diphenyl diselenide	D010	0.15	1	0	0	0	10	17	3		3	3		9		27
5707-04-0	Phenylselenyl chloride	D010	0.01	1	0	0	0	10	17	3		3	3		9		27
34837-55-	Phenylselenyl bromide	D010	0.06	1	0	0	0	10	17	3		3	3		9		27
7790-59-2	Potassium selenate	D010	0.02	1	3	0	0	10	22	3		3	3		9		32
3425-46-5	Selenocyanic acid, potassium salt	D010	0.01	1	0	0	0	10	17	3		3	3		9		27
10102-18-	Sodium selenite	D010	0.07	1	3	0	0	10	22	3		3	3		9		32
13410-01-	Sodium selenate	D010	0.39	1	3	0	0	10	22	3		3	3		9		32

NOTE: nsc = NIH Special Concern, rcra = RCRA, ods = Ozone Depleting Substance, dhhs = DHHS, np2 = NIH Pollution Prevention, npep = National. Partnership for Enviromental Priorities, ALT = Green Alternatives

MEETING MINUTES

Sustainable Lab Practices Working Group
NIH Environmental Management System (NEMS)
Wednesday, May 21, 2008
1:30 – 2:30 pm

ATTACHMENT 2

NIH Target Chemicals Ranking – Abbreviated Matrix

Chemical	Quantity Waste Gen. CY07	Mandated Regulatory Reduction	Reduction Feasibility Methods	Total Points	Use	Alternatives
Ethidium Bromide	10 (201.1 Kg)	0	15	66	• Nucleic acid gel stain	• GelRed™, SYBR Green, SYBR Red, EnVISION™ DNA Dye
CFC-11 and 12	1 (0.4, 15.9 Kg)	12	15	66	• Refrigerant	• HFC-134a
CFC-113	1 (10.2 Kg)	6	15	60	• Cleaning	• Isopropanol
Dioxins/furans and dioxin compounds	1 (.0002 Kg)	9	15	73	• (byproducts, contaminants)	•
PCBs	1 (0.15 Kg)	9	15	65	• Coolants, lubricants • Old fluorescent lighting fixtures and electrical devices containing PCB capacitors	•
Methoxychlor	1 (0 Kg)	9	15	61	• Insecticide	•
Chromium and compounds	1 (0.02 – 8.4 Kg)	9	15	58	•	•
Picric acid	1 (7 Kg)	6	15	74	• Staining agent	• Ferric ammonium sulfate
Acetonitrile	15 (3532.7 Kg)	9		50	• HPLC	• Reduce flow rates, reuse clean fractions
					• Solvent	• Polyethylene glycol
					• Organic synthesis	• Supercritical CO_2 and other fluids • Water

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Chemical	Quantity Waste Gen. CY07	Mandated Regulatory Reduction	Reduction Feasibility Methods	Total Points	Use	Alternatives
m-Xylene	15 (2548.6 Kg)	9		50	• Radioactive tracer studies (liquid scintillation cocktails)	• Non-hazardous proprietary liquid scintillation cocktails (National Diagnostics)
					• Clearing agents in histology	• Histo-Clear (National Diagnostics) • Clear-Rite 3™ • Americlear™ • Histosolv X™ • Mediclear II™
Methanol	15 (5656.3 Kg)	9		57	• Washing gels	• Ethanol • Water
Chloroform	15 (986.5 Kg)	9		62	• Parts washers	• Lactate esters
					• General, reaction solvent	• Dimethoxyethane polyethylene glycol
					• Traditional DNA extraction	• New DNA extraction kits using polycarbonate filters, PEG, and simple salts

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Chemical	Quantity Waste Gen. CY07	Mandated Regulatory Reduction	Reduction Feasibility Methods	Total Points	Use	Alternatives
Dichlormethane	15 (1095.5 Kg)	9		55	• Parts washers	• Lactate esters
					• Cleaning agent	• d-Limonene
					• General, reaction solvent	• Benzotrifluoride (trifluorotoluene) • Dibasic esters (DBE) • Diethoxymethane • Ionic liquids • Supercritical CO_2 and other fluids • Water
					• Chromatography and extractions	• Methyl tert-butyl ether (MTBE)

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