

RECYCLING MILITARY BATTERIES NOW ON GSA

29th NDIA
ENVIRONMENTAL AND ENERGY SYMPOSIUM
RICHMOND, VA
APRIL 7-10, 2003

ToxCo Inc

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RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

THE MILITARY
USES HUNDREDS
OF THOUSANDS
OF BATTERIES
EACH YEAR



RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

THERE ARE MANY DIFFERENT
TYPES OF BATTERIES
INCLUDING:

NICKEL CADMIUM
LEAD ACID, MAGNESIUM,
NICKEL METAL HYDRIDE,
LITHIUM, LITHIUM ION
MERCURY, SILVER,
THERMAL, AND OTHERS



RECYCLING MILITARY BATTERIES NOW ON GSA

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EACH TYPE PROVIDES POWER
FOR DIVERSE APPLICATIONS:



Military

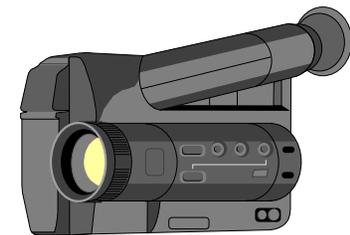
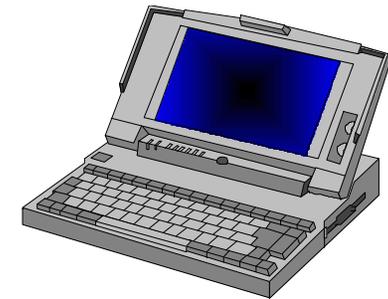
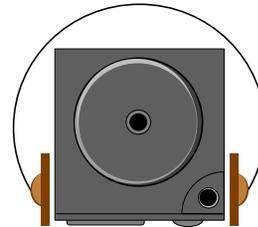


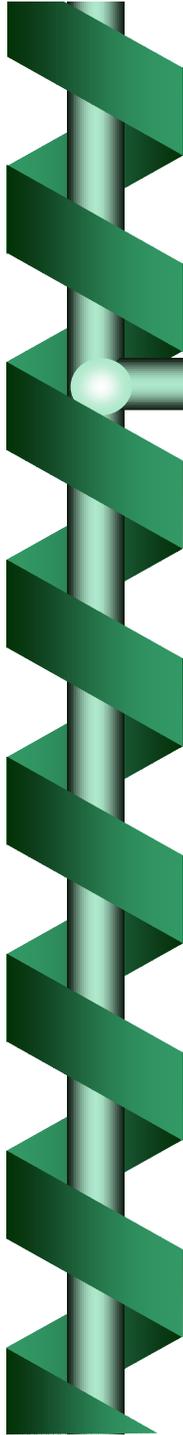
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**BATTERY POWERED CONSUMER ITEMS
USED BY THE MILITARY ARE INCREASING
AT A PHENOMENAL RATE:**

- COMPUTERS
- CAMCORDERS
- TOYS/GAMES
- PHONES
- RADIOS/CD PLAYERS
- CORDLESS TOOLS
- ELECTRIC VEHICLES





RECYCLING MILITARY BATTERIES NOW ON GSA

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**EARLY METHODS OF DISPOSAL PROVIDED
NO RECYCLING AND ARE OBSOLETE
WITH CURRENT TECHNOLOGY**

- **LANDFILL - FIRES, TOXIC GAS, EXPLOSIONS
AND GROUND CONTAMINATION**
- **INCINERATION - EMISSIONS, PLANT DAMAGE**
- **OPEN DETONATION - OBVIOUS DISADVANTAGES**
- **DISPOSAL AT SEA - ENVIRONMENTALLY INADEQUATE**

RECYCLING MILITARY BATTERIES NOW ON GSA

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**HAZARDOUS TO
THE ENVIRONMENT**

FLAMMABLE



EMISSIONS ARE OXIDES,
ACIDS, CAUSTICS, HEAVY
METALS, ORGANICS, AND
OTHER
PARTICULATES

RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

**HAZARDOUS TO
THE ENVIRONMENT**



**SOIL AND WATER
CONTAMINATION**

20 YEARS LATER



RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

Ramat Hovav fire blamed on ministry

Solution in sight for lithium batteries

By Gilboa Alon
and Zohar River
The Israel Times

The Ministry of Defense is responsible for the fire that raged at the Ramat Hovav toxic waste site last week, says a member of the Knesset Interior Committee charged in a meeting yesterday. The committee member has the authority to request a government inquiry.

"It is clear that the Ministry of Defense failed in its responsibility for sites across the country," Hovav Hovav, the chair of the Ramat Hovav regional council, said at the meeting. He called for a complete closure of the site until the investigating committee established by Environment Minister Rafael Eitan is completed.

For Dr. Shlomo Meyer, David Ben-Gurion University, said that all the toxic waste of the country was sent to Ramat Hovav, and the area was becoming an ecological disaster.

Meyers MK Zita Chen said this was probably the reason that the Israel Defense Forces evacuated it from the area.

Yehuda Alon MK Michael Hadasim, who chairs the subcommittee of the Finance Committee that is working solutions for the Ramat Hovav site, said, "The involvement of Ramat Hovav in this week points to negligence. The investigating committee that has been approached will have to establish who was responsible and to take the necessary measures against them." Hadasim asked Eitan why he was not fighting to increase the government's Ministry's budget for dealing with the toxic waste dumps in Israel. He was fighting against the second rubbish dump in the West Bank.

Later MK Micha Guldwaig,

also faces the Interior Ministry, emphasized the urgency of dealing with the toxic waste site and said it is not the government's responsibility for these sites.

Eitan rejected the criticism. At the beginning of the discussion he demanded a full report on the site, and then said he would participate if the report was positive. He said he would not take responsibility. He said he would not take responsibility for the site, but he would not take responsibility for the site. He said he would not take responsibility for the site, but he would not take responsibility for the site.

At the beginning of the meeting, Eitan proposed covering the toxic waste dump with a layer of cement, thereby eliminating the chance of an explosion. Hadasim, who is an environmental expert, responded, "This is not a solution. In Ramat Hovav there are tons of thousands of barrels containing dangerous substances. If you cover them with cement from above, they might leak from the bottom into the ground and one day they will be in the air."

In the meantime, reports of the toxic waste site have been circulating. The possibility of burning lithium batteries in the controlled furnace already functioning at the site. The process is problematic, since the substances' explosiveness could harm the furnace.

Eitan said, the managing director of Toxco, which is managing the furnace, said the substances would be burned in the furnace. However, he said, he has not yet been approved by the Environment Ministry, which has to approve the process.

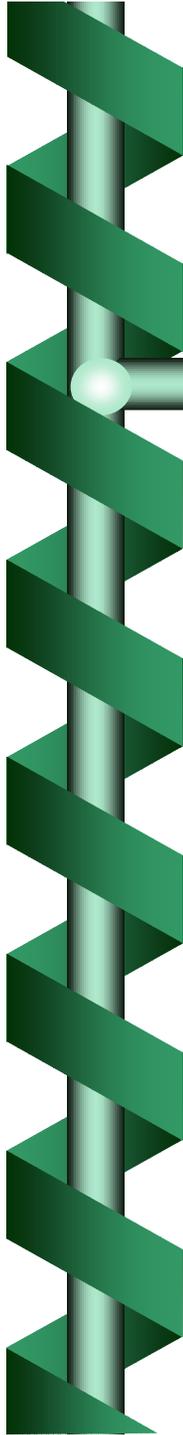


Barrels of poisonous waste photographed at the Ramat Hovav dump site yesterday.

- UNSAFE - FIRES, GASSES, EXPLOSIONS
- INCREASED PRESENT AND FUTURE LIABILITIES

“...MANAGERS OF THE TOXIC WASTE DUMP HAVE BEEN CONSIDERING THE POSSIBILITY OF BURNING LITHIUM BATTERY DUMPS IN THE CONTROLLED FURNACE ALREADY FUNCTIONING AT THE CITE. THE PROCESS IS PROBLEMATIC, SINCE THE SUBSTANCES EXPLOSIVENESS COULD HARM THE FURNACE.”

ח.ב. טכנולוגיות מחזור הטעיות
 עוק אקולוגי - פתרון בעיות זיהום סלקטים, טעיות טעיות
 מכל הסוגים.
 טכנולוגיות ביולוגיות למזוק טעיות במפרדי טמן.
 חומרי ניקוי וידידותיים ויחודיים לסביבה, לאים ילחי.
 טכנולוגיה מתקדמת לטרוול ריחות במקומות טעיות ותחודים.
 אספקת איכות לאחסון ושיטות חומרים טעיות
 ודידוקטיביים.
 ייצוג בלעדי של חב' ToxCo
 החברה המדולה והיחידה בעולם למחזור סוללות ומסולות
 ליתיום. 12 שנות טעיות, בטיחות ויעילות המחזור
 בקרו בחצר החברה: www.toxco.com
 ת.ד. 6300 נתניה 42% טל: 09-8855443 ספק: 09-8855439
 יחיד: 052-599086 (inter.net.il) e-mail: a-blain@inter.net.il



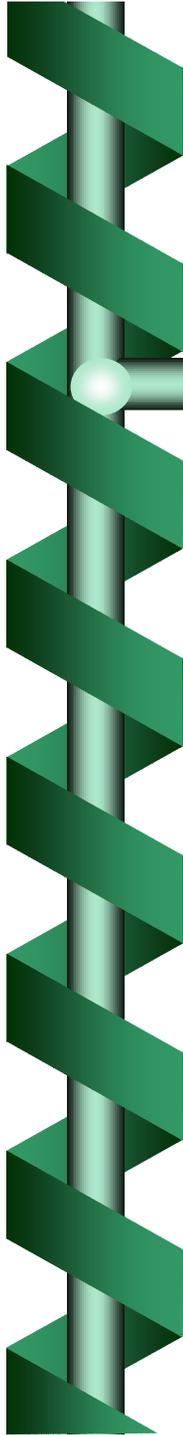
RECYCLING MILITARY BATTERIES NOW ON GSA

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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?
YOU DECIDE.....

TOXICITY:

FAILS Due to 5.8 grams acetonitrile per discharged D cell
(LD50 orally 3800 MG/KG (40 CFR 261.24 allows 5000
MG/KG))



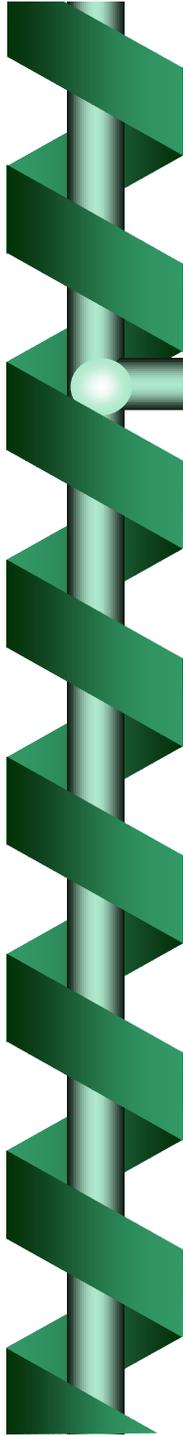
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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?
YOU DECIDE.....

• **ALSO FAILS** Due to sulfur dioxide gas (100 – 400 PPM IDLH (CFR 40 261.24 allows LC50 10,000 OR MORE) 2.5 Grams per discharged D cell)

NOTE: It is believed that lithium dithionite $\text{Li}_2\text{S}_2\text{O}_2$ (26.4 Grams per discharged D cell will also generate sulfur dioxide or sulfurous acid with water)



RECYCLING MILITARY BATTERIES NOW ON GSA

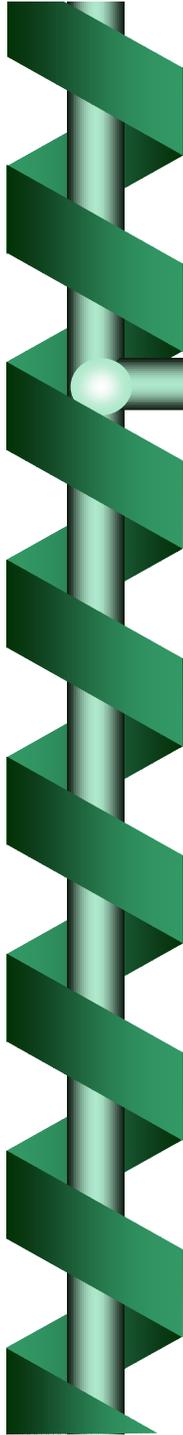
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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?

You Decide....

•**IGNITABILITY:** **FAILS**

Due to 5.8 grams acetonitrile per discharged D cell
(flash point 55 F (40 CFR 261.21 allows 140 F and
above))



RECYCLING MILITARY BATTERIES NOW ON GSA

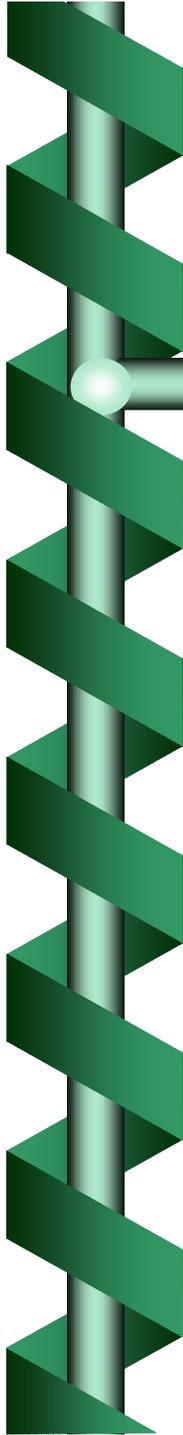
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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?

You Decide....

- BIO ASSAY- FAILS**

pH Less than 2 will not sustain life (sulfurous acid 2.5 grams per discharged cell plus so₂ from lithium dithionite)



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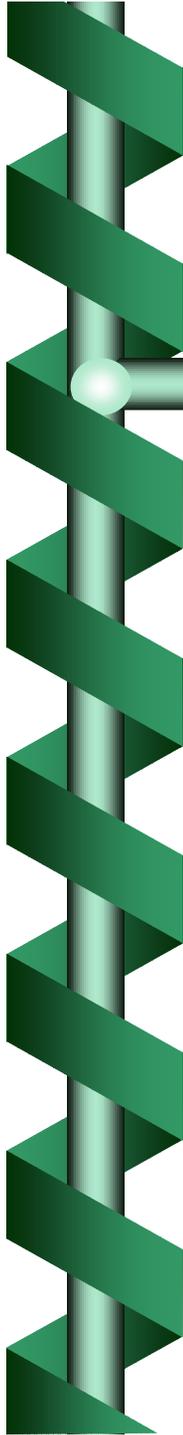
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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?

You Decide....

CORROSIVITY – FAILS

Due to sulfurous acid (H_2SO_3) generation
with water CFR 40 261.22 allows pH of 2-
12.5



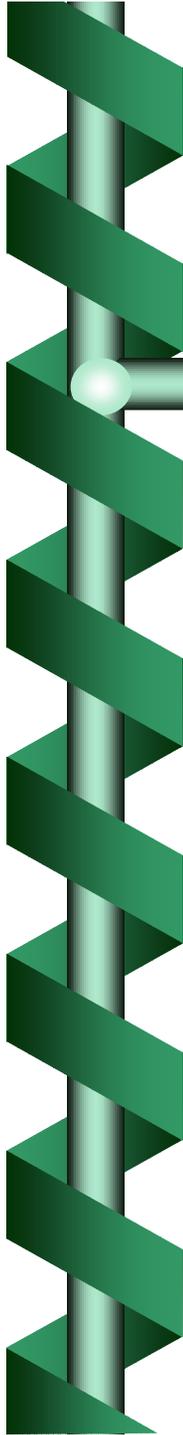
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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?

YOU DECIDE....

REACTIVITY: When completely discharged they may pass in theory but are too reactive to perform routine TCLP due to pressurized gas, flammable liquid, residual lithium, and rigid cell cases



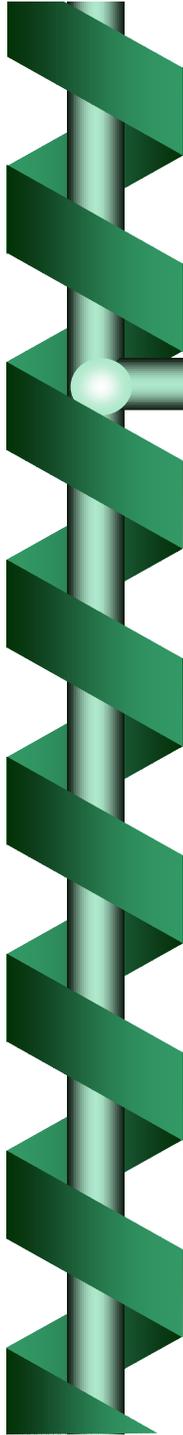
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LITHIUM SULFUR DIOXIDE BATTERIES:
ARE THEY SAFE TO LANDFILL?

YOU DECIDE....

**The US Army Communications Electronics
Command at Ft Monmouth has the
responsibility to buy, test, set policy, and manage
lithium sulfur dioxide batteries used by all other
services – THEY RECYCLE**

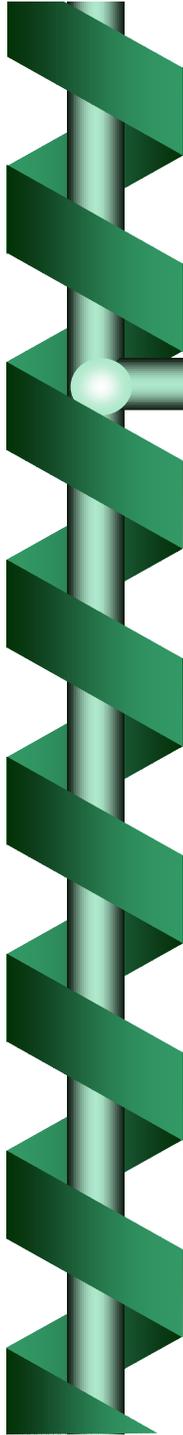


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PROCESS FOR DISCHARGE AND LANDFILL

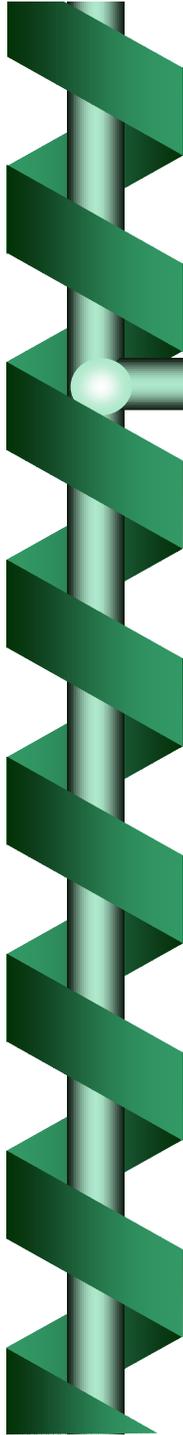
- Place Batteries In Rows With 8''
Between Each Battery
 - 2. Depress CDD
 - 3. Wait 5 Days
 - 4. Load In Drums
 - 5. Wait 5 Days To Ship
- Fire Risks Higher, Dedicated Area,
Time, Labor, Personnel Risks Higher



RECYCLING MILITARY BATTERIES NOW ON GSA

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- PROCESS FOR RECYCLING LARGE VOLUMES OF BATTERIES FOR RECYCLING VIA GSA – LOAD DRUMS AND SHIP
- PROCESS FOR RECYCLING SMALL VOLUMES OF BATTERIES FOR RECYCLING VIA GSA AND THE BIG GREEN BOX – FILL IT, SEAL IT, AND CALL UPS FOR PREPAID SHIPPING

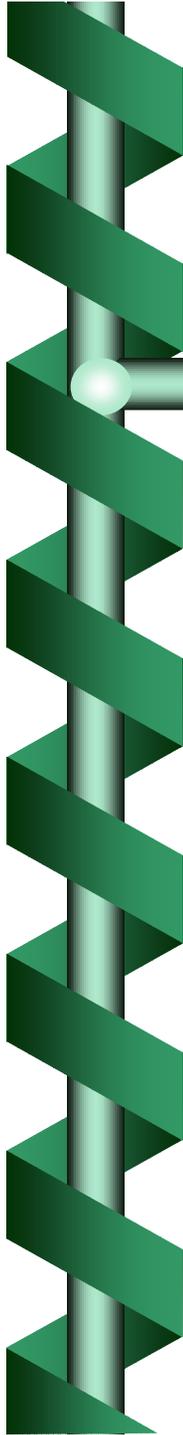


RECYCLING MILITARY BATTERIES NOW ON GSA

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UNIQUE FIRST EVER GSA CONTRACT:

- There has never been firm-fixed national costs to recycle any type battery
- There has never been a direct contracting method without a middle man/men
- There has never been a means to recycle small volumes of batteries cost effectively
- There has never been a recycling option for smaller facilities

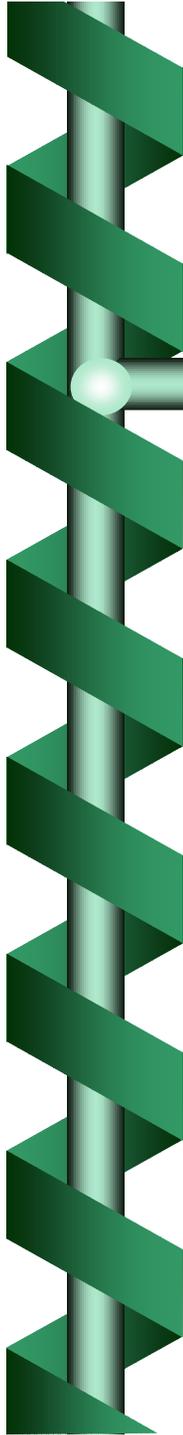


RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

Unique First Ever GSA Contract:

- GSA Contract GS-10F-0045N Awarded October 22, 2002 (valid for 5 years).
- Environmental Service Schedule 988-4
- 15 Types of batteries with a fixed cost to recycle
- Prepaid Container: The Big Green Box (recycling & transportation of any type battery up to 43pounds)



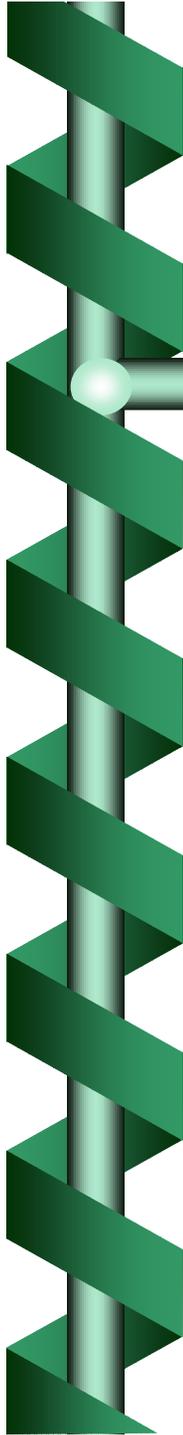
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Unique First Ever GSA Contract:

Per Pound Recycling Costs:

- Lithium Thionyl Chloride or Thermal - \$2.16
- Lithium Sulfur Dioxide or MnO₂ - \$1.54
- Lithium Rechargeable - \$0.32
- NiCd or Nickel Metal Hydride - \$0.43
- Lead Acid (aircraft, tank, and absolyte) - \$0.15
- Lead Acid - \$0.02



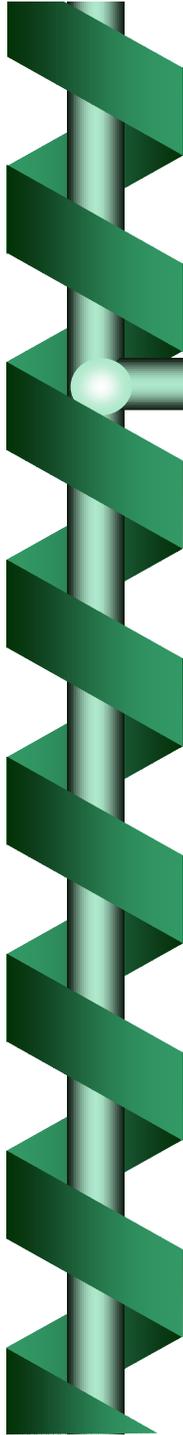
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Unique First Ever GSA Contract:

Per Pound Recycling Costs:

- Mercury - \$2.65
- Alkaline - \$0.61
- Magnesium - \$1.51
- Silver Zinc (reserve) \$2.47
- Silver Zinc (except reserve) \$0.25



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DRMO Lithium Battery Disposal/Recycling Costs
As of 5/2002 (● denotes recycling CLIN)

900 lbs LiSO ₂ -	\$6.36 (\$1.54)
42,943 lbs LiSO ₂ -	\$3.34 (\$1.54)
15,000 lbs LiSO ₂ -	\$4.05 (\$1.54)
15,000 lbs Lithium -	\$2.50 (\$1.54)
6,800 lbs Lithium -	\$7.49 (\$1.54)
166,000 lbs LiSO ₂ -	\$1.04 (\$1.35)

RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

The Big Green Box Program:

- Unique all inclusive recycling program focused on small volumes of mixed batteries
- Allows satellite or smaller facilities ease in recycling



RECYCLING MILITARY BATTERIES NOW ON GSA

TOXCO INC

The Big Green Box Program:

- Provides the most efficient means to ensure recycling
- Provides a means to eliminate unnecessary costs by working directly with the recycling facility vs. brokers



RECYCLING MILITARY BATTERIES NOW ON GSA



TOXCO INC

The Big Green Box:

- Recycle lithium, alkaline, NiCd, mercury, silver, sealed lead, and other types of sealed batteries



13"L x 13"W x 8.5"H
Capacity 43 pounds

RECYCLING MILITARY BATTERIES NOW ON GSA



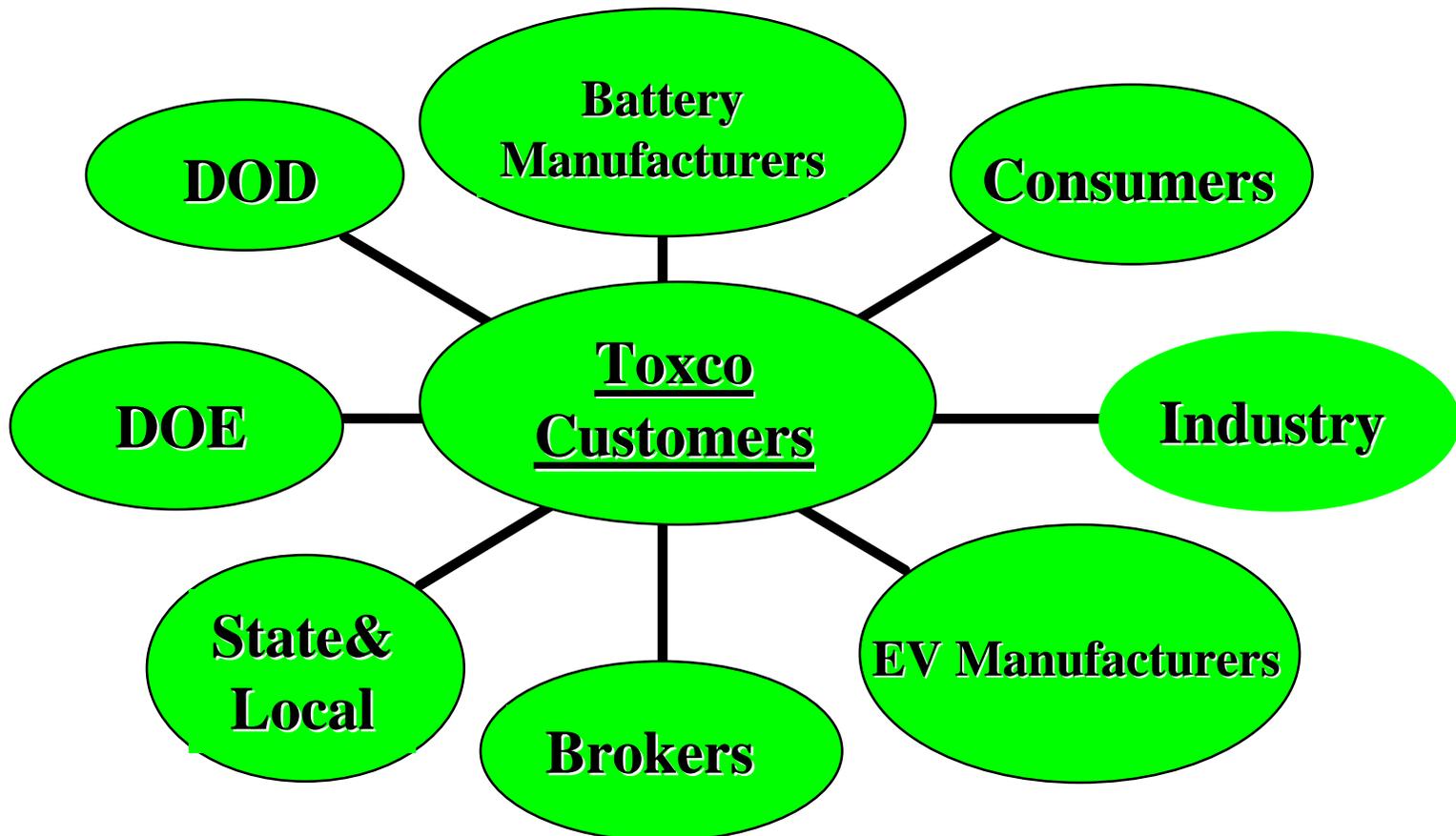
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The Big Green Box:

- **Selling Price Includes:**
 - **A United Nations approved, pre-labeled collection and shipping container**
 - **All shipping to customers**
 - **All shipping from customers**
 - **All sorting and handling fees**
 - **All recycling fees**
 - **All instructions**

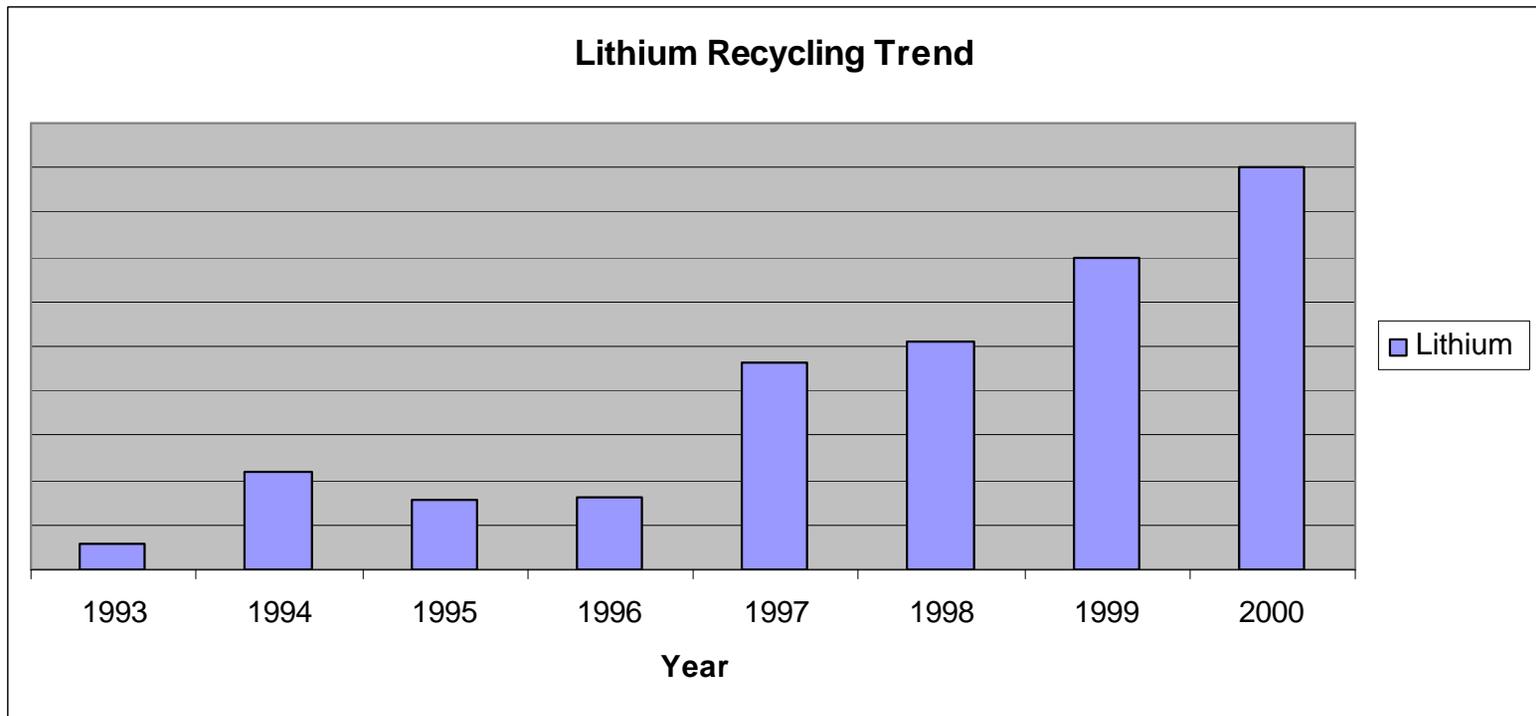
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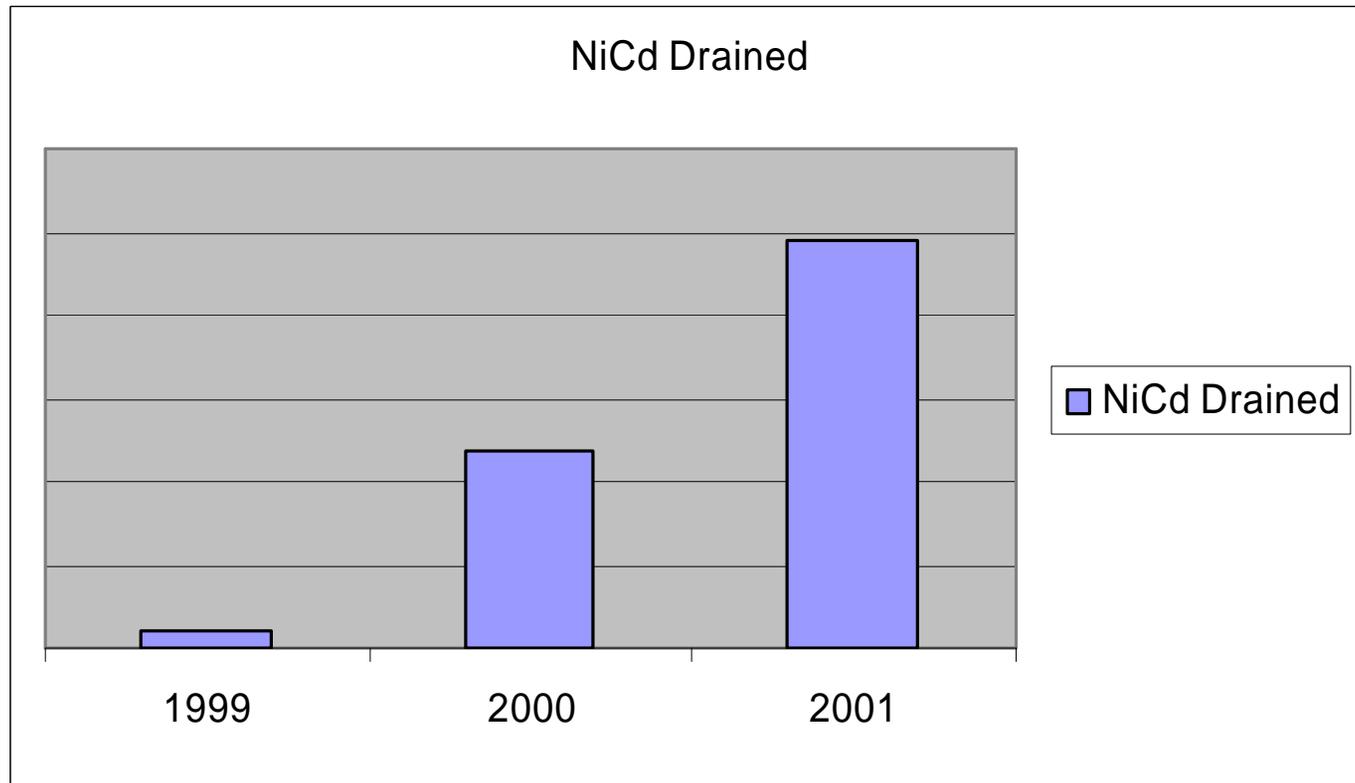
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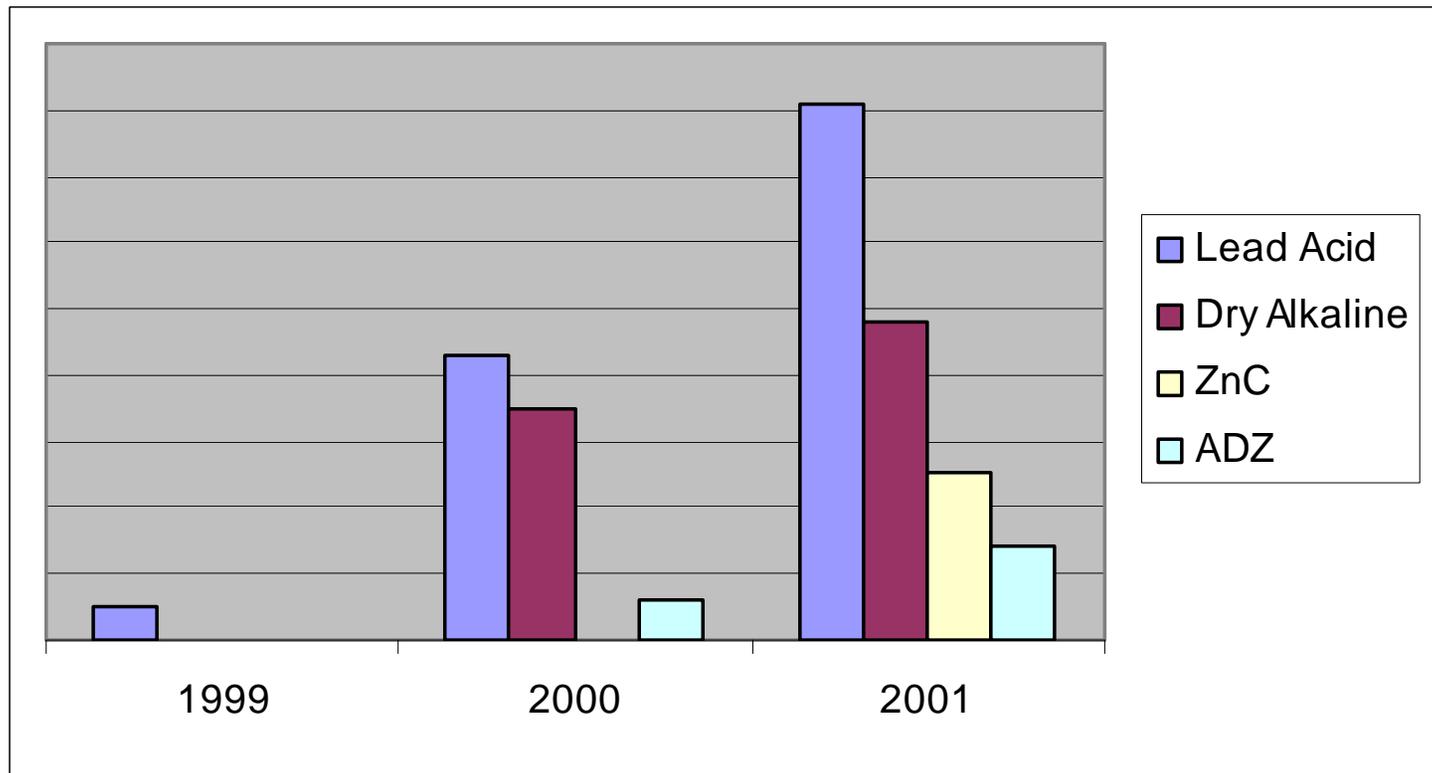
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**FOR ADDITIONAL
INFORMATION
PLEASE CONTACT**

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www.Toxco.com

www.BigGreenBox.com

Toxco Trail Facility

