Lakes Parkway Lithium Battery Fire

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NO SMOKING
FLAMMABLE GASES

Batteries on-site

- Approximately 15,000 lbs of batteries
  - Around 90% of them were once 14 lb 476 wH scooter batteries
  - Half of those were still largely intact and half were individual cells separated into groups

DOT Shipping Requirements - 49 CFR 173.185

(f) *Damaged, defective, or recalled cells or batteries.* Lithium cells or batteries that have been damaged or identified by the manufacturer as being defective for safety reasons, that have the potential of producing a dangerous evolution of heat, fire, or short circuit (*e.g.*, those being returned to the manufacturer for safety reasons) may be transported by highway, rail or vessel only, and must be packaged as follows:

(1) Each cell or battery must be placed in individual, non-metallic inner packaging that completely encloses the cell or battery;

(2) The inner packaging must be surrounded by cushioning material that is non-combustible, electrically non-conductive, and absorbent; and

(3) Each inner packaging must be individually placed in one of the following packagings meeting the applicable requirements of part 178, subparts L, M, P, and Q of this subchapter at the Packing Group I level:

https://www.youtube.com/watch?v=Cgt5VNvoAao

Advanced
Disposal

UN3480
ABC

First Fire of the Day – recently packaged bucket

Technically not a Fire

Second Fire of the Day – bucket packaged 5 days ago

20
GWINNETT
FUSION PRO
JACKSON

Aftermath

- Approximately 20 buckets were damaged during the second fire
- The bucket that caught fire had been packaged approximately 5 days ago and not been touched/moved for 4 days

Stop Work

Primary Goal:

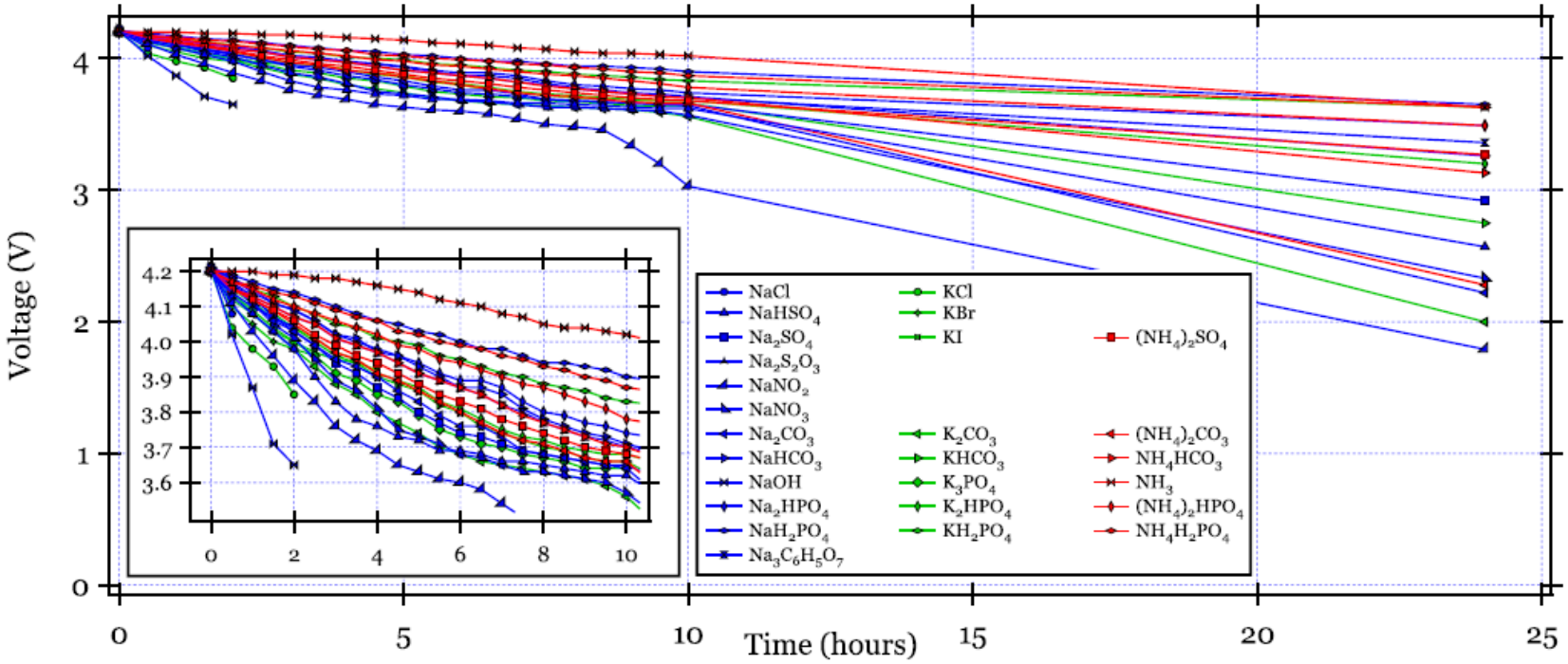
- Stop calling the Fire Department

Secondary Goals:

- Stop having fires
- Find a way to safely package/ship/dispose of the DDR batteries

De-energizing Batteries

- Recycling facilities regularly mentioned that prior to shredding they "soak" the batteries in salt water prior to shredding TO REDUCE EXPLOSIONS during the shredding process.



Battery De-energizing Test

- Salt water solution – Approximately 0.5% NaCl
- 1 lb NaCl per 25 gallons water
- Soak from 3 days to 3 months
- Potentially HF, Cl2, HCl, other gases similar to plastic fires released during combustion
- 24 hour results indicated full discharge of test batteries

Air Monitoring

- Due to the proximity of the surrounding community, EPA maintained air monitoring until all batteries were in drums and awaiting shipment

Location 7 - Southwest of Staging Area at Suites 114 & 116 Loading Dock Stairwell							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level
AreaRAE 3	VOC	No	2875	0	0 - 0 ppb	0 ppb	1000 ppb
	CO	No	2875	0	0 - 0 ppm	0 ppm	27 ppm
	H_2S	No	2875	0	0 - 0 ppm	0 ppm	0.33 ppm
	SO_2	No	2875	0	0 - 0 ppm	0 ppm	0.2 ppm
	Cl_2	No	2875	720	0 - 0.3 ppm	0 ppm	0.5 ppm
	γ	No	2875	2875	1 - 6 µrem/h	4.9 µrem/h	9 µrem/h

Location 8 - Eastern Side of Northern Roll-Off Battery Box							
Instrument	Analyte	Action Level Exceedance?	Number of Readings	Number of Detections	Concentration Range	Period Average	Action Level
SPM Flex 4	HCl	No	1490	0	0 - 0 ppm	0 ppm	1.8 ppm
SPM Flex 5	HF	No	867	0	0 - 0 ppm	0 ppm	1 ppm

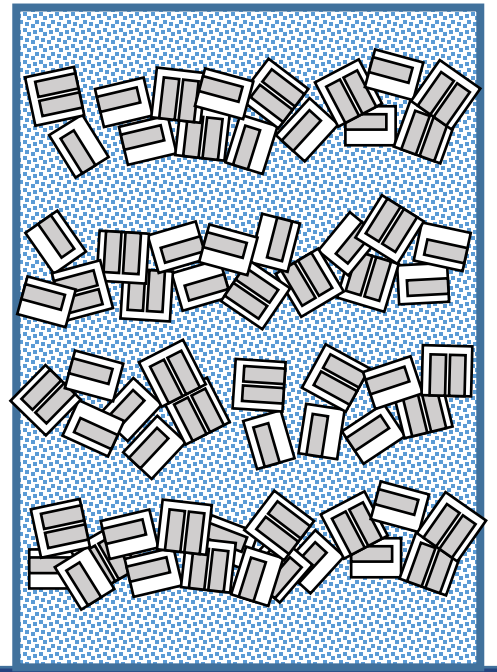
Timeline

- All batteries in the water by 12/24
- January 2 met with DOT and Recycling facilities to discuss shipment/disposal options
  - Disposal facility could not accept bulk shipment of batteries
- Started procurement process and special permit process
- Mid February
  - Special Permit approved – 6 days after application
  - Procurement complete
  - No fires in 6 weeks

Removing water and pile of batteries in rolloff

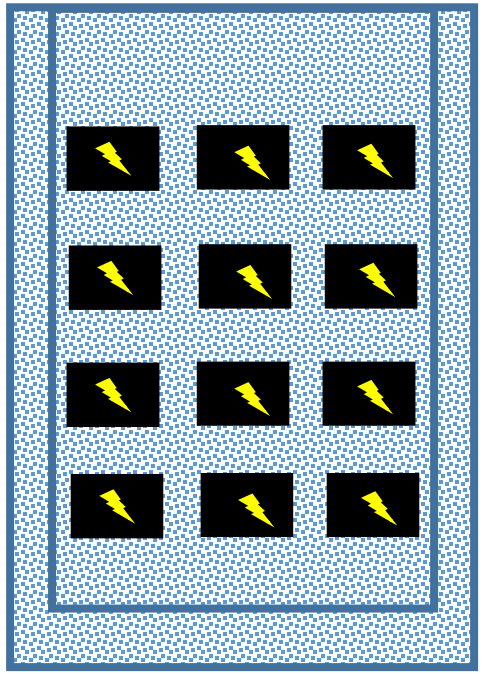
DOT SP-16532 – held by ER, not site specific

- Special Permit to package multiple “small” lithium ion batteries
  - Up to 400 lbs in a standard 55-gallon drum



DOT SP-21329 – held by R4, site specific

- Special Permit to package multiple “large” lithium ion batteries
  - Up to 180 lbs in a Call2Recycle drum ($800 per drum)



Project Completion

- Disposal Metrics
  - 13,414 lbs of batteries shipped
  - 6,300 gallons of non-haz water
  - 30 CY of non-haz sand
- 3 months from start to finish
- Total costs: $400,000

Lessons Learned

- De-energizing batteries will save time and money
- Involve DOT early
  - Special Permit is critical for shipping reasonable numbers of batteries in a drum
- Packaging Lessons
  - Plastic buckets (PG1) are allowed by DOT, but may not be appropriate for high watt-hour batteries
- Limited Disposal Options
  - Bulk shipment and on-site shredding are not currently available options
- Response.EPA.gov website for resources

Lessons Applied

Lessons Applied (cont)

Lessons Applied (cont)