



DEPARTMENT OF ENERGY

Office of River Protection

HANFORD SITE

**Single-Shell Tank
Retrieval & Closure Update**

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C-Farm 2014

- Consent Decree signed October 2010 established milestones to retrieve the Single Shell Tanks (SSTs) in C Farm to 360ft³ or less by September 2014

Project	Description	Date
B-1	Complete retrieval of tank wastes from the following remaining SSTs in WMA-C: C101, C-102, C104, C-105, C107, C108, C109, C-110, C-111, and C-112.	9/30/2014
B-2	Subject to the requirements of Section IV-B-3, DOE will advise Ecology of the 9 SSTs from which waste will be retrieved by 2022. Subject to the requirements of Section IV-B-3, DOE may substitute any of the identified 9 SSTs and advise Ecology accordingly.	9/30/2014
B-3	Of the 9 SSTs referred to in B-2, DOE will have initiated startup of retrieval in at least 5.	12/31/2017
B-4	Complete retrieval of tank wastes from the 9 SSTs selected to satisfy B-2.	9/30/2022





Single-Shell Tank
**Retrieval
& Closure**



RETRIEVED

2012

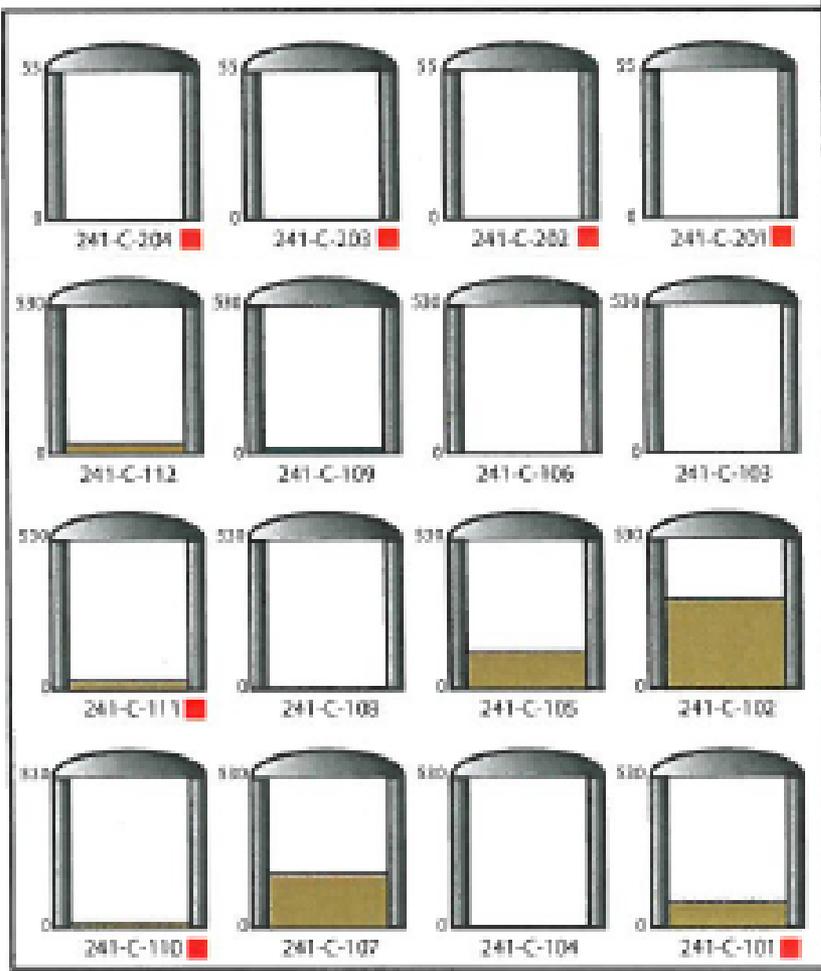
2013

2014



C-Tank Farm- Constructed 1943-1944
12 @ 530 Kgal Tank Capacity, Single-Shell
4 @ 55 Kgal Tank Capacity, Single-Shell

Tank	Kgal		
	Sludge	Saltcake	Supernatant
241-C-101 ■	88	0	0
241-C-102	316	0	0
241-C-103	2	0	0
241-C-104	5	0	0
241-C-105	132	0	0
241-C-106	3	0	0
241-C-107	186	0	1
241-C-108	5	0	0
241-C-109	8	0	11
241-C-110 ■	17	0	0
241-C-111 ■	32	0	0
241-C-112	34	0	0
241-C-201 ■	0	0	0
241-C-202 ■	0	0	0
241-C-203 ■	0	0	0
241-C-204 ■	0	0	0



■ Assumed leaker



C Farm Status for Fiscal Year (FY) 2012

- Completed retrieval in 3 SSTs in FY 2012
 - C-104 to 160ft³
 - C-109 to 151ft³
 - C-108 to 660ft³
- Total of 10 SSTs are retrieved
- Completed construction and installation of retrieval equipment for C-101 and C-102
- Completed bulk retrieval in C-112 using the Enhanced Reach Sluicing System (ERSS) for the first time
- Completed replacement of the hose-in-hose transfer lines going to Double-Shell Tank (DST) AN-106



C Farm Plans for FY 2013-14

- Replace pump in DST receiver tank AN-106
- Complete the dome cut for C-105 for MARS-Vacuum installation
- Complete installation of the MARS-Vacuum into C-105
- Complete retrieval in C-107
- Begin hard heel removal in C-111
- Complete bulk retrieval in C-101
- Complete bulk retrieval in C-102
- Complete retrieval in C-110
- Begin bulk retrieval in C-105

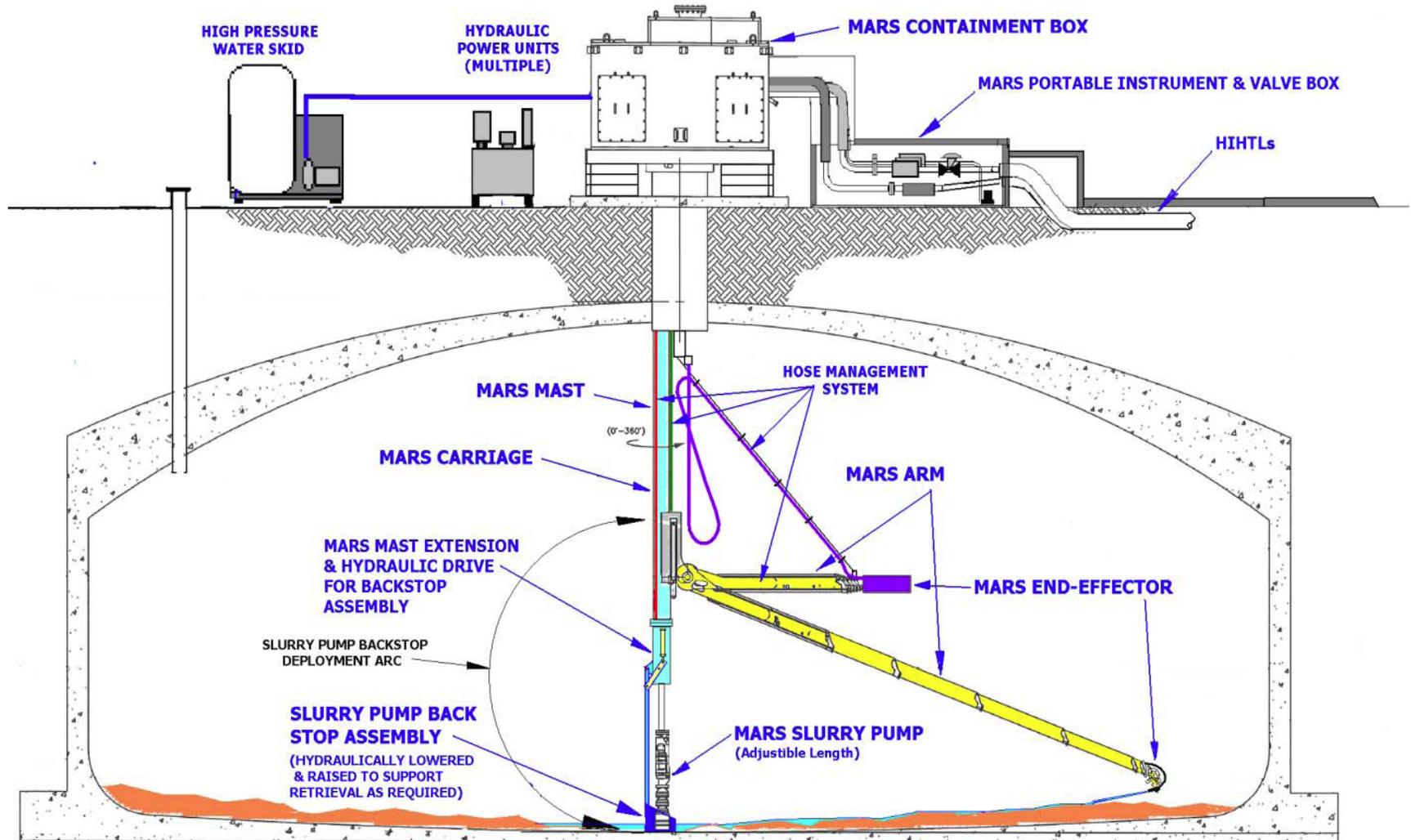


C-107 MARS-Sluicing

- Required a dome cut that used a water/abrasive (garnet) technique in 2010
- Unique end effector with fan nozzles and high pressure water nozzles
- Backstop by the slurry pump with high pressure water nozzles
- Above ground containment box allows for repairs of the arm
- Currently has 20% of waste remaining
- Awaits replacement of pump in DST receiver tank
- Estimated completion mid-January 2013



C-107





MARS Arm





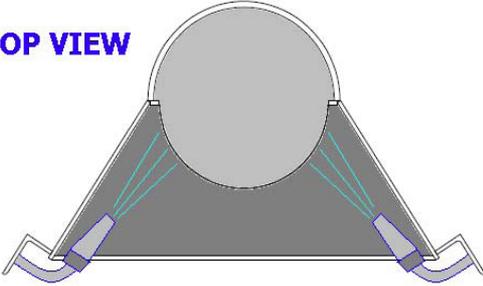
End Effector





Backstop

TOP VIEW

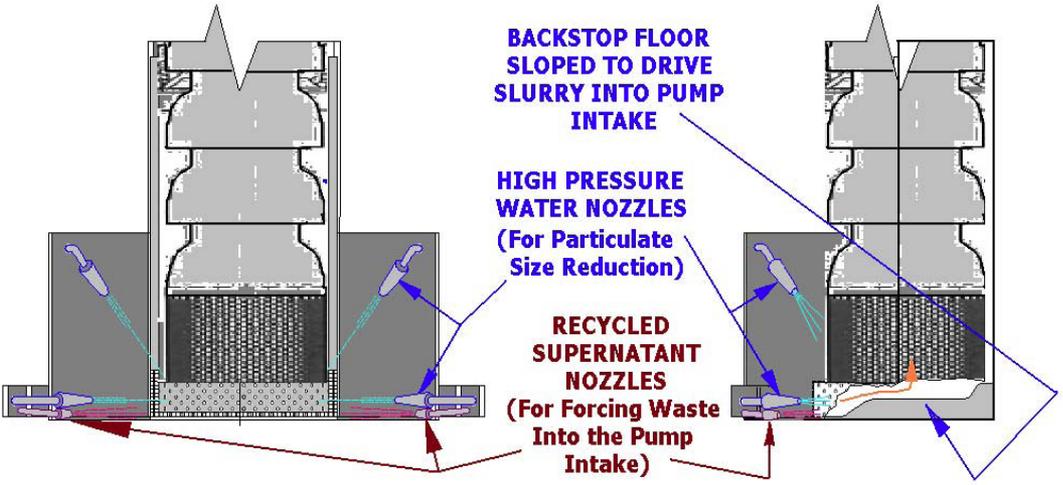


THIS IS THE MARS BACKSTOP ASSEMBLY WHICH IS MOUNTED ON THE BOTTOM OF AN ARTICULATION ASSEMBLY SHOWN IN FIGURE 3-1.

IT INCLUDES HIGH PRESSURE WATER AND RECYCLED SUPERNATANT NOZZLES TO SIZE REDUCE THE WASTE HEELS AND FORCE THEM INTO THE PUMP INTAKE AT SPEEDS ADEQUATE TO MAINTAIN SUSPENSION OF THE SOLID PARTICULATE

FRONT VIEW

SIDE VIEW





Challenges in C-107

This is the rotary union housed in the containment box above ground from the tank. It has 5 hose ports which allow for the various different liquids coming in and out of the tank. A leak had been discovered and after an attempt to repair the leak is still seeping.



Large Riser Cut for C-107



In December 2010 cut a 55 inch hole in top of tank for 48 inch riser

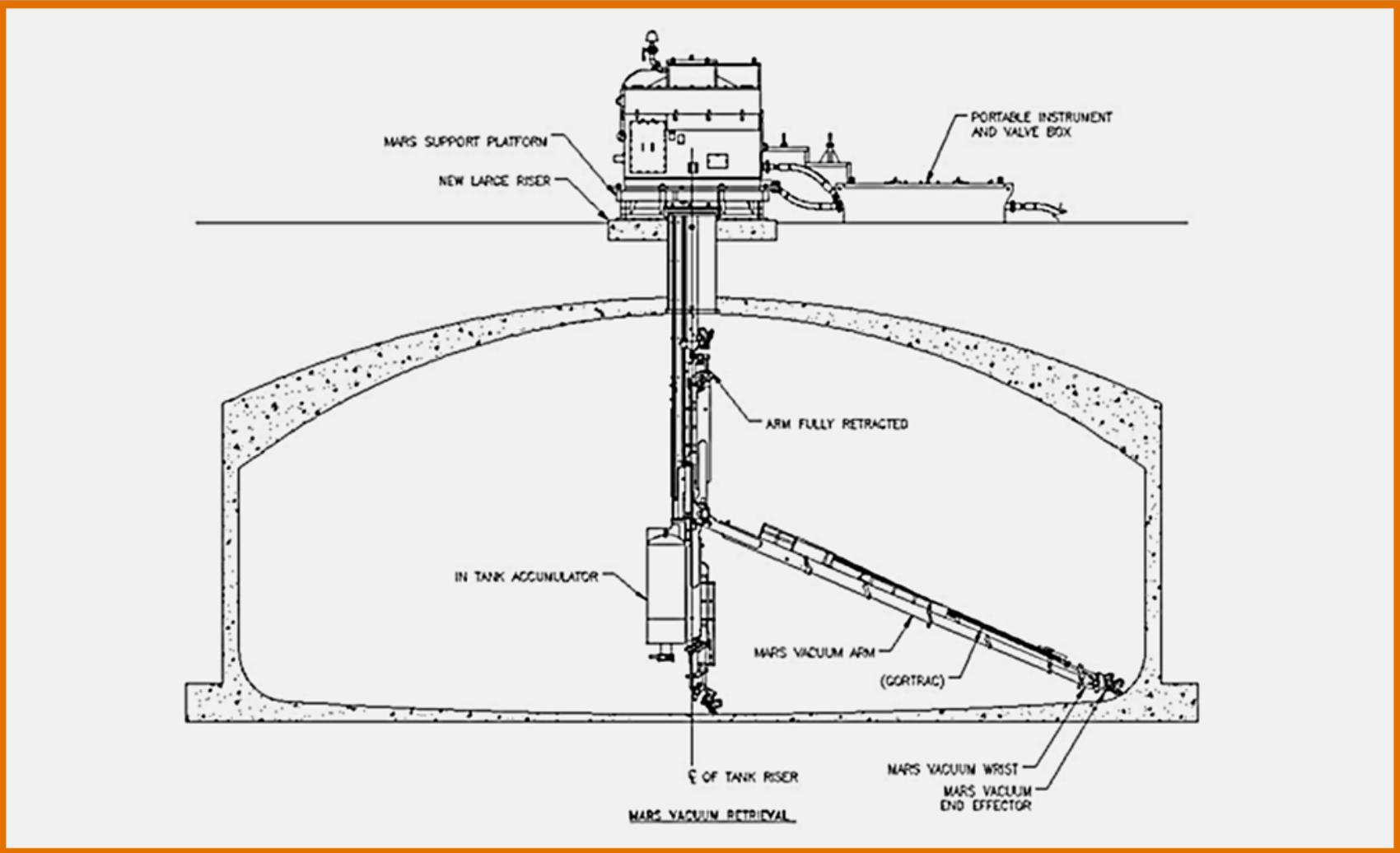


C-105 MARS-Vacuum

- Dry retrieval method for assumed leaking SSTs like C-105
- Requires a dome cut scheduled for FY 2013
- Employs a dual eductor system, a waste accumulator tank, pump inside tank and a different hose management system than MARS-Sluicing
- Unique end effector uses high pressure water nozzles
- Above ground containment box allows for repairs of the arm
- Dome cut using water/abrasive technique being evaluated
- MARS-Vacuum in operator training and completing design and fabrication reviews



C-105 MARS-Vacuum





C-105 MARS - Vacuum



The MARS-Vacuum arm being tested at Columbia Energy and Environmental Services (CEES) above and the Waste Accumulator Tank (WAT) on right







Challenges for MARS-Vacuum

Among the challenges operations has dealt with for the new MARS-Vacuum design is the screen plugging issue in both the WAT and the end effector. Design changes have been required.



C-105 Excavation

Preparations for installation of the MARS-Vacuum required excavation including the old pump pit which had the addition of concrete underneath making it a 78,000 pound lift.



C-101 and C-102

C-101

- Has 2 ERSSs installed to begin bulk retrieval this month
- Has 90,000 gallons of high-level waste

C-102

- Has 2 ERSSs installed to begin bulk retrieval in December 2012
- Has 300,000 gallons of high-level waste
- Has discovered concrete within the waste media



Concrete under Riser 2 in C-102

Although we discovered a mound of concrete under the riser where one of the ERSSs was to be installed, operations was able to successfully get the arm inside to tank to maintain schedule. This is indicative of the unknown challenges in the C Farm tank waste.



Enhanced Reach Sluicer System (ERSS)

Planned for tanks C-101, C-102, C-111, C-112. Each tank will get 2 ERSSs through 12 inch risers. This tool has High Pressure Water Nozzles that have been successful in MARS-Slucing.



C-111 and C-112

C-111

- Very little waste retrieved during bulk retrieval using standard sluicers
- Planned for 2 ERSSs to be installed in FY 2013
- Caustic addition prior to installation of ERSSs to soften waste and aid in retrieval

C-112

- Getting 2 ERSSs installed
- Resumes retrieval in FY 2014
- Has 30,000 gallons of high-level waste remaining
- Caustic addition prior to installation of ERSSs to soften waste and aid in retrieval



C-110

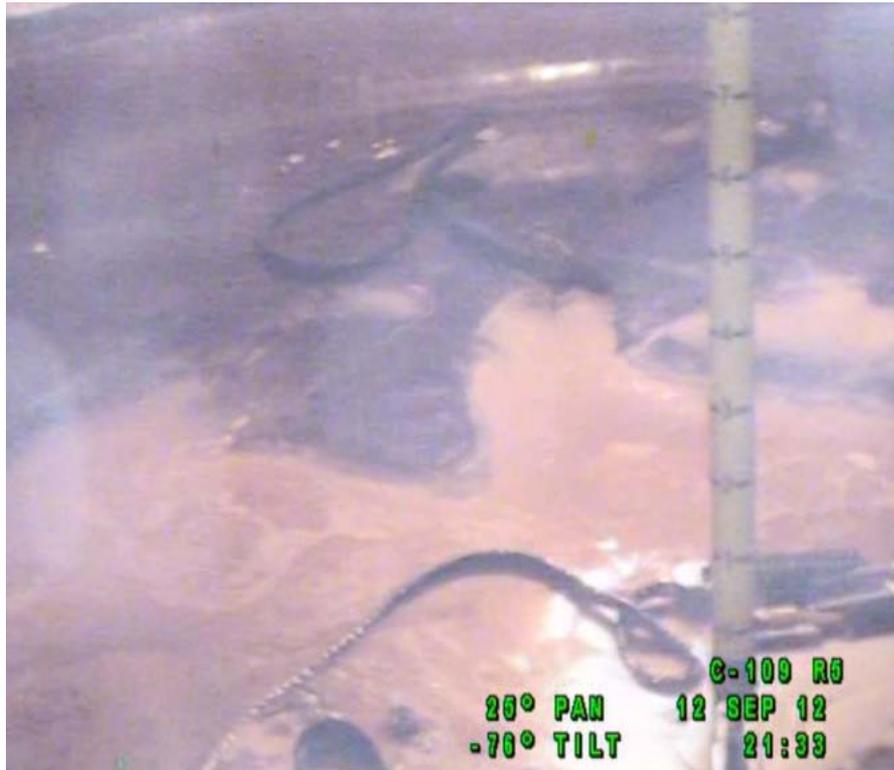


- Completed bulk retrieval in 2009
- Designing and fabricating a new Foldtrack that includes high pressure water nozzles
- Install in February 2013 with planned completion July 2013

Foldtrack that was deployed in tank C-109



C-109

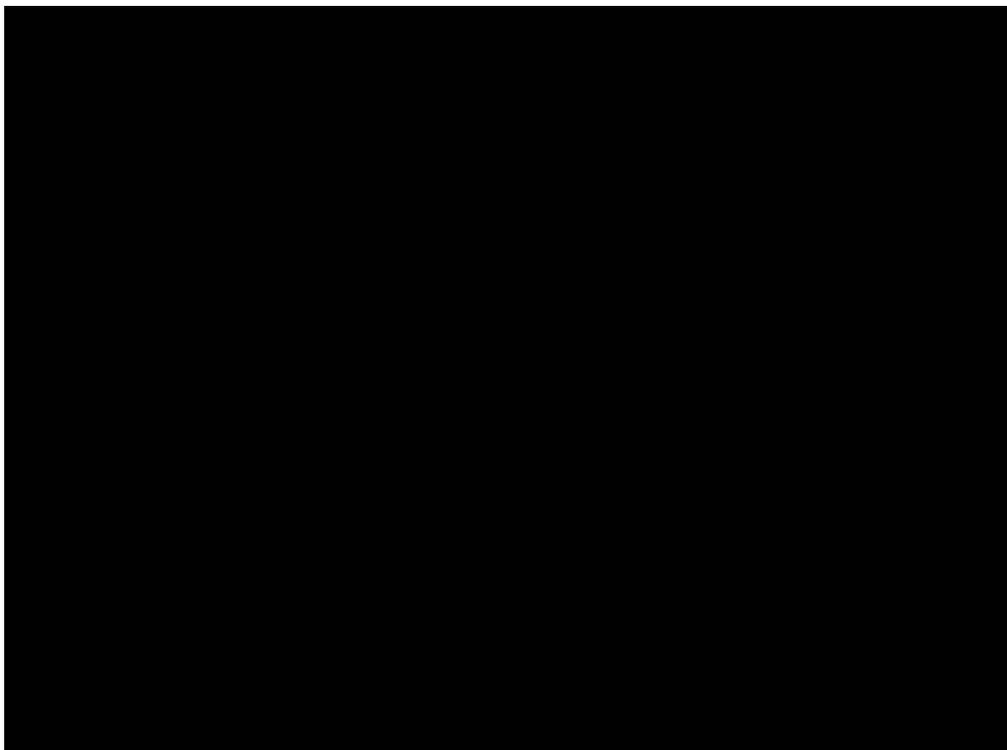


- Completed retrieval in September 2012
- Lowest volume of waste remaining in tank so far at 151ft³



C-104

- Completed retrieval in August 2012 at 160ft³





C-108

- Completed retrieval in March 2012 with 660ft³ remaining after deploying 2 technologies
- DOE believes it is not practicable to continue retrieving with a third technology
- Minimal mobile constituents remain in the residual causing no additional risk to leave waste above 360ft³ in C-108



Tank Completion

- DOE and Ecology have worked together to develop a template for Certification of Completion for a tank under the Consent Decree
- DOE submits to Ecology once a tank is complete
 - Describes the technologies deployed and how the operation was conducted to complete retrieval
- DOE will sample the remaining residual and produce a Retrieval Data Report within 1 year of certifying the tank to be complete in accordance with M-45-86