# SEPARATIONS PROCESS RESEARCH UNIT
# DISPOSITION PROJECT
## BASELINE SUMMARY
## June 2008

## BACKGROUND

The Separations Process Research Unit (SPRU) is located within the currently operating 170-acre Naval Reactor's (NR) Knolls Atomic Power Laboratory in Niskayuna, New York, near Schenectady. The Mohawk River forms the northern boundary of this site. General Electric's Global Research Center is to the west, and a closed municipal landfill and small town park is to the east. A residential area is located to the south (across the street) from the laboratory.

The SPRU Project includes the following nuclear facilities; Building H2 (including tanks within the building), Building G2, and interconnecting pipe tunnels, totaling about 50,000 square feet. The facilities were a pilot plant to research the process to separate plutonium from irradiated matrices. The facilities and process systems were flushed and drained after operations ceased in 1953; however, radioactive contamination remains in process piping and on floors, walls, and ceilings. Groundwater and soil immediately adjacent to the facilities are contaminated. In addition, about thirty acres of land including a former railroad staging area and an area known as the North Field were impacted by spills and leaks from radioactive waste containers that were temporarily stored in these areas. The Mohawk River also is slightly contaminated with radioactivity from past SPRU operations, although agreement has been reached with the State of New York that no cleanup will be needed there.

## SCOPE DESCRIPTION

The approved mission of the SPRU project is to disposition the facilities and land to achieve U.S Department of Energy, Office of Environmental Management (DOE-EM) project completion including transfer of all property back to NR for continued mission use by 2014. The SPRU project will fulfill the agreements in the 1992 Memorandum of Agreement (MOA) between NR and DOE-EM on the decontamination and decommissioning of SPRU, and will eliminate a legacy facility that has been inactive for fifty years. This will also allow DOE to close an inactive small site, stabilize and consolidate transuranic (TRU) waste at the Waste Isolation Pilot Plant (WIPP), and eliminate surveillance and maintenance (S&M) costs of the nuclear facilities. Naval Reactors has identified the SPRU project areas (apart from the North Field) as areas for future mission-related construction. One Naval Reactors facility (the Materials Development Facility, a line item construction project) is now held up due to lack of available real estate. Several other facilities are planned for construction in the 2012 – 2017 time frame, and Naval Reactors has advised DOE – EM that it intends to use land from the SPRU Project areas (the railroad staging area and footprint occupied by the SPRU former nuclear facilities ) as soon as it becomes available. DOE – EM has

prioritized remediation in the railroad staging area to make this area available to Naval Reactors by 2010. Cleanup of the North Field area is scheduled for 2014.

Cleanup goals for radioactive constituents in soil and groundwater at SPRU are based on DOE Order 5400.5, *Radiation Protection of the Public and the Environment* (DOE, 1993) and follow a dose-based model that prevents on site personnel from receiving more than an additional 25 millirem per year if they were to work in the SPRU areas after contamination is reduced to industrial land use requirements. Naval Reactors and EM have agreed to the cleanup criteria. The predominant radioactive contaminant is cesium-137, which has a soil cleanup level of 30 picoCuries per gram (pCi/g) (residual cesium-137 at levels of 30 pCi/g or less will decay to levels that will be protective of a residential user over the projected life of the KAPL facility). For chemical contamination, DOE's objective is to achieve No Further Action (NFA) determination from the State of New York for chemicals in the SPRU land areas. The chemical cleanup levels for SPRU soils were proposed in the Resource Conservation and Recovery Act (RCRA) Interim Corrective Measure Work Plan submitted to the New York State Department of Environmental Conservation (NYSDEC) on April 30, 2008. Cleanup levels for chemical contaminants are based upon protecting future use of the property for residential development as well as protection of groundwater. All soil contaminated above the cleanup levels for radioactive or chemical contaminants will be removed and shipped to an approved, off-site disposal facility.

The SPRU nuclear facilities will be removed in their entirety. All resulting wastes will be shipped to appropriate off-site disposal sites, and contaminated soils and groundwater will be removed or treated to meet the cleanup goals described above. The areas will be re-graded and placed in a condition so that they will be suitable for mission-related use by Naval Reactors. The transfer to Naval Reactors of the areas now occupied by the SPRU nuclear facilities is scheduled for 2014.

Portions of the SPRU disposition project will be regulated under a RCRA Corrective Action Permit now under negotiation with NYSDEC. While a project schedule will be submitted as part of the final permit, no enforceable milestones are currently in place.

**PROJECT MANAGEMENT**

Based on the direction from EM Headquarters, the SPRU Field Office developed the near-term baseline for each of its project components. These project baselines have undergone an independent review to verify the reasonableness of the scope, cost, and schedule for each project. An approved near-term baseline reflects the identified scope that can reasonably be accomplished for the identified cost in the identified time period if near-term baselines are funded as profiled and contingency funds are provided as required during project execution. It also establishes the baseline as an acceptable point from which to track and control future change. The review and approval process accommodates the likely changes in the EM complex, site priorities and funding plans. These changes could affect both near-term (within the next five years) and life-cycle cost, schedule and scope. Such future changes may be required to comply with applicable

environmental legal obligations while maintaining essential functions necessary to protect human health, the environment and national security; reflect funding different from the baseline assumptions; incorporate technological advances; realize specific programmatic risks; or implement programmatic business cases. Because the cleanup extends beyond the near-term, out-year planning estimates have also been developed and independently reviewed.

## LIST OF PROJECTS

The SPRU EM program consists of a single project as shown below: The Near-Term Baseline (NTB) for these projects is from FY 2008 – FY 2012 and the Out Year Planning Estimate Range (OPER) is from FY2013 through FY 2014.

| Project | Date Approved | |
|---|---|---|
| | Near Term Baseline (NTB) | Out Year Planning Estimate Range (OPER) |
| Nuclear Facility D&D – Separations Process Research Unit; VL-SPRU-0040 | May 31, 2008 (via IPR); projected Critical-Decision 2 approval is August 25, 2008 | May 31, 2008 (via IPR); Critical-Decision 2 approval is August 25, 2008 |

## PROJECT SCOPE

The Project scope is to achieve EM closure at the SPRU site, which includes the following:

- TRU waste in the tanks and enclosures in Building H2 (estimated at 50 cubic yards) is removed and shipped to WIPP or an intermediate site.
- All SPRU inactive nuclear facilities (approximately 50,000 square feet) are removed.
- All facility related waste is removed and shipped to an offsite approved/permitted disposal facility.
- All chemical and radiological contamination above cleanup levels is removed and the contaminated soil is shipped to an offsite approved/permitted disposal facility.
- The land in the facilities footprint is returned to Naval Reactors for continued mission use.

EM completion at SPRU addresses both technical and administrative requirements. EM completion is achieved when the following occurs:

1. The State of New York issues No Further Action determinations for the RCRA solid waste management units and areas of concern;
2. NR and an independent verification contractor agree that the cleanup criteria for soil have been met;
3. All required long-term response measures (e.g., groundwater treatment systems), if any, are constructed, operational and functional;

4. All project records are transferred to NR (through KAPL);
5. CD-4 (approval of project completion) is reviewed and approved; and,
6. All SPRU areas are returned to NR for future mission use.

## PROJECT COST

(dollars in thousands)

| Cost Element | Project Number VL-SPRU-0040 |
|---|---|
| 1. Prior Year Costs (1997-2007) | $20,000 |
| 2. Total Near-Term Baseline (50% Confidence Level) | $112,600 |
| 3. Unfunded Contingency | $6,000 |
| 4. Performance Baseline (80% Confidence Level) | $118,600 |
| 5. Out Year Planning Estimate Range | $11,500 - $12,000 |
| 6. **Total Life Cycle Cost** | $150,600 |

## SUMMARY LIFECYCLE BASELINE SCHEDULE