Idaho National Engineering & Environmental Laboratory
Bechtel BWXT Idaho LLC.

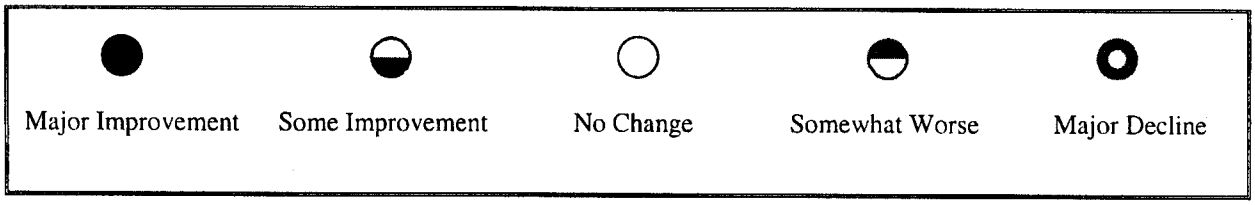
ORTEC ISOCART

Summary:
The ORTEC Isocart is a highly sensitive in situ gamma spectrometric system. It utilizes a germanium detector that can accurately determine the radioactive isotopes present in contaminated material. The system is set up over the contaminated medium and obtains measurements without disturbing or sampling the material. Deployment of the system helps reduce worker exposure to the contaminated material and avoids approximately $200 in sampling and analysis costs per area measured. WAG 5 used the system at approximately 100 locations at the ARA-16 site, resulting in an estimated sampling and analysis cost savings of $20,000. The cost to operate the Isocart was $8,350; therefore, the overall cost savings was $11,650. This does not take into account the cost savings realized by the fact that the Isocart provides real-time data in place of waiting for laboratory analytical results. The value of the time and manpower that was eliminated is estimated to be about $65 per hour times 8 hours per day or $520 for each of the 40 days saved. This equals another $20,800 saved. At the very least, 2 days would be lost just to mobilization and demobilization of the field crew and equipment necessary to perform the follow-on field work that would be necessary once analytical results were received from the laboratory. Based upon a daily cost of $10,000, this results in an additional cost savings to the project of $20,000. The total cost avoidance using this technology was $52,450.

The ORTEC Isocart will be used for field measurements during another remediation project at WAG 5 in the FY 2003 and FY 2004 timeframe.

This deployment helped to satisfy STCG need 6.1.02 (Real Time Field Instrumentation for Characterization and Monitoring Soils and Groundwater).

Qualitative Benefit Analysis		
Programmatic Risk	○	Minimal risk is encountered in ensuring that in situ measurements provide similar results to those obtained from laboratory analyses.
Technical Adequacy	○	Accuracy of data is similar to that obtained from standard laboratory measurements.
Safety	◒	Worker exposure is reduced when measuring radiologically contaminated soils.
Schedule Impact	●	The time to sample approximately 100 locations was avoided. Laboratory analysis of those samples would have required an additional 40 days.



Quantitative Benefit Analysis		
Cost Impact Analysis	Cost reduction was achieved by not having to sample and analyze approximately 100 samples. As outlined above, this resulted in a cost savings of $31,650 during FY 2001. An additional $20,800 was saved by shortening the schedule by 40 days. The total estimated savings are $52,450.	
	Annual Savings	$52,450
	Life-Cycle Cost Savings	$52,450
	Return-On-Investment (ROI)	NA %

Worksheet 1: Operating & Maintenance Annual Recurring Costs

Expense Cost Items *	Before (B) Annual Costs	After (A) Annual Costs
1. Equipment	$ -	$ -
2. Purchased Raw Materials and Supplies		$ -
3. Process Operation Costs:		
Sampling Costs	$ 20,000.00	$ 8,350.00
Labor Costs	$ 20,800.00	
Routine Maintenance Costs for Processes	$ -	$ -
Subtotal	$ 40,800.00	$ 8,350.00
4. PPE and Related Health/Safety/Supply Costs	$ -	$ -
5. Waste Management Costs:		
Waste Container Costs	$ -	$ -
Treatment/Storage/Disposal Costs	$ -	$ -
Inspection/Compliance Costs	$ -	$ -
Subtotal	$ -	$ -
6. Recycling Costs		
Material Collection/Separation/Preparation Costs:		
a) Material and Supply Costs	$ -	$ -
b) Operations and Maintenance Labor Costs	$ -	$ -
Vendor Costs for Recycling	$ -	$ -
Subtotal	$ -	$ -
7. Administrative/other Costs	$ 20,000.00	$ -
Total Annual Cost:	$ 60,800.00	$ 8,350.00

* See attached Supporting Data and Calculations.

Basis for Estimates

1	Equipment

2	Purchased Raw Materials and Supplies

3	Process Operation Costs:
Sampling Costs Approximately 100 locations were sampled. The lab analysis for this would have been $200 per sample or $20,000. There was $8,350 in costs to operate the Isocart for the project. This is based on actual project costs. **Labor Costs** Additional labor costs would have been incurred if the additional 40 days had been added to the project. A conservative addition of one person at $65/hour times 8 hours/day for 40 days would have added $20,800. **Routine Maintenance Costs for Processes**	

7	Administrative/other Costs (planner)
The costs to demobilize and remobilize would have been necessary if the samples had to be sent off-site.	

Summary

Worksheet 2: Itemized Project Funding Requirements*
(i.e., One Time Implementation Costs)

Category	Cost $
INITIAL CAPITAL INVESTMENT	
1. Design	$ -
2. Purchase	$ -
3. Installation	$ -
4. Other Capital Investment (explain)	$ -
Subtotal: Capital Investment= (C)	$ -
INSTALLATION OPERATING EXPENSES	
1. Planning/Procedure Development	$ -
2. Training	$ -
3. Miscellaneous Supplies	$ -
4. Startup/testing	$ -
5. Readiness Reviews/Management Assessment/Administrative Costs	$ -
6. Other Installation Operating Expenses (explain)	$ -
Subtotal: Installation Operating Expense = (E)	$ -
7. All company adders (G & A/PHMC Fee, MPR, GFS, Overhead, taxes, etc.)(if not contained in above items)	$ -
Total Project Funding Requirements=(C + E)	$ -
Useful Project Life = (L) 1 Years Time to Implemer 0 Months	
Estimated Project Termination/Disassembly Cost (if applicable) = (D)	$ -
(Only for Projects where L<5 years; D=0 if L>5 years)	

TOTAL LIFE-CYCLE COST SAVINGS CALCULATION FOR IPABS-IS

(Before - After) x (Useful Life) - (Total Project Funding Requirements + Termination)

Total Life Cycle Cost Savings Estimate = (B - A) x L - (C+E+D) $52,450

RETURN ON INVESTMENT CALCULATION

Return on Investment (ROI) % =

$$\frac{\textit{(Before - After) - [(Total Project Funding Requirements + Termination)/Useful Life]}}{\textit{[Total Project Funding Requirements + Project Termination]}} \times 100$$

$$ROI = \frac{(B-A)-[(C+E+D)/L}{(C+E+D)} \times 100 \quad \#DIV/0!\ \%$$

O&M Annual Recurring Costs:				Project Funding Requirements:			
Annual Costs, Before=	$	60,800	(B)	Capital Investment=	$	-	(C)
Annual Costs, After=	$	8,350	(A)	Installation Op. Exp=	$	-	(E)
Net Annual Savings=	$	52,450	(B-A)	Total Project Funds=	$	-	(C+E)

Note: Before (B) and After (A) are Operating & Maintenance Annual Recurring Costs from Worksheet 1.

SCIENCE AND TECHNOLOGY BENEFIT ANALYSIS
DEPLOYMENT APPROVALS

Technology Deployed: ORTEC ISOCART

Date Deployed: 11/15/00

EM Program(s) Impacted: Environmental Restoration Program

Approval Signatures

Lee Sente 8/21/01

Contractor Program Manager Date

N/A

Contractor Program Manager Date

Kathleen E Hain 8/23/01

DOE-ID Program Manager Date

N/A

DOE-ID Program Manager Date