SHC Project Maps

October 2016

Over the past year SHC has developed project maps that illustrate how **products** link to **outputs** for all four years of the StRAP. This visual representation of the planned research in each project, has helped SHC staff and scientists spot gaps and shortcomings in the plans as well as identify areas for further integration across SHC and ORD. While lengthy, this process has created a common understanding of the planned research and helped us become a more integrated program, which we hope will ultimately lead to better achievement of SHC's desired outcomes.

Please see the template below which will help guide you through the information in the map.

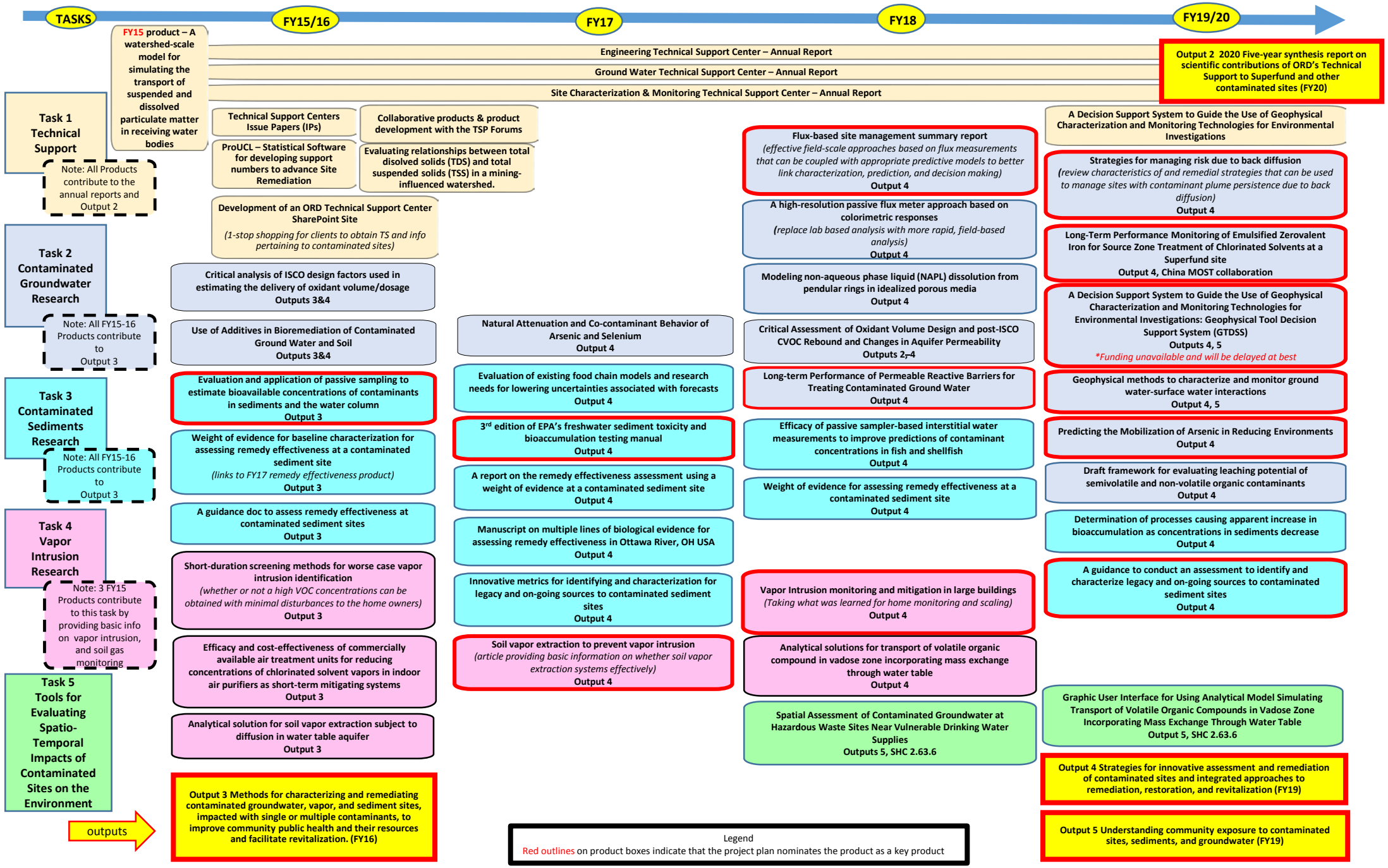
Full Product Title

(essence, nature or impact of the work)

Linkages to outputs, other products/tasks/projects, and other programs

*Red outlines indicate the product is a proposed key product or annual performance report (APR) product.

SHC Project 3.61 - Contaminated Sites Project Map – October 2016



Project 3.62 – Environmental Releases of Oils and Fuels - October 2016

TASKS	FY16	FY17	FY18	FY19
Task 1 Behavior, Fate and Effects of Oil and Spill Agents	**Documented approach on the development of fluorescence library for petroleum oils** *(Categorizing 3D High-Res fluorescence fingerprints for suite of oils chemically dispersed in water)* **Output 1**	**Report the biodegradation and toxicity of diluted bitumen crude oils to determine fate of bitumen discharged in water** *(Improved understanding of the degradation and toxicity of diluted bitumen blends. This is a high priority for OLEM and the Regions.)* **Outputs 2 & 3**	**Report on wave tank simulations characterizing the effect of dispersant on dispersion effectiveness during surface and deep ocean spills, an FOSC decision support guide.** *(evaluation of dispersant application at high flow rates and the effect on chemical composition, transport and droplet size distribution.)* **Outputs 3**	**Report on crude oil dispersion in high salinity (brine) waters.** *(dispersion of petroleum oils in brine / hyper saline waters – Artic and the Gulf)* **Output 3**
	Journal article on oil plume simulations within a wave tank: implication for spill response preparedness *(results of wave tank simulated oil plumes and documenting a calibration approach for field sensors during spills)* **Output 1**	**Report on screening of two potential reference oils for dispersant effectiveness, chemical characterization and toxicity.** *(New Reference Oil screening for OLEM – special request and funded directly from OLEM for rule-making purposes)* **Output 3**		
Task.2 Protocol Development for the NCP Product Schedule	**Peer-reviewed journal article on the evaluation of optimum mixing speeds for OEM's proposed Baffled Flask Test for the dispersant effectiveness Protocol** *(Determining the ideal mixing speed for NCP Subpart J dispersant effectiveness test for OLEM OEM.)* **Output 1**	**Report on the development of a Surface Washing Agent effectiveness protocol for products on the NCP Schedule with new reference oils.** *(Developing new Surface Washing Agent effectiveness protocol for OLEM OEM and NCP Product Schedule)* **Output 3**	**Propose an efficacy test protocol for solidifiers listed on the NCP Product Schedule.** *(Developing new solidifier effectiveness test for OLEM OEM and NCP Product Schedule.)* **Output 3**	
		Characterizing new reference oils for agent effectiveness testing. *(Full characterization, behavior and effectiveness testing of new reference oils for the NCP Product Schedule. OLEM is providing funds to ORD in FY16 for this targeted project.)* **Output 3**		
Task.3 Research to Support LUST Program Planning and Backlog Reduction	**User's Guide for PVIScreen Model including distributable software.** *(for assessing uncertainties in petroleum vapor intrusion.)* **Outputs 1 & 2**	**Mapping Private Wells and Site Densities of LUST** *(Assessment of domestic water well locations and proximity to LUST and potential brownfields sites)* **Outputs 2 & 4; feeds into SHC 2.62 (Task 5) and SHC 3.61**	**Plume transport tool for EnviroAtlas.** *(Software and user's guides for evaluating transport from released gasoline in simplified settings for use as a planning tool in the EnviroAtlas)* **Output 4; SHC 1.62**	**Models of hydrocarbon transport from sources in support of backlog reduction** *(Software and user's guides for evaluating transport from released gasoline, based on field observation of petroleum hydrocarbon distribution in various geologic settings.)* **Output 4**
	Report on ethanol corrosion studies and on-going tech support to states. *(long-term ageing and corrosion of steel tank sections in ethanol gasoline)* **Outputs 1 & 2**	**Report evaluating gasoline composition, including expanded information for state agency use.** *(describing data on gasoline composition from various nationwide data sources)* **Outputs 2 & 4**		**Output 3: Synthesizing the science and protocols necessary to advance our understanding and use of spill countermeasures listed on the NCP Product Schedule and for evaluating oil standards and dispersant effectiveness**
outputs	**Output 1: Tools for improved characterization, response and remediation of oil and fuels, to improve emergency response and other cleanup activities**	**Output 2: Tools for evaluating temporal and spatial impacts of fuels/oils site cleanup on public health and the environment, for use in oil spill response and in site remediation, restoration and revitalization**		**Output 4: Development and application of models of hydrocarbon transport to reduce the backlog of sites with UST/LUST**

Legend
Red outlines on product boxes indicate that the project plan nominates the product as a key product or APR

SHC 3.63 Sustainable Materials Management (SMM) -- October 2016

TASKS	FY16	FY17	FY18	FY19
Task 1 Tools and Methods for SMM Decision Analytics	State of the Practice for Construction, Demolition and Recycling Outputs 2 & 3	Inventories and flows of wood in the U.S. economy (*to evaluate impact of wood use on the environment and climate change for lifecycle inventories*) Outputs 2 & 3	EPA portals to Federal LCA commons and Global Network of LCA Databases (*so EPA scientists can share life cycle findings*) Outputs 1 & 2	Generating Experimental Emissions Inventory for C&D materials (*to incorporate into product-parameterized material life cycle inventories*) Outputs 2 & 3
	Updated SEFA (Spreadsheet Environmental Footprint Analysis) Tool System (*method to evaluate the potential env'l impacts of remediation*) Outputs 2 & 3	SMM Prioritization Tool (*to identify and prioritize materials, goods, and services that create environmental hotspots*) Outputs 2 & 3	Perspectives on Design of SMM Strategies through Application (*info on materials, process or technology substitution, clean technologies, & material reclamation*) Output 2	SMMDA (Decision Analytics) Framework to support materials mgmt decisions (*to explain SMMDA framework, its evaluation/refinement using case studies*) All Outputs
	Book on Incorporating Sustainability into Design of Products and Processes (*to facilitate design for sustainability*) Output 2	Dev't of a web-based tool for the application of of Green Engineering Materials Management (GEMM) for demonstrating technology substitution as SMM strategy (*for better integration with other ORD lifecycle tools*) Outputs 1 & 2		Parameterized material life cycle inventories (*to quantify life cycle impacts of changes in material management*) Outputs 1 & 2
	RIMM Tool System Technology Transfer and Demonstration (*apply RIMM to lifecycle for SMM*) Outputs 2 & 3	Interpretation of life cycle impacts to identify sustainable materials for laptop enclosures using DASEES (1.61) (*case study exploring the use of decision theory to interpret life cycle impact results*) All outputs		Demonstration of SMMDA Framework components in a Georgia Pilot Study (*to test EPA's SMM vision with/for the state of Georgia*) All Outputs
				RIMM Tool System OLEM/ORCR & ORD Collaborative Case Studies (*to test RIMM with EPA Waste program office; two case studies with key elements for each*) Outputs 2 & 3
Task 2 Beneficial Use of Materials	Guide for Use of Leaching Environmental Assessment Framework (LEAF) data and source term derivation for use of LEAF data (*to illustrate how to select LEAF methods and site data*) All Outputs	Land application of biosolids: field test 2 (*evaluate the fate of chemical/microbial species when Class B biosolids (sewage sludge) are land applied*) All Outputs	Methods to Quantify Beneficial Use of Un-encapsulated Waste (*to evaluate BU across the U.S. economy*) Outputs 2 & 3	LeachXS-Lite – LEAF data management, visualization, and automation of LEAF data to develop source term (to *update tool and allow it to be used for source-term characterization*) Output 3
	Optimizing the Beneficial Use of Waste Materials (*algorithm for eval waste reuse*) All Outputs	Mesoporous Material Derived from Poultry and Fishery Wastes (*to evaluate use of these renewable/biodegradable materials*) Outputs 1 & 2	Advances in Materials for Separation of Solvent-Water Mixtures (*for reuse/reprocessing of industrial solvents*) Output 2	Separation Process Options for Solvent Recovery and Reuse (*to develop advanced techs for energy-efficient solvent re-processing*) Output 1
			Method to Create Novel Platform Chemicals from Waste Cellulosic or Lignin Biomass (*to learn to convert these biopolymers into useful products*) Output 2	Beneficial Use Calculator (*to calculate greenhouse gases offset by beneficial use of wastes*) Output 3
				Biochar/Soil Amendments for Remediating Metals in soil All Outputs
Task 3 Innovation and Long-Term Perf	Comprehensive assessment of the flow of used electronics for selected states (*to track quantities/final disposition*) All Outputs	Designing Biochars for Remediating Metals-Contaminated Soils (*to evaluate ways of improving mine soil so as to support native plants*) Outputs 1 & 2	Protein-based Mesoporous Material (*to transform poultry feather waste to adsorbents for air and water purification*) Outputs 1 & 2	Software and Field Approaches for Landfill Moisture Characterization (tied Product 6) Output 3
	Subsurface Exothermic Reactions in MSW Landfills (*summarizes state of the science*) Outputs 1 & 3	Status of Platform Chemicals Derived from Biorefinery Methodology (*to evaluate the evolution and value of the biorefinery*) All Outputs	Evaluation of performance of MSW Containment Systems – 30 year update (*evaluating field performance*) Output 2 & 3	A Landfill Module for the Geophysical Toolbox Decision Support System (GTDSS) (*to characterize landfill makeup, moisture and potential issues*) Output 3
	Modelling Heat Generation and Migration Profiles in Landfills (*to identify factors for impact and magnitude*) Output 1	Evaluation performance of Hazardous Waste Containment Systems (*to assess and update field performance of Subtitle C landfills*) Outputs 2 & 3	Resiliency of Waste Containment Systems to Extreme Weather Events (*to understand potential issues due to climate change*) Outputs 2 & 3	Adapting materials management approaches to climate change (*evaluate issues and adaptations for extreme weather events*) Outputs 2 & 3
	Evaluation of Open Dumps in Remote Pacific Island Communities (*to evaluate practices for feasible SMM approaches*) Output 2	Mapping Soil-Moisture using Electromagnetic Induction (*evaluating technologies to identify important factors*) Output 3	Methodology for tracking, quantifying and reporting used electronics in the U.S. (*to evaluate prevention and recycling*) Output 3	Recovery of Critical Elements and the Conversion from Electronic Waste (*to identify ways to recover critical elements , especially those regulated under RCRA.*) Output 3
				Scientific Review of Materials Management Requirements (*evaluate the effectiveness of policies from 1980s and 1990s with new science*) Output 3
				State of Bioreactor Landfills (*to evaluate performance of these landfills for future regulatory considerations*) Output 3
Task 4 Net zero		Managing Food Waste in Columbia, SC (*case study on integrated mgmt strategies for organic waste*) Output 2		White Paper – Steps in Conducting an Organics Diversion Plan (*Guidance for a practical, effective organics diversion plan*) Output 2
		Towards Net Zero Waste: Co-Digestion at Fort Huachuca (*to assess anaerobically digesting food waste with wastewater*) Output 2		Comparison and Evaluation of Small-Scale Food Technologies towards Net Zero Waste (*to assess a variety of on-site food waste mgmt devices for benefits and limitations*) Output 3
		Output 1 - Sustainable Materials management options for industrial, construction/demo, and municipal materials including reduction, reuse, and recycling/repurposing to protect community public health and the environment	Output 3 Tools for evaluating temporal and spatial impacts of materials management on public health and the environment, for use in restoration and revitalization decisions making	Output 2 Integrated approaches for sustainable materials management

Legend

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C&D = construction and demolition waste **MSW** = municipal solid waste