EXECUTING THE NEXT GENERATION MODEL FOR ACCELERATING THE ECONOMIC VALUE OF PROPERTIES ENVIRONMENTALLY RESTORED AND REMEDIATED

ABSTRACT – As analyzed in this document, the US has window of opportunity to take an extensive portfolio of stranded real estate assets and put them to economic and recreational reuse. This is a national and strategic priority. Elevating stranded assets with a reuse that matches the positive economic trajectory that can occur in the US provides a pathway for US-based and other international companies to see us as the place for growth. This can be done because the current regulatory structure in place has done an admirable job of identifying immediate and significant risks. The regulatory system should now take these real and measurable successes and apply the approaches identified to reach a new generation of economic and environmental goals with precision, speed, and agility befitting to the world's most successful economic engine and cradle of ingenuity and risk management, the United States.

CMM CONVERGENCE MITIGATION MANAGEMENT

MARCH 2017

"Across America, there are thousands of underutilized and underperforming properties. Many of these properties contain environmental liabilities, which are, under existing state and federal law, being cleaned-up. The tenuous nature of the real estate market coupled with regulatory risk keeps developers and property-owners from advancing dialog on solutions that bridge risk reduction with economic opportunity. We can do better."

Context

The United States and its economy are at a crossroads. The ingenuity of American business and citizens has long been a mainstay of the U.S. economy. American's have created and led some of the world's foremost industries ranging from energy, chemical, automotive, defense and security, agriculture, finance, information technology, electronics, and healthcare. Underlying a spirit of innovation and competitiveness are American's values including ingenuity, persistence, hard work and dedication.

Since the late 1960s the U.S. has adopted environmental laws to protect human health and the environment. Laws including the Clean Air Act (CAA), Clean Water Act (CWA), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, aka Superfund) were created during a time of rapid industrialization, and in response to an era of wastes and pollution that were a byproduct of a country that was rapidly emerging in a global economy. However, those laws have not necessarily aligned or evolved in-step with America's growth as a nation or its stance and competitiveness in a global economy.

The energy, chemical, automotive, defense and security, agriculture and food systems, and mining sectors each represent a backbone of the American heritage, and remain an essential partner to our industrious future. For more than 100 years, these and other sectors have been the lifeline of American infrastructure, job creation, and economic development. These sectors have led to the development of significant breakthroughs in medicine, clean energy, efficient transportation, and communications.

However, on the heels of innovation, creativity, and prosperity, American businesses left another kind of legacy, environmental risks. For the past four decades, most major American industrial companies have managed their environmental liabilities in accordance with regulatory requirements applicable at the time. To maintain their "social license" to operate, companies have taken the initiative to go beyond compliance. Companies have invested in innovative technologies and partnerships that reduce or altogether extinguish environmental liabilities so that they no longer incur financial, social, health, or environmental risks.

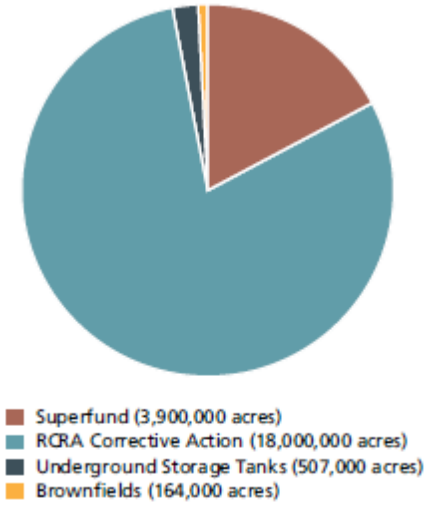
Today

It has become clear that the regulatory regime that protected human health and the environment in the 1970s-1990s has not kept pace with the advancement of technology and now actually hinders the capacity for industry to remain globally competitive and socially responsible. To remain competitive and financially solvent, companies need to innovate, grow, and operate in a safe, efficient and reliable manner. Clinging to a regulatory regime that is 40+ years old is minimizing the capacity of companies to go beyond compliance and integrate technology (that is proven and exists today) toward more expedient, efficient, and effective cleanup of contaminated properties.

America sits atop a fixed amount of real estate. Based upon its industrious beginnings, many contaminated properties lie at the nexus of critical ports, waterways, and regions of commerce. Underutilized contaminated property not only carries an environmental risk, but also a social/community stigma and an economic barrier. For America to thrive it is essential that we leverage all our assets toward creating and realizing a more prosperous and sustainable future.

America's Corporate Environmental Legacy and Landscape: Industry Trends and Observations

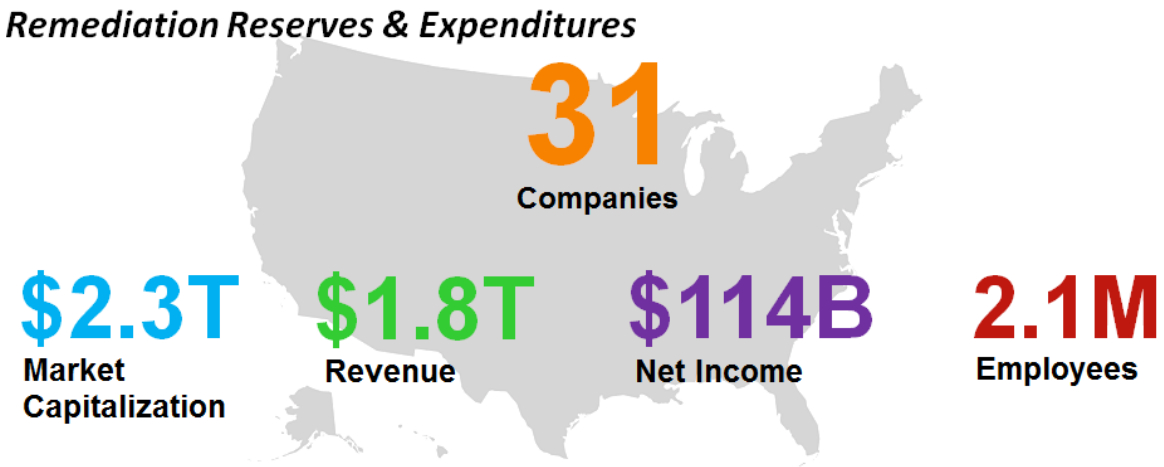
Management of environmental liabilities in the United States is a trillion-dollar industry and increasing. More than one trillion dollars of environmental liabilities are known and being actively cleaned-up under state-and-federal regulations including CERCA. Currently there are more than 22 million acres of land within the EPA's clean-up program portfolio[i] (See chart to the right and the Appendix for additional information).



Based on the polluter-pays principle, U.S. companies have financial responsibility for cleaning up properties which they contaminated. In many cases, U.S. companies are also paying for the cleanup of properties that they now own (*i.e.*, through acquisition) even if they were not the original polluter.

For the past decade, Convergence Mitigation Management (CMM) has been working closely with industry to benchmark best practices in corporate environmental performance. In the fall of 2016, CMM gathered information from 31 large industrial companies with U.S. headquarters and operations. The companies represented a cross-section of sectors including chemical, rail, oil/gas, telecommunication, automotive, agriculture, aerospace/defense, conglomerate, pharmaceutical, biosciences, and others. In total, the 31 companies represented a market capitalization of more than $2.3 trillion and had 2016 revenues in excess of $1.8 trillion.

Further, these select companies employ more than 2.1 million people worldwide. The environmental reserves for these companies range between $60 million to greater than $2 billion annually. In aggregate, the 31 companies reviewed have reserved more than $13B for their known environmental liabilities. With regard to annual expenditures, the companies range from less than $15 million to greater than $500 million in annual spend for environmental liabilities. In addition, in aggregate, the 31 companies spend more than $2.5 billion on their environmental liabilities each year. The visual below summarizes these figures:



Global Context	
RESERVES	SPEND
• Total greater than $13B	• Total greater than $2.5B
• Range <$60M to >$2B	• Range <15M to >$500M

Source: CMM

This summary information on the environmental reserve and spend of 31 U.S. companies is intended for illustration purposes only. These companies represent a subset of the U.S. based organizations, which have environmental liabilities. The point of this illustration is to demonstrate the scale and impact of these companies. Just 31 large industrials spend more than $2.5 billion annually on environmental liabilities.

Best Practices from Industry

Today, it is not enough to clean-up contaminated property in-line with the letter of the law. Increasingly, public-and-private interests are converging and collaborating to create and capture sustainable, long-term value from property restoration, reuse, and redevelopment. While historically the financial and regulatory focus of environmental liabilities has been placed on the polluter-pays principle, more and more stakeholders in government, industry, not-for-profit, and local communities are working together to devise integrated solutions, which transform blighted properties into strategic, critical, and productive infrastructures and end-uses.

This integrated approach has yielded billions of dollars of sustainable development across the U.S., where economic, environmental, and social performance is achieved. Over the past decade,

CMM has benchmarked and observed the spending trends and innovative practices of America's biggest companies as part of their goal to optimize risk management and mitigation of their known environmental liabilities. To optimize their environmental clean-up expenditures, the best companies have adopted models of public-private partnerships, which demonstrate the ingenuity of America in the face of increasing stakeholder expectations, competitive and challenging market conditions. Further, in aggregate, these examples provide a pragmatic framework for pursuing and achieving superior economic and environmental performance.

Dow Chemical & Nature Conservancy Partnership[ii]

In 2011, The Nature Conservancy and The Dow Chemical Company set out together to achieve an ambitious goal: demonstrating that building nature's value into business strategy could lead to better outcomes for companies and conservation. This unique partnership and collaboration is taking a hard-look at the economics of ecosystems including how natural systems support the resiliency, performance, and security of our natural and built environments.

Scientists, engineers, and economists from both organizations are working together to analyze the various services that nature provides to Dow's business operations and the communities in which they operate.

Those ecosystem services include water, land, air, oceans and a variety of plant and animal life.

The work involves validating tools and models that can assign a value to these ecosystem services in order to support Dow's decision-making when it comes to designing, constructing and operating its manufacturing sites.

By combining its resources and expertise, Dow has been successful in integrating the value of nature into its business decision-making.

But the partnership has not only helped build the case for why businesses should invest in nature; it has developed the tools and practices to assess business projects as they relate to nature.

Highlights include:

- Research showing that forests could be used to reduce air pollution and those natural solutions could help protect business assets from storm damage and mitigate risks associated with a water shortages.
- In early 2016, the collaboration released the ESII Tool, designed to help corporate, government, and organization decision makers rapidly assess the value of nature to a business or community.

This work is an example of how companies and organizations from different sectors can work together to make real change happen. The partnership hopes its efforts can serve as

a model for how other companies can incorporate nature into their business practices and increase investment in protecting nature's valuable resources.

Aerojet Rocketdyne & Golden State Water Company Partnership in California[iii]

Aerojet Rocketdyne, a subsidiary of Aerojet Rocketdyne Holdings, Inc. (NYSE: AJRD), Conceived in 2011, the American River Pipeline Conveyance Project (Project) is an example of regional partners (State, City/Municipal and Company) coming together to solve water supply reliability issues at a local level. The Project was developed to provide a replacement water supply for Golden State Water Company's (GSWC) customers in Gold River and parts of the City of Rancho Cordova utilizing existing treatment capacity at Carmichael Water District's (CWD) Water Treatment Plant. The project enables CWD to divert and deliver up to 4.5 million gallons of water per day. The replacement water supply originates from the remediated Aerojet Rocketdyne groundwater discharged to the American River at Buffalo Creek.

Project elements include:

- Approximately 7,400 feet of 24-inch diameter pipeline crossing the American River. The river crossing occurred approximately 80 feet below the river bed utilizing a pressure drilling method in order to leave the river bed and channel undisturbed.
- Existing abandoned water diversion assets dating back to the 1950s were demolished and the river bank was restored to a natural setting. This included the removal of three concrete intake structures and an existing exposed pipeline crossing the American River.
- Construction that took place on the northern bank was within an unnamed drainage outlet. The area was reconstructed with a naturalized channel, culvert, and improved riparian access to the upstream habitat.
- The project includes pump back capabilities to provide water to CWD from GSWC during emergency conditions.

Longer-term regional benefits include reduced groundwater pumping during wet years, which will help better manage the underlying groundwater basin. Working with the Regional Water Authority, a portion of the project funding was procured from the State under the Governor's Water Action Plan (Proposition 84). The project is one of 17 Sacramento-area projects awarded $9.7 million in California Department of Water Resources grants in 2014 for projects designed to help shore up the area's water supply reliability during the drought and beyond.

Billon Dollar Investment in American Cities: A Partnership between Honeywell, USEPA and Baltimore[iv]

The Baltimore Chrome Works Facility was constructed in the mid-nineteenth century on 18 acres of waterfront property near Fells Point. Chromium ore was processed to produce

chromium chemicals until 1985. Allied Chemicals, later AlliedSignal, now Honeywell, acquired the plant in 1954.

Environmental investigations conducted at the site during the 1980's established that large quantities of chromium, calculated to be approximately 62 pounds per day, were migrating from the site, with most of the chromium being released to the Baltimore harbor.

Through the application of sound science and best practices in engineering, Honeywell worked under the supervision of federal and state regulators, and as a key member of the redevelopment team, to ensure that the property was safe for reuse. The Harbor Point project demonstrates that former manufacturing sites can be reclaimed for productive use, resulting in new jobs and community opportunity.

Harbor Point is already redefining city life and expanding the urban experience in Baltimore, Maryland. Total buildout of this mixed-use RCRA redevelopment project, including office and residential buildings, specialized retail, hotel space, approximately 9.5 acres of parks and open space, off-street parking and a waterfront promenade, is projected to occur over the next 10 years with a total project cost of approximately $1 billion. The completed project will create 7,100 construction jobs and 6,600 permanent jobs.

RACER[v] Trust: A Model Framework for Property Restoration, Reuse, Redevelopment

The RACER Trust was created in March 2011 by the U.S. Bankruptcy Court to clean up and position for redevelopment properties and other facilities owned by the former General Motors Corp. before its 2009 bankruptcy.

When the RACER Trust was formed, it owned more than 44 million square feet of industrial space in 66 buildings across 7,000 acres in 14 states, principally in the Midwest and Northeast.

RACER is one of the largest holders of industrial property in the United States and is the largest environmental response and remediation trust in U.S. history.

RACER will clean up the properties to ensure that environmental conditions are not an impediment to sale or industrial re-use. In fact, in most cases, RACER properties can be sold for new uses even before environmental cleanups are started or completed, assuming RACER is guaranteed continuing access to the properties to conduct cleanup work.

Redeveloping the sites for new job-creating uses begins with meetings that RACER conducts with local elected officials, community leaders and economic development organizations. Its goal is to understand the local community's common vision for the optimal re-use of each location. Based on this common vision, RACER will determine how best to market the property for sale to prospective buyers. RACER then will publish a detailed marketing brochure and a standard letter containing the terms for purchase and formally open the bidding process.

A common thread across these best practices are partnerships based on trust. In each instance the partners share a common vision for an outcome and have come together to define a framework for open collaboration.

In reflection of these and other examples of successful partnership, CMM has also observed that many environmental liability sites are moving into longer-term operations, maintenance and monitoring (OMM). For many sites (and site owners), this means that the environmental contamination has been identified and characterized. For these sites, a plan for remediation has been development and implemented. The OMM plan stipulates the balance of known contamination that needs to be monitored and remediated.

Creating Value

Demarcation of sites as being in OMM does not mean that the site cannot be used for other uses while it is undergoing OMM. However, as a precaution, many corporations do not actively market or sell properties in OMM. Increasingly companies are interested in marketing and selling cleaned-up / remediated properties so that they can reinfuse capital back into their businesses. By creating value from underperforming assets, companies are able to revitalize their relationships with communities, reinvest in their workforce/people, and put capital back into their businesses in the form of new equipment, infrastructure, and other support. The value proposition for accelerating the clean-up of contaminated properties is simple:

Value Creation =

**Smart Cleanup + Reputation Enhancement +
Site Redeployment**

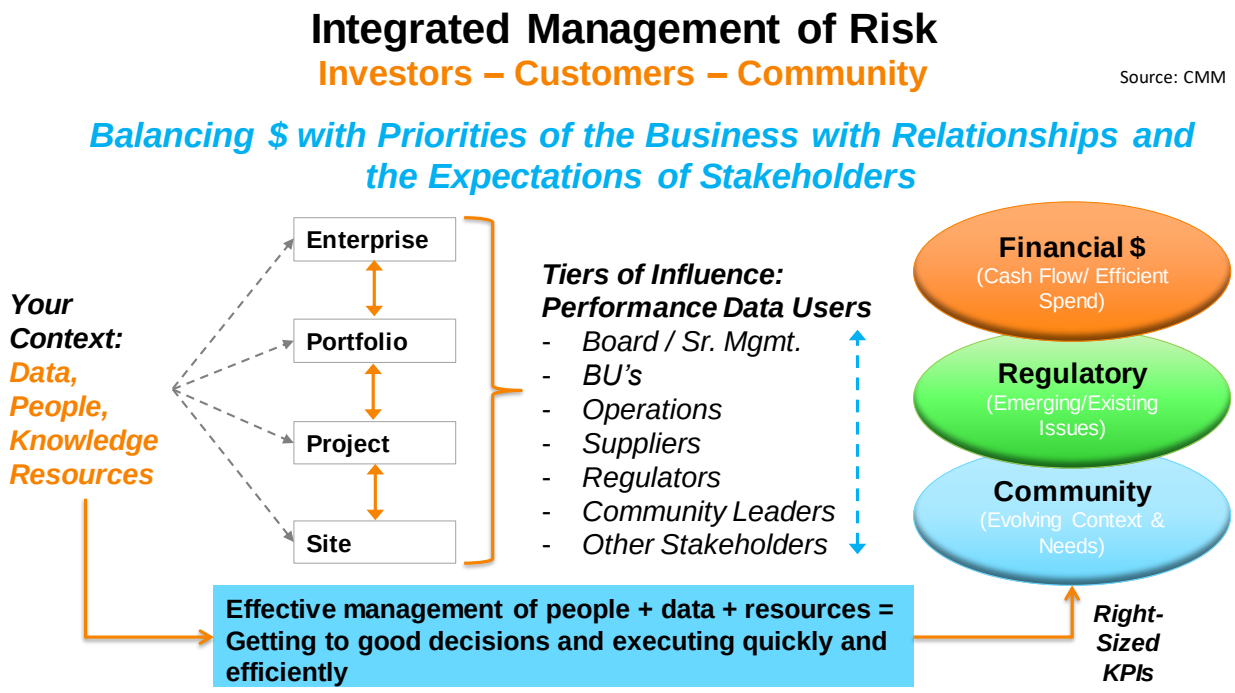
Each year, trillions of dollars are being reserved and spent (by U.S. corporations) on the cleanup of existing environmental liabilities, as well as the continued operations, maintenance and monitoring (OMM) of remediated sites.

Too often, former regulatory clean-up standards have not provided a framework for public-private partnerships. As a result, corporations remediate contaminated properties under the letter of the law, but don't often have incentives to align their assets (remediated properties) with highest and best public uses which could, particularly in our current environment, maximize economic potential for communities all across the U.S.

Public-private partnership models have been deployed with notable success. Adopting best practices from those models can yield a framework by which America can expedite environmental performance in-step with pragmatic solutions for economic recovery, growth, and development – particularly in communities hit significantly by economic downturn in the past decade.

By working together, business-government-civil society can turn former environmental liabilities into higher value assets that have measureable impacts tied to environmental, economic, and community performance.

In finding a new path forward we need to comprehend how these underutilized sites are being addressed. Based upon our experience with successful organizations, an integrated model for managing environmental risk (presented below) provides a more effective management of resources in-step with creating and capturing economic value.



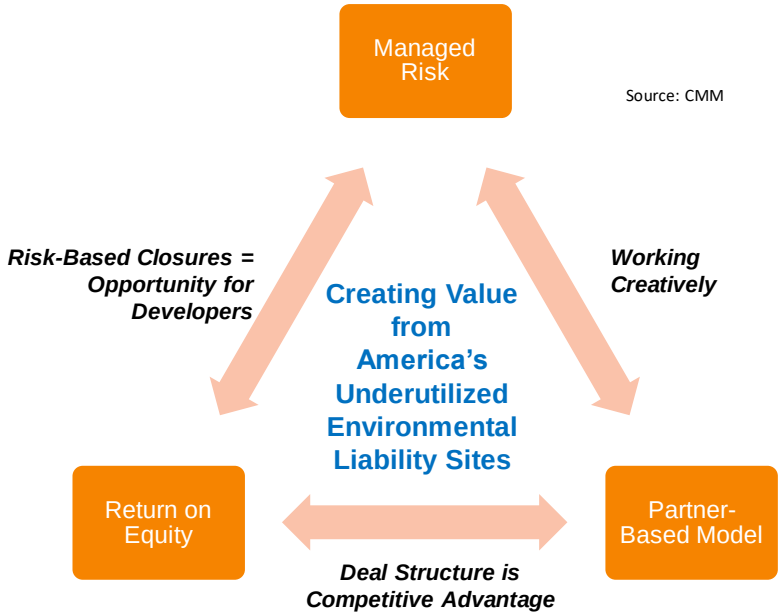
A Better Way to Achieve Environmental and Economic Results

Best practices from government, industry, not-for-profit, and community-based partnerships have demonstrated that environmental performance does not have to be exclusive of positive economic growth, community revitalization, and technological innovation. By beginning with the end-in-mind and working toward a common vision using a set of mutual principles which guide and align resources, stakeholders can attain mutual results. The examples noted in this paper demonstrate the potential for America to:

- **Managed Risk** – Refresh existing environmental regulatory controls that limit the capacity for industry to thrive.

- **Return on Equity** – Revitalize and redevelop underutilized properties so that they become community and national assets.

- **Partner-Based Model** – Reimagine partnerships, initiate opportunities, and implement solutions for protecting human health and the environment in ways that dramatically improve American quality of life.



Time for an Integrated Approach to Environmental Progress

Since the designation of Superfund in 1980 and the Brownfields Program in 1998, EPA's portfolio of cleanup programs have contributed to the protection of human health and the environment. It has been two decades since the EPA launched the Brownfield Program. Since that time there has been significant advancements in technology and changes in the economy. The real-estate market has gone through several booms and busts during this time – as have the hundreds of companies that continue to manage corporate environmental liabilities.

EPA has validated that the costs of cleanup programs and Superfund in particular, are increasing substantially. EPA has estimated Superfund will require between $335 million to $681 million per year to address future cleanup goals of those sites within the program.

Since the 1970s the command-and-control structure of the EPA and the social forces of civil society have provided a push and pull framework to ensure businesses continue to operate within the construct of the law and societies expectations. Today, the best businesses are pushing the boundaries of sustainable innovation, business resiliency and risk management. Companies have recognized that there is substantial business value in leading sustainable enterprises (*i.e.*, business models, which embrace the circular economy, sustainable design, cradle-to-cradle materials/product stewardship, triple bottom line, and other models illustrative of superior environmental business performance).

As a result, businesses are now more responsive to market needs and responsible to existing (and emerging) regulations. The regulatory frameworks of the past four decades remain vital to the foundation of environmental protection. These frameworks have helped business cleanup environmental risk while also helping to instill new governance and management structures that value and anticipate environmental risks before they occur. The net result of four decades of regulatory-societal-and-industrial collaboration is the establishment of a stronger foundation of environmental protections and environmental innovations.

The cost of cleaning up contaminated properties is rising. However, it is anticipated that amid regulatory controls and social expectations, fewer new environmental liabilities should be created into the future. The next generation of environmental reforms should balance the opportunity for business to reinvest their resources (people, capital, technology, and infrastructure) in ways that meet the regulatory requirements and optimize the economic, environmental, and societal impacts within communities.

The Foundation for a New Approach

In just 240 years America has established itself as a global economic leader, respected and renowned for its creativity, innovation, and inclusive culture. It's well substantiated that solving complex challenges requires interdisciplinary teams who can see eye-to-eye and who leverage resources and direct focus on shared solutions. Environmental performance and economic growth are not mutually exclusive.

A flexible, market-based approach, incorporating sound-science and mutual discourse is viewed favorably by industry, government, not-for-profit, and community groups. This model is grounded in managing risk, while optimizing economic and environmental value.

Substantial precedent for such models and frameworks of sustainable innovation already exists. Based upon the best approaches we have benchmarked that have successfully achieved environmental and economic performance, the following elements are proposed for a new American framework for reinvigorating its economy while significantly enhancing quality of life and environmental protections:

- **Market-based, Opt-In Process** (Provide a flexible model and accessible pathway for companies to opt-into a common framework clean-up program that want to position their liabilities as an asset)

- **Fast-track Environmental Clean-up and Property Restoration** (Incentive and mobilize central and regional coordination to ensure contaminated properties are cleaned-up in a timely, cost-conscious, and efficient manner)

- **Regionally Significant Infrastructure Redevelopment Plans** (Creating economic opportunity and value in strategically significant regions critical to U.S. capabilities ranging from defense, logistics, transportation, communications, healthcare, retail, innovation, technology, and so on. By focusing on critical infrastructure, regional assets,

national security, and economic opportunities, environmental restoration can enable the U.S. to position itself for a more prosperous, secure, and sustainable future.)

- **Innovation in Environmental Restoration, Protection, and Services** (Some properties simply may not lend themselves to regional economic development or market-based redevelopment. However, leveraging land as opportunities for technology testing, deployment, research and development can enable both the clean-up of contaminated properties and more productive end-uses. Evaluating and adopting opportunities for enhancing ecosystem services: carbon sequestration, bioremediation, wetlands creation and mitigation, biodiversity protection, conservation easements, etc. can also enable the U.S. to enhance environmental protections while meeting State, regional, national, and global environmental objectives).

In Summary

America continues to evolve as a nation, and as a force for good in a global society. Today, the U.S. is facing a new kind of environmental challenge. The rapid adoption of technology has disrupted industries, making some obsolete while giving rise to entirely new ones. The Internet-of-Things (IoT), Artificial Intelligence (AI), cognitive computing, rapid prototyping, bioinformatics, 3D printing, and a host of other technologies and applications are enabling the more efficient production and consumption of goods and services. This evolution of industrial capability has fostered a service economy, while dramatically re-calibrated the traditional manufacturing economy.

To remain competitive, respected, and valued on a global stage, as well as protect the rights of its citizens nationally, the U.S. should integrate the best practices from those public-private partnerships that have and continue to capture sustainable value.

Advancements in technology and innovative best practices from government and industry have already demonstrated the potential for creating and capturing value from the redevelopment of contaminated properties.

A new social-economic metric is evolving which can, if adequately tested and verified, accelerate the creation of economic value from remediated properties. We suggest that a pragmatic study be commissioned to assess the viability of accelerating the environmental cleanup of contaminated properties, which can yield significant near-term economic impacts.

In taking an integrated approach for accelerating the clean-up of environmental liabilities such as the framework proposed above, several immediate goals are achievable:

- **Strengthening Business** – Companies with applicable sites can opt-in to a framework that may allow them to clean-up sites sooner than typically prescribed under current regulatory structures. This would allow companies to have “an end in mind” for some sites, including a definable strategy for spending capital with less risk and uncertainty. As

such, companies would have the option to create, in partnership with other stakeholders, a community value from the underperforming site.

- **Achieving Environmental Performance: Enhancing Human Health and the Environment** – EPA will benefit from this kind of integrated framework because it will be able to demonstrate success while better aligning its limited staff, time, and financial resources to the most pressing environmental challenges, not those that are legacy items being managed under existing regulatory guidelines. By enabling a portion of corporate environmental liabilities (which need to be vetted and determined) to go into this framework, the EPA would be able to reach environmental closures and success sooner for a significant number of sites. Further, this would also enable innovation with the marketplace, yielding environmental partnerships and impacts that are unique and extend the mission and value of EPA into the national landscape. Finally, this framework would support EPA in prioritizing its budget toward environmental challenges in need of greater focus and attention.
- **Managing Long-Term Environmental Risk** – The proposed framework is different from the National Brownfield's program. This framework targets a specific population of sites within most large corporate environmental liability portfolio's which are well established, moving into (or currently in) OMM, and which have potential for enhancing America's regional economy through property redeployment redevelopment and as they intersect with national security and regional economic and infrastructure development objectives. As a result, the clean-up program(s) intended for protecting human health and the environment will continue. Short-and-long-term environmental risks will continue to be identified, evaluated, managed and mitigated.
- **Create Economic Value –** The key elements of a successful approach would integrate market-facing performance metrics which have been demonstrated and accomplished by leading-edge partnerships. These elements would be brought together to advance the next-generation environmental program:
  - Developing a Public-private partnership framework that enables agility, performance, and impact (*i.e.*, beginning with the end in mind and assembling the best doers from industry, academia, government, small business, and other key stakeholders).
  - Accelerated adoption of proven technologies (*i.e.*, de-risking and realigning the technology options which have demonstrated potential for faster cleanups and at lower total cost of operation).
  - Targeted regional economic advancement zones and stakeholders to collaborate on economic security as a national priority (*i.e.*, working with the National Manufacturers Council and others to determine regional priorities for advancing specific sites and assets in support of the revitalization of the U.S. manufacturing, technology, transportation, energy and utility, and infrastructure economies).

Through mutual agreements from public-private partners, America can rebuild its infrastructure, redeploy underutilized assets, and rejuvenate the spirit and potential of communities.

About CMM

Summary

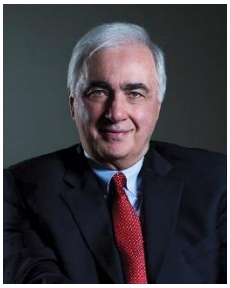
Convergence Mitigation Management (CMM), www.cmm-insights.com, is a high-value business intelligence, strategy, and management consultancy providing custom advisory services to business, government, applied research, and non-governmental organizations.

CMM is known for its integrity, accountability, tact, and confidentiality. CMM is a trusted advisor to a diversity of businesses, from small-to-medium sized companies to large Fortune 100 clients. CMM works with senior leaders to plan, prepare, mobilize, and transition their resources to achieve business success.

We assist clients in identifying, assessing, and understanding the converging issues and risks that have material impact their organization; and to integrate knowledge and resources into a tailored strategy for mitigating and managing risk.

Mark Coleman, President, CMM

Mark Coleman is the President of Convergence, Mitigation, Management (CMM) LLC, which provides custom business intelligence and advisory services for business, government, applied research, and non-governmental organizations. Mr. Coleman has advised hundreds of organizations in the areas of sustainability, risk, innovation, operational effectiveness, and business strategy. A recognized voice, business advisor and consultant on the convergence of sustainability, environmental stewardship, energy, technology, and innovation, Mr. Coleman has inspired audiences with his expertise, wit and wisdom. An award winning author, Mr. Coleman's second published book, "*Time to Trust: Mobilizing Humanity for a Sustainable Future"* was awarded a Silver Medal by the Axiom Business Books Awards in the "Business Ethics" category and was also an Award-Winning Finalist in the "Social Change" category of the 2015 International Book Awards. *Time to Trust* followed his seminal first book*, "The Sustainability Generation: The Politics of Change and Why Personal Accountability is Essential NOW!"* Mr. Coleman holds a Master of Science in Environmental Management and Policy from Rensselaer Polytechnic Institute and two Bachelor of Arts in Environmental Studies and Geography from Binghamton University. Mr. Coleman resides in the Finger Lakes region of New York with his wife Aileen and two sons, Owen and Neal.



Dennis Minano, Managing Director, CMM

Dennis R. Minano is a former senior automotive executive and current consultant in environmental, energy, governance, and transportation infrastructure strategies. He serves as a board member, trustee, executive leader and senior advisor to companies, non-profit organizations, economic development organizations and health care institutions. This follows a career at General Motors, where he served as Vice president of Public Policy, Chief

Environmental Officer and Vice President of Communications. At GM, he implemented cutting edge environmental and energy policies for its products and plants. He was responsible for GM's Public Policy Center, a consolidation of Environmental and Energy, Government Relations, Diversity, Corporate affairs, and the office of the Chief Economist. Earlier in his career, in GM's Office of the General Counsel, he managed high-risk legal matters that impacted product decisions. Mr. Minano holds a Juris Doctor degree and is a member of various Federal courts, including the U.S. Supreme Court, and was an adjunct Professor of Environmental Law at the University of Detroit Law School.

Specialized Knowledge, Experience, and Tailored Approach

For the past fourteen years, CMM has led the design, development, and facilitation of a portfolio of peer-to-peer workshops in the critical areas of Corporate Remediation, Product Stewardship, Safety, and Environmental Compliance. These workshops have brought together corporate environmental and risk leaders representing global businesses from all major industrial sectors: rail, automotive, oil and gas, utilities, mining, aerospace/defense, conglomerate, chemical, and others. This engagement has also enveloped government agencies, NGOs, not-for-profit organizations, and other stakeholders.

This multi-year knowledge exchange has yielded an ongoing dialog around the strategic, organizational, tactical, technology, science, advocacy, communications, regulatory and compliance, and financial aspects of cleaning up contaminated properties, facilities, and land assets. This unique workshop series brings together 20-30 global companies each year to benchmark on best practices in stakeholder communications, relations, knowledge sharing, organizational and operational efficiency and improvements.

CMM has facilitated these programs across a 12-month planning cycle with includes outreach and communications to corporate, engineering, government, research, not-for-profit, and other stakeholder interests. CMM works with these stakeholders to establish the right balance of data, information, and interest to establish an agenda that serves the needs of all stakeholders. CMM provides active facilitation of the workshop and incorporates shareholder-derived insights (from sensing interviews) with data collected from surveys and other sources to support a high –value knowledge exchange.

Contact

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APPENDIX

EPA Cleanup Portfolio, A Strong Legacy of Performance

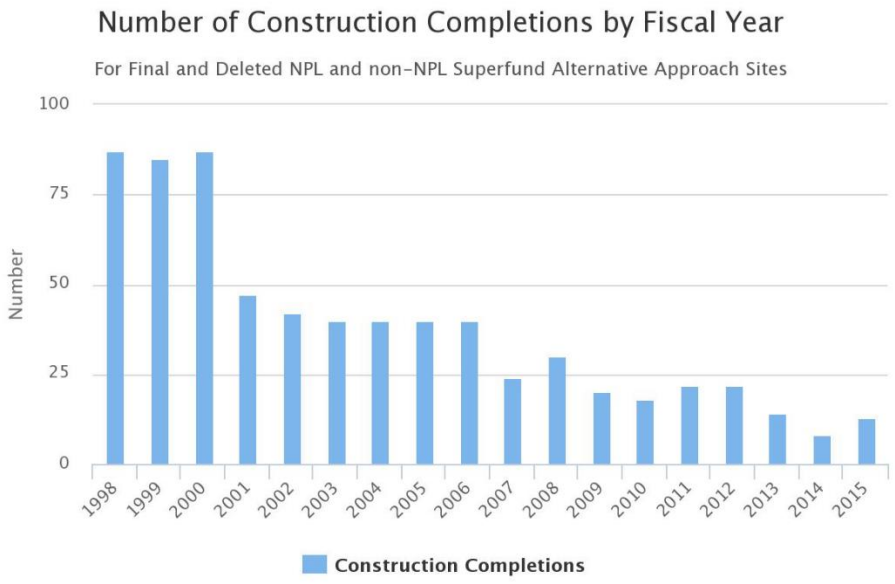
Respectively, the EPA's Superfund and RCRA programs have contributed to positive performance metrics. The table below summarizes the performance measures for each program.

Performance Metrics	
Superfund	*RCRA*

• Remedial Site Assessment Completions
• Remediation Action Project Completions
• Construction Completions
• Environmental Indictors
  ○ Human Exposure Under Control
  ○ Ground Water Migration Under Control
• Sitewide Ready for Anticipated Use
	Achieving final cleanup is the main objective of RCRA
	
	Two environmental indicators include:
	• Current Human Exposures Under Control
	• Migration of Contaminated Groundwater Under Control
	
	Long-term measures:
	• Final Remedy Construction
	• Performance Standards Attained

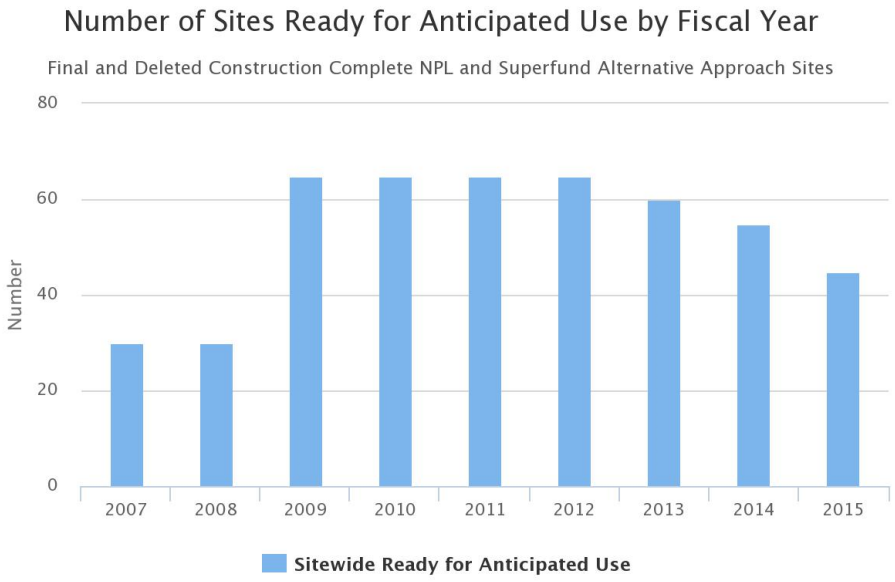
Source: EPA[vi]

As shown in the chart below, the number of construction completions has been steadily decreasing (for final and deleted National Priority List – NPL and non-NPL Superfund Sites) since 1998. In 2015 there, 13 total construction completions, whereas in 2000 there were over 75. The Superfund Program has been successfully achieving construction completions of high priority sites for nearly two decades.



Source: EPA, https://www.epa.gov/superfund/superfund-remedial-performance-measures

As depicted in the chart below, EPA's Superfund Program has also resulted in a portfolio of formerly contaminated sites which are now ready for anticipated use. Through the "Sitewide Ready for Anticipated Use (SWRAU) designation, NPL sites are deemed final insofar as the entire site has all cleanup goals accomplished registered in record(s) of decision and other remedy decision document(s) and unaccepted risks have been accounted for reasonably anticipated future land uses of the site. Further, all institutional or other controls of the record decision(s) or other remedy decision document(s) have been put into place.



Source: EPA, https://www.epa.gov/superfund/superfund-remedial-performance-measures

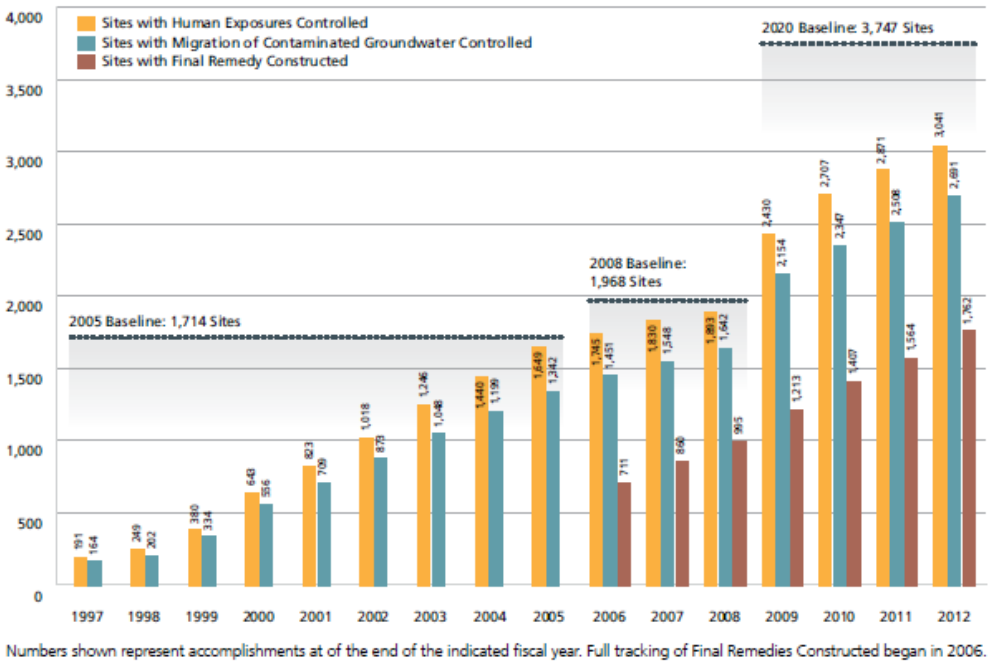
The efficacy of the Superfund Program has been strong, resulting in tangible benefits including:

- Protecting communities' health and ecosystems
- Preparing land for productive use
- Obligating funds for construction and post-construction activities
- Cleaning-up hazardous waste
- Safeguarding communities from imminent threats
- Funding new construction projects
- Ensuring long-term protection of human health and the environment

According to EPA[vii], sites in reuse have supported 3,900 businesses (in 2015) representing annual sales of $29 billion and an employment of more than 108,000 earning a combined income of $7.8 billion.

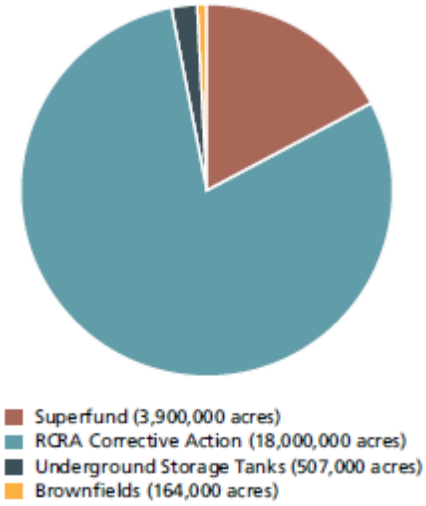
The RCRA Program has also demonstrated strong performance and impact on protecting human health and the environment. By the end of FY 2012 the RCRA program had reached final remedy construction at more than 1,700 sites (covering more than 2.1 million acres). Further, EPA's performance metrics for meeting human exposures and groundwater were also achieved at 3,041 and 2,691 sites respectively.

The chart below highlights the cumulative number of sites with human exposures controlled, groundwater migration controlled, and final remedy constructed.



Source: EPA, RCRA Corrective Action: Case Studies Report, April 2013, https://archive.epa.gov/epawaste/hazard/web/pdf/rcracorrective.pdf

The EPA Cleanup Program portfolio[viii] includes:



- Superfund (1980): sites that are abandoned, bankrupt, or have multiple responsible parties and uncontrolled releases of hazardous substances (3.9 million acres).
- RCRA Corrective Action (1984): sites with viable owners or operators that have treated, stored, or disposed of hazardous waste since 1980 and released hazardous constituents to the environment (18 million acres).
- Underground Storage Tanks (1984): leaking underground storage tanks (507,000 acres).
- Brownfields (1998): contaminated sites (Superfund, RCRA, or other) restored to usable property with assistance from a Brownfields grant (164,000 acres).

EPA estimates that more than 6,000 facilities in the U.S. are subject to RCRA Corrective Action. Currently 3,747 RCRA facilities (known as the 2020 Universe) are part of the program covering 18 million acres (a landmass the size of West Virginia). The median site size is 32 acres;

however, the average size is much larger (4,800 acres) because about 90 sites in the portfolio of 10,000 acres or more, affecting the average.

End Notes

[i] For more information see:
- https://archive.epa.gov/epawaste/hazard/web/pdf/rcracorrective.pdf

[ii] For more information on The Nature Conservancy and Dow Chemical partnership:
- http://www.nature.org/about-us/working-with-companies/companies-we-work-with/dow/
- http://www.dow.com/en-us/science-and-sustainability/collaborations/nature-conservancy
- http://www.dow.com/en-us/news/press-releases/dow-and-the-nature-conservancy-collaborate

[iii] For additional information on the Aerojet Rocketdyne partnership with Golden State Water see:
- http://www.rocket.com/article/aerojet-rocketdyne-supports-american-river-pipeline-conveyance-project-dedication

[iv] For additional information on Baltimore Harbor see:
- https://www.epa.gov/hwcorrectiveaction/hazardous-waste-cleanup-honeywell-baltimore-inner-harbor-baltimore-md
- http://www.mde.state.md.us/assets/document/Allied%20Honeywell%20short.pdf
- https://www.honeywell.com/newsroom/news/2015/03/former-honeywell-manufacturing-site-becomes-national-brownfield-model

[v] For more information on RACER Trust:
- http://www.racertrust.org/About_RACER/About_Us

[vi] Source: EPA
https://www.epa.gov/superfund/superfund-remedial-performance-measures
https://www.epa.gov/hw/measuring-progress-resource-conservation-and-recovery-act-rcra-corrective-action-facilities

[vii] Source: EPA
https://www.epa.gov/superfund/superfund-remedial-annual-accomplishments

[viii] Source: EPA
https://archive.epa.gov/epawaste/hazard/web/pdf/rcracorrective.pdf