

eco SPEARS

Vital • Clean • Brilliant

November 2019

Sergie Albino, Co-Founder

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Executive Summary

ecoSPEARS is an early stage clean technology company with a vision of a world where every human being has access to clean water, clean food, and clean air. The company's mission is to protect human health by ushering in the carbonless future of environmental cleanup.

PCBs & Dioxins are a Big Problem

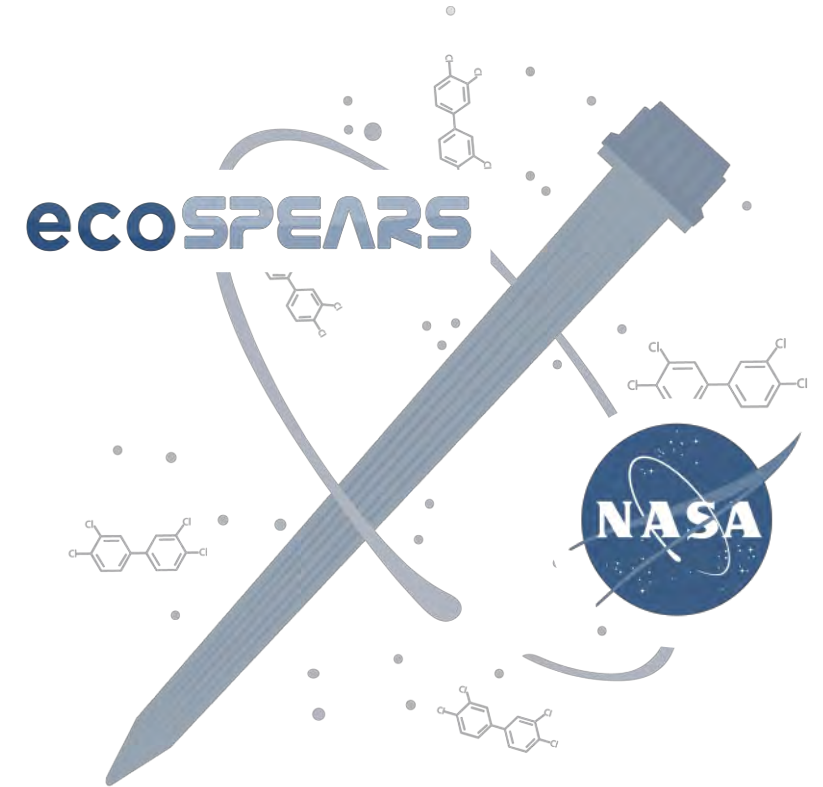
PCB and dioxins are the most widespread toxins in the world with no sustainable solution to eliminate the problem. U.S. alone has an estimated \$1.1 trillion worth of PCB and Dioxin liabilities.

Current Methods are Inadequate

Current remediation methods are extremely costly, outdated, disruptive to communities and destructive to the environment.

We Have a Distinctive Solution to Eliminate PCBs & Dioxins

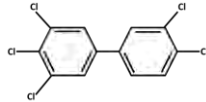
The company has obtained the exclusive license on patented NASA green remediation technologies to extract and destroy PCBs and dioxins from sediment, soil and groundwater. We both eliminate client liabilities and protect wildlife, people and the environment.



The PCB Problem

PCBs were produced from 1929 -1979 and utilized by every industrialized nation. They are now the most widespread known contaminant on earth, as they do not degrade naturally, existing in virtually every major waterway where they poison wildlife, habitats, communities, and people.

What are PCBs?



Polychlorinated Biphenyls (PCBs) are a group of manmade chemicals with very stable mixtures that are resistant to extreme temperature and pressure. Due to industrialization, PCBs were widely used in electrical equipment such as capacitors and transformers, as well as construction and textile materials.

ATSDR classifies PCBs as a known carcinogen

The Agency of Toxic Substances and Disease Registry (ATSDR) has linked PCB contamination to cancer in humans and other adverse health effects including chloracne, liver and digestive dysfunctions, learning disabilities, and mental development disorders.

PCBs are the world's most widespread contaminant

The United Nations Environmental Programme estimates that more than 50% of the PCBs ever produced have been released into the environment, causing trillions of dollars of damage to the environment, wildlife and human health.



Total U.S. Environmental Liabilities

Government agencies, organizations and public/private companies across industry sectors have created and not yet addressed remarkable economic liabilities, largely due to a lack of sustainable and cost-effective solutions.

State/Federal Agencies	States	Ports	DoD	DoE	EPA	NASA	Total Estimated
Liabilities	\$500B+	\$100B+	\$300B+	\$500B+	\$300B+	\$20B+	\$1.7 Trillion

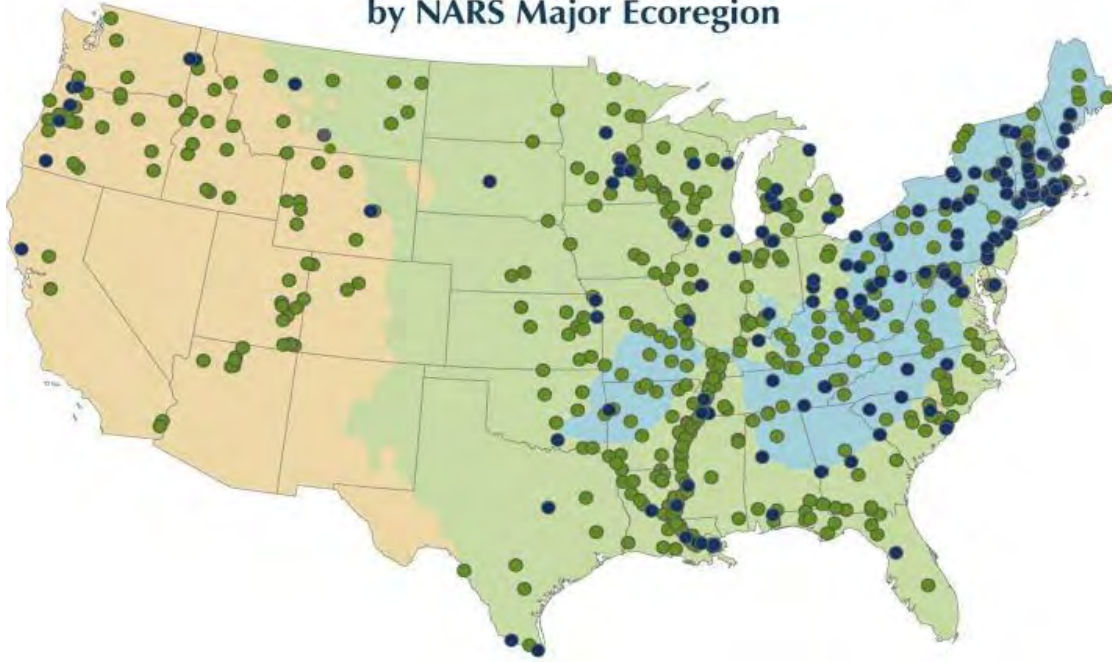
Other	Chemical	Utilities	Oil & Gas	Wood/Pulp & Paper	Total Estimated
Liabilities	\$400B+	\$300B+	\$500B+	\$300B+	\$1.5 Trillion

Total Estimated U.S. Environmental Liabilities = \$3.2 Trillion
Total Estimated U.S. PCB & Dioxin Liabilities = \$1.1 Trillion

We Are Tackling the Most Widespread Contamination Problem

Polychlorinated Biphenyls (PCBs) are a group of manmade chemicals with very stable mixtures that are resistant to extreme temperature and pressure.

National Rivers and Streams Assessment
Urban and Non-urban Sampling Locations
by NARS Major Ecoregion



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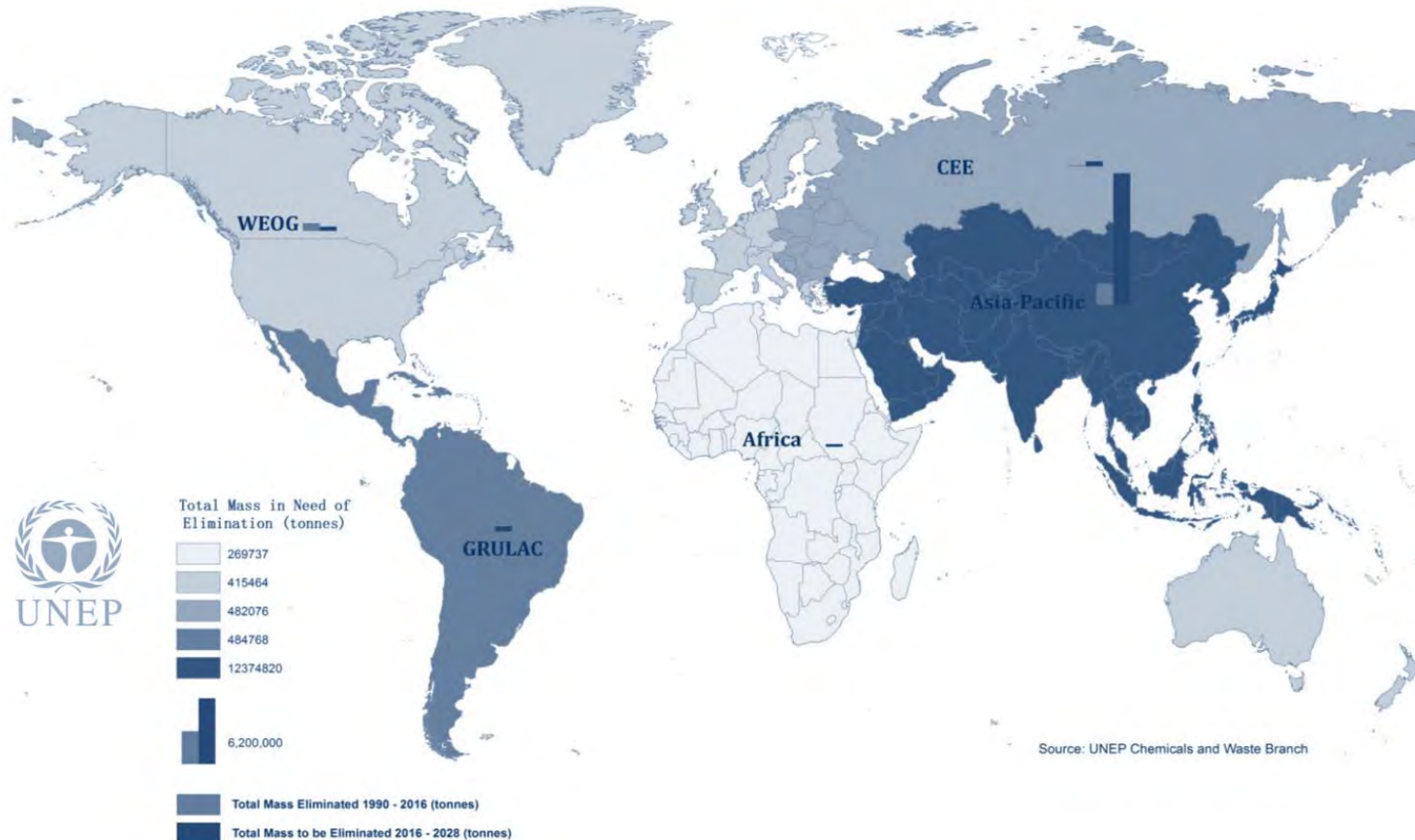
94% of tested fish tissue in U.S. rivers and streams sampled by the EPA, contained PCB, dioxin and other Persistent Organic Pollutants (POPs).

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PCB Contamination Worldwide Remains to be Eliminated

The Stockholm Convention requires Parties to phase out the use of PCB in equipment by 2025 and ensure worldwide elimination of PCB by 2028. 83% of global PCB contamination remains to be eliminated.

Total Mass of PCB in Need of Elimination by UN Region Groups: 2016 - 2028



AMOUNT ELIMINATED

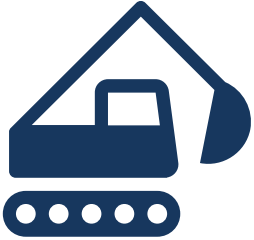
- Estimated ca. 3 million tonnes
- 17% of total

AMOUNT REMAINING TO BE ELIMINATED

- Estimated ca. 14 million tonnes
- 83% of total

Current Remediation Methods

Current remediation methods consists of digging contaminants and hauling offsite, burning the contaminants or using a “cap” to cover the contaminated area.



Dig & Haul (D&H) refers to the remedial action of dredging or excavating contaminated soil/sediment and loading it on dump trucks to be transported to an approved landfill facility – where the contaminated media will be stored in perpetuity.



Incineration is the only remedial action recognized by EPA under the CERCLA and TSCA acts as a method of "permanent destruction" of contaminated material. However, incineration is also associated with higher remedial costs, significant exposure risks, and generates massive carbon emissions.



Capping involves placing a layer of sand, soil, and/or gravel over an area of contaminated sediment or soil to prevent the contamination from spreading. This method, while not as costly as D&H or Incineration, is unable to permanently immobilize or destroy the contamination and possesses higher costs associated with long-term Operation & Maintenance (O&M).

Limitations of Current Remediation Methods

Current remediation methods are severely outdated. They are costly, hazardous, failure-prone, and do not eliminate the liability. They are not only destructive to the environment but to client's pocketbooks.



Landfill



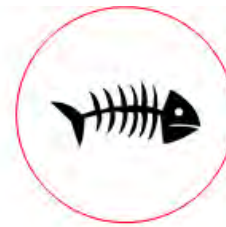
Incineration



Capping



Cost Prohibitive



Environmentally
Destructive



Disruptive to
Community



Unsustainable



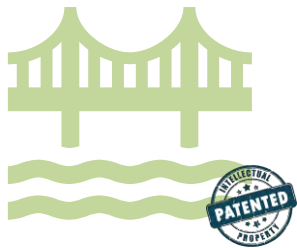
Ongoing Liabilities

NASA-Developed Solutions to Eliminate PCBs & Dioxins

ecoSPEARS green technologies extract toxins like PCBs and dioxins from soil, sediment and groundwater “like a sponge” – and destroys them permanently – using green chemistry. No landfilling or incineration required. The company’s solutions are more effective, better for the environment, less expensive to implement, and eliminates contamination permanently.

EXTRACTION TECHNOLOGIES

SPEARS



Sediment

The Sorbent Polymer Extraction and Remediation System (SPEARS) is a NASA patented in-situ technology that extracts PCBs and dioxins from contaminated sediments.

ADS



Soil

The Additive Desorption System (ADS) a patented ex-situ technology that extracts PCBs and dioxins from contaminated soil or dewatered sediment.

DESTRUCTION TECHNOLOGIES

UVAO/P



Groundwater

The Ultraviolet Advanced Oxidization with Peroxide (UVAO/P) is a patented ex-situ system to destroy PCBs and dioxins from aqueous contamination.

RIDS



Solvent

The Reductive Integrated Destruction System (RIDS) is an ex-situ system to destroy PCBs and dioxins extracted from contaminated media.

Revenue Model is a Proven Process of Success

ecoSPEARS typical client or project opportunity starts with a Treatability Study performed under lab conditions and is followed by a Pilot Demonstration phase on site. After demonstrating on-site results, clients or projects then move into Full Scale Deployment phase, lasting many years on large financial budgets.



Treatability Study*

The first step is to perform contaminated media verification process to evaluate site-specific conditions.

PHASE I
\$50,000 - \$75,000
2-6 Months



Pilot Demo

Second step is to execute on-site technology deployment on 10% of the contaminated site.

PHASE II
\$500,000 - \$1,000,000
2-12 Months



Full Scale Deployment

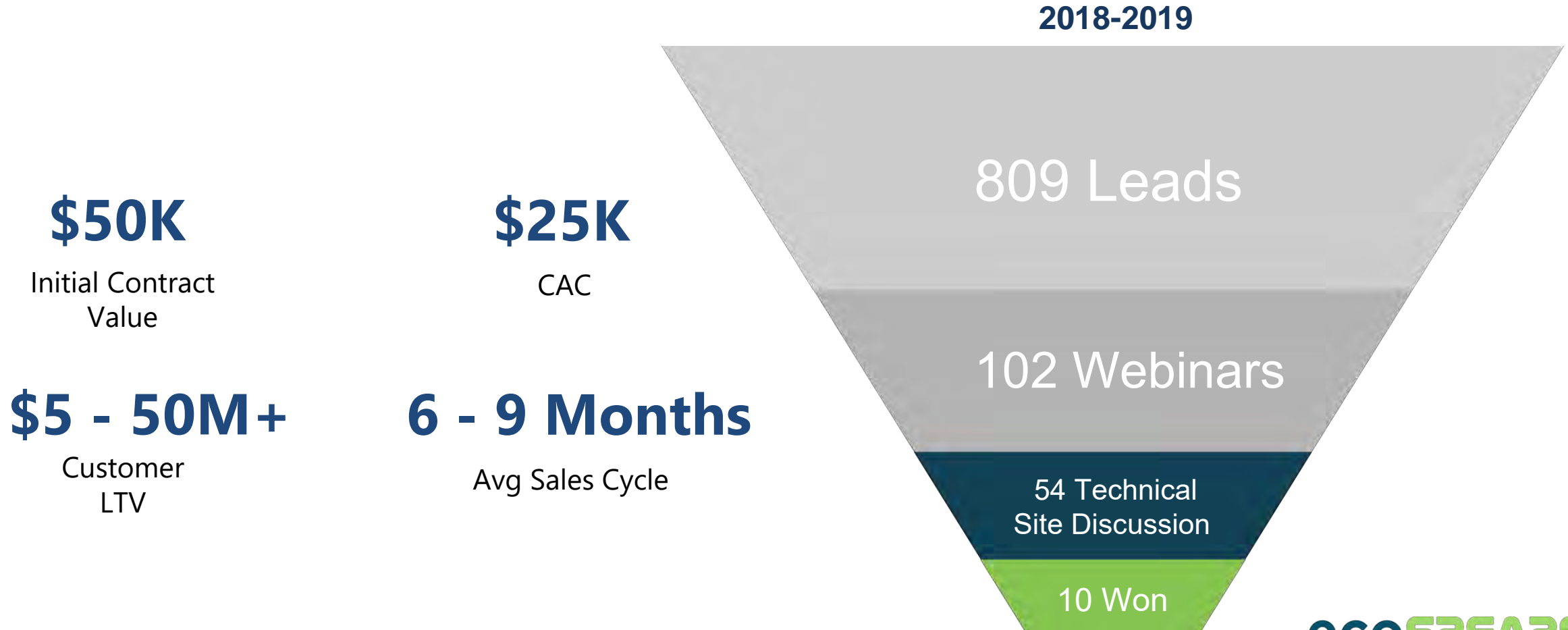
Final step is full-scale technology deployment. Cleaning up the entire contaminated site and eliminating liability.

PHASE III
\$5,000,000+
4-18 Months

*If timing is an issue for a select Client-Champions, where a partnership is expected to have significant ROI, ecoSPEARS may offer an initial Treatability Study at no charge (executive discretion). This strategy expedites acquisition of Pilot Demonstrations and Full-Scale projects.

Reliable and Scalable Sales Machine

Given lengthy sales cycles and the company's limited track record, sales effectiveness and conversion is key. Management is involved early and often in moving qualified leads through the company's sales process until projects are awarded and contracted.



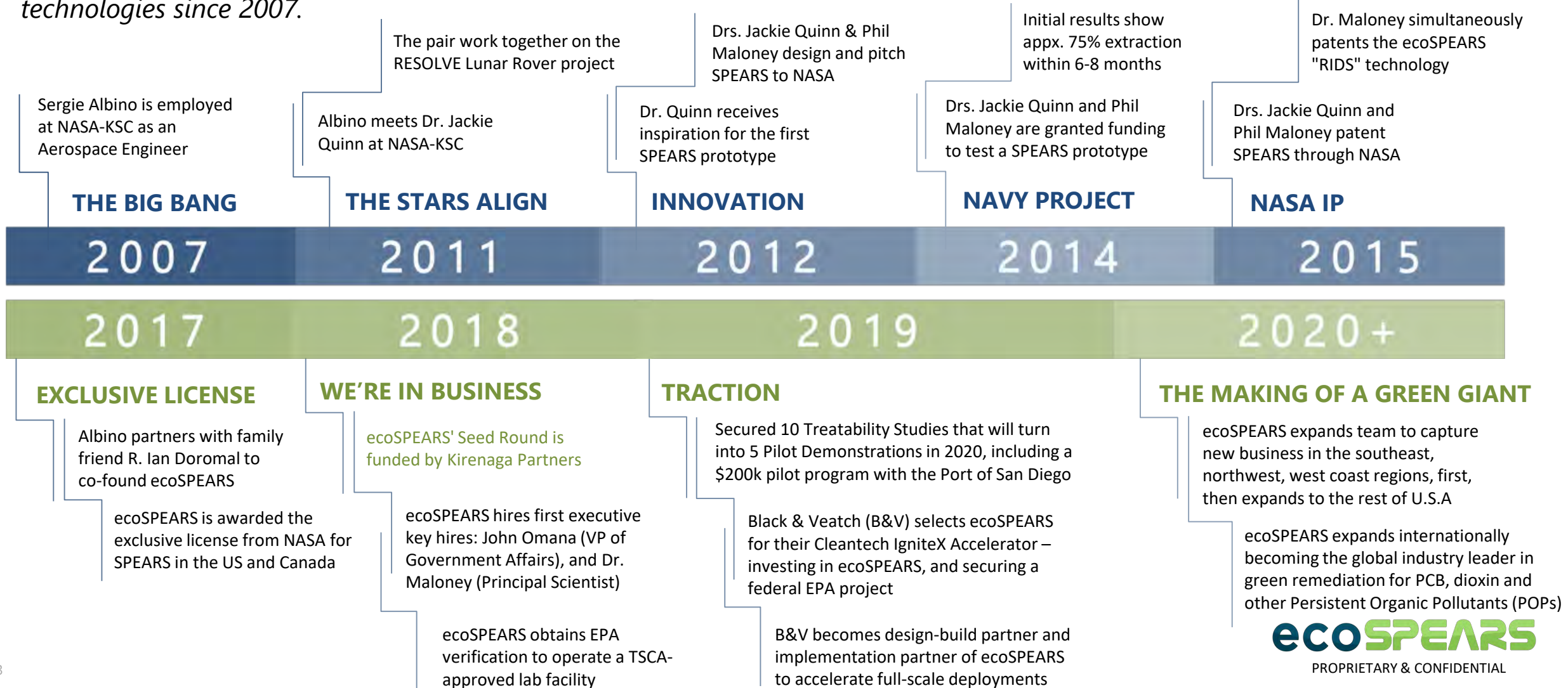
Solid Client Traction to Date

ecoSPEARS major market segments include federal & state agencies, commercial clients spanning multiple industries, and other segments such as ports and engineering consultant groups. The company has enjoyed success in all of its verticals.

Segment	Commercial	State	Federal/DoD	International	Other
Current Customers					
Current Customers					
Motivation	Protect Shareholder Value by Eliminating Environmental Liabilities	Protect Human Health & the Environment	Protect Human Health & the Environment	Protect Human Health & the Environment	Economic Development and/or Increased Shareholder Value

ecoSPEARS History

ecoSPEARS green technologies were invented and validated by NASA scientists and engineers who sought a better way to destroy PCBs and dioxins. The executive team has been directly involved in the development and commercialize of these technologies since 2007.



Management Team

Management has 80+ years of combined expertise in Environmental & Analytical Chemistry, Government Relations, as well as Mechanical, Aerospace, and Environmental Engineering and Consulting. This team is uniquely well resourced to grow and scale the company's business model.



Sergie Albino

Co-Founder & CEO

Serg, MBA, is an entrepreneur and former **NASA aerospace engineer**, and specializes in product development and design for Manufacturing. Serg leads the Engineering and Technology divisions of ecoSPEARS.



R. Ian Doromal

Co-Founder & EVP

Ian is an **entrepreneur** with 15+ years of experience in sales management, branding and lead generation, and scaling startups. He leads the Sales and Marketing divisions at ecoSPEARS.



Phil Maloney

Principal Scientist

Phil, PH.D., is an **environmental chemist**, and former NASA. He is a co-inventor of ecoSPEARS' technologies. Phil leads the Science division at ecoSPEARS.



John Omana

VP of Government Affairs

John comes equipped with 30+ years in **land-use, government experience**, city planning, and creating public-private partnerships. He has secured land development approvals and entitlements valued in excess of \$600 million.

+2 sales professionals, engineer, office manager and marketing specialist

Cleantech for a Better Future

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