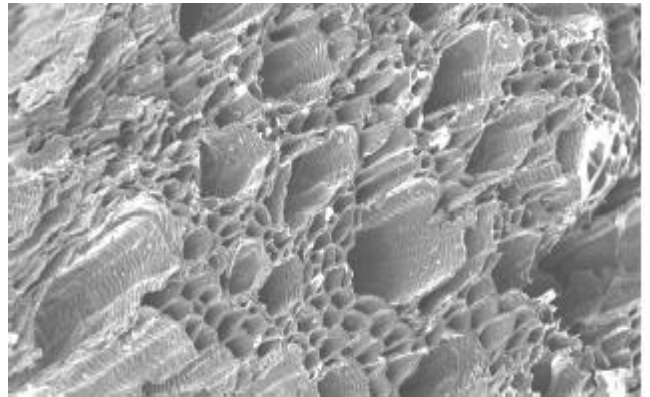


Bioavailable Absorbent Media (BAM)

BAM is a sustainable, pyrolyzed, recycled cellulosic bio-mass product (>80% fixed carbon) derived from a proprietary blend of recycled organic materials with a high cation exchange and an estimated half-life of 500 years. BAM has diverse pore sizes with a minimum total surface area of up to 1,133 square meters per gram.

BAM has numerous synergistic qualities and is relatively affordable in large quantities for remediation purposes for both **soils and groundwater**. It has the ability to provide ample usable surface area for maximizing microbial colonization and thereby an active microbial community. Due to its unique 'honeycomb' structure, BAM has the ability to provide increased pore space for the different strains of microbes. Most importantly, BAM's honeycomb structure allows for maximum contact (bio-availability through high sorbency). This allows for complete degradation of the contaminant.



Honeycomb Structure Example

Advantages

- **Immediate clean up of groundwater through absorption**
- **Treats both soils and groundwater**
- **Effective on wide range of hydrocarbons, chlorinated solvents, and some heavy metals**
- **Absorbed contaminants are treated biologically, and can be additionally treated through oxidation or chemical reduction**
- **Long lasting treatment with no additional costs after initial application**
- **Effective as a standalone and works simultaneously with various treatment chemistries**

The unique absorption capability of BAM prevents exterior surface microfilm buildup. This allows BAM to absorb contaminants for more productive bio-attenuation of contaminants over a longer period of time. Granular Activated Carbon (GAC) primarily adsorbs contamination to the surface of the media, which then is subject to bio-film development, preventing further adsorption. Whereas BAM can provide long term maintenance free remedial abilities over GAC. Laboratory testing shown that BAM has significantly more absorptive capacity than commercially available GAC products.

Application

The diverse honeycomb structure has various size pore openings. This variation in pore size enables BAM to be efficient at storing CO₂, treatment chemistries, and absorbing multiple contaminants from large chain structures to small chemical compounds. The greater storage capacity allows for favorable environments for the long-term destruction of contaminants. In recent years, the focus at TCA contaminated sites deepened to also investigate 1, 4-Dioxane. Also, Per and Polyfluoroalkyl Substances (PFASs) are also being investigated, especially at sites where PFAS containing fire retardants were used. Research for their adverse health effects of these emerging contaminants led to the EPA establishing new Minimal Risk Levels for both contaminants. Through ORIN's continued research, BAM has been successful at treating 1, 4-Dioxane, PFAS, and other listed contaminants.

BAM's exceptional ability to work alone in both aerobic and anaerobic conditions or with numerous other treatment chemistries makes it a flexible treatment choice. This characteristic emphasizes ORIN's belief of choosing the right treatment option for the contaminant. BAM allows chemical oxidation or chemical reduction to work more effectively than traditional methods due to the increased contact time between the treatment chemistry and the absorbed contaminant.

Some Treatable Contaminants

Total Petroleum Hydrocarbons

- DRO
- GRO
- ORO

Volatile Organic Compounds (VOCs)

- BTEX

Chlorinated - VOCs

- 1-4,-Dioxane
- Carbon Tetrachloride
- -ethenes
- -ethanes

Semi Volatile Organic Compounds

- Naphthalene
- Benzo(a)pyrene
- Pyrene
- Phenol's

Pesticides

- BHC's
- DDT
- Toxaphene

Per/Polyfluoroalkyl Substances (PFASs)

- Perfluorooctane Sulfonate (PFOS)
- Perfluorooctanoic Acid (PFOA)

And More!

Compatible Chemistries

- ZVI
- Sodium percarbonate
- Bioaugmentation
- Calcium peroxide
- Emulsified oils
- Hydrogen peroxide
- Soil nutrients