

**ENVIROSOURCE™ TECHNOLOGY
REDUCE CARBON.
INCREASE FLY ASH SALES.**



INNOVATIVE FLY ASH SALES RESULTS

If your fly ash sales aren't moving in the right direction, it's time for you to move to Charah Solutions. We're ready to upgrade the quality of your fly ash to boost your sales with our proprietary EnviroSource™ fly ash beneficiation technology (formerly MP618®) – at a significantly lower cost profile and a much more efficient footprint than competitive technologies.

EnviroSource technology is a proven thermal process that reduces loss on ignition (LOI), ammonia, activated carbon and moisture in fly ash, resulting in a much larger percentage of your ash meeting industry standards.

BOTH WET AND DRY FLY ASH

EnviroSource technology provides beneficiation of both wet or dry fly ash, reducing your utility's need for landfills, ponds and other disposal methods, all while your sales increase. These are the kind of fly ash beneficiation results that utilities are looking for. And fly ash purchasers want. And Charah Solutions delivers.

THE SUSTAINABLE SOLUTION

- **Reduces LOI, ammonia, activated carbon, mercury and other contaminants, while increasing supply**
- **Significantly lower cost profile than competitive technologies**
- **Efficient footprint with self-contained environmental controls**
- **Can be deployed in months versus years**
- **Modular design and scalability allow for production of 40,000 to 200,000 tons per year**
- **Reduces utilities' need for landfills, ponds and other disposal methods**
- **Cost-effective installation and operation**
- **Processing to remove mercury for emissions regulations compliance**
- **Can be installed at operating power plants, non-operating power plants or off-site**

PROVEN EXPERTISE IN ASH MANAGEMENT

The Charah Solutions team is recognized for its expertise in ash management, from start to finish. As an industry leader, we bring the proven ability to partner with utilities to build and implement the best ash management strategies, identify sustainable approaches and execute the plans for maximum results. With proprietary technology that better meets the need of utilities to beneficiate ash and produce high-quality, marketable ash, we provide not only the tools, but also the experience, the skills and the distribution network necessary for sustainable success.

HOW ENVIROSOURCE TECHNOLOGY WORKS

With EnviroSource technology, there is no impact on the power plant operation – EnviroSource technology can be fully independent or can be integrated with the operation of the power plant.

- **High LOI fly ash is exposed to indirect heat in the thermal desorber and off-gassed contaminants are separated from the solids in the gas reactor.**
- **The EnviroSource technology has a proprietary gas reactor that removes the metals, ammonia, chlorides and the products of the combustion from the gas stream.**



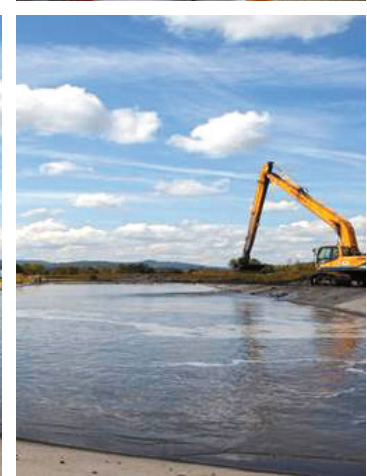
ENVIROSOURCE

ENVIROSOURCE TECHNOLOGY RESULTS

Reduction of LOI/Carbon			
Parameter	Coal Fly Ash unprocessed result units	Coal Fly Ash processed with EnviroSource result units	Percent reduction result
Loss on Ignition	16.20 %	1.18 %	92.72 %
Loss on Ignition	15.50 %	.84 %	94.58 %
Loss on Ignition	14.70 %	2.50 %	82.99 %
Loss on Ignition	14.53 %	2.10 %	85.55 %
Loss on Ignition	9.91 %	1.10 %	88.90 %
Loss on Ignition	8.30 %	2.20 %	73.49 %
Loss on Ignition	7.25 %	.15 %	97.93 %
Loss on Ignition	6.93 %	.30 %	95.64 %
Loss on Ignition	6.05 %	.43 %	92.89 %
Loss on Ignition	5.94 %	.17 %	97.14 %
Loss on Ignition	3.58 %	1.23 %	65.64 %
Loss on Ignition	1.77 %	.28 %	84.18 %
Average of above samples Loss on Ignition	9.22 %	1.04 %	88.72 %

Reduction of Ammonia			
Parameter	Coal Fly Ash unprocessed result units	Coal Fly Ash processed with EnviroSource result units	Percent reduction result
Nitrogen [Ammonia]	353 ppm	32 ppm	90.93 %
Nitrogen [Ammonia]	431 ppm	37 ppm	91.42 %
Nitrogen [Ammonia]	435 ppm	44 ppm	89.89 %
Nitrogen [Ammonia]	385 ppm	51 ppm	86.75 %
Average of above samples Nitrogen [Ammonia]	401 ppm	41 ppm	89.78 %

Reduction of Mercury			
Parameter	Coal Fly Ash unprocessed result units	Coal Fly Ash processed with EnviroSource result units	Percent reduction result
Mercury	40200 ppb	<100 ppb	99.75 %
Mercury	3870 ppb	<100 ppb	97.42 %
Mercury	4140 ppb	<100 ppb	97.58 %
Mercury	1380 ppb	<100 ppb	92.75 %
Mercury	1310 ppb	<100 ppb	92.75 %
Mercury	1184 ppb	<100 ppb	91.55 %
Mercury	815 ppb	<100 ppb	87.73 %
Average of above samples Mercury	7557 ppb	<100 ppb	98.68 %



ENVIROSOURCE TECHNOLOGY AND EXPERT MARKETING – ONE UNBEATABLE COMBINATION.

With over 100 years of power industry experience, our ash marketing team knows how to use a wide range of sales tools and expertise, including the powerful benefits produced by EnviroSource technology, to improve each utility's long-term position in the fly ash market.

We have a longstanding track record of success in marketing supplemental cementitious materials (SCMs) including fly ash and other raw materials to customers across the U.S., Canada and Mexico for use in ready mix concrete, precast and prestressed concrete, concrete pipe, concrete block, road building, soil stabilization and more.

Our team knows how to work with utilities to make sure that we can offer the exact, high-quality beneficial use products that concrete producers need and prefer, including our Class C and Class F fly ash, MultiCem™ slag cement, MultiPozz™ pozzolan, bottom ash, CFB ash, synthetic gypsum, IGCC slag, pozzolan and more.




Both utilities and fly ash customers know they can count on our dedicated sales team, backed by our MultiSource® materials network that includes nearly 40 nationwide locations with international sourcing and distribution, for a continuous and reliable supply of SCMs to meet the demand from a growing customer base.



INNOVATION MEETS SUPERIOR SERVICE

At Charah Solutions, we're ready with the expertise, the team and the innovative EnviroSource technology to keep your fly ash moving. For more information, contact us at 877-314-7724 or visit charah.com.



-  EnviroSource™ Fly Ash Beneficiation Technology
-  MultiSource® Terminal/Distribution Center
-  MultiCem™ Slag Cement

TOLL-FREE: 877-314-7724
PHONE: 502-245-1353
WEBSITE: charah.com
EMAIL: sales@charah.com

Charah Solutions, Inc.
12601 Plantside Drive
Louisville, KY 40299

