Austin Water Utility

Hornsby Bend Biosolids Management Plant

Protecting Austin's environment through urban waste recycling, environmental research, and education.

KEY ROLE IN PROTECTING AUSTIN'S ENVIRONMENT

The Austin Water Utility is committed to protecting Austin's environment. The Hornsby Bend Biosolids Management Plant plays a key role in that effort by recycling Austin's biosolids and yard trimmings. Hornsby Bend receives the sewage solids reclaimed from the millions of gallons of wastewater that Austin's wastewater plants treat every day. All of Austin's sewage solids are pumped to Hornsby Bend where they are treated to kill pathogens and the resulting "biosolids" are recycled. However, Hornsby Bend recycles more than just biosolids.

- All water from the biosolids treatment process and stormwater from the composting and basin area is treated in through a pond system, and no water is discharged from the site. Instead the water is recycled for irrigation of onsite hay fields.

- Methane gas produced in the treatment process is recycled to generate electricity and heat.

- Also, in partnership with Austin's Solid Waste Services Department, residential yard trimmings are brought to Hornsby Bend rather than the landfill, where they are recycled through composting with the biosolids. This recycling results in cost savings for the citizens of Austin and represents approximately 15% of all the solid waste recycled by the city.

BENEFITS OF BIOSOLIDS RECYCLING

The biosolids recycling at Hornsby Bend helps protect Austin's environment and preserve our natural resources by:

- Returning nutrients and organic matter to impoverished urban soils through its compost product, Dillo Dirt™ - a nutrient-rich soil conditioner used across the city on lawns, gardens, parks, golf courses, and other areas. Dillo Dirt™ aids plant growth in lawns and gardens, but also protects urban waterways by reducing soil erosion and conserves water by helping the soil hold moisture reducing the frequency of watering.

- Saving valuable landfill space, reducing landfilling costs, and reducing greenhouse gas emissions by diverting biosolids and yard trimmings for beneficial reuse.

- Generating renewable electricity and heat that is used by the facility by burning methane gas produced by the treatment process.

ENVIRONMENTAL RESEARCH AND URBAN SUSTAINABILITY

The 1200 acre Hornsby Bend site presents a unique opportunity for studying issues of ecology and urban sustainability. The Austin Water Utility supports scientific research and education through its Center for Environmental Research (CER) at Hornsby Bend.

BIODIVERSITY AND ECOTOURISM

Hornsby Bend is nationally known for its biodiversity and ecotourism. The biodiversity is present both because of the nutrient rich biosolids treatment processes used by the facility and because of the diversity of habitats at the site stretching along 3 miles of the Colorado River. One measure of this biodiversity is that Hornsby Bend is nationally known as one of the best birding sites in Texas – harboring over 370 species of birds and an abundance of other wildlife which is monitored through the CER's citizen science programs and university researchers. Another measure is that Hornsby Bend is listed by the Texas Parks and Wildlife Department as an ecotourism destination on its Heart of Texas Wildlife Trail.

THE TREATMENT AND RECYCLING PROCESS

Step 1: Pretreatment, Thickening, and Water Treatment

Austin's stringent pretreatment program requires that local industries and businesses treat or remove contaminants from their wastewater before it is discharged into the City's wastewater treatment system. This program ensures that Austin's wastewater meets all state and EPA requirements for safe recycling and reuse of treated biosolids.

Each day a million gallons of sewage solids are pumped to Hornsby Bend from Austin's two main wastewater treatment plants, which remove these solids from the 90 million gallons of wastewater that they treat each day. These solids are screened to remove inorganics, and a thickening process removes water from the solids to reduce volume. The separated water is sent through a sidestream water treatment process to remove more solids, and then the water is pumped to onsite treatment ponds. Additionally, all process water and stormwater from the treatment site is cleaned by the 180 acre treatment pond system and a five acre aquatic greenhouse before it is used onsite to irrigate hayfields. No water is discharged to the river.

AWU Industrial Pretreatment Program website - http://www.ci.austin.tx.us/water/wwwssd_iw_main.htm

Step 2: Anaerobic Digestion

Thickened solids are treated inside eight 2 million gallon digesters through an anaerobic digestion process to reduce pathogen levels and odor. Anaerobic digestion mirrors our own digestive process. In a similar way to our digestive system, anaerobic digesters provide warm, oxygen-free habitats where beneficial bacteria flourish and feed on the nutrients in the sewage solids. This biological activity kills most disease organisms and reduces the volume of material. The anaerobic bacteria produce methane gas as a by-product of digestion, which is collected and recycled to produce heat for warming the anaerobic digesters and electricity for the plant. This anaerobic digestion process takes about sixty days to turn sewage solids into reusable biosolids.

Step 3: Further Thickening

Following anaerobic digestion the biosolids are sent through belt presses where more water is removed to make the biosolids easier to handle for recycling. All water removed is sent for sidestream treatment and processed through the treatment ponds.

Step 4: Recycling through Composting

Part of the thickened biosolids is recycled through composting. For composting, the treated biosolids are combined with curbside collected leaves, grass, branches, and Christmas trees. These yard trimmings are brought to Hornsby Bend by the Solid Waste Services Department. Approximately 120,000 cubic yards of trimmings from the Curbside Recycling Program are diverted from local landfills annually and brought to Hornsby Bend for composting, saving valuable landfill space and avoiding the cost of substantial landfill fees. These yard trimmings are ground up and mixed with biosolids in six foot high compost piles up to 500 feet long. Within these "windrow" piles, the compost reaches temperatures of 170° F killing remaining pathogens (human and plant disease-causing microorganisms) and weed seeds. This high temperature composting takes at least four weeks with the windrows being turned at least five times. Then the windrow is sampled and tested to confirm that the compost is adequately treated. The compost is then placed in large static piles where it sits cooling for six to nine months. This static process allows for more beneficial soil organisms to grow improving the quality of the compost. Finally, the compost is screened to produce the uniform texture of the compost product sold as Dillo Dirt™. This process allows Dillo Dirt™ to meet EPA regulatory standards for unrestricted use which means that Dillo Dirt™ is considered safe for vegetable gardens. Moreover, revenue is generated from what used to be waste through sales of approximately 40,000 cubic yards of Dillo Dirt™ annually.

Step 5: Recycling through Land Application and Irrigation

Biosolids that are not composted are land applied to fertilize 500 acres of onsite hay fields and through land application on offsite farm land by a contractor. Nutrients from the biosolids improve the soil which increases the production of crops, thereby recycling the nutrients rather than burying them in a landfill. Water from the treatment ponds is recycled as irrigation water for over 100 acres of the onsite farm. Contract farmers harvest and market the hay, and the City of Austin receives a portion of sales revenue.

The AWU Hornsby Bend Biosolids Management Plant
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Austin Water Utility web site: www.ci.austin.tx.us/water
Hornsby Bend web site: www.ci.austin.tx.us/water/dillo.htm

Austin Water Utility

Center for Environmental Research

Community, Education and Research

The 1200 acre Hornsby Bend site presents a unique opportunity for studying issues of ecology and urban sustainability. The Austin Water Utility supports scientific research and education through its Center for Environmental Research at Hornsby Bend. The CER is a partnership with the University of Texas and Texas A&M University for research and education about ecology and urban sustainability. These universities and other Texas universities along with federal and state agencies work through the CER to utilize the Hornsby Bend site for research on biosolids, soil ecology, biodiversity, and more. As a community service, the CER auditorium and classrooms are used by a wide range of academic institutions, government agencies, and non-profit organizations for workshops, classes, and meetings.

RESEARCH PROJECTS

Biosolids, Compost, and Soil Ecology Research – in cooperation with the USDA, USGS, TCEQ, and TPWD to study environmental trace contaminants and soil ecology.

Hydrogeology of the Alluvial Aquifer – in cooperation with the University of Texas - Department of Geological Sciences to study the alluvial aquifer of the Colorado River at Hornsby Bend.

Riparian Ecology and Restoration Research – a program to research and restore the 3.5 miles of riparian habitat along the Colorado River at the Hornsby Bend site.

Avian Ecology – a database of over 50,000 bird records from Hornsby Bend dating back to 1959 is constantly updated through the Hornsby Bend Bird Observatory monitoring programs and university researchers.

Partnerships and Programs

The Texas Riparian Association – a statewide organization to promote awareness for protection, proper management, and restoration of Texas riparian areas hosted by the CER – http://www.texasriparian.org.

The Hornsby Bend Bird Observatory program – the HBBO was created to support research and monitoring of Central Texas bird populations.

- monthly bird survey begun in 1999 [2nd Saturday of every month 7a.m.]
- monthly field trips in partnership with the Travis Audubon Society (3rd Saturday of every month 7:30 a.m.)
- All bird data online at HBBO web site http://www.hornsbybend.org

Austin to Bastrop River Corridor Partnership – a stakeholder partnership of landowners, nonprofit organizations, governmental agencies, businesses, and citizens concerned with the future of 90-miles of the Colorado River in Travis County and Bastrop County.

- Monthly river monitoring trips [1st and 3rd Saturday of every month]

EcoHouses Partnership – a partnership with local non-profit environmental organizations that have used green remodeling to convert houses on the Hornsby Bend site into their offices –

Treefolks - www.treefolks.org

Austin Youth River Watch - www.ayrw.org

Public Safety Training Houses – a partnership with City of Austin and Travis County public safety agencies to use houses at the facility site for training.

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Austin Water Utility web site: www.ci.austin.tx.us/water
CER web site: www.ci.austin.tx.us/water/cer2.htm