Smith & Bybee Lakes Wildlife Area Management Committee
Nancy Hendrickson, Chair

Coordinated by:

Metro

600 NE Grand Ave.
Portland, OR 97232
(503) 797-1870

Smith & Bybee Lakes Management Committee Meeting

5:30 p.m. - 6:30 p.m., Tuesday, April 23, 2002
Metro Regional Center, Room 270
600 N E Grand Ave.
Portland, Oregon 97232

AGENDA

Welcome and introductions/ 5 min.	5:30 - 5:35 pm
Approve March meeting notes/ 5 min.	5:35 - 5:40 pm
Update: Recreational facilities design RFP (Lora Price)	5:40 - 6:00 pm
Decision: Response to Port's LUR for trail construction (Hendrickson)	6:00 - 6:45 pm
Updates/ 10 min.	6:45 - 6:55 pm
Setting May agenda/ 5 min.	6:55 - 7:00 pm

Smith & Bybee Lakes Management Committee
Summary Meeting Notes
April 23, 2002
5:30 pm

In attendance:

Jim Morgan *	Metro Executive Office
Dennis O'Neil	Metro Regional Environmental Management
Denise Rennis *	Port of Portland
Pat Sullivan	Metro Regional Parks & Greenspaces
Nancy Hendrickson *	Portland Bureau of Environmental Services
Elaine Stewart *	Metro Regional Parks Wildlife Area Mgr
Frank Opila *	Friends of Smith & Bybee Lakes
Patt Opdyke *	North Portland Neighborhoods
Jim Sjulin *	Portland Bureau of Parks & Recreation
Sheila Toomey	North Portland resident
Pam Arden *	40-Mile Loop Trust
Gerry Meyer	Port of Portland
Lora Price	Metro Regional Parks & Greenspaces
James Lascari	Mt Hood Community College student/ Metro Volunteer

* denotes voting member

Review March 2002 meeting notes

With the correction of a typographical error, the March meeting notes were approved as amended with a vote of six in favor and one abstention.

Update: Recreational facilities design RFP

Elaine Stewart reminded the committee of the $220,000 received from local share re-allocation of funds and approximately $200,000 from the "1% for Arts" program from construction of the jail facility on Leadbetter Peninsula. Another funding source may be approximately $100,000 from the Rivergate consent decree. Lora Price, a regional planner with Regional Parks and Greenspaces Dept., will also be pursuing grants for the project.

Price provided an update on the design and the related Request for Proposals (RFP). A collaborative team is being sought that will provide expertise in landscape architecture, engineering, planning, art and facility design, and environmental restoration.

The team's first task will be to review all existing plans related to Smith & Bybee Lakes Wildlife Area including the 1990 Natural Resources Management Plan (NRMP), the 1992 Recreation Master Plan, the 1992 Greenspaces Master Plan, the Regional Trails Plan, the 1999 Recreation Facilities Plan as well as current educational programs and recreational usage. Both suggested canoe launch sites will also be revisited. The 1999 plan put the launch site at the "triangle" property which, from an operations standpoint, may be the most desirable. There is also a de facto canoe launch that is recognized in the 1992 Master Plan. Another task will be working with Portland's Regional Arts and Culture Council (RACC) on an initial brainstorm workshop with key stakeholders identifying priorities and generating ideas for public art. A project advisory committee (PAC) will be appointed which will meet with representatives from the SBLMC, RACC and the Public Art Advisory Committee for the Wapato jail. This group will solicit input on conceptual art proposals, and canoe launch feasibility findings. The need and welcome for input from the SBLMC was emphasized.

Issues such as the potential for the triangle site being available for a canoe launch during periods of high water will be addressed during the feasibility analysis, according to Price. In the next few days committee members will be provided with the list of criteria for feasibility of the canoe launch sites; they can then communicate by e mailing Lora Price and copying each other.

It was suggested that 15 minutes be set aside at the May 28 meeting for a discussion of the criteria. A site visit to S & B will take place in lieu of the June 25th meeting. Details will follow.

Decision - Response to Port's Land Use Review (LUR) for trail construction

The Port of Portland is obligated to construct this trail, according to the consent decree mentioned above. The decree also stipulates where the trail is to be sited. The land use review is a City of Portland process which the Port must go through in order to fulfill its obligation. The committee expressed concern that the trail dead-ends at Bybee Lake and may lead to the creation of "bandit" trails by users proceeding off-trail.

It was suggested that the funds to be spent on the trail will be placed in an escrow fund and when problems with site placement are resolved those funds would be drawn from to put in the trail. According to Gerry Meyer of the Port, the idea of putting funds in an escrow account is not workable partially because of timing restrictions on construction. Those organizations, which are to sign off on the design, have been asked for their thoughts on it. The City of Portland OPDR has not signed off, one of its main concerns being the removal of trees. The initial design called for eliminating between 200 and 300 trees. Revision of the design has resulted in that number being reduced to less than 10. It was pointed out if the City of Portland removes the requirement to build the trail, the Port's obligation to build the trail is eliminated. Jim Sjulin also emphasized that the trail design must be consistent with the plan documents that have been adopted.

Other concerns with the trail siting which were discussed include: connection with the 40-mile loop trail, elevation, issues of health and safety on the landfill, and frequency of flooding and the resulting number of days of trail inaccessibility (the latter also being of major concern to Portland Parks). According to the Port, additional revisions to the design have reduced the estimated number of days of trail closure due to high water from 180 days to an average of between 14 and 15.

General agreement was reached that the committee would submit comments on the LUR. This will be a Type 2 review, which typically has a 14-day comment period. In attempting to capture the previous discussion, Hendrickson summarized that there was no major objection to placement of the trail, but the committee would like to find ways to discourage people from going off the trail. This would be due to concern to impacts on the wetland area and protection of the surrounding area.

A motion was made and passed for the committee to write a letter of support for the project with the provision that there is vegetative treatment and signage at the trail end to discourage off trail usage. The vote was divided, however, with four in favor, two in opposition and one abstention.

Hendrickson will produce the letter and send it around to committee members via e-mail asking for input in order to make sure it captures the members' viewpoints.

Updates -

Transportation money for buses to Smith & Bybee Lakes Wildlife Area for environmental education programs has been obtained through an EPA grant, although the process has been slowed in the implementation. IGAs with school districts are necessary as part of the process. The agreement will be with Portland Public Schools and is extended to June 30, 2003. This year all available slots for the field trips are booked.

The next meeting will be May 28th at 5:30 pm.

From: Elaine Stewart
To: Holly Michael
Date: 4/23/02 4:50PM
Subject: Re: tonite

Hope you can make it - I'll pass your message along to Nancy.

-Elaine

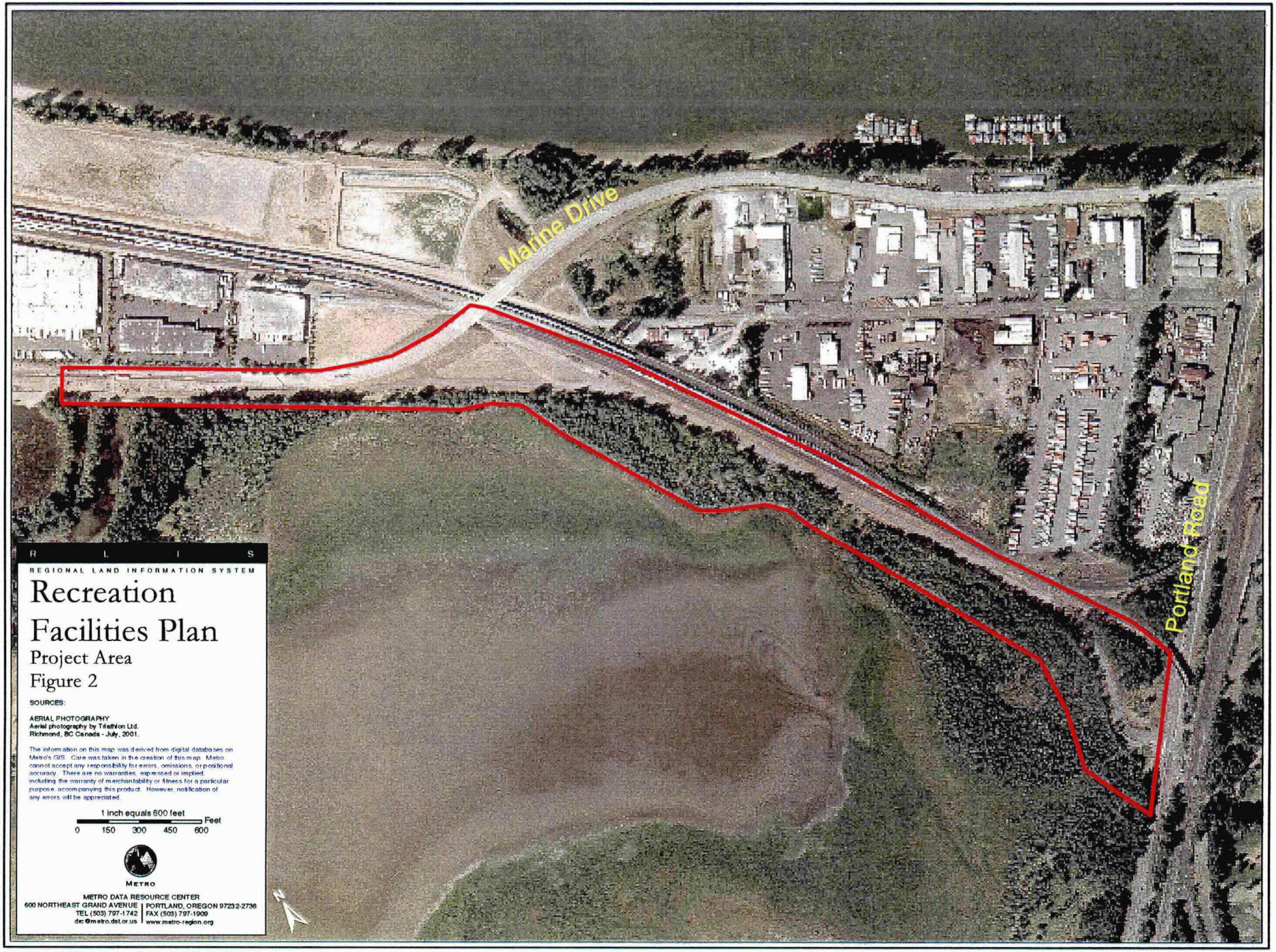
>>> "Holly Michael" <Holly.B.Michael@STATE.OR.US> 04/23/02 04:11PM >>>
Hi Elaine,
I'm going to be here at my desk for quite awhile yet - permit issues that must be resolved asap - so I don't know if I'll make tonite's S&B mtg. I hope you still have a quorum for the trails decision.
Personally, I don't feel a pressing need to put a trail in that is not in the best location for minimizing wildlife disturbance, but I realize others on the S&B Comm. feel strongly that the trail needs to go in, and soon.
If I can vote in absentia, I vote that the trail construction be postponed. That is - if I got the issue straight in my head. If I'm somewhere on Jupiter, please be kind. It has been such a long, long day.

If I don't arrive, would you please tell Nancy that I will arrange to get the bat box I promised to give her (for her to give to Tim at BES) at another time?

Thanks.

Also, please give Troy a big "happy wedding" smooch for me, until I can deliver one personally!

Hope to see you tonite
Holly,



R L I S

REGIONAL LAND INFORMATION SYSTEM

Recreation Facilities Plan

Project Area

Figure 2

SOURCES:

AERIAL PHOTOGRAPHY
Aerial photography by Triathlon Ltd.
Richmond, BC Canada - July, 2001.

1 inch equals 600 feet

0 150 300 450 600 Feet

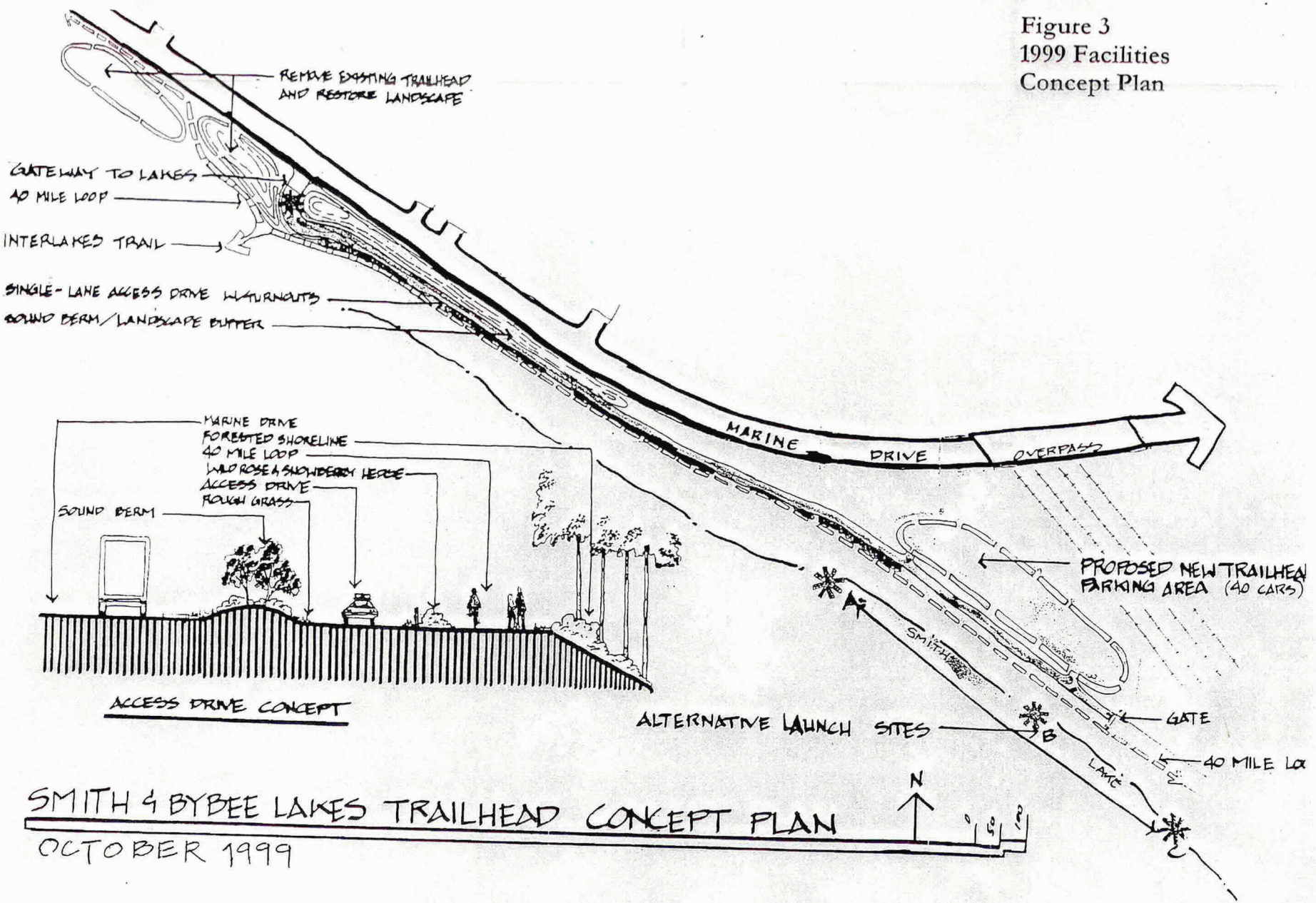
METRO

METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232-2736
TEL (503) 797-1742 | FAX (503) 797-1909
drc@metro.dst.or.us | www.metro-region.org

N

Project Date: Apr 2, 2002 Plot time: Apr 15, 2002 J:\price\02152\smithbybee_rfp.mxd

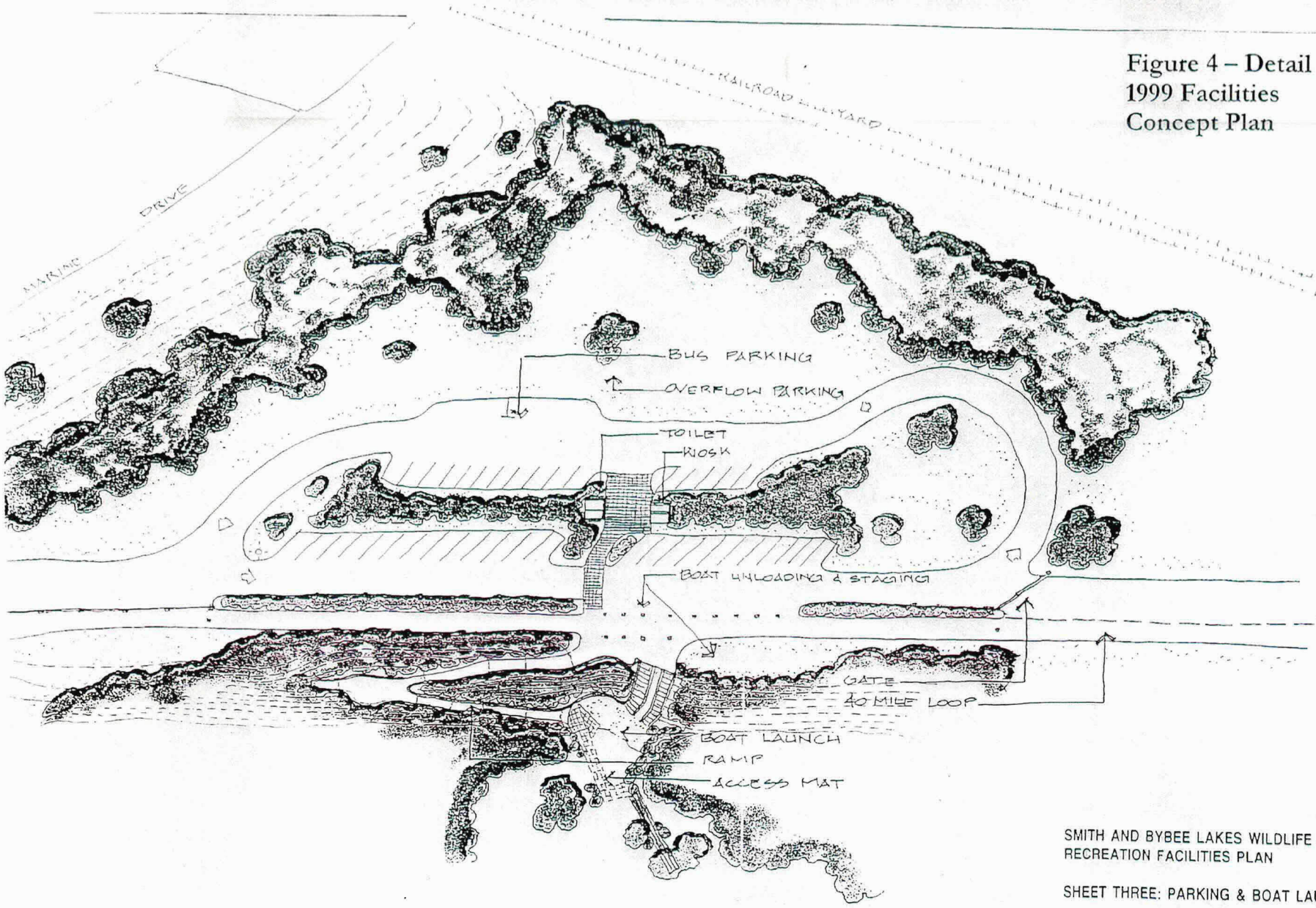
Figure 3
1999 Facilities
Concept Plan



SMITH & BYBEE LAKES TRAILHEAD CONCEPT PLAN

OCTOBER 1999

Figure 4 – Detail
1999 Facilities
Concept Plan



SMITH AND BYBEE LAKES WILDLIFE AREA
RECREATION FACILITIES PLAN

SHEET THREE: PARKING & BOAT LAUNCH AREA

OCTOBER 1999

Smith & Bybee Lakes Public Art and Recreation Facility Design

Schedule Of Request For Proposal Process

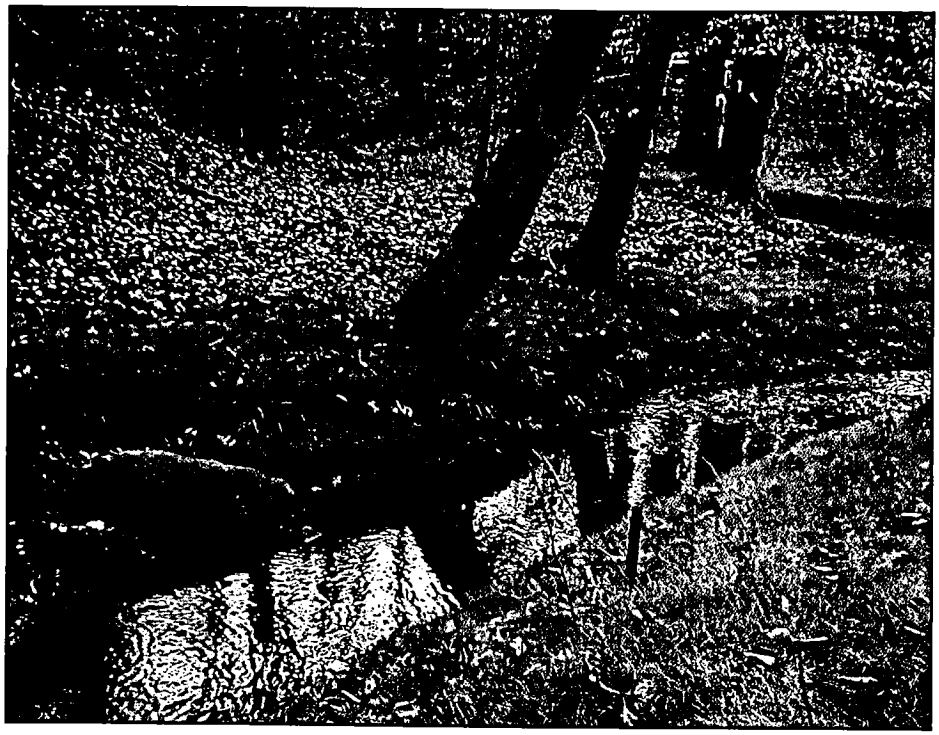
Advertise RFP	April 15, 2002
Pre-Proposal Conference	May 2, 2002
Proposals due	May 17, 2002
*Oral Interviews & Final Selection	May 30, 2002
*Contract Execution/ Project Commenced	June 11, 2002

*These dates are approximate and subject to change.

Tentative Project Timeline

1.	Initial Project Meeting	June 13, 2002
2.	Facilitate Art Workshop	July 2 ,2002
3.	Complete Site Analysis and Canoe launch feasibility findings	July 18, 2002
4.	Present Public Art Preliminary Concepts	July 23, 2002
5.	Present Revised Concept Plan	August 27, 2002
6.	50% Design Completion	September 30, 2002
7.	Develop and submit land use permits	October 15, 2002
8.	90% Design Completion	December 7, 2002
9.	Grant applications submitted by Metro	January 15, 2003
10.	Building permits submitted	January 15, 2003
11.	Construction Documents complete and permits obtained	April 15, 2003
12.	Advertise for Contractor	April 20, 2003
13.	Bid Opening	May 20, 2003
14.	Notice to Proceed	June 15, 2003
15.	Construction complete	September 15, 2003

Streambank Stabilization Using a new BMP... Compost?



Half of the roots of these trees were exposed prior to backfilling during the restoration project.

Germinating filtersocks are growing together and into the geotextile wrapped socks stacked on the banks of the creek.

By Rod Tyler

UNIVERSITY research, pri research, field demonstrations, and commercial use of compost for erosion sediment control show it works better most BMP's available today, yet it conti to suffer an identity crises. Compost i organic matter source that has the un ability to improve the chemical, phys and biological characteristics of soil growing media. It contains plant nutr but is typically not characterized fertilizer. Compost is the only annu renewable, recycled, 100 percent na organic product that gives so much valu the soil. And peat moss, barks, man and other organic sources work in comb tion with compost in mixtures that contractors adjust soil pH and fertility.

It is important you understand the of composting. The process reduces cerns with three major threats. Weed se diseases and insect larvae/eggs are s very important health and safety iss surrounding the use of composted prod When materials are properly compos these three nasty foes are killed in process. You can imagine the best pos application mechanism of spreading c composted products with a blower tr could surely create noxious weed probl the quickest of all...so it is imperative promote the use of composted product break the chain of these three problem pests.

Stabilization of streambanks become a huge focus for waters managers in an effort to become phas compliant. Previous issues of Land Water have appropriately identified m technologies for accomplishing streamb stabilization and restoration using m good tools. The majority of us wo agree that compost is not at the top of list of products considered for this typ challenging work. But the innovation containment and packaging systems allowed for compost to be used in th

Live stakes of purple winter creeper, plugs of liriope and english ivy and grass, roots into the socks and into the banks.

applications and the results are an exciting chapter in the story on erosion and sediment control.

Compost is not a stranger to environmental applications. The use of compost for traditional landscaping like planting bed preparation and backfill for tree pits has been documented as a standard practice for over ten years. Compost is produced locally in nearly every major city in the US, so supplies for upcoming erosion markets should be predictable and available. Since freight is less for materials produced locally, it sta to reason that the economics behind us compost for erosion control will sur allow for continued market expansion. ' technical merits of compost were sta most notably in a report issued by USEPA in 1997 indicating the benefits using compost for erosion control and ot remedial applications. For more infor tion on various studies regarding the us compost, go to http://www.epa.g epaoswer/non-hw/compost/index.htm.

When tools are assessed streambank stabilization and renovation, obvious that a number of combinations often used in order to be successful. Ro products, matting, excelsior products, g extiles and other materials are all u successfully in working with the force water. But with the introduction use compost, one glaring difference arises: ability of the compost to grow vegetatio very, very well.

A Panel of Experts

"We were asked to assist on a pro which seemed to border on some of capabilities", says Jim Wilson, President

Compost has been used in the green industry, including landscaping, topsoil blenders, and nurseries for about 20 years. Several years ago blower truck technology began replacing the common application systems of wheelbarrows and hand application. Now this pneumatic application method is common among many top landscape management firms because it actually frees up workers for other activities rather than mulching.

The truck manufacturers, Finn Corp. in Cincinatti, Ohio and Express Blower from Eugene Oregon, are proud that the pneumatic devices are helping to revolutionize placement of organic products. Finn claims their units, which are smaller, less expensive and easier to fit into tighter areas, will replace 3-5 normal workers for average mulch or soil installations. Express Blower points out that the carrying capacity o their units, often upwards of 30-90 cubic yards, allows a unique advantage to target large projects with their vehicles application capacity Express Blower also claims to have the only calibrated pneumatic seed injection system currently on the market, which has been used successfully in many 'Terraseeding' applications. Terraseeding is the process of using compost or topsoil with seed injection to establish vegetation.

"We were able to get seed to grow on a DOT roadside job last November where hydroseeding could not" claims Pat Campiletti from Precision Mulching in Cleveland, Ohio. "We used a compost blend that held the heat in the soil longer in order to give us the pop of germination to hold the area and overwinter", he said. "Our cutoff date for seeding should be September 15th!"

Theresa and Toby Hutchins of Carolina Mulch Plus found the longer seeding window to be true as well. "We seeded a project Octobe 3rd 2001 and had a little grass by early December. The areas outside of our DOT applications were hydroseeded and straw mulched and did not germinate as well. We think the compost added a lot of heat absorbing action to the slope", said Hutchins.

The blower trucks are able to blow the materials vertically as well as horizontally, offering special advantages for rooftop areas. "We saved a lot of labor on our rooftop garden project", explains Connie Cannon from Replenish Products in Salt Lake City, Utah. "We were able t get the lightweight soil mix into the planter areas more efficiently, saving a lot of time. It would have taken much longer bit by bit in an elevator or by other mechanisms", she said.

eXpress scapes Inc. in Easley, S.C. "Our local landscape contractor, Lee Cline, asked us about helping on a streambank project which involved rip rap or a concrete retaining wall", he continued. At first, Wilson believed his company would be asked to pneumatically place fill materials behind a concrete or pavestone wall. The blower trucks Wilson uses are able to pneumatically deliver a number of products efficiently, without the use of wheelbarrows or a lot of heavy equipment. "Upon our inspection, it was obvious that we might be able to save the client money and increase both performance and aesthetic appeal by introducing compost products."

Wilson worked with Cline to assess the situation and involved the clients in the process. The streambank had severe erosion and a constant flow of water, bordering the backyard of the client. During heavy rains, the stream often reached a depth of 3-4 feet, and had cut into the embankments of the backyard landscape and exposed roots of many tall mature trees. Oaks, poplars, sycamores and other large trees, many over a two-foot in caliper size, were at risk. The options for restoring this type of area, due to the severe undercuts, were limited.

Jim Wilson & Associate review progress of the streambank stabilization project six weeks after installation.

The total streambanks were about 500 feet long and varied in depth on the sides from 2 feet deep to just fewer than 5 feet. As the creek flowed harder and harder with each rain, it was obvious that the clients would lose more of their backyard and perhaps some of the larger specimen trees. In making the decision on what stabilization method to use, Wilson consulted a local arborist to get opinions on impacts created

clients agreed to do a trial section which cost about $4,000 and then once that worked, they allowed us to progress with the rest of the project", he said. The total project finished out at around $25,000, compared to $50,000-$75,000 for the other two options. Part of the high costs associated with the riprap and retaining wall options included very poor access to the site from the nearby road.

Project details

The project began on December 3-4, 2001, and when the photos in this article were taken several weeks later on January 17-18, 2002, germination and stabilization were evident. Wilson used the blower truck technology to fill the tubular mesh netting with compost, by parking on the road and dragging the blower truck hoses through the woods to the renovation area.

During the project, Wilson used a small dingo unit to help redistribute some of the sediment in the streambank to areas that needed extra fill. The combination of these techniques allowed the team to meet their objectives of zero tolerance of root disturbance or injury to the large specimen trees. In fact, some of the trees were actually stabilized due to more soil and materials being backfilled around exposed roots hanging over the streambank.

A total of 60 cubic yards of special mixes were used to achieve stabilization,

As the seeds germinate and grow out of the containment netting, they also root into the embankments, increasing the holding capacity significantly.

including a soil blend of 30% compost, 30% clay topsoil and 40% aggregate for backfill and soil planting areas behind the contained area. The material used to fill the FilterSocks was about 40% aggregate, 30% double shredded, composted bark and 30% compost. The compost product was a local yard waste compost screened to a 1/2" minus specification. "The aggregate helped the materials increase our density to provide ballast in high flow rate situations",

from bringing in heavy equipment required for either riprap or retaining wall work. "Our consulting arborist, Scott Carlson of Arbor Guard, indicated that we could cause severe root damage to some of these older, specimen trees and that we should expect a loss from these activities. The loss of trees was a major concern to our clients due to the park-like setting in their backyard", Wilson explained.

The riprap and stone retaining walls did not fit the natural look of the landscape and they seemed over-engineered for the application. What was needed was creative bioengineering with some new tools that would satisfy the client's goals while meeting economic realities and budgets. That is when Wilson thought about compost, using a containment system for the edges of the streambank. Wilson is a Certified Installer for Filtrexx Erosion Products, manufacturer of FilterSocks, a patent pending tubular mesh netting material that works to contain the compost. "These products are a specially composted material that is used in a number of applications, including stream banks and restoration projects", he said. "We explained to our client that although we had not performed one of these projects locally, we felt these tools were their best option".

Using compost materials and a containment system, together with backfill and redistribution of sediment already in the stream bed, they created the natural look that satisfied the client.

Together, the 'management team', which included the landscape contractor, Wilson, the arborist and the client decided to try the new system of stabilization. Using compost materials and a containment system, together with backfill and redistribution of sediment already in the stream bed, they created the natural look that satisfied the client.

Ironically, Wilson did not find out until after the project was underway that pricing for his system was significantly lower than the riprap or retaining wall options. "The

says Wilson.

During the filling of the socks and the backfilling operations, Wilson used a specially blended seed mixture consisting of fescue and rye, injected while the material was blown into place. The blower truck technologies offer a calibrated seed injection system, which gives applications like these an opportunity to pinpoint seeding densities. As the seeds germinate and grow out of the containment netting, they also root into the embankments, increasing the holding capacity significantly. "Compared to other systems with similar roll technology, we think using compost in the socks allows for the best chance for getting something to grow into the roll and into the bank", states Wilson.

For additional stability, a coarse weave geotextile was used to help secure layers of the socks together in a sandwich pattern. The fabric was placed on top of the tubular mesh netting prior to adding backfill, then over-layed to the next edge, then another layer of netting were added, and the process was repeated. "The geotextile served as a ribbon-like bridge and binding tie between the layers of socks and helped when the roots penetrated the mesh of both materials", explained Wilson.

"The geotextile served as a ribbon-like bridge and binding tie between the layers of socks and helped when the roots penetrated the mesh of both materials", explained Wilson.

The existing backyard of the clients included naturalized areas of English ivy, liriope, and purple winter creeper. Several thousand plugs of these species were planted, and incorporated in a random checkerboard stacked pattern along the composted and backfilled areas. In addition, Wilson included wetland grasses and other species as plantings in front of the oxbow areas in order for a naturalization area to again become established.

It is amazing to see how several thousand plugs make little impact on a planting area of this size, however, it is expected that with warm weather, the clients can simply live stake more plantings if they wish to invest the time and effort. "It is really easy to insert a live cutting into these socks, right through the mesh", says Wilson. "We felt it would be more economical and more engaging to allow our clients to be involved in this process if they add this during the spring months".

On one of the steeper and taller sides of the embankment, the FilterSocks were stacked nearly on top of one another against an embankment greater than 1:1 slope. "This creates what we call a 'Living Wall'", says Wilson. The area had definite stability problems from the eroding streambank, but had no load bearing support requirements that are often concerns on projects near parking lots or other more urban locations. The advantage to using a living wall in this project was that the bank required no additional excavation to create the natural angle and it allowed for existing vegetation to be tied into the steep slope at the top which offered further future protection against run-on water. On this application, the same weaving pattern using the geotextile was used to keep the containment socks from 'rolling out' from underneath each other under the added weight of each layer.

Conclusions

Experts have long known about the exceptional qualities of compost as a superior filtration and erosion control material. Until now however, no one has recognized the tremendous benefits that can be derived by combining quality compost with a quality containment material for a product that is extremely versatile and effective in streambank stabilization. **L&W**

For more information contact Jim Wilson, President of eXpress scapes Inc., 113 Village Lane, Easley, SC 29642, (864) 220-5154, e-mail: Jim@upstatemulch.com. Rod Tyler is owner of Green Horizons, a consulting firm outside Cleveland, Ohio and manager of Filtrexx International, LLC, www.filtrexx.com. Portions of this article were reprinted from Lawn and Landscape Magazine. For more information, go to www.lawnandlandscape.com.

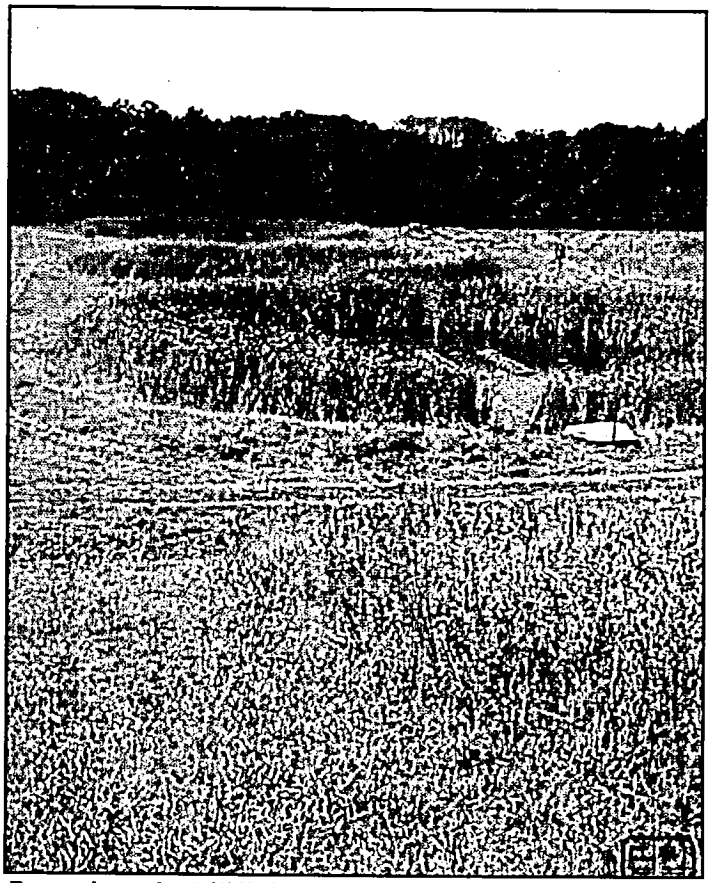
PVC Liners Pass the Test

About KBS

CEREAL magnate W.K. Kellogg was an early 20th century entrepreneur who believed that people should use their gifts and knowledge to help others. He was also an environmentalist who understood the importance of preserving the land and its resources.

Kellogg established, and later donated to Michigan State College, several important facilities that became part of what is now Michigan State University's Kellogg Biological Station (KBS).

KBS is Michigan State University's largest off-campus education complex and one of North America's premier inland field stations. The Station is administered through the College of Agriculture and Natural Resources and the College of Natural Science.



Research ponds at W.K. Kellogg Biological Research Station lined with 20 mil PVC geomembrane.

The KBS Experimental Ponds

In 1971, a grant from the National Science Foundation (NSF) to Michigan State University provided funds for the construction of 18 experimental ponds, two holding ponds and a reservoir.

Each experimental pond was approximately 100 foot in diameter with a maximum depth of 8 feet, with slopes of three horizontal to one vertical, and was lined with 20 mil fish grade PVC geomembrane liner to prevent seepage losses. The liners in the original 18 ponds were covered with 1 foot of compacted soil.

After construction, the ponds were allowed to colonize naturally with flora and fauna from surrounding lakes, and within a few years the experimental ponds closely resembled natural systems. These conditions provided the opportunity to conduct a number of significant experiments in the late 1970's and early 1980's on species interactions and habitat selection in fishes.

However, by the mid-1980's, the ponds had become choked with dense, persistent stands of macrophytes (predominantly *Ceratophyllum*). These conditions made many types of experiments impossible. In 1987, a grant from the NSF program for Field Stations and Marine Laboratories funded the renovation of 9 of the original 18 ponds. In these nine ponds, the organic rich sediments and plastic liners were removed. New 20 mil PVC liners were then installed and were covered with a mixture of sand and clay (1 foot depth). This sand/clay substrate was nutrient poor compared to the original topsoil. These renovations successfully returned the ponds to a less eutrophic state. Currently, Chara is the dominant vegetation cover in the renovated ponds (as it is in most nearby lakes), along with Potomogeton spp in the deeper water areas and Typha around the pond perimeters. The remaining original 9 ponds were renovated in a similar manner in late summer 2000, again with support from the NSF and MSU.

The PVC Test

In September 2000, the remaining nine ponds were cleared and re-lined with 20 mil PVC fish grade geomembrane liner. Environmental Protection, Inc, (EPI), fabricated 9 circular panels of 11,060 square feet each, using Geon material. The one piece liners were installed in ponds 4-8, 10, and 16-18, by Woolf Excavating of Kalamazoo, MI who were contracted to clean and reline the ponds. The renovation of the ponds provided an excellent opportunity to test the effectiveness of the originally placed liners. On September 13, 2000, representatives from EPI removed samples of 30 year old 20 mil PVC geomembrane from the ponds.

Samples were removed from three main locations:

- From side slopes above water line;
- From side slopes below water line under the cattails;
- From the bottom of the ponds.

Two samples were tested from each of these locations on 09/14/2000. All samples removed from the pond felt very soft and flexible during the removal process. Material removed from the bottom of the pond was softer to the hand than the material from above the water line. Once

20 mil PVC sample immediately after removal.

Drained pond prior to cleaning.

samples were dried off, the samples felt somewhat less flexible.

All samples were tested at the EPI lab in the days following removal from the ponds. Materials were transported in large plastic bags, sealed to minimize moisture loss prior to testing.

Two samples were tested from each location without any preparation, other than removal of any sand or dirt from the material. Two additional samples from each location were cleaned and allowed to acclimate in the lab for 40 hours according to standard ASTM test methods. Samples from each location were tested in both t Machine (MD) and Transverse (TD) dir tion.

After being buried for 30 years, the mil PVC geomembrane has retained plasticizer and its flexibility, enabling it perform its function without fail. It l retained its strength and has not deterio ed. It has also resisted puncture by roc biological attack from microorganisms, a has had no detrimental effect on the en ronment that it has protected since 1971.

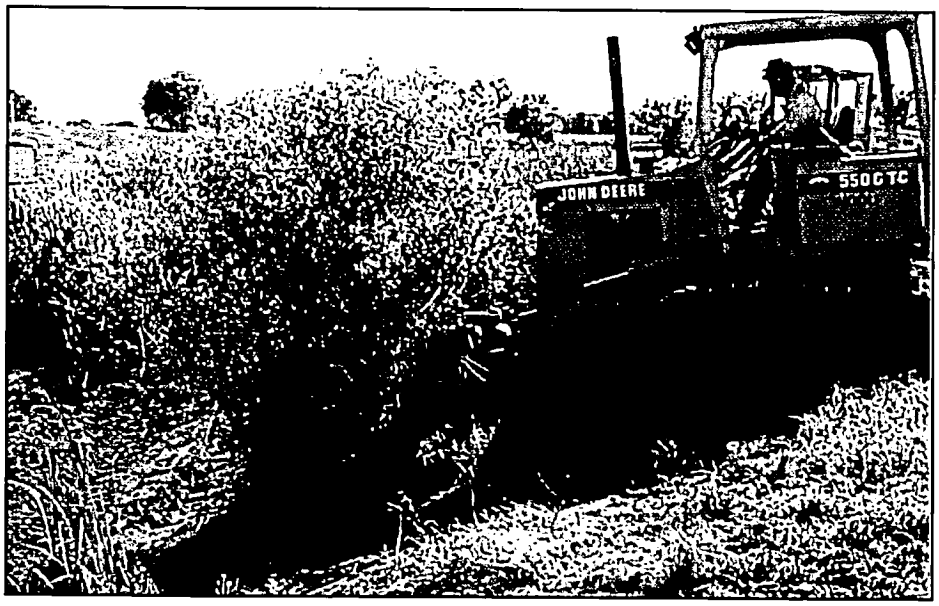
The potential for root penetration w a big question in the forensic study of th ponds. Each of the ponds had a lar amount of cattails around the perimeter the pond.

As the bulldozer removed the dirt fr the top of the liner under the cattail ar careful observation was made of the r zone of the cattails. These cattails produc one root stalk about 3/4" to 1-1/4" in dian ter, with a mass of smaller roots around t main root. The root length was appro mately 1 to 3 foot. All roots of the catta grew down to the liner, then grew horizo tally along the top surface of the liner. N evidence of liner intrusion was found.

One of the ponds that samples were removed from had a small willow tree (12-15 feet tall) growing below the anchor trench but above the water level. The willow tree was located approximately 5 feet down the slope from the anchor trench and had a trunk of 6-8 inches diameter.

As the bulldozer operator cleared the dirt from the sides of the tree, it was observed that the tree roots grew similarly to the cattail roots. They grew down to the liner, then turned and traveled along the surface of the liner. Main roots were 3-5 feet long, with some smaller roots up to 7 feet from the trunk. When the dozer pushed the tree, it slid down the liner to the bottom of the pond, leaving the liner intact. No damage was found from roots penetrating the liner.

In the center of each pond was an inlet/outlet structure. This concrete slab was approximately 2.5' x 2.5 feet, with the top level with the liner sub grade. The liner was placed over the concrete, sealed with mastic, and fastened to the concrete using 2x4" redwood batten strips and concrete nails. This structure and the batten appeared to perform well over the thirty years as indicated by no discoloration of the soil color under the liner and around the structure.



Bulldozer removing willow tree from PVC liner.

To learn more about the experimental ponds and research opportunities available, visit the Michigan State Univeristy web site for the W.K. Kellogg Biological Station at www.kbs.msu.edu/. **L&W**

For more information, contact Fred P. Rohe, Environmental Protection Inc., 9939 US-131 South, Mancelona, MI 49659, (800)OK-LINER, fax (231)587-8020, www.geomembrane.com, pvcliner@geomembrane.com.

North Lombard
OVERCROSSING PROJECT

Volume 1 Issue 3 Spring 2002

Project Description

The purpose of the North Lombard Overcrossing Project is to provide an overcrossing of rail lines that cross North Lombard Street between Burgard and North Rivergate Avenue at the south entrance to the Rivergate Industrial District. The project s being developed jointly by the Port of Portland and the City of Portland, with the City managing the project. The construction of the overcrossing will address current and future traffic delays associated with rail activity on North Lombard and the related safety and air quality issues

Special Points of Interest

- **The project budget includes 250,000 for environmental enhancement.**
- **The project will reopen a wildlife corridor from Smith and Bybee Lakes to Bonneville Pond.**
- **The project will take special provisions to minimize impacts to the Western Painted Turtle**
- **This is the third project newsletter.**

Project Schedule

The project is currently in Final Design the project will go to construction in July 2003

Final Design April 2002-June 2002

Construction July 2003-July 2004

Computer generated image of the future overcrossing.

The Project

The project will build a new two-lane structure for N. Lombard from the Burgard intersection to Rivergate Blvd.

The new structure will include

- 2 traffic lanes
- bike lanes
- a sidewalk on the north side

Detour

- N. Lombard will be closed from Burgard to N. Rivergate for one year.
- The proposed detour will use Time Oil Rd.

See detour map on back.

Costs and Funding

The estimated cost of the project is 22 million. The project is funded through several sources:

- Federal funds with local match from the Port of Portland and the City of Portland.
- City of Portland System of Development Charge Funds.
- Contributions from the railroads.

City Logo Goes Here

For more information please contact:

Dan Layden
Project Manager
City of Portland
(503) 823-2804
or E-mail at
dan layden@pdxtrans.org