



Planning for the Future:

Reuse Assessment for the Red Oak City Landfill Superfund Site

FINAL

July 2008

EPA Region 7
Superfund Redevelopment Initiative

funded by
United States Environmental Protection Agency

prepared for
City of Red Oak

prepared by
E² Inc.

Acknowledgements

E² Inc. would like to thank the following people and organizations for their hard work in support of the conceptual reuse and long-term stewardship planning process for the Red Oak Landfill Superfund Site and for their valuable contributions to this report.



Phil Eason, Academy of Model Aeronautics

Gary Maley, Academy of Model Aeronautics

Dan Penry, Academy of Model Aeronautics

Tom Bentley, City of Red Oak

Brad Wright, City of Red Oak

Janet Haynes, Intier Automotive Seating of America, Inc.

Carl Priebe, Iowa Department of Natural Resources

Bill Drey, Iowa State University Extension

Darwin Rossander, Montgomery County Extension

Curtis Woods, Montgomery County Shooting Sports

Phil Gohlinghorst, Montgomery County Shooting Sports

Brian Holmes, Natural Resources Conservation Service

Dale Brockshus, Pheasants Forever

Dan Cain, Shooting Sports

Tonya Howell, US Environmental Protection Agency

Rob Weber, US Environmental Protection Agency

Table of Contents

Introduction	Page 2	<i>List of Figures</i>	
Site Background	Page 3	Figure 1 - Site Location	Page 2
Site Overview	Page 4	Figure 2 - Site Map of the Red Oak Landfill Site	Page 5
Community Goals	Page 6	Figure 3 - Potential Reuse Zones	Page 7
Potential Reuse Zones	Page 6	Figure 4 - Potential Stewardship Zones	Page 13
Aeronautics Flying Field	Page 8		
Shooting Range	Page 9		
Habitat Restoration	Page 10		
Stewardship Considerations	Page 12		
Bank Stabilization	Page 14		
Summary and Potential Next Steps	Page 15		

Appendices

Appendix A: Participants of the Reuse Assessment Meeting
Appendix B: Montgomery County Extension Memo
Appendix C: Clay Target Program Brochure
Appendix D: Pheasant Habitat Brochure
Appendix E: Prairie Grass Planting Guidelines
Appendix F: Case Study: Prairie Grass Establishment on Landfill
Appendix G: Draft Guidelines: Prairie Grass Establishment on Landfill
Appendix H: Sample AMA Use Agreement
Appendix I: Engineered Logjam Overview

Introduction

EPA's primary responsibility at Superfund sites is to ensure the protection of human health and the environment. Consideration of a site's potential future use is an important part of this responsibility under the National Contingency Plan (NCP). The Superfund Redevelopment Initiative (SRI) was created by EPA in 1999 to help communities and stakeholders in their efforts to return environmentally impaired sites to protective and productive use. Local communities benefit by participating in EPA's evaluation of future uses for the site by helping to determine how the site's reuse might fit with and address community goals as well as the restrictions on uses for the site.

With funding from SRI, EPA Region 7 requested environmental consulting firm E² Inc.'s assistance with a reuse assessment for the Red Oak City Landfill Superfund Site (Red Oak Landfill Site), located in Montgomery County just outside the City of Red Oak, Iowa. This report summarizes the findings of the reuse assessment including a background summary, a site characterization, community goals, reuse options, stewardship considerations, potential next steps, and implementation resources. The purpose of the reuse assessment is to facilitate the long-term protectiveness and stewardship of the site by outlining reuse options and considerations for EPA, community stakeholders, the owner of the site, and additional potential responsible parties.

This reuse assessment was conducted following the information collection guidelines outlined in EPA's 2001 Reuse Assessment Guidance (OSWER 9355.7-06P). Information gathered and reviewed includes stakeholder interviews, site features, site ownership, existing and future land use plans, environmental considerations and regulations, community input, public initiatives, and likely future uses.

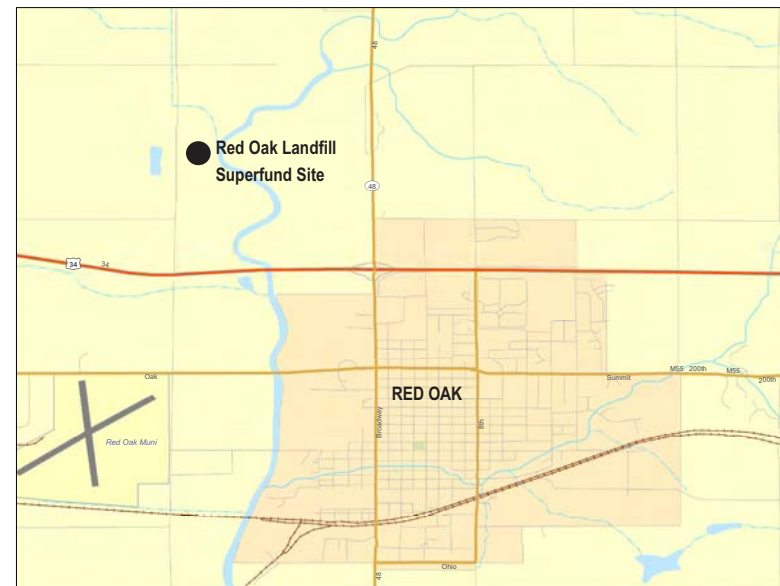
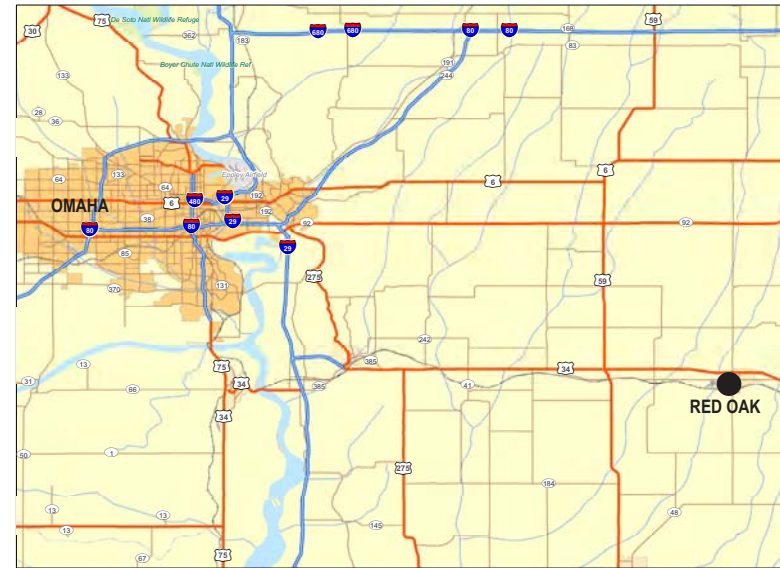


Figure 1 - Site Location

Site Background

The Red Oak Landfill Site is owned by the City of Red Oak (the City) with a population of 6,000. Red Oak sits adjacent to the East Nishnabotna River in southwest Iowa, approximately an hour southwest of Omaha, Nebraska.

The Red Oak Landfill Site was originally a limestone quarry which operated from the late 1940s to the early 1960s. The City of Red Oak purchased the property in 1962 and operated it as a landfill until it closed in April 1974. Waste disposed of at the site reportedly included construction and demolition debris, tree pruning waste, municipal refuse, and industrial waste from facilities in the Red Oak area.

The site was proposed to EPA's National Priorities List (NPL) in June 1986 and EPA signed a Record of Decision (ROD) for the site in 1993. An Explanation of Significant Differences (ESD) was issued in 1996 modifying the ROD. The remedy selected for the Red Oak Landfill included capping of the contaminated soils and wastes on-site, construction of diversion and drainage structures, contouring and re-vegetation of the riverbank slope, access and institutional controls, and ground water monitoring. The site achieved construction completion in 2001. The Red Oak Landfill Site was nominated as a 2007 SRI Return to Use Demonstration Project. The City owns the property and shares a maintenance agreement with the site's other potentially responsible party, Intier. The City is responsible for mowing, regular inspection and maintenance of the cap and drainage structures, and bank stability. Intier is responsible for conducting ground water monitoring.

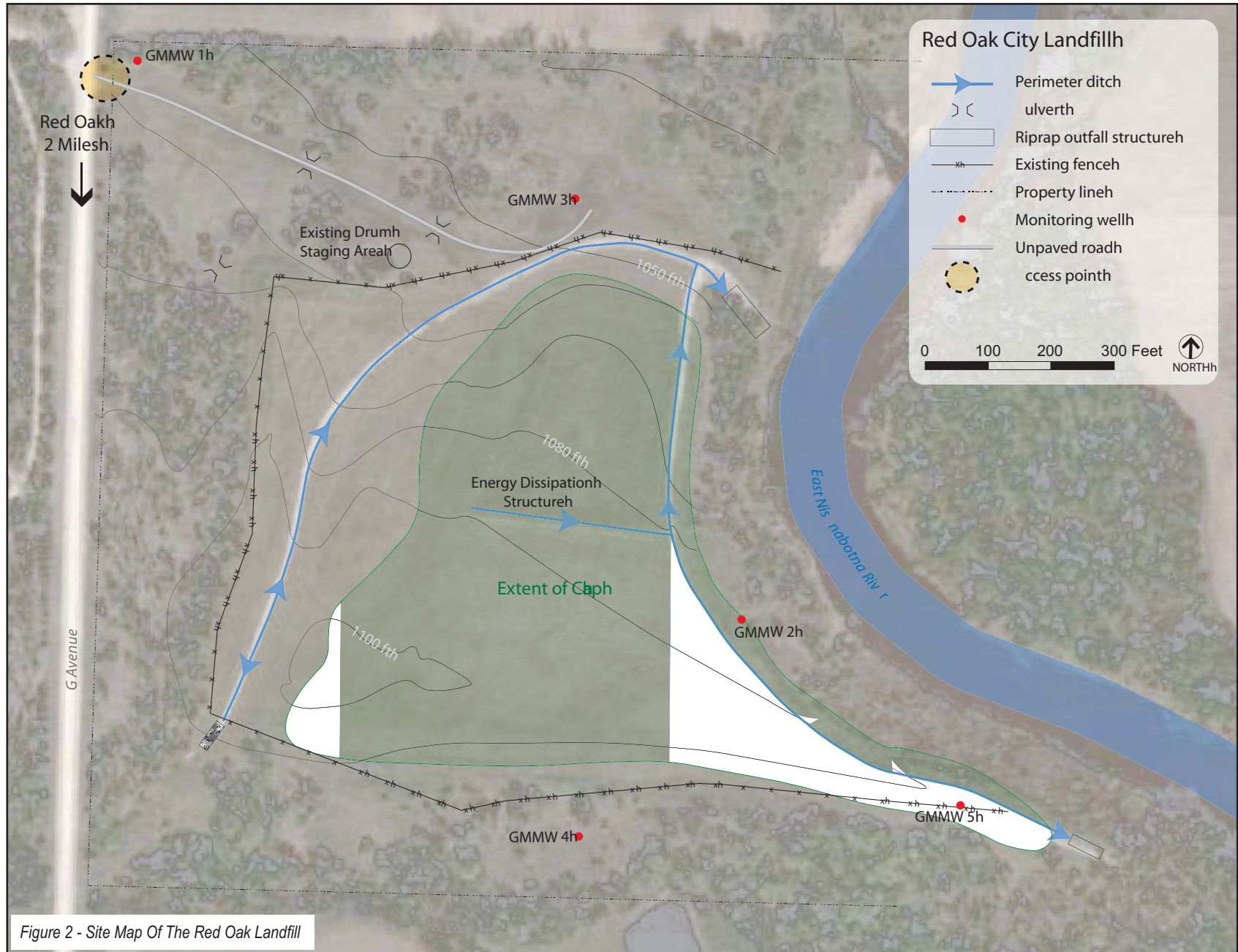
The second Five-Year Review, completed in September 2007, concluded that the contaminants levels have not increased in the on-site monitoring wells and the drainage structures, landfill cap, and the monitoring wells are in good condition. The assessment of this second Five-Year Review found that the remedy implemented for this site continues to be protective of human health and the environment.



Site Overview

The Red Oak Landfill Site occupies approximately 40 acres adjacent to the East Nishnabotna River. Figure 2 outlines key features of the site including access and remedy components. Current access to the site is limited to a gated dirt road entrance at the northwest corner of the site. The landfill cap, which includes an 18 inch clay and an 18 inch loam layer, covers a little less than half the site. The landfill cap is in good condition and covered in primarily cool season grasses. Rip-rap drainage swales outline the east and northwest cap perimeter to direct drainage away from the capped area. Both the cap and drainage structures are fenced and currently mowed once per year on or after June 1st, and a second time in the fall if needed, per the City's maintenance obligations. The site slopes up approximately 50-60 feet from the river elevation and entrance to the top of the cap at 1100 feet. Five ground water monitoring wells are located throughout the site. The remedy also includes bank stabilization along the steep riverbank slope. Erosion and slippage along the river bank slope discovered in 2007 will require ongoing operations and maintenance repair activities to be performed in 2008. Buried waste was not exposed along the river bank due to erosion in 2007. The landscape outside the fenced area includes primarily young cedars, cottonwoods, and shrubs.





Community Goals

The City has expressed interest in exploring low-impact site reuses, such as wildlife habitat, that may reduce maintenance costs and limit public access. Through a series of stakeholder interviews and reuse research, E² Inc. generated a set of reuse options and associated conceptual maps for how reuse might fit on the site. These uses included habitat restoration, a model aeronautic flying field, sports fields, and a walking trail.

On behalf of EPA, E² Inc. facilitated a reuse assessment meeting at the site on March 20, 2008 with a selection of community experts and stakeholders. The purpose of the meeting and associated site tour was to review the potential reuse options and gather reuse considerations for the site. Participants included representatives from the City, Intier, EPA Region 7, Iowa State Department of Natural Resources, the Red Oak Natural Resource Conservation Service office, Pheasants Forever, Montgomery County Extension, Iowa State University Extension, Montgomery County Shooting Sports, and the local Academy of Model Aeronautics club. Appendix A includes a list of the participants.

After the meeting and site tour, the participants concluded that habitat restoration, a model aeronautic flying field, and shooting sports may be appropriate uses for the site. Participants agreed that these uses would benefit the community by providing recreational venues for youth and adults, provide for controlled access via a formal agreement, and enhance the long-term stewardship of the site. Each of these proposed uses has a local organization or agency that could partner with the City and Intier to facilitate and sustain protective reuse at the site. Participants agreed that these uses could easily co-locate on the site with some proper planning. EPA site staff indicated that, with further research, the uses could be compatible with the long-term protectiveness of the site's remedy. Participants concluded that sports fields and a walking trail were not appropriate for the site at this time due to lack of demand, lack of a community sponsor, and concerns regarding unsupervised access to the site given its remote location.

In addition to the reuse meeting, E² Inc. met with staff from the Anderson Conservation

Area (ACA). The ACA noted that habitat restoration would be extremely beneficial given that many of the regional conservation easements are due to expire and are at risk of being returned to farmland. The ACA also cautioned that prairie grass roots can reach up to ten feet deep and additional research may be needed to determine if the roots would compromise the cap. Finally, the ACA agreed that given the remote location of the landfill, supervised access was likely most appropriate at this time.

Potential Reuse Zones

During the reuse site tour, participants identified appropriate locations for habitat restoration, model aeronautics flying, and shooting ranges. The potential use zones are shown in Figure 3.

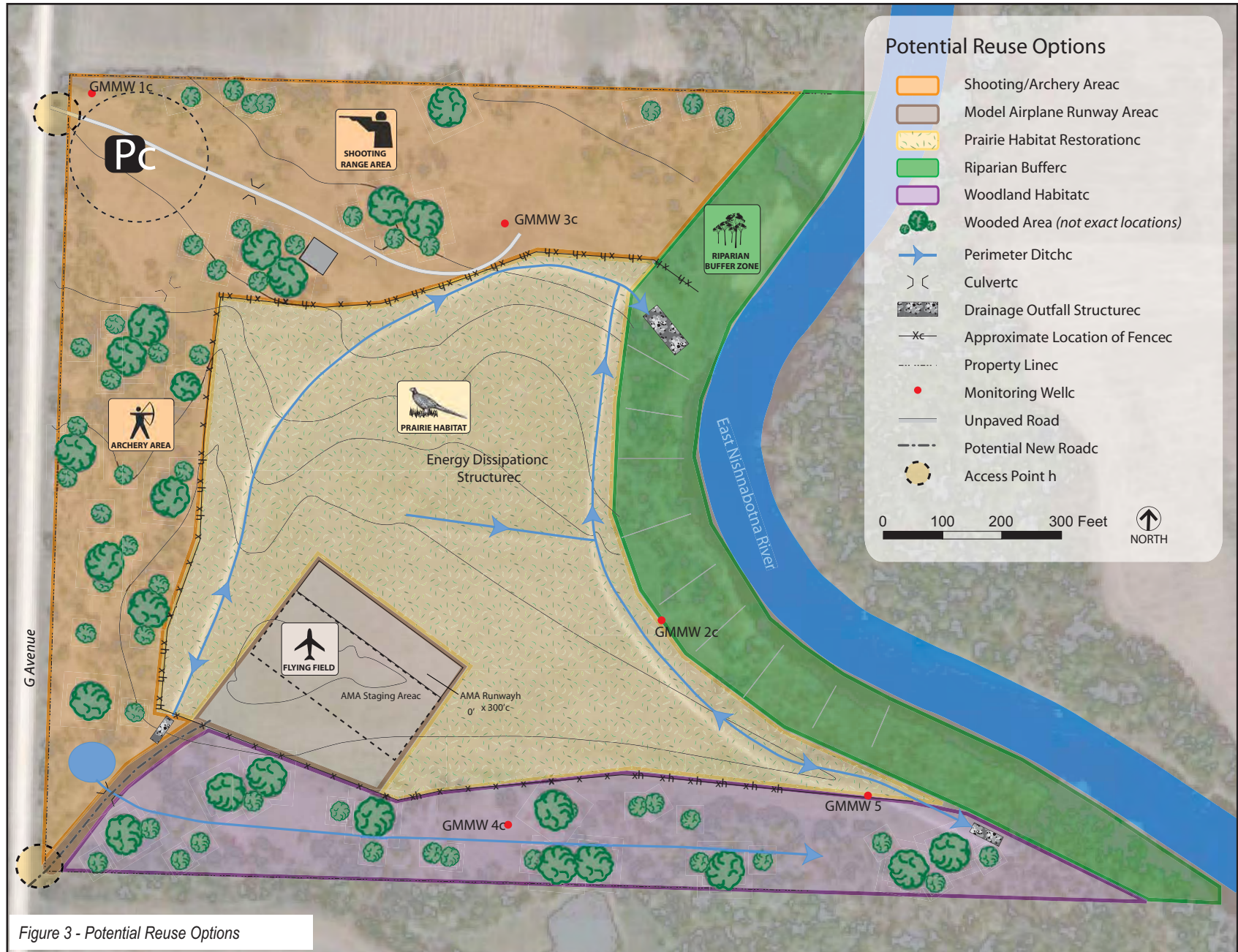


Figure 3 - Potential Reuse Options

Aeronautics Flying Field

Model aeronautic flyers typically fly three to four times a week during evenings and weekends. However, the nearest flying field is approximately 25 miles away. A local flying field would eliminate significant traveling for local aeromodelers and likely generate additional local interest in AMA use. Moreover, the unique scenic qualities of the potential site would likely appeal to AMA flyers from across the region for regional or multi-state flying events. Participants agreed that the high point of the capped area would be an ideal location for the model aeronautics flying field. This location is removed from trees and provides a clear viewing area. Access could be constructed from the southwest corner of the site and would need to include a drainage crossing and ensure erosion protection. Alternatively, AMA members could park along the current northwest access point and walk to the flying field. The runway (60 feet by 300 feet) would orient northwest to southeast to take advantage of the most level grade. An adjacent (50-foot by 150-foot) mowed area could provide a spectator area. The spectator area typically includes a minimum (3-foot high, 150 to 200-foot long) safety fence separating viewers and operators from the runway. This fence could be temporary and anchored with sandbags to avoid penetrating the cap. The runway could be optimized by adding fill to level the grade even further. Flyers noted that a level width grade is more critical for runway performance than a level length grade. The fill added to the landfill cap may serve as additional infiltration protection for buried waste. However, potential infiltration, erosion, and runoff will need to be evaluated during plan review to determine if adding fill will continue to be protective of the remedy.



Considerations

- AMA representatives noted that they could maintain the runway and associated amenities, but that they do not have funding to construct access or grade the runway at this time.
- An AMA Flying Site Development/Improvement Grant, if approved, would provide up to 10% of the total cost of the project.
- Phasing AMA use could allow members to begin mowing and using the field in the near term and provide upgrades as funding becomes available.
- Individual AMA members have AMA insurance that covers users and spectators from accidents due to flying activities. For chartered AMA clubs, liability coverage is granted and extends to model flying accidents and nonflying accidents. The owner of a flying field also receives liability coverage if the AMA members with permission to use the flying field are first chartered as an AMA club.
- Recommended specifications for Radio Control Flying Fields are included on pages 5-8 of the new AMA membership guide, available at <http://www.modelaircraft.org/PDF-files/Memanual.PDF>.
- EPA noted that the Superfund Consent Decree for the site may need modification to permit AMA activities including filling of the cap for runway, parking and drive surfaces. Further evaluation during plan review will be needed to determine the design and location of these proposed structures.
- Additional discussion and evaluation is needed to determine whether vehicle access would be allowed in a spectator area on the cap.

Shooting Range

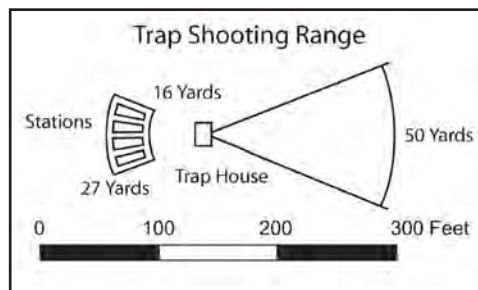
Red Oak currently does not have an adequate shooting range. Bill Drey, Education Director for Montgomery County Iowa State University Extension, submitted a memo noting that the Red Oak Landfill site would be an ideal shooting range location for the County Extension and 4-H shooting programs (see Appendix B). He added that the youth programs could also use the Red Oak Landfill Site to instruct youth on wildlife skills such as tracking, plant identification, camping, and photography. He also noted that a shooting range could provide practice ranges for the County sheriff and Red Oak police. Other participants agreed and noted that the area could also include a trapshooting range to serve the Iowa Scholastic Clay Target Program (see Appendix C for a program brochure.) Participants noted that the nearest trapshooting range is 30-50 miles away.

Participants agreed that the northern portion of the site, outside the capped area is the most appropriate location for a set of shooting ranges. This area contains some natural berms that could be re-graded to function as shooting range berms. Regrading proposals would need to be evaluated for impacts to drainage. Access to this area is from the current northwest gated dirt road. An informal parking area could be located near the entrance. Constructed ranges could include air rifle, shotgun, muzzleloader and trapshooting. Each range would include a (10-foot high, 50-foot long, U-shaped) constructed berm. A sample layout with dimensions for a trapshooting range is located to the right. Participants agreed that the west side of the site, which contains cedars and a natural berm running parallel to the road, would be the most appropriate location

for an archery range.

Considerations

- Additional planning would be needed to site the ranges appropriately to ensure safety, minimize noise for adjacent property owners to the north and west of the site, and prevent lead from being used and migrating into the site soils and to the river. The range should be sited to ensure shot is directed away from the river.
- Participants noted that there is adequate funding and volunteer support in the community for the construction and maintenance of shooting range facilities.
- The County Extension service noted that they have liability insurance for their youth programs.
- Concerns for range implementation include lead in munitions including shot, bullets, propellants, and primers and polycyclic aromatic hydrocarbons (PAHs) contained in non-biodegradable sporting clays manufactured with petroleum-based products.
- The EPA has national guidance regarding the management of lead shot at shooting ranges (<http://www.epa.gov/region2/waste/leadshot/>.) Given the concern for lead in the environment, the consideration of non-lead, non-toxic shot and biodegradable (non-petroleum-pitch containing) sporting clays is suggested.



Habitat Restoration

Participants agreed that the remainder of the site could be used for habitat restoration for pheasant and other ground-nesting birds. Native prairie (warm-season) grass provides the best food source for pheasants. A brochure outlining considerations for pheasant habitat is located in Appendix D. The grass currently covering the cap is predominately cool season and does not offer much food source.

At a minimum, mowing frequency and timing could be adjusted to increase the shelter benefits of this existing grass cover. Representatives from Iowa DNR Wildlife and Pheasants Forever both agreed that mowing on or after August 1 would ensure better nesting protection. In addition, mowing could be reduced to every three to five years supplemented with spot weed and invasive removal.

In addition, native prairie grass could be seeded in designated areas. Planting guidelines and a sample seed mix from Iowa DNR wildlife is included in Appendix E. Seed mix is also available from Pheasants Forever. As mentioned earlier, native prairie grass can generate roots up to ten feet deep, and thus some care is needed in determining whether to seed the cap area with these deep rooted grasses. Jeff Popp, Land Restoration Program Manager from the Wildlife Habitat Council (WHC), suggests that prairie grass establishment can enhance the protectiveness of a cap remedy. He notes,

“While the warm season grasses do have the ability to send roots down to significant depths, the roots still need oxygen and will not grow in soils or cap layers with such hypoxic conditions. If they get close, they can actually be a benefit by stabilizing the cap in the case of a heavy rain event, where they also will quickly absorb the water.”

Appendix F highlights a case study from WHC in Joliet, IL, where prairie grass has been established on a capped contaminated landfill. The WHC also provided draft EPA guidelines for establishing prairie grasses on landfill caps in the mid-Atlantic (included in Appendix G). If after further consideration, establishing prairie over the cap is still a concern, prairie could still be established in the non-capped areas of the site. Dale Brockshus, local Chapter President of Pheasants Forever, indicated that Pheasants Forever could potentially fund habitat restoration and maintenance and noted that habitat restoration could be integrated around other selected uses.

The Anderson Conservation Area staff also noted that bluebird boxes could be an appropriate use of the site and enhance bluebird populations by providing nesting shelter. Bluebirds once popular in Iowa nearly disappeared when many of the old trees were cleared for farming. Once volunteers began hosting bluebird boxes to replace the shelter formally provided by the trees, the bluebird population returned. The ACA could



provide up to 50 boxes if a volunteer was identified to check the boxes twice a year to prevent appropriation by sparrows. This additional habitat use was not discussed at the reuse meeting, but could potentially co-exist with the other proposed uses.

Considerations

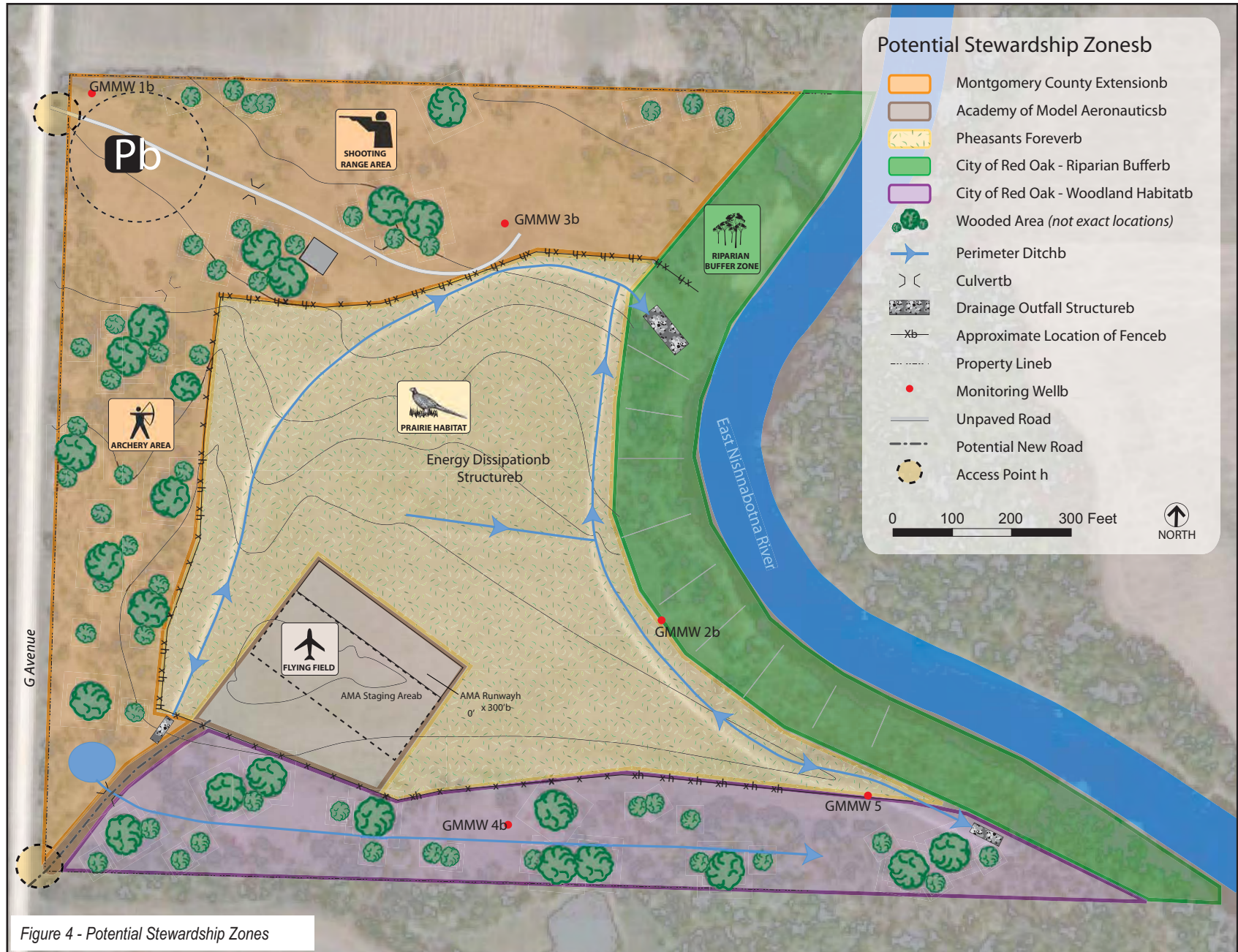
- Additional discussion and evaluation may be needed to determine whether prairie grass establishment on the capped area will be protective of the remedy.
- Burning and discing may not be used at the site for habitat maintenance.
- During site preparation, care should be taken to minimize herbicides and keep weed killers away from the drainage structures and riverbank.
- The Consent Decree including the Statement of Work, Monitoring Operation and Maintenance Plan, and decision documents requirements shall be reviewed to determine if the proposed uses are supported by the remedy for the site. Further evaluation will be required for proposed uses.



Stewardship Considerations

The future uses identified by the community could offer additional stewardship for the site. Figure 4 outlines potential stewardship zones that could be used to facilitate further discussions with EPA and develop use agreements with appropriate organizations or agencies. Any of the future uses discussed in this report will also need to address the following considerations:

- Specific construction proposals would need approval by the City, Intier, Iowa DNR, EPA Region 7, and perhaps the Court.
 - Prospective user groups would need an approved use agreement with the City and Intier to clarify access conditions, maintenance responsibilities, use restrictions, and liability coverage. A sample AMA agreement is included in Appendix H.
 - Prospective users would need to take care not to disturb any of the remedy components including the cap, the drainage structures, the bank stabilization, the fencing (and associated signage) and the monitoring wells. These precautions, and any associated controlling mechanisms, would need to be outlined in any future reuse proposal.
 - Any clearing and grading proposals would need to delineate specific locations for approval and employ appropriate erosion and sediment controls to protect the drainage structures, the river, and on-site water bodies.
 - The City and Intier are required by the Consent Decree to continue to fulfill their operation and maintenance obligations.
 - Approval by EPA, and perhaps the Court, would be needed for any proposed changes in use, access, and maintenance activities.
- Public access would need to be restricted to approved users, and vehicle access, including all-terrain vehicles (ATVs) would need to be restricted to designated roads and parking areas.
 - Any waste that is exposed would need to be addressed according to all the State solid waste regulations.



Riverbank Slope Operation and Maintenance

As noted in Figure 4, the City would need to continue to maintain the bank stability in the riparian zone. During the reuse site tour, Brian Holmes from NRCS provided references to the NRCS Engineering Field Handbook, which outlines several bio-engineering techniques in the “Streambank and Shoreline Protection” chapter. The guidance recommends that cuttings, pole plantings, and live stakes (e.g., willows) are more resistant to erosion than seeding. The diagram to the right illustrates a sample bioengineered technology. Anchored Cutting Systems arrange large numbers of cuttings in layers or bundles to prevent erosion from upslope water sources, promote trapping of sediments, and quickly develop dense roots and sprouts to stabilize the slope. These engineered systems include:

- Brush mattresses – cuttings laid side by side and interwoven or pinned down with jute cord or wire held in place by stakes.
- Brush layers – cuttings laid on terraces dug into the bank, then buried so that the branch ends extend from the bank.
- Fascines or wattles are bundles of cuttings tied together, placed in shallow trenches arranged horizontally on the bank face, partially buried, and staked in place.
- Reed roll – partially buried and staked burlap rolls filled with soil and root material or rooted shoots to establish herbaceous species in appropriate habitats.

Participants discussed the possibility of considering engineered logjam (ELJ) technology upstream of the steep slope as part of the ongoing riverbank slope operation and maintenance obligations. ELJs have been used successfully on large river systems for similar uses. Appendix I includes an overview of ELJ technology and highlights several successful case studies. Further evaluation of river bank slope repairs shall be reviewed and conducted by qualified professionals under operation and maintenance activities.

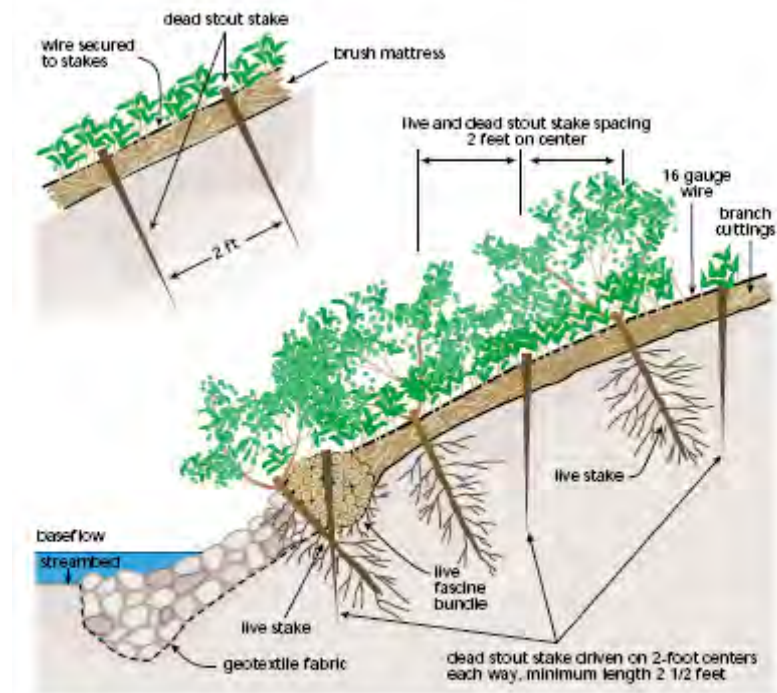


Figure 8.40: Cutting systems. Details of brushmatress technique.

Source: USDA-NRCS 1996a.

Note: Rooted/leafed condition of the living plant material is not representative at the time of installation.

Summary and Potential Next Steps

In summary, this reuse assessment has concluded that there are several viable reuse scenarios for the Red Oak Landfill Site. Habitat restoration, an aeronautic flying field, and a shooting range could each provide community benefits, potentially reduce the City's maintenance costs, and enhance the long-term stewardship of the site. Each of these potential uses has a local sponsoring organization or agency that could partner with the City to facilitate reuse implementation and negotiate appropriate use agreements. The EPA Regional Project Manager for the site indicated that the uses discussed would be considered. A proposal will need to be provided to EPA with the proposed uses. EPA shall review the proposed uses based on the Superfund Decision Documents, Superfund Consent Decree, and recent data and research information for the site in consultation with EPA legal counsel and EPA landfill experts. EPA will consider innovative uses such as those proposed. However, under the Superfund Consent Decree, EPA in its sole and unreviewable discretion, with possible review by the Court, can approve or disapprove proposed restricted uses for the site. The following next steps could be considered to facilitate these uses at the Red Oak Landfill Site:

- The City and Intier must obtain contingent preliminary approval on the concepts proposed at the site.
- EPA Region 7, the City, and Intier could hold a follow up meeting or conference call to discuss the proposed elements of a reuse proposal that EPA would need in order to approve any construction or changes in use, access, and maintenance activities.
- Once the City has obtained preliminary approval, city officials could meet with representatives of each of the prospective use sponsors to agree on the location of the use zone and conditions regarding access, such as insurance, use restrictions, and maintenance obligations.
- A representative from each of the sponsoring organizations could draft a use

agreement, based on a template provided by the City, for review by the City and Intier. The agreement could outline the designated use location, access protocols, use restrictions, penalties for violating use restrictions, maintenance obligations, liability protections, and contact information.

- A representative from each of the sponsoring organizations could draft a proposed construction plan for any proposed disturbances including demolition, clearing, grading, seeding, fencing, paving, building, or signage for review by the City, Intier, Iowa DNR, and EPA Region 7.
- The AMA club could obtain a cost proposal for constructing access, adding fill to level a runway and any additional amenities and submit a funding proposal to the National AMA via the District Vice President Bill Overdieck (734-283-4813, sgaeroinc@comcast.net).
- The City could explore alternative bank stabilization techniques to determine whether a bioengineered or engineered log jam might be suitable options for future consideration.
- The City could propose an amendment to the Operations and Maintenance Plan to modify the frequency and timing of mowing to enhance habitat value and reduce costs.
- After discussion with prospective user groups, the City could develop a reuse proposal that outlines changes in use, access and maintenance activities for review and approval by EPA Region 7 and IDNR.

Appendices

Red Oak Landfill Reuse Meeting AttendanceMarch 20th, 2008

Name	Organization	Position	Phone Number
Darwin Rossander	Montgomery County Extension		712-829-2234
Bill Drey	Iowa State University Extension	Education Director	712-623-2592
Curtis Woods	Montgomery County Shooting Sports		712-623-2249
Phil Gohlinghorst	Montgomery County Shooting Sports		712-623-2004
Tom Bentley	City of Red Oak	Wastewater Superintendent	712-623-6508
Brad Wright	City of Red Oak	City Administrator	712-623-6520
Carl Priebe	Iowa Department of Natural Resources	Biologist, Wildlife Division	712-374-3133
Dan Cain	Shooting Sports		402-490-9417
Phil Eason	Academy of Model Aeronautics	Local Representative	712-623-6318
Gary Maley	Academy of Model Aeronautics		712-623-4430
Dan Penry	Academy of Model Aeronautics	President, Southwest Iowa Flyers	712-310-3853
Janet Haynes	Intier Automotive Seating of America (Magna)		905-726-7488
Brian Holmes	Natural Resources Conservation Service	Red Oak Office Engineer	712-623-1962
Tonya Howell	US Environmental Protection Agency	Region 7 Reuse Coordinator	913-551-7589
Rob Weber	US Environmental Protection Agency	Remedial Project Manager	913-551-7918
Dale Brockshus	Pheasants Forever	Local Chapter President	712-623-3566
Miranda Maupin	E ² Inc.	Manager, Community Planning & Design Team	434-975-6700 ext. 227
Kate Bird	E ² Inc.	Associate	434-975-6700 ext. 246

IOWA STATE UNIVERSITY
University Extension

Bill Drey
Montgomery County
400 Bridge Street Suite 2
Red Oak, IA 51566
Phone: 712-623-2592
FAX: 712-623-2594
E-mail: drey@iastate.edu

To: Whom It May Concern

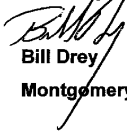
Montgomery County Extension and 4-H has a Shooting Sports program. The disciplines are wildlife, archery, air rifle, rifle, shotgun, and muzzleloader. The 4-H program has been looking for an area to hold practices. We have over 60 youth who are involved in the program.

We feel the old city dump would be an excellent area to do this and only take a small area for our activity. Our program requires that we have burms on three sides for safety purposes. Safety and Education are our main goals for the program.

It could also be an area that the Red Oak Police and the Montgomery County Sheriff Department could also use as well as other groups.

We would appreciate your consideration.

Sincerely,



Bill Drey

Montgomery County Extension Education Director

Two of our instructors here today are Darwin Rossander and Curtis Woods.



4-H Shooting Sports
Learn By Doing

Iowa 4-H Safety and Education Shooting Sports (SESS) Program Objectives

- To enhance the physical, cognitive, social and emotional development of youth through safe, educational, and socially acceptable involvement in a shooting related activity.
- To teach safe and responsible use of firearms and archery equipment including sound decision-making, self-discipline, and concentration.
- To promote the highest standards of safety, sportsmanship and ethical behavior.
- To encourage understanding of our natural resources and the development of a personal environmental stewardship ethic by young people through participation in shooting, hunting, and related activities.
- To strengthen families through life-long recreational activities.
- To expose participants to the broad array of vocational and lifelong avocational activities related to the shooting sports.
- To complement and enhance the impact of existing safety and hunter education programs.

2008 Club/Individual Sponsorship

Individual - \$500

- Listing in shoot program
- Sponsor sign at both events
- 2 lunch tickets for each event
- Subscription to the Iowa SCTP newsletter

Club Listing - \$250

- Club name listed in shoot program
- Contact information listed in shoot program

Single Line Listing - \$100

- Program listing for business or individual

Note: To be included in the 2008 Iowa High School and Scholastic Clay Target Program state shoot program, all donations must be received no later than March 1, 2008.

2008 Iowa Scholastic Clay Target Program, Inc. Board of Directors

President	Vice President
Ben Berka	Dave Swanson

Secretary/Treasurer - Marita Vogel

Fundraising Co Chair - Randy Cook

Fundraising Co Chair - Guy Thomas

High School Programs Advisor
Dan Ramaeker

Collegiate Programs Advisor
Lee Van Brocklin

Facts About The Scholastic Clay Target Program

- Sporting clays, skeet and trap shooting are safer than all popular school sports**
- SCTP goes beyond competitive shooting - it builds character. Seven in 10 senior shooters credit SCTP for providing leadership skills*
- 30% of participants would not have been introduced to shooting without SCTP*
- 78% of students said they would shoot more often if they had the opportunity to earn a scholarship*
- 57% of parents said their view of the shooting sports is more acceptable because of their child's involvement in SCTP*
- >95% of parents said that SCTP has been a positive influence in their child's development*
- >45% of parents said that their child's grades have improved since being part of SCTP*

*From National Shooting Sports Foundation Industry Intelligence Report Vol2No4

**From American Sports Data, Inc. - "A Comprehensive Study of Sports Injuries in the U.S."

For More Information Contact:

**Iowa Scholastic Clay
Target Program, Inc**
636 Boone Drive, Waukee, IA 50263
515-201-8395
www.IowaSCTP.org

Iowa Scholastic Clay Target Program, Inc. A Charitable Foundation



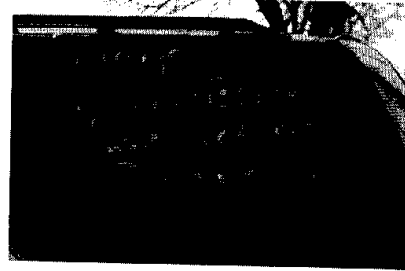
**Helping Kids One
Shot at a Time**

Iowa Scholastic Clay Target Program, Inc.

The Scholastic Clay Target Program (SCTP) is a team-based clay target shooting program that is changing the lives of grade, middle and high school students nation-wide and in Iowa. Through organized clay target shooting, kids are learning lifelong skills such as gun safety, teamwork, respect for self and others, mental focus and self-discipline.

Sponsored by the National Shooting Sports Foundation and the national governing bodies of each sport, SCTP has >10,000 participants nationwide. In Iowa, the Scholastic Clay Target Program has joined forces with the strong tradition of Iowa high-school trapshooting programs to establish a spring shooting season for organized trap, skeet and sporting clays. Starting in March, teams are lead by certified coaches, practices are conducted, and local matches are held with neighboring teams. All of these activities lead up to the Iowa High School and SCTP Championships each May.

Established in 2006, the Iowa Scholastic Clay Target Program, Inc. is committed to supporting organized youth, high school and colligate clay target shooting programs across the state of Iowa.



You Can Make a Difference by making a tax-deductible donation to the Iowa Scholastic Clay Target Program, Inc. - a 501(c)(3), charitable corporation. The average cost for one student to participate in one shooting discipline throughout the spring shooting season is \$500, not including equipment costs. Your generous contribution will help offset costs and will provide funding for academic shooting scholarships for high-school students pursuing collegiate shooting careers. Donations to the Iowa Scholastic Clay Target Program, Inc. may be in the form of monetary gifts, firearms, shooting supplies/equipment, ammunition, services, vehicles and/or property.

As a sponsor, you will be recognized at the annual SCTP and High School State Championship events which will be attended by >500 shooters and their families. The 2008 state skeet and sporting clays event will take place on May 9/10 at the New Pioneer Gun Club in Waukee and the trap event will take place on May 17 at the Iowa State Trapshooting Association Homegrounds in Cedar Falls.

2008 Corporate Sponsorship Levels

Platinum - \$5000+

- Commemorative sponsorship plaque
- Verbal recognition at awards ceremony
- Name and logo on event t-shirts
- Sponsor booth and/or banner display
- Full page add and logo in shoot program
- Name and logo on all media promotion
- Sponsor sign at both events
- 20 lunch tickets for each event
- Subscription to the Iowa SCTP newsletter

Gold - \$2500

- Name and logo on event t-shirts
- Sponsor booth and/or banner display
- Full page add and logo in shoot program
- Name and logo on all media promotion
- Sponsor sign at both events
- 20 lunch tickets for each event
- Subscription to the Iowa SCTP newsletter

Silver - \$1500

- Name on event t-shirts
- Sponsor booth and/or banner display
- 1/2 page add and logo in shoot program
- Name on all media promotion
- Sponsor sign at both events
- 10 lunch tickets for each event
- Subscription to the Iowa SCTP newsletter

Bronze - \$750

- Name on event t-shirts
- Sponsor booth and/or banner display
- 1/4 page add and logo in shoot program
- Sponsor sign at both events
- 5 lunch tickets for each event
- Subscription to the Iowa SCTP newsletter

Pheasant Ecology: Food & Cover Plots

(from <http://www.pheasantsforever.org/page/1/foodandcover.jsp>)

Establishing Food and Cover Plots



Winter food is mostly in abundant supply and is generally not considered a limiting factor in the traditional pheasant range. Indeed, starvation of wild pheasants is practically unheard of. Why, then, do most biologists consider food plots an essential part of good pheasant management? The answer is simple—winter cover is much more effective with a high-energy food source nearby. Food plots are critical for pheasant management because of the relationship between food, winter cover, movement and mortality. This brochure will help you better understand this relationship and provide guidance on what,

where, and how to establish proper food/cover plots.

Winter Pheasant Biology & Food

The protective nature of cover on the landscape changes remarkably during winter. Grain stubble and weed patches that concealed feeding birds during fall are soon buried in winter's blowing snow. Unlike fall when birds are widely scattered, pheasants concentrate in limited heavy roosting cover during winter, venturing only as far as needed. They hesitate to feed beyond a half mile from cover, even if abundant food exists beyond that range. Thus, food near these islands of habitat is quickly reduced. Pheasants feeding on waste grain buried in the snow are forced to forage further from cover each day, exposed to predation and harsh winter weather in the open.

It's even trickier for hen pheasants, however. It's not merely staying alive—they must actively gain weight through mid-winter in order to replenish that lost during the previous nesting season. Hens that undergo a great deal of stress during the winter months suffer their highest mortality rate the following spring during nesting, and there is a strong correlation between spring body weight and successful chick production. Well-placed food patches establish safe foraging patterns, restrict unnecessary movements, and provide dependable food to carry female birds through harsh winters in good condition. Even in a mild winter, the closer secure winter cover and food are positioned, the more pheasants will benefit.

What to Plant?

Plan your food plots carefully, keeping the previous discussion in mind, and taking the worst-case scenario into account. Don't bother to create a project that is going to be buried by the first winter blizzard. Corn and grain sorghum are among the most reliable food sources (see Table). Planted separately or in combinations, they retain grain on stalks, stand well in winter weather and provide very high-energy food. Large blocks of corn, and combinations of forage sorghum and grain sorghum can also provide excellent cover. Wheat, soybeans, millets, rye and buckwheat are good food sources, but are often buried by snow, forcing birds into the open to utilize them.



Food plot mixes combining many of the crops above are available commercially or from PF, and can be broadcast for easy establishment. Pheasants Forever produces Midwest Mix (corn, sorghums, sunflowers, and buckwheat), Nebraska Mix (a combination of sorghums and millets) and Western Mix (sorghums, sunflowers, millets and clover). All are attractive to a wide range of wildlife. Select crops and maturities appropriate for your area, fertilize the plot, and control weeds to avoid excessive competition. Some weed cover benefits pheasants, but grain production will be reduced if weeds become a serious problem.

How much and where?

The two most critical design factors for food plots are location and size. Food plots can be established almost anywhere, such as on Conservation Reserve or Wetland Reserve Program land, or right next to your farm grove. The key to a successful food source is its location next to heavy winter cover that is frequented by pheasants and other upland wildlife.



In open country, up to 50 rows of standing crop can be filled in a single blizzard. There, large (3-10 acre) square or block-type food plots are preferable to smaller, linear food plots. Whenever possible, large food plots should be located directly adjacent to woody and herbaceous winter cover on the windward side (generally the northwest). If this is not possible, effective food plots can be established nearby if they are linked via corridors of escape cover to traditional winter cover. Where winter cover is scarce, large 10-acre-plus blocks of corn maybe planted to serve as both food and shelter for the birds. Bear in mind that

these areas will be used by many species of wildlife and that some, such as deer and turkeys, consume a great deal of grain daily and can potentially exhaust food resources well before winter has ended.

Smaller plots may work fine, if there is substantial winter cover nearby, if there is limited acreage to devote to food, if competition for the food is minimal, or if there is a greater need for other permanent habitat (nesting cover, for instance). Take an objective look at your area's particular habitat needs and what cover exists on adjacent properties, and get an idea of the worst-case winter. Then commonsense, and some advice from a wildlife professional can help you to determine the correct food plot size.

If plots will be small, minimize drifting by establishing snow traps (leave 4-6 rows windward, then harvest 12-20 adjacent rows as a snow catch). This same approach can be used to make wetlands, and small patches of woody cover more effective wintering areas—by placing food plots on their windward side to catch snow before it enters the winter roosting cover. Link any nearby satellite food plots to the best winter cover with travel corridors of heavy vegetation.

How do I plant this?

Whether by standard tractor and corn planter or grain drill, or via broadcast seeder mounted on ATV or pickup truck, there is a way to get a food plot in the ground where it will do the most good for wildlife (see Table). If you are without planting equipment, it may be available to rent from local conservation offices. Some agencies and some PF chapters provide planting services at nominal rates, and there are often local custom operators willing to plant these areas.

Check Local Sources for Help

It often works well to dovetail with farm programs like the Conservation Reserve and Wetland Reserve, which have acreage eligible for food plots. Food plots on these acres make valuable use of land that is already taken out of production. Acreage allowances and crop restrictions vary by state, so contact county NRCS/FSA offices to check local guidelines. State or local wildlife agencies may also provide food plot assistance to landowners



Still confused about food plots?

Then try the Pheasants Forever Essential Habitat Guide—a handy reference on all kinds of pheasant cover, including shelterbelts, food plots and nest cover. And, be sure to check with your local Pheasants Forever chapter, where you will find cost sharing, planting assistance, or just advice from a friendly chapter volunteer. *Many of the photos provided are courtesy of Roger Hill.*

Native Grass/Forb Planting Guidelines for Planting Into Brome Sod Fall Spraying - Spring Planting

1. (August 15-Sept. 1)

Mow, hay, or burn the area that is to be planted for site prep for the first herbicide application.

2. (Sept. 20-October 10th)

®) per acre on the area to be

Apply 2 quarts of glyphosate (Roundup) planted in the fall (Sept-Oct).

3. (April 10 - May 15)

®) per acre on the area to be

Apply 2 quarts of glyphosate (Roundup) planted in the spring.

4. (May 1 - June 30)

Plant mixed native grasses and forbs with a no-till drill at least 1 week

after last herbicide application.

5. Top clip/mow off weed competition above the planted vegetation

only if necessary. This may not be needed if the variety of (6-12" high) weeds present to clip/mow should not exceed 2-3 times, but one or zero clippings may also be sufficient. The maximum number of

clippings may also be sufficient.

6. When your stand of natives starts to become thick and you see less and

less forbs and bare ground present you need to incorporate some sort of disturbance. Some examples of good types of disturbance for you of

include disking, grazing, herbicide application, burning, and possibly native hay. The timing of herbicide application, burning, and possibly native hay should be completed in the fall after August 1st which is the end of the primary nesting season.

Also, herbicide application and disking should be completed from September 15th - October 15th to encourage the best

annual vegetation fix allowed. Disking or spraying in the spring will give you more fix allowed. is not as beneficial for brood rearing cover.

If you have any other specific questions give me a call.

Matt Dollison
IDNR Wildlife Biologist
(712) 243-2913 ext. 211



Case Study 7

Joliet Case Study	
Name and Location	<p>Site Name: Joliet, IL</p> <p>Site Location: Joliet, IL</p>
Ecological Enhancement	Vegetative cover of deep-rooted prairie grasses and flowers.
Site Description	The Joliet Chemicals facility is an operating plant owned by BP. The landfill leachate needs to be managed. Precipitation falling onto the landfill would run-off or infiltrate into the landfill creating leachate that potentially migrated downgradient towards the Kankakee River
Site Reuse Description	This site is part of an operating facility. The landfill itself is closed. A vegetative cover of deep-rooted prairie grasses and flowers was planted in 2001 to manage landfill leachate. It will continue to exist as a landfill.
Stakeholder Involvement	Stakeholders include BP and Illinois EPA. This project was funded by BP.
Site Assessment Approach and Cleanup	This site is under the authority of RCRA. The site is undergoing recontouring to further promote run-off versus infiltration. Revegetation was also planned. Reselected vegetation to maximize rain interception (and subsequent evaporation) to reduce run-off and infiltration. Deep-rooted prairie species were selected due to their substantial rain interception capacities and high ET rates. Standard operation, maintenance, and monitoring of the landfill. Annual mowing plus irrigation/fertilization as needed.
Reuse	Site will continue as a closed landfill; no further developments planned. Native prairie restoration and ecological services created through plant re-selection.
Obstacles	
Costs and Funding	
Economic and Other Incentives	Reduced infiltration = reduce leachate production = reduced leachate management (currently extracted through a downgradient interceptor trench and pumped to the WWTP)
Time	Planting was completed after reconstruction of the landfill cover (within 1 year).
Other	List any other information that may be of value for this case study. This can be used to insert a “lessons learned” section, or highlight other information of interest. Also, you may add additional sections as needed, if additional information does not fit in the categories above.
Contact Information	Dr. David T. Tsao, (630) 420-4321.

PLANTING OF NATIVE GRASS SPECIES ON LANDFILL CAPS AND FORMERLY CONTAMINATED WASTE SITES IN THE MID ATLANTIC

Native warm season grasses provide extremely valuable habitat for ground-nesting birds and many mammals. They are very deep rooted, making for a long lasting, stress tolerant, low maintenance plant. The root biomass of native warm season grasses far exceeds that of the introduced cool season grasses. This characteristic provides increased organic matter in soils and more rapid infiltration rates. The bunch-type habit of these grasses provides space for the inclusion of native forbs, wildflowers, and legumes to further improve habitat quality.

In the past, most landfill caps and remediated waste sites have been vegetated with a monoculture of cool season non-native turf grasses (e.g., Tall Fescue or Kentucky 31). These non-native species may provide quick cover that can stabilize soils, but they require regular mowing and periodic fertilizing to maintain plant vigor. These species are also invasive and can out compete native plant species. These non-native species generally provide little food or cover for grassland birds or other wildlife, and it essentially wastes land that could be productive for wildlife. This is especially critical when breeding bird surveys note continuing declines in populations of many grassland birds (e.g., field sparrows, grasshopper sparrows, and Henslow's sparrow). There are alternative strategies that produce vegetative cover that can stabilize the soil and provide erosion control, provide habitat for a wide range of birds and other wildlife, and have lower maintenance costs than what is currently used. By striving for a diverse grassland community, habitat will be provided for several species of grassland birds with declining populations. Planting a seed mix with a both native warm and cool season grasses can achieve all of these objectives. Cool season grasses grow and flower in the early and cooler part of the summer. Warm season grasses grow in the later and warmer part of the summer. Warm season grasses are better adapted to poor soils and drier conditions, making them well suited for landfill and other caps systems, as well as most formerly contaminated waste sites.

While these cool and warm season grasses do require some mowing/haying to prevent woody species invasion and to maintain plant vigor, these grasses can often be managed on a three year mowing rotation. Conversely, species typically planted (e.g., Kentucky 31 fescue) requires mowing and fertilization at least twice a year. Thus the long-term mowing costs of these non-native species, as proposed for many cap systems, are six times the cost of mowing a native warm season grass community. Using 2003 estimates, it costs \$50/acre to mow a Resource Conservation and Recovery Act (RCRA) cap. Using Kentucky 31 as a cap seed mixture on a 30 acre landfill, and mowing twice a year for six years costs \$18,000. However, managing the same site planted in native grasses for six years costs \$3,000.

Establishing a community of native grasses does take more effort, planning, and care initially. Seeding must be done at appropriate times, and sometimes requires specialized equipment. It also takes two years to fully establish the warm season grass plants. But the long-term maintenance costs will pay off, and the difference in habitat value for wildlife species is substantial.

Site Preparation

Warm season grasses are very adaptable, but grow particularly well on moderately well drained soils or better. Soil pH should be adjusted to achieve a pH of 5.5 or higher. Bring fertility up to medium levels for phosphorus and potassium, but **do not** apply nitrogen at or before planting time. Nitrogen will only stimulate weed competition.

Seed Mix

The following seed mix is an example of what can be used for restoration. These species are available from commercial vendors, but orders should allow sufficient time for delivery. The seed mix can be adjusted to site specific and seasonal conditions, however the species are adapted to a wide variety of site conditions. All seeding rates are per acre of **pure live seed (PLS)**. The PLS should be specified when ordering.

	<u>Pounds/acre PLS</u>
Big Bluestem (<i>Andropogon gerardi</i>)	4
Little Bluestem (<i>Schizachyrium scoparium</i>)	6
Switchgrass (<i>Panicum virgatum</i>)	2
Indiangrass (<i>Sorghastrum nutans</i>)	6
Canada Wild Rye (<i>Elymus canadensis</i>)	10
Partridge Pea (<i>Chamaecrista fasciculata</i>)	2
Annual Rye Grass (<i>Lolium multiflorum</i>)	25

The heavier seeding with annual rye grass provides immediate erosion control, as it will sprout and easily become established. The annual rye grass and the Canadian wild rye will also act as a nursery crop to protect the smaller seedlings of the other species until they can become established. Planting of a legume species (partridge pea) will improve soil conditioning and habitat quality. When the annual rye grass dies after one year, the other warm season grass species should be fairly well established, and will provide the longer term erosion control needed on these landfill caps or other cap systems. Wildflowers can also be planted with the mix to provide nectar source for birds, butterflies and other insects. The following wildflower species are widely distributed and adapted to similar conditions and should be added where additional plant diversity, wildlife value, and color is desired. All of the species listed are tall enough that they will be able to compete with native grasses for sunlight.

	<u>Pounds/acre PLS</u>
Black-eyed Susan (<i>Rudbeckia hirta</i>)	1/2
Lanceleaf Coreopsis (<i>Coreopsis lanceolata</i>)	1/2
Common Milkweed (<i>Asclepias syriaca</i>)	1/2
Wild Bergamot (<i>Monarda fistulosa</i>)	1/2

Application of Seed

Seeding should generally be done in early spring (April or May). Planting can be done in the fall as the cool season grasses will sprout immediately, however, the warm season grasses will not sprout until the next spring. Heavier seeding rates of the warm season grasses may be needed to compensate for herbivory and mortality, if planted during the fall. Planting, regardless of the season, should not be done during periods of severe drought, high winds, excessive moisture, frozen grounds, or other conditions that preclude satisfactory results. Seeding can be accomplished using a Tyeddrill or a Brillion drill seeder or a 3,000 gallon hydroseeder. If a Brillion drill seeder is chosen, seeds should be planted no deeper than 1/4 inch. After seeding with a drill, compact with a landroller, such as a cultipacker. With proper equipment, sowing seed and cultipacking in one operation is satisfactory. If a Hydroseeder/mulcher is used, it should have a minimum 3,000 gallon capacity with two paddle agitators, and one cutter agitator for complete shredding of mulch, capable of maintaining a homogeneous slurry. Recirculating type slurry agitation is not acceptable, as this type of agitation reduces seed viability.

Management of the Warm Season Grasses

First growing season: The cool season grasses (e.g., Canada Wild Rye) will be the first plants to sprout. The warm season grasses (e.g., Bluestems, Switchgrass, and Indiangrass) take longer to sprout, and will primarily establish roots during this season. The area should be mowed two to three times, depending on rainfall, to reduce annual weed invasion and enable light to reach some of the small warm season grass seedlings. Mowing should be timed to prevent seed production by annual weeds. Blade height should be sufficient to crop annual weeds without damaging perennial seedlings (approximately 6-8 inches).

Second growing season: Mow once, depending on climate. Mow no lower than 10 inches, as mowing lower will significantly damage the crown of these grasses, cause mortality, or open site for invasion by less desirable species.

During the third and subsequent growing seasons: Mow one-third of the site once a year, and rotate so that each area of the site is mowed approximately once every three years. After mowing, the area should be "hayed" (i.e., collect debris) because the warm season grasses are very dense and mowed debris will kill new growth trying to germinate. Mowing should not be done during the nesting season (April 15 through July 30) to preclude killing ground-nesting birds and their eggs/young. Mow no lower than 10 inches, as mowing lower will significantly damage the crown of these grasses, cause mortality, or open site for invasion by less desirable species.

Monitoring Recommendations

Quantitative monitoring of the grasses is generally not performed, however, approximately 80% of the site should be warm season grasses after 3 years. This could be a qualitative descriptive type of assessment. Please note that warm season grass species take several years to become established and substantial top growth may not occur until the third year. As long as weed species are mowed periodically in the first year, to provide sunlight to the small seedlings, these grass species are relatively easy to establish.

During the establishment period, the site should be managed for the control and elimination of non-native invasive plant species (e.g., fescue, Johnson grass, Japanese honeysuckle). Techniques employed for control of undesirable plant species can consist of physical removal and the spot or wick application of herbicides. Control of these invasive species should only be necessary during the establishment period.

During the establishment period, the site should be monitored for any significant erosion. Areas exhibiting erosion should be restored to pre-disturbance conditions as soon as possible and stabilized with standard erosion controls methodologies including, but not limited to: biodegradable matting, seeding with a native seed mix that includes annual rye grass, and depending on severity of erosion, silt fencing, or staked hay bales to reduce soil runoff. Jute matting is preferred as it is 100% biodegradable and is less harmful to wildlife.

License Agreement for the Use and Supervision of the Auburn Road Property

**Between the Town of Londonderry, New Hampshire and
The New Hampshire Flying Tigers RC Club
For exclusive use by the New Hampshire Flying Tigers Radio Control Club for
model activities.**

This License Agreement ("Agreement"), entered into this _____ day of _____, 2007, by and between the New Hampshire Flying Tigers RC Club (hereinafter referred to as the "NHFT," a New Hampshire non-profit corporation, and the Town of Londonderry, New Hampshire, hereinafter referred to as the "Town," for the use of that certain portion of the Auburn Road Landfill Site (hereinafter referred to as the "Property") identified on the Property Plan attached as Exhibit 1 hereto (hereinafter referred to as the "NHFT Area") for model activities.

WITNESSETH THAT:

A. WHEREAS, the Auburn Road Landfill Site is an EPA Superfund site which is listed on the National Priorities List and which is in the process of being remediated under a consent decree¹ entered in United States District Court, District of New Hampshire, and

B. WHEREAS, Area 1 is a portion of the Auburn Road Landfill Site encumbered by a use restriction in the consent decree limiting the use of the property for a period of fifteen (15) years to public recreational purposes approved by EPA after consultation with the State, and

C. WHEREAS, under the consent decree, the Town must demonstrate to EPA and the State of New Hampshire that the proposed use will not adversely affect the remedy for the Site, or the public health, welfare, or the environment, and

D. WHEREAS, the NHFT Area is located on Area 1 of the Auburn Road Landfill site and the use of the NHFT Area for model activities will not adversely affect the implementation of the remedy at the site, and will also promote the operation of models, a hobby which is recognized as a recreational activity, and

E. WHEREAS, the successful operation of a model activities field, and the protection of the model operators and the general public from improper use of the FCC assigned radio frequencies requires that such a facility be under the supervision of a competent authority that is familiar with the requirement of proper utilization of these radio frequencies, and the NHFT is such an authority;

F. WHEREAS, the Academy of Model Aeronautics (hereinafter known as the "AMA") is the chartering organization for more than 1600 model clubs across the

¹ *United States of America and State of New Hampshire v. Exxon Corporation et al.*, C-92-486, C-94-148-L, District Court, District of New Hampshire, May, 2000.

Initials: _____

United States and provides its chartered clubs with substantial insurance and other hobby and professional assistance, and

G. WHEREAS, The New Hampshire Flying Tigers Radio Control Club, Inc. (NHFT) is a chartered club of the AMA.

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth herein, the parties hereto do hereby mutually agree as follows:

Licensed Property, Use

1. The area of the Property which is to be utilized by the NHFT as a model activities field and which is directly subject to this License Agreement is limited to the NHFT Area, located within Area 1 of the Auburn Road Property, located in the Town of Londonderry, New Hampshire, on Auburn Road (EPA ID# NHD980524086, Site ID# 0101137) and as set forth in the Property Plan attached as Exhibit 1. It is agreed that during the term of this Agreement, the NHFT Area shall be utilized by the NHFT solely for the purpose of operating a model activities field and for ancillary and related purposes. All persons operating models in the NHFT Area must be current members in good standing, or guests, of the NHFT and are subject to the rules and regulations of the NHFT and the AMA. NHFT shall be solely responsible for insuring that the NHFT Area is utilized in a manner consistent with the terms, conditions and limitations of this Agreement. This Agreement does not give NHFT any right to use any other portion of the Property.

Limitation on Use; EPA Approval

2. The NHFT Area is located within Area 1 as such term is defined in the Consent Decree. Use of Area 1 (including the NHFT Area) is limited by the Consent Decree to:

public recreational purposes approved by EPA, after consultation with the State, and ... a use restriction limiting the use of the property from January 1, 2013, through January 1, 2038, to a public purpose approved by EPA, after consultation with the State. ... EPA may approve a proposed use of Area 1 for public recreational purposes upon a showing by the Town and determination by EPA that the proposed use will not adversely affect the remedy for the Site, or the public health, welfare, or the environment. Any such proposal by the Town shall be submitted to EPA, the State, and the Performing Parties simultaneously. EPA and the State shall coordinate review of any such proposal.

The NHFT understands that use of the NHFT Area is subject to prior approval by the US EPA, and use under this Agreement may not commence until such approval is obtained.

Term, Renewal, Cancellation

3. This Agreement will become effective on the date on which all necessary approvals from EPA have been obtained (the "Effective Date"), as provided for in paragraph 39(a) of the Consent Decree, attached hereto as Exhibit 2.

4. This Agreement shall remain in force for a period of three years after the Effective Date; however, the Town reserves the right to terminate this Agreement without cause by giving ninety (90) days' advance written notice, unless a material breach of this Agreement occurs, in which case this agreement will terminate as of the date of breach, without prior notice. After the initial three-year period this Agreement may be renewed by mutual agreement of the parties. Written Notice to be sent to:

New Hampshire Flying Tigers R/C Club, Inc.
P.O. Box 99
Derry, NH 03038-0099

Consideration

5. In consideration of the supervisory services and other obligations to be undertaken by the NHFT pursuant to the terms of this Agreement, the Town hereby agrees to grant the NHFT (including its members and guests) a license to use the NHFT Area for model activities; the Town reserves the right to use the NHFT Area for any other activities, so long as these other activities do not unreasonably interfere with the rights granted to NHFT by this Agreement.

Rights and Obligations of the NHFT

6. Only the NHFT will hold the license to use the NHFT Area for model activities during the term of this Agreement, and may extend use privileges to its members and guests. NHFT must safely control and conduct model activities in the NHFT Area without concern for interference by other activities or uses of the NHFT Area.

7. Subject to all the terms of this License Agreement, the NHFT shall be solely and exclusively responsible for operating in the NHFT Area in accordance with all applicable Town, State and federal laws, rules, regulations, orders, consent decrees, and/or other applicable controlling documents.

8. All guests of the NHFT must always be under direct supervision of a NHFT member while in the NHFT Area. The NHFT will not be responsible for any person, nor the actions of any person who enters the NHFT Area without the permission and direct supervision of the NHFT. The NHFT will notify the Town immediately of the presence of, or evidence of, trespassers on the Property.

9. The NHFT agrees to carry, during the term of this Agreement, insurance through the Academy of Model Aeronautics (AMA), covering the NHFT, its members and the Town, in the amount of \$2,500,000 combined single-limit for personal injury or property damage. Such insurance shall be evidenced by filing with the Town and attaching hereto as Exhibit 3, prior to the Effective Date, of an AMA chartered club additional insured certificate, naming the Town as an additional insured under the AMA general liability policy. The NHFT will cover all costs of this insurance through its Academy of Model Aeronautics insurance policy. The company providing the insurance shall be licensed to do business in New Hampshire. No modifications or termination of insurance shall be permitted without first providing the Town with ten (10) days' notice of any action to be taken by the insurance company.

10. The NHFT will be responsible for maintaining the NHFT Area in use for model activities, and will be responsible for keeping the area clear of debris and maintaining a runway and parking area, and cutting and keeping any vegetation growth down to an acceptable level in the runway and primary operational area.

11. The NHFT will control access to the NHFT Area by providing its members with a key or combination to the entrance gate on Auburn Road. Unless personally attended by an NHFT member, said gate must be kept locked at all times. Members must immediately lock the gate behind them as they enter or leave the NHFT Area. The NHFT will keep a list of members who have been provided keys or a combination to the lock, and will produce this list upon demand by the Town Manager. The NHFT will provide the Town with sufficient keys or copies of the combination, as applicable, to assure the Town will have access whenever needed. The NHFT may not change the lock cylinder or combination without prior written approval of the Town Manager. The NHFT will be responsible for the cost of providing said keys or changing said combination. The NHFT will have the right to sponsor and to supervise model related special public events at the Property, subject to the prior written approval of the Town Manager. Please note the number of keys that will be issued has not been specified in this document. The NHFT shall keep a log on site with the names of all members and guests who use the Property, the dates and times of their entry and exit, and any other observations of note.

12. The NHFT may use the Property seven days a week for modeling operations. Engines may only be run from 10 AM to Sunset and are subject to maximum sound output per the NHFT operational rules, contained in the Club Bylaws set forth in the NHFT Membership Handbook attached hereto as Exhibit 4. Operation of engines during any other times will require prior written approval of the Town Manager on a case-by-case basis.

13. As long as no action interferes with implementation of the remedy at the Auburn Road Landfill Superfund Site, the NHFT will be allowed to make certain improvements to the NHFT Area, such as to create a runway suitable for model use, and a parking area. Improvements may include clearing stones and rubble, making the area smooth by raking, rolling and leveling, and growing of grass or the use of another material suitable

for use as a model runway. However, NHFT may not pave the runway or use any materials that would seal the surface or make it impervious to rainwater, other than at the Filling Station, as defined below. The NHFT may also erect a sun shelter and install picnic tables for the use and benefit of its members and guests. The NHFT will be allowed to either repair current fencing or to install additional fencing to protect the model activity areas from damage due to vandalism. The NHFT will be responsible for maintaining said improvements during the term of this Agreement at no cost to the Town. All improvements must be approved by the Town before being constructed. Upon expiration of this Agreement, at the Town's sole option, all improvements shall remain on the site and become property of the Town at no cost to the Town. Otherwise, NHFT agrees to remove improvements within thirty (30) days of the expiration of this Agreement, at NHFT's sole expense.

14. The NHFT will be allowed to keep a small storage shed or container on the NHFT Area, which will be used for the storage of maintenance equipment and other model related operational items. Any fuels or other liquids (such as gasoline or oil for lawn mowers) to be stored in the storage shed or container must be kept in an EPA and/or DOT approved container. No such fuel or other liquid is to be spilled or disposed of within the Property at any time. Fueling must be done at the Filling Station, as defined below.

15. The NHFT will be allowed to provide for a sanitary portable toilet to be located on the NHFT Area and the Town will allow the service of said portable toilet by the vendor chosen by the NHFT. The NHFT will pay for all costs for the said portable toilet and for coordination of its service with its vendor of choice.

16. The location of all proposed improvements, including but not limited to the runway, sun shade, picnic tables and portable toilet, are marked by NHFT on the Property Plan attached as Exhibit 1 hereto, and are subject to the prior approval of the Town Manager. The runway must not be closer than One Hundred (100) feet to the fence which surrounds the capped landfill areas. Also, the EPA monitoring wells shall be protected from damage by placing barriers around each well. If the NHFT wishes to make additional improvements during the term of this Agreement, it must submit a marked map and a narrative description of the improvement, including its specifications, to the Town Manager for prior written approval.

17. To minimize the risk of spilling fuel onto the bare ground, the NHFT will require the use of a double containment system to be used when fueling models with liquid fuel, as specified in the Auburn Road Flying Site Usage Rules attached hereto as Exhibit 5. Additionally, the NHFT will build a concrete pad to be used as a so-called "Filling Station." NHFT shall be responsible for remediation of any spills or discharges, in accordance with all applicable Federal, State, and local laws, rules, regulations, orders, and consent decrees.

18. The NHFT will not enter the landfill capped and fenced-in areas anywhere on the Property at any time without the prior written approval from the Town Manager. If for some reason a model strays into one of the capped and fenced-in areas, the NHFT will contact the Town for direct assistance by a person approved to enter said capped areas. The Town reserves the right to assess a reasonable fee to have Town personnel respond to requests for retrieving model aircraft.

19. There will be no disposal of batteries or other "trash" on the NHFT Area or the Property. The NHFT will maintain a "carry in, carry out" policy in regards to all consumable items. In the event the Town incurs costs to clean up any trash generated by NHFT, it shall be reimbursed by NHFT for such costs.

20. The NHFT will not use any ground or surface water from the Property. This includes any type of drilled or dug well. The NHFT understands that water from this site may not be suitable for consumption or use of any kind. Tests have found that the water is not suitable for use. As a result, institutional controls in the form of easements have been implemented to restrict use of the surface water and ground water at the site. Additional institutional controls such as a groundwater management zone are being established in order to further restrict use of groundwater. Any water use at the Property shall be from potable water supplies only.

21. At a minimum, a once per year review meeting shall be scheduled between an authorized officer of the NHFT, the EPA Remedial Project Manager (RPM), the NHDES project manager, and an authorized representative of the Town to review the site usage and to address any issues which may have developed during the use of the Property. The RPM and NHDES project manager are:

Byron Mah, Remedial Project Manager
NH/RI Superfund Section
1 Congress Street
Mail Code: HBO
Boston, MA 02114

Email: mah.byron@epa.gov
Telephone: 617-918-1249

Tom Andrews
New Hampshire Department of Environmental Services
6 Hazen Drive
Concord, NH 03302-0095

Email: t.Andrews@des.state.nh.us
Telephone: 603-271-2910

22. All users of the Property for model activities are subject to the NHFT Constitution and By-laws, as well as the NHFT Safety and Operational guidelines which are in effect at any given time. Copies of the NHFT Constitution, By-laws and the NHFT Safety and Operational Guidelines are all included within the Membership Handbook attached as Exhibit 4. During the term of this Agreement, the NHFT will promptly notify the Town Manager of any amendments to the Constitution, By-laws, or Safety and Operational Guidelines, and will deliver amended copies to the Town Manager.

23. In the event that legal action is required in order to enforce NHFT rules and regulations, then the NHFT shall be entitled to bring such action for the use and benefit of the NHFT, but at no cost to the Town.

24. The NHFT shall indemnify and hold the Town harmless for all claims, demands, damages, costs, fines, penalties, attorneys' fees, and all other expenses arising out of or related in any way to enforcement of this Agreement, the activities in the NHFT Area or on the surrounding Property undertaken pursuant to this Agreement.

Rights and Obligations of the Town

25. The Town, EPA, the State, and its designees reserve the right to enter the NHFT Area at any time for any purpose related to the environmental monitoring, remediation, or operating and maintenance activities at the Property. If the Town, EPA, the State or any of their designees need to stop model activities for periods of time to allow for such environmental activities to be completed, it shall give as much advanced notice as possible to NHFT, and shall place a sign on the entrance gate stating that model activities are suspended during the defined environmental activities period.

26. This Agreement constitutes the sole and entire agreement between the NHFT and the Town concerning the license to use the Property and may not be modified other than by written agreement signed by all parties.

27. If any portion of this Agreement is determined by a court or administrative agency as being in conflict with the Consent Decree, then the language of the Consent Decree shall govern and all other sections of this Agreement shall remain in effect as written.

IN WITNESS WHEREOF, The Town and the NHFT have executed this Agreement on the day and year first written above.

Town of Londonderry, New Hampshire NH Flying Tigers R/C Club

Its : _____
(Duly Authorized)

Its: _____
(Duly Authorized)

Date _____

Date _____

Written consent to use the Property in accordance with this Agreement was received from EPA on _____, 2007.

EXHIBIT 1

Property Plan

(Attached)

[Designate locations of NHFTA Area and proposed sunshelter, picnic tables, portable toilet, Filling Station Area, and other improvements, if any]

Bank Stabilization with Engineered Log Jams

(excerpts from Washington Department of Fish and Wildlife Aquatic Habitat Guidelines)

Overview

Engineered log jams are collections of large woody debris that create or redirect flow and provide stability to a downstream bar or island. Engineered-log-jam constructions are patterned after stable, natural log jams and can be either unanchored or anchored in place using man-made materials. Naturally occurring log jams in alluvial channels are usually formed by one or several key members, consisting of large trees with rootwads attached, that stabilize and anchor other debris that is “racked” against the key members. Log jams extend above bankfull water surface and, when connected to a streambank, are hydraulically similar to groins.



Photo: Herrera Environmental Engineers

Application

Engineered log jams are used to realign a channel or redirect flow away from a streambank to protect it from erosional forces. They are also used to increase channel roughness to reduce flow velocities and shear stress along eroding banks. Large-woody debris jams create a hydraulic shadow, a low-velocity zone for some distance downstream that allows sediment to settle out and stabilize. By locating a log jam along an eroding bank, the bank downstream of the jam becomes a deposition zone rather than an erosion zone. The deposition zone tends to become vegetated and continues to grow in volume over time. Prior to designing and constructing an engineered log jam as a bank-protection technique, it is important to understand the existing physical characteristics

and geomorphic processes present at a potential project site and along the reach (see Chapter 2, *Site Assessment* and Chapter 3, *Reach Assessment* for guidance).

Engineered log jams are best applied on long, uniform bends in alluvial channels. They are also appropriate when the mechanism of failure is toe erosion since they provide roughness and redirect erosive flows away from an eroding bank. When applied along a bend, they are apt to grow significantly as they recruit wood, so changes to the opposite bank should be expected. Engineered log jams are also useful in degrading channels for capturing and storing sediment and large woody material. They can slow the rate of erosion in an equilibrium channel that is migrating laterally or where there is potential for a chute-cutoff, though they still allow for gradual meander migration. Large-woody debris jams occur naturally at the inlet of many side channels. Jams can be assembled at the inlet of pre-existing or constructed side channels to regulate the amount of flood flow entering the side channel. This protects the banks in the side channel, prevents the side channel from capturing the main channel and protects existing spawning and rearing habitat in the side channel.

Engineered log jams may be appropriate when the mechanism of failure is scour. They should be placed upstream from the scour hole to redirect flow away from the obstacle that is creating the scour or to dissipate some of the energy that is causing the scour. They should not be placed directly in a scour hole. In tight-radius bends or other constricted reaches, they may not be very effective, and their application can further exacerbate existing erosion problems or move them upstream. Care in sizing and spacing engineered log jams is crucial to avoid creating a constriction.

Refuse Site Protection on the South Fork Nooksack River

During high flows in early 2005, waste and debris were washed into the river from the Nooksack River Refuse Site as a result of on-going bank erosion. As an emergency measure, the Nooksack Indian Tribe moved the waste and debris back from the eroding bank to reduce its direct entry into the river. To further reduce the risk of additional waste entering the river at this location, the Tribe is implementing a short term floodplain roughening project and designing a long term ELJ stabilization project to help limit the rate of erosion along this bank.

Missouri River Bank Stabilization Strategy

The Omaha District Army Corp of Engineers, the National Park Service, and local stakeholders hired an engineering-geomorphology team (Herrera Environmental Consultants) to develop and design a bank stabilization strategy to treat severe erosion threatening an important county road located at Mulberry Bend on the Missouri River, Nebraska. The bank stabilization strategy provided an alternative to traditional rock revetments that simulated native cottonwood snags found along the natural banks of the Missouri River. The designs included timber spur dikes interlaced with tree boles, toe protection, bank sculpting, and re-vegetation measures that significantly enhanced short-term actions implemented by the Army Corps of Engineers.

For more information, please contact:

E² Inc.
2417 Northfield Road
Charlottesville, VA 22901
T: 434.975.6700 - F: 434.975.6701
www.e2inc.com

