

TYPICAL SECTION



October 24, 2002

Ward G. Wilson, Chairman
Jefferson County SWCD
4233 Bardstown Rd., Suite 100-A
Louisville, KY 40218-3280

**SOI - Soil and Site Evaluation for Urban Development:
*Oakland Heights Subdivision***

Enclosed you will find the soils and site evaluation report on the proposed Oakland Heights subdivision project. This parcel of approximately 745 acres has 668 acres+ located in Jefferson County. The property is currently being used for production agriculture and has a developed wildlife habitat. There are two streams located on the tract, Old Mans Run and Floyds Fork. Most of the drainage from the proposed development will enter into one of these two streams. The proposed landuse change seeks to transform this farm into a residential development of 759 lots on 355 acres and 313 acres of open space. Part of the open space may have a proposed future use as a golf course.

The predominant land cover on the tract includes a mix of hardwood tree species on hillsides and drainageways and domestic grasses or annual wildlife covers on the ridgetops. Soil erosion from the tract is not a current concern because of the existing vegetative covers on the tract. The only areas, at present, with potentials for accelerated soil erosion are those planted to annual crops of corn or small grain. If these areas are no longer managed to maintain the annual covers, thought should be given to sowing temporary covers that are perennial in nature.

There is an existing riparian buffer along both Floyds Fork and Old Mans Run. This buffer ranges in quality from excellent (where both grasses and woody vegetation exist at a minimum distance of 50' from the top of bank) to marginal (where vegetation is predominantly grass-like).

The existing buffers should be maintained to serve two primary purposes: stream shading and water quality benefits. It is also important that the waterways or intermittent stream channels that run perpendicular to major streams be maintained in vegetation because these areas will be used as conduits to direct flows to the two named streams. The areas along the toe slope of hillsides and the floodplains and terraces between the streams and developed upland area will play a major role in water quality efforts. These mostly flat areas can be used as "sponges" and "filters" to clean up water before it enters the major streams. In order for this function to take place, these buffer areas must be planned and the vegetation managed to accomplish the water quality goal.

The proposed subdivision plan appears to recognize a value to minimizing the use of steeper slopes as building areas. The roadways utilize top of ridgelines and lots are planned as "fall-a-ways." Hopefully, the existing vegetation of grasses, herbaceous species and trees can be salvaged on many of these lots, especially those with slopes over 20 percent. An effort should be made to save as much existing cover since this is the best way to address erosion control on these areas where soils are clayey and shallow to bedrock.

A comprehensive sediment and erosion control plan should be developed for this project. The preliminary plan notes a discussion of using measures to capture sediments near the top of drainageways and slowly step water down the slope in order to minimize sediment loads to streams. Other measures are planned at outfalls to pipes and designed ditches which will reduce outflow velocities and reduce gulley erosion in channels. These particular Best Management Practices should be designed based on watershed and flow calculations for each of the small units or basins. The plan, as mentioned earlier, should have a focus on reducing soil erosion by minimizing areas of disturbance and working to preserve existing vegetation as much as possible.

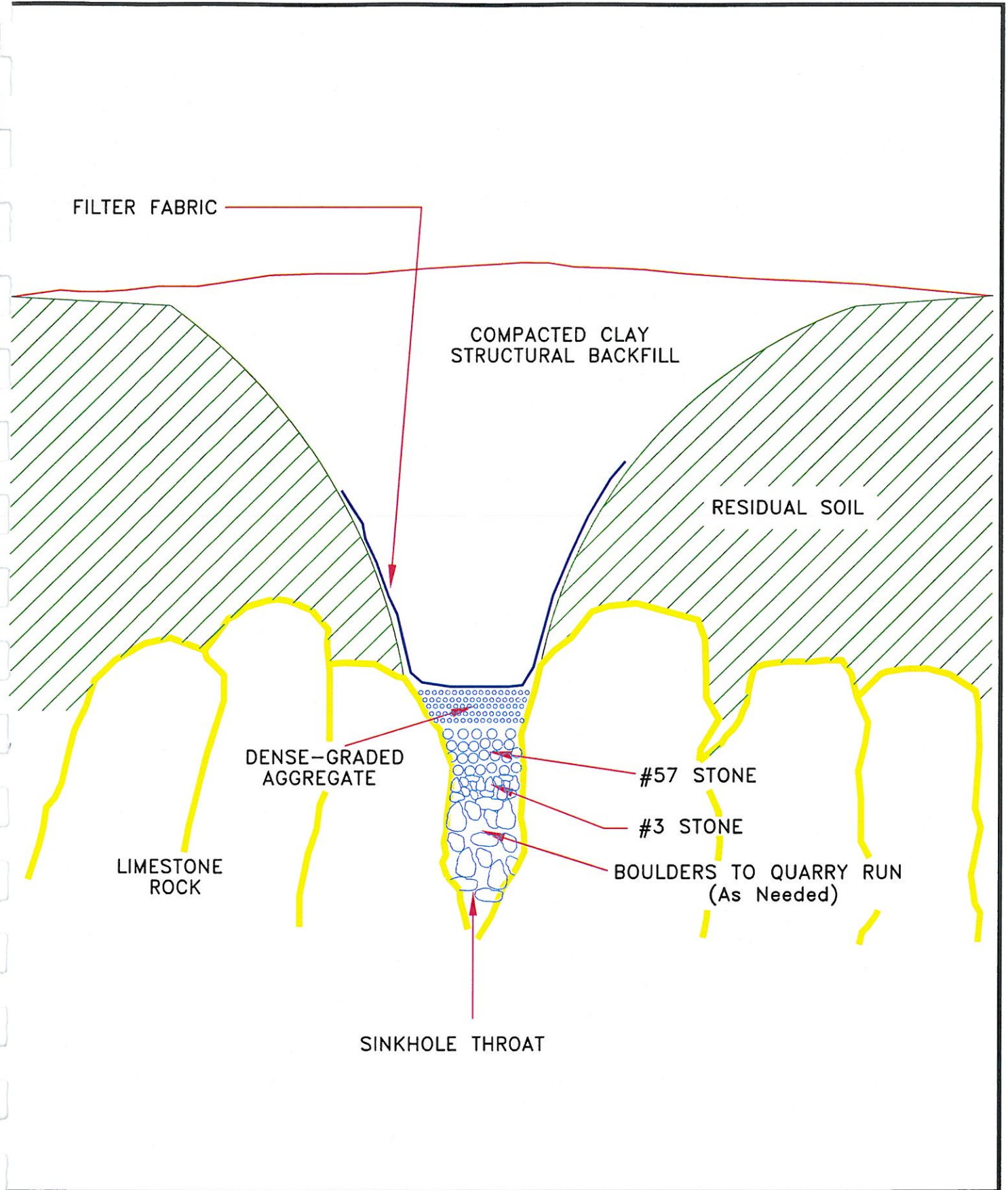
The tract, more predominantly the northern most sections, has some sinkholes and karst features. Identifying these areas and providing a means to address their stability should be part of the project plan. Again, the preliminary plan notes that sinkholes will not be "capped" using concrete but allowed to provide needed surface drainage by using gravel and other measures that will not impede drainage through these basins.

Over all, the planned development recognizes the sensitive features of steep slopes, floodplains, erodible soils, sinkholes and streamside buffers and works to address natural resource concerns that may arise resulting from the planned change in landuse. If our office can be of assistance as the Soil and Water Conservation District Board reviews plans on this project, please feel free to call on us.

KURT D. MASON, CPESC
District Conservationist

1 Enclosure

cc: (w/enclosure)
Pat Dominik, Sabak, Wilson & Lingo, Inc., Engineers



OAKLAND HILLS
SUBDIVISION

PROJECT NO. 50545-2-2169

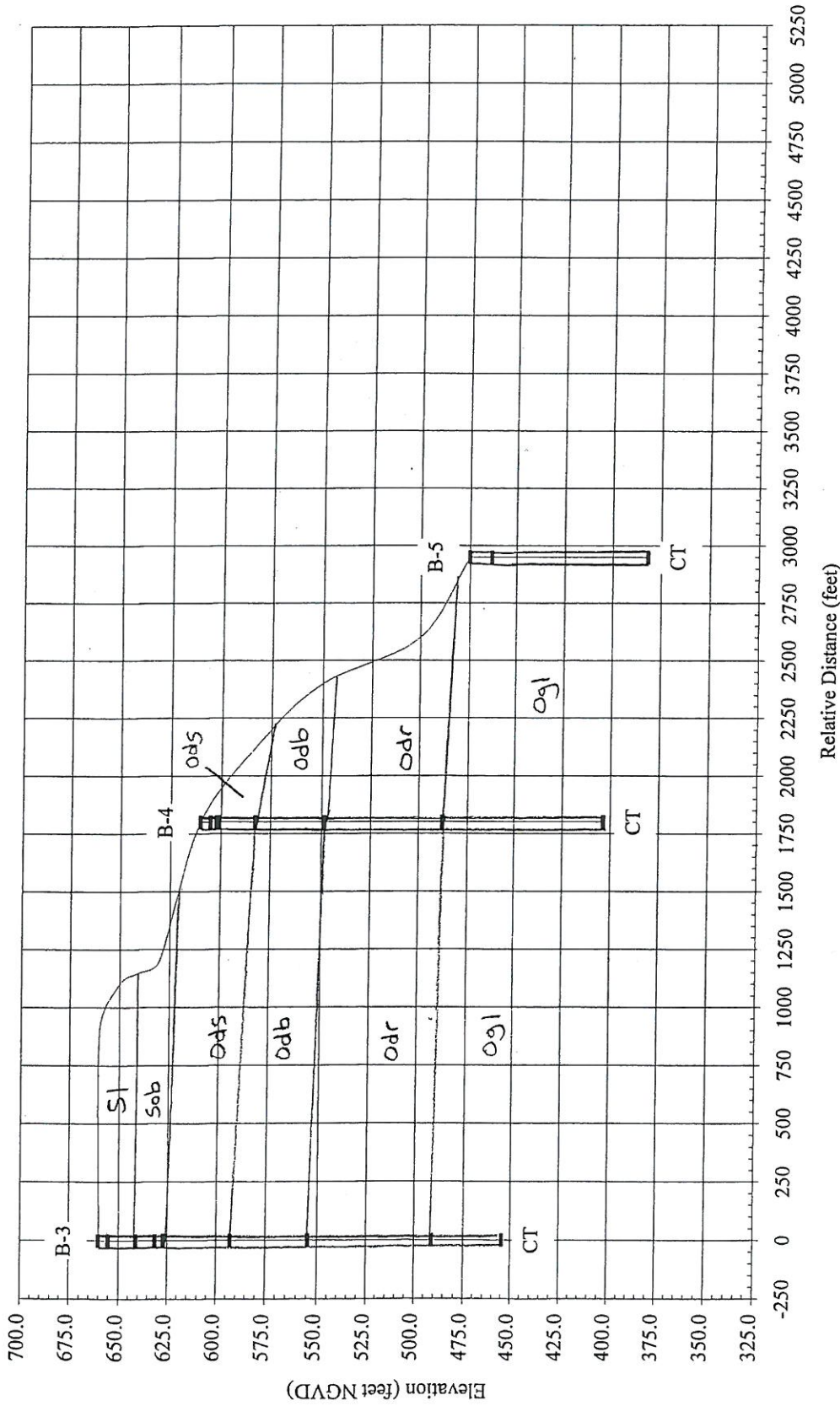
MACTEC

13425 Eastpoint Centre Drive, Ste 122
Louisville, KY. 40223
Phone: 502-253-2500 Fax: 502-253-2501

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SOLUTION CAVITY

PLOT DATE: 4/24/03
CADD FILE: CONCRETE PLUG2

FIGURE 2

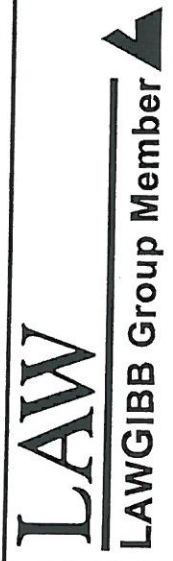


Prepared By: TMO
 Approved By: _____

G:\Projects\5054592516\Figure 6.doc
 March 12, 1999

Figure 6 – Point-to-Point Profile
 Proposed Quarry Site
 Bardstown Road and Floyds Fork Creek,
 Jefferson County, Kentucky

LAW Project Number 50545-9-2516



R. Gene Smith, Inc.

7. Brief resumes of key persons, specialists, and individual consultants anticipated for this project:

a. Name

Nicholas G. Schmitt PE

c. Name of Firm



e. Education - Degree(s) / Year

Bachelor of Science Civil Engineering and Applied Science 1973 University of Louisville
Master of Engineering Civil Engineering 1973 University of Louisville

b. Project Assignment

Geotechnical Engineer

Of Record

Mr. Schmitt has conducted geotechnical exploration and design projects in over 20 states in the US in the past 30 years. His projects have included earth dams, fill slopes and cut slopes as high as 175 feet, foundation support for both low-rise and high-rise structures and unique facilities. Mr. Schmitt has worked on projects involving landfills, stadiums, rivers and streams, military facilities, office buildings, airports, and industrial plants. He has evaluated existing dams and river back structures for both long-term and short-term stability. His duties have included project coordination, supervision of field exploration and laboratory testing, analyses and critical review, field inspection, sequence of construction, construction specification and quality assurance program development, report development and client presentation.

Due to his expertise and experience, projects that he directs often require organizing, coordinating, and managing staff and resources from multiple geographic areas and disciplines.

Geotechnical Studies and Foundation Explorations Mr. Schmitt has provided foundation and site development recommendations for industrial facilities, commercial structures, communication towers, cement and grain silos, highways, dams, bridges, landfills, storage tanks, utility lines, and power plants. His project experience includes Interstate Bridges, 500-foot tall office buildings, steel mills and automotive assembly plants on 1400 acre developments, earth structures as tall as 175-foot, riverports including wharves, barge loading and unloading, railroad alignments, a dams in seismic active areas. His broad project experience has included the geotechnical evaluation of roadway stability of 8 million-pound equipment moves and, new

d. Years experience

this firm 30 year(s)
other firms 0 year(s)

f. Active Registration - Year First Registered / Discipline

1977 / Professional Engineer
AL / OH / KS / WV / IN / KY / IL / MI / MO / PA

structures designed to span over existing structures. Mr. Schmitt has extensive experience with roadway, subdivision and housing projects.

He has used such exploration techniques as soil test borings, static and dynamic cone soundings, flat-blade dilatometer, in-situ testing, packer testing, down-hole and cross-hole geophysics, and remote sensing. His studies have included extensive settlement analyses, seepage studies, shallow foundations with bearing capacities as high as 20,000 psf, deep foundations with individual pile capacities as high as 160 tons (both end-bearing and friction), drilled pier with contact pressures of over 200,000 psf and diameters as large as 9 feet. His pile installation experience includes driven concrete, steel, and timber piles, as deep as 300 feet, and auger cast piles as deep as 75 feet.

Mr. Schmitt dam and embankment experience is quite diverse and includes an extensive series of dikes for control a water-fowl nesting areas in the Muskatatuk Wildlife refuge, a series of coal mine fine refuse impoundments, to new dams for recreational purpose to stability and dam safety reviews for structures that have experienced overtopping. His work has included seepage control of leaking structures and evaluating structures in series.

Karst Experience: Mr. Schmitt has spent most of his professional career providing geotechnical explorations in areas of Karst Terrain beginning with his years in Alabama and continuing with his work in Kentucky, Indiana, Missouri and Tennessee. He worked on two karst development projects with the late Professor George F. Sowers, author of *Building on Sinkholes, Design and Construction of Foundations in Karst Terrain*. One project was an industrial park in Birmingham, Alabama and one was a major manufacturing facility in Russellville, Kentucky. He has evaluated the occurrence of sinkholes on developments as

7. Brief resumes of key persons, specialists, and individual consultants anticipated for this project:

Nicholas G. Schmitt, P.E.

large as 10,000 acres. He is proficient in the invasive and the geophysical (non-invasive) techniques used to explore sites in karst terrain.

Site Development and Civil Design: Mr. Schmitt has designed and prepared construction drawings for coal mine impoundments, siltation control structures and retention ponds, temporary seepage control devices, permanent diversion ditches and spillway rehabilitation. He has designed retaining walls, earth structures, mechanically stabilized earth structures, culverts, roadways, taxiways, and foundations.

Continuing Education: Mr. Schmitt has attended and/or participated in the following seminars and short courses to expand his technical background.

Ohio River Valley Soils Seminar (ORVSS) II, *Earthwork Start to Finish*, October 1972

ORVSS III, *Lateral Earth Pressures*, October, 1972

ORVSS IV, *Geotechniques in Transportation Engineering*, October 1973

ORVSS VI, *Slope Stability and Landslides*, October 1975

Design and Installation of Driven Piles, Tulane University, 1975

ORVSS VIII, *Earth Dams and Embankments: Design, Construction and Performance*, October 1977

Groundwater Pollution and Hydrology, Princeton Short course, January 1982

ORVSS XIII, *Recent Advances in Geotechnical Engineering Practice*, October 1982, Mr. Schmitt was the conference Chair.

ORVSS X IV, *Foundation Instrumentation and Geophysical Exploration*, October 1983

ORVSSXXIX, *Problematical Geotechnical Materials*, October 1998 Mr. Schmitt was a presenter.

Ground Water Investigations at Hazardous Waste Sites, National Water Well Association, January 1983

Geotechnical and Geoenvironmental Seminar, MACTEC Houston, TX, 1994

Eight Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karsts, April 2001

ORVSSXXII, *Regional Seismicity and Ground Vibrations*, October 2001, Mr. Schmitt was the conference moderator.

ORVSS XXXIII, *Ground Stabilization and Modification*, October 2002, Mr. Schmitt was a presenter.

Publications: Mr. Schmitt has participated in the following presentations and seminars:

Use of Mechanically Stabilized Earth and Other Techniques to Stabilize Subsurface Conditions for the Emergency Bridge Replacement, I-20, Oxford, Alabama, Ohio River Valley Soils Seminar XXXIII

Development of a Rock-Soil Fill Using On-site Blasting and Crushing Techniques for Preparation of Large Sites, ASCE Journal of Construction Practices.

Site Development Techniques and Geotechnical Explorations, AIA Development Series, March 2002.

Brownfields Redevelopment, AIA Development Series, November 2000.

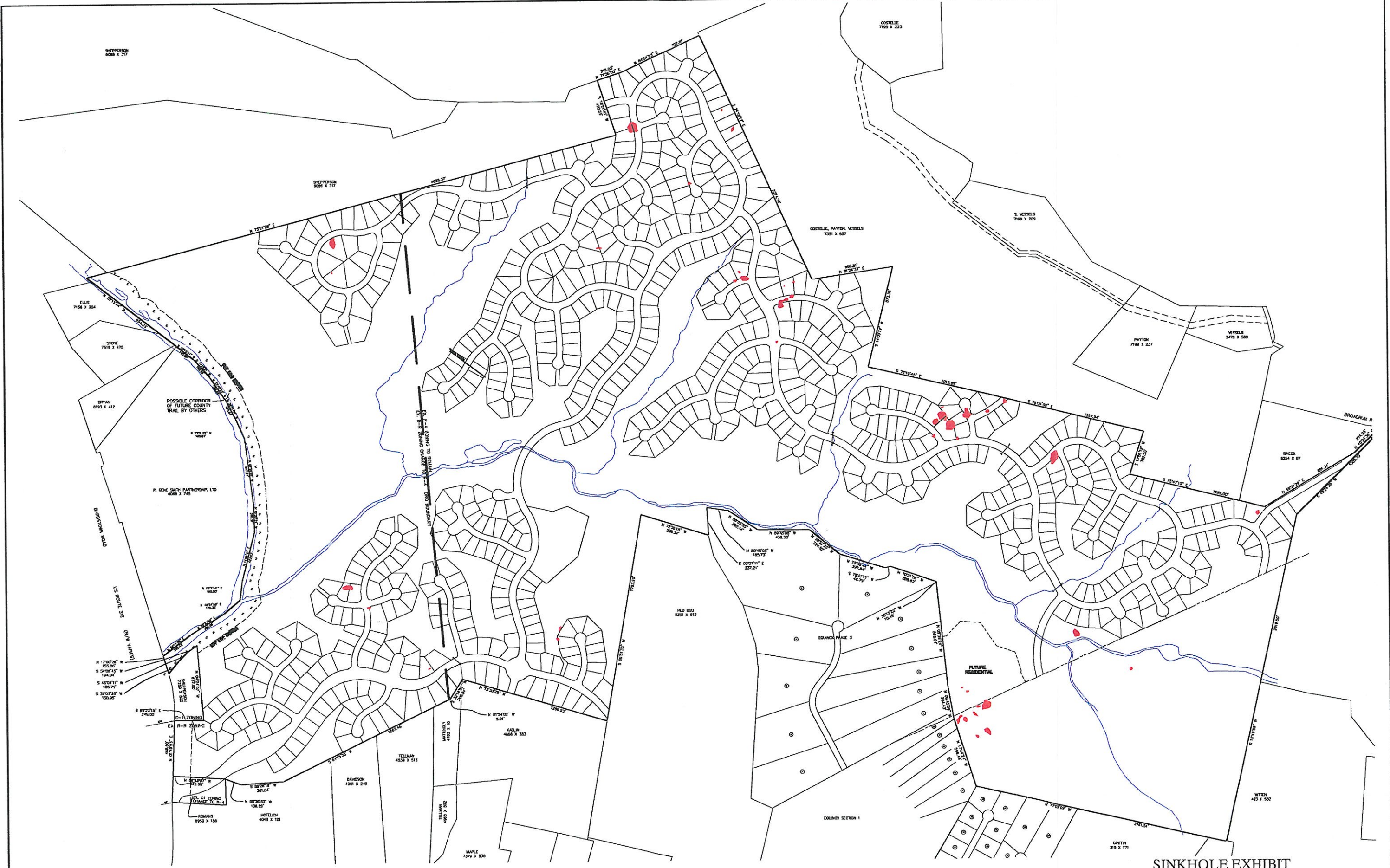
Brownfield Redevelopment "A Successful Case Study" SAME 2000 Missouri River Regional Training Conference,

Engineering Properties of Louisville Subsoils, Ohio River Valley Soils Seminar, October, 1973

Foundations on One Hundred Years of Construction Debris, Ohio River Valley Soils Seminar, October 1, 1998.

From a Brownfield to a Football Field, University of Louisville, Papa John's Cardinal Stadium, Industrial Site Recycling Conference, September 1999, Pittsburgh, PA, (Phoenix Award Winner).

Geotechnical Aspects of Karst Terrains, Geotechnical Exploration and Site Preparation Techniques for a Large Mall in Karst Terrain, ASCE National Symposium on Karst Development, May 10-11, 1988.



SINKHOLE EXHIBIT
FOR
OAKLAND HILLS



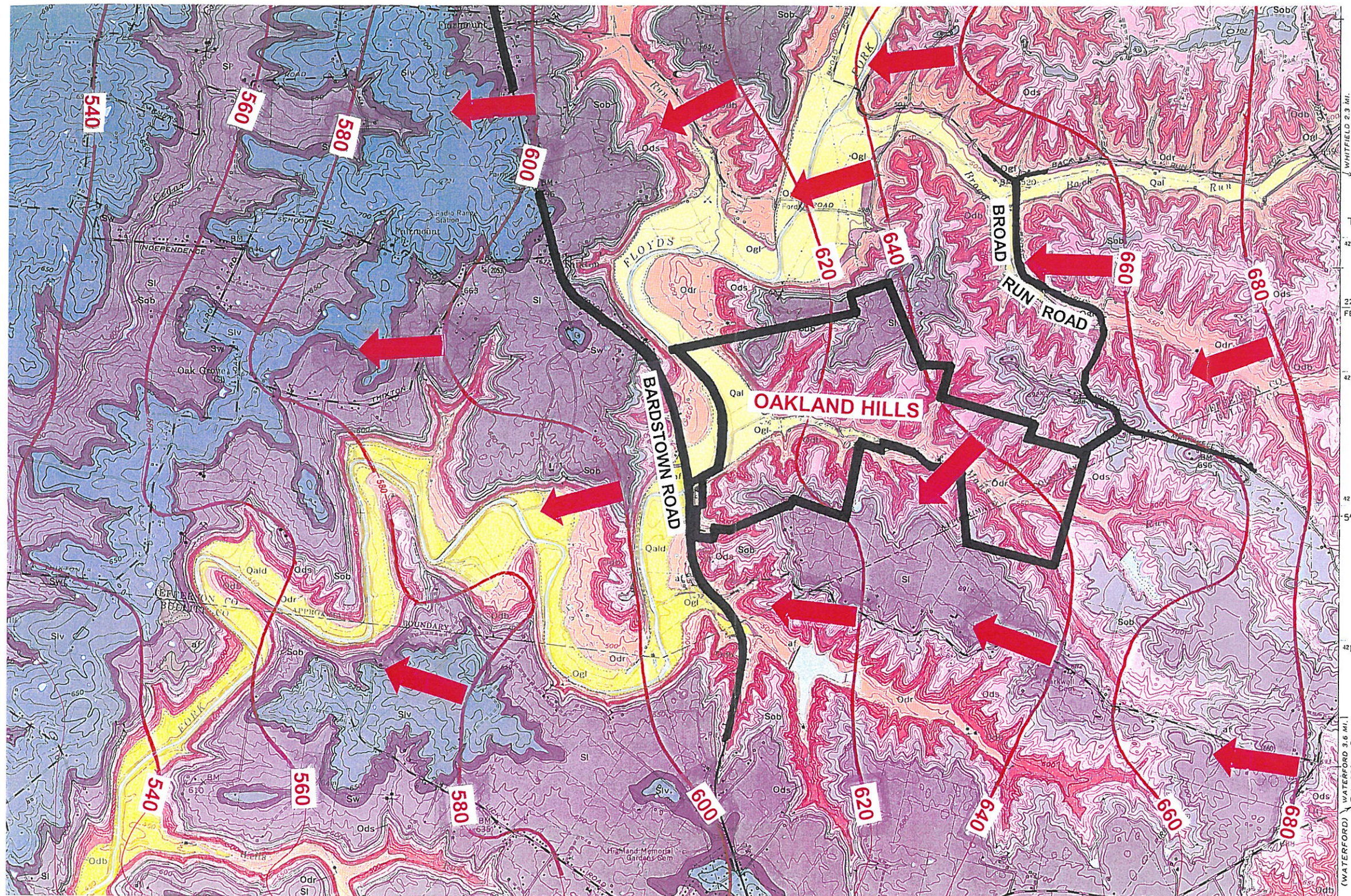
SABAK, WILSON & LINGO, INC.
ENGINEERS, LANDSCAPE ARCHITECTS & PLANNERS
315 WEST MARKET STREET, LOUISVILLE, KENTUCKY 40202 (502) 584 - 6271

Scale: NO SCALE
Date: 4/25/03

11403 BARDSTOWN CREEK ROAD
JEFFERSON COUNTY, KENTUCKY

File: 2188-DDP
D
Sheets in Set:

GEOLOGIC MAP OF THE MOUNT WASHINGTON QUADRANGLE, NORTH-CENTRAL KENTUCKY



By
 Roy C. Kepferle
 1976

KENTUCKY DEPARTMENT OF FISH AND WILDLIFE RESOURCES



Brian Clark
Kentucky Dept. of Fish and Wildlife Resources
129 Howell Drive
Elizabethtown, KY 42701
270-766-5214

CASE NO: 56
COUNTY: Jefferson

HABITAT IMPROVEMENT PLAN

For
Oakland Hills
c/o R. Gene Smith
3600 National City Tower
101 S. Fifth Street
Louisville, KY 40202

Examined By: Brian Clark, private lands wildlife biologist; R. Gene Smith, property co-owner; and Pat Dominik, landscape architect.

Date: 1 April 2003

Location: The Oakland Hills property is located just east of Hwy. 31-E in southern Jefferson Co., immediately north of the Bullitt Co. line and east of Floyd's Fork.

**Cooperator's
Interests:**

A wildlife habitat field assessment was conducted to determine preservation and management practices that would improve the aesthetics and wildlife values of the proposed open spaces, as well as general features on the proposed development.

Plan Format:

This plan covers the examination of approximately ~668 acres of property. For the purposes of this plan, the general conditions and natural features of the property will be discussed and then specific recommendations will be made regarding particular features or areas examined.

**General Property
Description:**

This property is comprised of relatively flat ridgetops, sideslopes, and bottomland fields along and near Floyd's Fork and Old Man's Run. The ridgetops are currently used primarily for wildlife food plots or are occupied by oak-hickory forest, the sideslopes are covered in permanent herbaceous and woody vegetation, and the bottoms are covered in plots of grass/legume forage mixtures and annual grains for wildlife.

**General Habitat
Conditions:**

The wooded portions of the property are relatively diverse in terms of tree and shrub species, the majority of which can be described as (1) early successional/scrub-shrub and (2) maturing oak-hickory forest. The open land has been largely rid of tall fescue and planted to more beneficial covers, though some bottomland fields and reverting hillsides are still occupied by fescue.

**Watershed
Conditions:**

No serious erosion or other forms of watershed problems were observed. The streamsides are generally covered with varying width zones of trees and shrubs and permanent grasses.

**Aesthetic
Features:**

The property has many attractive features. The relatively high ridgetops surrounded by the hillsides and meandering stream systems are especially attractive.

**Potential for
Recreation:**

The property is well suited to hiking, hunting, nature photography, and potentially other recreational pursuits.

**Rare, Threatened,
and Endangered
Species:**

During my examination, I did not detect any rare, threatened, or endangered species on the property. However, Indiana and Gray Bats do occur in Jefferson County and a more thorough inventory of the property would be needed to gauge possible use of the tract. Increasing the woody cover along the streams should improve habitat for both species. Please refer to the appended *Kentucky's Threatened and Endangered Species* and *Bats of the United States* booklets, and recommendations below, for further information.

Wetlands:

Wetlands are important habitats for a wide range of wildlife species, including waterfowl, amphibians, furbearers, and songbirds. Wetlands are defined as areas that have water at or near the surface for a portion of the growing season and which are typically characterized by a majority of trees and plants adapted to live under the conditions. Other than Floyd's Fork, Old Man's Run, and the blue-line drainages on the property, I did not observe any areas that appeared to be federal or state jurisdictional wetlands. However, other portions of the property may be classified as wetland under the technical definition currently in use; consult Kurt Mason of the Jefferson Co. Natural Resources Conservation Service (formerly SCS) office at 502-499-1900 if you have questions about possible wetlands on this property and their regulation.

Management Recommendations:

1. *I recommend creating a riparian buffer of a continuous minimum of 200 feet in width along Floyd's Fork and 100-150' in width along Old Man's Run. The buffer should consist of a mixture of planted or naturally occurring bottomland hardwood tree and shrub seedlings and flood-tolerant (or otherwise site-adapted) native herbaceous plants. Areas within this buffer width that have already grown up in woody cover could be left to continue succeeding naturally to forest cover. The utility right-of-way areas could be planted to native grasses and forbs (see below) to be compatible with utility maintenance and still optimize habitat value.*

In the long run, this would help further stabilize the banks of the streams because of the stability that woody plants and deep native grass roots bring to the soil, while also reducing sedimentation and filtering pollution from groundwater runoff. Riparian zones with ample cover are used by many species of wildlife as travel lanes or nesting and feeding cover. In addition, the trees cast shade in summer, cooling stream water and increasing oxygen levels, which benefits fish and other aquatic life. Please refer to the Habitat How-To bulletins on Streamside Management, Trees and Shrubs, and Native Warm Season Grasses for more details.

Implementation of the practice would first include complete, strip or spot herbiciding of the expanded buffer with Roundup[®] Ultra Max or equivalent herbicide to eliminate tall fescue and other weed competition with planted seedlings and seed. As long as this is done as prescribed by label instructions and when rain is not predicted for at least 6 hours, there should be no problems with leeching and you should have good success. Please refer to the Habitat How-To on Fescue Eradication for more detail.

Planting tree and shrub seedlings would involve setting tree seedlings with a mechanical tree planter (similar to a tobacco setter) or hand spade ("dibble bar"). I recommend spring planting during late February-early April before leafout, using bare-root seedlings 1 to 3 years old. They tend to not suffer as severely from transplant shock as balled and burlap stock, plus they are much more economical, and easy to handle and maintain. Seedlings should be planted on about a 10-foot spacing. This will allow maintenance mowing if it is needed, and be dense enough to compensate for some seedling mortality. Select seedlings suited for bottomland situations, such as swamp white and swamp chestnut oak, pin oak, cherrybark oak, green ash, baldcypress, and shellbark hickory. Low-growing shrub species that would be suitable here include viburnums, common alder, elderberry, downy serviceberry, spicebush, and silky and gray dogwoods. These could be interplanted at random, or systematically between tree seedlings. After reaching fruiting age, all of these will contribute acorns, nuts and fruits to the food base in the area for wildlife plus they will afford additional color to the fall palette. Kentucky Division of Forestry (270.766.5010) sells many native tree and shrub seedlings and loans out mechanical tree planters. Other vendors are listed in the attached Trees and Shrubs bulletin.

This practice is eligible for enrollment in the Conservation Reserve Program, which pays a portion of establishment costs (currently effectively 90% for riparian buffers!) and an annual rental payment based on soil type and slope. Contact Kurt Mason with the NRCS for more information on CRP and other USDA programs.

2. *The designated 50-foot permanently wooded buffers along intermittent drains should provide sufficient protection of these watercourses. Those with existing buffers of some width should be protected and expanded as necessary, while those without vegetation should be stabilized with trees, shrubs and perennial grasses.* The buffers will not only help protect and enhance the quality of water as it drains into the streams and provide some wildlife cover, but they will also help to keep the soil in the drain channels stabilized.
3. *Some of the bottomlands near the mouths of the intermittent drains may be suitable for creation of shallow-water wetlands.* Kurt Mason's staff and I could provide you with a more in-depth site evaluation for this purpose, if you are interested. The Shallow-water Wetlands publication describes this practice at length.

This practice is also eligible for funding or materials assistance through a variety of programs such as WHIP and the Kentucky Partners for Wetland Wildlife.

4. *If you would like to keep open most of the bottomland field on the western end of the property, adjacent to Floyd's Fork, it would make an ideal site for re-creation of a*

mesic prairie. A mixture of big bluestem, Indiangrass, and eastern gamagrass, all native to Kentucky and formerly dominant field species, would be well adapted to this area.

Wildlife value and aesthetics of such a planting would be optimized with inclusion of native wildflowers in the mixture. Legumes such as Illinois bundleflower and partridge-pea, and other forbs such as black-eyed susans and coneflowers, would provide canopy cover for grassland birds such as northern bobwhite quail to brood in with less likelihood of depredation by raptors.

Native prairie systems are best maintained with periodic prescribed burning, but alternative management techniques such as strip disking and mowing may be used. I recommend abstaining from mowing or disking from 15 March to 15 August to allow grassland birds to hatch off their clutches and to give young birds time to develop their escaping skills. Late winter or late fall mowing or disking of 1/3 of the total grassland area in a given area is best for wildlife. If prescribed burning is pursued, the Jefferson County Air Pollution Control District would need to be contacted to obtain an Agricultural Burning Permit and Prescribed Burning Plan template. I can provide you with technical guidance on planning and conducting prescribed burning. Trained consultants are also available to actually conduct burns for landowners. Please refer to the Habitat How-To bulletins on Native Warm Season Grasses, Wildflowers, Prescribed Burning, Strip Disking, and Mowing for more details.

If part of the area along Floyd's Fork is developed with a trail for recreation and interpretation, the majority of the area could still be planted to native grasses, and trailsides sowed to more hardy cool-season vegetation such as redbud grass to facilitate closer mowing (if necessary).

The following warm-season grass/legume mixture (per acre rate) could be used on extended streamside buffers and designated prairie area(s):

Big Bluestem	2 pounds of Pure Live Seed
Eastern gamagrass	2 pounds of Pure Live Seed
Indiangrass	2 pounds of Pure Live Seed

These grasses grow in clumps 4-10 feet tall and provide excellent habitat for both upland game (quail & rabbits) and grassland songbirds. The foliage of the native warm-season grasses is highly nutritious and because they grow in clumps, they allow the growth of forbs (wildflowers and legumes) between grass plants, unlike fescue, which tends to smother out other plant types. Haying the grasses would be another management option. Haying or maintenance mowing should cease before 1 September to allow the grasses to store energy for re-growth the following spring. Also, the native grasses are fairly rigid when allowed to go to seed and thus withstand winter snow and ice quite well, thereby providing good winter cover.

The grasses are tolerant of a wide range of moisture conditions and soil types, though the recommended species dominate others in wetter situations, whereas others are

more adapted to drier areas. They are planted in late spring to early summer (mid April-June) at a depth no greater than 1/4 inch. The seed of some of these grasses is light, fluffy, and hairy so it will not flow freely through conventional seeders; the Dept. of Fish and Wildlife Resources has a special no-till drill that can be borrowed for planting these grasses. This allows you to plant without disturbing the soil after spraying to kill the fescue. A nurse or cover crop is not normally used when planting these grasses, though if you do not get a good stand the first year, as is sometimes the case, a cover crop of wheat can be planted in late September. Lime and fertilizer are not necessary.

Fescue eradication and native grass planting are eligible for enrollment in the USDA programs such as WHIP and FLEP. Contact me for information on signing up or about program rules if you are interested.

5. *The Kentucky Division of Forestry examines private woodlands for possible enhancement, such as timber stand improvement (TSI).* Timber stand improvement often involves such things as identifying exotic-invasive problems for remediation, and selective thinning to improve tree stand quality and habitat value. Your concept of minimizing impact to areas surrounding house lots is commendable. Keep in mind that excavation or grading work within the dripline of trees will likely adversely affect or gradually cause decline or death of the trees. Native trees and shrubs should be retained around homes as much as possible. The designated Open Space and Tree Protection Area(s) will go a long way toward preserving the current beauty and other natural benefits on the site. Homeowners should be encouraged to retain existing native plants as much as possible for wildlife, aesthetic, and soil and water conservation purposes.

TSI is eligible for enrollment in the USDA programs such as FLEP. Forestry can provide you with details on funding and program requirements for this practice.

6. *The slopes falling within the Open Space/Tree Protection Area that are relatively open and that have significant residual tall fescue could be treated with a selective herbicide such as Plateau[®] to kill the fescue, encourage native plants, and improve growing conditions for volunteer woody plants.* This could be as low-intensity as simply spraying passable fescue-dominated areas once with an ATV- or truck-mounted sprayer and allowing the areas to continue natural succession.
7. *Standing dead trees and coarse woody debris on the ground should be left as much as possible, to provide food and cover for dependent wildlife such as woodpeckers and squirrels and to recycle the nutrients of the woody debris more uniformly into the soil.* I do not recommend leaving unstable snags or damaged trees adjacent to foot trails due to human safety concerns. Snags and coarse woody debris, as well as other habitat features of interest or that could be regarded as unsightly by residents unaware of their wildlife benefits, could be interpreted with signs to improve resident understanding of their value. The Snags and Cavity Trees habitat bulletin discusses many of the benefits of these features.

8. Wildlife nesting boxes could be erected to improve habitat for cavity-nesting animals and to improve wildlife viewing opportunities as well. Eastern bluebirds, prothonotary warblers, eastern screech owls, tree swallows, and purple martins are among the species that readily use nesting boxes that are properly constructed and placed. Refer to the Nesting Structures publication for details on this beneficial practice.

If you have any future wildlife management needs, please do not hesitate to contact me. If necessary, I will be glad to discuss in further detail, or help you carry out, the recommendations made in this plan.

Prepared by



Brian Clark
Private Lands Wildlife Biologist