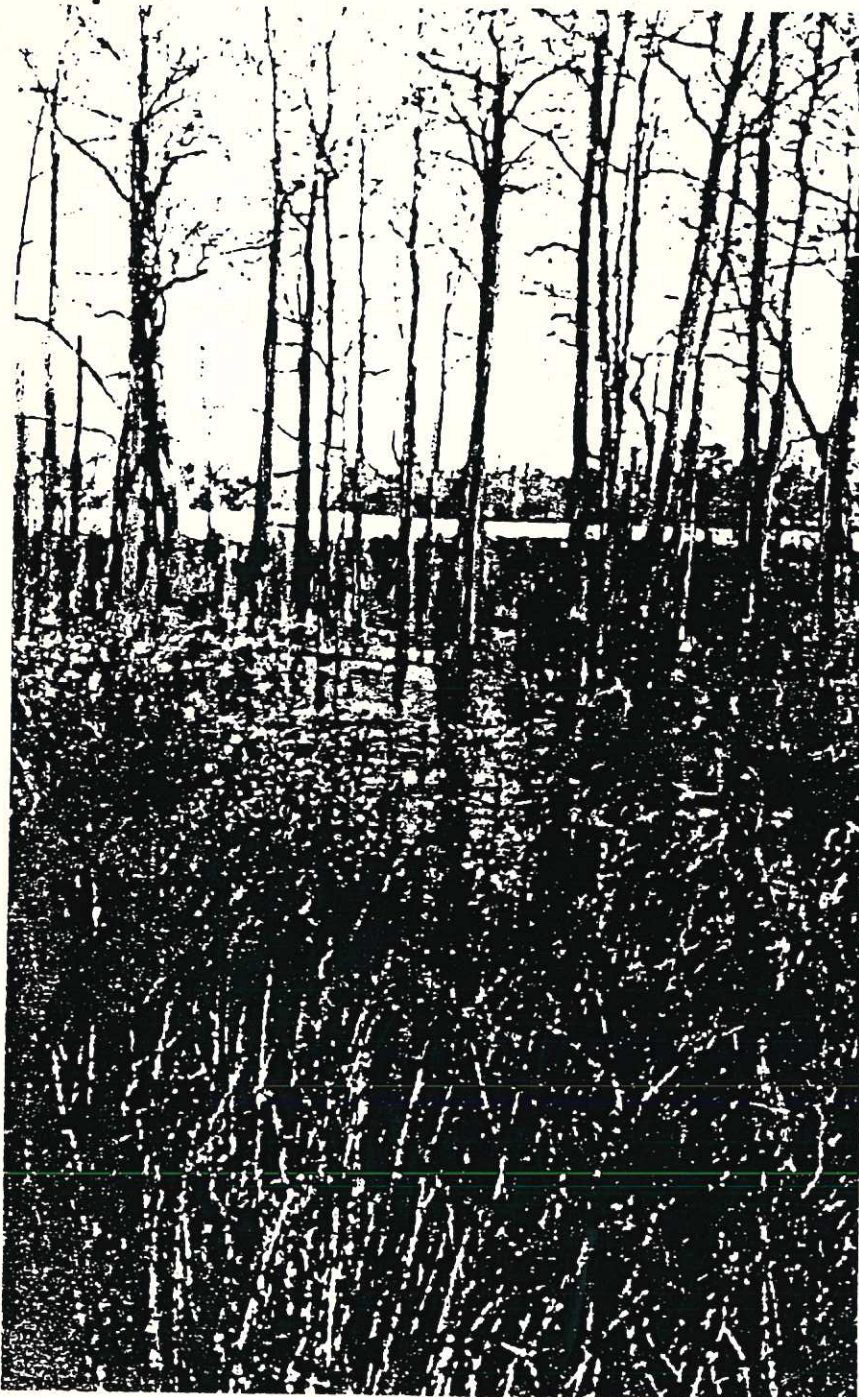


Macclesfield Park Master Plan



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Sidney H. Lehmann
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Joseph Darwak
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Patricia Miiller
Nick Sbarro
Barbara Sherwood
Ralph Thomas

Amy Tetlow - Organizing Chairman

MASTER PLAN BY:

Lovrek Associates, P.C.
Architecture, Planning, Design

Goodheart-Heinrich
Landscape Architecture

Van Note-Harvey
Engineering

Richard Best
Traffic

Lovrek associates, p.c.

180 Nassau Street, Princeton, N.J. 08542
609-924-5919

architecture · planning · design



Lovrek associates, p.c.

180 Nassau Street, Princeton, N.J. 08542
609-924-5919

architecture · planning · design

17 August 1987

We are pleased to submit this Final Master Plan for the Macclesfield Park in Lower Makefield Township. Throughout this process we have focused on providing you the best guidance in making the decisions that will bring the Park to successful completion.

We would like to thank especially the following individuals for their support in the preparation of this Master Plan:

Amy Tetlow
Joseph Linus
Ruth B. Hoyt

Joan Barley
James Smith
Patricia Miiller

In order to expedite the construction of the Park, several matters are to be resolved by the Township Engineers as they prepare construction drawings.

Any inaccuracies in the survey documents in regard to topography and treelines.

Relocation of larger soccer playing fields to the middle of the loop road as well as provision of additional parking. Parking is shown for 300 cars, which is at the low end of the traffic consultant's range. Parking should be increased to 360 - 375 spaces; this is easily accomplished if the loop road is lengthened. The bus parking, as shown, can be deleted. The cost estimates should be adjusted accordingly.

The Planning Commission has asked for an acceleration as well as a deceleration lane. This should be shown on the construction plans. According to Richard Best, traffic consultant, Penn Dot will not require an acceleration lane. Best doesn't think that a left turn lane will be required in River Road at the present time. The Township's traffic consultant could provide advice on future need for such a lane.

A more centrally located drinking fountain should be shown on the construction plans.

The Planning Commission requested a security gate and posted operating hours at all entrances to the park.

A fence and screening at the cemetery are to be shown on the plans.

The bike path on River Road and the screening of the portable toilets are to be deleted.

Future lighting of the fields and concession stand design details should be finalized.

The vegetation report by Helen Hendrickson has been revised in accordance with the Planning Commission's comments.

The maintenance building should be raised approximately 2'-0" above floodplain elevation to satisfy requirements of the Zoning Hearing Board.

As discussed at public meetings at Township Hall, negotiations with Conrail concerning the use of the railroad embankment, fencing of the tracks and electrical towers, and cleanup of trash have not been completed.

Thank you for this opportunity to work towards a more enjoyable, useful, and healthy environment.

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ANALYSIS

HISTORY

The most notable feature of the developmental history of the Kauffman Tract is the extent to which interested members of the community have been involved. It has drawn its lifeblood from those people who have maintained an active interest in the park over several years.

In May of 1985, the Board of Supervisors authorized inquiry into the possible purchase of the tract. The Kauffman Tract Committee members met with various officials and consultants to the Township as negotiations for the purchase of the land proceeded and as a program began to form. The sale was concluded during the summer of 1986. Later that fall, Amy Tetlow, Chairman of the Parks and Recreation Board and the Kauffman Tract Advisory Committee, on behalf of the Township, received a "Take Pride in Pennsylvania" award for proposing to develop the tract as a recreational site and for stimulating community awareness of the need to preserve natural resources. The award is part of a national program "Take Pride in America: This Land is Your Land Campaign" which focuses interest on public lands.

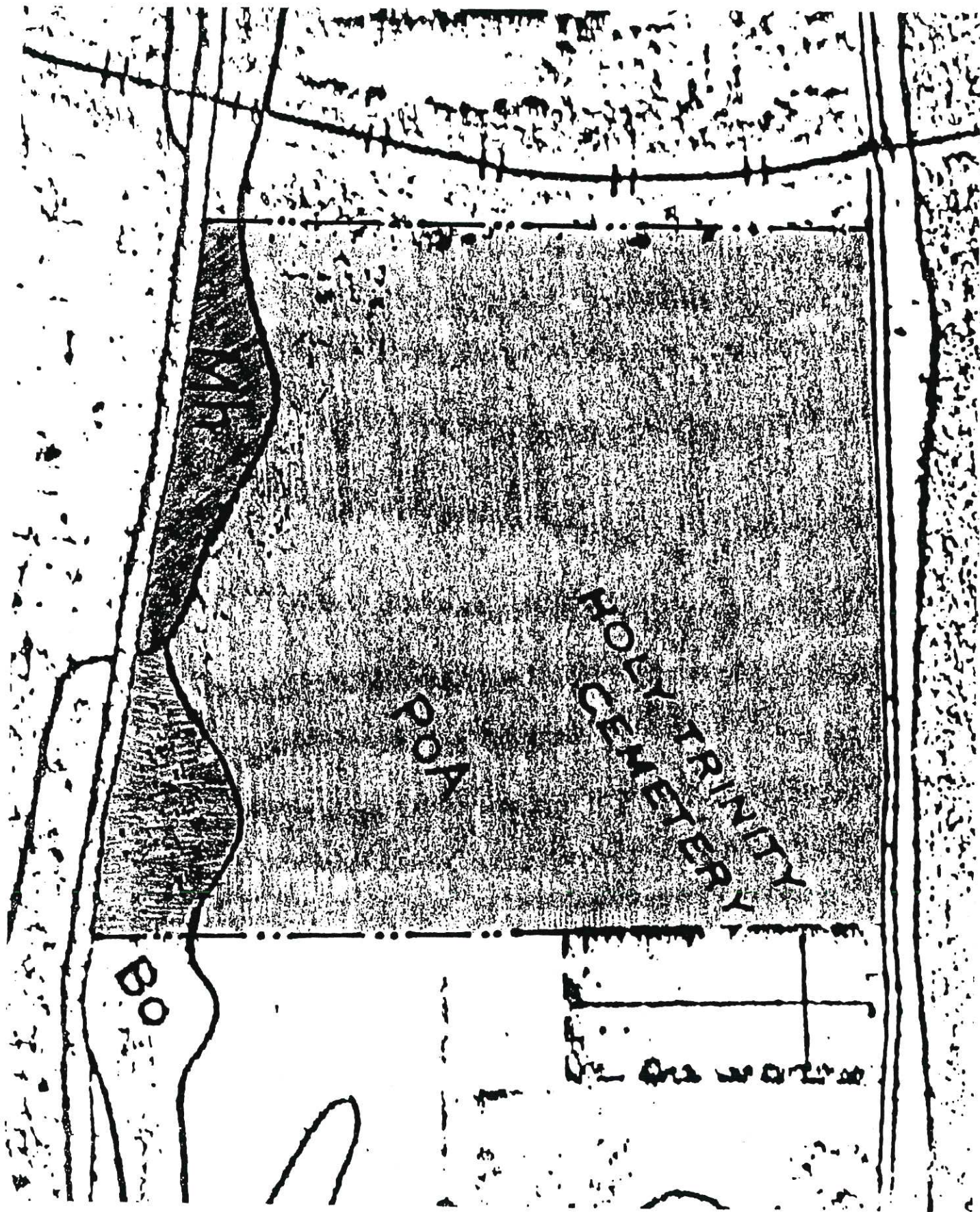
Shortly thereafter the Kauffman Tract Committee, and then the Joint Park Committee, began to meet with its planning consultants to discuss options and budgets for the Park Master Plan. These efforts have been multidirectional, directed at providing for the needs of the community of Lower Makefield, as well as those specific groups of users who have been so ably represented on the Kauffman Tract Committee. Care has been taken to contact and involve all public bodies from local through State and even Federal levels to ensure regulatory compliance during the construction permitting process.

Finally, a word about this Master Plan. It documents an ongoing process. Its purpose is to let others know what we have in mind and to establish an organizational framework for future community efforts. The planners have endeavored to provide an informational base and to help the Committee find the inherent organization, both physical and human, that logically responds to that information.

SOILS

Initial mapping and interpretation by the Soils Conservation Service is shown. Later, the Township and the consulting civil engineers had on-site soils logs and groundwater observations pits dug. Subsequent groundwater observations have been made by Lovrek Associates. These logs are shown in the appendices.

Soils Map



Pope Series

The Pope series consists of deep, well-drained, nearly level to gently sloping soils on flood plains and terraces. These soils are adjacent to or very near the Delaware River (fig. 29). They formed chiefly in loamy alluvial sediment derived from weathered shale, sandstone, quartz, and limestone.

In a representative profile in a cultivated area, the plow layer is dark-brown loam about 10 inches thick. The subsoil is 39 inches thick. The upper 13 inches is brown loam and very fine sandy loam; the lower 26 inches is brown and dark yellowish-brown fine sandy loam. The substratum is dark yellowish-brown and dark grayish-brown very gravelly loamy sand and gravelly sand that extends to a depth of 80 inches.

Runoff is slow to medium, and the hazard of erosion is slight to moderate. Available water capacity is high, and permeability is moderately rapid. Flooding is a limitation to most nonfarm uses of these soils.

Representative profile of Pope loam, 0 to 5 percent slopes, in a nursery one-half mile north of Erwinna. This is the soil S68Pa-09-1(1-9) sampled for characterization analysis in tables 12 and 13.

- Ap—0 to 10 inches, dark-brown (10YR 3/3) loam; weak, thin, platy structure parting to weak, very fine, subangular blocky; friable; strongly acid; abrupt, smooth boundary.
- B1—10 to 14 inches, brown (7.5YR 4/4) loam; weak, thin, platy structure; friable, slightly sticky and slightly plastic; medium acid; clear, wavy boundary.
- B21—14 to 19 inches, brown (7.5YR 4/4) very fine sandy loam; weak, medium, subangular blocky structure; friable, slightly sticky; medium acid; clear, wavy boundary.
- B22—19 to 23 inches, brown (7.5YR 4/4) very fine sandy loam; weak, medium, subangular blocky structure; friable, slightly sticky; medium acid; clear, wavy boundary.
- B23—23 to 27 inches, brown (7.5YR 4/4) fine sandy loam; weak, coarse, subangular blocky structure; very friable; medium acid; gradual, wavy boundary.
- B24—27 to 37 inches, brown (7.5YR 4/4) fine sandy loam; very weak, medium, platy structure; very friable; medium acid; diffuse, wavy boundary.
- B3—37 to 49 inches, dark yellowish-brown (10YR 4/4) light fine sandy loam; very weak, medium, platy structure; very friable; medium acid; clear, wavy boundary.
- IIC1^a—49 to 61 inches, dark yellowish-brown (10YR 4/4) very gravelly loamy sand; single grained; very friable; 50 percent gravel; medium acid; clear, wavy boundary.
- IIC2—61 to 80 inches, dark grayish-brown (10YR 4/2) gravelly coarse sand; single grained; very friable; 45 percent gravel; slightly acid.

The solum ranges from 40 to 50 inches in thickness. Depth to bedrock is more than 5 feet. The B horizon ranges from brown to dark yellowish brown. It is loam to fine sandy loam and medium acid to slightly acid. The content of gravel in the IIC horizon ranges from 35 to 65 percent.

Pope soils in Bucks and Philadelphia Counties have a slightly higher reaction and contain more coarse fragments in the C horizon than is defined in the range for the series, but these differences do not alter the use, management, or behavior of these soils.

Pope soils are in close association with Alton soils on the flood plains and Howell soils on terraces of the Coastal Plain. Pope soils contain less gravel in the A and B horizons than Alton soils and contain less clay than Howell soils.

Pope loam, 0 to 5 percent slopes (PoA).—This soil is on flood plains along the Delaware River. Areas are elongated and 3 to 50 acres in size. The profile of this soil is the one described as representative of the series.

Included with this soil in mapping are some areas of similar soils that are moderately well-drained. Also included are some small areas of Alton gravelly loam, flooded.

Most of this soil is used for crops. It is suited to most cultivated crops commonly grown in the area. This soil is subject to flooding during periods of intense rain.

The hazard of flooding limits most nonfarm uses of this soil. Capability unit IIw-1.

CAPABILITY UNIT IIw-1

This capability unit consists of nearly level, deep, well drained and moderately well drained soils on flood plains. These soils are of the Pope and Rowland series. They are subject to short-duration flooding that generally occurs each year early in spring or late in fall, before or after the growing season. Pope soils are flooded less frequently than Rowland soils, and flooding is of shorter duration. Rowland soils also have a water table late in winter and early in spring. These soils are easy to till, but tillage is delayed during some wet seasons. Permeability is moderately slow to moderately rapid, and the available water capacity is high. Natural reaction is slightly acid to very strongly acid.

These soils are suited to most crops commonly grown in the area. Growing cover crops and green manure crops, utilizing crop residue, and including hay in the cropping system maintain the organic-matter content and improve tilth. Keeping natural drainageways open and providing outlets in depressions improve drainage.

Marsh

Marsh (Mh) is along shorelines subject to ponding or tidal overflow or is in depressions where runoff collects. The soil material is variable, but it consists mostly of loamy to clayey marine and alluvial deposits. It is always very wet. Areas are irregular in shape and range from 5 to 100 acres or more in size. Included in mapping are a few small areas of very poorly drained soils that are not so frequently flooded.

Reeds, cattails, and other grasslike wetland plants grow on Marsh. It is much too wet for cultivation but is suited to wildlife or esthetic uses.

Most nonfarm uses are limited by flooding and wetness. Capability unit VIIIw-1.

CAPABILITY UNIT VIIIw-1

Only the land type Marsh is in this capability unit. Marsh is in depressions on tidal flats and inland areas of the Coastal Plain. It is very wet or covered with water much of the time.

It is restricted largely to wildlife habitat, recreation, or esthetic uses.

Bowmansville Series

The Bowmansville series consists of deep, poorly drained, nearly level soils on the flood plain (fig. 18). Most areas are along small meandering streams. These soils formed in loamy alluvium that washed from upland soils underlain by red and brown shale and sandstone.

In a representative profile in an area of pasture, the plow layer is dark-brown silt loam about 8 inches thick. The subsoil is 23 inches thick. The upper 10 inches is reddish-brown silt loam that has reddish-yellow and pinkish-gray mottles. The lower 13 inches is reddish-gray and dark reddish-gray heavy silt loam that has strong-brown and pinkish-gray mottles. The upper part of the substratum is pinkish-gray silt loam that has reddish-yellow mottles and extends to a depth of 50 inches. The lower part is stratified sand and gravel.

Runoff is slow, and the hazard of erosion is slight. Available water capacity is high, and permeability is moderately slow. Flooding normally occurs annually late in winter and spring. Flooding, restricted permeability, and wetness are limitations to nonfarm use of these soils.

Representative profile of Bowmansville silt loam, in a pasture south of Pine Run Creek, 175 feet northeast of Limekiln Road, Doylestown Township.

- Ap—0 to 8 inches, dark-brown (7.5YR 4/2) silt loam; common reddish-yellow (7.5YR 6/6) stains around root channels; weak, very fine, granular structure; friable; medium acid; abrupt, smooth boundary.
- B1—S to 12 inches, reddish-brown (5YR 5/3) silt loam; many, coarse, distinct, reddish-yellow (5YR 6/6) mottles; weak, fine, subangular blocky structure; friable; thin, discontinuous silt films on faces of peds; medium acid; clear, wavy boundary.
- B21—12 to 18 inches, reddish-brown (5YR 5/4) silt loam; many, medium, faint, pinkish-gray (7.5YR 6/2) mottles; weak, medium, subangular blocky structure; friable; faint silt films on peds and in pores; medium acid; clear, smooth boundary.
- B22g—18 to 24 inches, reddish-gray (5YR 5/2) heavy silt loam; many, coarse, faint, strong-brown (7.5YR 5/6) mottles; weak, medium, prismatic structure parting to weak, medium, subangular blocky; friable, slightly sticky and plastic; silt films in pores; medium acid; clear, smooth boundary.
- B23g—24 to 31 inches, dark reddish-gray (5YR 4/2) heavy silt loam; many, coarse, distinct, strong-brown (7.5YR 5/6) and pinkish-gray (7.5YR 6/2) mottles; weak, coarse, prismatic structure parting to weak, medium, subangular blocky; firm, sticky and plastic; silt and clay films in pores; medium acid; abrupt, smooth boundary.
- C1g—31 to 50 inches, pinkish-gray (5YR 6/2) silt loam; many, medium, distinct, reddish-yellow (7.5YR 6/6) mottles; massive; firm; medium acid.
- IIC2—50 to 55 inches, stratified sand and gravel; medium acid.

The solum ranges from 30 to 40 inches in thickness. Depth to hard rock ranges from 3½ to 12 feet. The content of subrounded coarse fragments of shale or sandstone ranges from 0 to 10 percent in the solum and from 0 to 30 percent in the C1g horizon. The B horizon ranges from weak red to reddish brown and has gray, reddish-gray, reddish-yellow, or strong-brown mottles. The B horizon is mainly silt loam or silty clay loam but ranges to sandy clay loam. The B2 horizon ranges from weak, medium, subangular blocky structure to weak, coarse, prismatic. The B horizon ranges from strongly acid to slightly acid. The C horizon is silt loam, silty clay loam, or sandy loam and is stratified sand and gravel at a depth below 40 inches.

Bowmansville soils are in close association with Rowland soils on the flood plain and are more poorly drained than those soils.

Bowmansville silt loam (0 to 5 percent slopes) (Bo).— This is the dominant soil on the flood plains along creeks in areas of shale and sandstone. Areas are long and narrow and 3 to 50 acres in size.

Included with this soil in mapping are some small areas of similar flood plain soils that are well drained. Also included are some areas of soils that were cut and gouged by swift-flowing water.

Most of this soil is used for pasture or is idle. On a few of the wider areas on flood plains the soil is used for crops.

Flooding, the high water table, and moderately slow permeability are limitations to the nonfarm uses of this soil. Capability unit IVw-1.

CAPABILITY UNIT IVw-1

This capability unit consists of nearly level, deep, poorly drained soils on flood plains. These are soils of the Bowmansville and Hatboro series. They have a high water table, are wet most of the year, and are subject to flooding. Permeability is moderate or moderately slow, and available water capacity is high. Natural reaction is very strongly acid to slightly acid.

Wetness and flooding severely limit the use of these soils for crops. A very low intensity cropping system that includes moisture-tolerant hay and pasture crops is needed. A water-tolerant row crop can be grown occasionally, but it has to be planted after the water table has receded late in spring or early in summer. Drainage can be improved by keeping natural drainage-ways open, by providing outlets for depressions, by bedding, by using random tile drains, or by using open ditches if outlets are available.

Soil Survey of Bucks and Philadelphia Counties
Pennsylvania.

USDA/Soil Conservation Service, July 1975.

VEGETATION

This analysis of existing vegetation in various sections of the park site is based on the following sources of information:

1. Site inspection by the design team.
2. Review of "Vegetation and Stream Survey of Lower Makefield Township" report developed by the Academy of Natural Sciences of Philadelphia, 1978, especially sections on "Forest Vegetation of Lower Makefield Township" and "The Flora of Wetlands and Poorly Drained Woods of Lower Makefield Township".
3. Review of "Environmental Report of Kauffman Tract" submitted by Rich Mellon to James J. Dillon, Township Manager, October 1985.

Based on these sources of information, the vegetation found on the site can be divided into five distinct areas:

1. Disturbed-site, early successional vegetation along the railroad embankment.
2. Disturbed-site, upland and wetland vegetation along the east side of the Pennsylvania Canal.
3. Large, overgrown, planted ornamentals along the side of the cemetery.
4. A hedgerow found at the westerly border of the cemetery on adjacent farmland.
5. Upland, disturbed-site, early successional vegetation bordering Route 32.

A more detailed look at each section will clarify which vegetational resources might be made part of the park and which native and adapted species might be planted.

According to the Academy study, the land in Lower Makefield Township south of the railroad tracks is noteworthy for the change from typically Piedmont vegetation to that more often found in the Inner Coastal Plain. Species more prevalent in South Jersey, such as Sweet Gum, appear with a shrub layer made up of Sweet Pepperbush, Highbush Blueberry, Spicebush, and some Swamp Azalea.

The railroad embankment, with very steep, highly erodible banks, is a collection of plants which volunteer when a site is highly disturbed: American Sycamore, White Oak, Ash, Paulonia, Sweet Gum, with vines such as Pokeweed, Goldenrod, Japanese Honeysuckle, Foxtail and Broomsedge grasses on the flatter areas. There is no native reproduction taking place and alien species dominate.

Along the canal in the northwest corner of the park, there is evidence of land filling, with much broken glass and bottles. The early successional vegetation does not show evidence of methane gas or other products of garbage disintegration. The plants here are Sweet Gum, Red Maple, American Sycamore, and Tulip Poplar. Sumacs, Alders, Japanese Honeysuckle, Ailanthus, and Bittersweet are to be found along the higher banks. The Academy of Sciences study described this area as severely disturbed Mesic Upland and Lowland Forest (Oak, Sweet Gum, Red Maple).

At lower elevations, where water levels fluctuate depending upon the season and rainfall, the swampy forests of Sweet Gum and Red Maple are moderately disturbed, but the shrub layer (Alders, Shrub Dogwood) is impaired and the ground layer in the swamp is being replaced by aliens such as Purple Loosestrife. This condition was identified in the 1978 Academy report. It is even more apparent eight years later that alien species are getting the upper hand. Even so, these wetlands are called "the most extensive wetland in the township, one of the most aesthetically appealing places along the canal for hikers". Its nearness to densely populated areas and the Delaware River highlights its ecologically important role as a wetland, holding excess water, retaining sediment, filtering pollutants, and recycling nutrients. Its capture by exotic plant species is therefore of some significance when considering future vegetation maintenance of the wetland areas.

In the third section of vegetation, along the sides of the cemetery, two rows of Larches were planted with Arborvitae to set off the burial ground and block the wind. These have grown to a large size and have a tangle of Honeysuckle and vegetative debris underneath. With their striking chartreuse spring leaf color and golden fall color, these trees will stand out among the Oaks and Sweet Gums around the other borders of the park.

The hedgerow to the west of the cemetery adjacent to the site is composed of trees and shrubs, the species of which could be used in the park as native, low-maintenance screens. In the hedgerow are found Crabapples, Apples, Red Cedar, Black Locust, Sassafras trees and shrubs such as Grey Dogwood, Blackhaw and Arrowwood Viburnums.

In the last vegetational area, along Route 32, a row of almost evenly spaced Ash trees is found with Poison Ivy underneath them and climbing up their trunks.

Vegetation Management for the Park

The vegetational resources with the most value for the park are the areas along the toe of the slope of the railroad embankment and the natural area to the east of the canal towpath. Vegetation along the embankment represents tough, drought-resistant species which can survive a very hostile

environment while providing some food and shelter for wildlife. After the trash is cleared away from this area, native species can be encouraged, bare areas sealed with plantings of Sumac and Grey Dogwood to discourage the passage of visitors into the shrubs and up the embankment.

As for the natural area of uplands and wetlands between the towpath and the higher elevations of the park immediately to the east, the interest in this area comes from its demonstration of what Nature can do despite a high degree of degradation and disturbance. It is not a pristine wild area full of endemic plant and animal species which must be preserved. There are two alternative plans of action for managing this area from which to choose:

1. The town may wish to make an attack on the alien vegetation such as Purple Loosestrife, Japanese Honeysuckle and Ailanthus trees, in order to clear out the vegetation which may be competing with native species more beneficial to wildlife. Hand pulling and cutting when the ground is soft is somewhat effective but for final eradication it may be necessary to apply carefully directed, limited applications of EPA-approved herbicides to vines, stumps and other vegetative parts to conquer these invasive species.

The Purple Loosestrife (*Lythrum salicaria*) is a particularly vigorous invader, replacing plants more valuable as food and shelter sources, thus resulting in a total reduction of wildlife diversity over time as habitat diversity is reduced. Officials of the U.S. Fish and Wildlife Service in Pennsylvania and New York have experience, developed over the past few years, in trying to rid their refuges of this pest. The most effective method seems to be a combination of actions to put the plant under stress: alternation of water levels, cutting, treatment with Rodeo herbicide. At the Montezuma Wildlife Refuge in northern New York state, 1100 acres of Loosestrife have been reduced to 525 acres using these techniques.

With water from the canal available, it would be possible to manipulate the water levels in the marsh to stress the Loosestrife, but not without effect on other vegetation growing there. For advice on what to do, Lower Makefield can call on Wildlife Refuge Manager Grady Hocutt of the U.S. Fish and Wildlife Service, at the Montezuma Refuge:

Grady Hocutt, Manager
Montezuma Wildlife Refuge
3395 Route 5 - 20E
Seneca Falls, New York 10148
(315)568-5987

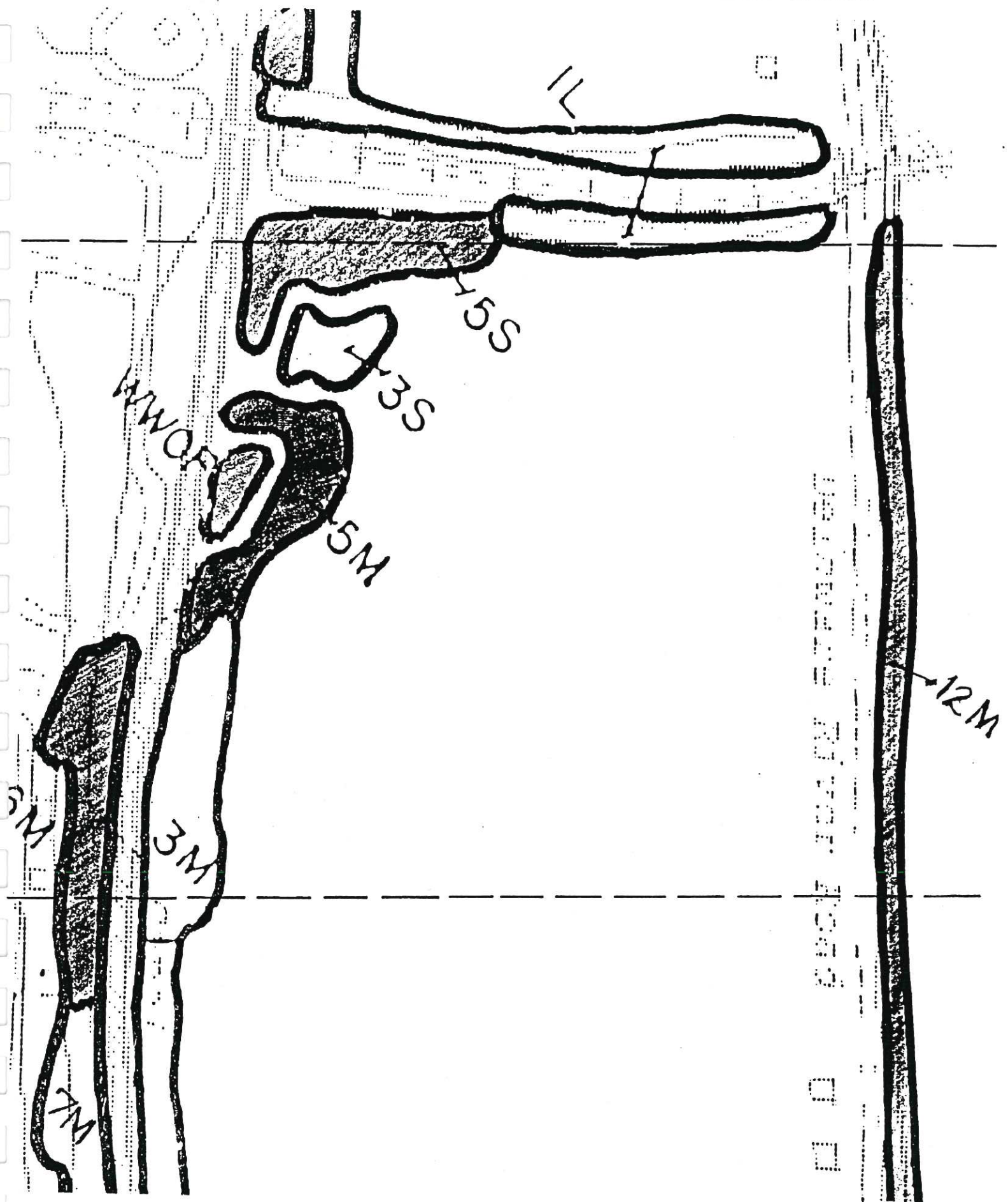
With a map of the area to be dealt with and more specific information, Mr. Hocutt offered to help develop a plan of attack. In addition, he could visit the area and consult with park officials when he is next down this way.

2. The natural area could be mapped and studied for what it is: an attractive example of what Nature can do even with highly disturbed conditions. With such a limited area and so much human contact, highly rare and endangered plant and wildlife species are not likely to make themselves at home even if invasive species were reduced. The nature study program could focus on what is there and the changes, over time, to alien and indigenous plant and animal communities found in a disturbed site.

Recommendations

1. Use native plants found on site as guides to plants which will grow with the least maintenance. Plant mixed groves and hedgerows of native trees and shrubs to provide species diversity and wildlife habitat.
2. Try to reduce the spread of alien species by covering bare ground with native or adapted species, leaving no biological niches for the aliens to invade.
3. Develop the natural area as a laboratory for the study of the effects of man's disturbance on plants and animals, keeping the aliens from spreading more widely but leaving them in place as they are found now. Design in such a way that no structures or vegetation management strategies prevent the wetlands from fulfilling their ecological role.
4. The large ornamentals found along side the cemetery would be a great asset to the site, if they were pruned and the overgrowth removed.
5. Remove Poison Ivy plants.

Map - Forest Vegetation Of Lower Makefield



Key - Forest Vegetation Of Lower Makefield

UPLAND FORESTS

1L

BLACK LOCUST

Robinia pseudoacacia

MESIC UPLAND AND LOWLAND FORESTS

3M

SWEET GUM/RED MAPLE

Liquidambar styraciflua, *Acer rubrum*

3S

SWEET GUM/RED MAPLE

Liquidambar styraciflua, *Acer rubrum*

5M

OAK/SWEET GUM/RED MAPLE

Quercus rubra, *Q. alba*, *Q. velutina*,
Liquidambar styraciflua, *Acer rubrum*

6M

OAK/RED MAPLE/ASH/TULIP POPLAR

Quercus rubra, *Q. alba*, *Q. volutina*,
Acer rubrum, *Liriodendron tulipifera*

7M

OAK/HICKORY/BEECH

Quercus rubra, *Q. alba*, *Q. velutina*,
Carya ovata, *C. glabra*, *Fagus grandifolia*

FLOODPLAIN FORESTS

12M

SILVER MAPLE/SYCAMORE/ELM

Acer saccharinum, *Platanus*
occidentalis, *Ulmus americana*

WEOF

WETLAND WOODY OLDFIELD

L = Low disturbance

M = Moderate disturbance

S = Severe disturbance

Vegetation mapping prepared by Andropogon Associates from aerial photography provided by Bucks County Planning Commission (DVRPC, 1975 series), with field reconnaissance of all labelled stands of vegetation, September-October 1978

VISUAL ANALYSIS

The Visual Analysis identifies the overall visual quality of the site and the existing and potential views into and off the site. See Site Observations Map, page 16.

Overall Site Character

The 60 acre site between the Delaware Canal and the Delaware River is striking for its bowl-like quality and the lack of views of the water from most of the site. A gently sloping bowl, the site is surrounded by woodlands which will change color as the seasons progress from the grays of winter to the red and green buds of spring, the solid green of summer, and a tapestry of reds, oranges and yellows in the fall. The railroad embankment provides a solid visual barrier on the northwestern edge, a bank again softened by vegetation.

Only at the far northern corner of the site can the river be seen from within the site. At other points one is unaware of the presence of water bodies on either side. Views of the canal could be provided by cutting through the vegetation to the marsh.

The Township of Lower Makefield is characterized by houses of varying configurations with small windows and chimneys. Native stone is often used for foundations and chimneys, with frame construction forming the structure above. The scale of the architecture and the use of building materials could be duplicated in buildings and signage used for the park.

Visual Scales

A visitor sees the park at different scales depending on his/her vantage point.

1. **The Pedestrian Scale**

The pedestrian might enter from the Delaware Canal towpath or eventually from the proposed housing area to the south. From the Canal the observer experiences a water-woodland setting, woods blocking the views into the park and focusing attention on the wetlands in the foreground. These views will change with the passing of seasons and the difference in water levels that will affect the vegetation in view.

Pedestrians entering from the housing area will experience views created by the design of the park. Placement of hedgerows of vegetation, buffers, and athletic facilities will be immediately visible as one enters the park from the south. At this point one is in the middle of a wide, flat bowl tipping slightly to the west. There is no hint in summer that there is water on both sides. This impression

is even stronger at the high points alongside the cemetery and against the railroad embankment.

The view of the river begins only as one comes close to the road on the northeastern edge. In the far northeastern corner, where the bank down to the river slopes more gently, one can see the river from farther back into the site. It is vegetation along the road and the edge of the river which blocks these views, vegetation which could be managed by design to open up more riverside views.

The pedestrian would normally have no chance to experience the view from the railroad tracks since one would have to climb the embankment and risk encounter with a high-speed train to gain this viewpoint.

2. The Automobile Scale

The auto would normally approach from both directions on River Road. The enclosed woodland experience of the area beside the canal would be unavailable to visitors in cars unless a new forest was planted in the future and encouraged near the entrance for those arriving by auto to enjoy.

The marsh, and views opened up toward the canal, can be seen by both pedestrians and passengers.

3. The Railroad Scale

Passengers on the commuter trains would enjoy, briefly, a bird's eye view of the site and the activities happening there as they speed by. They would not experience the enclosing woodland-marsh environment as the vegetation is not as high as the railroad embankment. They would have some sense of the wide bowl and the proximity to the river.

Recommendations

1. Clear views for visitors at all three scales:
 - Toward the marsh and park for canal viewers.
 - Toward the marsh and canal for those on foot or in autos within the park.
 - Into the park for train viewers.
 - Along River Road to prepare auto traveler for visiting the park.
2. At the southern edge, consider the recreation of a woodland experience which could serve as a visual buffer between the park and the new housing, completing the edge of the bowl.
3. Bring autos, pedestrians or both to the high points and to places where the river and the marsh are visible from the interior of the park wherever possible.

4. If facilities and programs are developed jointly with the Delaware Canal Park, develop views into the park from the canal to signal to hikers and canoeists that picnic/restroom facilities are available to them at that location; and develop those views so that park visitors can catch glimpses of Canal facilities available to them.

TRAFFIC

Richard N. Best Associates has been retained by Lovrek Associates, P.C. to project the traffic which would be generated by the Park, determine the peak hour impact at its driveway and River Road and to determine the facility parking requirements.

The Park will provide facilities for active recreation such as soccer, Little League, Girls Softball, Babe Ruth, tennis and hiking. All facilities will not be constructed initially, however, for the traffic study it was assumed that six soccer, one Babe Ruth, and one softball field were in use at one time.

TRAFFIC GENERATION

To project the number of vehicular trips to be generated by a proposed development, data from the Institute of Transportation Engineers (ITE) "Trip Generation" manual is used. Generation data for this particular type of park is not available. The Consultant, having worked with a youth organization for sixteen years, used his own experience to determine the generation rates used in this report. Although the generated traffic volumes will vary from one age group to another, an average rate was used as follows.

Soccer	15 veh./team
Little League	15 veh./team
Girls Softball	15 veh./team
Babe Ruth	8 veh./team

Therefore, the number of vehicles used to support the activity of six soccer, one Babe Ruth and one softball game occurring at the same time would be a total of 226. Many players are dropped off for pregame practice by the parents who return later to watch the game. A figure of 25 percent was used to represent this exiting volume during the peak traffic hour.

TRAFFIC DISTRIBUTION

The Consultants collected existing PM peak and 24 hour traffic volumes on a typical weekday for the area.

A 50/50 percent distribution split was used for traffic entering and exiting the Park. For a worse case scenario, the projected Park traffic and the existing PM peak hour traffic on River Road for an average weekday were assumed to occur at the same time and are shown in Figure 1. These volumes were used to analyze the intersection of the driveway with River Road.

N
4

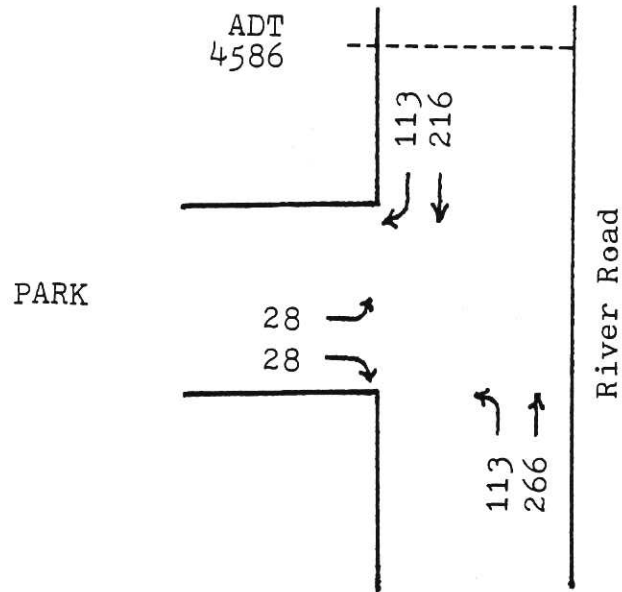


Figure 1

TRAFFIC VOLUME PROJECTIONS

TRAFFIC ANALYSIS

Although the Park traffic is higher on the weekend, the one hour peak would be greater on a weekday when there is a heavy flow of motorists returning home from work.

The traffic volumes given in Figure 1 were analyzed and indicated the Park exit to operate at a "B" Level of Service and the northbound left turn at an "A" Level.

The intersection approaches were analyzed by a methodology adopted by the Transportation Research Board (Circular Number 212, January 1980). This method considers all movements and their conflicts in order to evaluate acceptable gaps in the traffic for the motorist to enter the main flow. Once the capacities of the individual flow are determined, they are then compared to the existing or projected flows. The amount of reserve capacity determines the Level of Service.

Level of Service "C" is the recommended design level where motorists entering the flow would experience only average traffic delays. "A" and "B" Levels are much better with short or no delay.

DRIVEWAY CONSIDERATIONS

The Pennsylvania Department of Transportation (Penn DOT) requires that every effort be made to design and construct the safest and most efficient access onto a State highway.

Driveway design requirements are based on the 24 hour traffic volumes using the driveway. The average weekday traffic would require only a "Minimum Volume" design. Due to the heavier weekend use, the design should be that for a "Medium Volume" driveway.

For added safety, a 150 ft. deceleration lane with a 75 ft. taper should be constructed. An acceleration lane is not recommended. It may tend to encourage motorists to park in this area to enter the nearby soccer field. "No Parking" signs should also be considered in this area to discourage parking along River Road.

PARKING REQUIREMENTS

On Saturday and Sunday there will be back-to-back games and many players will arrive for their game before the previous game has been completed. This will increase the parking demands on a weekend. Weekday requirements are for 226 spaces and during the weekend it should be 50 to 100 percent greater.

REGULATIONS

Two letters were issued by Lovrek Associates, dated January 14, 1987 and February 10, 1987, regarding the regulatory process. They are updated through March 18, 1987 with new information added, below.

Inquiries have been made at the various agencies that might have jurisdiction over aspects of the development of the Kauffman Tract. Copies of regulations and permit packages have been obtained and the project discussed with various officials having jurisdiction at the local, state and national level. The regulations promulgated by local bodies will be discussed first.

TOWNSHIP REGULATIONS

Lower Makefield has three major documents that regulate land development. They are the 1981 Master Plan Revision, the Zoning Ordinance and the Codified Subdivision and Land Development Ordinance as amended September 1984. Additionally, there are other referenced ordinances and surveys. The proper steps adopting the Master Plan have been taken. The Planning Commission Minutes of April 6 and April 20, 1987; the Zoning Hearing Board Minutes of June 2, 1987 and the Board of Supervisors Minutes of July 13, 1987, as well as the Zoning Hearing Board Appeal #87-605 by the Township Board of Supervisors, document this process.

1. The conversion of the Kauffman Tract into recreational facilities fulfills the stated goals of the Master Plan by creating an open space link between the Kauffman Tract and Roosevelt State Park, preserving the environmentally sensitive marsh land along the Canal, as well as providing a minimal amount of construction in the flood plain. This area of the Township is specifically designated in the Master Plan for future recreational facilities. According to the Master Plan, which uses 1980 population figures, the need for soccer and baseball fields was satisfied at that time. The present citizen interest in these facilities clearly indicates that this is no longer the case.
2. A review of the Zoning Ordinance discloses the following information:
 - a. The Kauffman Tract is in the R-1 Zone. The Ordinance requires that a special exception be made by the Zoning Board to permit a publicly owned park in this zone. See Section 12.21 (f.3). This has been accomplished.

- b. From examination of the Flood Boundary and Floodway Map, the Kauffman Tract lies within the 100 year Flood Plain. Section 12.125 (e.4) clearly permits recreational uses in the flood plain.
 - c. The need for a detention basin has been waived by the Township Engineer. Section 12.125 also offers relief since it permits recreational uses and public facilities in the flood plain.
 - d. The Zoning Ordinance also mandates that active recreation areas be set back 100' from adjacent lot lines and that outdoor play areas be screened and acoustically buffered. At the property line adjacent to the railroad embankment an exception has been sought and granted since the playfields should cause no disturbance. See Section 12.131 (a.5). Another item is the requirement that no structure be located closer than 80' from the right of way of River Road which is designated as a collector road.
 - e. Naturally development in the Wetlands is prohibited, however we would like to see a link between the Kauffman Tract and Roosevelt State Park; this will be discussed later in this report.
 - f. Another item in the Zoning Ordinance is the requirement for off-street parking. The Ordinance mandates one space for every five persons of park capacity; the traffic consultant has made recommendations which are described in the section on traffic.
3. The Subdivision and Land Development Ordinance has detailed regulations that govern approvals and construction on the Kauffman Tract.
- a. Section 11.10(26) of the Ordinance refers to the Engineering Design Standards Manual which will regulate improvements on the Tract. It is our opinion that the issues that may be raised by these Standards are of a detailed nature that is best left to resolution with the Township Engineers at the time construction drawings are done. Budgetary limitations proscribe the type of paving to be used on the roadways, the extent of curbing and the need for paved parking.
 - b. The Ordinance sets the right-of-way width of River Road, a collector road, at 80'; currently the right-of-way is 33'. The Joint Park Committee would like to dedicate this land as a right-of-way at this time.

- c. The issue of the accel/decel lane is addressed in the Traffic Section of the Master Plan.
- d. Cul-de-sacs have a permitted length of 440 feet. See Section 11.47(a). If Option "2" is selected an exception must be granted to this requirement.
- e. Sidewalks between facilities are required by the Ordinance. A 4' wide bituminous path, is proposed. The path shown on the plans will provide handicap access to remote parts of the Park. See Section 11.49 (b).
- f. Street trees will not be replanted at the decel lane as required by Section 11.51 due to budgetary considerations.
- g. There are very specific standards for parking areas. Each must contain not more than 36 cars. It is required that all automobile parking be paved to Township Standards. However this is not feasible from a budgetary point of view, so gravel parking areas are proposed. Also a 9' x 20' rather than a 10' x 20' parking stall is proposed for Option 3. Crosswalks are required every 200' in parking areas. Additionally, lighting is required for all parking areas; however the committee suggests "shared" lighting with the playfields when the budget allows this enhancement. Not addressed in the ordinance is the requirement for street lights on River Road. The Chief of Police believes if the park is to be used at night, they would be desirable. See Section 11.64. Additionally, Section 11.72 requires parking areas to be visibly secluded from the surrounding area, a clarification of the extent of this screening is needed since the budget for planting is limited.
- h. Water supply will be from a well. The issue of fire hydrants should be addressed. A preliminary notification to the Fire Marshall can take place at time of Planning Commission review.
- i. Section 11.82 regulates buffer areas, it is not clear if any are required on the Kauffman Tract; perhaps they are required at the R-2 Zone boundary or the Yardley Borough boundary; the Planning Commission could clarify this point.

- j. The Land Use Ordinance has requirements for grading and drainage. The Township Engineers feel a basin is not required. The Master Plan will not provide for a basin. If one is required later, amendments to the plan must be made. See the Summary of this section for additional information on this issue. See Section 11.91 and 11.92.
 - k. Soil erosion control is addressed in the Township Ordinance. There should be no difficulty in complying with this at the planning level; the County and State requirements will be discussed later.
4. Also reviewed was the Bikeway Map and Ordinance as referenced in the Land Use Ordinance. The Map shows a bikeway connecting Manor Lane with the Kauffman Tract along the westerly side of River Road. Along the Canal the practical width of the towpath is less than is needed for safe pedestrian and bicycle use simultaneously; however it is safer than River Road for bicycle usage.
- a. We have spoken to Douglas Hoehn of Roosevelt State Park who states that the extent of State lands along the Canal is 12' beyond the lip of the Canal on the towpath side except where ancillary drainage exists. In that case, the State lands extend to the eastern side of the drainage ditch. Douglas Hoehn also said that these lands were not mapped but described in a court decree.
 - b. See the Appendix for further information regarding Roosevelt State Park plans for bicycle use of the towpath.

COUNTY REGULATIONS

1. Moving away from the Township, there are other regulatory agencies. One is the County Soils Conservation Service, which regulates soil erosion and, tangentially, water quality. When Construction drawings are prepared, a soil erosion and sedimentation plan must be drafted by a civil engineer and reviewed by the County office. There is no charge to the Township for County review. The County SCS will check for compliance with the Clean Stream Laws and the Water Quality Act. This review will take 30 days. However, if more than 25 acres of land is disturbed at one time then the plans must be reviewed by the Bureau of Soil and Water Conservation, DER, in Harrisburg. A copy of this permit application can be found in the appendix.

The time frame for this review is three to four months for issuance of a permit. Preliminary calculations on "Option 2" indicate the minimal acreage for 3 soccer fields, 1 Babe Ruth field, one softball field, roads and parking is slightly under 25 acres. If all rough grading is done, as in "Option 1" as much as 40 acres may be disturbed. If the construction budget for all rough grading can be afforded, it will cause less disruption in the long run. This approval process can be started as soon as the construction documents have progressed sufficiently.

2. The Bucks County Comprehensive Plan for 1977 has also been checked; it shows the need for 70-100% open space in this area. (See Natural Resource Protection Map).
3. The Joint Park Committee has discussed the possibility of a concession stand in order for the leagues to raise cash to support Park maintenance. This was thought to be a good idea. Bucks County Board of Health Regulations limit the sale of food-stuffs by unlicensed organizations to prepackaged goods. Licensing requires a substantial investment in facilities as well as a permit review and continuing inspection. Drinking water provided by the well must be tested for potability according to the Pennsylvania Safe Drinking Water Act. These tests are done privately and cost approximately \$600. Disinfection is recommended but not required, at a cost of \$1000. If the water is used by a facility that is licensed, disinfection is required. Tests for bacteria are required. In light of these restrictions no provisions have been made for a licensed facility in the Master Plan.

STATE REGULATIONS

1. We have also contacted the Department of Environmental Resources about other permits that may be necessary. The Bureau of Dams and Waterway Management regulates construction in the flood plain. Our civil engineer thinks that permits may be necessary if a detention basin structure is found to be required that changes the volume of flood plain water that the site is capable of storing due to unbalanced cut and fill operations.
 - a. We have spoken to both the local and Harrisburg offices of this Bureau; they generally don't review Master Plans but will if they are asked. They do review the construction documents, and the process takes two to three months.

- b. We have also contacted the Flood Plain Management Division of the Department of Community Affairs and the Coastal Zone Management Division of the Department of Environmental Resources. Neither of these agencies require review or approval.
 - c. Copies of the permits applications can be found in the appendix.
2. Penn Dot has also been contacted by our office and by Richard Best Associates, the traffic consultants. They will review preliminary plans but will not make a final commitment until they have engineering drawings and calculations. Robert Weekley stated that approval time takes from two to six months depending on the response time of the Owner's engineer. Richard Best believes that the study he is providing as part of the Master Plan will preclude any additional traffic studies being required during the final contract document stage. He has also confirmed that neither an accel nor a decel lane is required. However, an accel/decel lane is preferred.

REGIONAL REGULATIONS

1. The DER recommended we contact the Delaware River Basin Commission. A conversation with David Everett revealed that their chief concern was keeping the floor level of whatever structures which may be built above the 100 year flood plain and keeping the chemicals from the portable toilets above the flood plain levels. We think that this can be accomplished with minor grading at the time of construction documents. No permit is required from their agency for this work. The Delaware River Basin Commission Flood Plain Regulations do not prohibit a recreational use in the flood fringe where the Tract is located. They have no requirements for detention basins.

FEDERAL REGULATIONS

1. If the wetlands are crossed, permission from the Corps of Engineers must be obtained. Alan Goodheart has spoken to several individuals and has concluded that if catwalks on pilings or boardwalks on sleepers are used, the permit process should be very simple, requiring twenty days. A permit application is also automatically reviewed for compliance with water quality regulations. The National Wetlands Inventory indicates that the Wetlands along the rear of the Tract are officially

regulated by the Corps. The Corps also recommends that we send them preliminary plans for their review so they can see if additional permits are required.

SUMMARY

1. The time frame for approvals by the various agencies are summarized as follows:

Penn Dot Approval	Two to Six Months
SCS Approval/Local	One Month
SCS Approval/State	Three to Four Months
Dams and Waterways	Two to Three Months
Corps of Engineers	One Month

2. Following these reviews and approvals, construction must be performed, generally, seeding being one of the last operations. Time duration for work has been estimated as follows:

Negotiation of Contract Document Services by the Township	Three Weeks
Preparation of Contract Document by Design Professionals	Eight Weeks
Township and State Approvals	Twelve Weeks
Contractor Bid Period	Three Weeks
Construction	Twelve Weeks

Since this totals 38 weeks or 9 months and we cannot remove the inherent risks due to delayed approvals or changes requested by various agencies, we suggest the following:

- a. The Contract Documents to be started as soon as possible. The Approvals Process is beyond our control. We have allowed twelve weeks which is an average time. However Penn Dot says it is possible for the process to take six months. One of the plans, "Option 2", shows a scheme which would not require State SCS approval. If the grading, cut and fill can be balanced (which is not yet known) and no detention is required, then the Dams and Waterways permit may not be required. This could have a salutary effect on the completion date. The bid period could be started before final approvals are received, if comprehensive preliminary remarks from the various Agencies are obtained. This means construction could commence as soon as Final Approvals are received. The construction could be arranged, out of normal sequence, to seed before completion of road work and other facilities. These measures, in combination, could speed the process significantly.

b. Every agency has been asked if they will require a detention facility. Not one has responded positively. Additionally, our civil engineer Bob Dougherty of Van-Note Harvey Associates has done some research, including a call to the County's civil engineering consultants, J.G. Parks, who told him that the County will not require detention facilities if the Township does not. Concerning the detention basin, Jim Dillon met with the Township Engineers, Pickering Corts and Summerson; it was concluded that they did not see the necessity for a detention basin. However, Jim Dillon and the Planners are concerned with the remote possibility that some agency may require this facility during the permitting process which includes a review of engineered drawings. The Committee has decided that Jim Dillon should write to these agencies, confirming that they've been contacted and do not see a need for a basin.

PROGRAM

PARK USES

As all the members of the Joint Park Committee are aware, there have been extensive negotiations about what facilities the Park should provide when the factors of need, budget, and available area are all taken into consideration. Based upon minutes of the Committee's program meeting of January 28, 1987 two options have been generated that address these needs, budgets and space. These facilities, chosen by the Committee, were not selected with budget numbers in mind; therefore, options have been produced with related cost estimates. We have found it impossible to provide all the facilities requested within the previously discussed budget of \$600,000.

The Committee's list includes:

1. Location, demarcation, and preservation of archeological areas.
2. Six Soccer Fields, two of each designated size.
3. Two Babe Ruth Ballfields.
4. One Softball Field.
5. One Jogging Trail with Paracourse, 1/2 to 1 mile long.
6. Picnic Area with Tot Lot located as far as possible from River Road.

Roads, maintenance areas, sidewalks and drainage as needed (left to the discretion of the planners).

Land set aside for future facilities such as tennis courts, basketball and handball (if funding for these or other similar items becomes available at a future date).

The goal of the Park as articulated by the Committee is to provide a cost effective functional park for both passive and active recreation, which is aesthetically pleasing and makes optimum use of the existing features and resources, yet creates minimum negative impact upon the environment.

The objectives set by the Joint Park Committee have been articulated and fulfilled by the planners in the following manner:

1. To increase the number of large playing fields available for team sports in the Township. The Master Plan illustrates how this is accomplished to the limit of the funding.

2. To provide suitable and convenient facilities for non-structured individual activities both active and passive. Individual activities have been provided at the wetlands preservation area, the jogging trail and bike path, the archeological dig site and the picnic area. Land has been banked for future facilities as funding permits.
3. To provide safe and convenient access for pedestrians by developing canal side access. This has been accomplished with the inclusion of the jogging trail and boardwalk through the wetlands. As discussed in the appendix, the safe use of the towpath must continued to be discussed with the several agencies involved in the refurbishment of Roosevelt State Park.
4. To protect the existing wildlife areas. This has been accomplished as much as possible, given the fact the area will no longer be a grain supply. For a complete discussion of the wetlands preservation, see the section on vegetation.
5. To set aside potentially historically interesting areas as a historical dig site. The local archeologists have been consulted and this area has been located. The only disturbance in this area will be the grading for the entrance road.
6. To provide buffering for aesthetic and practical considerations. The buffer areas will consist of the setback mandated by the Township ordinance and trees planted with the help of volunteers as funds become available.

The issue of staging as explored by the Committee has been addressed due to budgetary considerations. Option "2" shows a plan which leaves between twelve and fifteen acres open for continued farming.

Option "1" shows the program outlined by the Committee in their letter of January 28, 1987.

League Play Schedules

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
GIRL'S SOFTBALL				█	█	█	█					
BOY'S LITTLE LEAGUE				█	█	█	█					
BABE RUTH				█	█	█	█					
BABE RUTH - FALL								█	█	█		
SOCCER SPRING SEASON			█	█	█	█	█					
SOCCER SUMMER TRAINING							█	█				
SOCCER FALL SEASON									█	█	█	

MAINTENANCE OPERATIONS

To protect Lower Makefield's investment in the fields and facilities of this park, it is crucial to plan for maintenance. The following recommendations are based on two assumptions:

1. For a relatively low-maintenance, heat and drought-resistant turf, a grass seed mixture such as the following will be used:

60% TURF-TYPE Tall Fescue
20% Perennial Rye
20% High Quality Blue Grass

This mixture should be seeded at a rate of 170 pounds per acre. Since this kind of grass uses 1/4th the normal rate of fertilizer and weed control chemicals, money saved by using cheaper types of grass seed will be more than made up in maintenance costs later.

2. Maintenance will consist of regular yearly applications of a series of measures to increase the health and density of the turf rather than one-shot major overhauls five or more years down the road when the poor conditions of the turf require attention.

Levels of Maintenance

Given the differential usage of parts of the park there will be three levels of maintenance needed:

PARK AREA	MAINTENANCE REQUIRED	WHEN
1. Ball fields	Rolling Aerating Liming Fertilization Weed control Overseeding Irrigating Mowing Field lining Trash pickup	Early April April, late October As needed mid March Mid May-June, mid Aug-Sept, Oct-Nov Mid May-June Mid March, mid Aug, mid Sept. Spring, fall depend- ing upon weather conditions. Weekly mid April-Oct. Each game After each event, weekly during season

- | | | | |
|----|------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 2. | Rest of
Developed
Area | Fertilization
Mowing
Planted Areas:
Weeding, Mulching
Irrigation
Trash pickup | Mid Aug-Sept.
Weekly April-Oct.
May, July-Oct.
As needed if droughty
Spring cleaning,
weekly during season |
| 3. | Natural
Areas | Litter pickup
Path clearing | Spring, Fall
As needed, Spring |

Maintenance During Establishment Period

It is assumed that the contractor building the park will be required to maintain the plantings for at least one growing season and guarantee survival during that period. After that, new plantings of turf grass and shrubs will need extra care until well established. How much care will be required depends greatly upon the weather, especially the amount of natural rainfall (which would provide crucial moisture for the new plants and affect the growth rate of planting grass, shrubs and weeds). At the very least, those maintaining the park will need to be able to irrigate when conditions are droughty and mow the turf as needed. The plantings will only be truly "low-maintenance" once they are well established.

Requirements at the Site

In order to provide the levels of maintenance outlined above, certain requirements must be met at the site:

1. Water must be available for irrigation, chemical mixing, cleaning. Because of the size of the areas to be irrigated, at least agriculturally sized hoses and control devices will be required. The well and pump providing the water must be adequately sized for a large-capacity system. Using garden-sized equipment will require much more time and therefore much more labor, either volunteer or paid.
2. Equipment must be supplied for the park and stored in a convenient, secure location on site. The equipment must be suitable for use both on flat and sloped surfaces and be adequately sized for the rolling, aerating, mowing, chemical application, and overseeding operations. A dumpster for trash collection is needed and a shed for storage of all equipment.

3. For the most efficient maintenance results, a person whose prime responsibilities are located in the park would meet the needs best. This person must be experienced with heavy equipment, able to handle chemicals with care and meet any state requirements for certification, and have experience caring for plants and turf. He or she should work closely with Township maintenance officials and the Park and Recreation Board to develop written maintenance procedures that are reasonable within the financial and time resources available.

Scheduling of Maintenance

With heavy use of the athletic fields anticipated, maintenance must be scheduled around the use of these fields. Games are scheduled from five o'clock evenings and on weekends. Therefore, regular maintenance must be done during the day on weekdays.

The ball leagues plan an extensive season, with activities in both spring and fall in most cases. Respite for the turf areas might occur during break periods in the middle of the summer, however, this is a time when grass goes dormant, and many maintenance procedures are not worth the effort.

The accompanying Field Maintenance Rotation Schedule provides some maintenance to each field every few years and time for a more concentrated approach once in six years. Fields scheduled for this concentrated maintenance could be fenced off and allowed to rest, permitting new grass to grow and turf to recover from heavy wear.

For estimates of the cost of these procedures, Lower Makefield could approach a local landscape contractor or the superintendent of a local golf course with a list of requirements. These professionals could give a good idea of the cost of labor and materials for these operations.

Alternatives

1. Provide no maintenance for the turf and shrub plantings except regular mowing, leaving provision of water to nature.
2. Provide for spring work every year or two on each soccer field and concentrated fall work on one soccer field each year. Provide fall work on one baseball/softball field each year. Allow treated fields to rest and recover for five months.
3. Provide full schedule of maintenance procedures to each field each year, allowing no time for rest and recovery.

Recommendations

We recommend alternative 2; it provides an adequate standard of maintenance while allowing the grass areas time to recover from heavy wear. Alternative 1 provides no assistance, no time for recovery, a low chance of getting well established, and almost no chance of long term success. Alternative 3 will work well initially but the fields under heavy use will gradually deteriorate and will inevitably require reconstruction taking them out of service for a year at greater expense.

Jim Coyne, Road Superintendent, has submitted a report on maintenance issues to the Township dated February 26, 1987.

Field Maintenance Rotation Schedule

	SPRING	FALL
YEAR 1	A & B	G & C
YEAR 2	D & E	H & A
YEAR 3	C & F	G & B
YEAR 4	A & B	H & D
YEAR 5	D & E	G & F
YEAR 6	C & F	H & E

Soccer	A	Lime	-----
Soccer	B	Fertilize	Fertilize
Soccer	C	Roll	-----
Soccer	D	Aerate	Aerate
Soccer	E	Weed Control	-----
Combination	F	Overseed	Overseed
Babe Ruth	G	Water	Water
Softball	H		Other, as needed

VOLUNTEERS

The Lower Makefield Joint Park Committee is committed to involving volunteers from the community in the development and maintenance of the park. They have a useful model in the Friends of Five-Mile Woods organization, which is heavily involved with the maintenance and program of that park in the Township. There are good reasons to make this effort:

1. A great deal of money can be saved by having volunteers do some of the building and maintenance tasks. Township maintenance personnel can devote their time to other duties instead of spending hours on duties in the park which users can perform.
2. The more people of different ages and abilities, representing diverse segments of the community, are physically involved with the building and care of the park, the more interest and responsibility they will take towards it, thus cutting down on vandalism and building public support.

Lower Makefield has a number of groups which could be sources of volunteers for various projects. Some have already indicated their willingness to help:

The Citizens of Yardley
Soccer YMS and Baseball PAA Program Parents
and participants
Girl and Boy Scouts

Others can be approached for contributions of labor or funds:

Rotary Club
Local garden clubs
Lion's Club
Junior Chamber of Commerce

Working with volunteers, people who generally have commitments to jobs, families and homes, requires special efforts to keep up the momentum and accomplish what needs to be done without burnout and loss of interest. On-going volunteer efforts in large parks such as Central and Prospect Parks in New York City, have shown the value of the following:

1. Continuous recruitment of willing people to involve as many as possible for short-term commitments; continuous contact with previous volunteers as likely candidates for re-enlistment.

2. On-site training and supervision coupled with encouragement and positive feedback to ensure end products of an acceptable level of quality and workers who are satisfied with the results of their efforts.
3. Coordinated organization and planning to make sure that labor, materials, and tools and equipment come together on-site in a timely way so that time and energy are not wasted; alternate plans in case of inclement weather.
4. Rewards both tangible and intangible including t-shirts, special identification buttons, certificates of merit at the end of a period of volunteer effort, special events to honor the volunteers, thank-you visits from town officials; above all, visible proof of a job finished and well done.

What the Volunteers Can Do

Volunteers can be involved in two stages of the park, the initial development and on-going maintenance.

During development of the park, the following projects would offer diverse assignments for volunteers:

1. Clearing and grubbing of trash and overgrown vegetation.
2. Planting of new groves of trees or shrub beds: digging, raking, planting, mulching, watering, weeding.
3. Carpentry: working with saws, hammers, nails, drills, screws and various sizes and types of lumber, to build:
 - Gazebo
 - Tot Lot
 - Benches for soccer, baseball, park sitting areas
 - Goalposts for soccer
 - Picnic tables
 - Jogging trail exercise stations
 - Walkways
 - Bollards
4. Painting and staining of wooden equipment.
5. Post-hole digging to set the supports for the above items. (The local telephone company may be willing to donate poles and a truck mounted auger to dig holes for them.)

After the park is built, volunteers can participate in on-going maintenance activities such as:

Horticultural care such as weeding, watering, mulching, clipping, fertilizing.

General sprucing up including litter pickup.

Repainting and staining wooden items.

Edging special grass areas, striping playing fields.

Manning concession booths during games as a fund raiser.

Fund Raising

Volunteers can also become involved in an on-going effort to raise funds to support various facilities in the park and maintenance. Special events have already been held with the proceeds going towards the cost of the park. It will be even easier to encourage contributions when specific facilities or areas in the park are identified and made visible as goals.

Individuals or groups can adopt parts of the park ranging in scale from individual plants (see the AHS program "Adopt a Piece of History") to whole complexes or fields. Certain plantings can be adopted by a group and produced through their efforts. Some ideas that have been used in other parks:

School children pick up the most perfect acorn they can find and plant them in a site slated for a grove of trees. The area can be mulched and fenced to be watched by the town as it develops into a forest over the years.

A garden club can adopt a focal point and take over its construction and maintenance.

A fitness trail has been donated by large companies in some communities. With specific needs identified, companies can decide just how much of a commitment they would like to make.

Selling drinks and snacks during games is a way to make money for maintenance and equipment or facility needs. Whatever is done must meet the local Department of Health standards.

Concern About Liability

With the land for the park belonging to the Township, it is important to consider ways to cover the town for situations

which might cause injury. It is also important to negotiate with the design consultant, who will have the responsibility of producing working drawings and plans for those items built by volunteers, to find a way to reduce their liability for injuries caused by lack of conformance to the plans or poor workmanship. Thus liability toward the volunteers during their work on the park and toward the public as the park becomes used must both be addressed.

According to James Dillon, Township Manager, the Friends of Five-Mile Park are covered under a blanket insurance policy carried by the town. He felt that new groups of volunteers formed for this park could be added to that policy. In the event that this does not develop, there are several other ways in which liability has been handled in other parks. These should be explored with legal counsel.

1. Set up a separate entity (Friends of the Park) and obtain insurance to cover its members. All volunteers would need to be members of the organization in order to be covered for accidents or liability.
2. Let each participating organization cover its members with appropriate insurance to cover their volunteer activities as well as park-related pursuits.
3. Ask volunteers to fill out an application form which includes some form of hold-harmless clause. (See application forms from the New York parks.)

Alternatives

1. Have no volunteer participation in the actual building of the park. Volunteers could pick up maintenance duties after professionals covered by insurance complete the construction work.
2. Have volunteers work only on "softscape" items, i.e. those that involve plants, and others which do not involve the use of potentially dangerous tools. Hire professionals to do the carpentry and assembly of wooden items as well as the field construction work.
3. Have volunteers involved in the wooden items and the softscape areas with on-going, full time management by a work coordinator who would be responsible for coordinating all projects and assembling the resources to accomplish them. Professionals would be responsible for drainage and grading, seeding of the fields and other major construction.

4. Have volunteers involved in both softscape and hardscape items as much as knowledge and experience are available in the community. Hire a full time coordinator-of-volunteers or construction manager who would be responsible for the completeness and quality of the work.

These alternatives differ in the degree and amount of participation by volunteers. The first two alternatives might result in more costly construction but less expensive liability insurance. The second two alternatives require a full time coordinator to ensure that the work proceeds smoothly without wasted effort, and possibly more money spent for insurance.

Recommendations

Alternative 3 above would provide a great deal of participation by volunteers but ensure that the major physical aspects of the park - the design layout, grading, drainage, and establishment of turf - would be completed by professional contractors who can be required to meet the standards and specifications set.

A full time person to coordinate the volunteers is required, as the chief executive of a special organization to concentrate on the needs of the park. Within this organization there could be several committees, for example: fund raising, natural areas, historical areas, sports field areas. The coordinator would recruit individuals or groups interested in doing the work needed, maintain on-going relationships with all volunteers to encourage their continued participation, prioritize tasks and locations, develop a budget for each project, assemble materials and tools needed, arrange for the training and supervision required. The coordinator could try to vary the tasks from week to week to create variety and interest and plan for the rewards and benefits which make the work worthwhile to volunteers.

This recommendation does not necessarily require that the work coordinator be a paid professional. At the present time the Joint Park Committee is thinking of a rotating volunteer leadership position for this job. Our experience suggests that, while this is a possibility, almost all successful organizations pay for professional guidance. This decision should be considered carefully when detailed plans for future volunteer participation are made.

Adopt a Piece of History

It cost George Washington \$2,885 in 1760. The First President reaped an excellent return on his investment, harvesting an abundance of wheat, rye and corn from his River Farm.

Now, as the proud custodians of this historic property, AHS members can make a beautiful harvest possible through the River Farm Adopt-A-Plant Program.

When you make a contribution to this Program, we'll send you a hand-lettered "adoption certificate" as our way of commemorating your gift. Or you may choose to make a gift adoption—by making a contribution in support of a plant or garden for a special gardener in your life. We'll be happy to send a certificate announcing your gift. With the holidays coming up, why not consider adopting a Christmas fern, a Japanese snowball or that early harbinger of spring, a snow-drop?

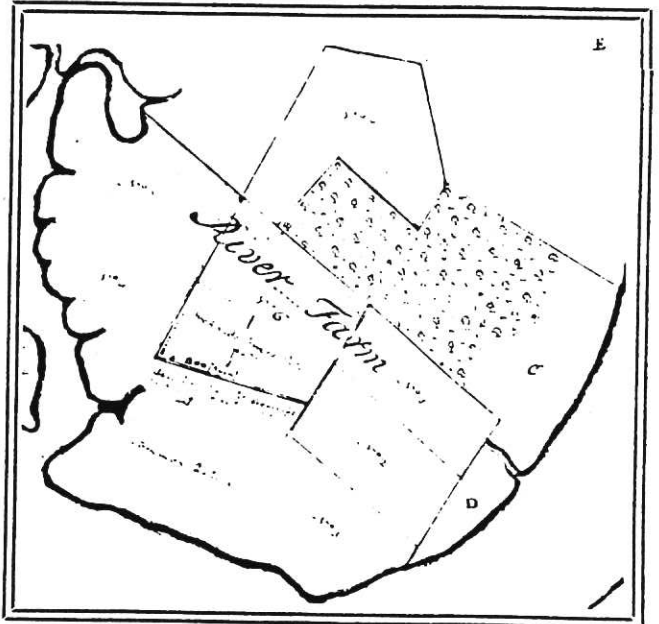
Select your favorite plant from the following list, and send the corresponding "adoption" contribution today with your instructions to Sallie Hutcheson, AHS, PO Box 0105, Mount Vernon, VA 22121. Help us keep Mr. Washington's heritage growing. Adopt a plant or garden at historic River Farm.

FOR \$10:

Snowdrop (*Galanthus nivalis*)
 Oriental Poppy (*Papaver orientale*)
 Magic Lily (*Lycoris squamigera*)
 Columbine (*Aquilegia canadensis*)
 Money Plant (*Lunaria annua*)
 Rose (*Rosa* cvs.)

FOR \$25:

Forget-Me-Not (*Myosotis alpestris*)
 Miniature Rose (*Rosa* cvs.)
 Virginia Bluebell (*Mertensia virginica*)
 Lily-of-the-Valley (*Convallaria majalis*)
 Bleeding-heart (*Dicentra spectabilis*)
 Crown-imperial (*Fritillaria imperialis*)
 Christmas Fern (*Polystichum acrostichoides*)



River Farm map drawn by George Washington in 1793.

FOR \$50:

Heavenly Bamboo (*Nandina domestica*)
 Tropical Water Lily (*Nymphaea* cvs.)
 Climbing Hydrangea (*Hydrangea anomala* subsp. *petiolaris*)
 Virgin's Bower (*Clematis* cv.)
 Japanese Snowball (*Viburnum plicatum* forma *plicatum*)
 Japanese Anemone (*Anemone hybrida* 'Alba')
 Japanese Wisteria (*Wisteria floribunda*)
 Flowering Dogwood (*Cornus florida*)
 Butterfly Bush (*Buddleia davidii*)
 Trifoliolate Orange (*Poncirus trifoliata*)
 Fig (*Ficus carica*)

FOR \$100:

Beautybush (*Kolkwitzia amabilis*)
 Golden-Rain Tree (*Koelreuteria paniculata*)
 Japanese Pagoda Tree (*Sophora japonica*)
 Lily-of-the-Valley Bush (*Pieris japonica*)
 Tamarisk (*Tamarix parviflora*)
 Chaste Tree (*Vitex agnus-castus*)
 Tree Box (*Buxus sempervirens* 'Arborescens')
 Bridal-Wreath Spirea (*Spiraea prunifolia*)
 Tree Peony (*Paeonia suffruticosa* cvs.)
 Black Walnut (*Juglans nigra*)
 Tulip Tree (*Lirodendron tulipifera*)
 Southern Magnolia (*Magnolia grandiflora*)
 Copper Beech (*Fagus sylvatica* 'Atropunicea')
 Fringe Tree (*Chionanthus virginicus*)

FOR \$200:

Herb Garden	Children's Garden
Rose Garden	Wildflower Meadow
Chrysanthemum Garden	Woodland Walk
Daffodil Garden	Dwarf Fruit Tree Collection
Dahlia Garden	Hybrid Camellia Collection
Lily Garden	Aquatic Plant Collection
Daylily Garden	Rhododendron Collection
Hosta Garden	

FOR \$250:

Collection of 100-year-old English Boxwood

L.I.V.E. VOLUNTEER APPLICATION
(please print or type)

Date: _____

(name)

(home address) (Apt.#)

(city) (state) (zip code)

(home telephone) (business telephone)

(best time to call) (best time to call)

How did you hear about the L.I.V.E. Program? _____

Please tell us a little about yourself and any interests, skills and training that you might be willing to share.

Interests: _____

Skills: _____

Volunteer Experience: _____

Work Experience: _____

Education: _____

I am interested in volunteering because _____

Availability:

I can _____ cannot _____ volunteer on a regular basis (daily, weekly, monthly).

I am available for pre-scheduled work only _____ sometimes _____.

I can assist on short notice with special projects.
Yes (____) No (____).

I prefer to work (circle one):

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Total Hours per week (approximate): _____

How long a commitment can you make at this time? _____

Programs _____ When are you available to work?
_____ Adult L.I.V.E. Program _____ Wed. _____ Sat. _____ Sun.

_____ School Volunteer Program _____

_____ Visitor Services _____ Dairy _____ Castle _____

_____ Office Work: _____
(i.e. typing, stuffing envelopes, making calls)

_____ Special One-day Projects _____

_____ Special projects _____
(i.e. surveys, selling T-shirts)

_____ Other _____

In case of emergency please notify :

_____ Relationship: _____
(name)

_____ (Apt. #)
(address)

_____ (zip code)
(city) (state)

_____ (business telephone)
(home telephone)

Please return to: L.I.V.E. Program - Volunteer Coordinator
830 Fifth Avenue - Room 103
New York, N.Y. 10021



City of New York
Parks & Recreation

Henry J. Stern
Commissioner

Litchfield Villa
Prospect Park
Brooklyn, New York 11215

Tupper W. Thomas
Prospect Park Administrator
(718) 965-8951

Susan Moore
Coordinator of Volunteers
Phone: 965-8960

Please type or print your response. Please include your zip code.

Applicants' Name _____ Date: _____

Home Address _____ Phone: _____

Business Address _____ Phone: _____

Because we anticipate volunteers' use of park-owned equipment, handling of money and merchandise, and responsibility for antiquities, we request that you please list 2 references (other than family members) who know you well.

1. Name _____

Address _____

Home Phone _____ Business Phone _____

2. Name _____

Address _____

Home Phone _____ Business Phone _____

In case of emergency, please notify:

Name _____

Address _____

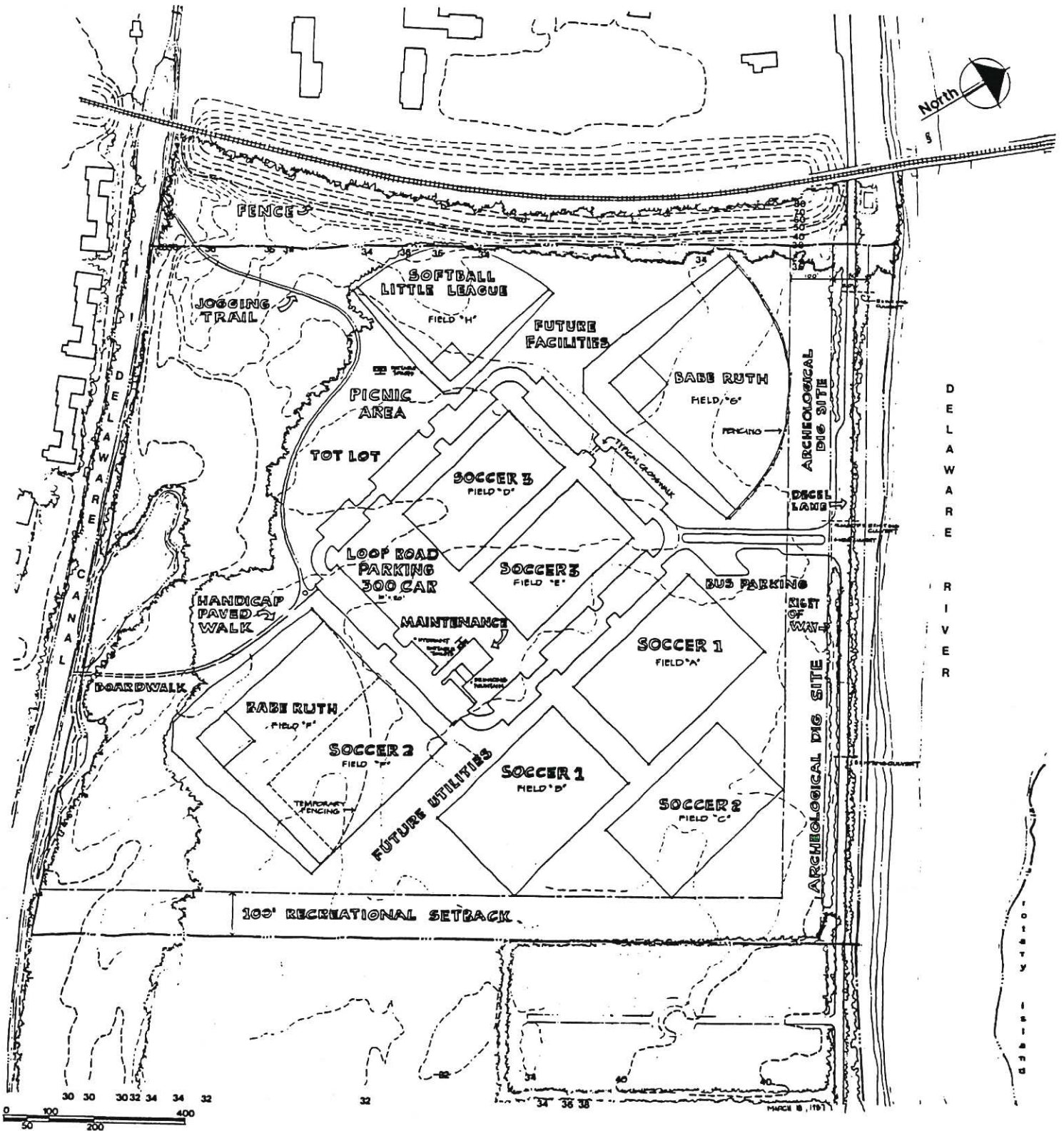
Home Phone _____ Business Phone _____

I am interesting in volunteering because _____

Signed

PLANS/COSTS

OPTION 1



LOWER MAKEFIELD COMMUNITY PARK
 OPTION 1
 Preliminary Cost Study
 March 18, 1987

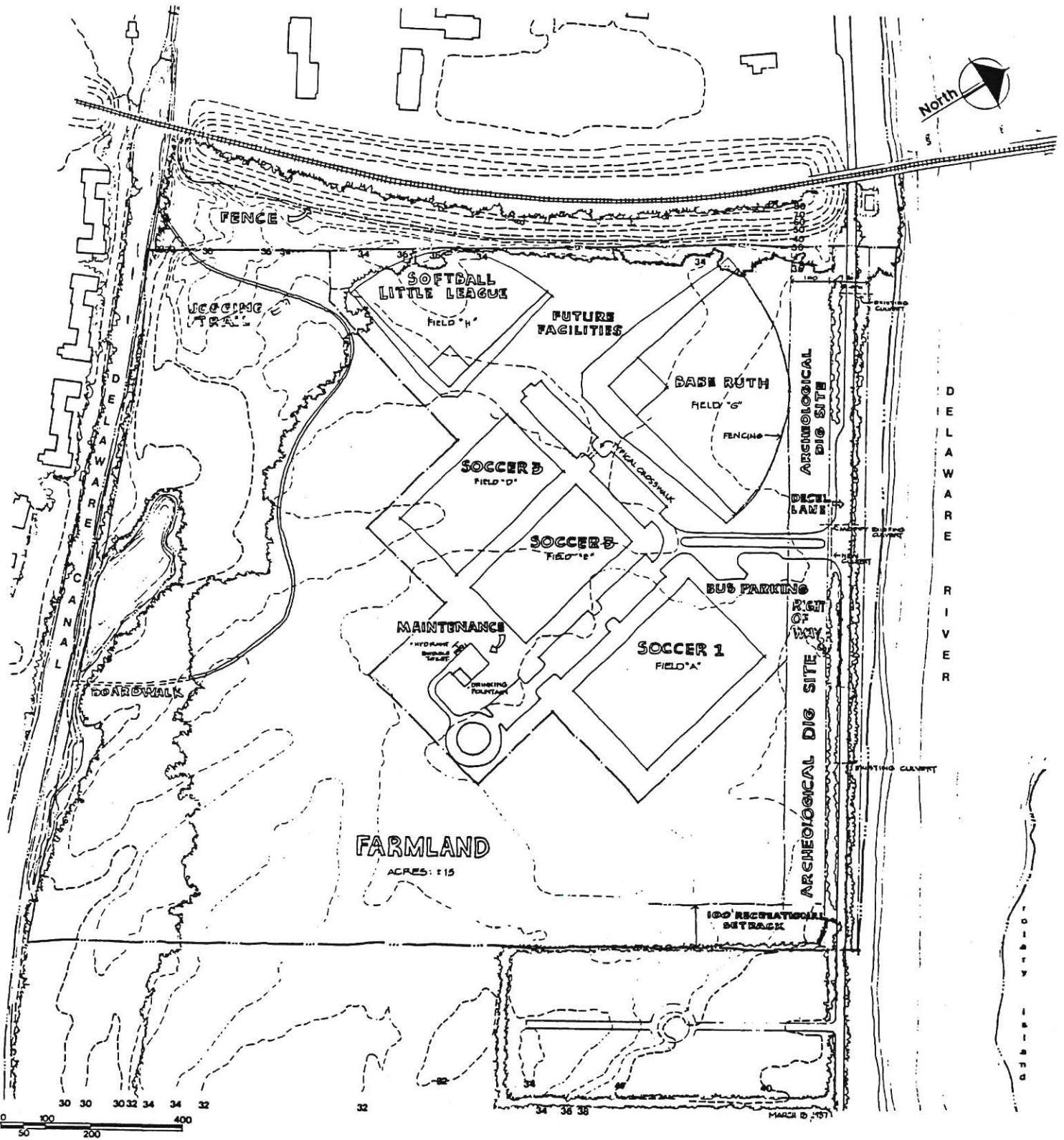
ITEM	UNIT	UNIT COST	TOTAL
1. Deceleration Lane Signage/Inlet/Clearing/ Drainage	175 lf	\$ 106.35 lf	\$ 18,610.
2. Archaeological Dig Site Buffer Planting	0	\$ 0.00	\$ 0.
3. Trash Removal Dumpster Rental/Haul & Dump only Volunteers to do rubbish handling.	800 cy	\$ 9.875 cy	\$ 7,900.
4. Soccer Field 1 (Large 80 yds x 120 yds) Fields A & B Minimal Quality Field includes earthwork/ grading/seeding Installation of benches and goals by volunteers.	19,200 sy	\$ 3.975 sy	\$ 76,320.
5. Soccer Field 2 (Medium 70 yds x 115 yds) Field C Minimal Quality Field includes earthwork/ grading/seeding Installation of benches & goals by volunteers.	8,050 sy	\$ 4.09 sy	\$ 32,920.
6. Soccer Field 3 (Small 60 yds x 110 yds) Fields D & E Minimal Quality Field includes earthwork/ grading/seeding Installation of benches & goals by volunteers.	13,200 sy	\$ 4.25 sy	\$ 56,100.
7. Baseball Field (Babe Ruth - 18,730 SY) Fields F & G/Minimal Quality Construction includes earthwork/grading/seeding/ backstop/skinned infield/ outfield fencing Field "F" includes soccer field Installation of benches by volunteers.	37,460 sy	\$ 3.99 sy	\$149,460.

8.	Softball/Little League Field H Minimal Quality Field includes earthwork/ grading/seeding/backstop/ skinned infield Installation of benches by volunteers.	7,850 sy	\$	4.30 sy	\$ 33,750.
9.	Jogging Trail Rubber-vermiculite asphaltic paving Includes grading/ seeding adjacent area	1,000 lf	\$	6.74 lf	\$ 6,740.
10.	Para Course Equipment Material cost only Installation by volunteers				\$ 1,250.
11.	Picnic Area (No rough grading/no trees) Includes fine grading/ seeding. Ten benches (material cost only)/Bench installation by volunteers	7,222 sy	\$	1.90 sy	\$ 13,720.
12.	Tot Lot (Purchased playground equipment) Includes fine grading/ mulching/wood edging/ seeding adjacent areas & 4 pieces of playground equipment. No volunteer effort.	4 ea	\$1,155.00	ea	\$ 4,620.
13.	Nature Trail (Boardwalk 4' wide) Material cost only Installation by volunteers.	250 lf	\$	30.00 lf	\$ 7,500.
14.	Portable Comfort Stations (Single Station) Rental for 1 year Does not include screening	4 ea	\$	867.50 ea	\$ 3,470.
15.	Maintenance Facility Exposed block structure with flat roof. Yard, fencing and dumpster.	800 sf	\$	42.92 sf	\$ 34,340.
16.	Prepackaged Foodstuff Concession Stand. Added area to maintenance facility Includes drinking fountain	120 sf	\$	54.00 sf	\$ 6,480.
17.	Fence - Vinyl Coated 8' High @ railroad only	1,600 lf	\$	14.12 lf	\$ 22,590.
18.	Parking (10' x 20' space) Rough grade/Gravel surface	300 ea	\$	210.00 ea	\$ 63,000.

19.	Loop Road Paved 25' wide/trees and bollards material cost only/ Installation of pedestrian walk, trees and bollards by volunteers	3,288 lf	\$	73.57 lf	\$241,890.
20.	Drainage Hard surface swale 2'-3" wide. Includes grading/seeding adj. areas.	6,500 lf	\$	3.37 lf	\$ 21,900.
21.	Handicapped Bituminous Walkway	325 lf	\$	4.62 lf	\$ 1,500.
22.	Well/Pump	200 vlf	\$	36.70 vlf	\$ 7,340.
23.	Fire Hydrant/Frost Proof Includes pipe from well 500 LF	1 ea	\$10,000.00	ea	\$ 10,000.
24.	Irrigation Hybrid System	32 acre	\$1,500.00	acre	\$ 48,000.
25.	Electrical Conduit	2,400 lf	\$	18.82 lf	\$ 45,170.
26.	Open Space/Fine Grading and Hydroseeding	8 acre	\$6,730.00	acre	\$ 53,840.
27.	Surveying Cost per Acre	60 acre	\$	200.00 acre	\$ 12,000.
28.	Engineering/Architectural Fees - 5% of Total Project				<u>\$ 49,010.</u>
TOTAL PROJECT COST					\$1,029,500.

NOTE: This is an estimate of project costs. Note that soils work estimates are the most illusive in the construction industry since the logs provide only a fragmentary analysis of subsurface conditions. This estimate does not include field lights or their wiring, sanitary sewer or flush toilets, comfort station screens, a licensed concession stand, detention facilities, work at towpath, or materials for volunteer work with the exception of the boardwalk, soccer benches and goals, baseball benches, paracourse equipment and picnic benches. Nor does it reflect items added after the publication of the draft Master Plan which include gates and signs at entries, removal of more than 6" of topsoil at roadway, grading along the railroad embankment, fencing at the cemetery and relocation of the drinking fountain.

OPTION 2



LOWER MAKEFIELD COMMUNITY PARK
 OPTION 2
 Preliminary Cost Study
 March 18, 1987

ITEM	UNIT	UNIT COST	TOTAL
1. Deceleration Lane Clearing/Signage/Inlet	175 lf	\$ 106.34 lf	\$ 18,610.
2. Archaeological Dig Site	0 lf	\$ 0.00 lf	\$ 0.
3. Trash Removal Dumpster Rental/Haul & Dump only; Volunteers to do rubbish handling.	800 cy	\$ 9.875 cy	\$ 7,900.
4. Soccer Field 1 (Large 80 yds x 120 yds) Fields A Minimal Quality Field includes earthwork/ grading/seeding Installation of benches & goals by volunteers.	9,600 sy	\$ 3.975 sy	\$ 38,160.
5. Soccer Field 2 (Medium 70 yds x 115 yds) Minimal Quality Field includes earthwork/ grading/seeding Installation of benches & goals by volunteers.	0 sy	\$ 4.09 sy	\$ 0.
6. Soccer Field 3 (Small 60 yds x 110 yds) Fields D & E Minimal Quality Field includes earthwork/ grading/seeding Installation of benches & goals by volunteers.	13,200 sy	\$ 4.25 sy	\$ 56,100.
7. Baseball Field (Babe Ruth - 18,730 SY) Field G Minimal Quality Field includes earthwork/ grading/seeding/backstop/ skinned infield/outfield fencing Installation of benches by volunteers.	18,730 sy	\$ 3.99 sy	\$ 74,730.

8.	Softball/Little League Field H Minimal Quality Field includes earthwork/ grading/seeding/backstop/ skinned infield Installation of benches by volunteers.	7,850 sy	\$	4.30 sy	\$ 33,750.
9.	Jogging Trail Rubber vermiculite asphaltic paving Includes grading/ seeding adjacent area	1,000 lf	\$	6.74 lf	\$ 6,740.
10.	Para Course Equipment Material cost only Installation by volunteers	0 ea	\$1,250.00 ea	\$	0.
11.	Picnic Area (No rough grading/no trees) Includes fine grading/ seeding. Ten benches (material cost only)/Bench installation by volunteers	0 sy	\$	1.90 sy	\$ 0.
12.	Tot Lot (Purchased playground equipment) Includes fine grading/ mulching/wood edging/ seeding adjacent areas & 4 pieces of playground equipment. No volunteer effort.	0 ea	\$1,155.00 ea	\$	0.
13.	Nature Trail (Boardwalk 4' wide) Material cost only Installation by volunteers.	250 lf	\$	30.00 lf	\$ 7,500.
14.	Portable Comfort Stations (Single Station) Rental for 1 year Does not include screening	2 ea	\$	867.50 ea	\$ 1,730.
15.	Maintenance Facility Exposed block structure with flat roof. Yard fencing and dumpster.	800 sf	\$	42.92 sf	\$ 34,340.
16.	Prepackaged Foodstuff Concession Stand/ Added area to maintenance facility Includes drinking fountain	120 sf	\$	54.00 sf	\$ 6,480.
17.	Fence - Vinyl Coated 8' High @ railroad only	1,600 lf	\$	14.12 lf	\$ 22,590.
18.	Parking (10' x 20' space) Rough grade, Gravel parking only	151 ea	\$1,210.00 ea	\$	31,710.

19.	Linear Road, 25' wide paving. 60' radius cul-de-sac with gravel surface. Trees and bollards material cost only. Installation of pedestrian walk, trees and bollards by volunteers	1,570 lf	\$	73.57	lf	\$115,500.
20.	Drainage Hard surface swale 2'-3" wide. Includes grading/seeding adj. areas.	3,200 lf	\$	3.37	lf	\$ 10,780.
21.	Handicapped Bituminous walkway	0 lf	\$	4.62	lf	\$ 0.
22.	Well/Pump	200 vlf	\$	36.70	vlf	\$ 7,340.
23.	Fire Hydrant/Frost Proof Includes pipe from well 500 LF	1 ea	\$10,000.00	ea		\$ 10,000.
24.	Irrigation/hybrid system	19 acre	\$1,500.00	acre		\$ 28,500.
25.	Electrical Conduit Trenching and backfill	2,400 lf	\$	18.82	lf	\$ 45,170.
26.	Open Space/Fine grading and hydroseeding	0 acre	\$6,730.00	acre		\$ 0.
27.	Surveying	60 acre	\$	200.00	acre	\$ 12,000.
28.	Engineering/Architectural Fees - 5% of Total Project					<u>\$ 28,480.</u>
TOTAL PROJECT COST						\$598,110.

NOTE: This is an estimate of project costs. Note that soils work estimates are the most illusive in the construction industry since the logs provide only a fragmentary analysis of subsurface conditions. This estimate does not include field lights or their wiring, sanitary sewer or flush toilets, comfort station screens, a licensed concession stand, detention facilities, work at towpath, or materials for volunteer work with the exception of the boardwalk, soccer benches and goals, baseball benches, paracourse equipment and picnic benches. Nor does it reflect items added after the publication of the draft Master Plan which include gates and signs at entries, removal of more than 6" of topsoil at roadway, grading along the railroad embankment, fencing at the cemetery and relocation of the drinking fountain.

APPENDICES

INTERFACE WITH DELAWARE CANAL (ROOSEVELT STATE PARK)

The historic Delaware Canal, the site of Roosevelt State Park, is a 60 mile corridor extending from Easton south to Bristol, Pa. It consists of a narrow strip of land along the canal and its towpath in 2 counties and 18 municipalities which are the homes of more than 220,000 people.

Mostly undeveloped as a park resource, the canal territory is suffering from physical deterioration and more and more encroachment from incompatible land uses adjacent to the park. A concerted effort is being made at present to create more public awareness and concern for this important recreational resource. A Friends of the Canal group has led in efforts to inform the public about its benefits and problems and to create legislative interest in finding funds to improve its condition and facilities. The first draft of a new Master Plan for the park was presented to State park officials and legislators in late February 1987.

Roosevelt State Park, at present, even without a formalized program and facilities, is heavily used by thousands of Pennsylvania citizens. While there is no official statistical study of use, best guesses show the following kinds of use:

50%	Pleasure driving along roads next to the Canal
22%	Hiking, horseback riding, cross country skiing
14%	Fishing
13%	Boating
4%	Picnicking
2%	Bicycling
0.2%	Ice sports

Observations of the park rangers show that most of the visitors are from the local area near the Canal except in the New Hope area where a tourist concession runs boat trips along the Canal.

The park suffers from lack of adequate access and parking for visitors nearby. There is also a shortage of support businesses along the route which could provide canoes and other supplies. The main recreational features in the park are the canal itself, its lock areas, and the narrow towpath which varies in width and topography.

The Delaware Canal Master Plan sees many uses for this resource:

1. Historic resource.
2. Recreational resource - hiking, biking, canoeing.
3. Learning center - canal history, technology.
4. Economic advantage - towns along its route could supply services for tourism, recreation.
5. Community facility - firefighting, storm and flood water control.

The Master Plan goals include encouraging compatible land uses, providing for safe, continuous circulation along the canal, recognizing and promoting the special recreational opportunities provided, offering recreational programs, protecting natural features such as vegetation and wildlife habitat. The 16-member panel representing many recreation interests which drafted the Master Plan found that the size and configuration of the canal made it especially appropriate for recreation in which the user travels, (canoeing, hiking, bicycling) or for linking nearby local and county recreational facilities into a regional greenway system.

Feeling that the State of Pennsylvania need not be the only provider of recreation, the Master Plan sets as a goal an interface with county and local parks with some sharing of support facilities and recreational offerings. While the document is not precise about where these links could be created, it seems that this new park in Lower Makefield Township is clearly an example of the kind of development where some linkages could be forged.

In its capital improvement budget, the Roosevelt State Park Master Plan focuses first upon making repairs so that water remains in the canal. This would require expenditures of state funds to mend stretches of the canal north of Lower Makefield as a first priority. Lock 5, a critical crossover point for Lower Makefield's park, is scheduled for \$500,000 of repairs but has only a moderate priority. Thus this work would not be done for 3-4 years at best. There is also a plan to riprap the inside of the towpath and other improvements for some 2,000 feet south of Lock 5, with an even lower priority than the repairs to Lock 5.

While the intention of the Roosevelt State Park Master Plan is to develop a natural, low impact, informal, almost wilderness recreational experience along the length of the Canal, there is recognition among State park officials that at certain points where there is intensive use, more hardscaping approaches will be necessary. It would be possible to provide a firm surface on the towpath for bicycling, jogging, handicapped access out of hardened quarry dust which still provides a naturalistic, low-key appearance.

If Lower Makefield Township wants to use part of the towpath as an access route into the park, it will be necessary to meet with the appropriate State representatives to work out the details of such an interface. There are advantages to both groups in such a collaboration:

1. Cooperation in making the necessary structural repairs and improvements would save time and money for both the township and the state. Perhaps the State could provide the engineering expertise necessary to repair Lock 5 and the walls at the slope of the towpath while the township could concentrate on the widening and surfacing of the path.

2. The marsh along the towpath within the boundaries of the Kauffman Tract is reputed to be among the most interesting and beautiful wetlands in the whole course of the canal. This park would preserve this visual and natural resource for enjoyment of townspeople and those passing through by canoe or on foot.
3. Future development of an interpretative program by the State could add depth and breadth to the program at the park in Lower Makefield without duplication of effort and expense.

Alternatives

1. That Lower Makefield Township make the State aware of its needs for this stretch of the canal during the Master Plan review stage and work physically and politically to make it possible for the township's needs to be included in the State's budget for the Canal. At the same time the town could try to raise the priority on those items included within the park boundaries by showing the State the increased usage these areas would immediately receive.
2. That Lower Makefield and the State recreational officials discuss their plans for this stretch of the canal and work out a cooperative approach in which some aspects would be repaired and improved by the State and some by the town as part of the park-building process. Again, effort should be made by Lower Makefield to justify raising the priority for this part of the Canal by showing the projected increases in use.
3. That the park in Lower Makefield should turn its back on the Canal and focus its attention; create its access totally from the river side. The Canal towpath could be a minor hiking path leading into the park but without dramatized attention so that only those who lived in town and knew about the link would use it.

Recommendations

The second alternative is recommended as fitting the needs and priorities of both groups the most closely. Lower Makefield could create a safe access for children on foot or bicycles along the towpath and complete the loop of its jogging trail by running along the water's edge. With this use documented, the State could make a stronger case for funds to make necessary repairs to Lock 5 and the towpath walls and be more successful in winning legislative recognition of the urgent need for these funds.

The improvement of this part of both parks would be effected that much more quickly if both groups join their resources and leveraging abilities to produce what is needed to do the job.

SOILS FEASIBILITY STUDY

BACKGROUND

It was requested by Lovrek Associates that Van Note-Harvey Associates conduct a soil feasibility study in order to ascertain what potential impact adverse soil profiles might have on the planning of roads, parking areas, and athletic fields at the site of the proposed Lower Makefield Community Park.

Preliminary site inspections had revealed standing water in some areas of the cultivated fields which comprise nearly the total acreage of the site in question. Concerns were raised about subsurface drainage and soil clay content, both factors which might affect future development.

DETAILS OF INVESTIGATION

A backhoe was provided by Lower Makefield Township and on 4/13/87 VNH representative R.A. Jasaitis conducted a site survey. Six soil log pits were dug to the water table, or in the absence of water, as deep as possible. Enclosed are the descriptions of the soil profiles and a map showing their approximate location.

Soil logs SL100 and SL200 investigated the area with the most severe standing water problem. At the time of the survey the surface was dry, clayey, mud cracked, and had brown vegetation in contrast to the early spring growth in other areas of the field. Soil log SL100 was placed in the center of the topographic low where the water had collected and this log revealed a well drained subsurface profile. This location did have an extreme development of clay loam to 80" depth. Soil log SL200 was placed just outside the area of brown vegetation and revealed a similar well drained profile as did SL100. The development of clay loam, though not as extensive as SL100 (to only 52"), is still extensive enough to be of some concern. Based on observations on these two profiles, the standing water appears not to be due to high seasonal ground water but instead to a lack of vertical percolation down through the soil profile. As the wet areas on this site are located in topographic lows the solution to this problem is to carefully grade these areas to provide better surface drainage.

Soil log SL400 was placed to test the eastward extent of this clayey subsurface lens. This well drained soil profile did not

have the clay loam development as seen in SL100 and SL200 but instead had from 6 - 42" a silty clay loam layer. The silt content of this layer promises better vertical drainage.

Soil logs SL300, SL500 and SL600 were placed to examine the southern extent of the clay development. All of these logs were markedly different and had a sandy component missing from the previously discussed set of logs.

These logs are beyond the clayey lens and should provide excellent subsurface drainage.

SUMMARY

All logs described at the site of the proposed Lower Makefield Park are well drained. There is more clay development in the B horizon of the soil profiles in the northern part of the site. Suggestions to avoid saturated surface conditions would be to regrade the topographic lows for better surface drainage, divert runoff from the railroad embankment, and re-orient athletic fields so that the less used outfield areas are positioned adjacent to property boundaries.

Soil conditions observed are generally suitable for roads and parking areas with normal preparation.

The upper soil horizons are loams and silt loams and should display excellent water retention capacity. The general rule of thumb for area golf course fairway irrigation is about 1 inch per week. A basic, flexible irrigation system will insure a well-wearing surface on the athletic fields and provide insurance against the occasional drought.

SL 100

- 0 - 10" Very dark grayish brown (10YR 3/2) silty clay loam. Moist, moderate subangular structure, friable to plastic, many roots, abrupt smooth boundary.
- 10 - 80" Dark yellowish brown (10YR 4/4) clay loam. Moist, strong subangular to weak massive structure, friable to plastic, few roots to 20", gradual smooth boundary.
- 80 - 90" Dark yellowish brown (10YR 4/4) sandy clay loam with coarse rounded gravel and cobble sized pieces of dark gray diabase and light brown sandstone. Moist, strong massive structure, friable, gradual smooth boundary.
- 90 - 103" Dark yellowish brown fine to medium grained sand mixed with gravel and cobble size pieces of diabase and sandstone. Moist to saturated, strong massive structure, loose.

Water in pit at 103".

MAKEFIELD PARK
VNH #24826

SL 200

- 0 - 10" Very dark grayish brown (10YR 3/2) silt loam. Moist, moderate subangular structure, friable, many roots, abrupt smooth boundary.
- 10 - 52" Dark yellowish brown (10YR 4/4) clay loam. Moist, strong subangular to blocky structure, friable to plastic, few roots to 16", gradual smooth boundary.
- 52 - 75" Yellowish brown (10YR 5/4) sandy clay loam with 5% fine to medium gravel. Moist, strong massive structure, friable to plastic, diffuse smooth boundary.
- 75 - 104" Yellowish brown (10YR 5/4) sandy clay loam to loamy sand. Moist, strong massive structure, friable to plastic, abrupt smooth boundary.
- 104 - 108" Yellowish brown (10YR 5/4) loamy sand with 20% fine to coarse rounded gravel. Moist to saturated, weak granular structure, loose to friable, abrupt smooth boundary.
- 108 - 122" Dark brown (10YR 3/3) sand with 60% rounded gravel and cobble size pieces of diabase and sandstone. Moist, strong granular structure, loose.

Water in pit at 118".

MAKEFIELD PARK
VNH #24826

SL 300

- 0 - 8" Very dark grayish brown (10YR 3/2) silt loam. Moist, moderate subangular blocky to strong granular, friable, common roots, abrupt smooth boundary.
- 8 - 19" Dark yellowish brown (10YR 4/4) silty clay loam. Moist, moderate subangular, friable, few roots, gradual smooth boundary.
- 19 - 50" Dark yellowish brown (10YR 4/4) sandy clay loam. Moist, weak granular structure, friable, gradual smooth boundary.
- 50 - 92" Dark brown (10YR 4/3) fine loamy sand with trace medium gravel. Moist, strong granular, loose, diffuse smooth boundary.
- 92 - 128" Brown fine sand mixed with layers of dark brown loamy sand all with trace gravel. Moist, strong granular structure, loose, abrupt smooth boundary.
- 128 - 135" Brown (10YR 5/3) sand mixed with fine to coarse rounded gravel and cobble size pieces of sandstone and diabase. Strong granular structure, loose.

No water entering pit.

MAKEFIELD PARK
VNH #24826

SL 400

- 0 - 6" Very dark grayish brown (10YR 3/2) silt loam. Moist, strong subangular to blocky structure, friable, many roots, abrupt smooth boundary.
- 6 - 42" Dark yellowish brown (10YR 4/4) silty clay loam. Moist, moderate subangular to weak massive structure, friable to plastic, few roots to 26", diffuse smooth boundary.
- 42 - 90" Dark yellowish brown (10YR 4/4) loam. Moist, weak massive structure, friable, smooth diffuse boundary.
- 90 - 120" Dark brown (10YR 4/3) loamy sand. Moist, weak massive structure, loose, smooth gradual boundary.
- 120 - 140" Brown (10YR 5/3) sand.
- No water entering pit.

MAKEFIELD PARK
VNH #24826

SL 500

- 0 - 14" Dark brown (10YR 3/3) sandy loam. Moist, strong subangular structure, friable, many roots, abrupt smooth boundary.
- 14 - 32" Dark yellowish brown sandy clay loam with trace rounded boulders and gravel. Moist, moderate subangular to weak massive structure, loose to friable, few roots to 18", abrupt smooth boundary.
- 32 - 108" Dark yellowish brown (10YR 4/4) loamy sand with trace fine to coarse rounded gravel. Moist, strong massive structure, loose, clear smooth boundary.
- 108 - 120" Dark yellowish brown sand. Moist, strong massive structure, loose, abrupt smooth boundary.
- 120 - 144" Yellowish brown (10YR 5/4) sand. Moist, strong massive structure, loose.

No water entering pit.

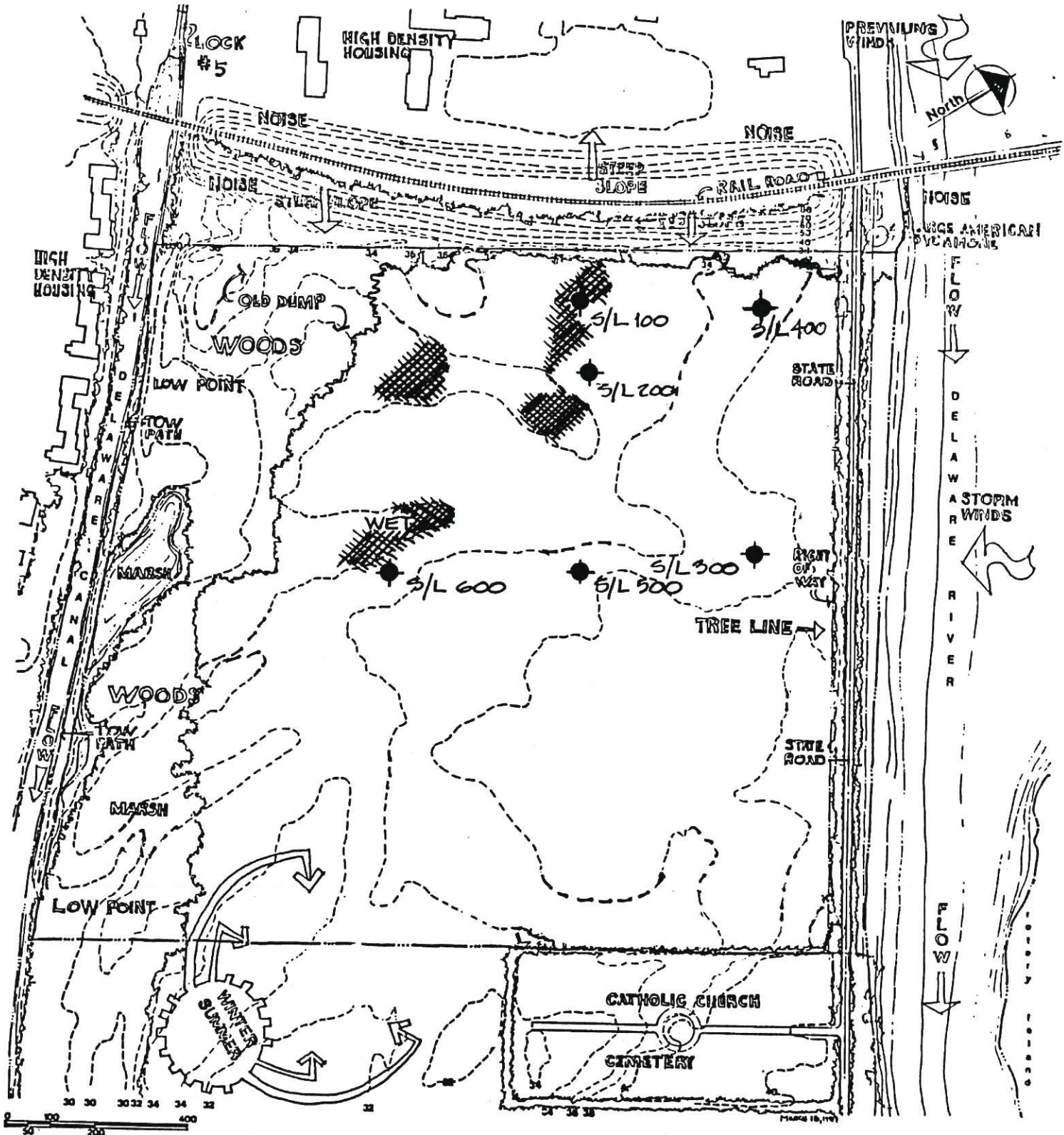
SL 600

- 0 - 9" Very dark grayish brown (10YR 3/2) silt loam. Moist, strong subangular structure, friable, many roots, abrupt smooth boundary.
- 9 - 26" Dark yellowish brown (10YR 4/4) silty clay loam with trace rounded boulders and gravel. Moist, strong massive structure, loose to friable, few roots, clear smooth boundary.
- 26 - 58" Dark yellowish brown (10YR 4/4) sandy clay loam. Moist, strong massive structure, loose, diffuse smooth boundary.
- 58 - 84" Dark yellowish brown (10YR 4/4) sandy loam. Moist, strong massive structure, loose, abrupt smooth boundary.
- 84 - 112" Dark brown (10YR 3/3) sand. Moist to saturated, strong massive structure, loose.

Water in pit at 112".

MAKEFIELD PARK
VNH #24826

SOILS LOG



FIELD REPORT

Project: LOWER MAKEFIELD NEW COMMUNITY PARK

Date: 22 MAY 1987

Time: 8:30 AM

Conditions: DRY, 75°

Field measuring of water level after 2 days of rain and then one dry day.

S/L 100

104" deep, dry at bottom of pipe top of pipe 23" from top to grade.

Note: Found rock on top of pipe.

S/L 200

108" deep, dry at bottom of pipe. Top of pipe 15" from top to grade

S/L 300

115" deep dry at bottom of pipe top of pipe 15" to grade.

Submitted by:

Craig D. Hill

cc: B. Dougherty
J. Barley
J. Coyne

REGULATORY PERMIT APPLICATIONS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

APPLICATION FOR DAM OR WATER OBSTRUCTION PERMIT

..... , 19

In compliance with the provisions of the Act of November 26, 1978, P.L. 1375, *as amended* (32 P.S. §693.1 *et seq.*) known as the "Dam Safety and Encroachments Act"; Act of October 4, 1978, P.L. 851 (32 P.S. §679.101 *et seq.*), known as the "Flood Plain Management Act"; and the Administrative Code, Act of April 9, 1929, P.L. 177, *as amended*, which empowers the Department of Environmental Resources to exercise certain powers and perform certain duties by law vested in and imposed upon the Water Supply Commission of Pennsylvania, and the Water and Power Resources Board.

.....
Applicant

hereby makes application for the consent or permit of the Department of Environmental Resources to construct, maintain, modify, enlarge or abandon

.....
.....

in, along, or across
(Here state name of stream or other body of water.)

.....
at a point
(Here give location, by distance from mouth of stream, county, township, or municipal boundary; also give city, town or township and county in which located.)

.....
.....
.....
.....

for the purpose of
(Here state fully the purpose, necessity, and description of the proposed obstruction.)

.....
.....
.....
.....
.....
.....

in accordance with the complete maps, plans, profiles, and specifications filed with this application and made a part hereof.

By:
(Print Name)

.....
Telephone No. of Applicant

.....
(Signature and Title)

.....
(Address)

CHECK ONE:

- Privately Owned
- Corporation
- Partnership
- Government Agency

If privately owned, the individual owner must sign. One or more members authorized to sign on behalf of an entire partnership must sign. For a corporation, signatures of the president, vice president or other responsible official must sign and affix the corporate seal. For political subdivisions, we require signatures of the chief officer or officers, or other responsible officials empowered to sign for the political subdivision with the seal affixed and attested by the clerk.

SEAL:

WITNESS:

.....

If a fictitious name entity, are you registered with the Pennsylvania Department of State? Yes No

Effective September 27, 1980, all applications for permits, except those submitted by federal, state, county or municipal agencies, must be accompanied by a check payable to "Commonwealth of Pennsylvania" in accordance with the following schedule:

Dams		Water Obstructions and Encroachments	
*Class A	\$ 200	Bridges Over 15 foot Span	\$ 100
Class B	\$ 200	Enclosures	\$ 100
Class C	\$ 50	Channel Changes	\$ 100
		Commercial Dredging	\$ 100
		All Others	\$ 50

A single application may be submitted or a single permit may be issued for multiple structures and activities which are part of a single project or facility or part of related projects and facilities, located in a single county, constructed, operated, or maintained by the same person or persons. Where a single application covers multiple structures or activities other than a single structure and related maintenance dredging, the application fee shall be the sum of fees set forth above for the applicable structures and activities but shall not exceed \$600. All stream crossings located within a single county for the installation of a public service line shall be treated as a single structure or activity.

Duplicate applications with duplicate set of plans shall be submitted to Department of Environmental Resources, Bureau of Dams and Waterway Management, P. O. Box 2357, Harrisburg, PA 17120.

This application, together with all maps, plans, profiles and specifications, and all papers, information and data filed in connection therewith, will remain on file in the Department.

*Based on size classification as defined in § 105.91 of Chapter 105, Rules and Regulations.

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF ENVIRONMENTAL RESOURCES
 BUREAU OF SOIL AND WATER CONSERVATION

OFFICIAL USE ONLY Application Number

APPLICATION FOR AN EARTH DISTURBANCE PERMIT

APPLICANT	PROJECT
NAME	COUNTY
MAILING ADDRESS	MUNICIPALITY
	LOCATION
TELEPHONE NUMBER	
RESPONSIBLE OFFICIAL	RECEIVING STREAM
TITLE	DESCRIPTION
TELEPHONE NO.	ACRES _____

HEREBY APPLIES FOR APPROVAL OF AN EROSION AND SEDIMENTATION CONTROL PLAN

ATTACHMENTS	DATE OF APPLICATION _____
Attached are 3 application forms <input type="checkbox"/> , 3 copies of the plan map <input type="checkbox"/> , 3 copies of the plan narrative <input type="checkbox"/> and a check for \$ _____. Please specify any other plans, modules or documents included. _____	

AFFIDAVIT	COMMONWEALTH OF PENNSYLVANIA COUNTY OF _____
I, _____, being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief.	
SWORN AND SUBSCRIBED TO BEFORE ME THIS _____ DAY OF _____ 19 _____	
NOTARY PUBLIC	SIGNATURE OF APPLICANT OR RESPONSIBLE OFFICIAL _____

PREPARER	DATE OF AGREEMENT _____
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This section is to be completed by the person authorized by the applicant to prepare this application.

NAME OF PREPARER OR FIRM	TELEPHONE NO.	PROFESSIONAL SEAL (WHEN APPLICABLE)
MAILING ADDRESS		
SIGNATURE OF PREPARER		

INSTRUCTIONS TO PREPARE AN APPLICATION FOR AN EARTH DISTURBANCE PERMIT

I. Application Form ER-SWC-20: Rev. 2/85

A. APPLICANT SECTION

NAME—Company, corporation, partnership or individuals

MAILING ADDRESS—Address at which the person responsible for this project can receive mail—list zip code

TELEPHONE NUMBER—Company's business number

RESPONSIBLE OFFICIAL—Person in charge of this project with the authority to speak and act for the company

TITLE—Official position title of the person above named

TELEPHONE NUMBER—Of the official above named

B. PROJECT SECTION

COUNTY—Wherein the project will be located — if more than one list them all and indicate the major county

MUNICIPALITY—Wherein the project will be located. If more than one, list them all. In accordance with Act 14 of 1984 an applicant must provide notice to the municipality wherein the activity is located. Proof of this notification must accompany the application.

LOCATION—Name the location by listing its relative position to known landmarks. Examples: ½ mile west of Centerville on PA Route 63 on the north side of the highway/on the southeast corner of the intersection of Leg. Rt. 71746 & TO75

RECEIVING STREAM—Name the stream that will receive the drainage from the project. List the nearest named stream and its tributary if applicable. Example: an unnamed tributary to Clear Creek

DESCRIPTION—Identify the project in general terms. Examples: (A shopping mall; an industrial park; a residential development; an office complex)

ACRES—Total project acres including support areas that are contiguous and will be disturbed

C. ATTACHMENTS SECTION

DATE OF APPLICATION—Insert the date the application is to be submitted. Check the proper boxes to indicate the attached materials

D. AFFIDAVIT SECTION

Have the form signed and Notarized

E. PREPARER SECTION

If someone other than the applicant prepares the application, that information must be entered in the last section on the bottom of the form. List date preparer contracted to prepare the application under agreement date.

II. The Application

A. Three copies of the completed and notarized application form

B. A check for \$200.00 to pay the filing fee. This check is to be payable to the *Commonwealth of Pennsylvania*. It is to be dated as near to the date of application submission as convenient.

The filing fee may be returned after the conservation district has accepted the application and forwarded the applicant's check to the DER, Comptroller's Office if the applicant withdraws the application.

Instructions to claim a refund of the filing fee are available upon request from the conservation district.

C. Three copies of an Erosion and Sedimentation Control Plan

1. The plan consists of a map and a narrative

2. Plan requirements are listed in Section 44 of the Pennsylvania Soil Erosion and Sedimentation Control Manual, available from the conservation district.

D. The schedules, construction information, improvements, erosion and sedimentation controls, maintenance and other project and site information are the basis of the permit application review. Be as accurate and concise as possible. Plans that are wordy, unclear, incomplete and inadequate will be returned for correction. This return and resubmission increases the permit processing time and may even cause a permit denial.

E. Three copies of the completed application must be submitted to the conservation district. Multi-county project (a permit required area with less than 25 acres in each county) applications must be submitted to the Bureau of Soil & Water Conservation, D.E.R., P.O. Box 2357, Room 211, Executive House, Harrisburg, PA 17120. Two county project applications must be submitted to the county with the greatest area.

MUNICIPAL AND COUNTY NOTIFICATION OF PERMIT APPLICATION

Act 14, P. L. 834, enacted February 17, 1984, requires that each applicant for a permit under the Dam Safety and Encroachments Act must give written notice to the municipality(ies) and the county(ies) in which the permitted activity is located. The written notice shall be received by the municipality(ies) and the county(ies) at least thirty (30) days before the Department of Environmental Resources may issue or deny the permit.

You may notify the municipality(ies) and the county(ies) by providing a copy of the application to each municipality and county by CERTIFIED MAIL, RETURN RECEIPT REQUESTED, or by personally delivering a copy to and obtaining a written acknowledgement or receipt from each municipality and county.

The submission of your application to the Department must include evidence that municipal and county notification has occurred. Acceptable forms of evidence include:

- (1) Certified mail receipt and copy of letter sent to each municipality and county,
- (2) Written acknowledgement from each municipality and county

Failure to provide evidence of municipal and county notification will delay processing of your application.

-APPLICATION CHECKLIST-

Please check the following list to make sure you have included the required information with your application:

- Evidence of municipal and county notification
- Application is correctly signed and witnessed, with corporate or municipal seals
- Application fee
- Location map
- General plan view showing property lines
- Cross-sections at the project site showing existing and proposed conditions
- An Erosion and Sedimentation Control Plan and a copy of a letter of approval from the Conservation District in the county indicated in the permit application regarding this plan
- Registered professional engineer's seal and certification (if required)
- Hydrologic and hydraulic analysis (if required)

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES
Bureau of Dams and Waterway Management
Permit Application Procedure
Stream Encroachments

Applications for most stream encroachment permits are processed by our Department on a centralized basis at the present time; therefore, all applications except for those stream encroachments directly resulting from a sanitary sewerage project (i.e. stream crossing by sewers, outfall, headwall, etc.) should be submitted to the following location: Bureau of Dams and Waterway Management, P.O. Box 2357, Harrisburg, PA 17120, (Phone No. 717 787-6826).

Please note that for those stream crossings and outfall structures which are part of a sanitary sewerage project, the encroachments may be included as part of the sewerage application, thereby avoiding the need for a separate encroachment application. If a sewerage application is not required, the stream encroachments resulting from a sanitary sewerage project must be included in an encroachment application which should be submitted at the aforementioned address.

An application for an encroachment consists of the following documents:

1. Two application forms properly completed and signed (ER-DWM 12:9/80)
2. Two sets of plans
3. Two sets of relevant specifications and reports
4. Two copies of a soil erosion and sedimentation control plan to be implemented and maintained during and following any earth moving activities relative to the stream encroachment, and an approval letter from the respective county conservation district. Mr. John A. Thomas, Telephone No. 215-348-1166, with Bucks County Conservation District should be contacted in regard to this plan.
5. Evidence that the Township or Borough and the County in which the project is to be located has been properly notified of the intended work.

Please note that any reports, each folio of plans, and each volume of specifications may require the seal and signature of a registered professional engineer, depending on the scope of the project. In addition, each plan sheet in the folio may require the seal and signature of a registered professional engineer.

A copy of our Chapter 105 Regulations, which is a guide for the preparation of applications, reports, and plans has been enclosed.

When several Department permits are required for a project, all necessary applications should be submitted to the Department promptly as our coordination policy requires joint issuance of permits for a given project.

We are also enclosing application forms for your use in preparation of an encroachment permit application. Any questions regarding submission of a permit application for stream encroachment should be directed to our Department's Bureau of Dams and Waterway Management in Harrisburg at (717) 787-6826, or to the Norristown's Regional Hydraulic Engineer at (215) 270-1948.

R5/84 JM246/A6

Lovrek associates, p.c.

180 Nassau Street, Princeton, N.J. 08542

609-924-5919

AGENCY REPRESENTATIVES CONTACTED REGARDING PERMITS AND
DETENTION BASINS

Local

Township Engineers
Charles Doherty
Pickering Corts and Summerson
126 South State Road
Newtown, Pennsylvania
215-968-9300

Contacted by Bob Dougherty of Van Note Harvey Associates.
Would not require detention for sketch plan as shown because
of low impervious coverage and because of location in Flood
Plain.

County

Mr. John Thomas
Bucks County Soils Conservation Service
4259 Swamp Road
Box 16
Doylestown, Pennsylvania 18901
215-348-1166

Contacted by Laurel Lovrek. Regulates soil erosion, not
detention basins.

County Consulting Engineers
Mr. Donald Garrety
J.G. Parks and Associates Inc.
Taylorsville Road
Washington Crossing, Pennsylvania
215-493-5546

Contacted by Bob Dougherty of Van Note Harvey. If Township
waives detention requirements they will follow suite.

State

Mr. Michael Stover
Bureau of Soil and Water Conservation
Department of Environmental Regulation
Room 211 Executive House
P.O. Box 2357
Harrisburg, Pennsylvania 17120
717-787-5267

Contacted by Laurel Lovrek. Their agency reviews soil disturbance of more than twenty-five acres, not detention facilities.

Mr. John Smith
Bureau of Dams and Waterways Management (Local Branch)
Department of Environmental Resources
3661 Skippack Pike
Harleysville, Pennsylvania 19438
215-270-1937

Contacted by Laurel Lovrek. Their agency doesn't regulate detention, it is regulated by Township storm water management policy.

Mr. Timothy Keptner
Floodplain Management Division
Department of Community Affairs
Bureau of Community Planning
551 Forum Building
Harrisburg, Pennsylvania 17120
717-787-7403

Contacted by Laurel Lovrek. Was told they help Townships set up municipal regulation, they do not regulate individual sites.

Mr. Lawrence Toth
Division of Coastal Zone Management
P.O. Box 1467
Harrisburg, Pennsylvania 17120
717-783-9500

Contacted by Laurel Lovrek and Alan Goodheart. Kauffman Tract is not in Pennsylvania Coastal Zone.

Mr. Jack Ford
Bureau of Dams and Waterways Management
Department of Environmental Resources
P.O. Box 2357
Harrisburg, Pennsylvania 17120
717-787-6826

Contacted by Laurel Lovrek and Bob Dougherty. Will review cutting and filling in the floodplain but not detention facilities. DER does not have regulations for detention of storm water.

Regional

Mr. Frank Cianfiani
Chief of Regulatory Board
U.S. Army Corp of Engineers
Custom House
2nd and Chestnut Streets
Philadelphia, Pennsylvania 19106

Not contacted, his secretary referred us to others.

Mr. Richard Hassel
Chief of Applications Section
U.S. Army Corp of Engineers
2nd and Chestnut Streets
Philadelphia, Pennsylvania 19106

Not contacted by phone but his assistant Robert Parkin spoke with Alan Goodheart. Based on the conversation there was no clear indication that detention would be required.

Mr. David Everett
Delaware River Basin Commission
25 State Police Drive
West Trenton, New Jersey
609-883-9500

Contacted by Laurel Lovrek. Said he didn't regulate storm water.