

Derry Township

Stormwater Management Study — 2nd Phase

December 9, 2008



[BUILDING RELATIONSHIPS.
DESIGNING SOLUTIONS.]

HRG CONTACT INFORMATION

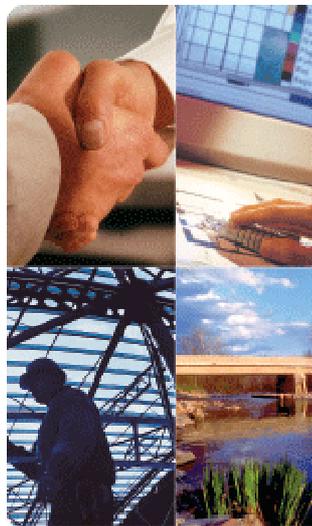
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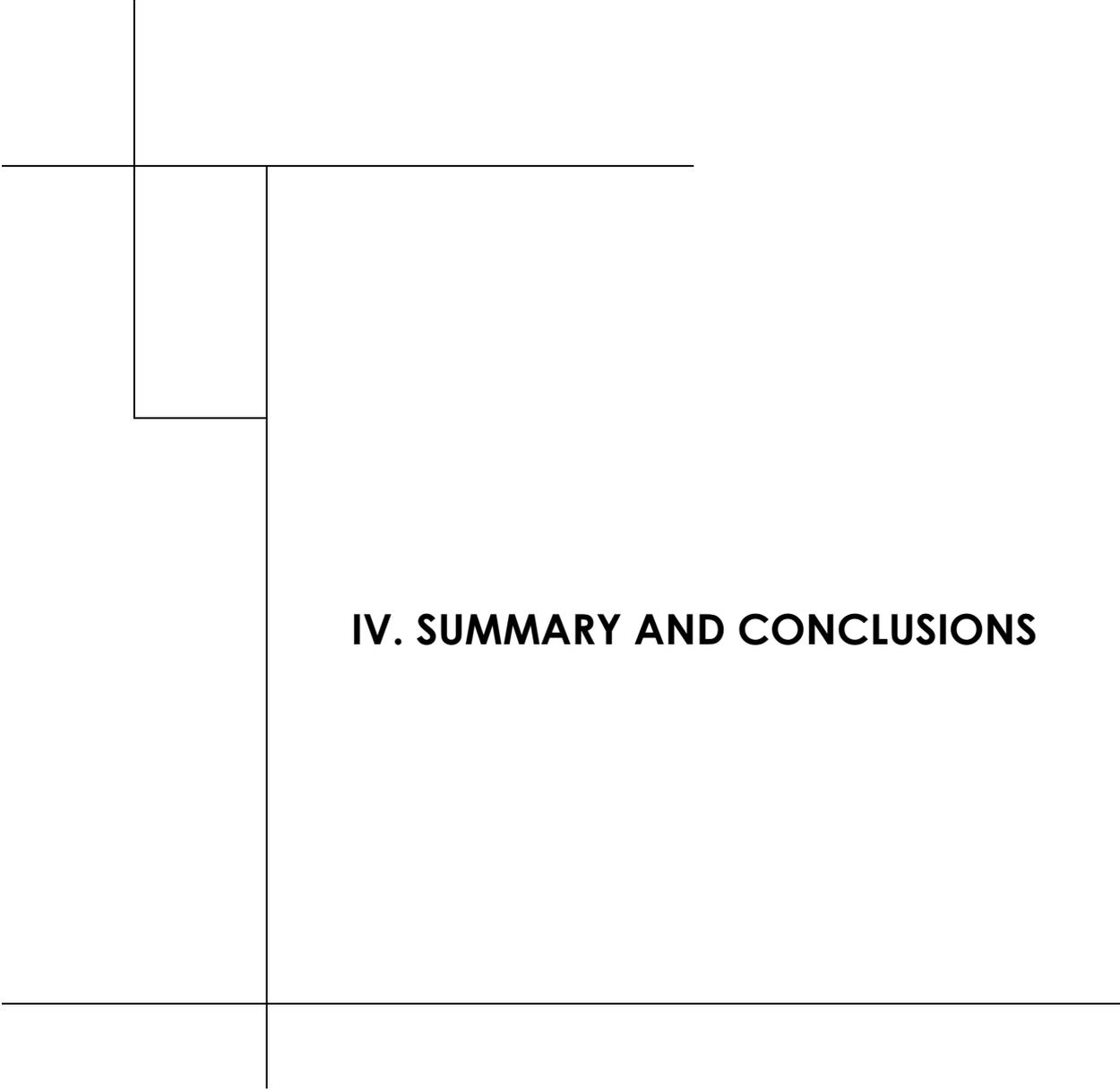
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**BUILDING RELATIONSHIPS.
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IV. SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

The stormwater flooding and erosion problems that have occurred throughout Derry Township will continue and could progressively worsen as development continues, unless stricter controls are implemented on new development.

The most important concept to understand and accept is that flooding is a naturally occurring process that will always arise and that man has never been able to completely control or prevent damage from flooding. The best that can be done is to reduce the level of impact as much as is economically feasible and then restrict or control development in flooding areas so that the structural damage and safety issues are minimized to the greatest extent practicable.

The Township should consider implementing the following steps as soon as practical:

SHORT TERM GOALS

1. Revise the Township's zoning, subdivision and land development, and floodplain regulations to better control the impact of future development on storm runoff. This includes requiring new development to implement more restrictive runoff volume and rate controls as well as implementing groundwater recharge wherever sinkhole conditions do not preclude it. HRG is currently developing a model stormwater management ordinance under the Dauphin County Act 167 Study based on the Pennsylvania Department of Environmental Protection's *Stormwater Best Management Practices Manual*. This model ordinance should be used as a guideline for updating the Township's ordinances.
2. Implement a program of public education and foster volunteer actions on the part of property owners to implement Best Management Practices for storm runoff control wherever possible.
3. Continue, and where possible, enhance the Township's maintenance program for: cleaning inlets and storm sewers; removing obstructions from culvert and bridge openings; repairing pipes, culverts, and stream banks when they are damaged, and; inspecting and requiring repairs to existing stormwater detention basins.
4. Coordinate with PennDOT to ensure that their storm sewer and drainage systems are maintained to avoid unnecessary ponding and flooding due to clogged or debris filled inlets and pipes.

MEDIUM AND LONG TERM GOALS

1. Conduct a detailed survey of the existing storm sewer system to locate pipes and inlets, and determine sizes, materials, and invert elevations of all pipes, manholes, and inlets to allow an evaluation of the physical condition and capacity of the system elements.

2. Establish budget and administrative measures for implementing the recommended solutions to the existing stormwater problems in the Township.

Implementing the above mentioned goals will not prevent all flooding or eliminate all steam bank erosion in the Township. There will always be storm events that exceed the design level of the controls that are implemented. The goals of the recommendations in this study are to reduce the frequency and level of flooding, and mitigate the severity of damages associated with those events, while still retaining the beauty and tranquility of the streams in the Township.

With respect to implementing the solutions recommended in this report, a priority list has been established based on an evaluation of the severity of the problem, the impact of the problem on property and structure flooding and road closings, and cost of solution. There are no records available relating to property damage estimates for previous flooding events, so the priority analysis is subjective and could be revised if additional information becomes available. The recommended priority for implementation is presented in Table 26.

**TABLE 26
IMPLEMENTATION PRIORITY FOR RECOMMENDED SOLUTIONS**

PRIORITY NO.	LOCATION	ESTIMATED SOLUTION COSTS
1	Mill Street / Cherry Drive	\$1,249,200
2	Cocoa Avenue / Governor Road	\$595,280
3	Cocoa Avenue between Elm & Areba	\$286,280
4	Forest Avenue, Clark and Sand Hill Roads	\$139,060
5	Hershey Park Drive – Shopping Center	\$1,045,500
6	Wood Road at Bullfrog Valley Road	\$345,160
7	East Chocolate Avenue	\$27,540
8	Sunset Drive	\$310,800
9	Lucy Avenue	\$68,860
10	Mill Road Underpass	\$72,160
11	Palmdale Park and Route 422	\$449,430
12	West Chocolate at Swatara Avenue	\$34,280
13	Route 422 / 322 Interchange	\$648,190
14	Norfolk Southern RR near Sipe Avenue	\$423,760
15	Bindnagle Road	\$297,110
16	Highmeadow Camp Parking Lot	\$144,300
17	West Mansion Road	\$2,100,000
	TOTAL COST	\$8,236,910

Table 27 identifies the type and number of structures that would be benefited by the recommended solutions. “Structures Benefited” is a relative term and no distinction is

made on the value of the structures, which could be a single-family residence, a condominium or apartment building, a business or factory, or even an athletic field. For single-family residences, the count only includes the primary house, not any out-buildings (e.g., garage). For three locations (Priority Area Nos. 10, 12 and 14), there are no buildings benefited. The impact at these locations is only street and field flooding.

**TABLE 27
PROBLEM TYPE AND STRUCTURES BENEFITED FOR RECOMMENDED SOLUTIONS**

PRIORITY NO.	LOCATION	PROBLEM TYPE	RESIDENTIAL	COMMERCIAL/ INDUSTRIAL	OTHER
1	Mill Street / Cherry Drive	F	16	5	-
2	Cocoa Avenue / Governor Road	F, E	7	3	-
3	Cocoa Avenue between Elm and Areba	F	9	-	2
4	Forest Avenue, Clark and Sand Hill Roads	F	12	-	-
5	Hershey Park Drive – Shopping Center	F	-	2	-
6	Wood Road at Bullfrog Valley Road	F, E	-	-	1
7	East Chocolate Avenue	F	-	1	-
8	Sunset Drive	F	13	-	-
9	Lucy Avenue	F	-	1	-
10	Mill Road Underpass	F	-	-	1
11	Palmdale Park and Route 422	F	-	-	2
12	West Chocolate at Swatara Avenue	F	-	-	1
13	Route 422 / 322 Interchange	F	-	-	1
14	Norfolk Southern RR near Sipe Avenue	F	-	-	-
15	Bindnagle Road	F	1	-	-
16	Highmeadow Camp Parking Lot	F, E	-	-	1
17	West Mansion Road	F	-	1	2

PROBLEM TYPE: F = Flooding E = Channel Erosion

A traditional cost-benefit assessment could not be made for the priority areas because there is no information available on damage estimates for prior flooding events. Assessed property values could be used; however, this would be very misleading since flooding on a parcel that does not impact a structure (house, store, factory, etc.) would have a low damage value compared to flooding that damages the structure.

Due to the severity of the problems, it is recommended that Priority Area numbers 1 through 9 be considered as Medium Term Goals and 10 through 17 as Long Term Goals.

A survey was conducted of possible sources of grants or low-interest loans that could be used to fund the design and construction of the recommended facilities. Appendix D provides a brief description of those sources that are considered viable for funding some of the costs. The PA H2O Act has the greatest potential for funding some or all of the recommended facilities. However, that grant program, and several others, requires a match of funds or the equivalent value of in-kind services (e.g., land purchase, etc.). Derry Township will consider all options for funding the recommended solutions. One option would be to seek support from commercial, industrial, and institutional entities

that would benefit from implementation of the recommended facilities. Table 28 is a list of those entities that would benefit and could possibly become partners in the projects through monetary contributions or donation of needed land area:

**TABLE 28
POSSIBLE FUNDING PARTNERS FOR RECOMMENDED SOLUTIONS**

PRIORITY NO.	LOCATION	POSSIBLE PARTNERS*
2	Cocoa Avenue / Governor Road	Milton Hershey School
3	Cocoa Avenue between Elm and Areba	Derry Township School District
5	Hershey Park Drive – Shopping Center	Pizza Hut (E. Catalone) McDonalds Corp. Milton Hershey School
6	Wood Road at Bullfrog Valley Road	Milton Hershey School
7	East Chocolate Avenue	Hershey Office LP
8	Sunset Drive	Peifer Brothers
9	Lucy Avenue	Robert Welsh
13	Route 422 / 322 Interchange	Milton Hershey School
14	Norfolk Southern RR near Sipe Avenue	Norfolk Southern RR Hershey Foods
15	Bindnagle Road	Milton Hershey School
16	Highmeadow Camp Parking Lot	Milton Hershey School
17	West Mansion Road	Hershey Chocolate Corp. Hershey Entertainment

*NOTE: Possible partners are identified as the property owners of benefited commercial, industrial, or institutional property.