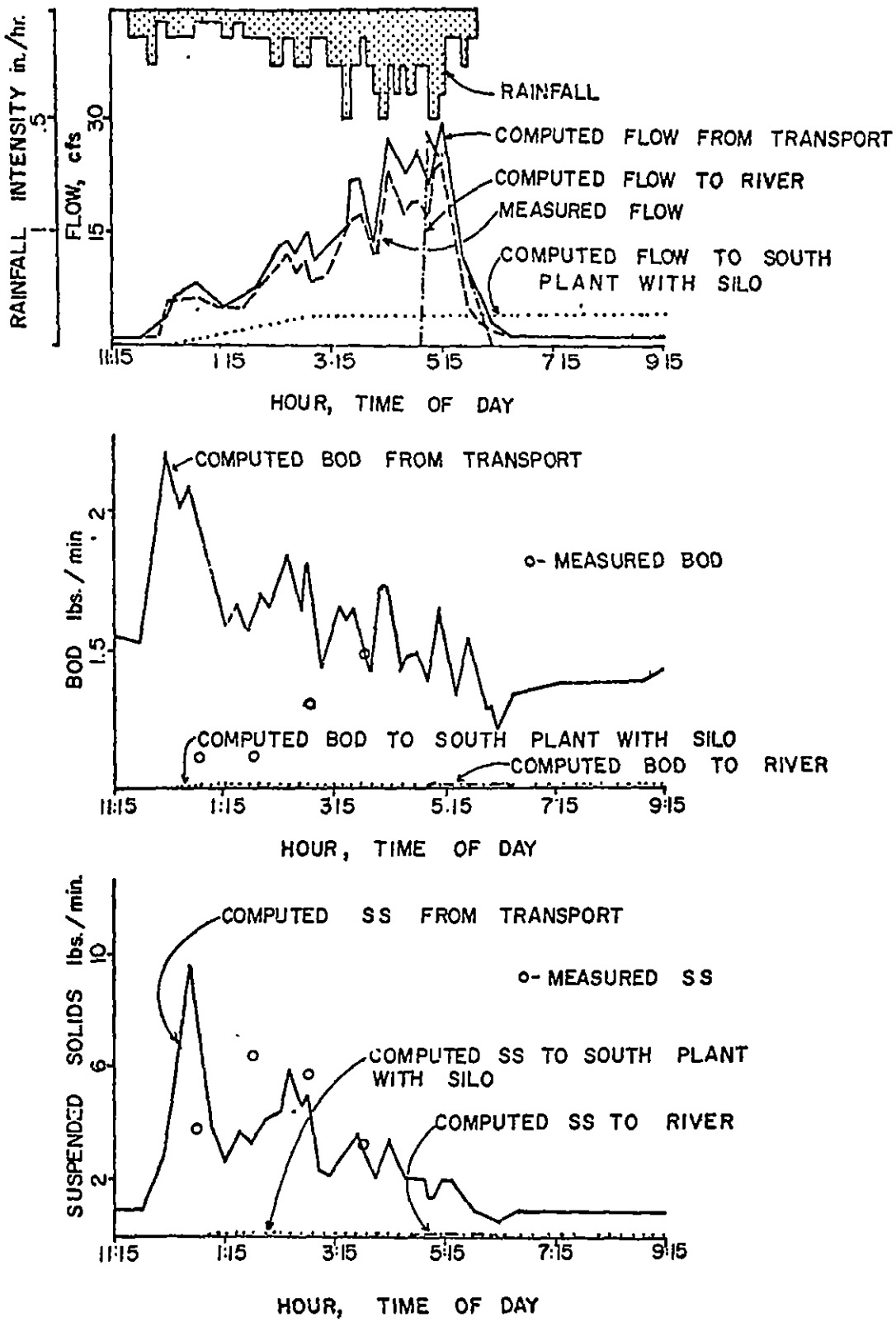

Figure 2-11
Runoff-Transport Simulation for Stevens Avenue with Silo and Swirl Concentrator.
Study 4.

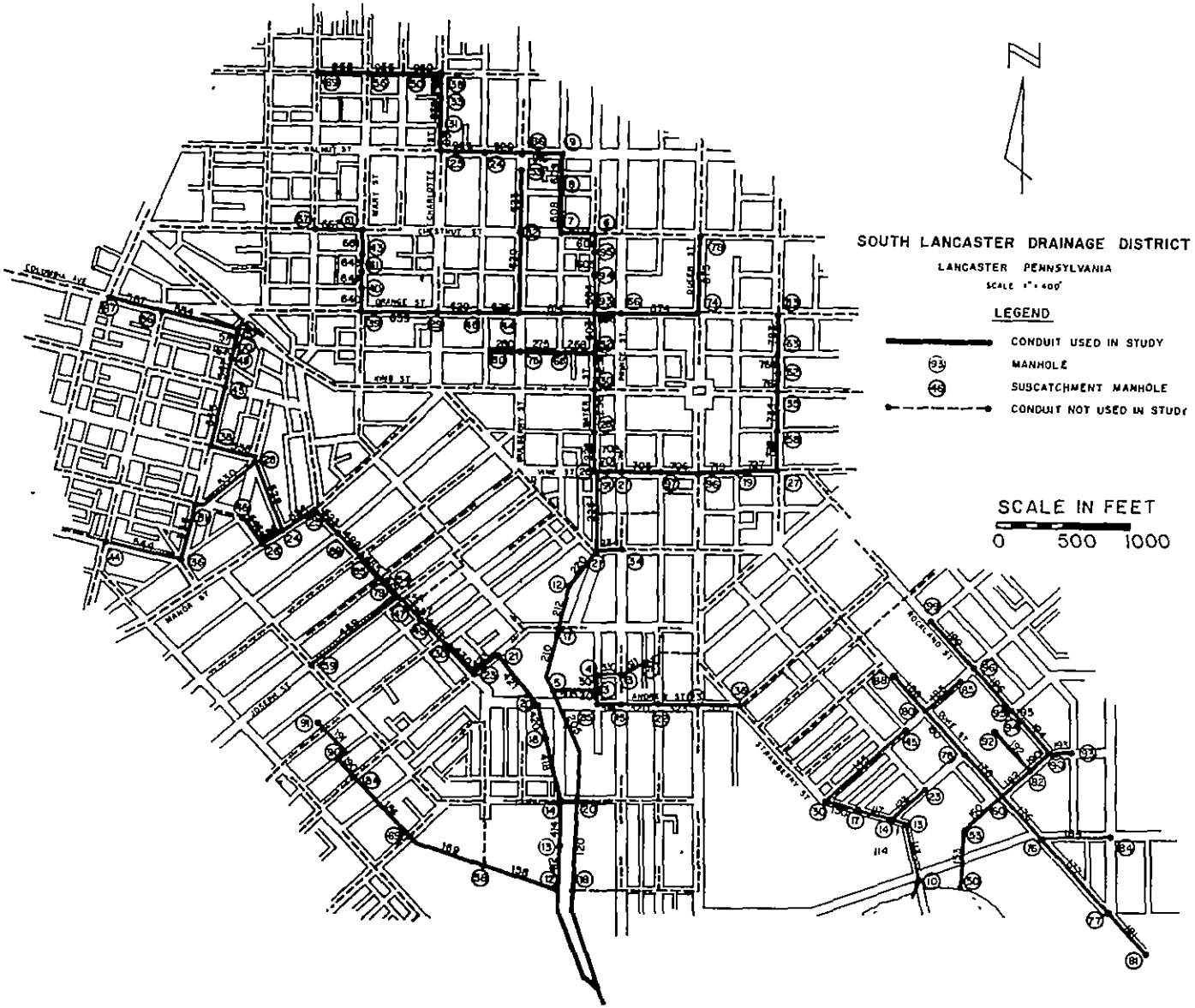

Figure 2-13
South Drainage District with Runoff-Transport Numbering System.

Results of computer simulation for Study No. 3 for the North district are presented in Figure 2-14 and for the South district in Figure 2-15. The North district outfall is located at point 1 while the South district outfall is located at point 12 as shown in Figure 2-11.

An examination of these figures shows that for a rainfall event equivalent to Study No. 3, overflow from the North district would be about 100 cfs and from the South district, 160 cfs. The BOD and SS discharged to the river would be 7,075 pounds and 9,696 pounds from the North District and 4,468 pounds and 10,006 pounds respectively for the South district.

4. EFFECT ON RECEIVING WATER

To simulate the effect of the overflow on the Conestoga Creek, Receiving Water Model was run on the entire city for the Study No. 3. The manner in which various districts were combined is shown on Figure 2-16. In conducting this run, the swirl concentrator was used at Stevens Avenue while Refined Storage and Treatment Model, as described elsewhere, was utilized to simulate the existing biological treatment at the North and South plants. The silo was deleted in order to have an overflow at Stevens Avenue outfall since the installation of the silo prevents any overflow for rainfall event equivalent to Study No. 3.

The reaeration coefficient for the Conestoga Creek was computed from a formula by O'Connor and Dobbins (1958). Results of the Receiving Water Model are shown in Figures 2-17 through 2-20. Figure 2-17 shows

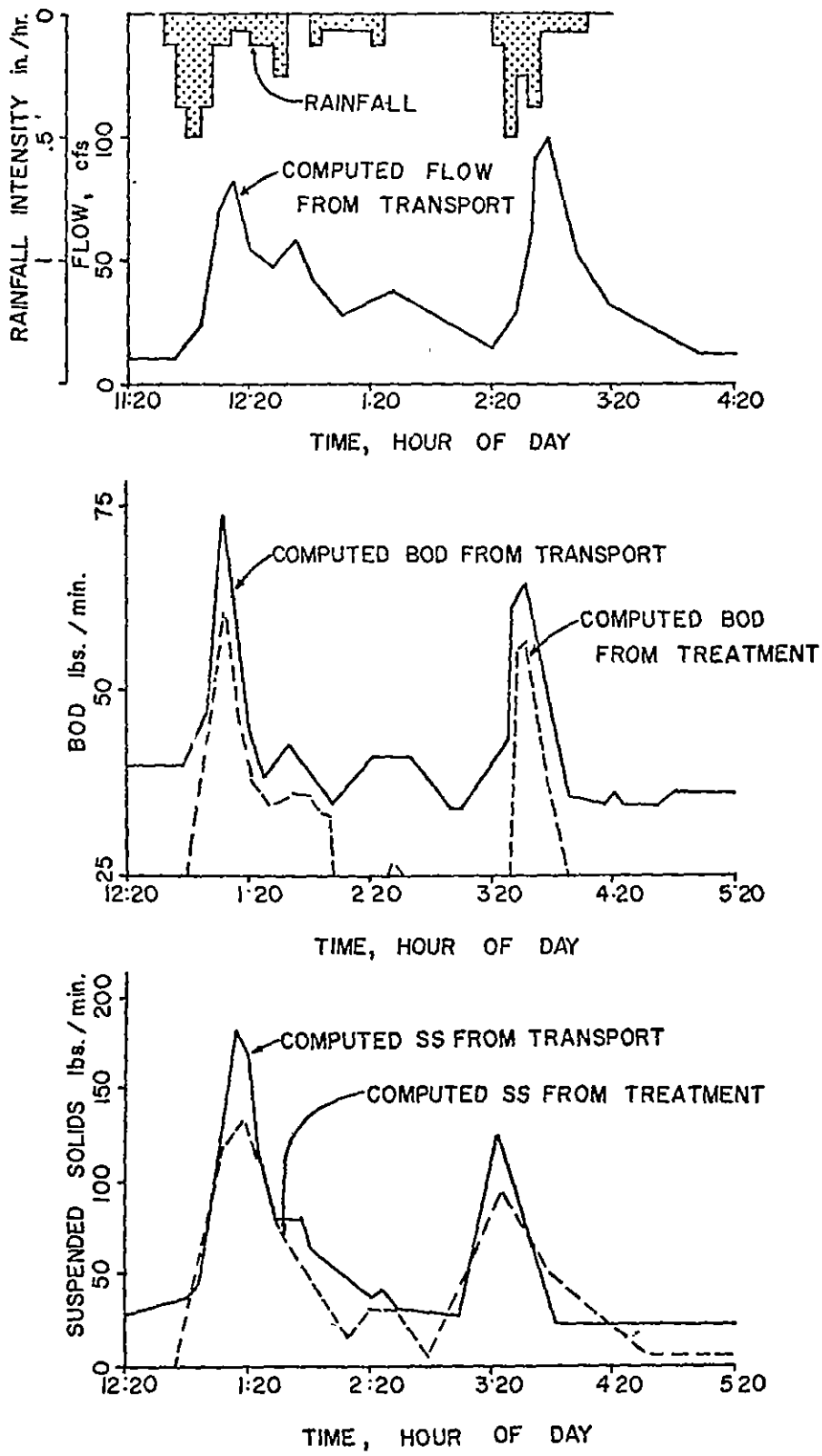

Figure 2-14
Simulation of North Drainage District.
Study 3.

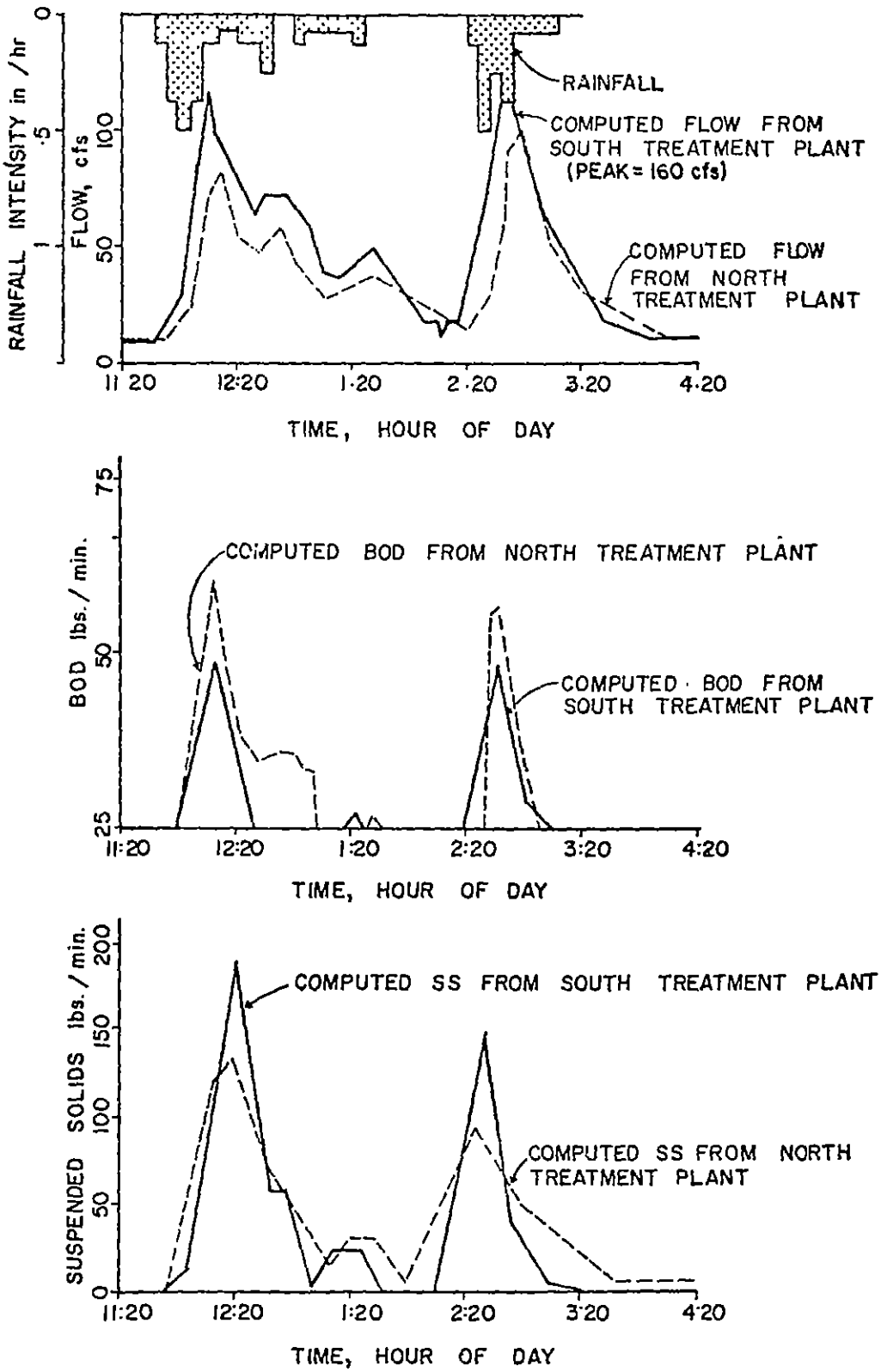

Figure 2-15
Simulation of North and South Drainage Districts.
Study 3.

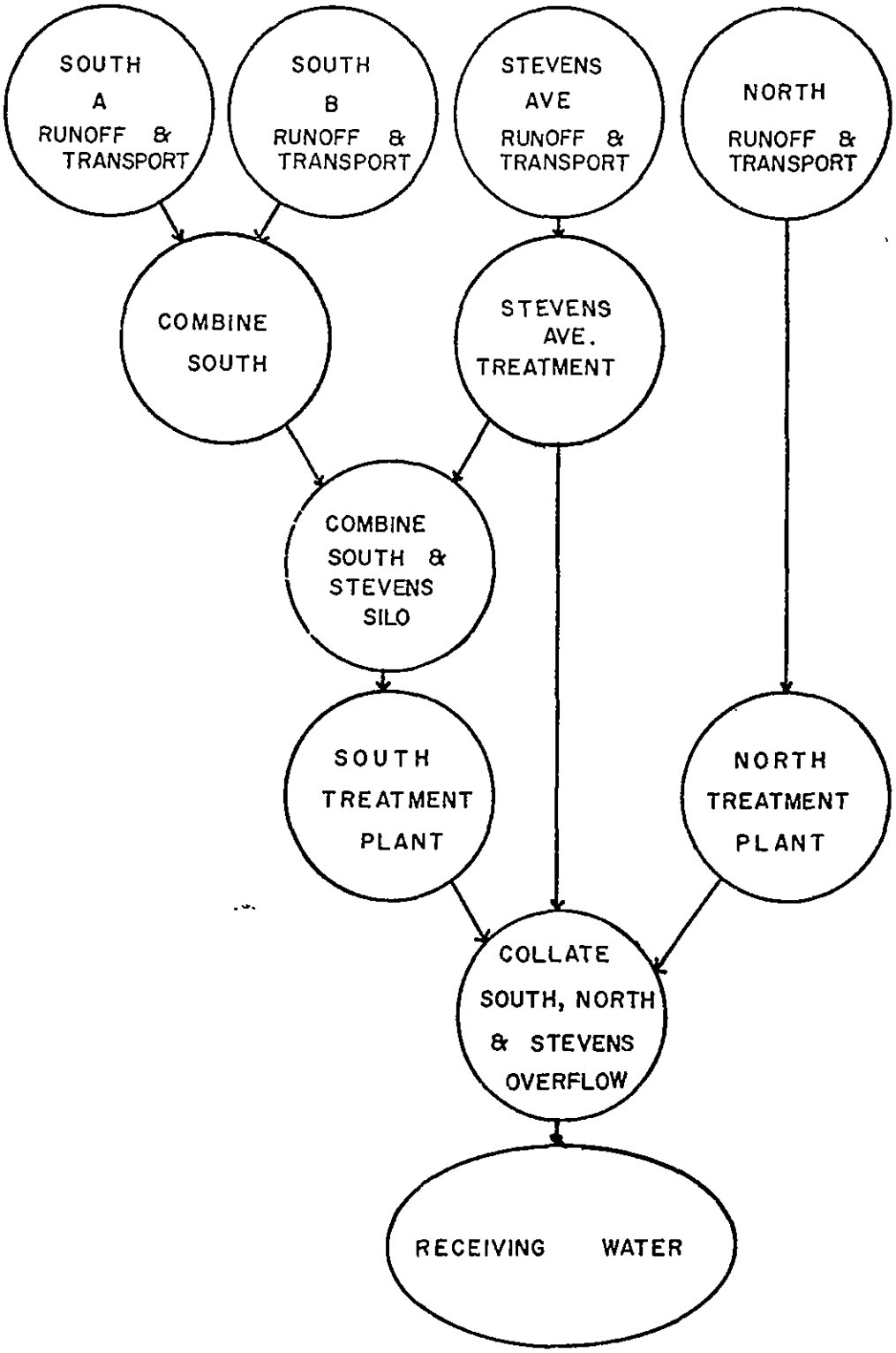

Figure 2-16
Combination of SWMM Runs for Overall Lancaster Simulation.

DO profiles 24 and 48 hours after the storm inception, while Figure 4-28 shows the BOD profile for the same period. Suspended solids and coliform are shown in Figures 2-19 and 2-20 respectively. Initial values used to simulate the Receiving Water Model are listed in Table 2-1:

TABLE 2-1
PARAMETERS USED FOR SIMULATING RECEIVING WATER MODEL

Dissolved Oxygen in Conestoga Creek (all junctions)	10.0 mg/l
BOD in Conestoga Creek (all junctions)	5.0 mg/l
Suspendid Solids in Conestoga Creek (all junctions)	10.0 mg/l
Coliform in Conestoga Creek (all junctions)	50/100 ml
Decay Coefficient (BOD)	0.20/day
Reaeration Coefficient	1.50/day
Flow in Conestoga Creek (entering junction 1)	700 cfs

5. SUMMARY

The above discussion can be summarized as follows:

1) The SWMM was able to predict fairly accurately the quantity as well as quality of the combined overflow for the Stevens Avenue district in Lancaster.

2) The installation of the swirl concentrator and the silo will result in substantial improvement in the quality of the overflow at Stevens Avenue, provided the full-scale performance of the swirl concentrator is comparible to the results obtained in laboratory studies by APWA.

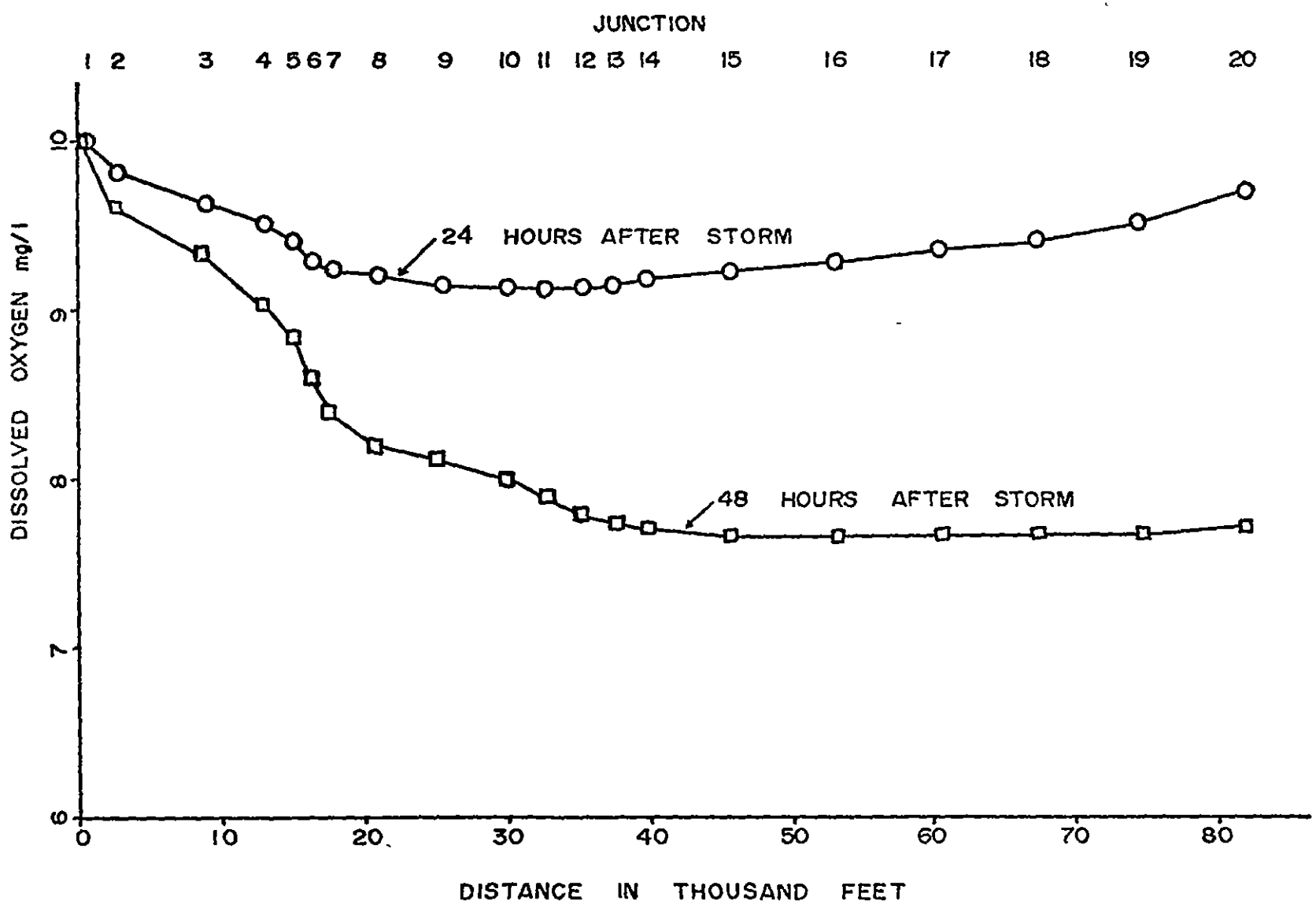

Figure 2-17
Dissolved Oxygen Profiles Along the Conestoga Creek.
Study 3.

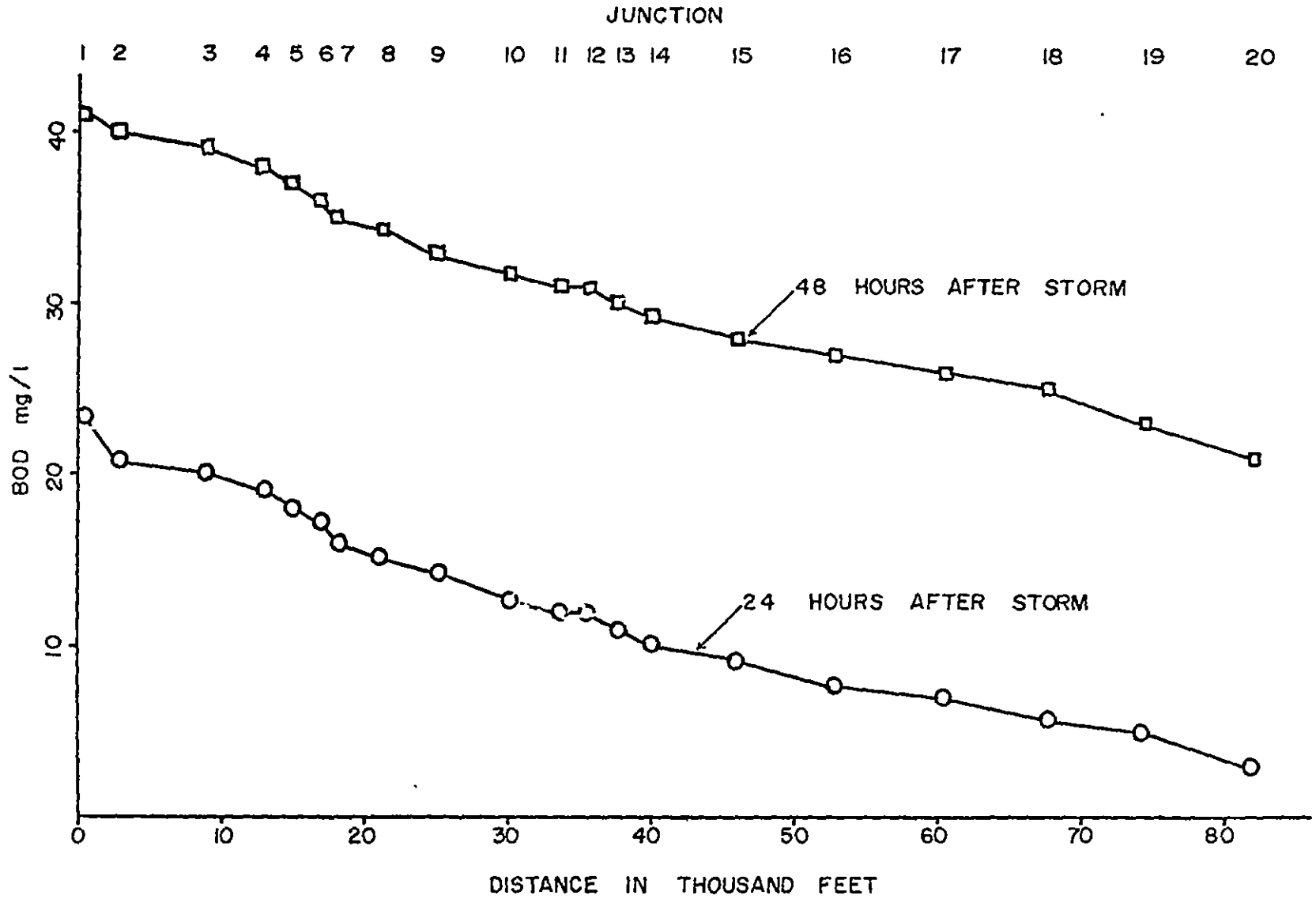

Figure 2-18
BOD Profiles Along the Conestoga Creek.
Study 3.

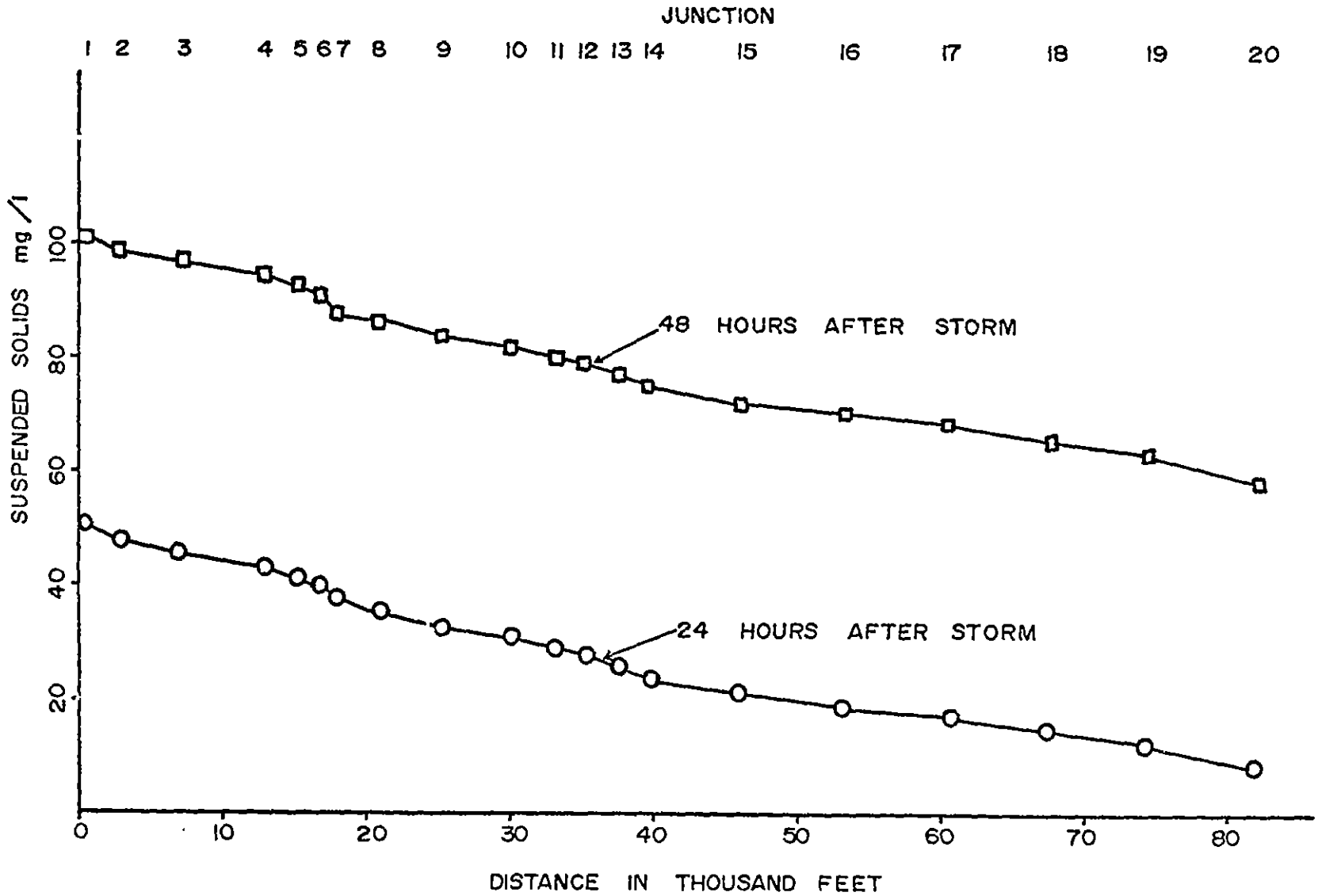

Figure 2-19
Suspended Solids Profiles Along the Conestoga Creek.
Study 3.

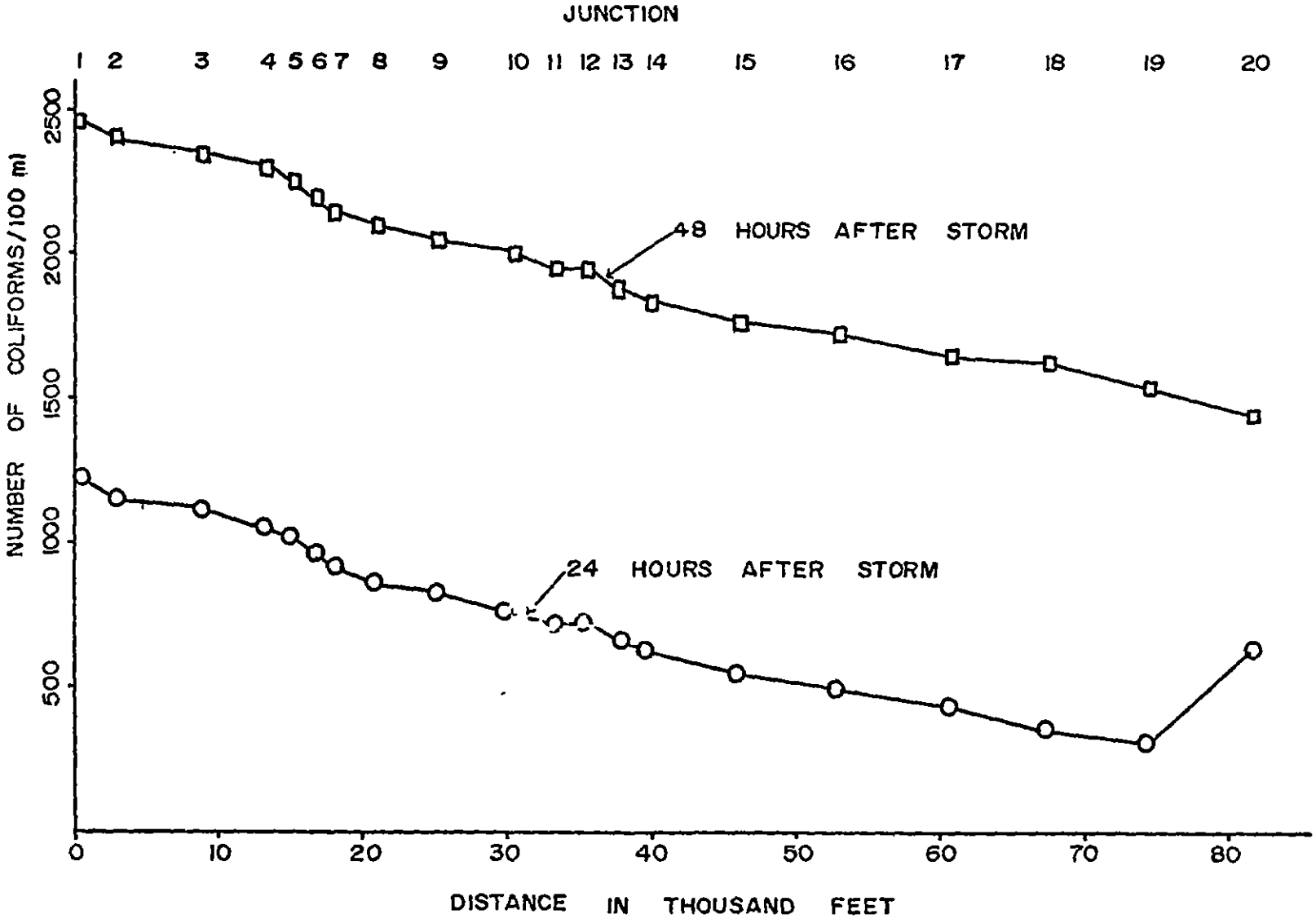

Figure 2-20
Coliform Profiles Along the Conestoga Creek.
Study 3.

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b. "Volume II, Verification and Testing," Rept. No. 11024DOC08/71
c. "Volume III, User's Manual," Rept. No. 11024DOC09/71
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4. ACKNOWLEDGEMENTS

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16 Abstract

The U.S. Environmental Protection Agency in conjunction with the New York State Department of Environmental Conservation conducted three one-day seminars on the problem of wet-weather flow pollution abatement. Many facets of the problem were considered including a brief overview of its magnitude and what the federal government is doing to manage and control this source of pollution. Various management, control, and treatment techniques were described and the most up-to-date information on design and economics was presented. The audience consisted of consulting and municipal engineers from all areas of New York State.

This publication is a compilation of the papers presented at the seminar.

17a Descriptors: Combined sewer overflow management and control

17b. Identifiers: Infiltration/Inflow, Regulation, Pressure Sewers, Microstraining, Filtration, Dissolved Air Flotation, Disinfection, Storm Water Management Model.

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