

**CORPORATION OF THE CITY OF CAMBRIDGE  
HESPELER WEST SUBWATERSHEDS STUDY WORKING COMMITTEE  
MEETING NO. 5  
MINUTES**

Thursday, February 5, 2004  
Allan Reuter Seniors' Centre, 507 King Street, Cambridge (Preston)

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**Committee Present:** Councillor Rick Cowsill (City) (Chair), Erich Ritzmann (MGWA), Cathy Murphy (MGWA), Ron McKitrick (alternate for John Vasiga (MGWA)), Chris Gosselin (RMOW), Ken Cornelisse, Tricia Rosa (GRCA), Wendy Wright (City), April Souwand (City), Ian Rawlings (Large Property Owners), Charlene Schiedel (MGWA)

**Others Present:** Gus Rungis (GRCA), Nancy Davy (GRCA), Mary Hammer (landowner)

**1. Call to Order**

The meeting was called to order at 3:30 p.m.

**2. Declarations of Pecuniary Interest**

None

**3. Confirmation of Minutes**

Erich Ritzmann pointed out that the header on p. 2 has the wrong date on it.

Erich Ritzmann, on behalf of the MGWA, questioned the accuracy of the statement on Page 2, Paragraph 2, "He explained that the information from the HWSS provided by Dougan and Associates was well within 30 metre plus or minus level of accuracy that is expected of wetland evaluations in the province." Erich Ritzmann read from a prepared statement expressing concern about the recording of this statement (attached to the minutes). Rick Cowsill thanked the committee for reviewing the minutes in such detail. He indicated minutes should reflect what was said, and he is glad the committee is doing this, to keep everyone on their toes. In order to resolve this, Ken Cornelisse suggested that the phrase "well within" should be changed to "generally within". Ian Rawlings suggested that the minutes do reflect the points of refinement that wetland evaluations can be subject to. Erich Ritzmann suggested that "30 metre" should be "40 metre". Ron McKitrick emphasized that the concern is that errors could be plus or minus 40 metres in the wetland mapping presented in the report. It is important that people reading the report are aware of this, as the error could be as wide as the frontage of several urban lots.

Moved by Ron McKittrick

Seconded by Erich Ritzmann

THAT the Minutes of the Hespeler West Subwatersheds Study Working Committee meeting held January 15, 2004 be amended as follows:

- The second sentence in the second paragraph on Page 2 change “was well within the 30 metre” to “was generally within the 40 metre”
- The header on the second page be changed from “Meeting No. 3 Minutes December 18, 2003 to Meeting No. 4 Minutes January 15, 2004

And adopted as amended.

CARRIED

#### **4. Drainage Basins and Floodlines**

Presentation: Gus Rungis (Senior Water Resources Engineer, Grand River Conservation Authority) gave a presentation on flooding issues (attached to minutes), from the perspective of the Grand River Conservation Authority. He divided his talk into three sections: Hydrology, Hydraulics and Floodplain Mapping. There was discussion about the use of the Hurricane Hazel Storm as the Regional Storm event and how the Conservation Authority regulates this. The delineation of watershed/subcatchment boundaries was discussed with respect to techniques used and accuracies of scale. Gus Rungis explained that the information sources used to do this vary with respect to their level of accuracy. He then explained that the GAWSER model is used to generate evapotranspiration, runoff and infiltration numbers for the pre- and post-development scenarios. Model validation and simulation output (peak flows and flow rates) was shown. The hydraulic model used was HEC-RAS (commonly used in floodline work). The major output of this model is flood elevations and velocities. This information is then used to generate floodplain mapping. Accuracy depends on topography in the area, among other things. When there is a well-defined valley, the accuracy does not change much if there are discrepancies in hydrology/hydraulics inputs. However, in a relatively flat area, there can be interpolation differences between cross-sections and the hydrology/hydraulics inputs can result in bigger changes. The federal Flood Damage Reduction Program standards specify levels of accuracy. Refinements can be made to floodlines based on new/more detailed information or changes that have occurred. The statement on p. B-46 re overtopping of Briardean Road will be reviewed by Gus Rungis and explained at the next meeting. The refinement of the subcatchment line in the north end of the Middle Creek subwatershed will be done to recognize new information. A minimum area of land to determine floodlines is not prescribed in Conservation Authority regulations, but pragmatically, an upper limit is set based on different factors. It was pointed out that the assumptions about future development and non-development lands are very important in the final product. Gus Rungis also pointed out that monitoring of

change over time is important to see if development occurs as predicted. Erich Ritzmann had some questions about contributing areas (specifically subcatchment 2125). He had a report done by England Naylor Engineering (John Vasiga had it in his personal library) that gave details on some drainage work done here. Ian Rawlings spoke about modeling calibration used to validate the model. He wondered how many points of actual data were gathered. Gus responded he thought there were 3 data collection points. Ian Rawlings wondered if floodlines were “open files” like the wetland files of MNR. Gus responded that the GRCA would consider new information and adjustments could be made. The MGWA was concerned that pit extraction was not considered in floodplain calculation. Ken Cornelisse explained that this deals with groundwater and the study of hydrogeology. Gus Rungis indicated that the first half metre of soil is considered by GAWSER. Erich Ritzmann will put the MGWA questions into an e-mail to Gus Rungis to respond to at the next meeting.

### **5. Other Business**

- a) Tricia Rosa distributed scheduled area maps promised by Nancy Davy at the last meeting.
- b) Wendy Wright will put forward a future meeting schedule of what is coming up for the next few meetings.
- c) Follow-up list will be updated for the next meeting.

Erich Ritzmann motioned to adjourn.

Meeting adjourned at 5:30 p.m.

**Next meeting – Allan Reuter Seniors’ Centre – 3:30 to 5:30 pm, Feb. 19, 2004**

MGWA Review of Minutes for Jan 15th

The header on page 2 of the minutes reads ... meeting No.3 December 18, 2003. It should have read mtg 4, January 15, 2004.

Last meeting I suggested we quantify the general margin of error for the air photography interpretation methodology being used. This appears on page one of the minutes and reflects what was said: 40m. Numbers are important and I thank you for including it.

I would however like to speak on behalf of the MGWA regarding the following statement on page two of the minutes:

"... the information from the HWSS provided by Dougan and Associates was well within the 30m plus or minus level of accuracy that is expected of the wetland evaluations in the province."

The members of the MGWA who reviewed the minutes and the video, are not sure that this was really what had been said.

It seemed that that we said that the 1:10000 airphoto interpretation system was used for the HWSS. And that, that system could have errors of plus or minus 40m. We recap some of the known sources of error:

Pencil line of 1mm is equivalent to 10m of reality on 1:10,000 air photos. Plus digitization errors which could exceed that amount. Add to that yaw and pitch errors. Plus, Ken suggested height errors might add another 5% or so in scale errors.

Last meeting, Unit 2.13 was removed from the wetland classification. This unit was 40m at its widest point.

In September, we removed unit 2.11 from wetland classification. That unit was 90m at its widest point.

Furthermore, we observe that in a direct response to the question raised by Ron McKittrick, it had been stated that the original Study had not been done with ortho-imagery. It was made very clear that the (old) 1:10,000 scale air photos were used. For this technology, it was said that the possible error could be 40m, plus or minus.

The instances cited, are each readily visible from the road. If anything, they reflect errors that should have been caught prior to the finalization of the study. They weren't, and that is why we are here.

Plus or minus 40m accuracy reflects the discussion and it reflects precisely the type of error we seek refinement on.

And we invite you to reflect on the purpose of this Committee. Are we here to hand kudos to the work of a specific consultant? I would suggest, we are not here to criticize, or flatter any of the individuals who contributed to the Study. We are here precisely, because the results have not measured up to the standards of the people who live, work and own these lands. Democratic standards are the standards we are striving for in this working committee. If the work of the consultant had

measured up, then why do you suppose we are here?

Loaded statements which do not reflect the views and discussion of the working committee should not be used on the record.

...

It was moved that the minutes be adjusted, so that the wording "generally within the 40m plus or minus" be used instead. Everyone agreed that this wording more accurately reflects the discussion.

## Hespeler West Subwatersheds

### Flooding Issues

- how floodlines are determined

## Subwatershed Planning

- Resource management done on a watershed basis
- Done in advance of development
- Develop technical information – including floodplain analysis

# Floodplains

- Floodplain – an area, typically adjacent to a river system, which would be inundated by water during a major storm event.
- Floodlines – outer extent of the floodplain.
- Regulatory Floodplain – Floodplain resulting from a storm equivalent to Hurricane Hazel.
- 100 year floodplain – floodplain generated by a storm event with a one percent chance of being equaled or exceeded in any given year.
- Technical standards – MNR Technical Guide – River and Stream Systems: Flooding Hazard Limit

## Developing a floodplain from a rainfall pattern

Three main components to the work:

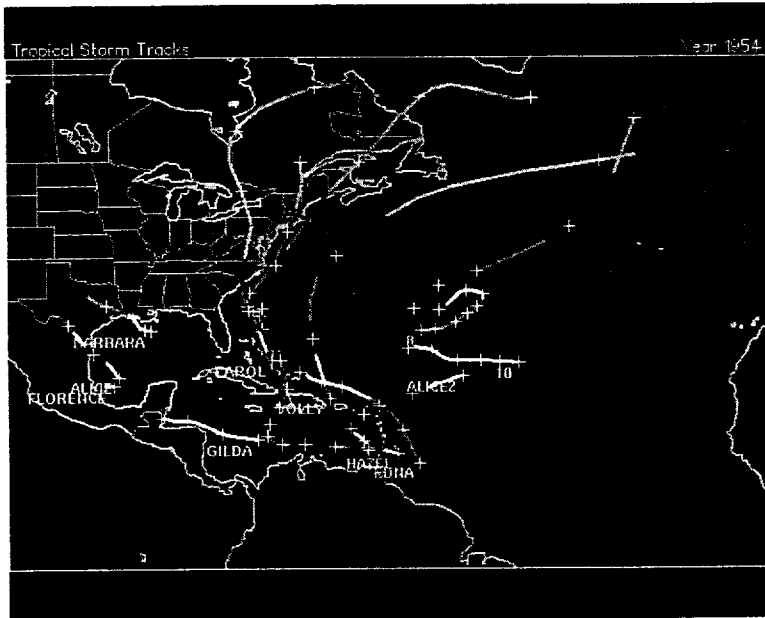
1. Hydrology – determining the flood flows
2. Hydraulics – determining the flood elevations
3. Floodplain Mapping – identifying the floodplain

## Hydrology

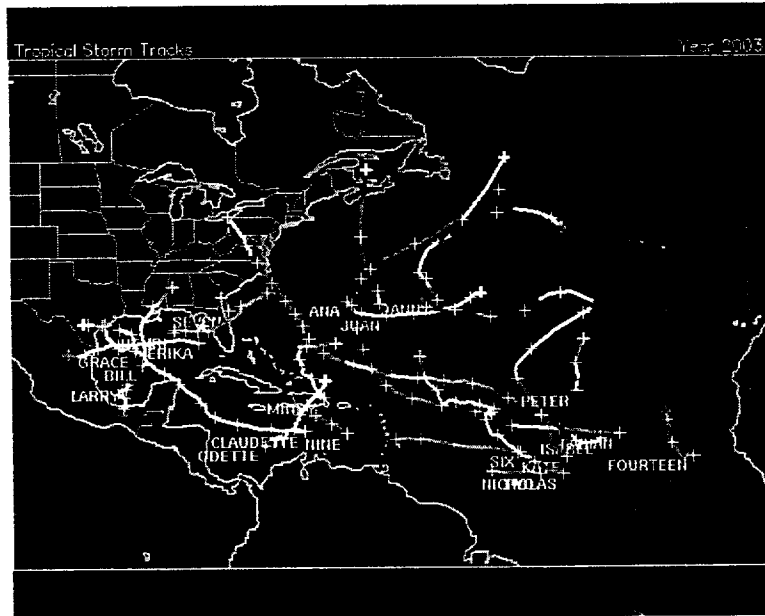
- Hydrologic models are used to convert the rainfall to runoff and generate flows for the area of interest
- GAWSER used in Hespeler West study
- Major inputs include – breakdown of drainage areas, rainfall, soil conditions, land use, drainage channel characteristics, storage areas,
- Major outputs – water balance, flow hydrographs, peak flood flows
- Models are calibrated based on observed stream flows, sensitivity analysis
- Hydrology work generally includes future land use considerations and control strategy including baseflow, stream erosion, and flooding concerns.

## Regional Storm

- Specified Rainfall event equivalent to Hurricane Hazel magnitude
- 285 mm of rainfall (11.2 inches) over 48 hours
- Specified rainfall pattern – 73mm first 36 hours, followed by hourly rainfalls of 6, 4, 6, 13, 17, 13, 23, 13, 13, 53, 38, and 13 mm.



<http://weather.unisys.com/hurricane/index.html>



<http://weather.unisys.com/hurricane/index.html>

## Watershed/Subcatchment Boundaries

- Height of land determining which way will the water flow
- From mapping (various scales and sources), other studies or information sources (hydrology studies, drainage studies), field inspection, survey.
- Subcatchments are delineated as required for flow outputs, hydrologic connections and characteristics, future changes.



GAWSER Modelling

Water balance results

Precipitation – 882mm

	Pre	Post
E/T	497	324 mm
Runoff	205	462 mm
Infil	179	97 mm

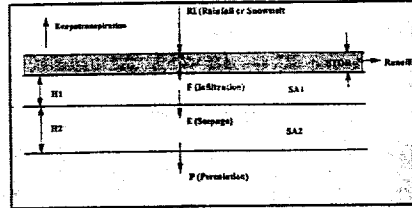


Figure 2.2.1a Two-layer soil concept for runoff generation model

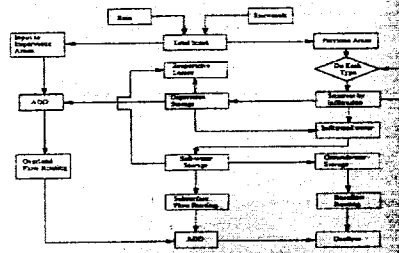


Figure 2.2.1b Flow chart of runoff generation processes in GAWSER

HWSS – Middle Creek at Speedville Rd

Figure 2.8.2 Flow Duration Curves Middle Creek Existing Conditions

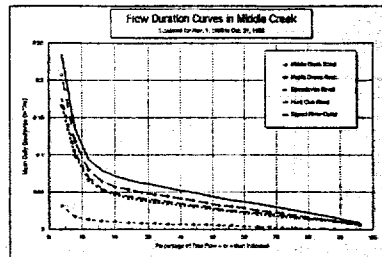
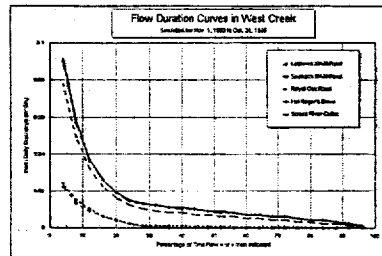
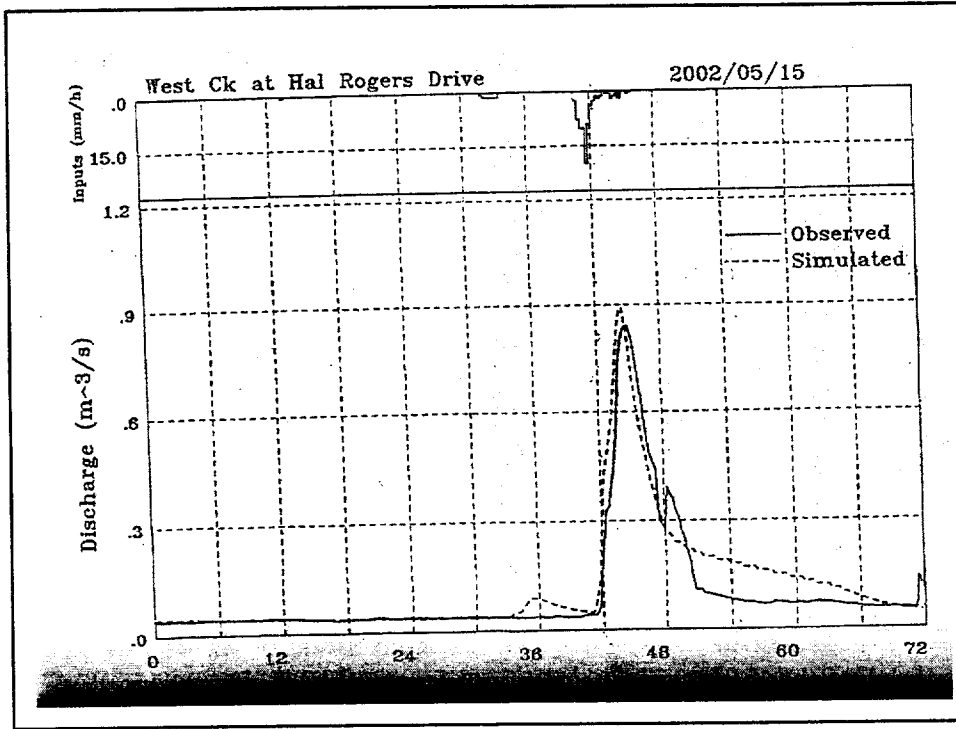


Figure 2.8.3 Flow Duration Curves West Creek Existing Conditions





Hesper West Subwatersheds Study  
Appendix D

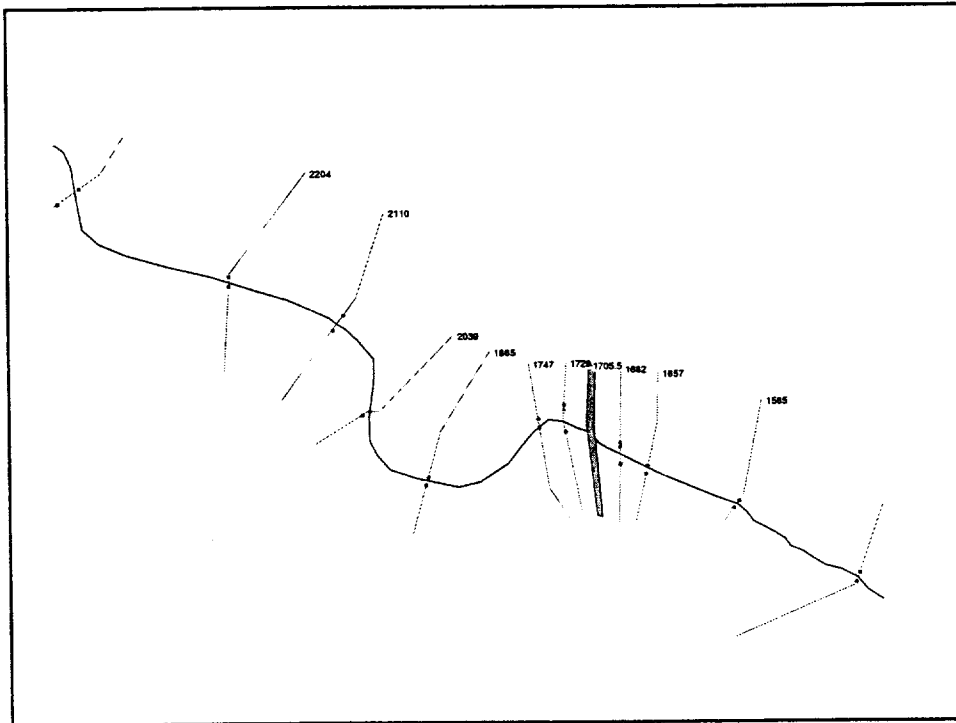
April, 2003

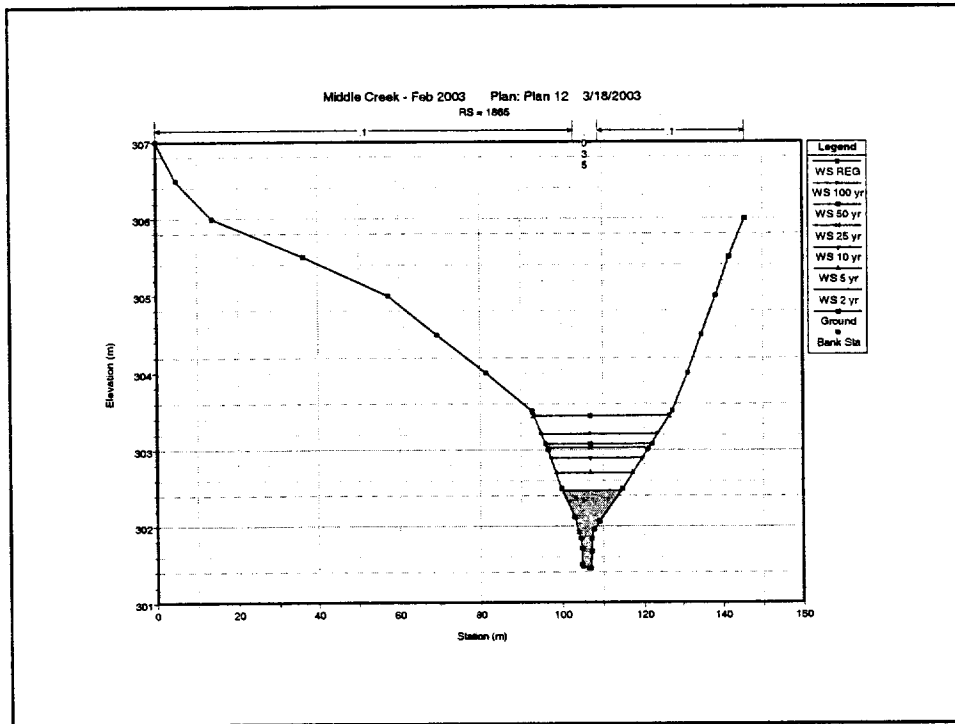
Table 3.4.6 Summary of Flood Flow Estimates: Hesper West Subwatersheds Study  
Scenario 3 (Ultimate with Controls)

No. Point of Interest	Area km <sup>2</sup>	Peak Flow (m <sup>3</sup> /s)							
		25 mm	1:2 yr	1:5	1:10	1:25	1:50	1:100	Req
1503 East Ck - Headwater Pond	0.309	0.039	0.064	0.089	0.289	0.777	0.930	1.370	2.866
1503 East Ck at Mohawk Road	0.384	0.047	0.072	0.100	0.359	1.050	1.252	1.890	3.940
1210 East Ck at Node 1213	0.302	0.047	0.072	0.100	0.359	1.050	1.250	1.890	4.712
1213 East Ck at Node 1213	1.279	0.036	0.268	1.300	2.298	3.240	3.640	5.060	9.240
1232 East Ck - Lower Wetland	1.023	0.011	0.027	0.095	0.191	0.291	0.856	2.460	7.970
1225 East Ck at Maple Grove Rd	1.332	0.038	0.219	1.190	2.270	3.130	3.580	5.070	9.170
1235 East Ck at Beaverdale Rd	1.607	0.085	0.295	1.630	3.400	4.980	5.540	8.200	22.200
1255 East Ck at Speed R outlet	1.764	0.150	0.377	2.210	2.260	3.450	3.800	4.500	19.800
2215 Middle Ck at Block Road	2.069	0.108	0.358	0.862	1.520	2.170	2.780	4.140	12.400
2228 Middle Ck at Station 11+25	2.285	0.115	0.366	0.902	1.613	2.310	2.780	4.140	12.400
2235 Middle Ck at Station 16+25	3.759	0.356	0.716	2.210	4.110	6.610	7.940	12.100	28.400
2240 Middle Ck at Node 2240	4.029	0.374	0.779	2.440	4.530	7.250	8.770	13.900	31.200
2245 Middle Ck at Maple Grove Rd	4.512	0.418	0.869	2.910	5.540	8.760	10.500	15.900	36.500
2260 Middle Ck at Briarclan Rd	4.894	0.440	1.070	3.160	6.490	10.300	12.300	18.500	40.900
2263 Middle Ck g/s Briarclan Rd	5.110	0.465	1.150	3.470	6.660	10.100	12.300	18.500	40.900
2265 Middle Ck - Inlet Farm Pond	5.314	0.477	1.130	3.470	6.660	10.500	12.860	19.400	42.400
2275 Middle Ck at Hunt Club Rd	5.860	0.478	0.863	3.340	6.580	10.500	12.860	19.400	42.400
2285 Middle Ck at Speed R Outlet	6.191	0.097	0.094	0.216	0.441	0.688	0.818	1.210	1.478
3501 West Ck - Loblaw SWP Pond	0.151	0.064	0.093	0.133	0.722	1.360	1.730	2.900	7.950
3502 Outlet Seaforth SWP Pond	2.686	0.111	0.116	0.799	1.990	3.613	3.620	5.440	8.620
3204 West Ck Start Toyota Divers.	0.848	0.127	0.233	1.010	2.420	3.930	4.590	5.880	8.620
3210 West Ck w/s ATD Site	0.114	0.044	0.057	0.134	0.459	0.842	1.070	1.790	1.430
3505 Outlet ATD SWP Pond	1.222	0.198	0.152	1.340	3.250	5.180	6.280	9.510	12.300
3235 West Ck at Royal Oak Rd	1.382	0.212	0.338	1.270	3.185	5.190	6.200	9.530	13.400
2245 West Ck at Hal Rogers Drive	1.403	0.220	0.349	1.270	3.190	5.210	6.310	9.700	13.500
3247 West Ck at Hal Rogers Drive	1.477	0.231	0.354	1.280	3.160	5.190	6.320	9.770	13.500
3255 West Ck at Speed R Outlet	1.477	0.231	0.354	1.280	3.160	5.190	6.320	9.770	13.500

## Hydraulics

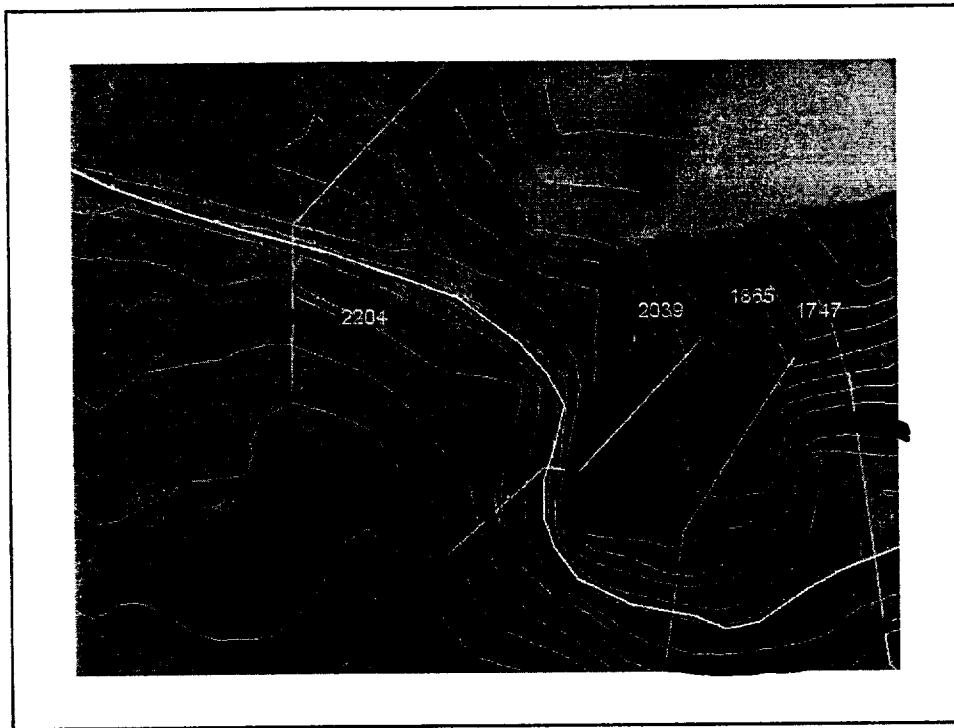
- Flood flows are converted to flood elevations
- Hydraulic model HEC-RAS is used
- Major inputs: flood flows, surveyed stream cross-section geometry, roughness, hydraulic structures
- Major outputs – flood elevations, velocities





## Floodplain Mapping

- Detailed topographic mapping developed to at least extent floodplain along watercourses
- Cross-sections plotted
- Floodplain interpolated between cross-sections based on flood elevations
- Can be done manually or automated



- Questions?