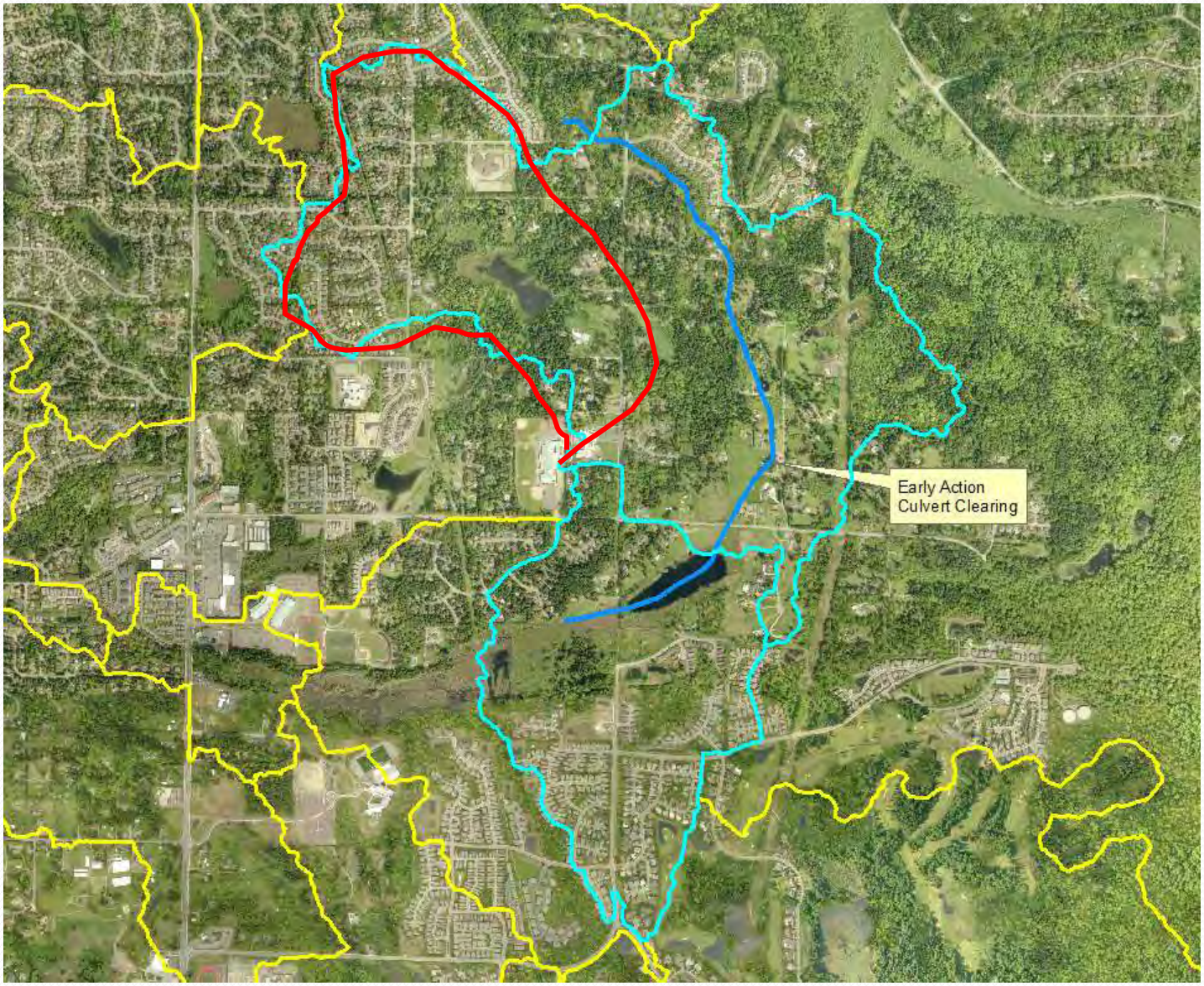
Allen Lake Outlet Tributary

Preliminary Results of Hydraulic Analysis

October 29, 2011

King County

Catchment Drainage Area



- Drainage Area totals 940 acres (286 + 654)

- Area circled in red most likely feeds into stream system downstream of 244th Ave. NE crossing (roughly 250 – 300 acres)

How big of flood was Dec 2010?

	Existing	Future
Return Period	1985	Unmitigat
(years)	(cfs)	(cfs)
2	8	15
10	15	26
25	19	31
100	24	39

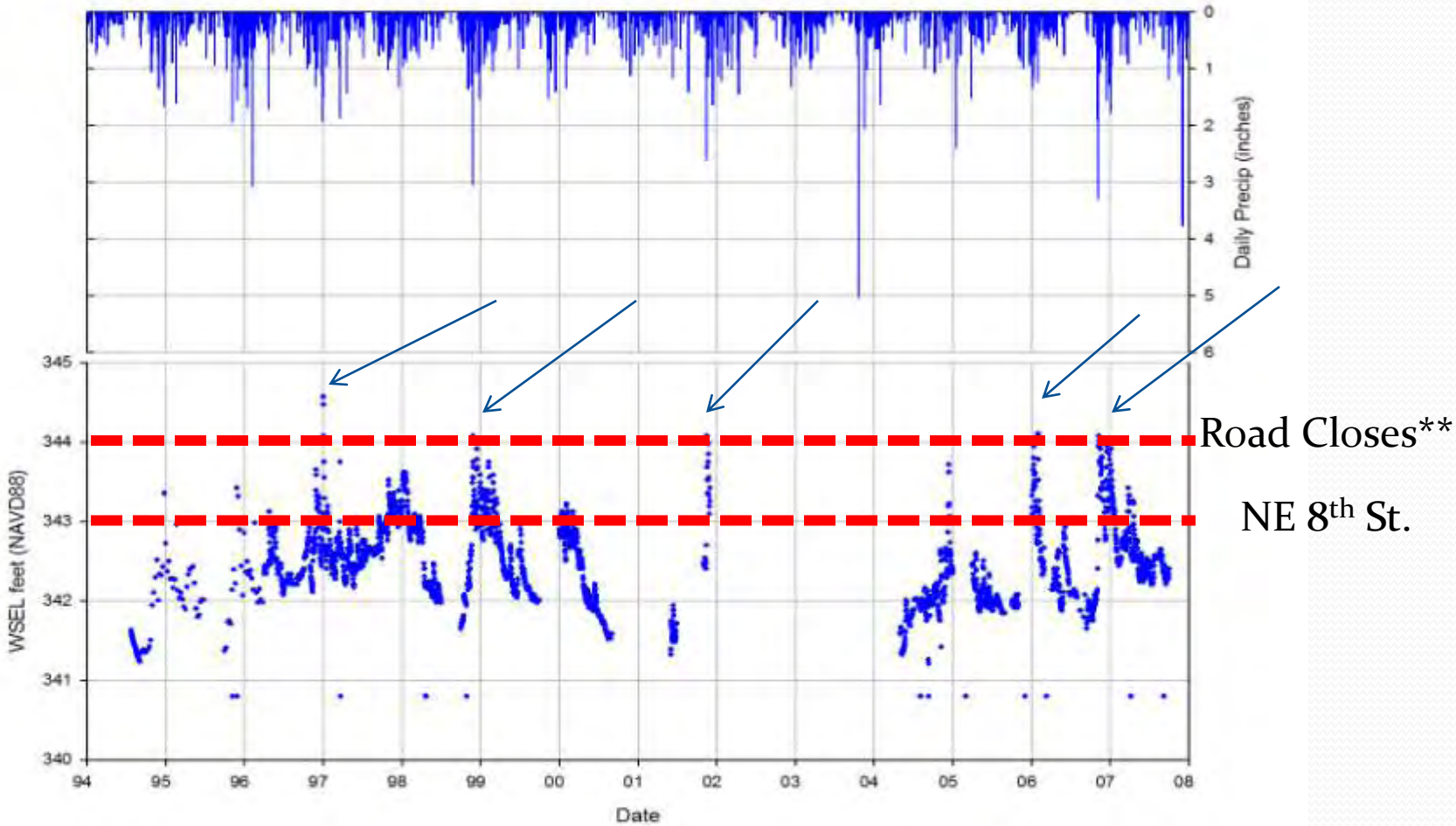
Using Bear Creek Current and Future Conditions Report (revised) Catchment E16 represents Allen Lake Outflows

- 2011 Conditions somewhere in between 1985 and Future conditions.

- December 2010 Event had a very rough estimate of 26~28 cfs (+/-) with NE 8th overtopped by about 18 inches

- For this study used range of 26 to 30 cfs for December 2010 event which is approximately a 10- to **25-year** event hedging towards future conditions, given 1985 is 25 years in the past.

Allen Lake Elevations*



Source: Burton

*Elevations are approximations

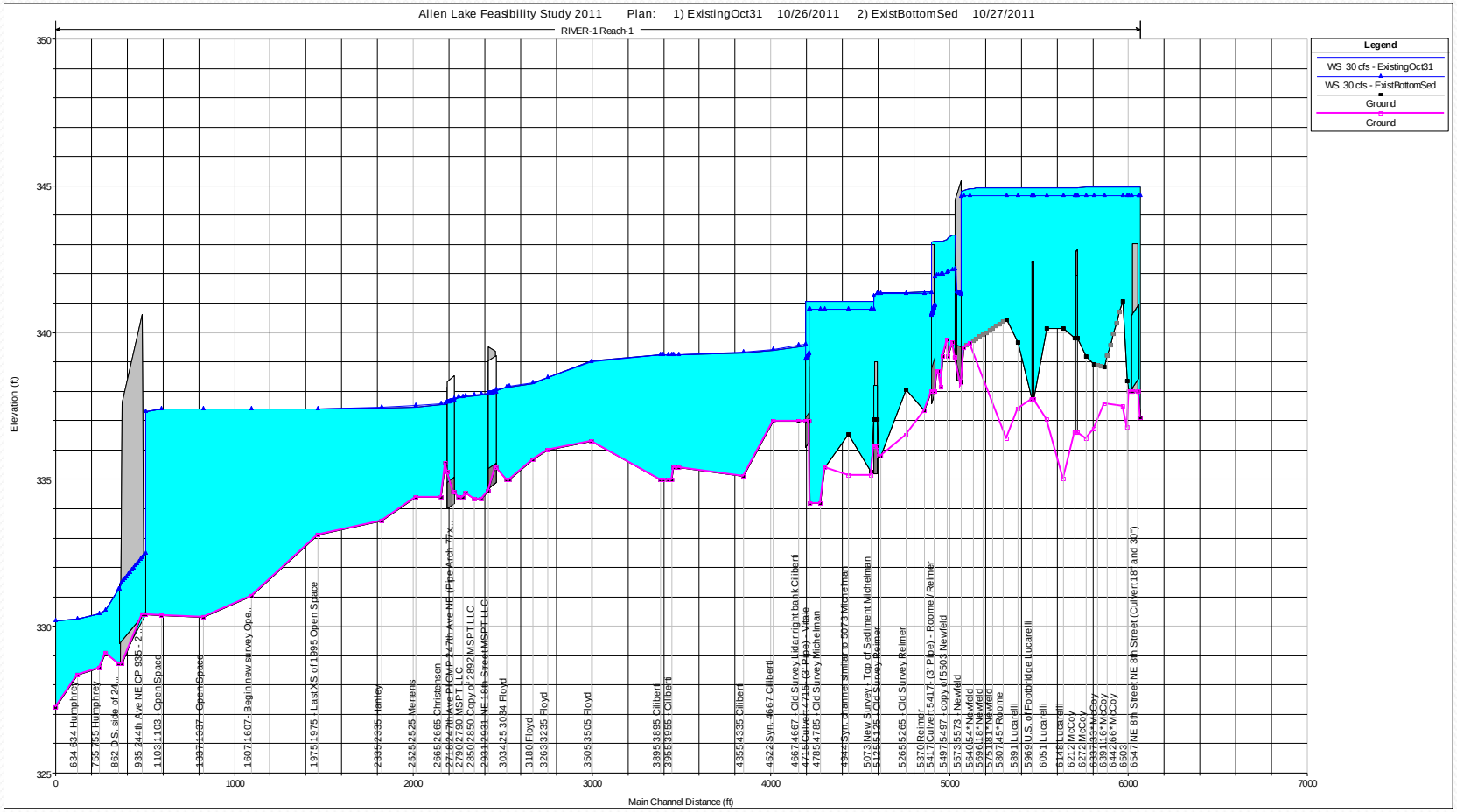
**Theoretically at 1-ft deep

Stream Alignment of Study Area

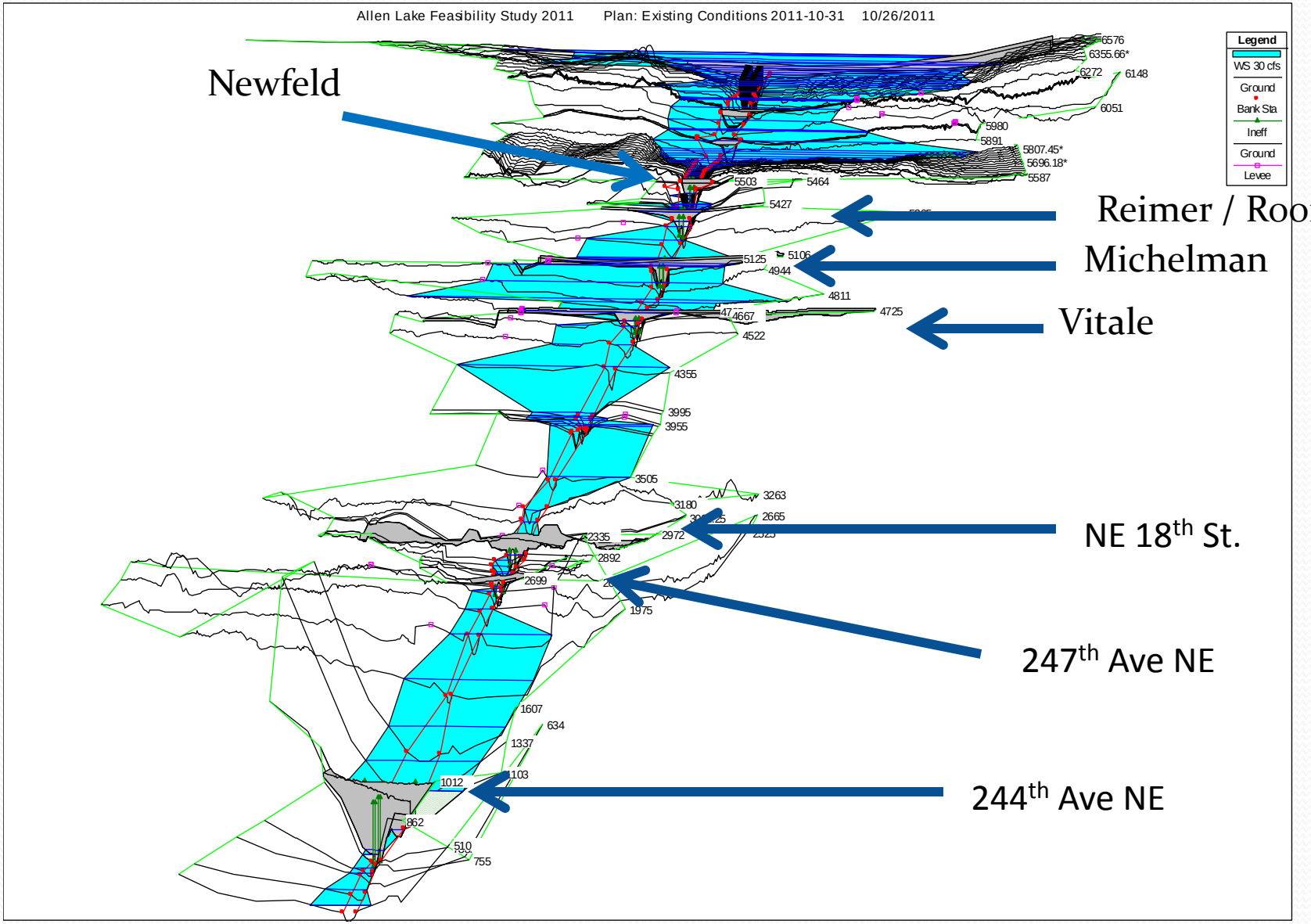
- Approximately 5500 feet of stream length between NE 8th St. and 244th Ave NE

Modeled Existing Conditions

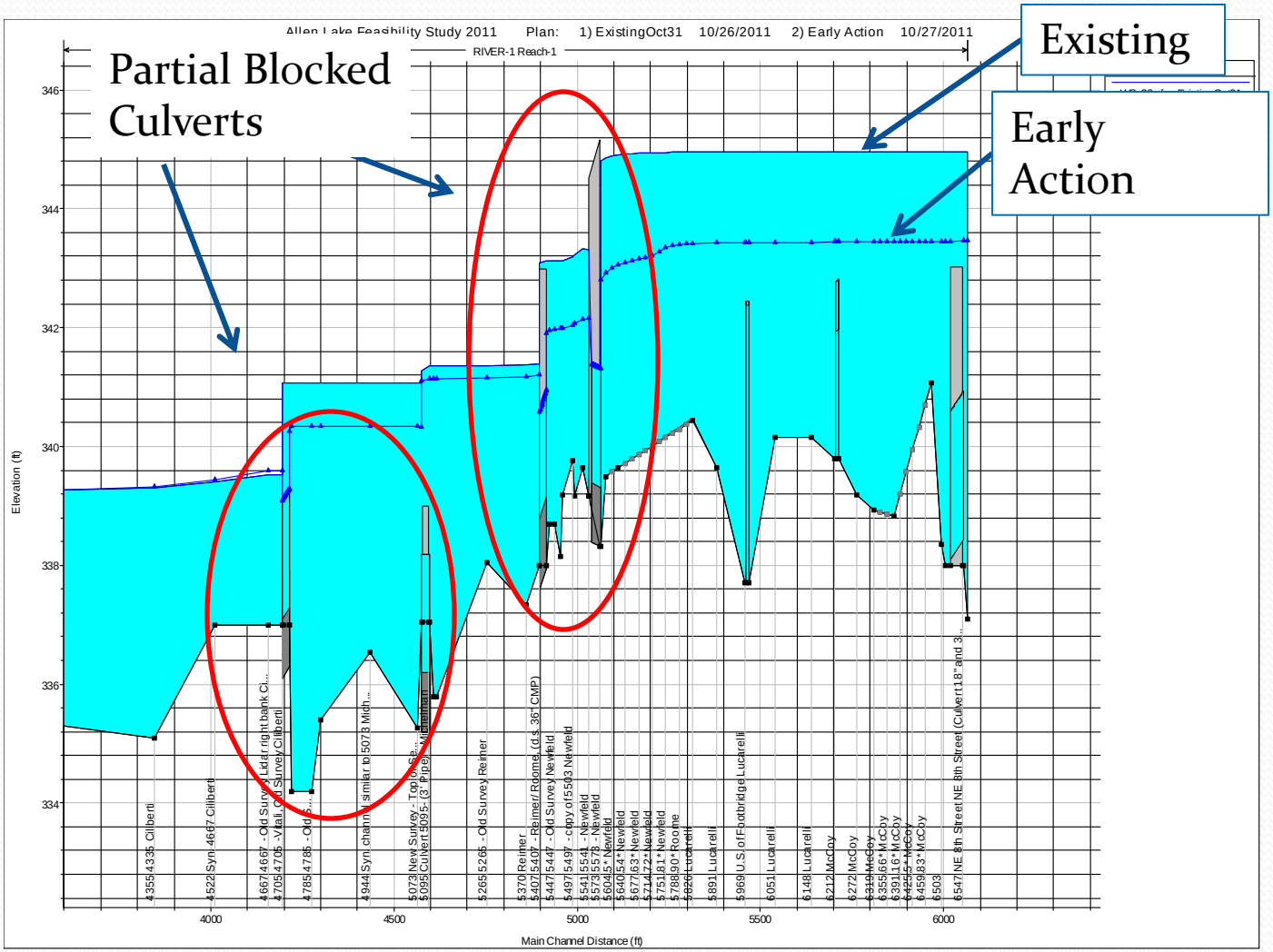
- At 30 cfs, NE 8th Street overtops approximately 24 inches
- At 27 cfs, NE 8th Street overtops approximately 18 inches
- Bottom of Sediment shown in Red, muck can be > 3 ft deep



Existing Conditions Flooding



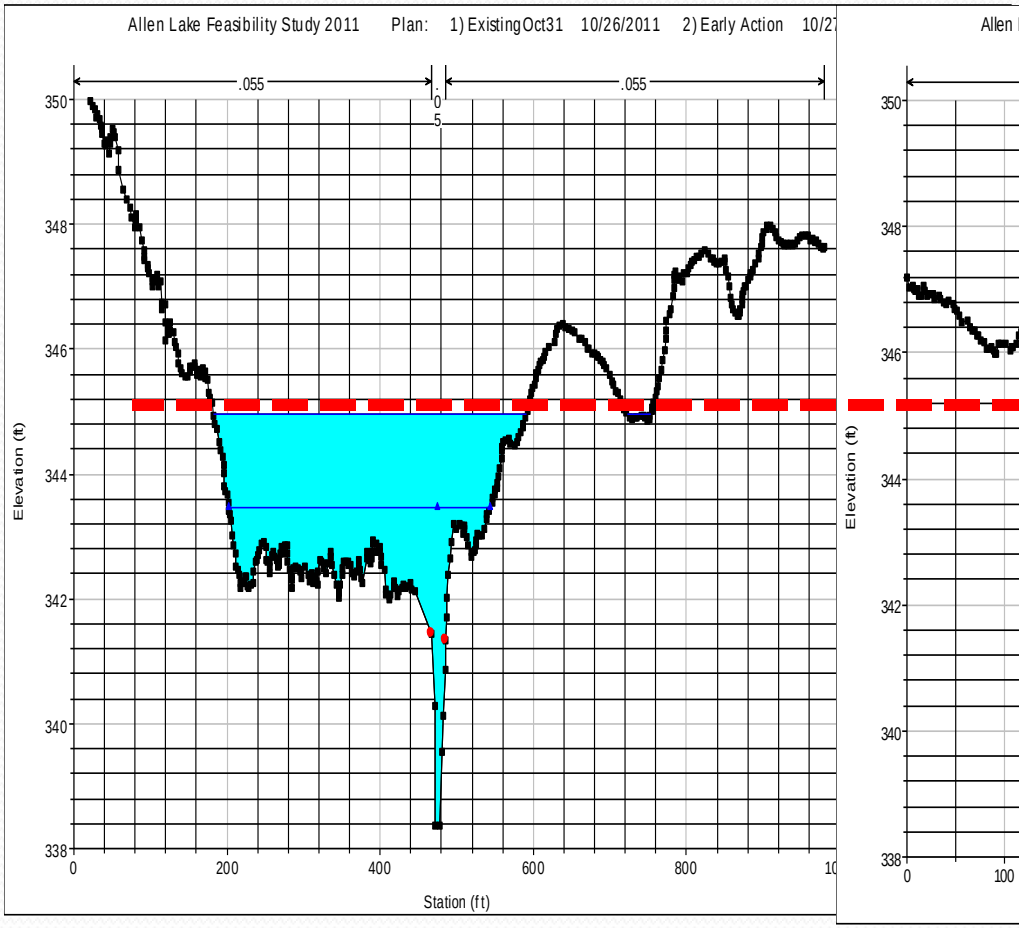
Existing Conditions & Effect of Early Action



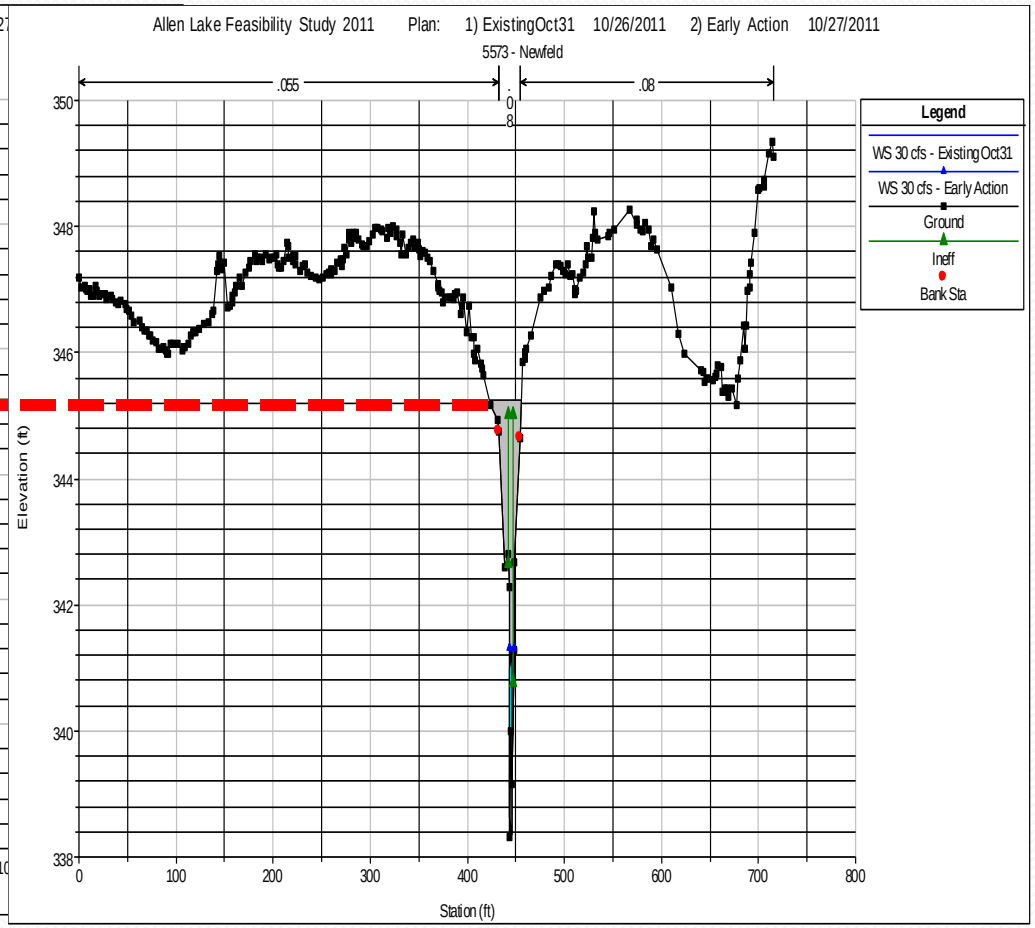
- Remove blockage in culverts, water depth over NE 8th St reduces from 24 inches to < 6 inches
- This is predicated on channel conveyances leading up to and exiting below are not significantly blocked.
- High point in channel will backwater NE 8th at lower flows (but not over the road)

Clearing channel vegetation is secondary in effectiveness because water can go overbank

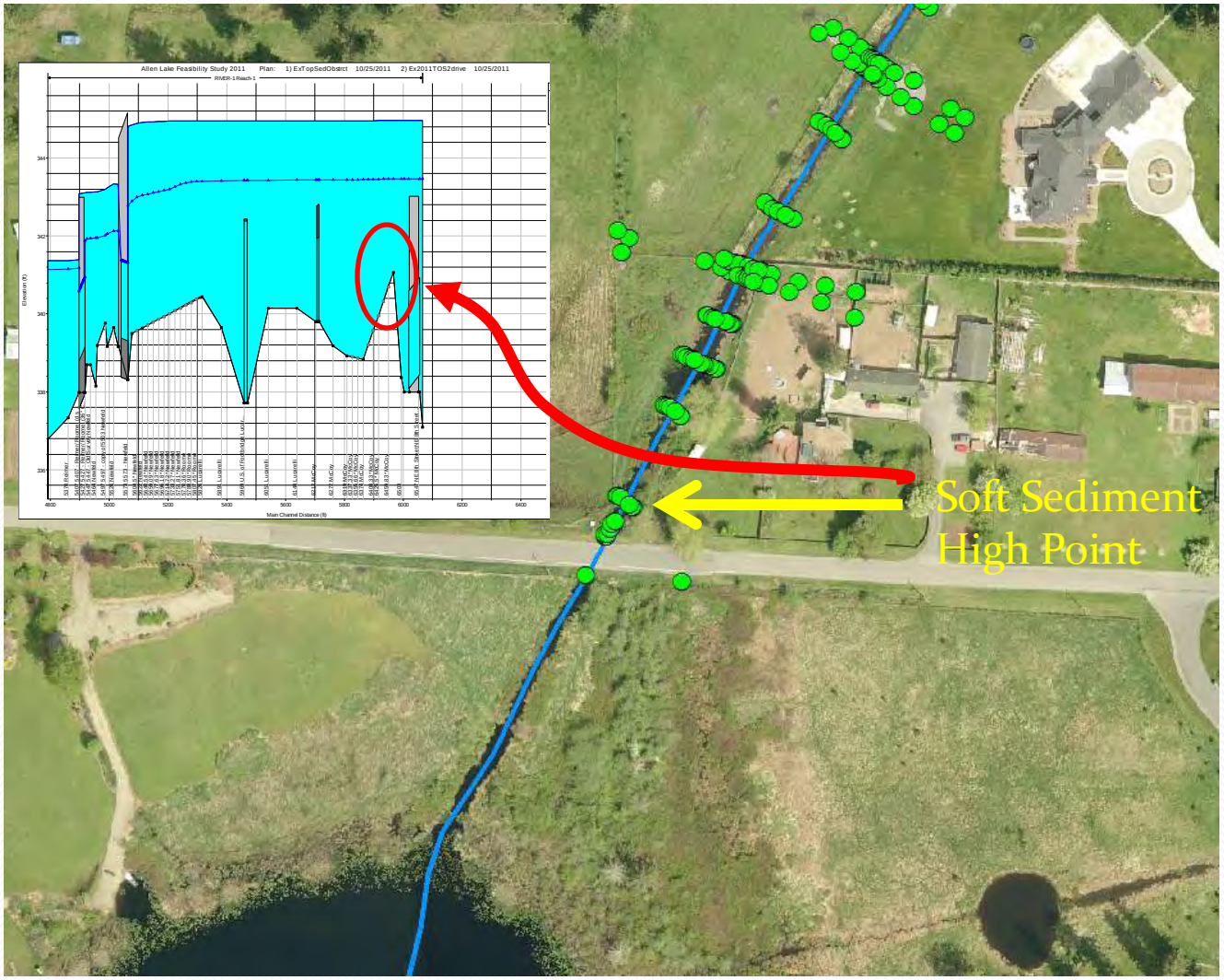
900 feet upstream



Newfeld farm bridge

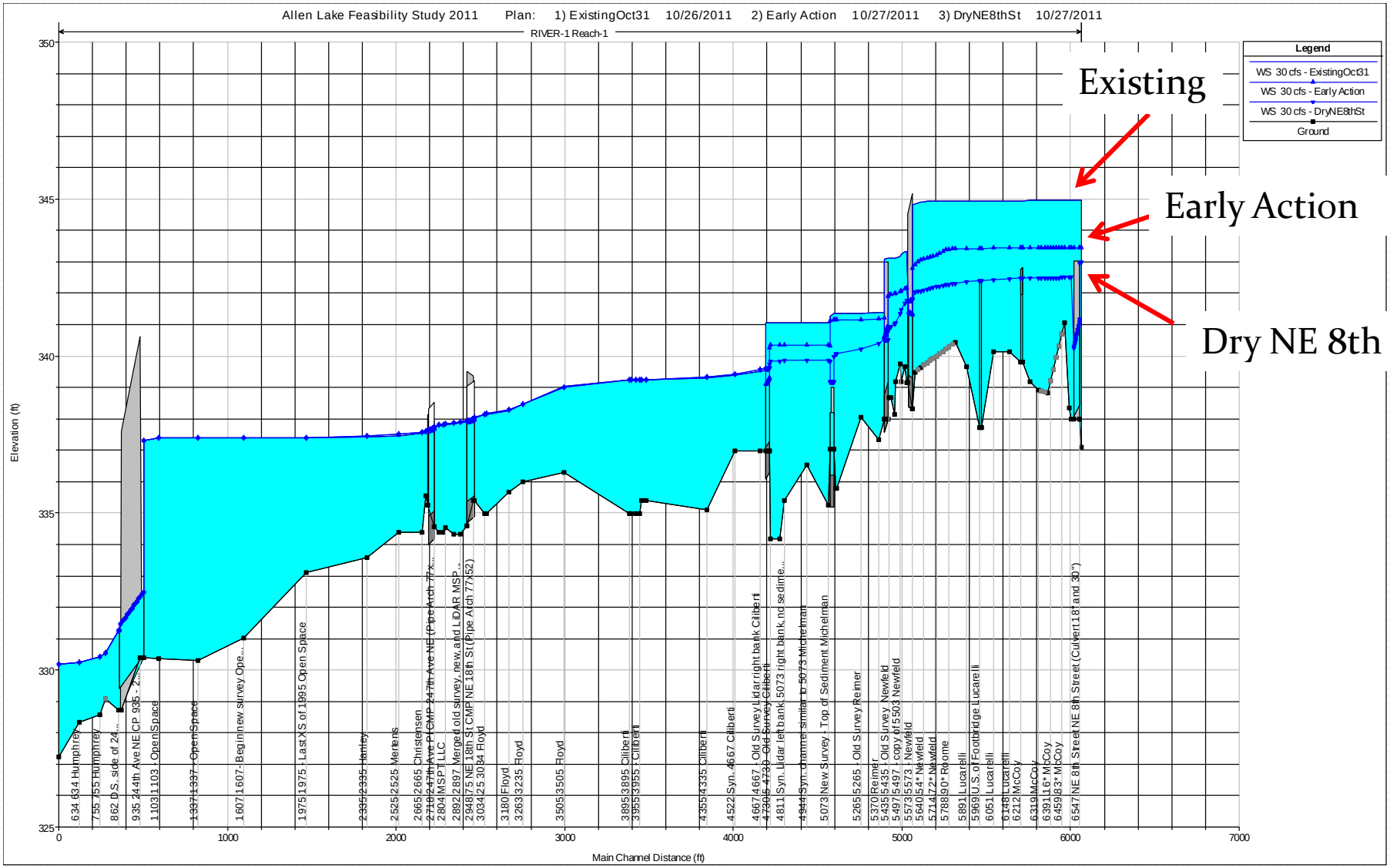


Low flow backwater conditions



A local high point (WSEL of 341 ft) in **soft** sediment deposition will back up culverts under NE 8th St, locally controls lake levels during low flow conditions, but **NOT** the cause of overtopping.

Existing, Early Action, Dry NE 8th St.



Summary

- Causes of NE 8th overtopping, are a combination of:
  - Partial culvert blockages and sediment filling in
  - Low gradient (slope) of stream system
  - Culvert capacities
  - Vegetation reducing stream conveyance capacity
- Existing Conditions (at 30 cfs)
  - Greater than 1.5 ft water over NE 8th St.
  - Sheet flows over Vitale driveway,
  - A few inches over Michelman's,
  - An inch or so over Reimer/Roome,
  - Not overtopping Newfeld
  - December 2010 event was approximately a 10 to 25 year event in magnitude.

Summary

Proposed Early Actions

Results: Less than 6 inches over NE 8th for that size event

- future 100-yr (39 cfs) overtops NE 8th approx. 1.5 ft,

Make NE 8th dry for that size of event (aka Dry NE 8th St.)

Results: NE 8th is dry (*barely!*) for that size event

- 100 year overtops a few inches

Results are preliminary.