

Hana Farm Base Flood Elevation Determination

Prepared By:

Ajay Jain, PE, CFM

Ralph C. Stark, Jr., P.E., C.F.M.



Project Location



Project Overview

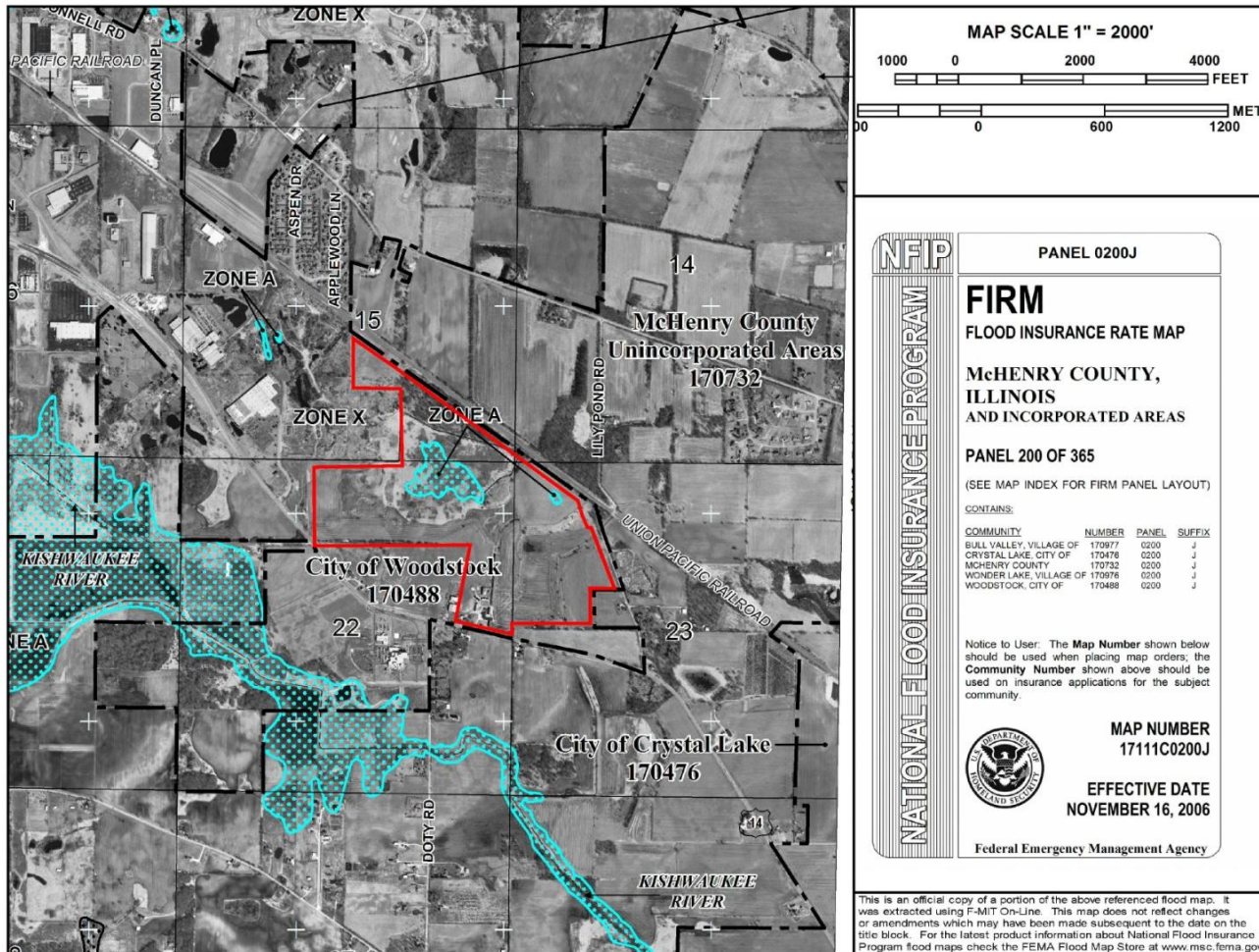
- ❖ Located in McHenry County, IL
- ❖ Consists of a series of interconnected depressional storage areas, two (2) zone A floodplains and isolated wetlands
- ❖ Tributary area to floodplains 430 acres with only 7.5 acres tributary to a smaller mapped floodplain
- ❖ Scope was to determine Base Flood Elevation (BFE) and obtain BFE certification
- ❖ Since tributary area > 20 acres and < 640 acres, BFE certification required from McHenry County Stormwater Committee (MCSC)

Goals and Objectives

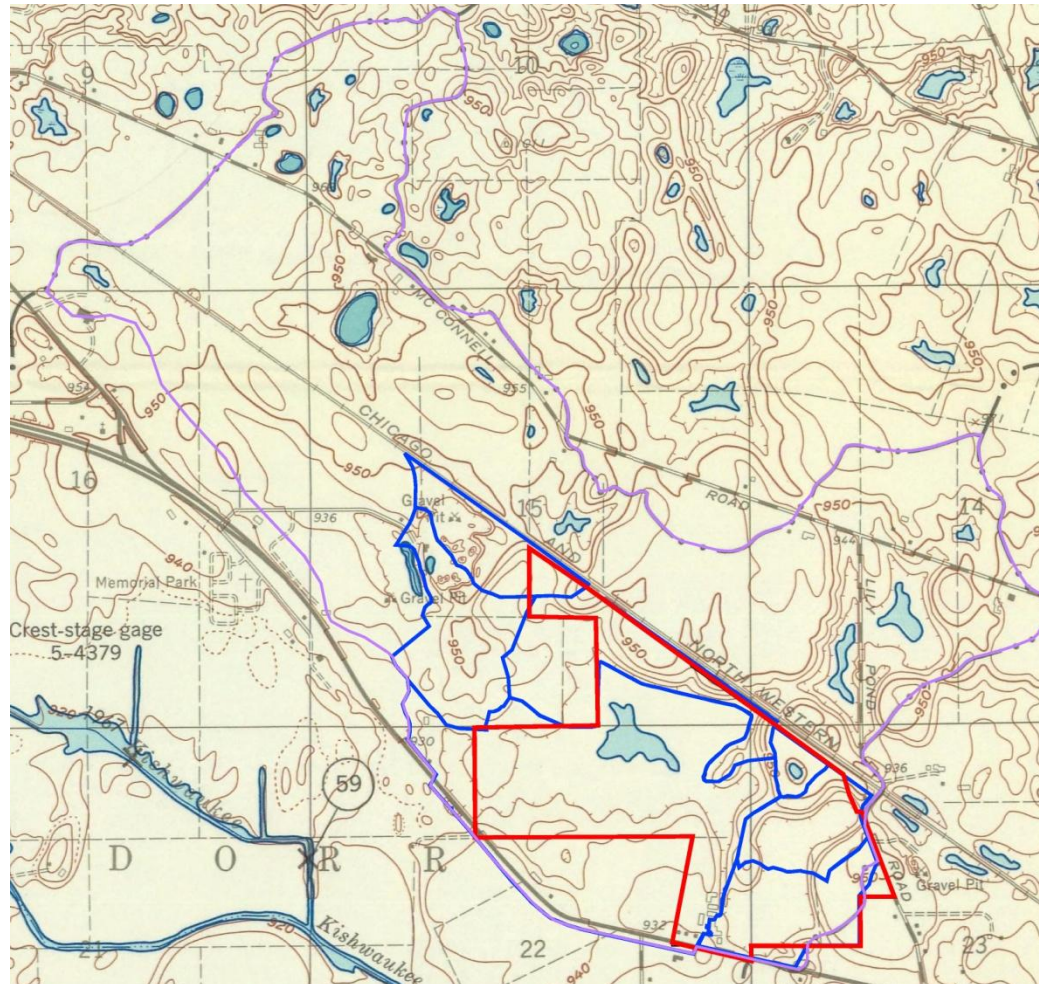
- ❖ Identify potential footprint of zone A floodplain
- ❖ Identify depressional storage volume on-site
- ❖ Identify regulatory requirements and potential development opportunities (is this site developable?)
- ❖ Obtain written BFE certification from MCSC
- ❖ End goal was to allow owner to market the property and foster development



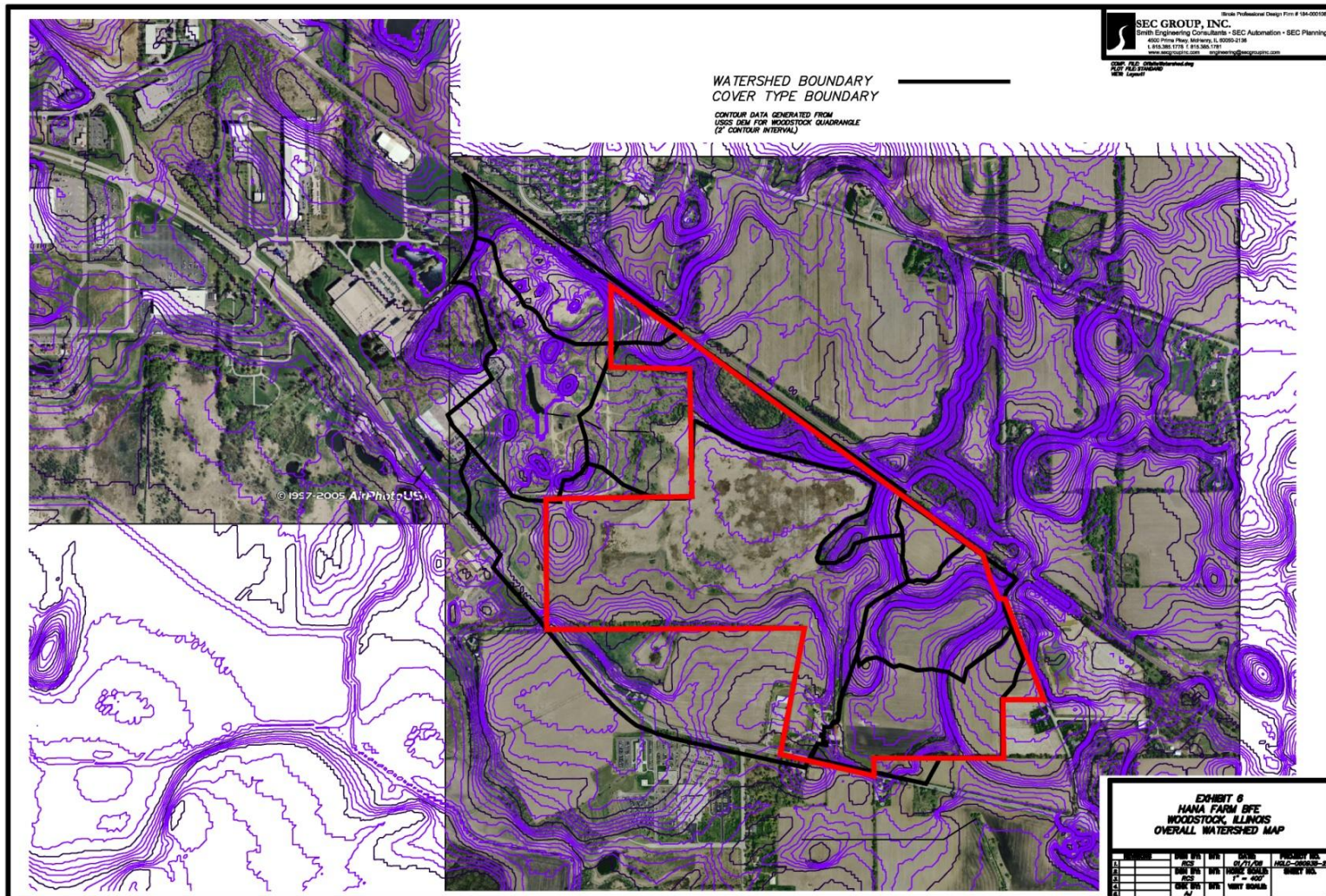
Floodplain Map

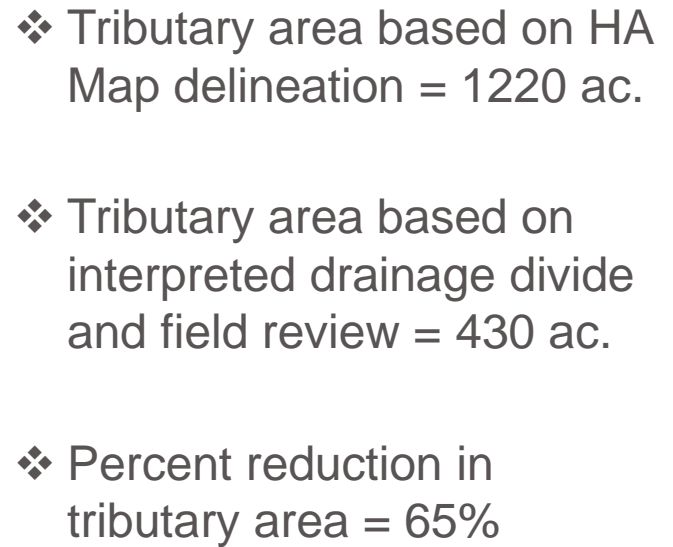


Hydrologic Investigation Atlas (HA) Map

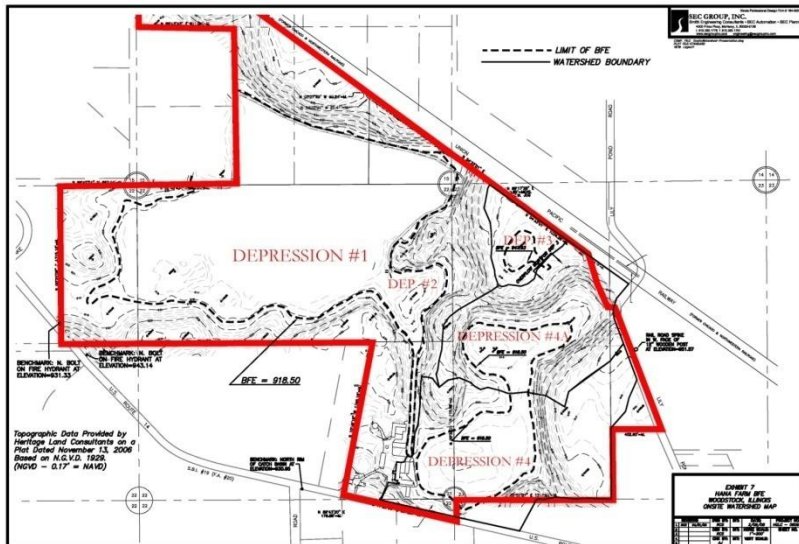


Overall tributary area map



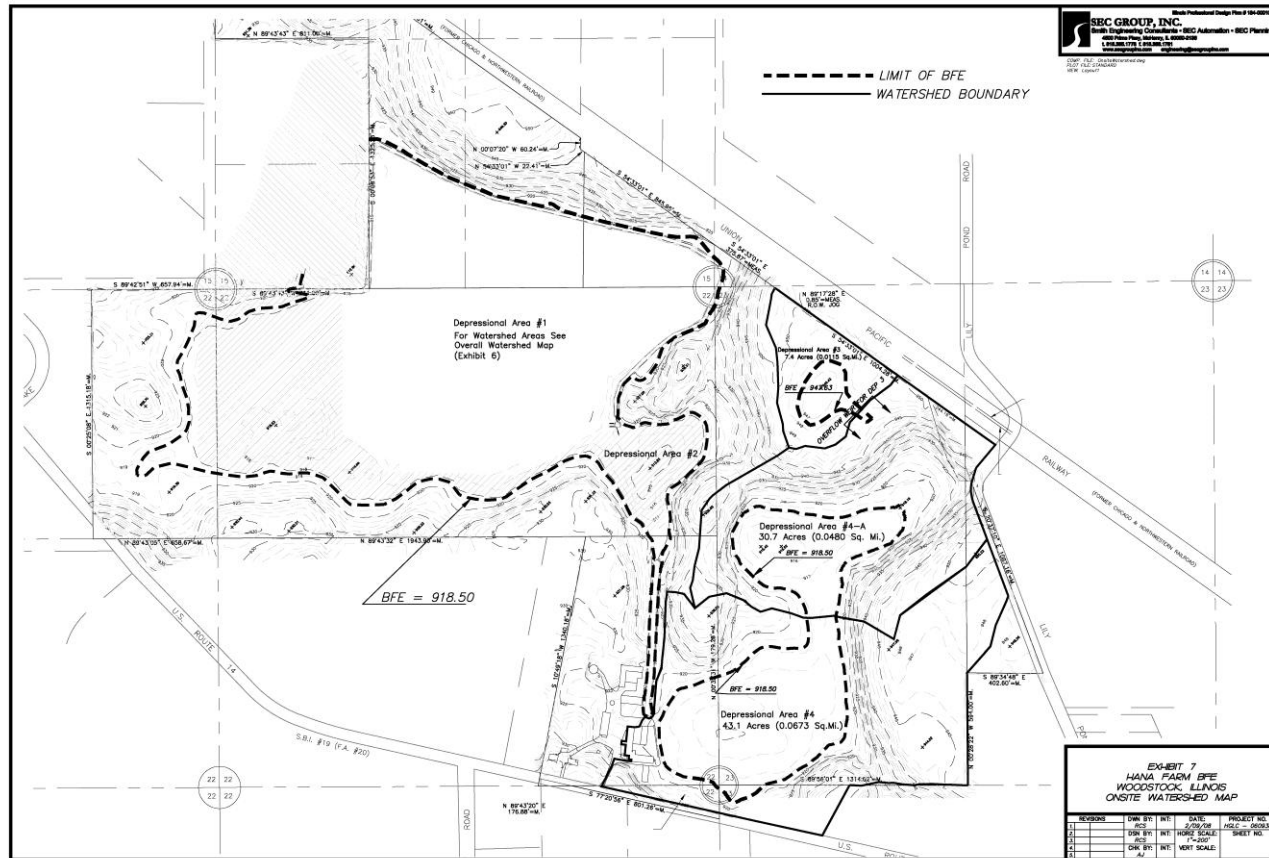






- ❖ Depression 1-4 interconnected via drain tiles and overflows
- ❖ Depression 1 forms the zone A floodplain and overflows into depression 2
- ❖ Depression area 2 interconnects with depression 4 with a drain tile
- ❖ Depression 3 is an isolated zone A floodplain in the northeast corner and overflows to depression area 4A
- ❖ Depression 4 and 4A are interconnected with drain tiles
- ❖ Depression 4 is ultimately drained via a 15" pipe with a 2 cfs capacity

BFE Modeling - Methodology



Site Conditions



Hydrologic Modeling Inputs

Summary of Hydrologic Modeling Inputs

Project: **Hana Farm**

Trib. ID	Area		RCN	Tc (hr)	Lag (hr)
	Ac.	Sq.Mi			
GRAV-N	31.7	0.0496	77	0.39	0.24
GRAV-S	50.8	0.0793	79.1	0.90	0.54
D1a	61.4	0.0960	61	0.50	0.30
D1	209.3	0.3271	73.7	0.24	0.14
D3	7.4	0.0115	78	0.36	0.22
D4a	30.7	0.0480	71.6	0.15	0.09
D4	43.1	0.0673	74.7	0.33	0.20



Modeling Methodology

Comparison of High Water Levels with Zero Flow out of Depression 1
for division of tile capacity between Depression 1 and Depression 4

2 Year Storms (HANAFARM.dat)

Duration	Dep 1	Dep 4	
3hr	914.35	915.83	Dep 4 exceeds Dep 1 - No outflow from Dep 1
6hr	914.51	916.02	Dep 4 exceeds Dep 1 - No outflow from Dep 1
12hr	914.71	916.13	Dep 4 exceeds Dep 1 - No outflow from Dep 1
24hr	914.95	916.34	Dep 4 exceeds Dep 1 - No outflow from Dep 1
48hr	915.09	916.44	Dep 4 exceeds Dep 1 - No outflow from Dep 1
72hr	915.27	916.47	Dep 4 exceeds Dep 1 - No outflow from Dep 1
120hr	915.63	916.52	Dep 4 exceeds Dep 1 - No outflow from Dep 1
240hr	916.00	916.15	Dep 4 exceeds Dep 1 - No outflow from Dep 1

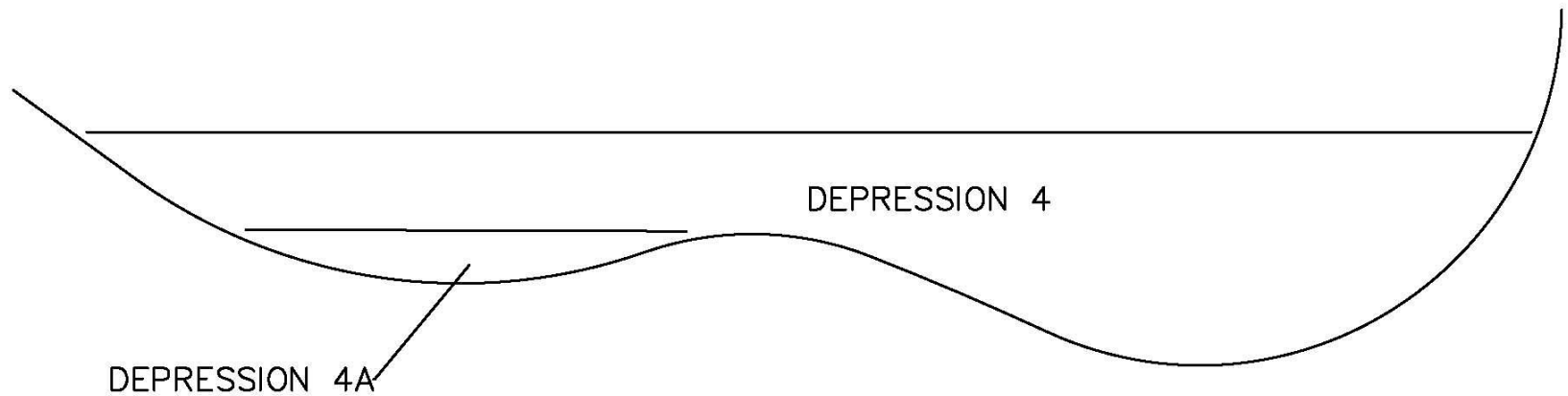
100 Year Storms (HANAFARM.dat)

Duration	Dep 1	Dep 4	
3hr	915.93	917.31	Dep 4 exceeds Dep 1 - No outflow from Dep 1
6hr	916.34	917.58	Dep 4 exceeds Dep 1 - No outflow from Dep 1
12hr	916.78	917.88	Dep 4 exceeds Dep 1 - No outflow from Dep 1
24hr	917.22	918.12	Dep 4 exceeds Dep 1 - No outflow from Dep 1
48hr	917.45	918.18	Dep 4 exceeds Dep 1 - No outflow from Dep 1
72hr	917.69	918.27	Dep 4 exceeds Dep 1 - No outflow from Dep 1
120hr	918.13	918.32	Dep 4 exceeds Dep 1 - No outflow from Dep 1
240hr	918.58	918.20	Dep 1 exceeds Dep 4 - Add outflow from Dep 1 to balance elevation

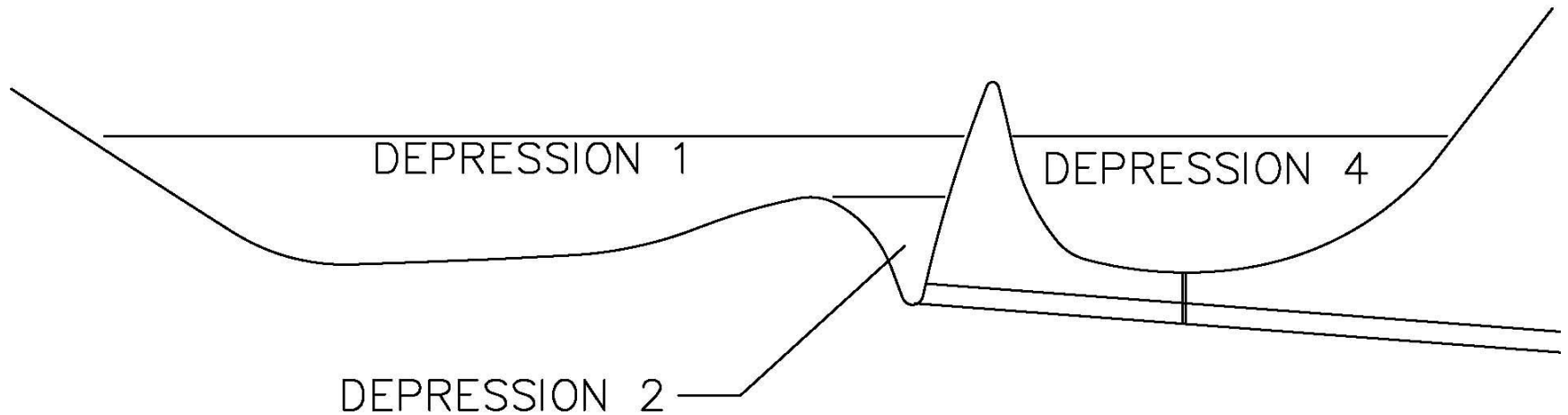
10 Day-100 Year Storm with outflow from Dep 1 (HANACRIT.dat)

	Dep1	Dep 4
240 hr	918.50	918.50
Critical Duration		

Modeling Methodology



Modeling Methodology



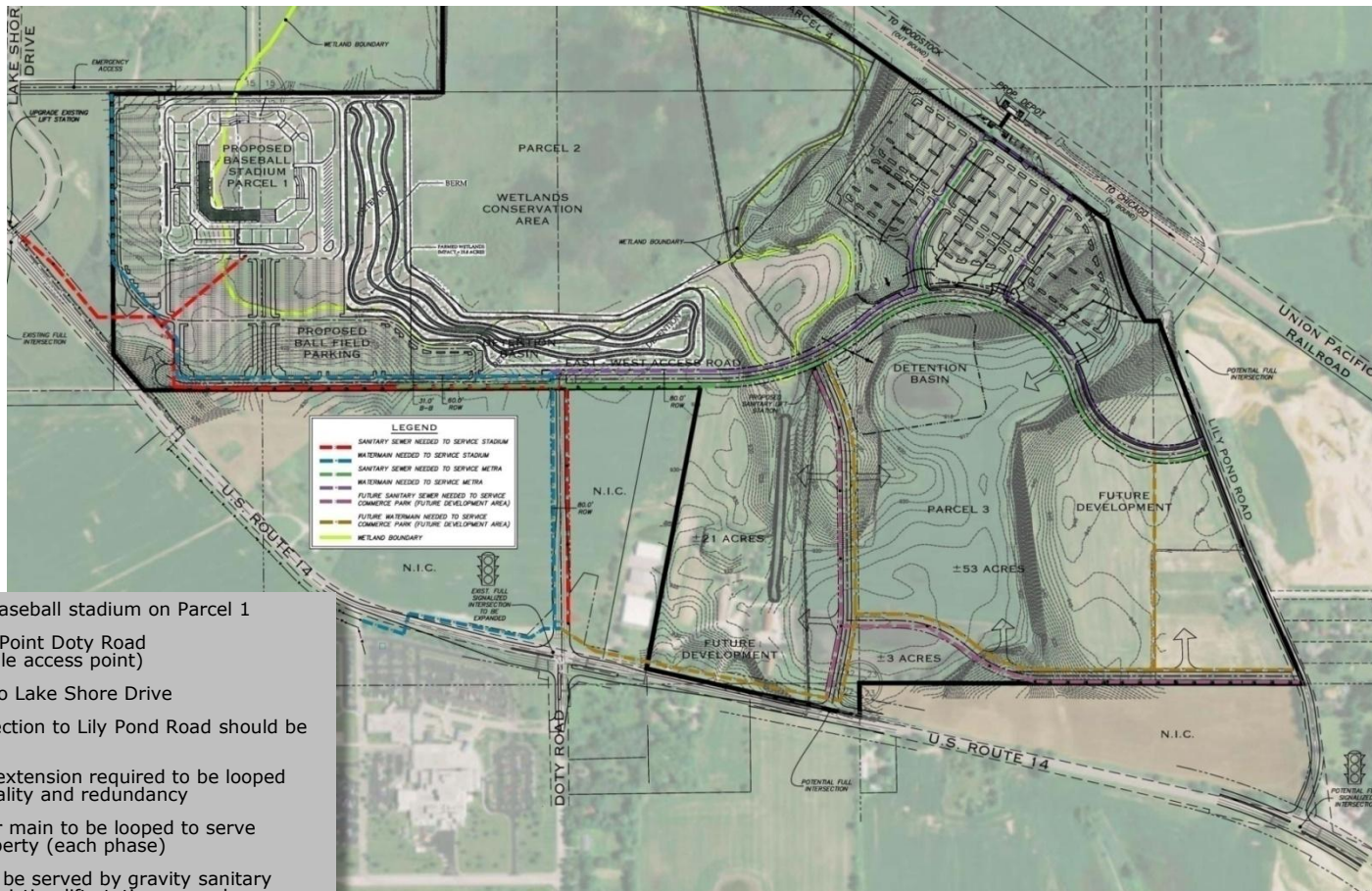
BFE Results

EXISTING CONDITIONS BASE FLOOD ELEVATION AT HANA FARM

BASIN	STORM EVENT	ELEVATION	VOLUME (Ac-Ft)
Area 1&2	100-Yr, 240-Hr	918.50	213.0
Area 3	100-Yr, 3-Hr	947.63	0.8
Area 4&4A	100-Yr, 240-Hr	918.50	34.6



Concept Development Plan



- 6,500 seat baseball stadium on Parcel 1
- Main Access Point Doty Road Extension (single access point)
- Fire Access to Lake Shore Drive
- Future connection to Lily Pond Road should be considered
- Water main extension required to be looped for water quality and redundancy
- Future Water main to be looped to serve easterly property (each phase)
- Stadium can be served by gravity sanitary sewer with existing lift station upgrades
- Future property will need lift station and additional gravity sewer for service