PRELIMINARY STORMWATER MANAGEMENT REPORT

PROJECT SITE:

THREE FLOYDS TAPROOM EXPANSION
MUNSTER, LAKE COUNTY, INDIANA

PREPARED FOR:

Three Floyds Brewing, LLC.
9750 Indiana Parkway
Munster, Indiana 46321

PREPARED BY:

V3 COMPANIES, LTD.
7325 JANES AVENUE
WOODRIDGE, ILLINOIS 60517
630.724.9200

SEPTEMBER 28, 2023

THREE FLOYDS TAPROOM EXPANSION

THREE FLOYDS TAPROOM
MUNSTER, LAKE COUNTY, INDIANA

Preliminary Stormwater Report
TABLE OF CONTENTS

SECTION 1: Project Overview

- Project Narrative
- Project Exhibits
  - Project Location Map
  - Aerial Map
  - USGS Topographic Map
  - FEMA FIRM MAP
  - Lake County Flood Zones Map
  - National Wetlands Inventory Map
  - Lake County Advanced Identification of Wetlands Map
  - Lake County Soils Map

SECTION 2: Stormwater Submittal

- Midwest Central Industrial Park Stormwater Plan
- NAVD 29 to NAVD 88 Conversion Calculation
- Midwest Central Industrial Park Runoff Coefficient
- Aerial Overlay Exhibit of Midwest Central Industrial Park (Exhibit 1)
- Existing Pervious/Impervious Area Exhibit –South of Superior (Exhibit 2)
- Existing Runoff Coefficient Calculation – Properties South of Superior
- Proposed Pervious/Impervious Area Exhibit – Three Floyds (Exhibit 3)
- Proposed Runoff Coefficient Calculation – Three Floyds

SECTION 1

THREE FLOYDS TAPROOM EXPANSION

MUNSTER, LAKE COUNTY, INDIANA

PROJECT OVERVIEW

The proposed Three Floyds Taproom Expansion is located along Indiana Parkway, within the Town of Munster in Lake County, Indiana. See Exhibit 1, Project Location Map. The subject property is on two parcels, separated by Indiana Parkway, totaling 8.37± acres of land (6.99 acres on the west and 1.38 acres on the east). Currently the properties are being utilized as the Three Floyds Brewery, associate parking lots, and vacant land. The proposed improvements are located on the southern third of the property on the west side of Indiana Parkway. The proposed improvements include building expansion to the existing taproom, outdoor patio/bar area, and outdoor lawn area enclosed by landscape berms. The proposed improvements will also involve reworking the existing parking area on the east side of the taproom.

EXISTING SITE CONDITION

The subject property is located within the Midwest Central Industrial Park (MCIP), and is bounded on the north by Superior Avenue, the east by Indiana Parkway, the west by a Town of Munster detention pond, and on the south by a School District bus facility. The site currently consists of the existing Three Floyds facilities, a gravel parking lot to the north, asphalt parking lot to the east, and vacant land to the south that was previously a woodworking facility. An expansion of the Three Floyds facility was completed in 2015 consisted of the distillery addition and parking lot on the east side of Indiana Parkway

The site generally drains through storm sewers and surface runoff that discharge into the detention pond on the west side of the Three Floyds property. The detention basin is interconnected with another basin to the north. And both are controlled and drained by and existing stormwater pump station north of Superior Avenue that is owned and operated by Hammond Sanitary District. The water is pumped west under the railroad, and continues draining west, ultimately tributary to The Little Calumet River. The existing stormwater management was designed for the full buildout of the overall MCIP. See Exhibits in Section 2 of this report.

Based on review of the FEMA Flood Insurance Rate Map, the entire site is located within the 500-year floodplain. An exhibit has been included at the end of this section showing the floodplain limits.

Location, Wetland, Hydrologic, and Soil Survey Exhibits are attached for reference.

PROPOSED SITE CONDITION

The proposed improvements will include a building expansion, outdoor patio/bar area, lawn area enclosed by landscaped berms, and reworking the existing parking east of the taproom. The site is located on Indiana parkway within Lake County, Indiana. The Town of Munster will manage the stormwater review and approval process.

In the proposed condition the site will continue to be tributary to the existing detention basin to the west. Existing drainage patterns will be maintained and the proposed site will be routed through storm sewer which will directly discharge into the basin.

Site Runoff Requirement

The site storm sewer will be designed to convey runoff up to and including the 10-year storm event. Existing emergency overland overflow routes to the existing detention will be maintained in the proposed condition.

Site Detention Requirement

The Town of Munster has provided historical documents that show the original stormwater plan and design for the Midwest Central Industrial Park prepared by Mackie Consultants Inc. (See Exhibit in Section 2). This document indicated that the MCIP has an overall drainage area of 191 acres. Two detention basins were designed, one northwest of Three Floyds that has a volume of 30.0 ac-ft, and one directly west of Three Floyds that has a volume of 19.7 ac-ft. Both basins have a high-water level of 612.0. The original MCIP stormwater plan was based on NAVD29 elevations. Current topographic surveys are based on NAVD88 elevations. Therefore, the HWL of the detention basins have been converted to an elevation of 611.68 to be consistent with the current survey. See NAVD29 to NAVD88 conversation calculation provided in Section 2.

The original stormwater management design for the MCIP was based on a runoff coefficient of 0.80 for the entire property in a fully developed condition. See MCIP stormwater Plan in Section 2. In our opinion, the 0.80 runoff coefficient is based on 75% impervious coverage and 25% pervious coverage, site runoff coefficients of 0.95 and 0.35 respectively, resulting in a composite C factor of 0.80. See MCIP Runoff Coefficient calculation provided in Section 2. An Aerial Overlay Exhibit of the MCIP Stormwater Routing Plan is provide in Section 2 and shows the extents of the land area that was included in the original design, and the land coverage (pervious and impervious area). In our opinion, there is much less impervious area than originally planned for the Industrial Park. This results in less stormwater runoff to the detention basins, and thereby an excess of detention in the basins.

The portion of the Industrial Park south of Superior Avenue was analyzed in greater detail to determine the amount of pervious/impervious area that exists today in this portion of the park. It was determined that this area of the Industrial Park is approximately 74.46 acres. Using aerial imagery, the pervious/impervious cover for this area was calculated. It was determined that approximately 48.7% of this area is impervious and 51.3% is pervious. In existing conditions, this area of the Industrial Park has a composite runoff coefficient of approximately 0.64. These calculations show that the detention basin has excess capacity based on existing land coverage, and that approximately 19.6 acres of impervious area could be added based on the original stormwater design. See exhibits and calculations included in Section 2.

The proposed Three Floyds site will have approximately 3.88 acres of pervious area (46%) and approximately 4.49 acres of impervious area (54%); resulting in a composite runoff coefficient of 0.67. An exhibit showing pervious/impervious areas for the Three Floyds site and the resulting runoff coefficient is included in Section 2.

The proposed impervious coverage (54%) and runoff coefficient (0.67) are within the allowable parameters of the original stormwater management design (75% an 0.80). Therefore, stormwater management for the proposed improvements are adequately provided for in the MCIP stormwater management system.

Erosion Control

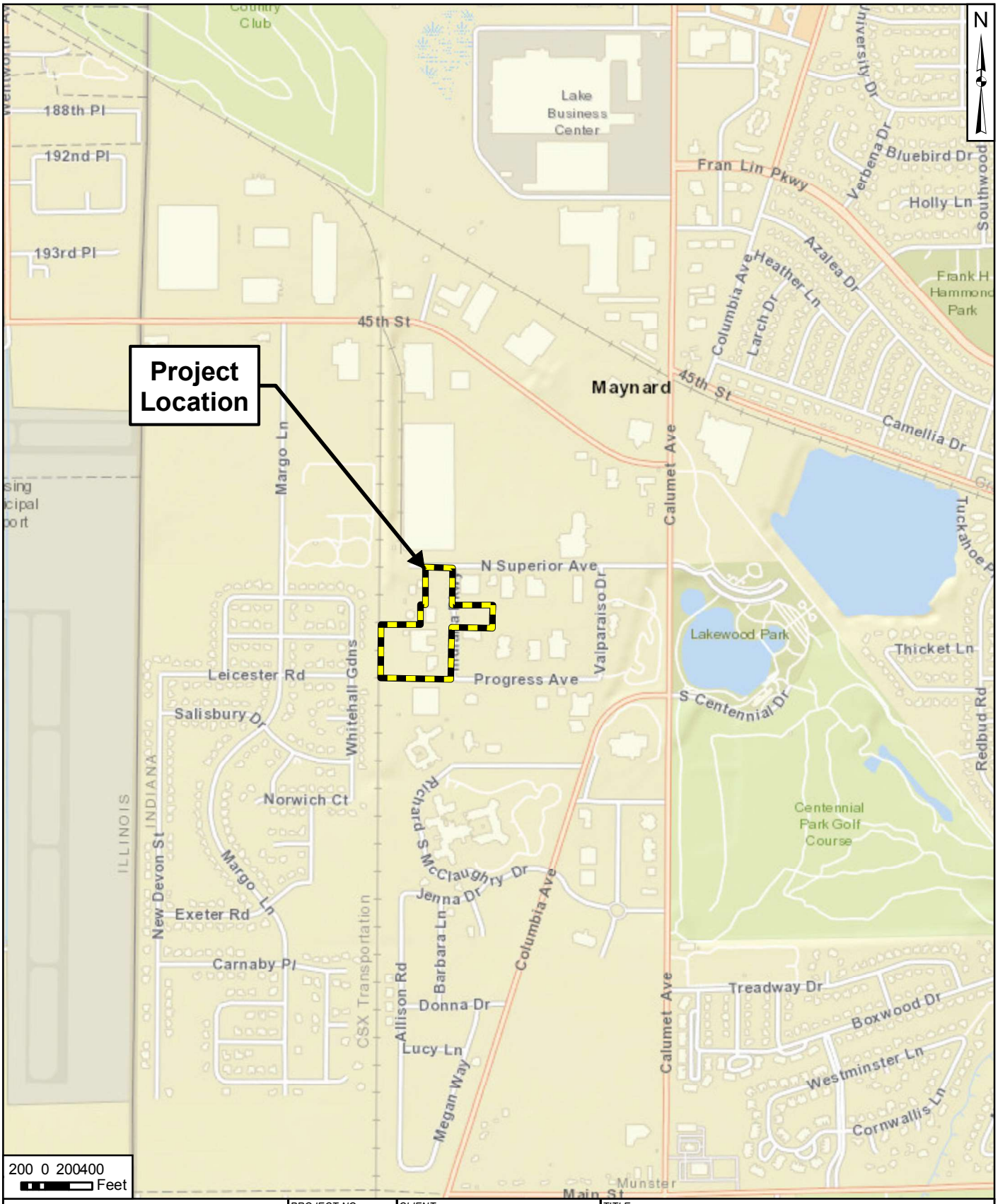
Erosion and sediment will be controlled during construction using silt fence, stabilized construction entrances, erosion control blanket, and other methods that will be indicated in detail on the final engineering plans and in the Stormwater Pollution Prevention Plan (SWPPP). Measures will remain in place and shall be maintained until the site has been stabilized. Within thirty days of disturbed areas being permanently stabilized, temporary erosion control measures shall be removed from the site.

Best Management Practices (BMPs)

All of the stormwater runoff from the site is tributary to the existing MCIP stormwater management system., which was designed for the entire Industrial Park in a fully developed condition. The existing detention basin generally have flat bottoms with native vegetation that is below the outlet elevation of the basin. This condition promotes infiltration, removes suspended solids and other pollutants from stormwater, and thereby provides the required water quality BMPs.

Conclusion

In our opinion, all stormwater detention and water quality requirements have been met in the existing MCIP detention basins and stormwater management system, which was originally designed for the full buildout of the 191.0-acre Industrial Park.



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Woodridge, Illinois 60517
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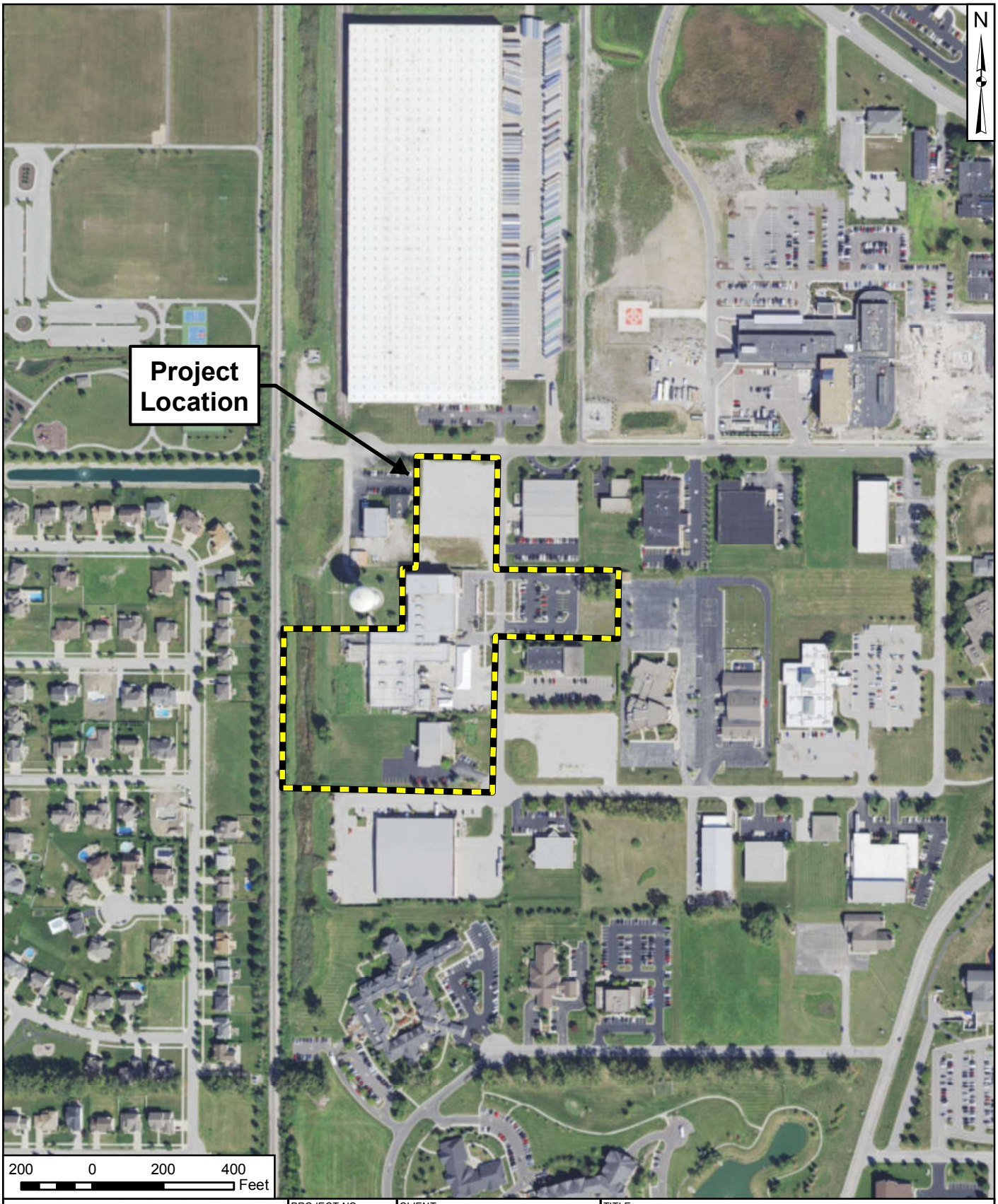
630.724.9202 fax
www.v3co.com

Visio, Vertere, Virtute...
"The Vision To Transform with Excellence"

PROJECT NO.:	17265
CREATED BY:	RMS
DATE:	11/29/2017
SCALE:	See Scale Bar
CLIENT:	Three Floyds 9750 Indiana Pkwy Munster, Indiana 46321
BASE LAYER:	ESRI World Street Map
TITLE:	**PROJECT LOCATION MAP**
SITE:	Three Floyds Expansion Munster, Indiana
EXHIBIT	1

N:\2017\17265\Drawings\ArcGIS\LD\EX1loc17265.mxd



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PROJECT NO.: 17265	CLIENT: Three Floyds 9750 Indiana Pkwy Munster, Indiana 46321	TITLE: **AERIAL MAP**	
CREATED BY: RMS			
DATE: 11/29/2017	BASE LAYER: DigitalGlobe Aerial Imagery (2016)	SITE: Three Floyds Expansion Munster, Indiana	EXHIBIT 2
SCALE: See Scale Bar			

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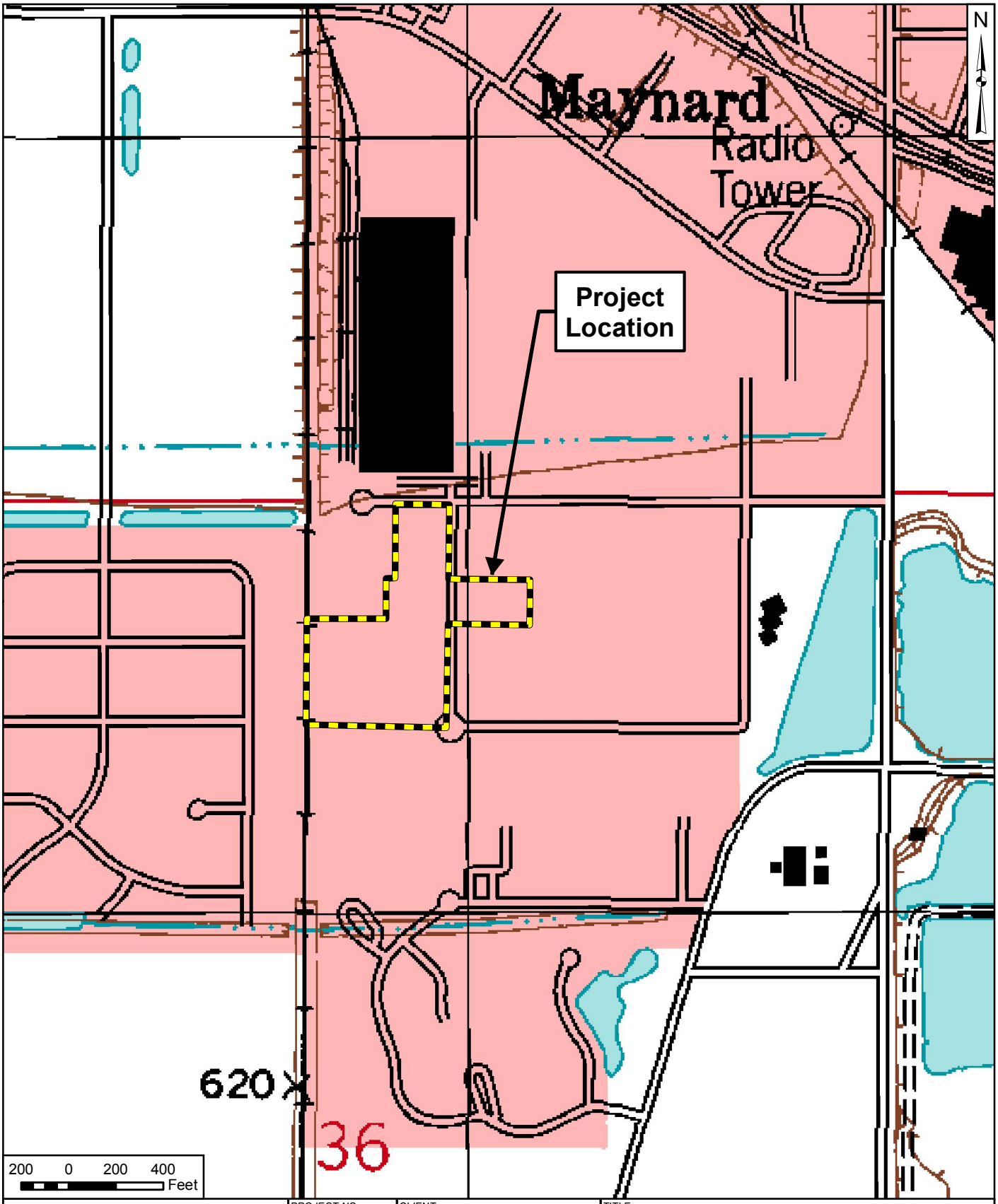

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PROJECT NO.:	17265
CREATED BY:	RMS
DATE:	11/29/2017
SCALE:	See Scale Bar
CLIENT:	Three Floyds 9750 Indiana Pkwy Munster, Indiana 46321
BASE LAYER:	USGS Topographic Map Calumet Quadrangle (1998)
TITLE:	**USGS TOPOGRAPHIC MAP**
SITE:	Three Floyds Expansion Munster, Indiana
EXHIBIT	3

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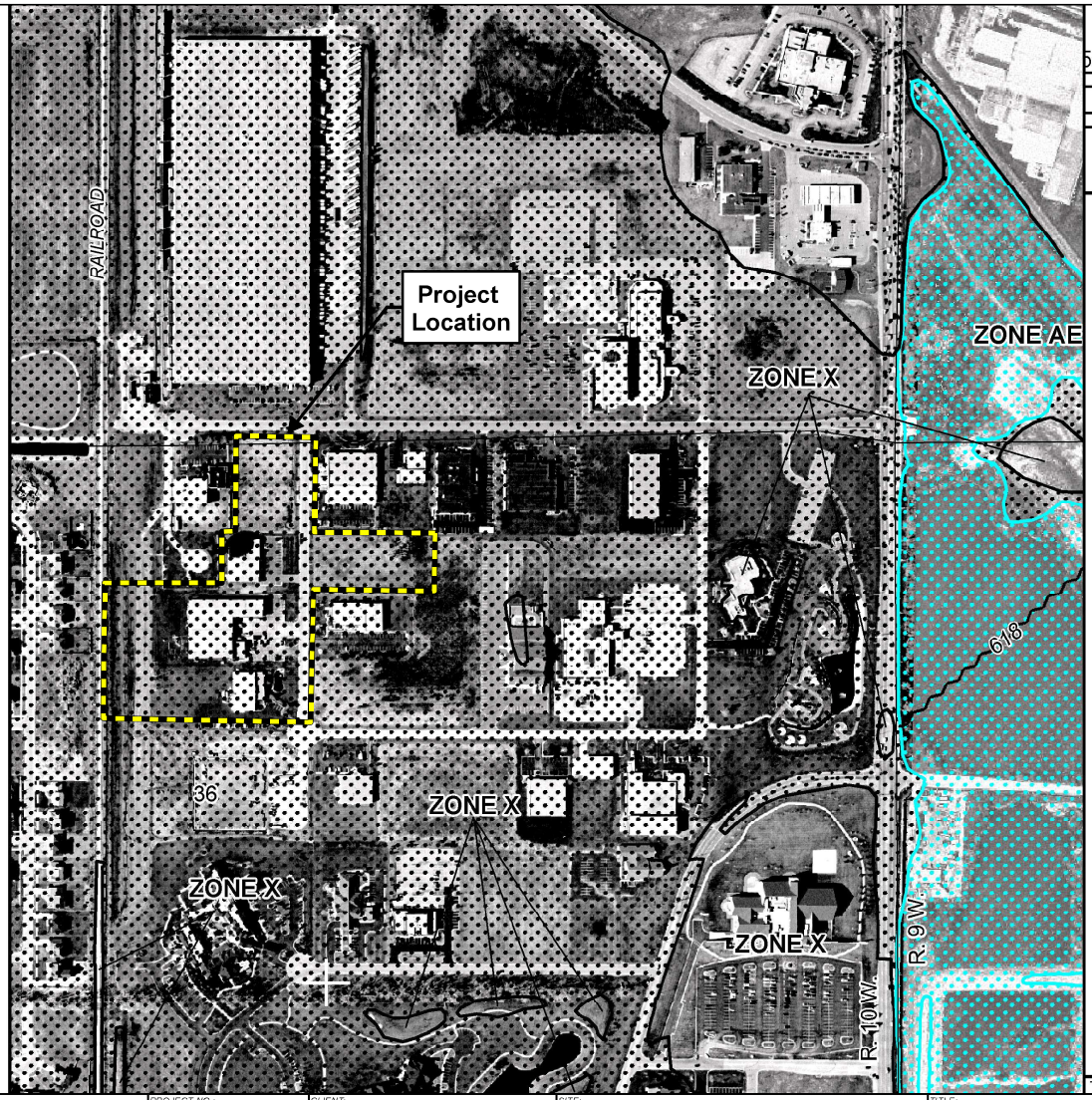

MAP SCALE 1 " = 500'

50 0 500 1000 FEET

0 150 300 METERS

N

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0117E

FIRM

FLOOD INSURANCE RATE MAP

LAKE COUNTY, INDIANA

AND INCORPORATED AREAS

PANEL 117 OF 480

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MUNSTER, TOWN OF	180139	0117	E

Notice to User: The **Map Numbers** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
18089C0117E

EFFECTIVE DATE
JANUARY 18, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It

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PROJECT NO.:	17265
CREATED BY:	RMS
DATE:	11/29/2017
SCALE:	See Scale Bar

CLIENT: Three Floyds
9750 Indiana Pkwy
Munster, Indiana 46321

BASE LAYER: FEMA FIRM Panel 18089C0117E

SITE: Three Floyds Expansion
Munster, Indiana

TITLE: **FEMA FLOOD INSURANCE RATE MAP (FIRM)**

EXHIBIT: 4

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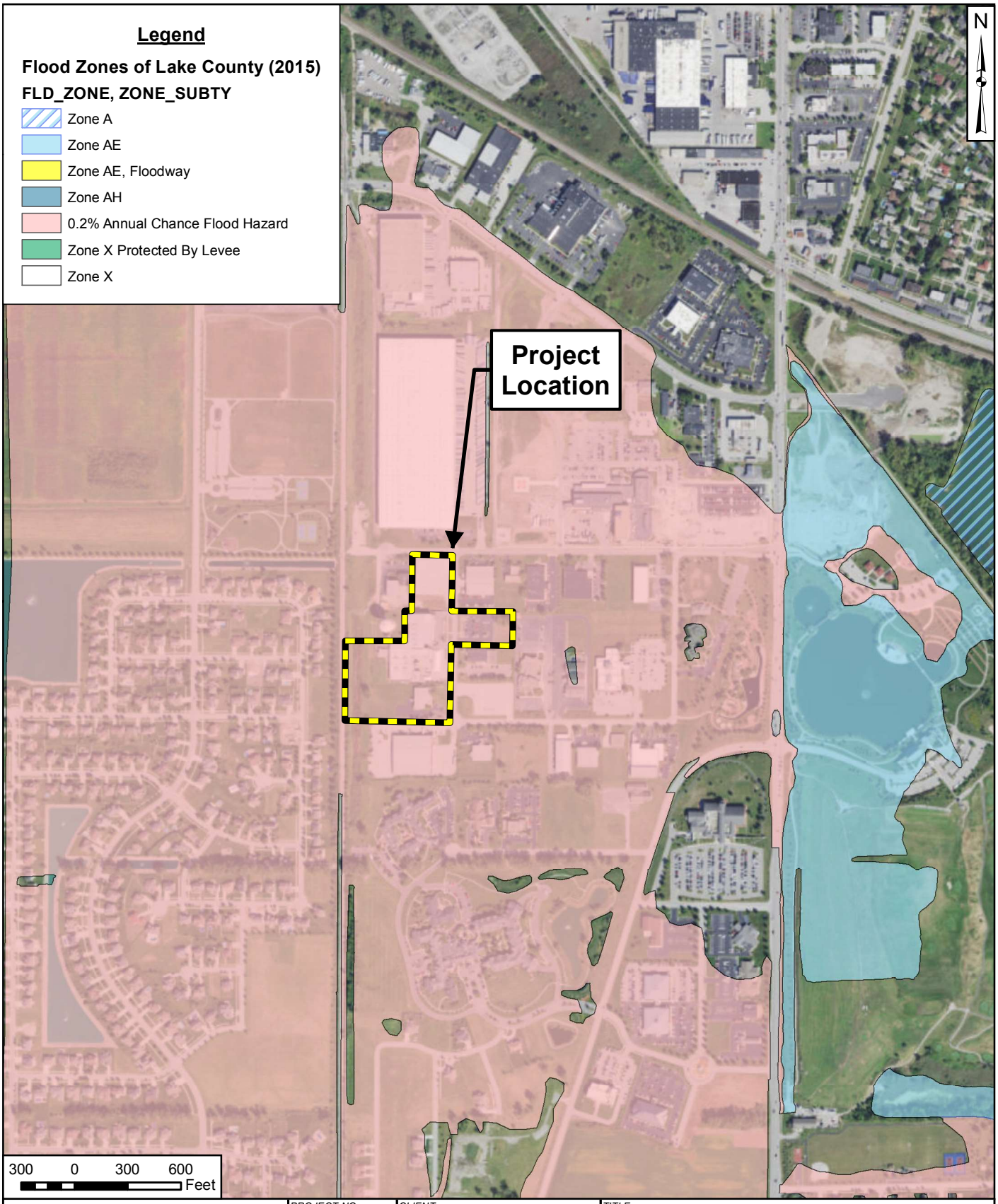

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PROJECT NO.:	17265
CREATED BY:	RMS
DATE:	11/29/2017
SCALE:	See Scale Bar
CLIENT:	Three Floyds 9750 Indiana Pkwy Munster, Indiana 46321
BASE LAYER:	DigitialGlobe Aerial (2016)
TITLE:	**FLOOD ZONES OF LAKE COUNTY, INDIANA (2015) MAP**
SITE:	Three Floyds Expansion Munster, Indiana
EXHIBIT	5

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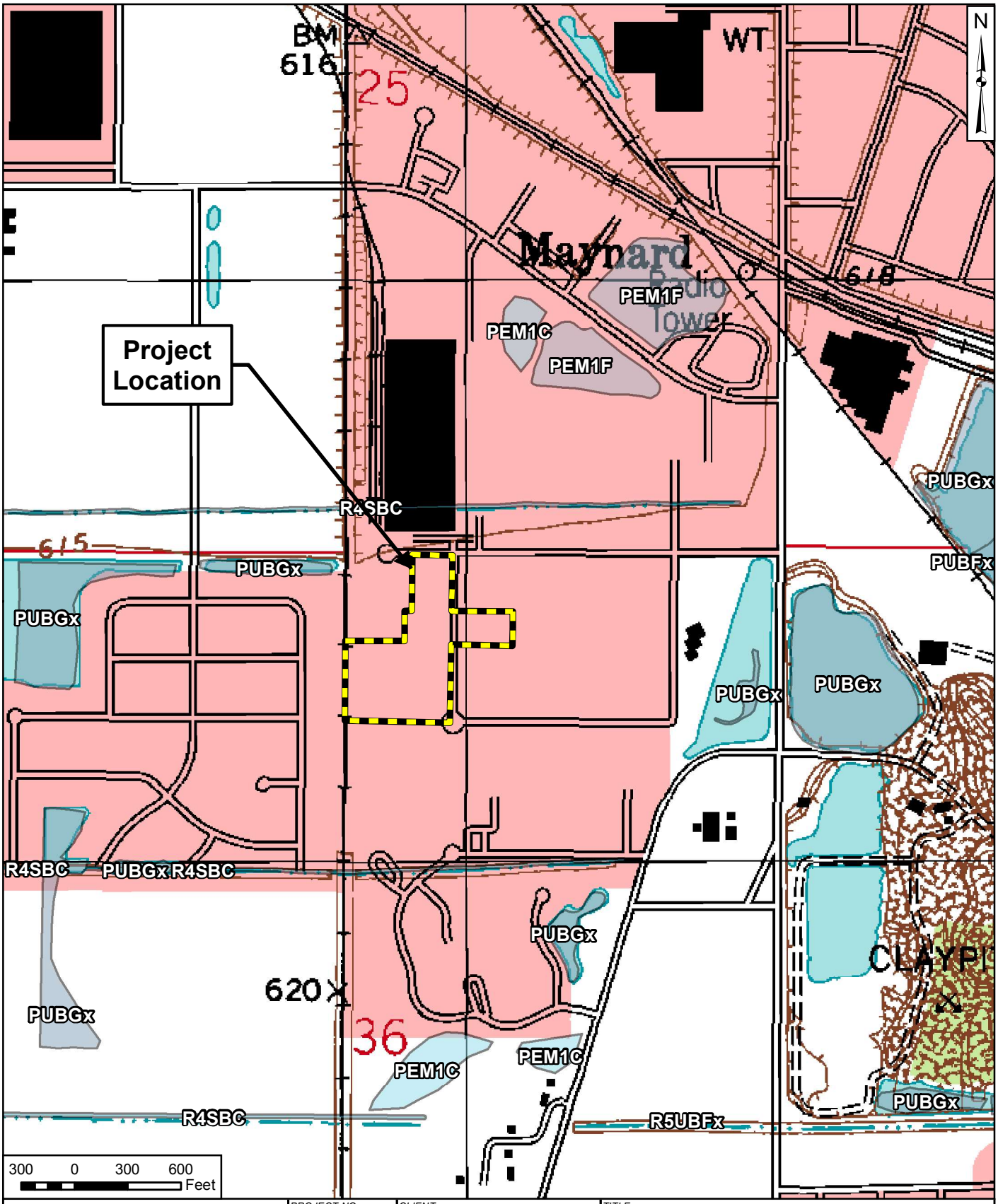

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PROJECT NO.:	17265
CREATED BY:	RMS
DATE:	11/29/2017
SCALE:	See Scale Bar
CLIENT:	Three Floyds 9750 Indiana Pkwy Munster, Indiana 46321
BASE LAYER:	USGS Topographic Map Calumet Quadrangle (1998)
TITLE:	**NATIONAL WETLANDS INVENTORY (NWI) MAP**
SITE:	Three Floyds Expansion Munster, Indiana
EXHIBIT	6

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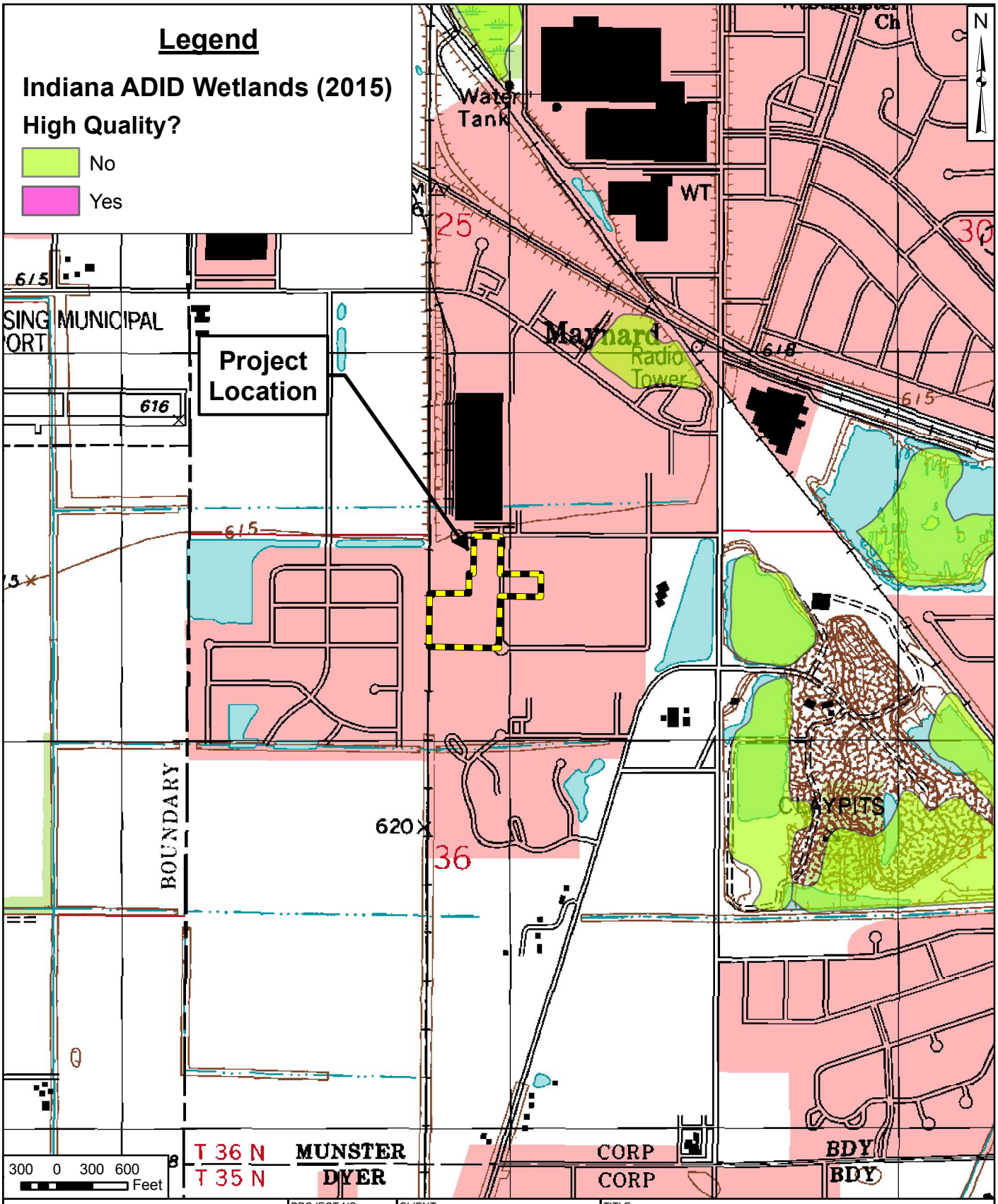

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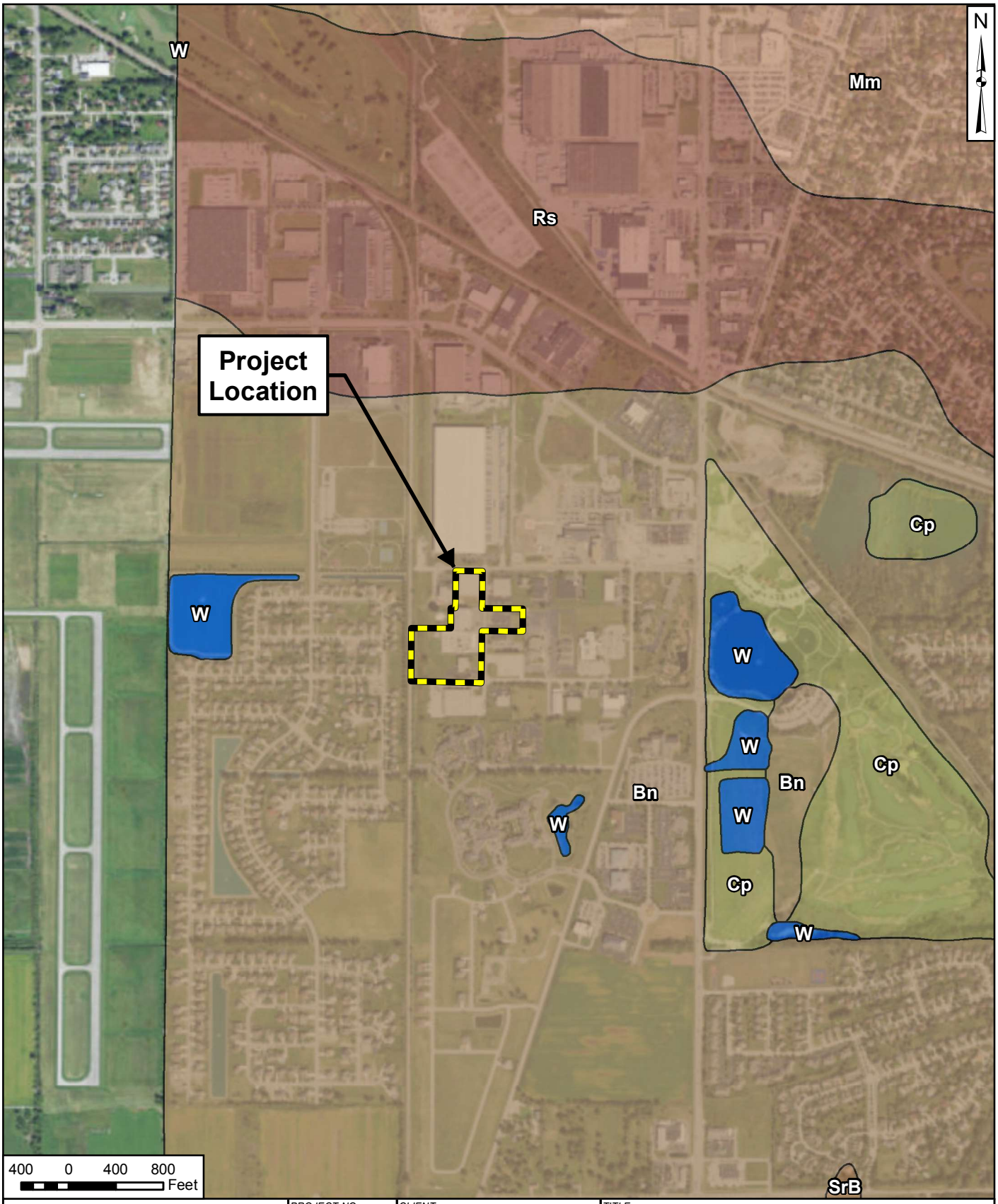
CREATED BY:	RMS
DATE:	11/29/2017
SCALE:	See Scale Bar
CLIENT:	Three Floyds 9750 Indiana Pkwy Munster, Indiana 46321
BASE LAYER:	USGS Topographic Map Calumet Quadrangle (1998)
TITLE:	**LAKE COUNTY ADVANCED IDENTIFICATION OF WETLAND (ADID) MAP**
SITE:	Three Floyds Expansion Munster, Indiana
EXHIBIT	7

N:\2017\17265\Drawings\ArcGIS\LD\EXH7adid17265.mxd



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PROJECT NO.: 17265	CLIENT: Three Floyds, 9750 Indiana Pkwy, Munster, Indiana 46321	TITLE: **SOIL SURVEY OF LAKE COUNTY, ILLINOIS MAP**	
CREATED BY: RMS			
DATE: 11/29/2017	BASE LAYER: DigitalGlove Aerial Imagery (2016)	SITE: Three Floyds Expansion, Munster, Indiana	EXHIBIT 8
SCALE: See Scale Bar			

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SECTION 2

STORMWATER DETENTION CALCULATIONS

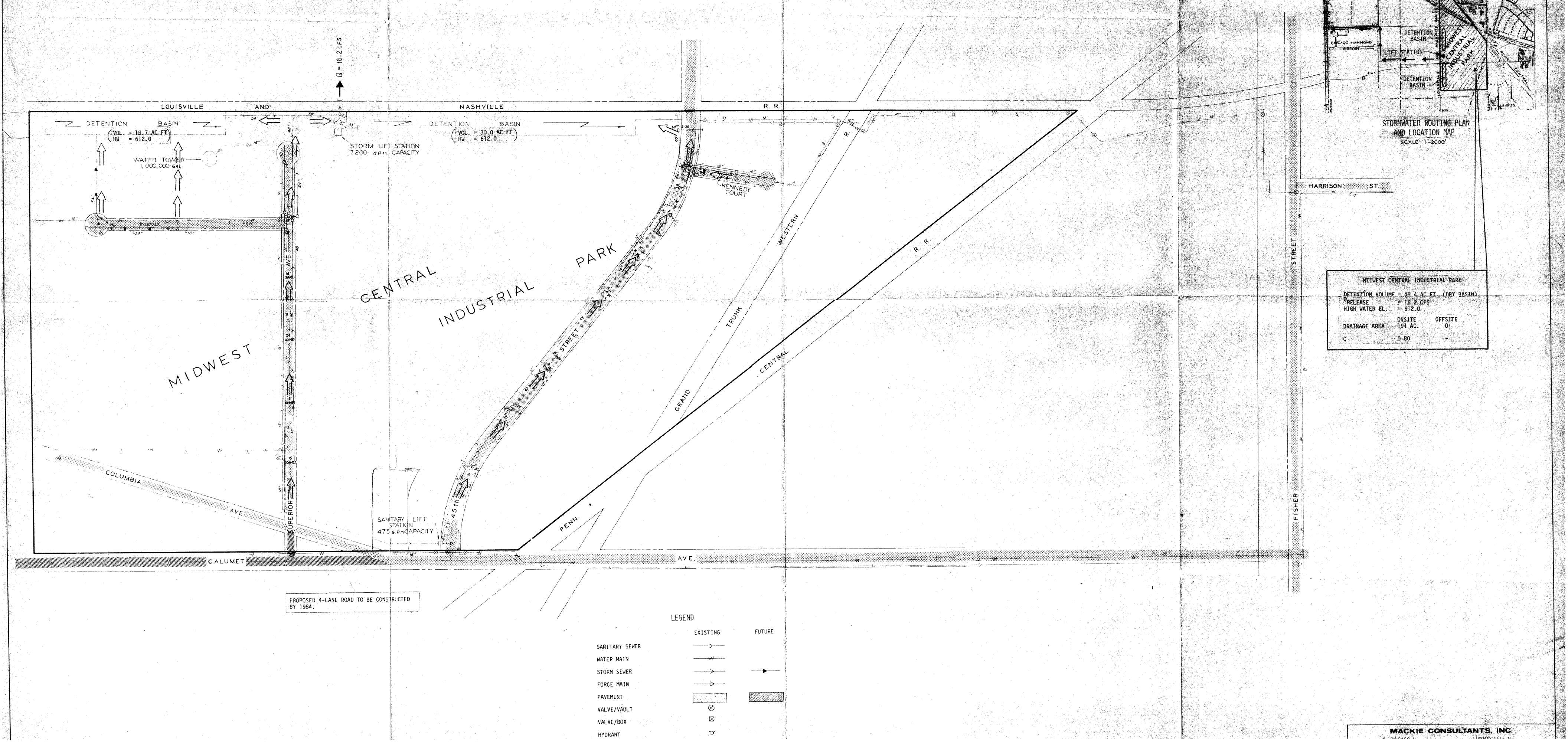
ENTER RUNOFF FACTOR C
0.80

ENTER DRAINAGE AREA A (AC)
191.00

ENTER RELEASE RATE Q(C) (CFS)
16.20

MAXIMUM TIME? (IN HOURS)
24.00

DURATION TIME (HRS)	INTENSITY FOR 100-YR. STORM (IN/HR)	INFLOW RATE (CFS)	STORAGE RATE (CFS)	STORAGE REQUIRED (AC-FT)
0.17	7.60	1161.28	1145.08	15.904
0.33	5.50	840.40	824.20	22.894
0.50	4.40	672.32	656.12	27.338
0.67	3.70	565.36	549.16	30.503
0.83	3.20	488.96	472.76	32.831
1.00	2.80	427.84	411.64	34.303
1.50	2.10	320.88	304.68	38.085
2.00	1.70	259.76	243.56	40.593
3.00	1.20	183.36	167.16	41.790
4.00	1.00	152.80	136.60	45.533
5.00	0.84	128.35	112.15	46.730
6.00	0.73	111.54	95.34	47.672
7.00	0.65	99.32	83.12	48.487
8.00	0.58	88.62	72.43	48.283
9.00	0.53	80.98	64.78	48.588
10.00	0.49	74.87	58.67	48.893
11.00 (DESIGN CONDITION)	0.46	70.29	54.09	49.581
12.00	0.43	65.70	49.50	49.504
13.00	0.40	61.12	44.92	48.663
14.00	0.38	58.06	41.86	48.841
15.00	0.36	55.01	38.81	48.516
16.00	0.34	51.95	35.75	47.669
17.00	0.33	50.42	34.22	48.484
18.00	0.31	47.37	31.17	46.752
19.00	0.30	45.84	29.64	46.930
20.00	0.29	44.31	28.11	46.853
21.00	0.28	42.78	26.58	46.522
22.00	0.27	41.26	25.06	45.936
23.00	0.26	39.73	23.53	45.095
24.00	0.25	38.20	22.00	44.000



LOUISVILLE AND NASHVILLE R. R.
DETENTION BASIN (VOL. = 19.7 AC FT) (HW = 612.0)
DETENTION BASIN (VOL. = 30.0 AC FT) (HW = 612.0)
Q = 16.2 CFS
STORM LIFT STATION 7200 GPM CAPACITY
WATER TOWER 1,000,000 GAL
INDIANA PKWY
SUPERIOR AVE
KENNEDY COURT
45th STREET
MIDWEST CENTRAL INDUSTRIAL PARK
GRAND TRUNK WESTERN R. R.
CENTRAL R. R.
PENN
COLUMBIA AVE
CALUMET AVE.
SANITARY LIFT STATION 475 GPM CAPACITY
FISHER STREET
HARRISON ST
PROPOSED 4-LANE ROAD TO BE CONSTRUCTED BY 1984.
LEGEND
EXISTING
FUTURE
SANITARY SEWER
WATER MAIN
STORM SEWER
FORCE MAIN
PAVEMENT
VALVE/VAULT
VALVE/BOX
HYDRANT
TO LITTLE CALUMET RIVER VIA NORTH CREEK
DETENTION BASIN
LIFT STATION
DETENTION BASIN
MIDWEST CENTRAL INDUSTRIAL PARK
STORMWATER ROUTING PLAN AND LOCATION MAP
SCALE 1"=2000'
MIDWEST CENTRAL INDUSTRIAL PARK
DETENTION VOLUME = 49.4 AC FT (DRY BASIN)
RELEASE = 16.2 CFS
HIGH WATER EL. = 612.0
ONSITE OFFSITE
DRAINAGE AREA 191 AC. 0
C 0.80 -
MACKIE CONSULTANTS, INC.

Questions concerning the VERTCON process may be mailed to _NGS

Latitude: 41.536

Longitude: 087.516

NGVD 29 height: 612.0 FT

Datum shift(NAVD 88 minus NGVD 29): -0.322 feet

Converted to NAVD 88 height: 611.678 feet

RUNOFF COEFFICIENT CALCULATION

Midwest Central Industrial Park

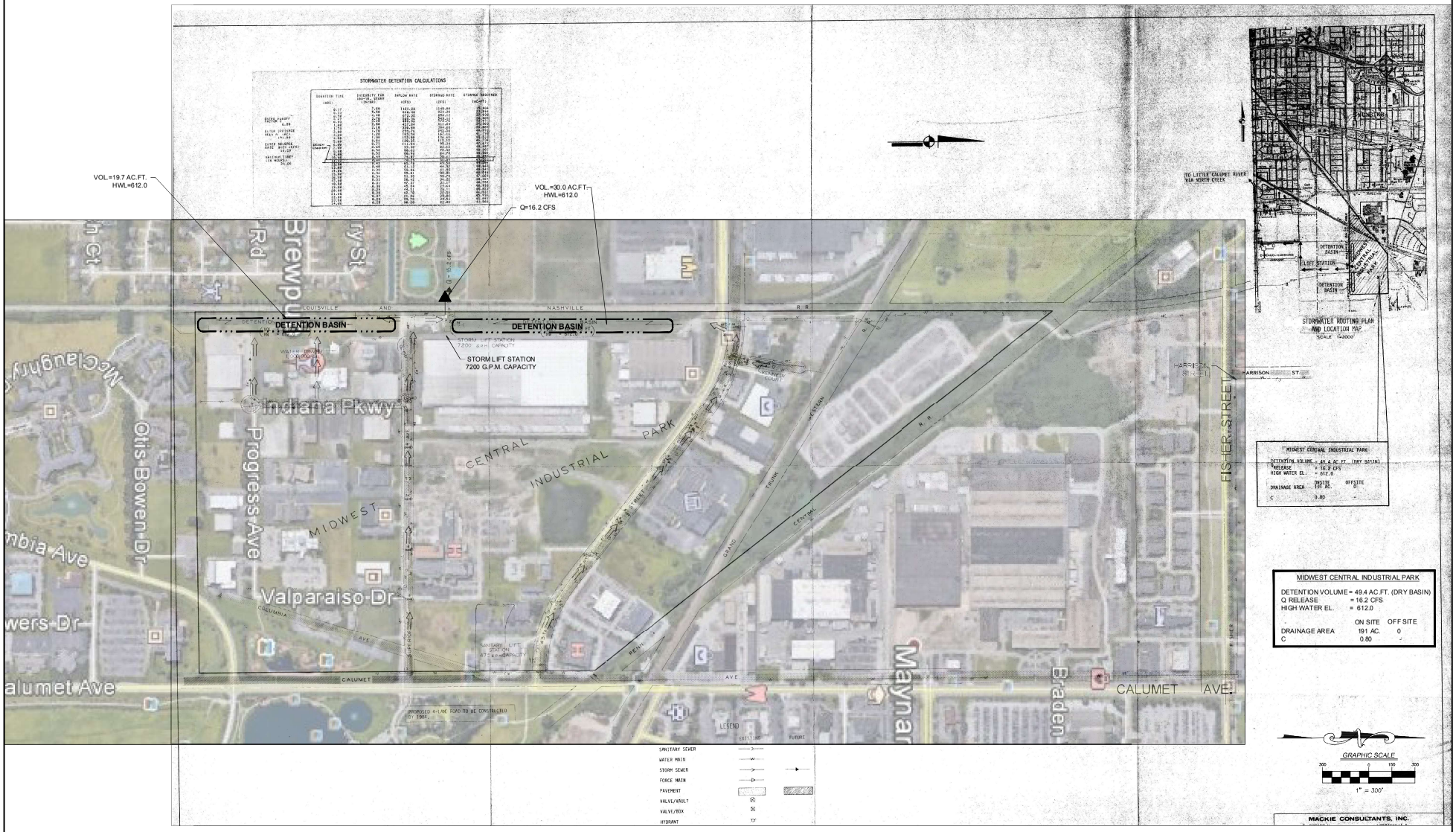
PROJECT: **Three Floyds**
V3 FILE NO.: **17265.3F2**
DATE: 09/25/23
PREPARED BY: MR
REVIEWED DATE: 09/25/23
REVIEWED BY: RMS

Impervious Area (ACRE)	142.63
Impervious c-factor	0.95
Pervious Area (ACRE)	48.37
Pervious c-factor	0.35
TOTAL AREA (ACRE)	191.00

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.35 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (143.25 \text{ acre}) + 0.3 * (47.75 \text{ acre})}{191.00}$$

C = 0.80



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REVISIONS

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION

PROJECT NO.: 17265	DESIGNED BY: RMS
FILE NAME: EX 2 STWATER 17265	DRAWN BY: NRS
ORIGINAL ISSUE DATE: 11-15-17	CHECKED BY: JRB
SCALE: 1"=300'	PROJECT MANAGER: JRB

THREE FLOYDS EXPANSION
MUNSTER INDIANA

AERIAL OVERLAY EXHIBIT OF MIDWEST CENTRAL INDUSTRIAL PARK

DRAWING NO. EX 1

N:\2017\17265\Drawings\ACAD\LDS\02\Misc Drawings\EX 2 Exhibit 17265.dwg 3/9/2018

17265 - STORM WATER ROUTING PLAN

SUMMARY

TOTAL AREA = 74.46 ACRES
IMPERVIOUS = 48.67%
PERVIOUS = 51.33%

MIDWEST CENTRAL INDUSTRIAL PARK
PERMITTED RUNOFF COEFFICIENT, C = 0.80
(ASSUMED 75% IMPERVIOUS @ 0.95,
25% PERVIOUS @ 0.35)

PROPERTIES SOUTH OF SUPERIOR AVE.
RUNOFF COEFFICIENT, C = 0.64
(48.67% IMPERVIOUS @ 0.95, 51.33% PERVIOUS @ 0.35)

GRAPHIC SCALE
100 0 50 100
1" = 100'

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REVISIONS

NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION

PROJECT NO.: 17265.3F2	DESIGNED BY: RMS
FILE NAME: 5X PERVIOUS IMPERVIOUS EXHIBIT	DRAWN BY: NRS
ORIGINAL ISSUE DATE: 09-25-2023	CHECKED BY: JRB
SCALE: 1" = 100'	PROJECT MANAGER: JRB

THREE FLOYDS EXPANSION
MUNSTER INDIANA

EXISTING PERVIOUS/IMPERVIOUS AREA - SOUTH OF SUPERIOR

DRAWING NO.
EX 2

17265 - EXISTING PERVIOUS IMPERVIOUS AREA

E:\2017\17265\17265.3F2\Drawings\ACAD\LDS03\Misc Drawings\EX 1 Pervious_Impervious Exhibit 17265.dwg 9/28/2023

RUNOFF COEFFICIENT CALCULATION

Properties South of Superior Ave. in Midwest Central Industrial Park

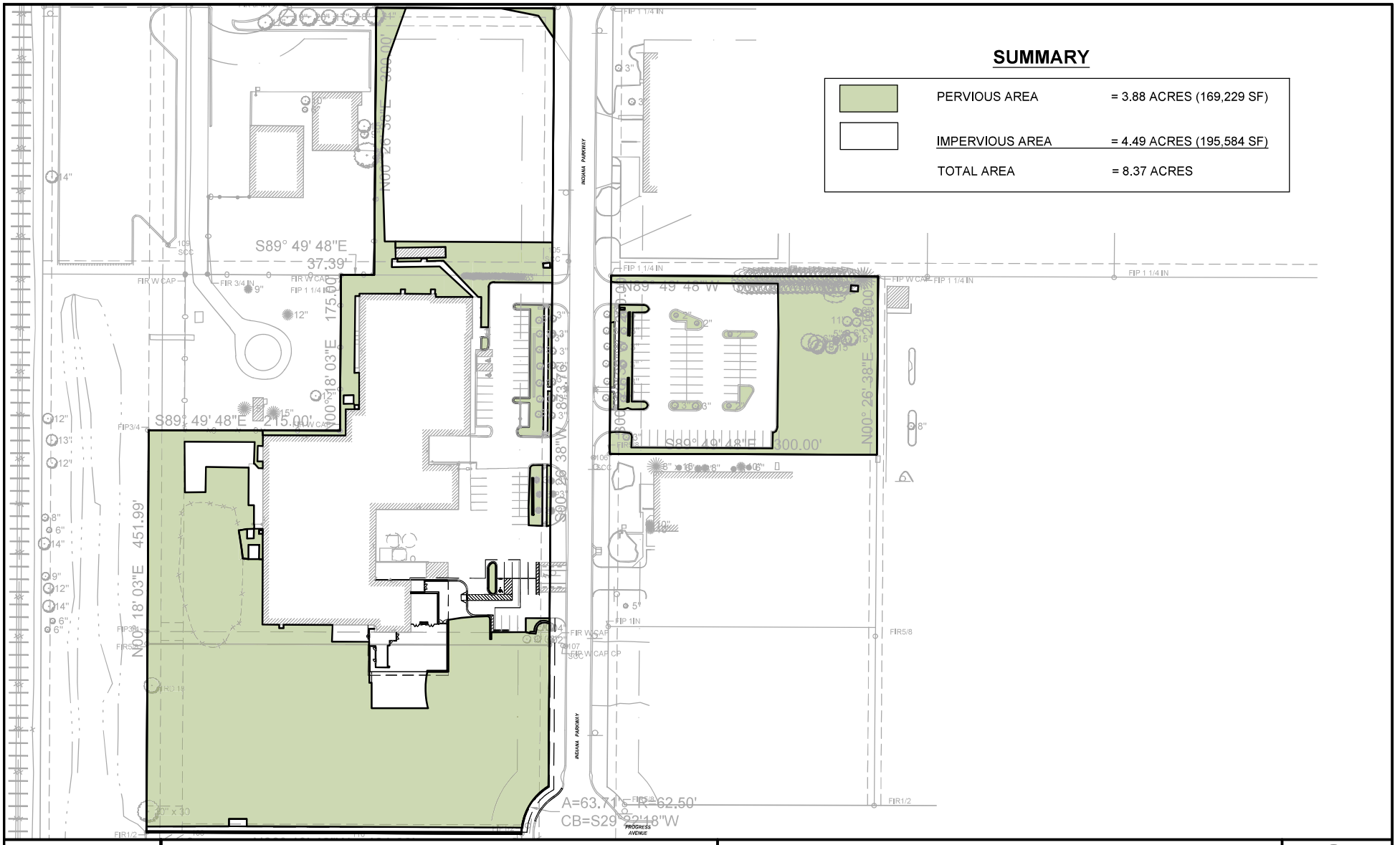
PROJECT: **Three Floyds**
V3 FILE NO.: **17265.3F2**
DATE: 09/25/23
PREPARED BY: MR
REVIEWED DATE: 09/25/23
REVIEWED BY: RMS

Impervious Area (ACRE)	36.24
Impervious c-factor	0.95
Pervious Area (ACRE)	38.22
Pervious c-factor	0.35
TOTAL AREA (ACRE)	74.46

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.35 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (36.86\ \text{acre}) + 0.3 * (37.60\ \text{acre})}{74.46}$$

C = 0.64



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630.724.9200 phone
www.v3co.com

THREE FLOYDS BREWERY

MUNSTER INDIANA

EXHIBIT 3 - PROPOSED PERVIOUS/IMPERVIOUS AREA

DATE: 09-25-23

N

0 50 100

SCALE: 1"=100'

E:\2017\17265\17265.3F2\Drawings\ACAD\LD\S03\Misc Drawings\Pr Pervious 2023 0925.dwg 09/25/23

RUNOFF COEFFICIENT CALCULATION

PROJECT: **Three Floyds Brewery**
V3 FILE NO.: **17265.3F2**
DATE: 09/25/23
PREPARED BY: MR
REVIEWED DATE: 09/25/23
REVIEWED BY: RMS

Impervious Area (ACRE)	4.49
Impervious c-factor	0.95
Pervious Area (ACRE)	3.88
Pervious c-factor	0.35
TOTAL AREA (ACRE)	8.37

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.35 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (6.61 \text{ acre}) + 0.3 * (1.76 \text{ acre})}{8.37}$$

C = 0.67