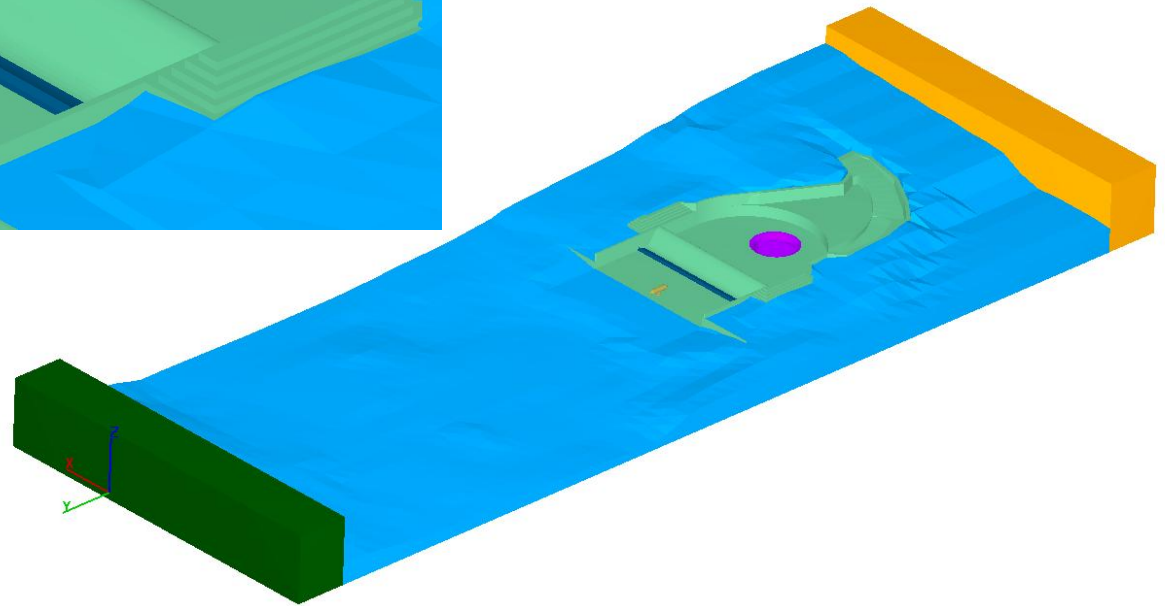
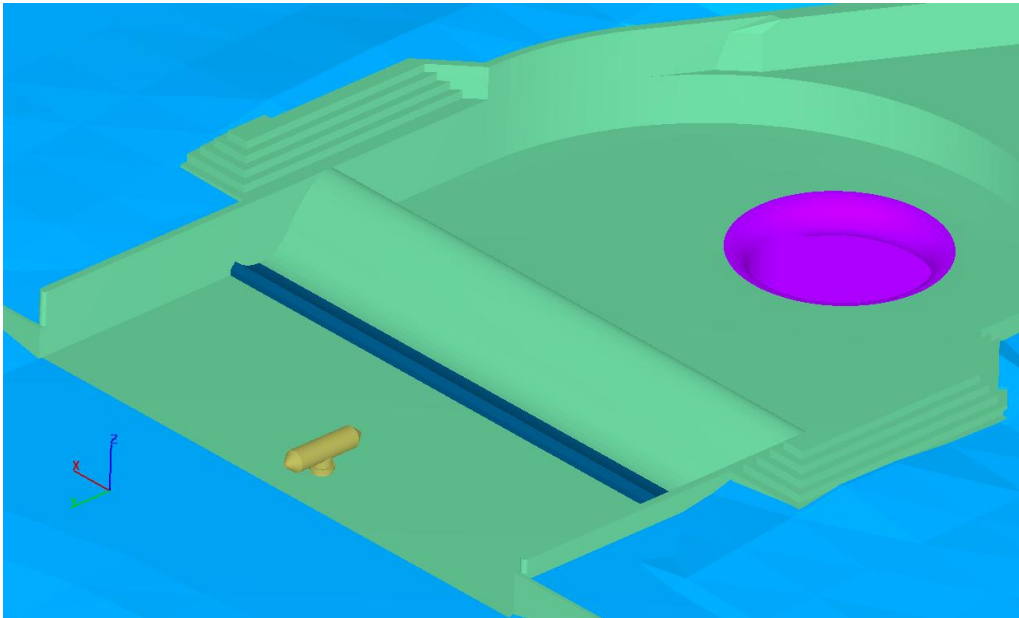


Waller Creek Outlet CFD Modeling Results

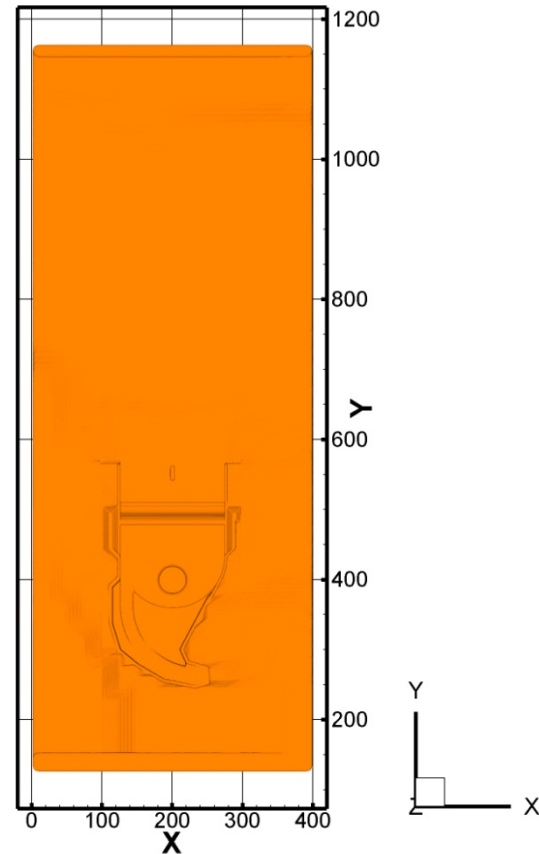
Connection #2 with 3' High Spillway Flip Bucket
2-Year Flood (2320 cfs)
Lady Bird Lake Inflow (1.25 ft/s)

General View of the CFD Model



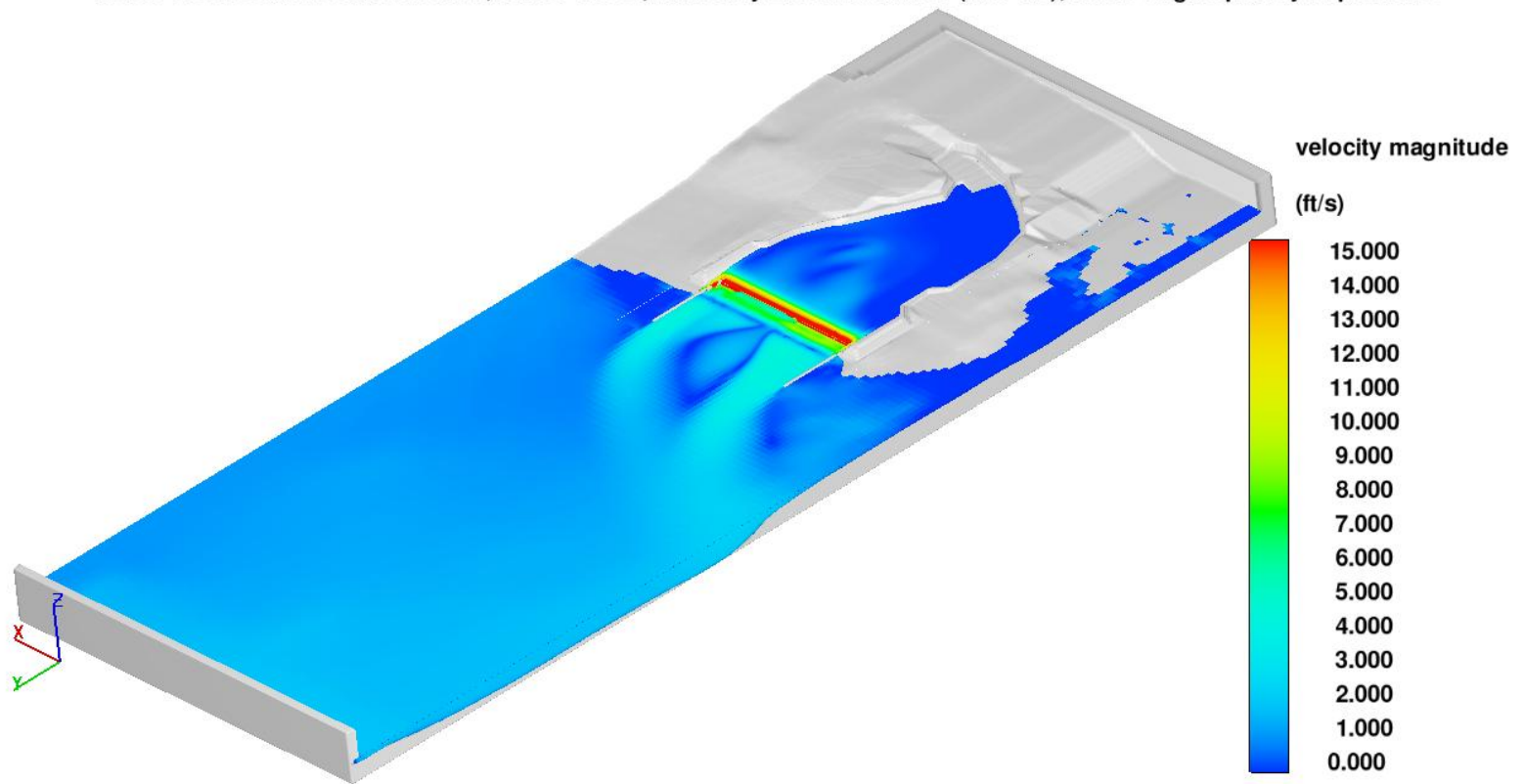
Plan View of the CFD Model

Waller Creek Outlet CFD Model: Connection #2



Velocity Contours at Water Surface

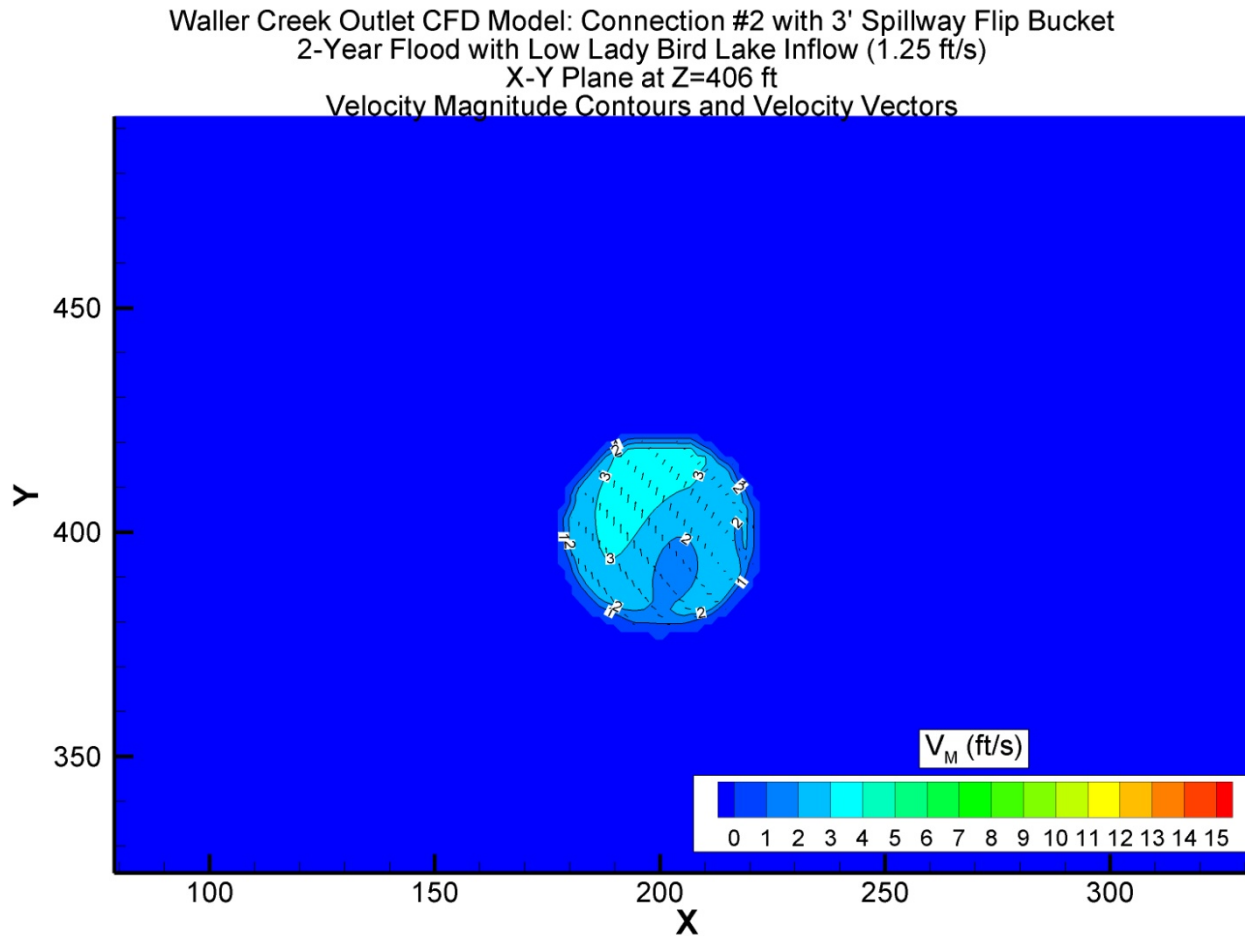
Waller Creek Outlet: Connection #2; 2-Year Flood; with Lady Bird Lake Inflow (1.25 ft/s); with 3' High Spillway Flip Bucket



Flow Patterns

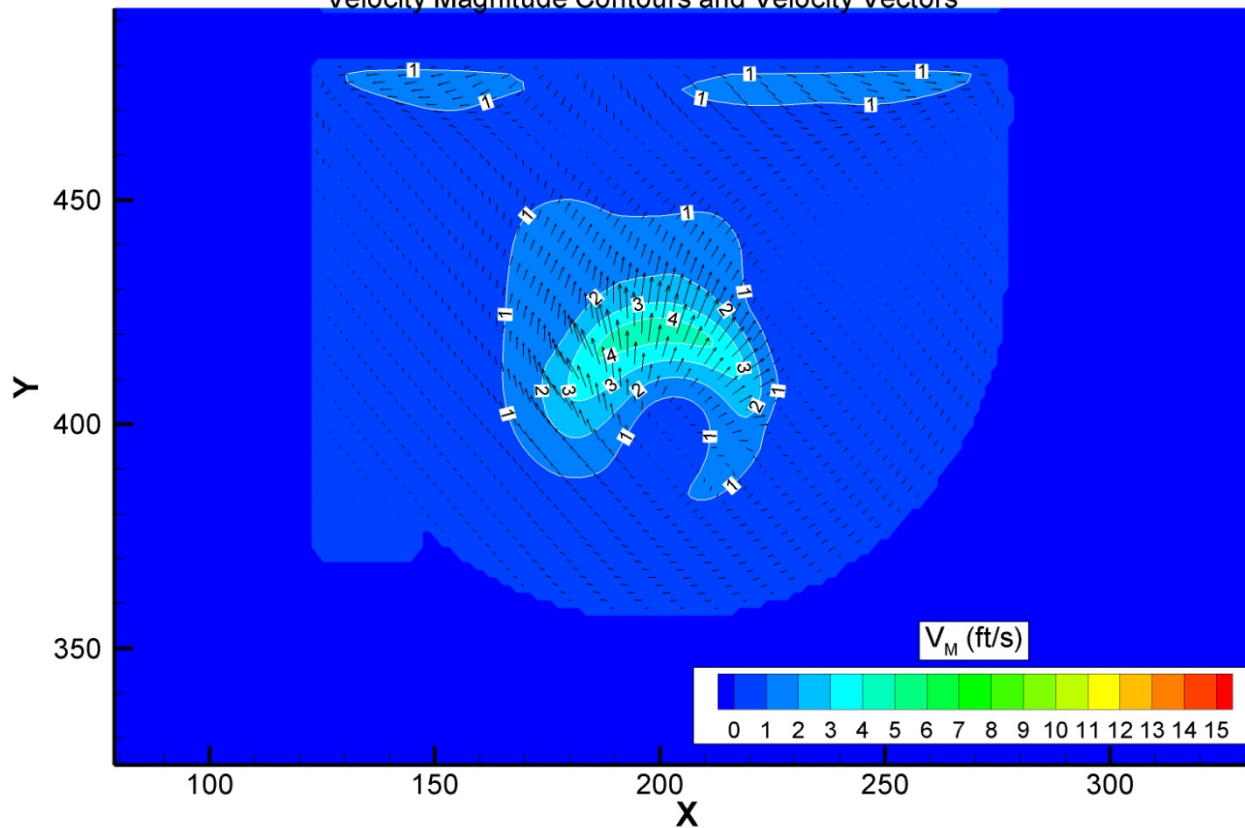
From the Tunnel Shaft to the Spillway

Velocity Magnitude Contours and Velocity Vectors in Horizontal Plane at Z=406 ft

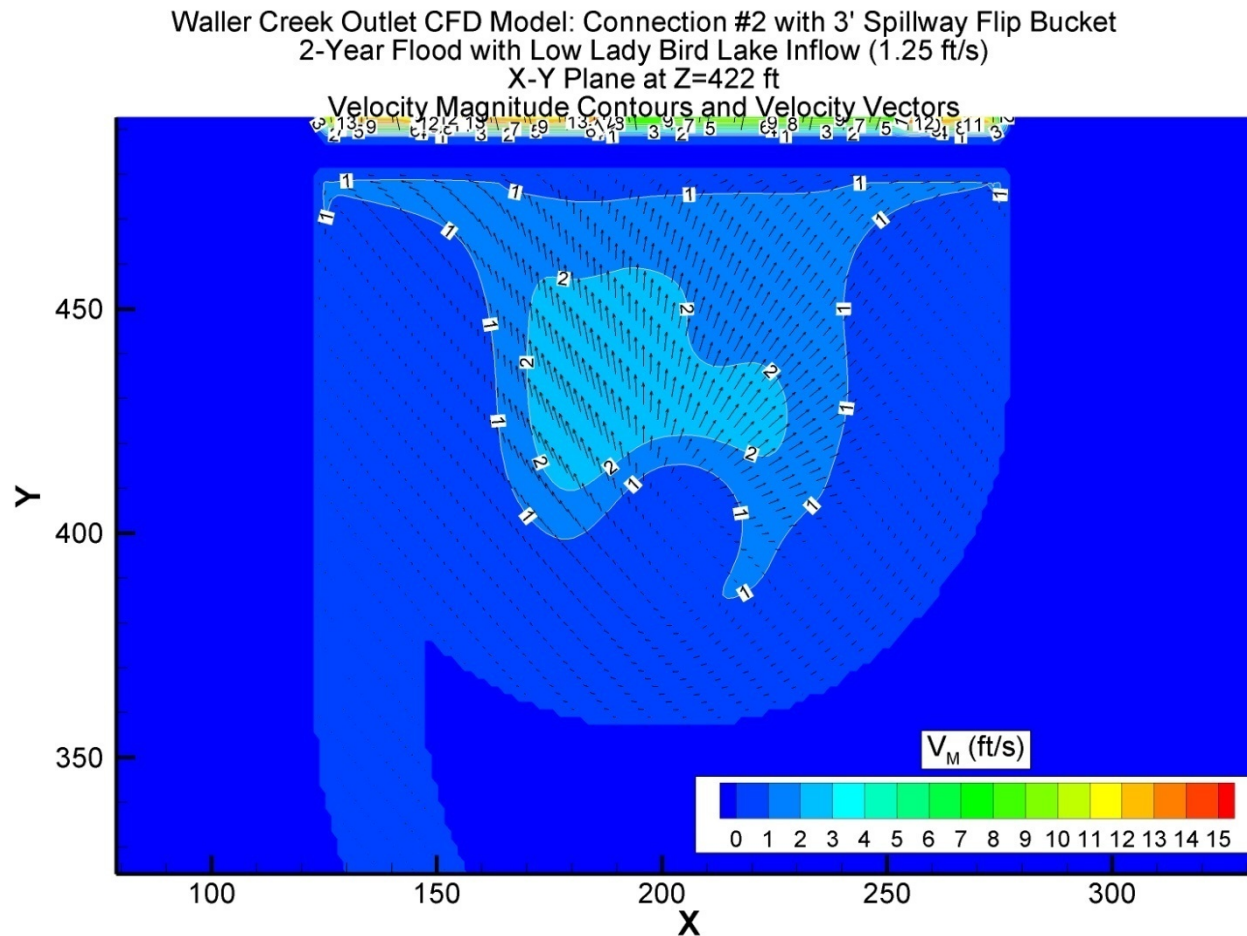


Velocity Magnitude Contours and Velocity Vectors in Horizontal Plane at Z=415 ft

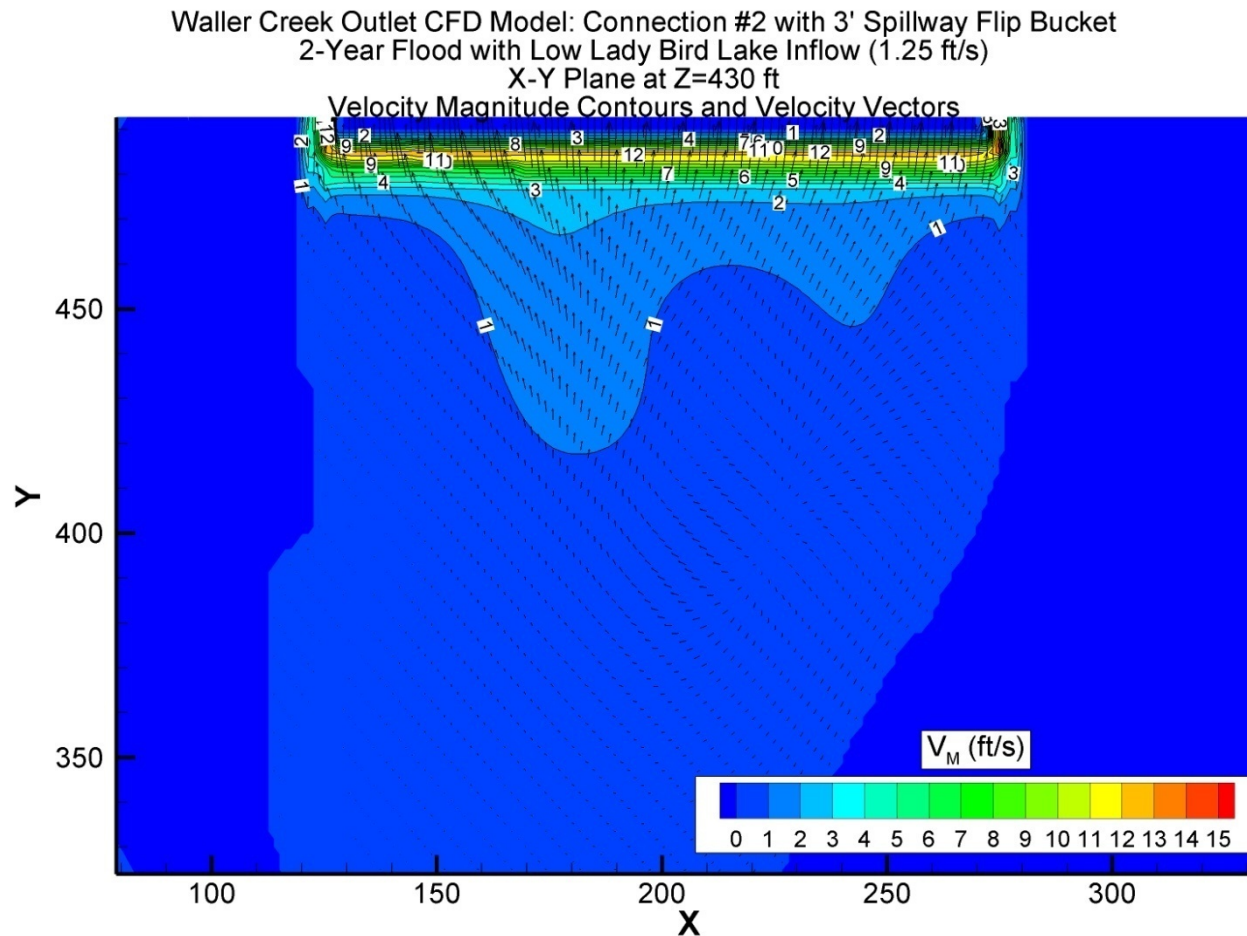
Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
X-Y Plane at Z=415 ft
Velocity Magnitude Contours and Velocity Vectors



Velocity Magnitude Contours and Velocity Vectors in Horizontal Plane at Z=422 ft

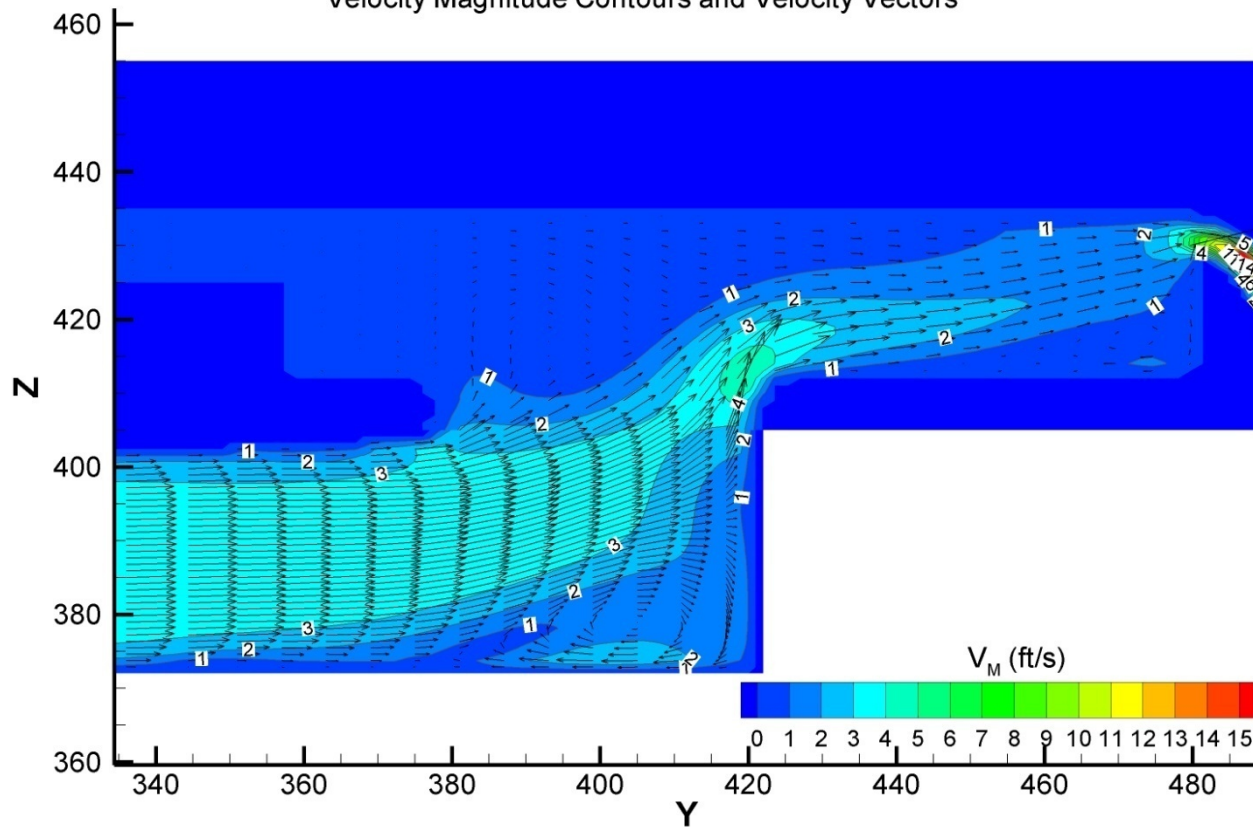


Velocity Magnitude Contours and Velocity Vectors in Horizontal Plane at Z=430 ft

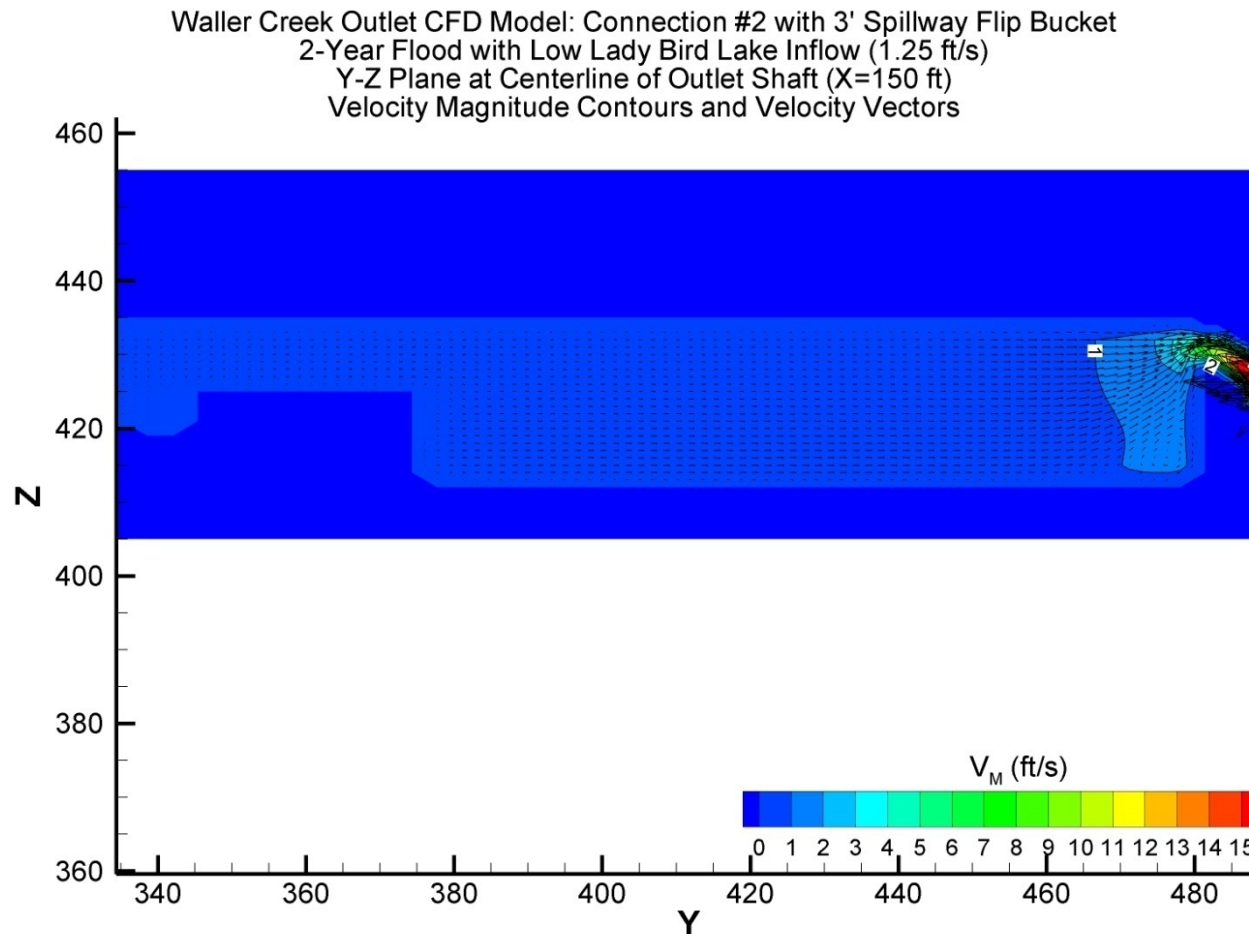


Velocity Magnitude Contours and Velocity Vectors in Longitudinal Plane at X=200 ft

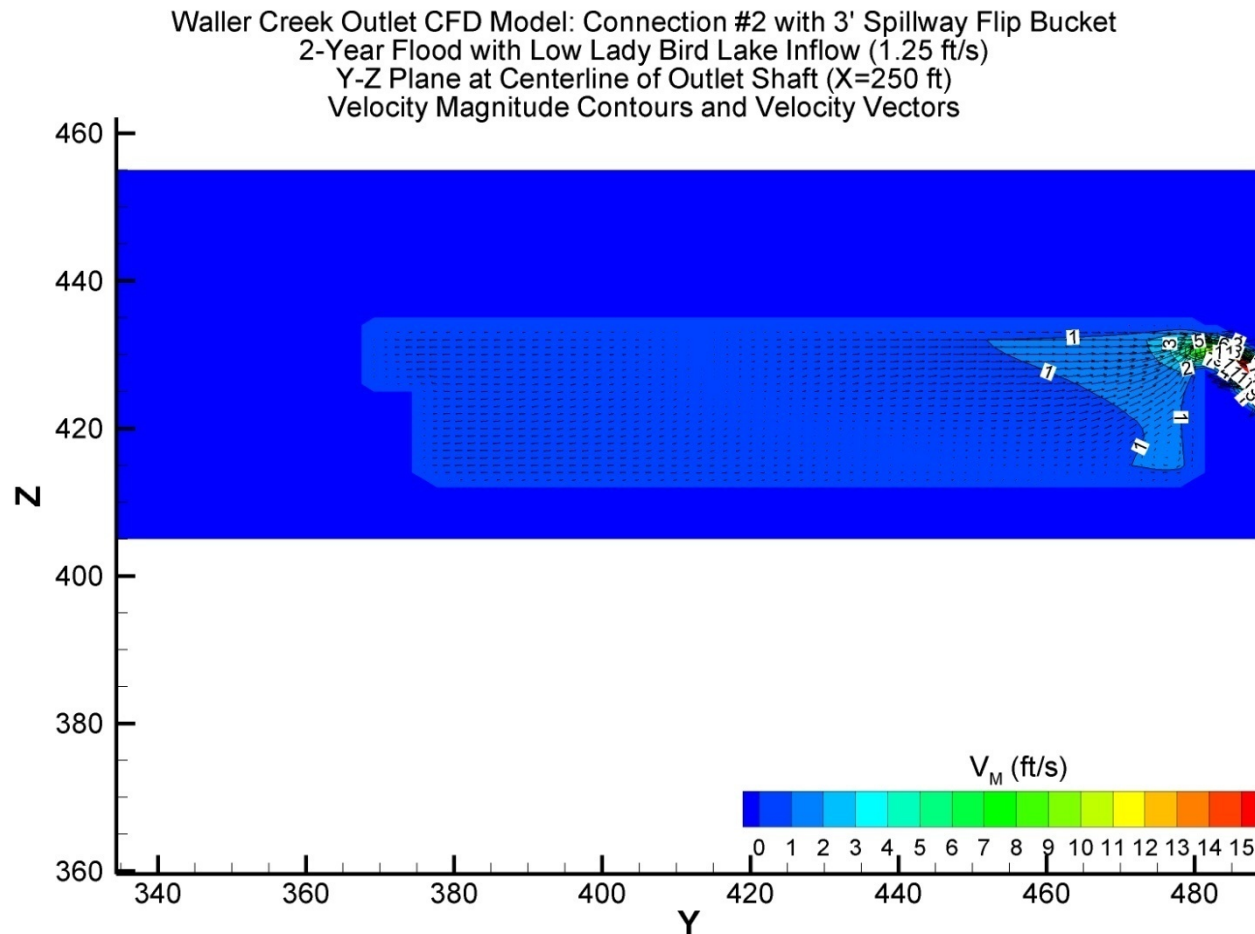
Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
Y-Z Plane at Centerline of Outlet Shaft (X=200 ft)
Velocity Magnitude Contours and Velocity Vectors



Velocity Magnitude Contours and Velocity Vectors in Longitudinal Plane at X=150 ft

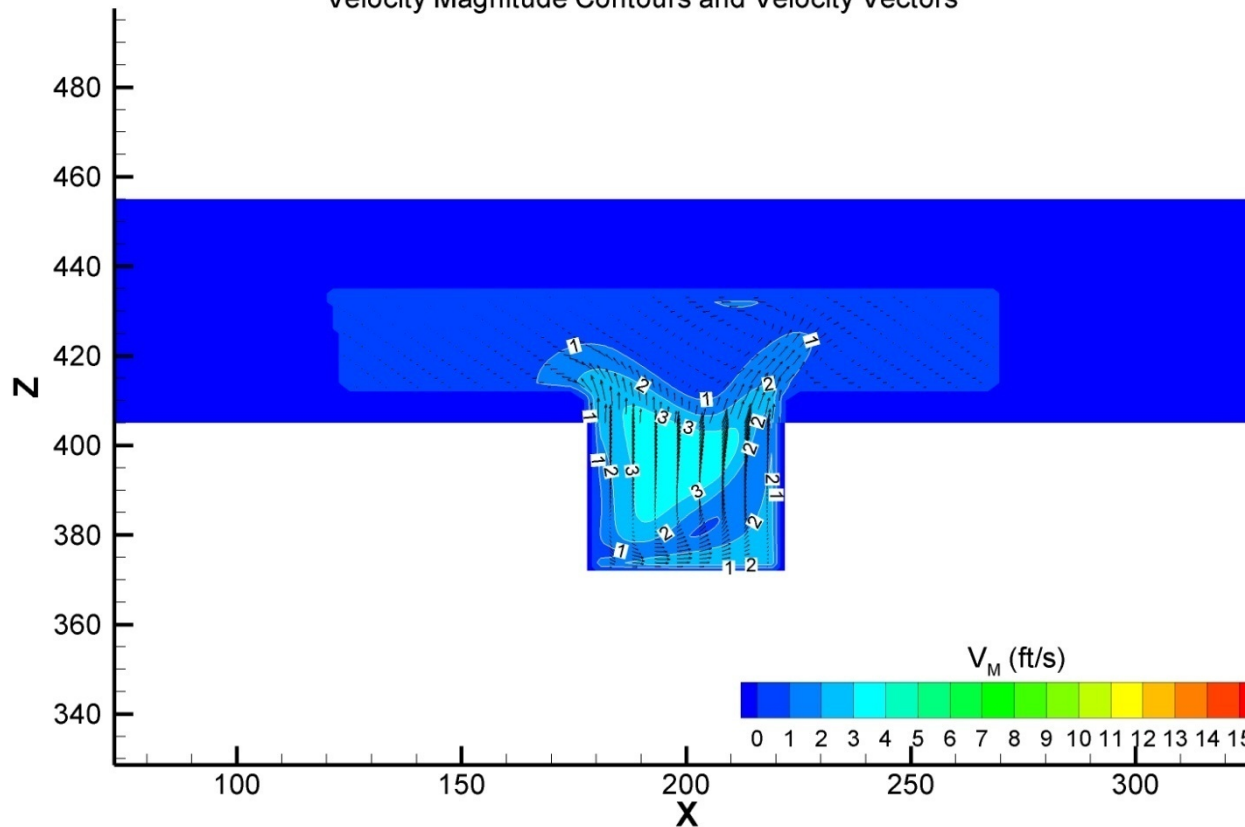


Velocity Magnitude Contours and Velocity Vectors in Longitudinal Plane at X=250 ft



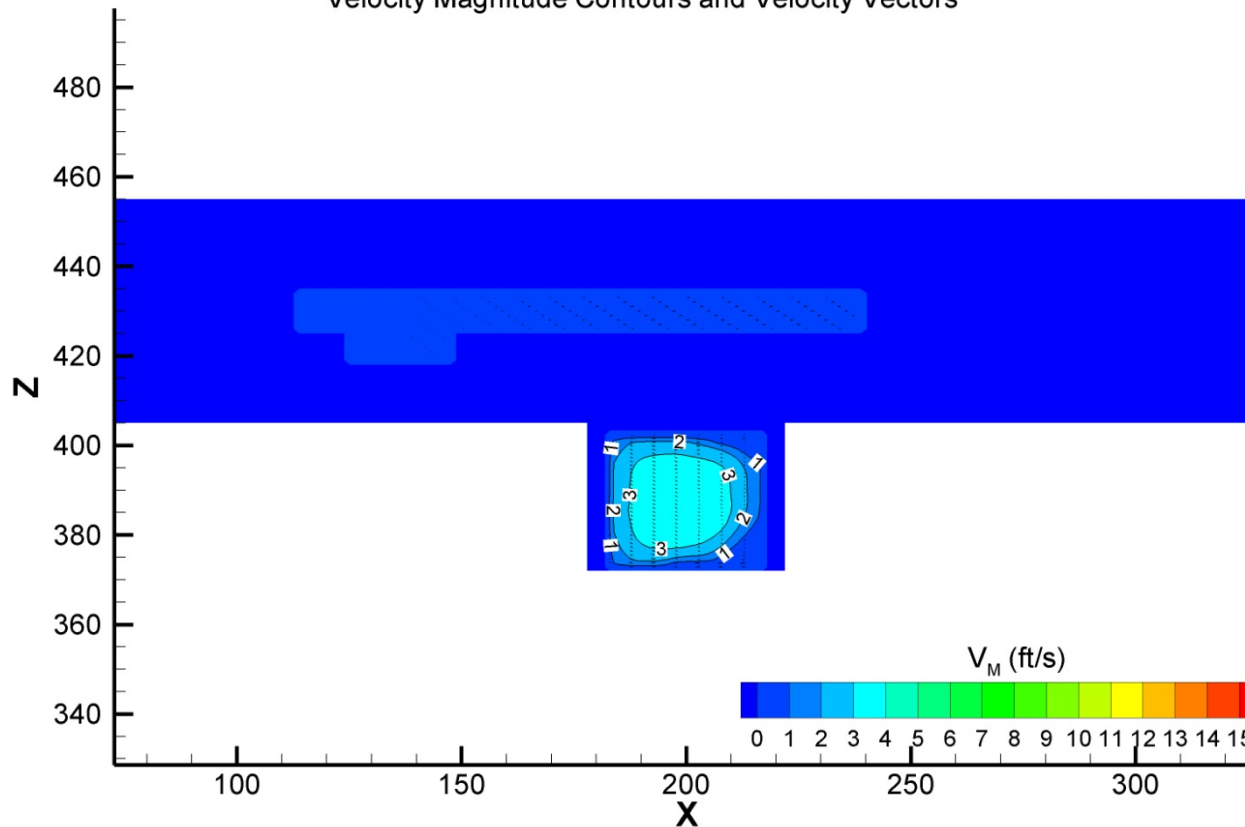
Velocity Magnitude Contours and Velocity Vectors in Lateral Plane at Y=400 ft

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
X-Z Plane at Outlet Shaft Centerline (Y=400 ft)
Velocity Magnitude Contours and Velocity Vectors



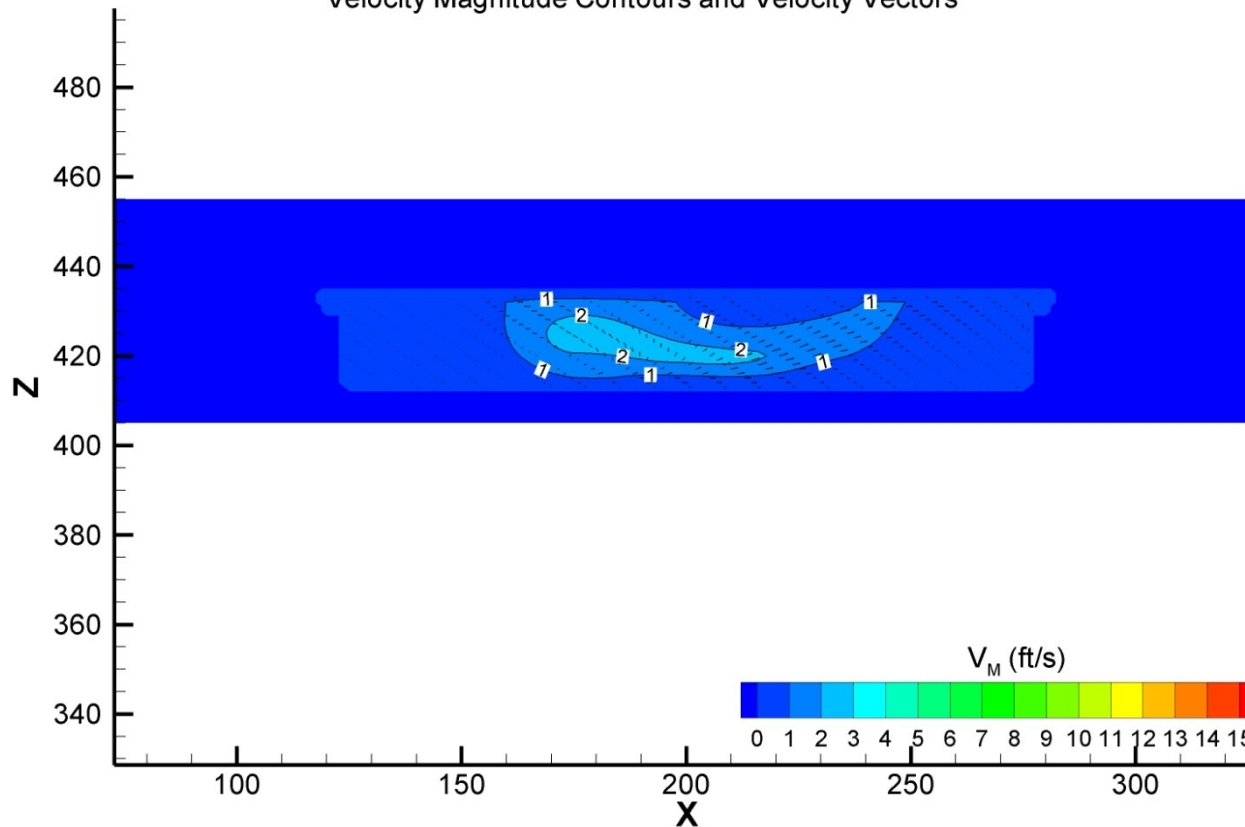
Velocity Magnitude Contours and Velocity Vectors in Lateral Plane at Y=350 ft

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
X-Z Plane at Outlet Shaft Centerline (Y=350 ft)
Velocity Magnitude Contours and Velocity Vectors

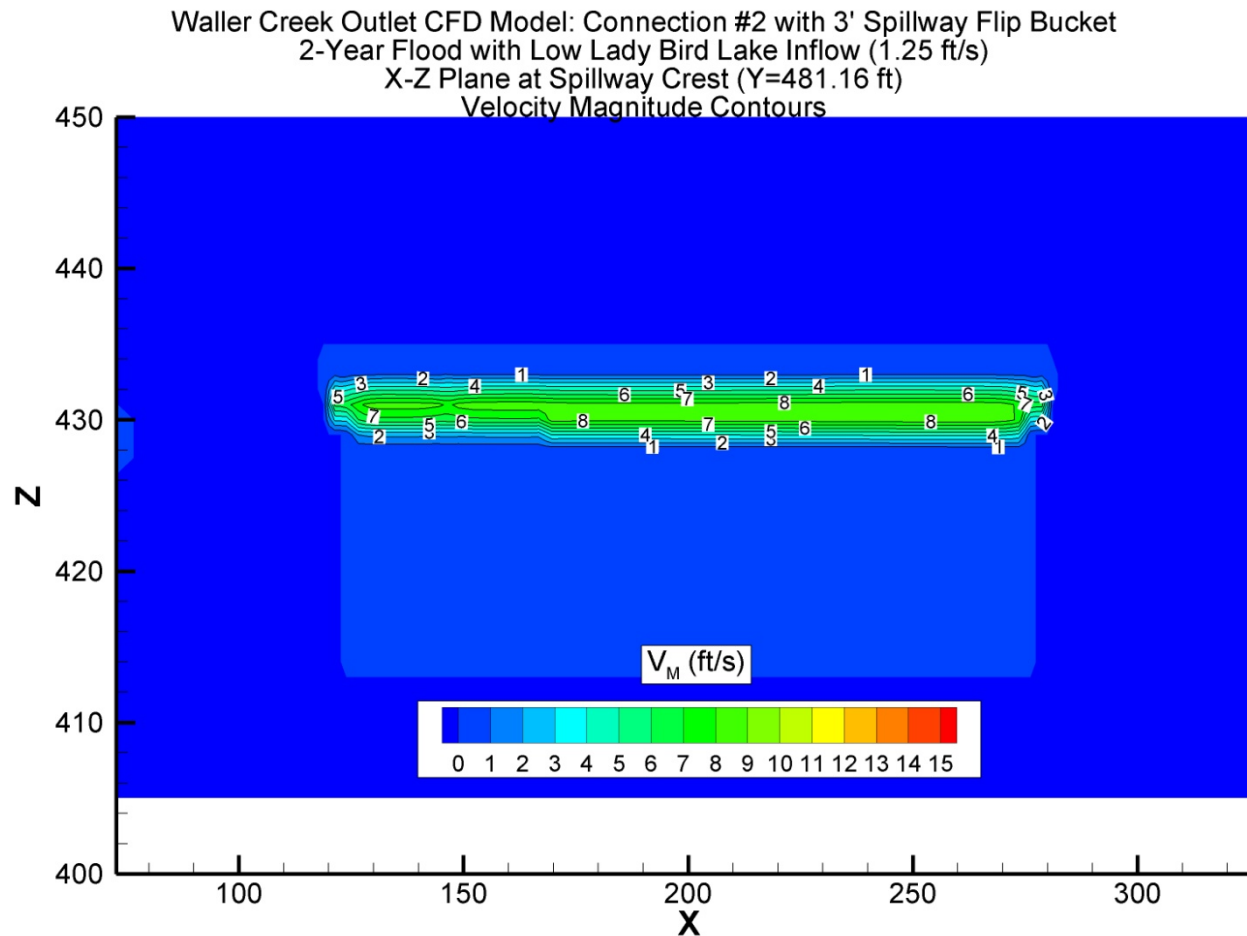


Velocity Magnitude Contours and Velocity Vectors in Lateral Plane at Y=450 ft

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
X-Z Plane at Outlet Shaft Centerline (Y=450 ft)
Velocity Magnitude Contours and Velocity Vectors



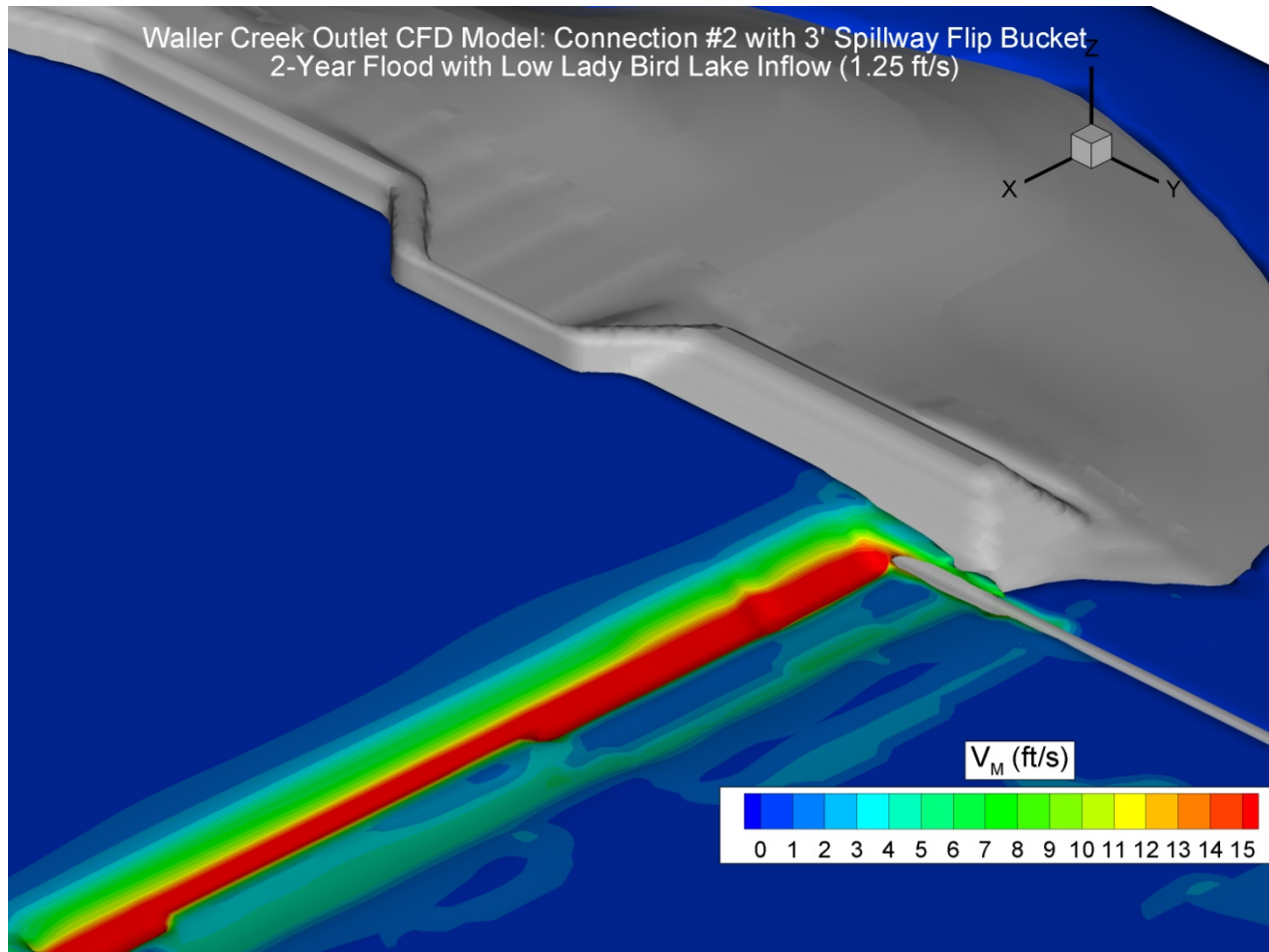
Velocity Magnitude Contours and Velocity Vectors in Lateral Plane at Spillway Crest



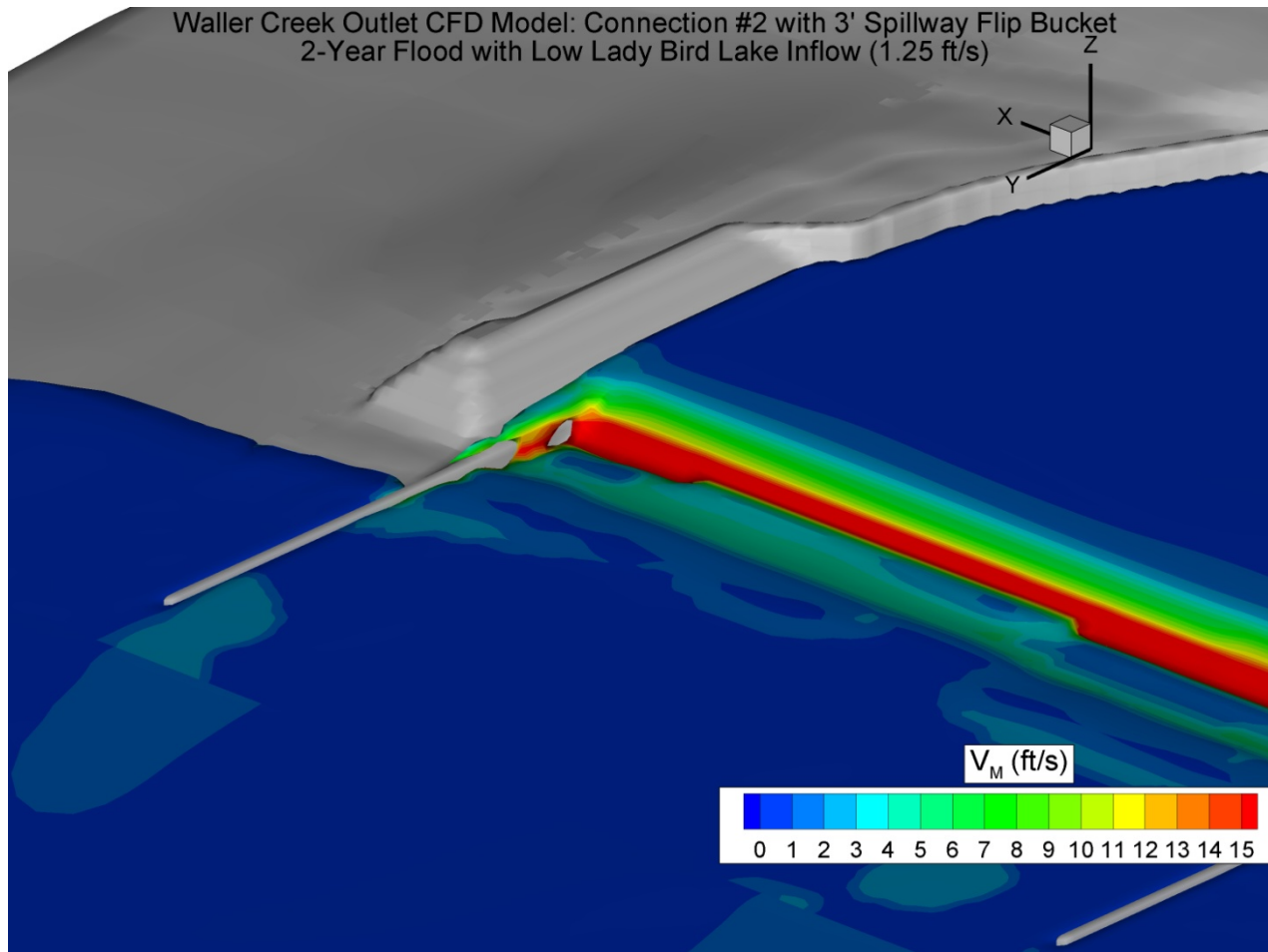
Flow Impacts

Caused by Stacked Rock at the Ends
of the Spillway Crest

Left Side Stacked Rock



Right Side Stacked Rock

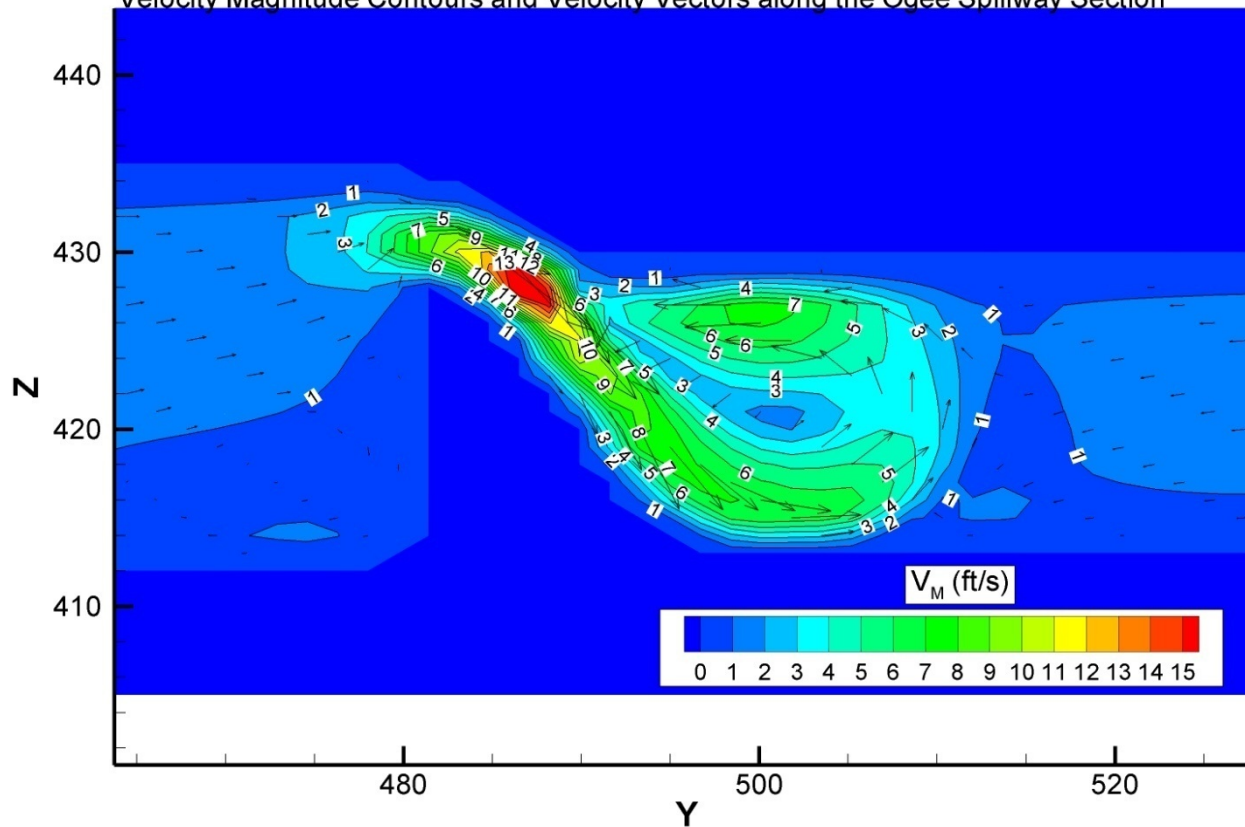


Velocity Profiles

Along the Ogee Spillway Section

Velocity Profile along the Spillway Ogee Section at X=200 ft

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
Y-Z Plane at Centerline of Outlet Shaft (X=200 ft)
Velocity Magnitude Contours and Velocity Vectors along the Ogee Spillway Section



Velocity Profile along the Spillway

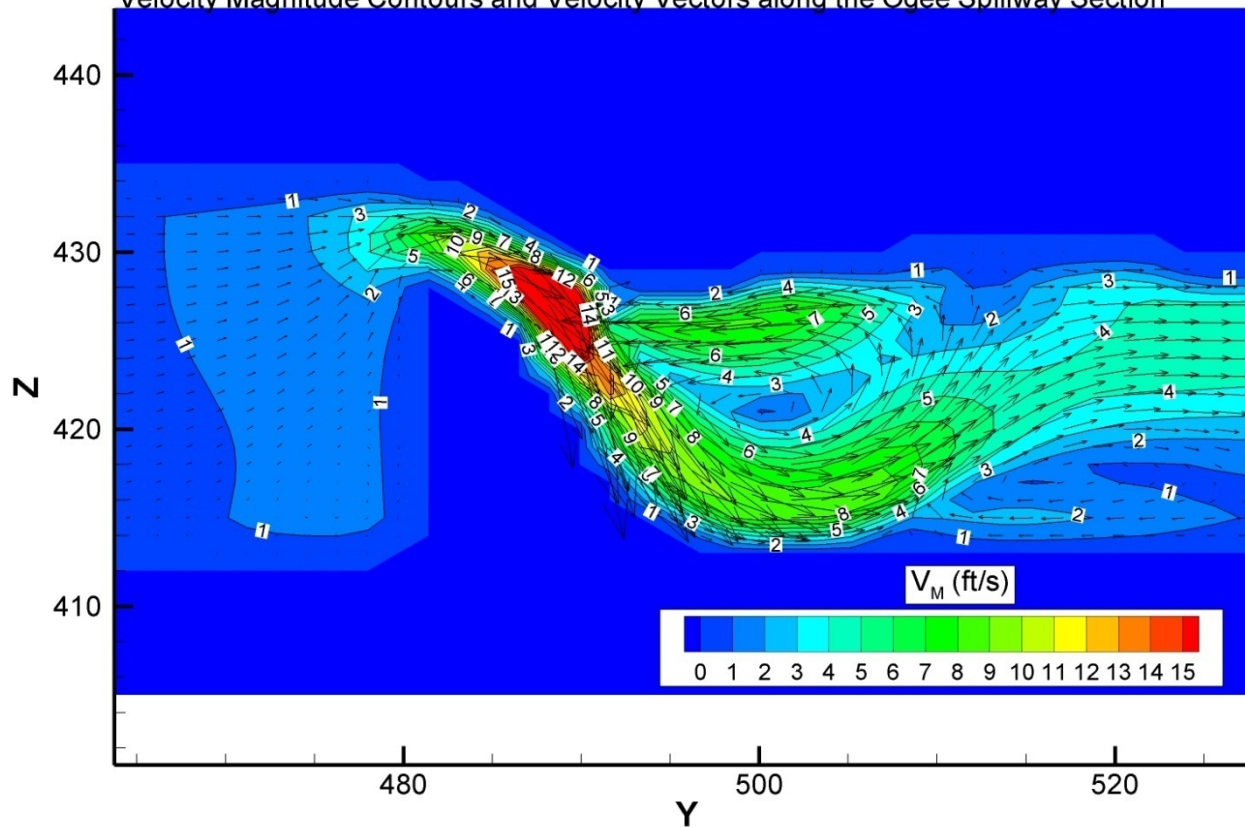
Ogee Section at X=150 ft

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket

2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)

Y-Z Plane at Centerline of Outlet Shaft (X=150 ft)

Velocity Magnitude Contours and Velocity Vectors along the Ogee Spillway Section



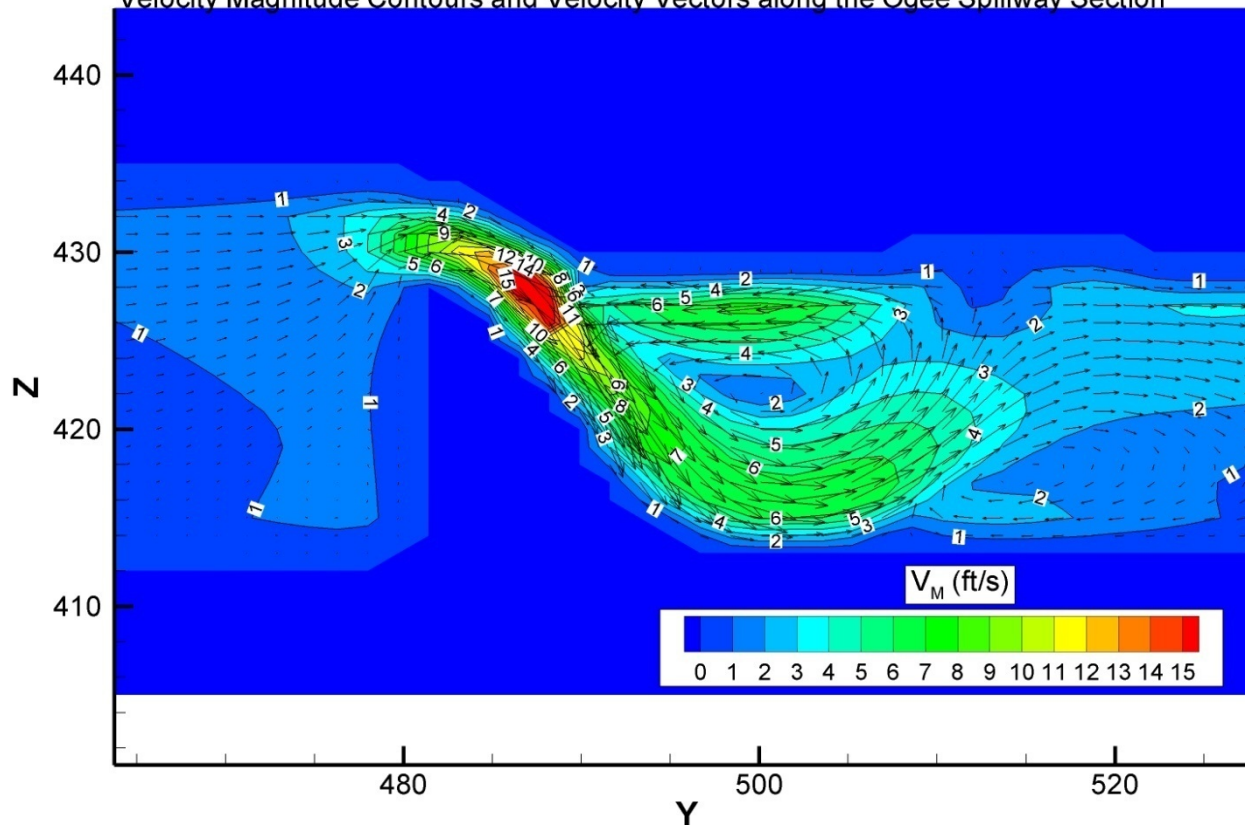
Velocity Profile along the Spillway Ogee Section at X=250 ft

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket

2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)

Y-Z Plane at Centerline of Outlet Shaft (X=250 ft)

Velocity Magnitude Contours and Velocity Vectors along the Ogee Spillway Section

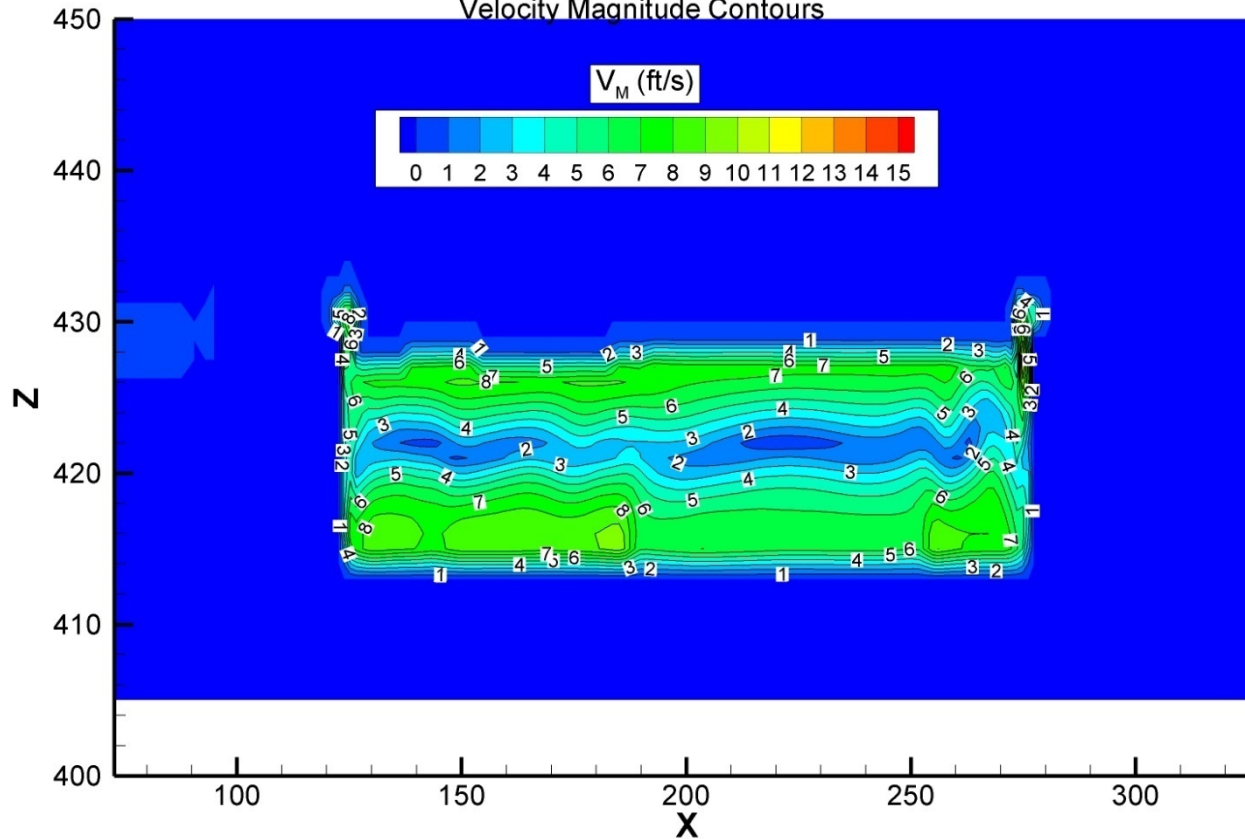


Hydraulic Jump at the Toe of the Spillway

Velocity and Froude Number

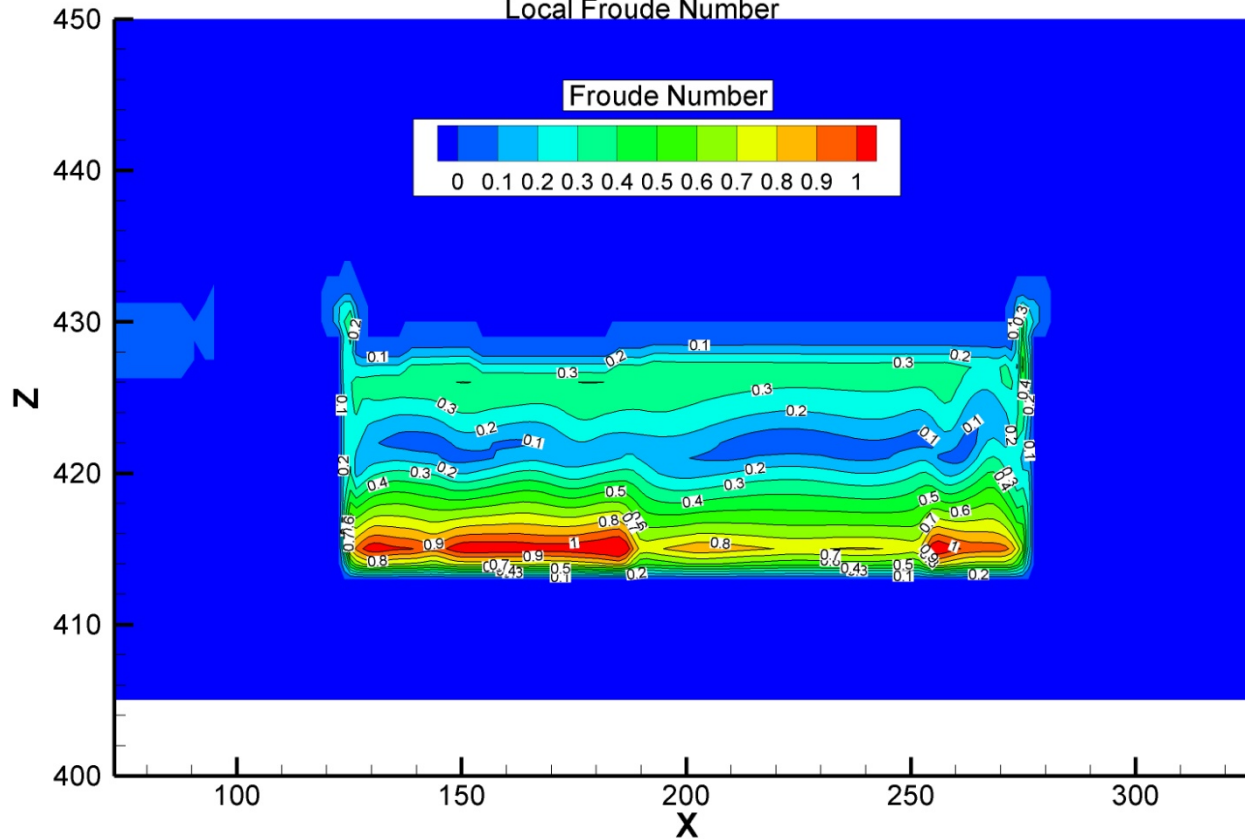
Velocity

Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
X-Z Plane at Spillway Toe (Y=500 ft)
Velocity Magnitude Contours



Froude Number

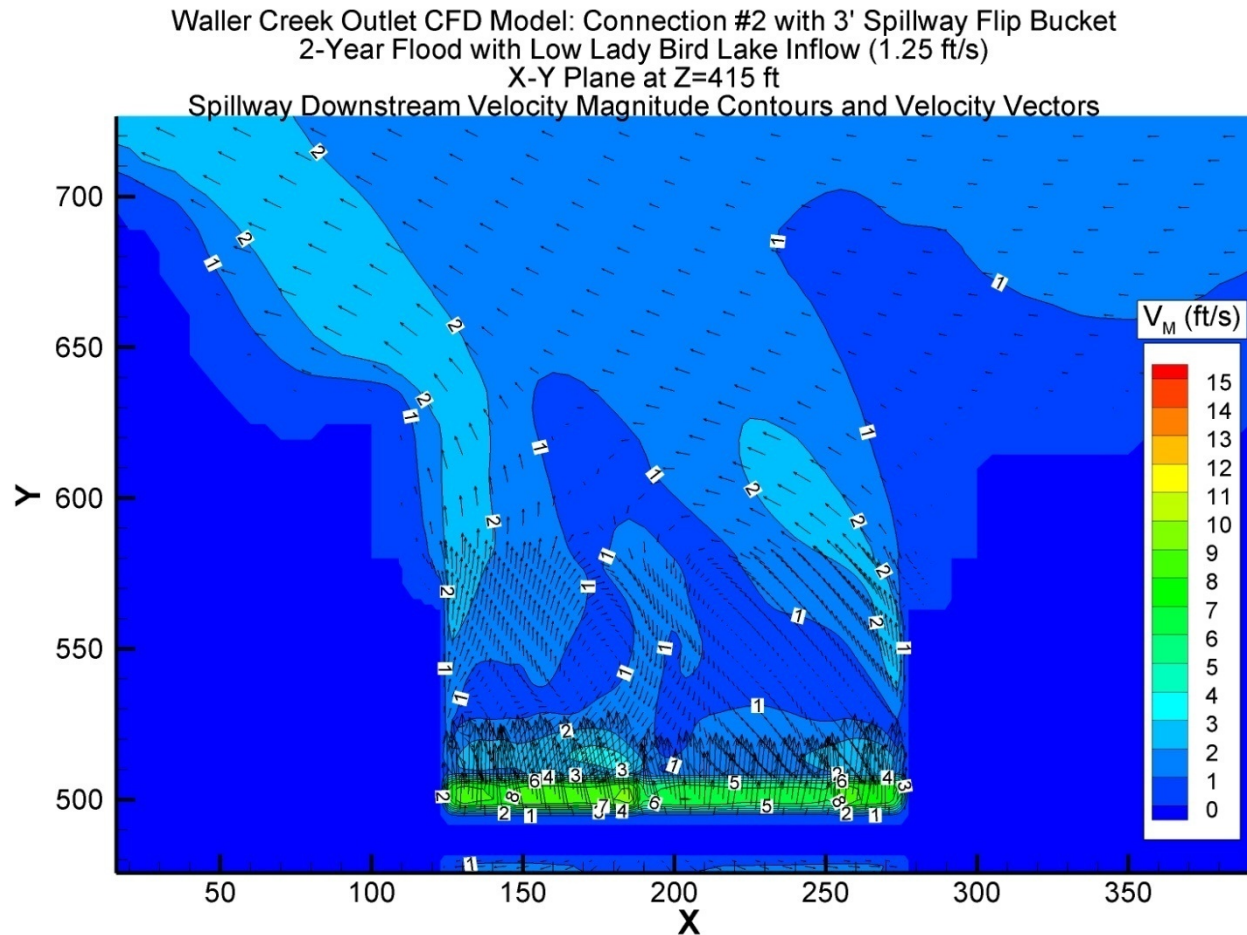
Waller Creek Outlet CFD Model: Connection #2 with 3' Spillway Flip Bucket
2-Year Flood with Low Lady Bird Lake Inflow (1.25 ft/s)
X-Z Plane at Spillway Toe (Y=500 ft)
Local Froude Number



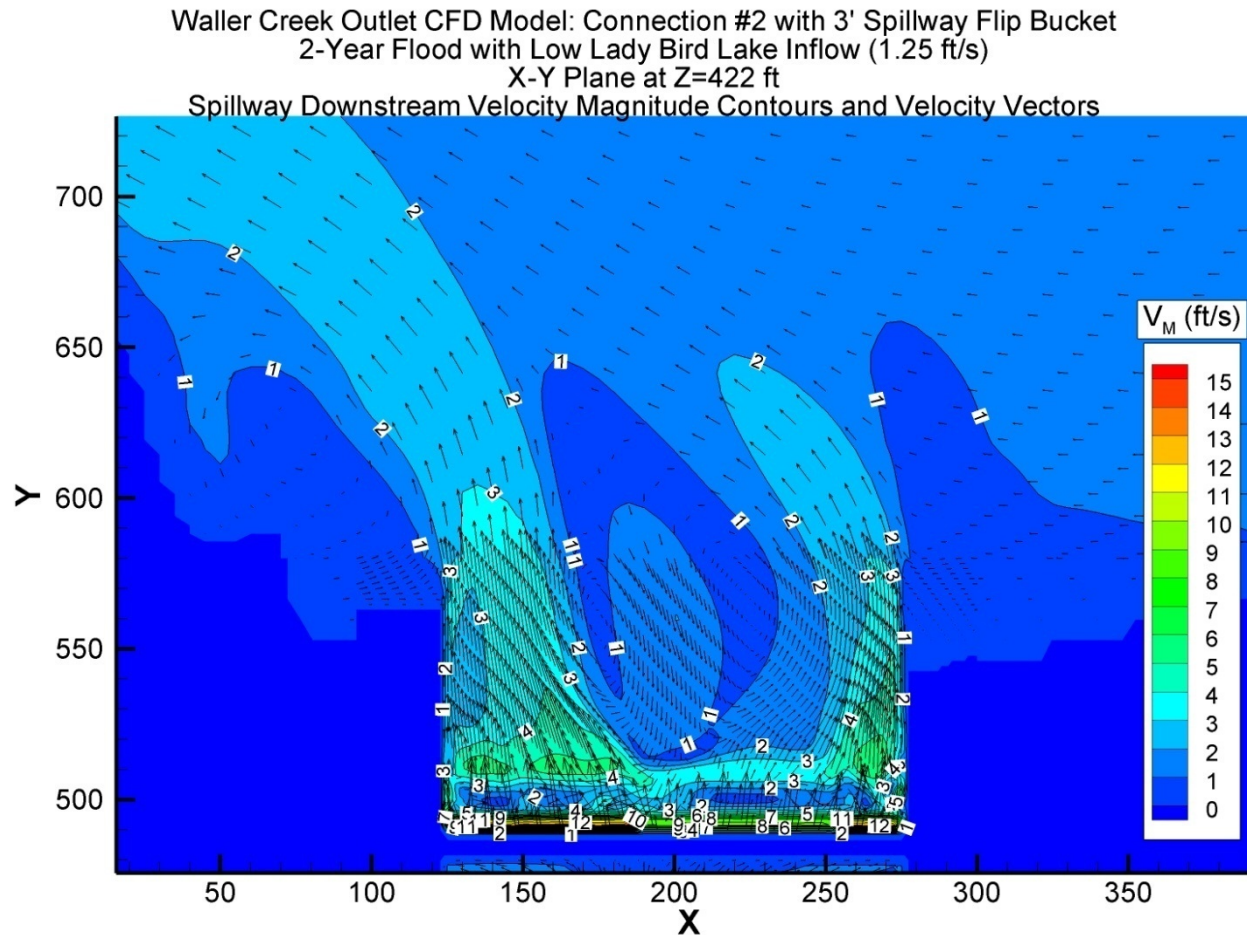
Scour Potential

In the Exit Channel, both Concrete
Apron and Riprap Section

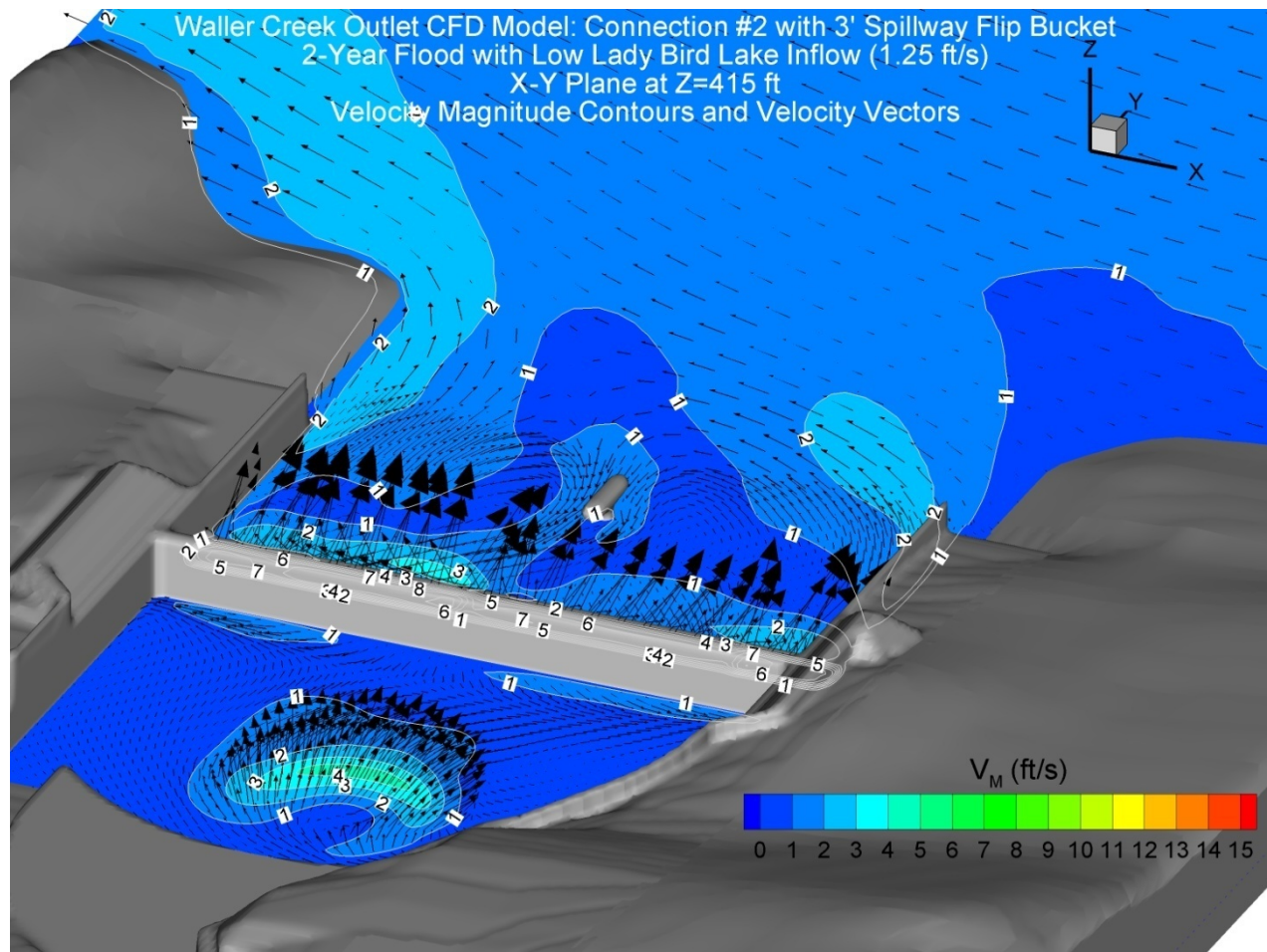
Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Horizontal Plane at Z=415 ft



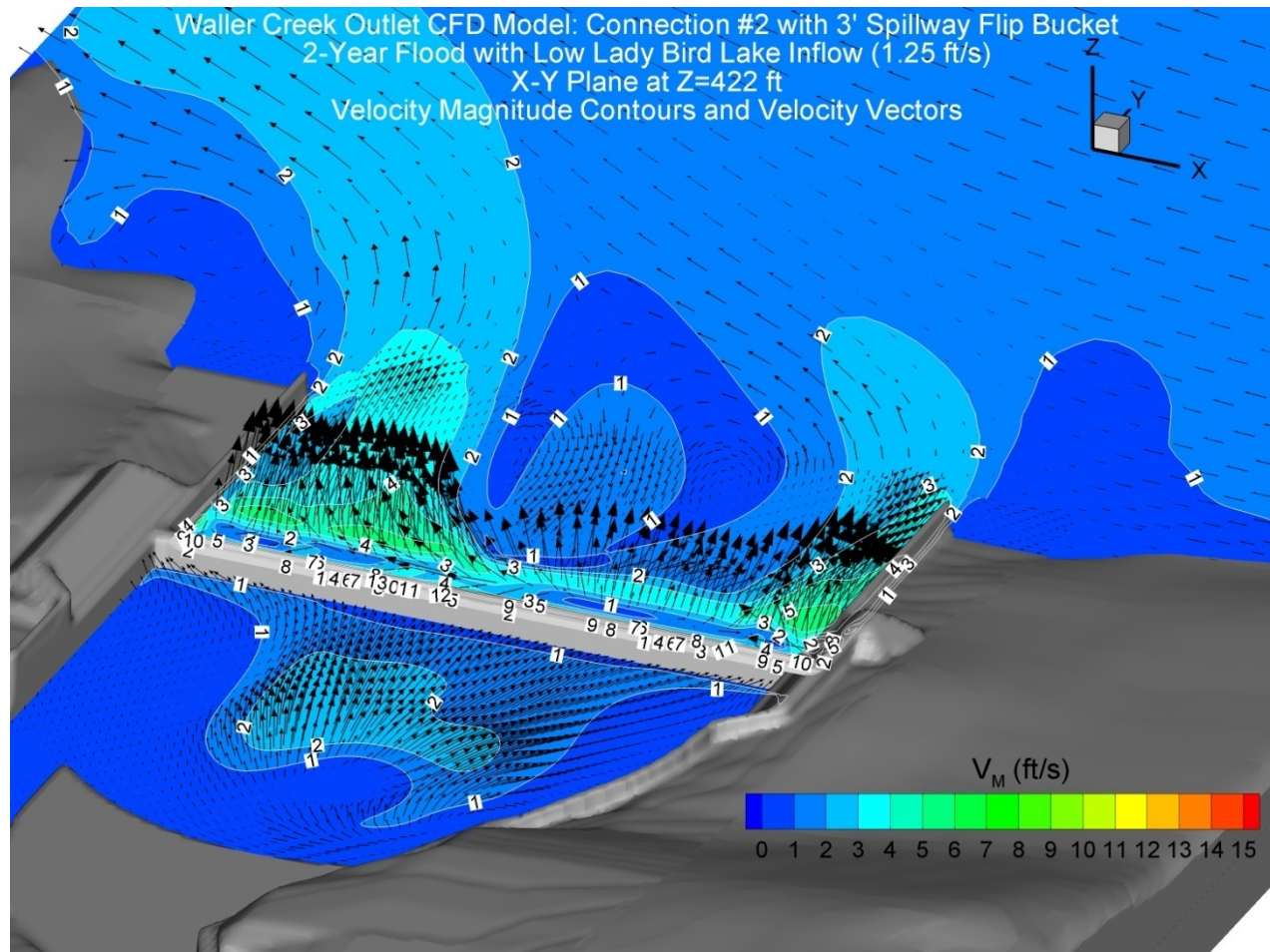
Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Horizontal Plane at Z=422 ft



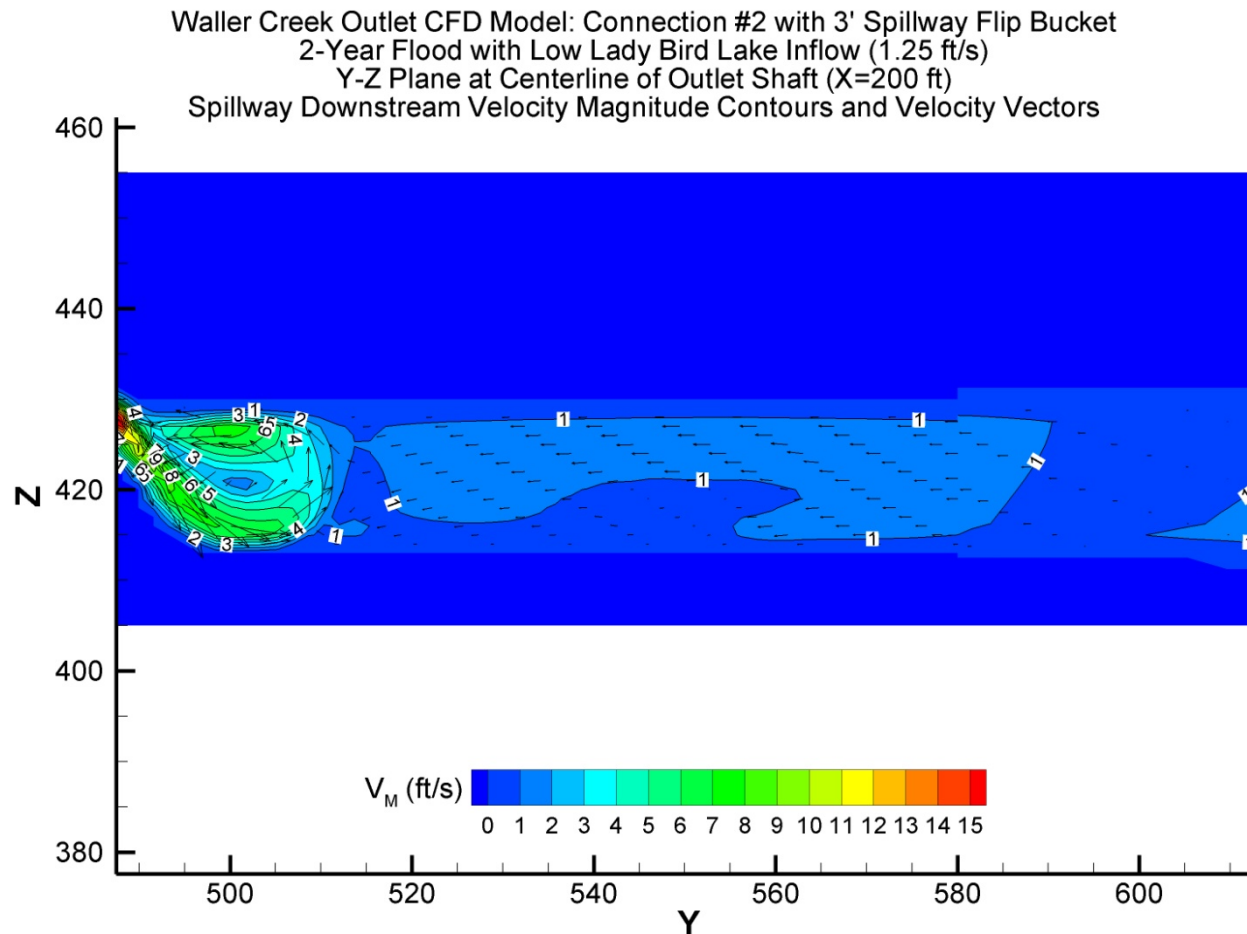
Velocity Magnitude Contours and Velocity Vectors in Horizontal Plane at Z=415 ft



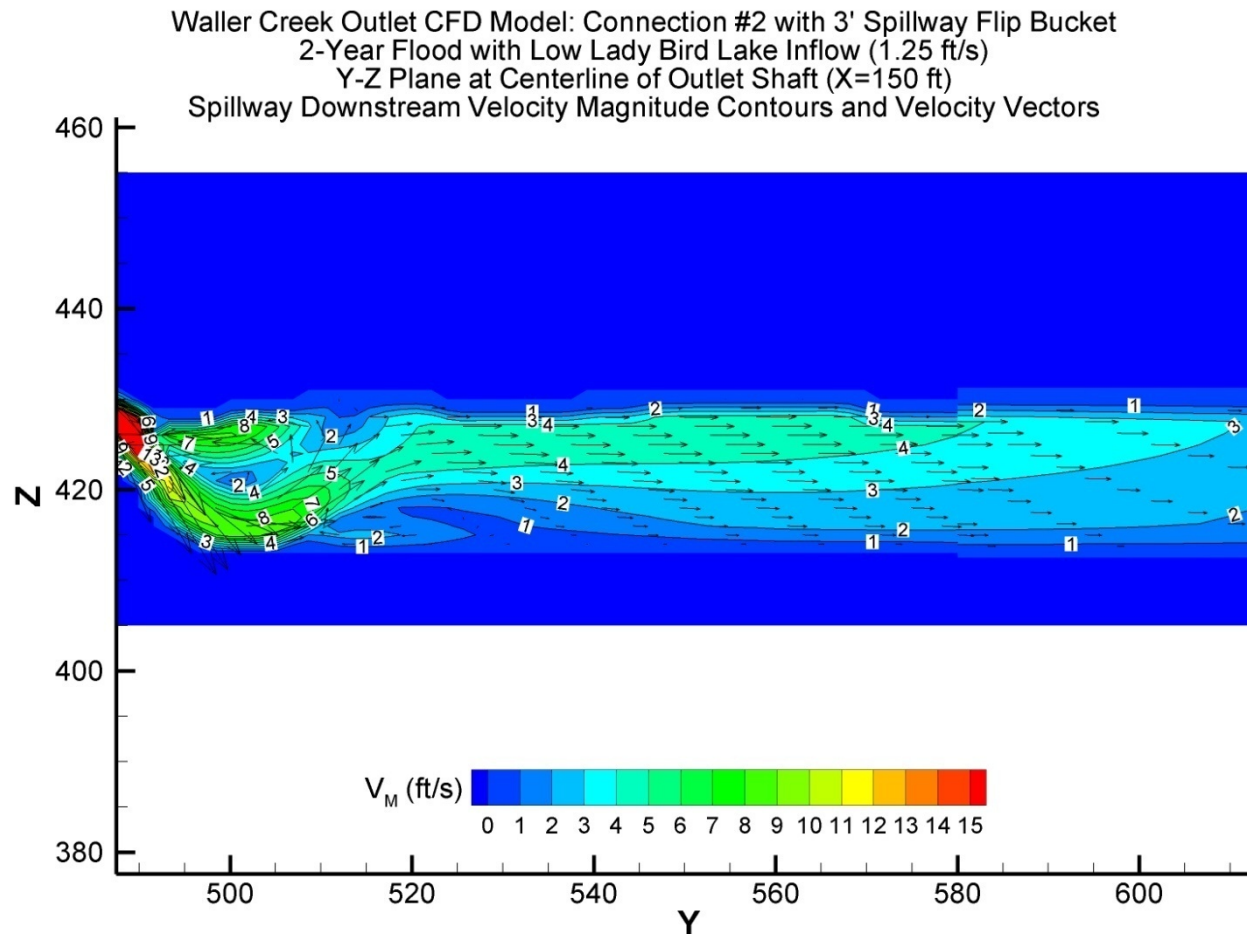
Velocity Magnitude Contours and Velocity Vectors in Horizontal Plane at Z=422 ft



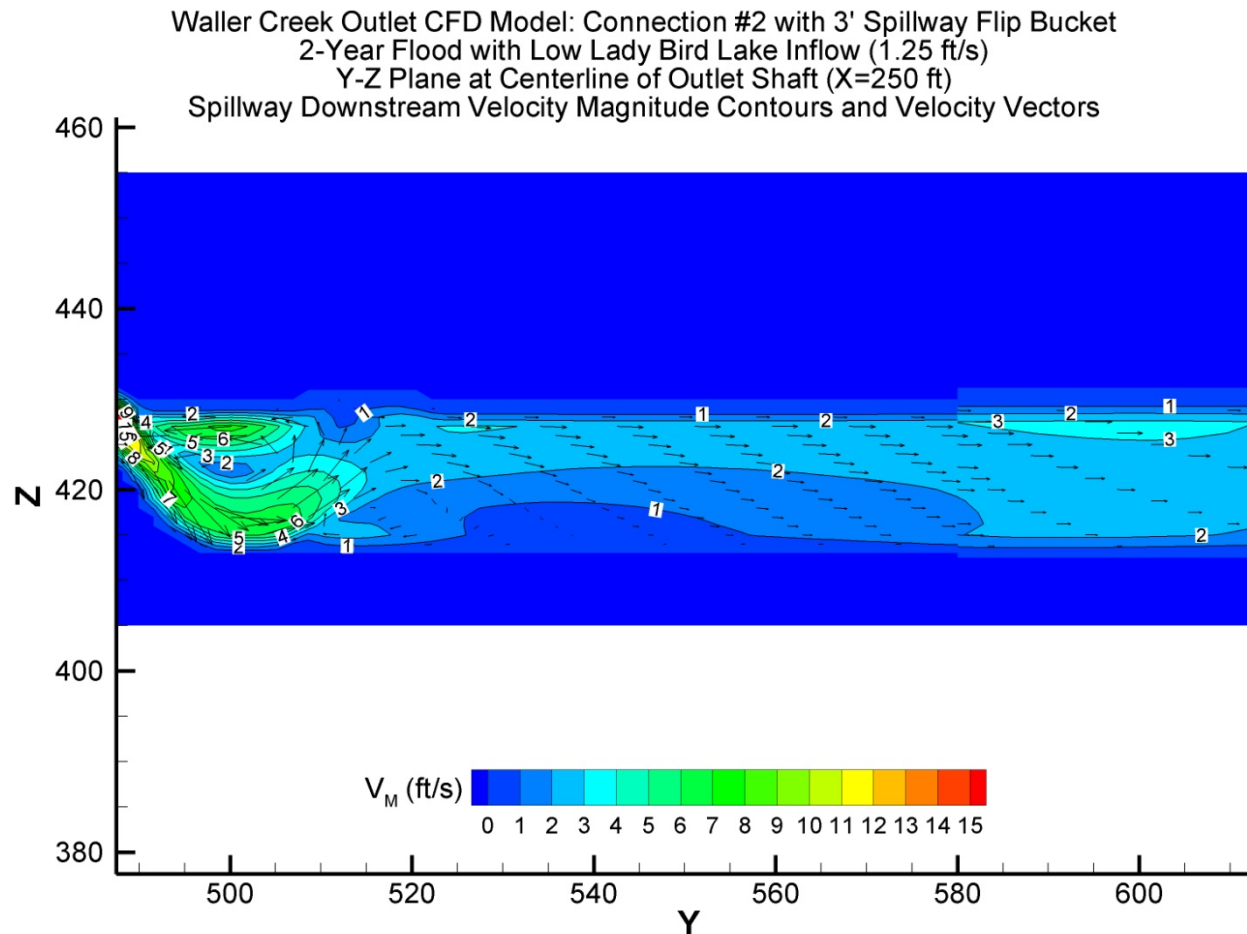
Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Longitudinal Plane at X=200 ft



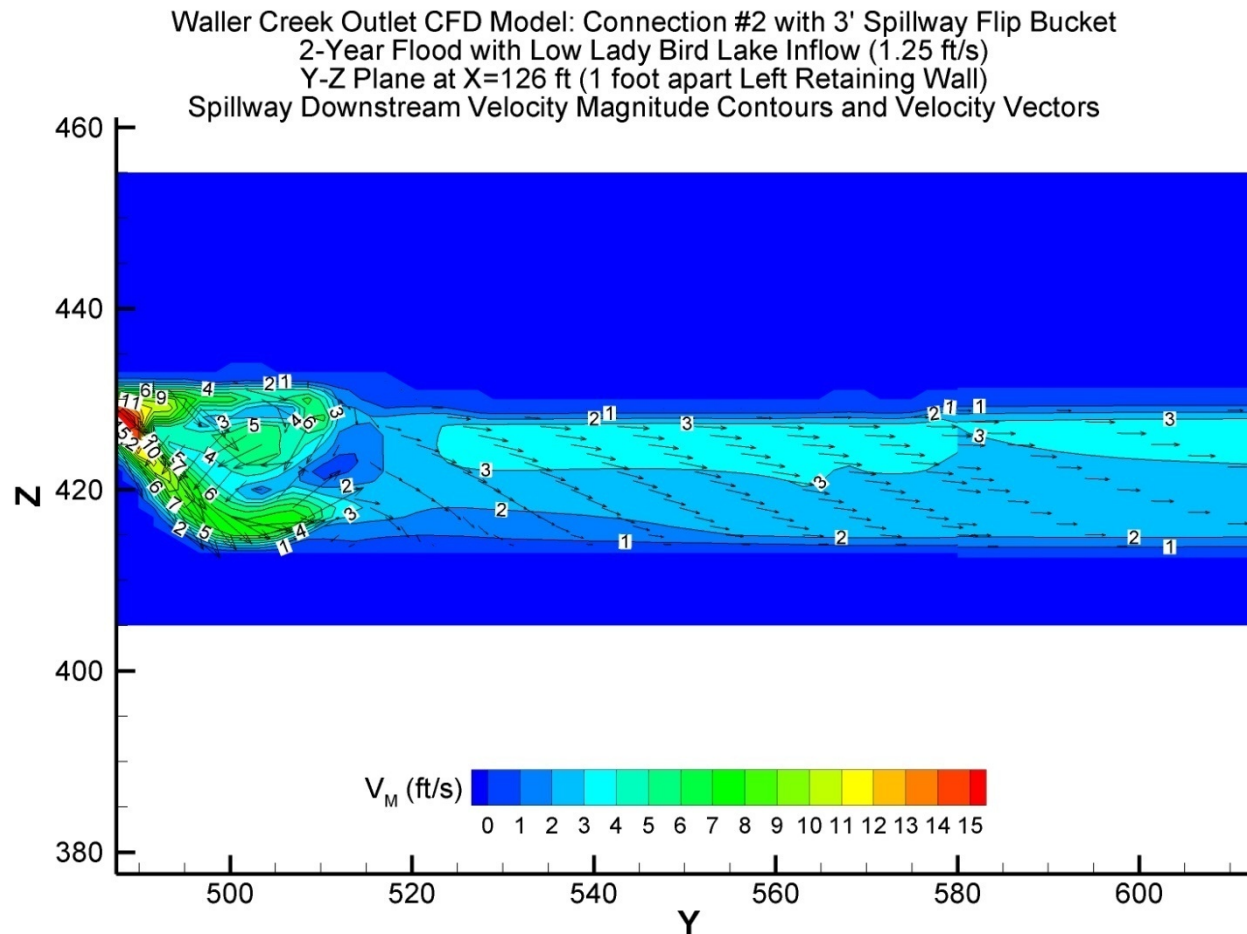
Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Longitudinal Plane at X=150 ft



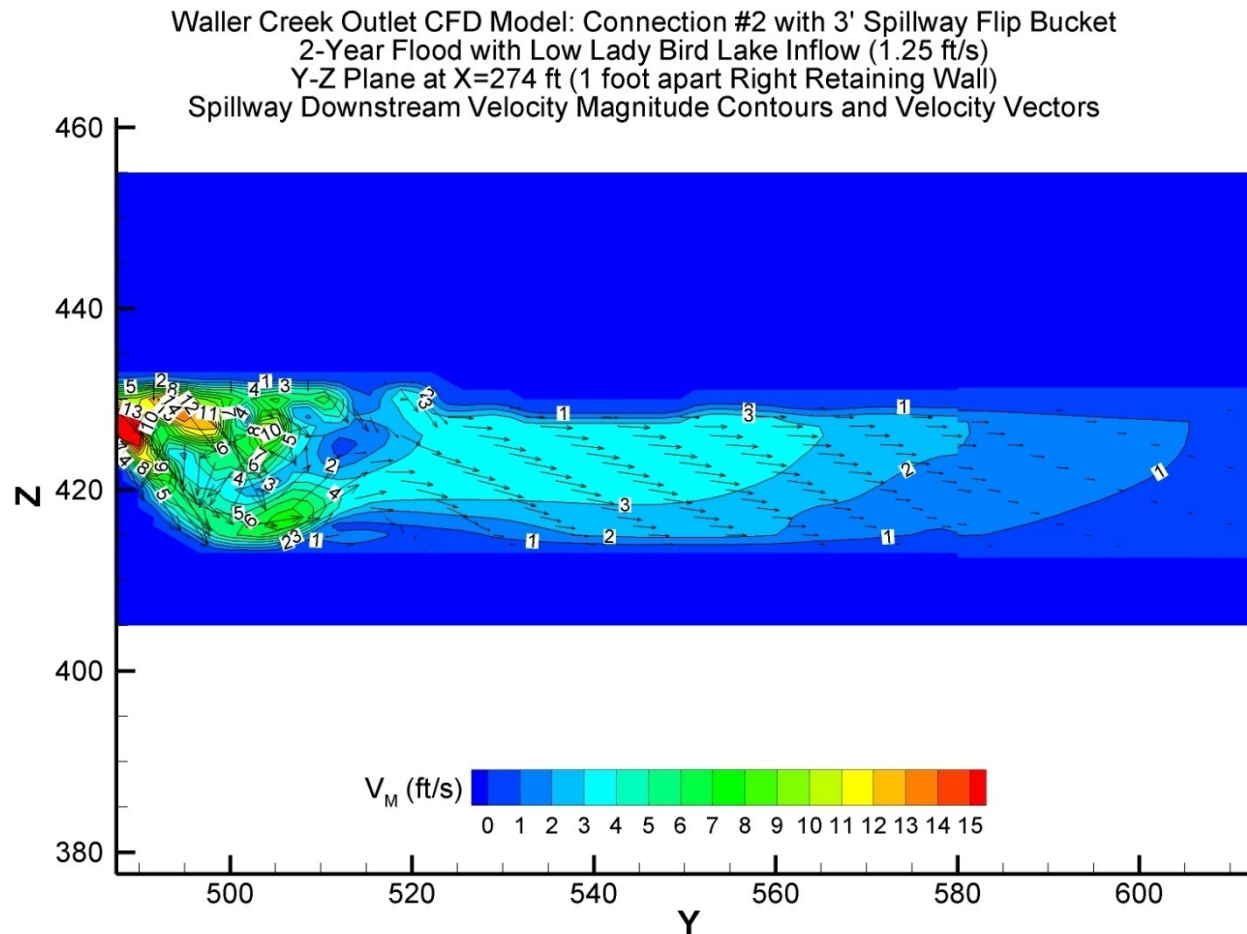
Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Longitudinal Plane at X=250 ft



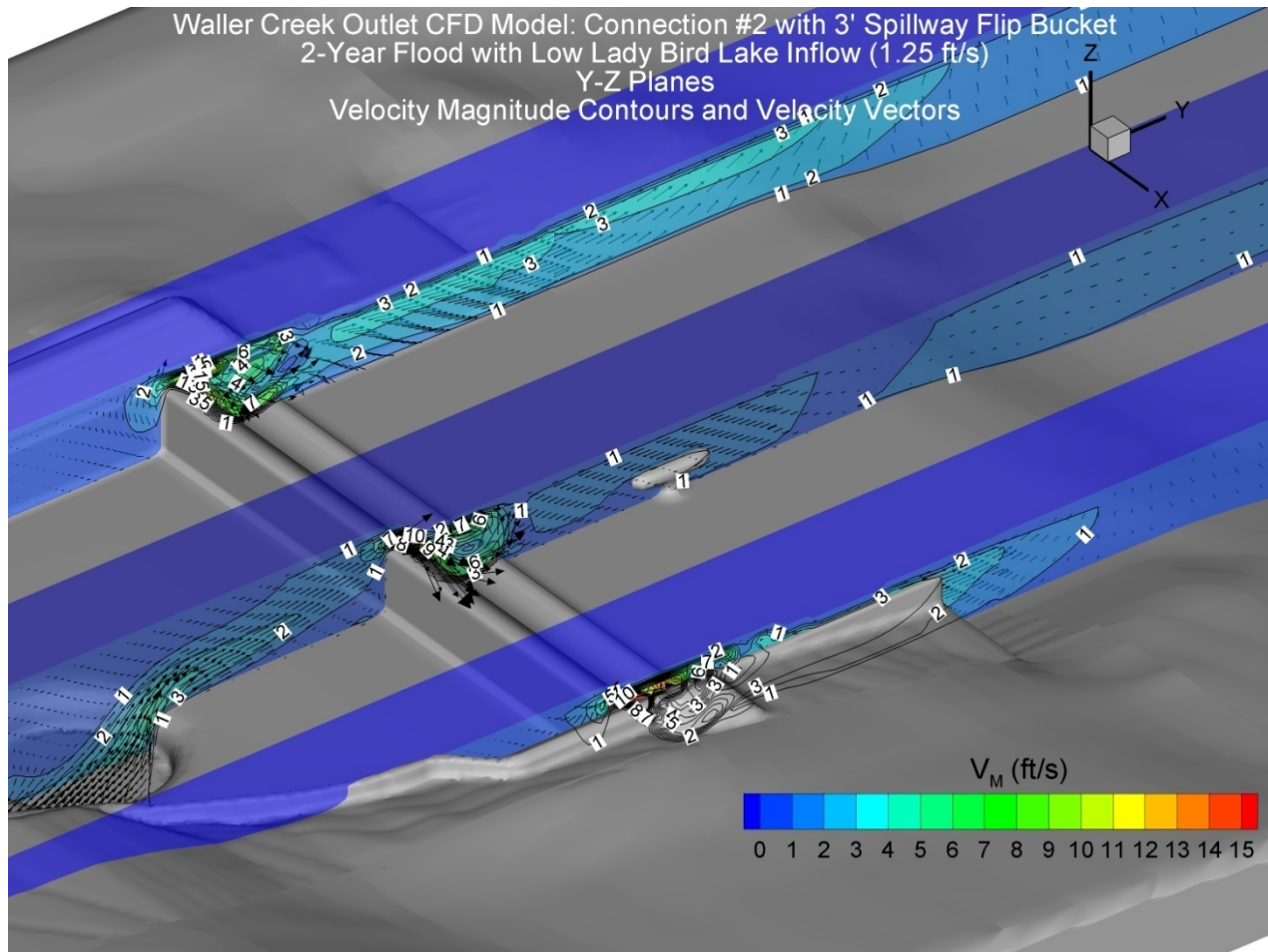
Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Longitudinal Plane 1 foot apart Left Retaining Wall



Velocity Magnitude Contours and Velocity Vectors in the Exit Channel in Longitudinal Plane 1 foot apart Right Retaining Wall



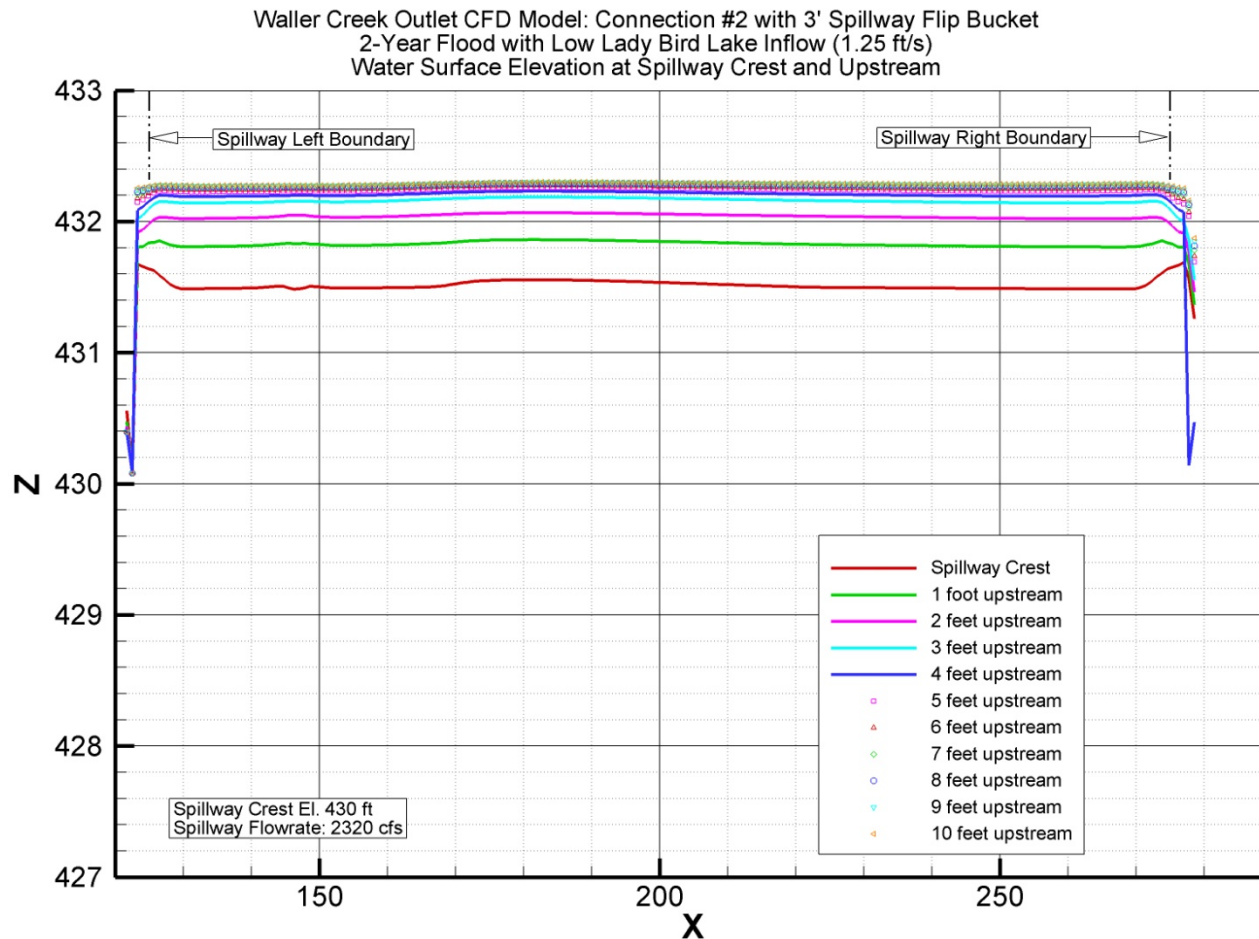
Velocity Magnitude Contours and Velocity Vectors in Vertical Planes



Water Surface Elevations

At Spillway Crest and Upstream

Water Surface Elevations at Spillway Crest and Upstream



Pressure Forces

On the Pipe Riser and Water Intake Screen

Pressure Force on Pipe Riser and Water Intake

Time (second)	X-Force (lbf)	Y-Force (lbf)	Z-Force (lbf)	Total (lbf)
Average	1774	-622	-622	1895