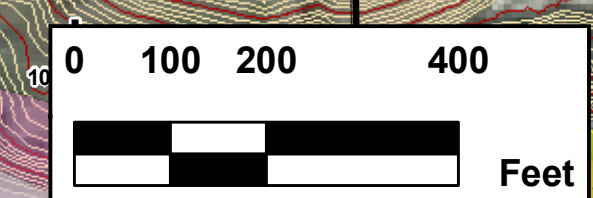


- LEGEND**
- BFE CONTOUR
 - BANK STATIONS
 - HEC-RAS CROSS SECTION LOCATIONS
 - STREAM FLOWPATH
 - AE
 - FLOODWAY
 - AO (1 FT)
 - AO (2 FT)
 - AO (3 FT)
 - NONE
 - X
 - FEMA Q3 ZONE X500
 - FEMA Q3 ZONE A
 - INDEX CONTOUR
 - INTERMEDIATE CONTOUR
 - STURGIS CORPORATE LIMITS - AUG 2006



BEAR BUTTE CREEK OVERFLOWS ON THE RIGHT BANK ALONG THIS STRETCH BETWEEN THE DM&E RAILROAD AND THE I-90 BRIDGES. AGAIN, A SPLIT FLOW WEIR AT THE BASE OF THE LEVEE WAS USED TO DETERMINE OVERFLOW RATES. A SEPARATE MODEL WAS PREPARED FOR BBCOVFNORTH. SEE BEAR BUTTE CREEK MODEL FOR SIDEFLOW WEIR GEOMETRY.

BBC OVERFLOWS HERE ALSO. NO SPLIT FLOW MODEL WAS CREATED. AE ZONE WAS ESTABLISHED BASED ON CREEK ELEVATIONS. TRANSITION TO AO ZONES DETERMINED FROM NO-LEVEE MODEL.

MODELED DISCHARGE:
BBC - 7,189 CFS
BBC OVERFLOW NORTH - 1,930 CFS

MODELED DISCHARGE:
BBC - 9,110 CFS
BBC OVERFLOW SOUTH - 2,800 CFS

WHITEWOOD ROAD BRIDGE IS CURRENTLY UNDER CONSTRUCTION. THE BEAR BUTTE CREEK MODEL INCORPORATES THE NEW BRIDGE GEOMETRY.

UPSTREAM LIMIT OF DETAILED STUDY

MODELED 1% CHANCE DISCHARGE:
12,000 CFS

BEAR BUTTE CREEK BEGINS TO OVERFLOW AT THIS POINT AND EXTENDS TO DM&E RAILROAD. THIS OVERFLOW SECTION IS CALLED BBCOVFSOUTH. A SEPARATE MODEL IS PROVIDED FOR THIS AREA. OVERFLOW RATES WERE DETERMINED BY USING A SIDEFLOW WEIR WITH ELEVATIONS SET TO GROUND LEVEL. SEE BEAR BUTTE CREEK MODEL FOR SIDEFLOW WEIR GEOMETRY.

AREA BETWEEN BEAR BUTTE CREEK AND SD HWY 14A WAS SPLIT INTO AO ZONES SOUTH OF THE DM&E RAILROAD. THIS WAS DONE IN CONSULTATION WITH JOHN LIU. DOWNSTREAM OF HWY 14, AE ZONE WAS USED DUE TO THE DEPTH OF FLOW. AE ZONE WAS EXTENDED TO A POINT JUST EAST OF I-90 RAILROAD OVERPASS. DOWNSTREAM OF THE END OF THE AE ZONE, FLOW SEEMS TO SPLIT IN MANY DIFFERENT DIRECTIONS AND THEREFORE ASSUMED TO BE VERY SHALLOW, HENCE THE ZONE X DESIGNATION.

AREA BETWEEN DM&E RAILROAD AND I-90 ALSO HAS AN AO ZONE THAT IS A BYPRODUCT OF A NEW PROPERTY DEVELOPED NEAR BEAR BUTTE CREEK ON THE NORTH SIDE OF WHITEWOOD ROAD. THIS PROPERTY FORCES OVERFLOWS OF BBC TO STAY WEST AND FORCED NORTH TO THE I-90 EMBANKMENT. I USED AN AO ZONE TO SHOW THAT FLOODING OF A FOOT IN DEPTH IS POSSIBLE ACROSS THIS NEW PROPERTY AS WELL AS IN A DIRECTION TO THE NORTH AND EAST OF IT. THE AREA ALONG THE I-90 EMBANKMENT IS ALL AE ZONE WITH BASE FLOOD ELEVATIONS DETERMINED.

DIGITAL ORTHOQUADRANGLE OBTAINED FROM THE SOUTH DAKOTA GEOLOGICAL SURVEY. PHOTO DATE: AUGUST 2004. TOPO DATE: NOVEMBER 2001.

ALL DATA SHOWN IS UTM ZONE 13, NORTH AMERICAN DATUM 1983 (NAD83). ELEVATIONS ARE REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).

CORPORATE LIMITS WERE OBTAINED FROM MEADE COUNTY GIS IN AUGUST 2006. LIMITS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

FINAL SUBMITTAL

EXHIBIT 1
STURGIS, SOUTH DAKOTA (460055)
BEAR BUTTE CREEK
UPSTREAM STUDY LIMIT TO
I-90 EXIT 32
WORK MAP W/ DELINEATIONS
OCTOBER 2006



PREPARED BY: DMH DATE PREPARED: 10-1-06