



Project No. ST-7529 (212) February 2010



Village of Columbus / POE  
New Mexico

# MASTER DRAINAGE PLAN - PHASE 2 Improvement Alternatives



# DRAFT



**WILSON  
& COMPANY**  
ENGINEERS & ARCHITECTS

in association with

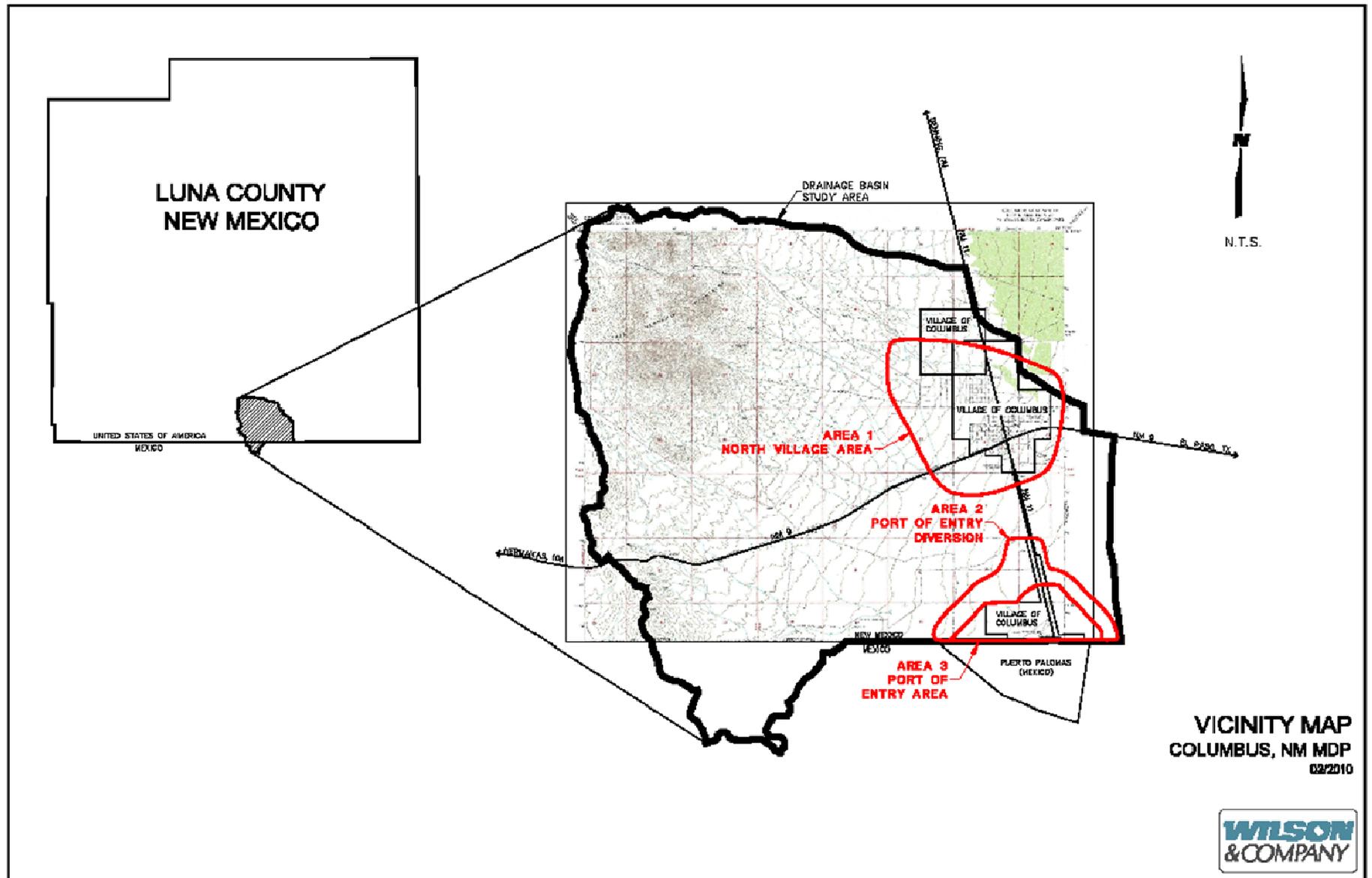


# Agenda

1. Introductions
2. Sign-in
3. Project Location
4. Project Background
5. POE Drainage Alternatives
6. Project Benefits
7. Open Forum
8. Adjourn



# Project Location



# Project Background

ASCG Inc. completed a Project Development Study (PDS) in June 2007 for the US Port of Entry in Columbus, NM. The PDS was a GSA led program development endeavor for an improved Port of Entry (POE) in this region. PDS estimates \$49,422,794 (construction cost) for a total of 44,184 Gross Floor Area (GSF).

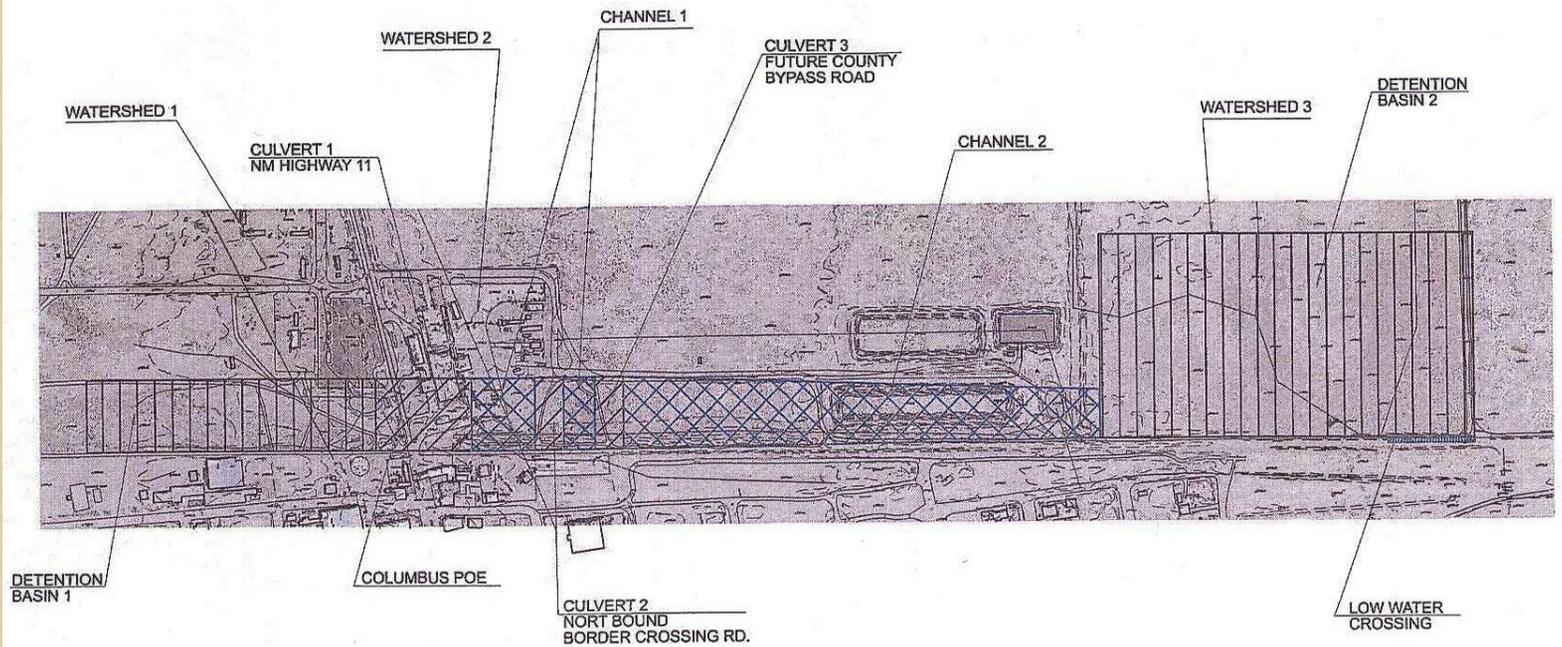




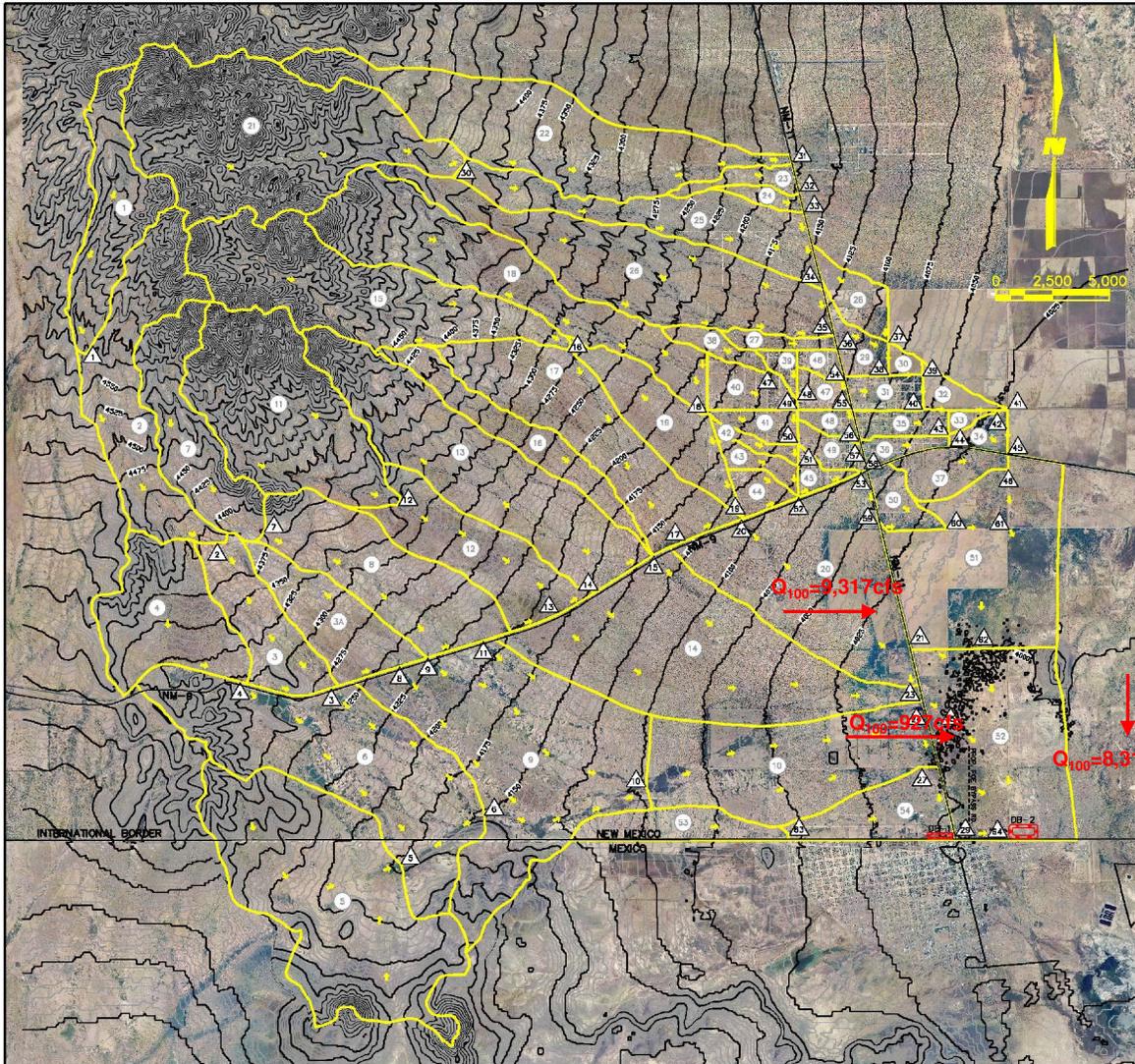
# Project Background

The main POE site includes 4.5 acres. Luna County and an adjacent private land owner will donate approximately 10.22 acres for the expansion of the existing POE. These improvements and acquisitions will bring the total POE site to 14.7 acres. The POE also intends to retain 1.1 additional acres directly west of the existing POE and NM 11, called Lot 21, for use as a storm retention pond and parking lot. The PDS report further defines the site as subject to “large rainfall runoff due to the 35 square mile drainage basin that flows towards the POE from the northwest”. The report references that government led projects in the next couple of years will be instrumental to alleviating the \$49M POE expansion facility.

# Project Background



# Project Background



| Analysis Point $\Delta$ | Area (sq. mi.) | $Q_{50}$ (cfs) | $Q_{100}$ (cfs) | Analysis Point $\Delta$ | Area (sq. mi.) | $Q_{50}$ (cfs) | $Q_{100}$ (cfs) |
|-------------------------|----------------|----------------|-----------------|-------------------------|----------------|----------------|-----------------|
| 1                       | 0.92           | 790            | 949             | 33                      | 0.09           | 43             | 55              |
| 2                       | 2.31           | 1,628          | 1,971           | 34                      | 1.02           | 427            | 520             |
| 3                       | 2.99           | 1,848          | 2,255           | 35                      | 2.86           | 1,172          | 1,425           |
| 4                       | 1.08           | 700            | 863             | 36                      | 0.12           | 121            | 145             |
| 5                       | 3.84           | 2,002          | 2,490           | 37                      | 0.24           | 141            | 176             |
| 6                       | 9.23           | 4,464          | 5,502           | 38                      | 3.40           | 1,272          | 1,549           |
| 7                       | 0.93           | 649            | 794             | 39                      | 3.46           | 1,274          | 1,563           |
| 8                       | 0.71           | 297            | 375             | 40                      | 3.64           | 1,313          | 1,601           |
| 9                       | 0.93           | 642            | 791             | 41                      | 3.77           | 1,336          | 1,629           |
| 10                      | 13.71          | 6,003          | 7,502           | 42                      | 0.04           | 19             | 25              |
| 11                      | 1.29           | 624            | 773             | 43                      | 0.17           | 129            | 158             |
| 12                      | 1.81           | 1,678          | 2,012           | 44                      | 0.12           | 101            | 123             |
| 13                      | 2.76           | 1,958          | 2,357           | 45                      | 4.23           | 1,265          | 1,546           |
| 14                      | 2.76           | 1,941          | 2,352           | 46                      | 4.51           | 1,339          | 1,638           |
| 15                      | 5.28           | 2,837          | 3,442           | 47                      | 0.14           | 133            | 160             |
| 16                      | 1.84           | 1,373          | 1,651           | 48                      | 0.21           | 211            | 253             |
| 17                      | 3.27           | 1,959          | 2,363           | 49                      | 0.46           | 510            | 610             |
| 18                      | 1.71           | 771            | 937             | 50                      | 0.62           | 670            | 800             |
| 19                      | 2.38           | 1,068          | 1,298           | 51                      | 0.71           | 760            | 906             |
| 20                      | 5.66           | 2,662          | 3,222           | 52                      | 0.98           | 1,038          | 1,240           |
| 21                      | 7.60           | 3,426          | 4,190           | 53                      | 1.07           | 1,117          | 1,342           |
| 22                      | -              | -              | -               | 54                      | 0.08           | 94             | 113             |
| 23                      | 32.10          | 7,163          | 9,317           | 55                      | 0.20           | 225            | 268             |
| 24                      | 32.10          | 649            | 704             | 56                      | 0.29           | 330            | 391             |
| 25                      | 32.10          | 6,514          | 8,611           | 57                      | 0.43           | 459            | 547             |
| 26                      | -              | -              | -               | 58                      | 1.50           | 1,599          | 1,879           |
| 27                      | 0.93           | 422            | 495             | 59                      | 1.50           | 1,567          | 1,870           |
| 28                      | -              | -              | -               | 60                      | 1.70           | 1,671          | 1,989           |
| 29                      | 33.02          | 664            | 725             | 61                      | 6.21           | 2,692          | 3,290           |
| 30                      | 2.60           | 1,943          | 2,337           | 62                      | 8.06           | 2,716          | 3,336           |
| 31                      | 4.60           | 2,207          | 2,677           | 63                      | 0.39           | 103            | 132             |
| 32                      | 0.15           | 62             | 80              | 64                      | 42.66          | 6,486          | 8,317           |

Notes:  
 30% area reduction factor has been applied to rainfall depths for Analysis Points 23, 24, 25, 29, and 64  
 93% area reduction factor has been applied to rainfall depths for Analysis Points 15, 20, 31, 45, and 46.  
 Analysis Points 22, 26, and 28 are not included in model.

### LEGEND

- $\odot$  DRAINAGE BASIN ID
- $\Delta$  ANALYSIS POINT ID
- BASIN BOUNDARY
- PROPOSED DETENTION BASIN
- $\rightarrow$  GENERAL FLOW DIRECTION

### ANALYSIS POINTS COLUMBUS, NM MDP

07/29/2009

FIGURE 2-7



NOTE: AP 23 DENOTES TOTAL COMBINED FLOW WEST OF NM-11 AND NORTH OF AP 27. AP 24 DENOTES FLOW TRAVELING SOUTH ALONG THE WEST SIDE OF NM-11 TO PROPOSED DB-1 NEAR THE POOL. AP 29 DENOTES FLOW THAT OVERTOPS NM-11 AS WELL AS FLOW THROUGH MULTIPLE CULVERTS IN NM-11 TO PROPOSED DB-2.

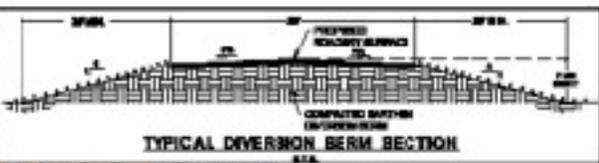
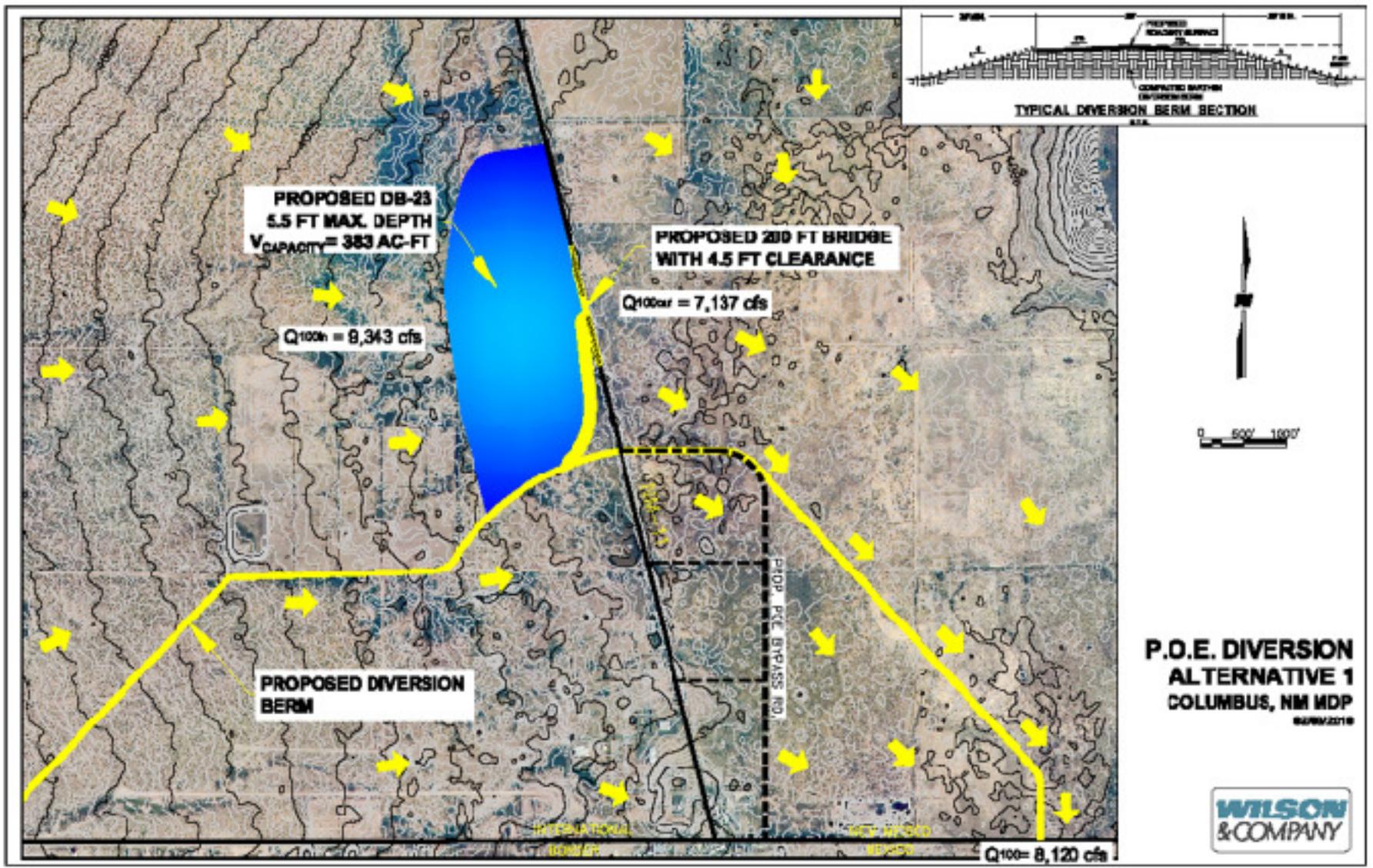


# POE Drainage Alternatives



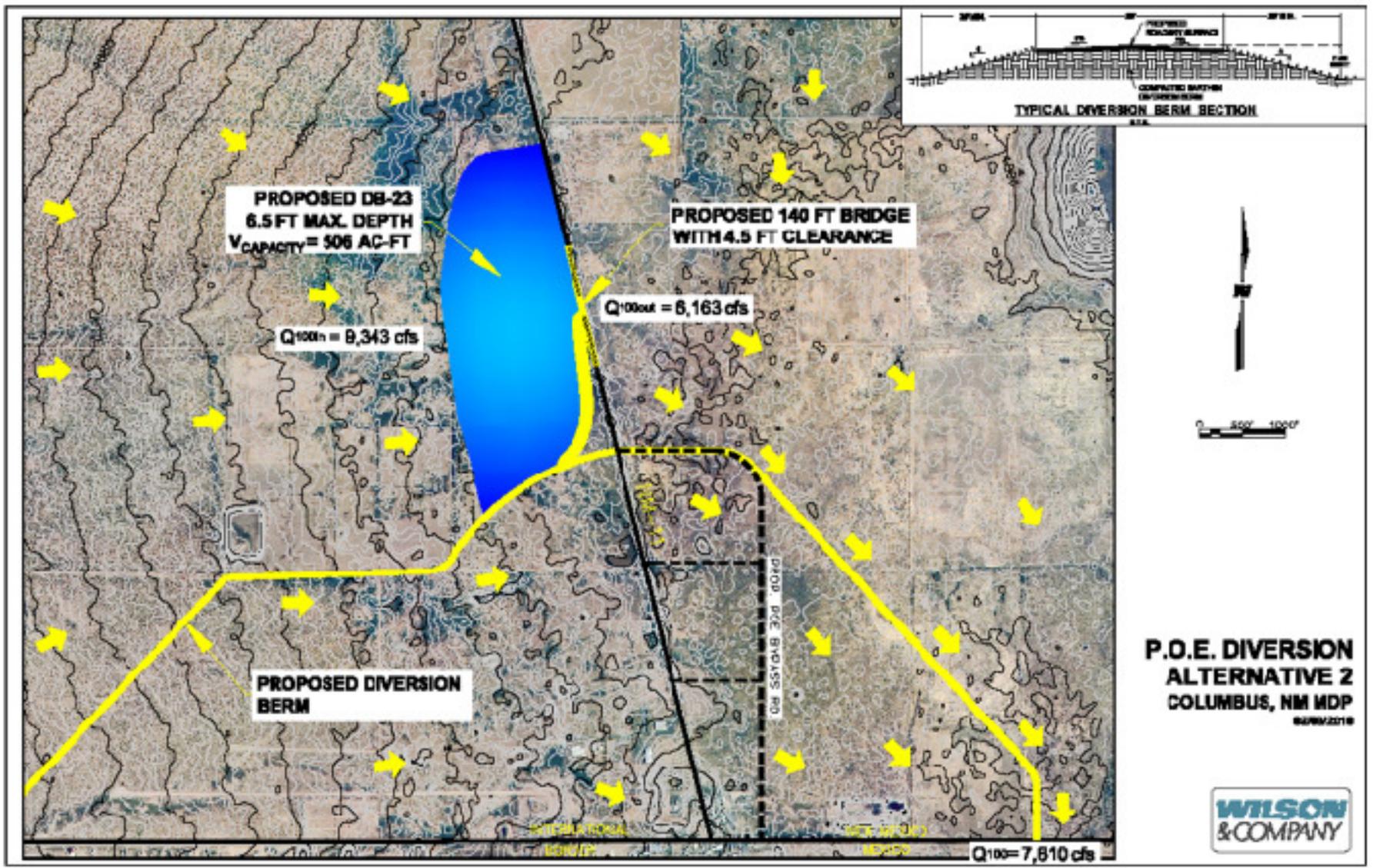
# Port of Entry Diversion

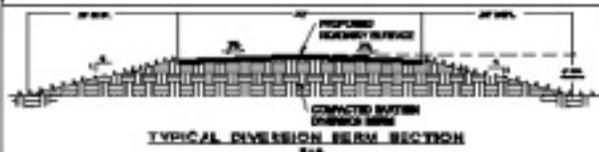
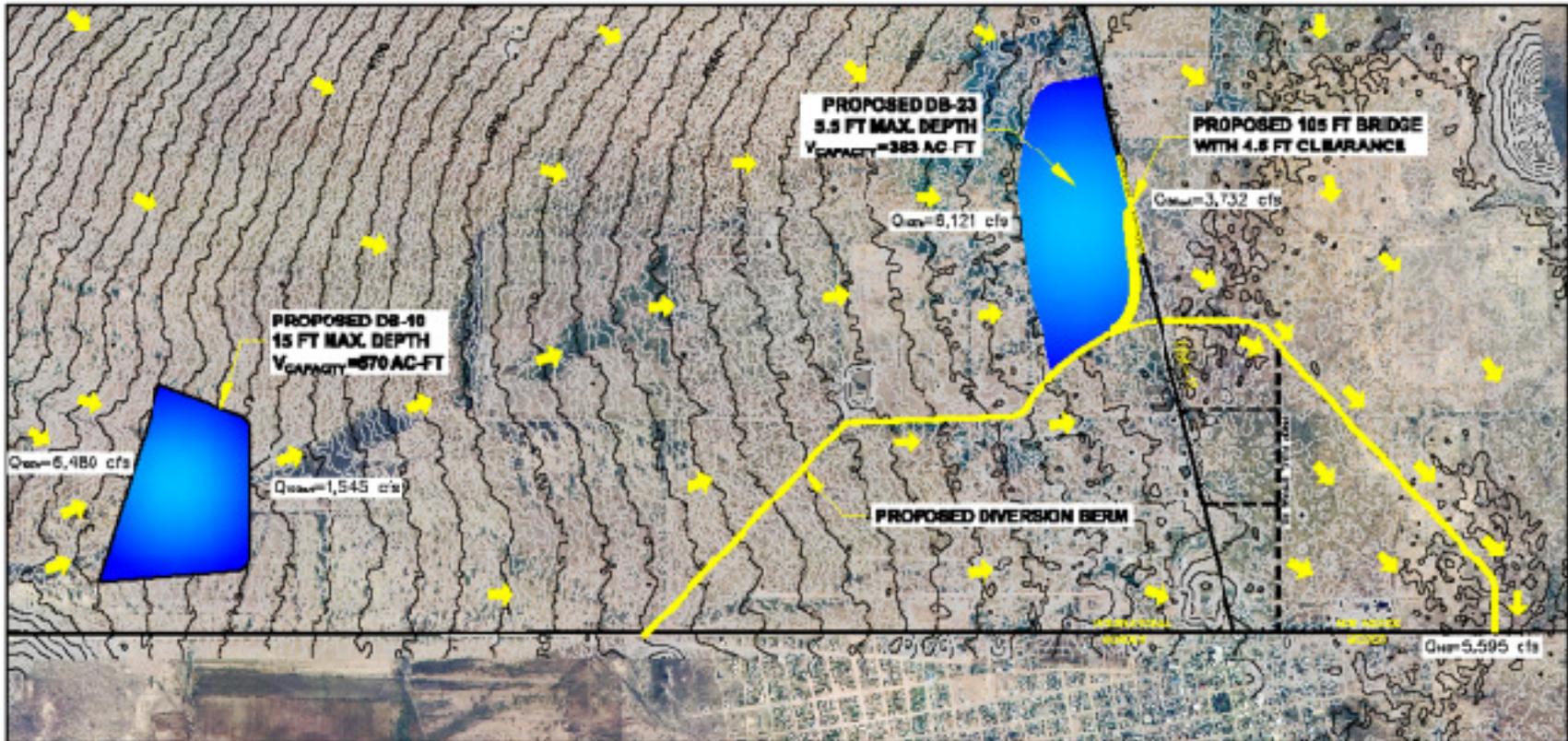
1. 100-year Capacity Berm and Bridge in NM-11 Meeting NMDOT 100-year Spread Criteria at NM-11
2. 100-year Capacity Berm and Bridge in NM-11 With 100-year Spread to Crown of NM-11
3. 100-year Capacity Berm and Bridge in NM-11 Meeting NMDOT 100-year Spread Capacity at NM-11 with Upstream Detention Dam



**P.O.E. DIVERSION  
 ALTERNATIVE 1  
 COLUMBUS, NM MDP**  
 02/09/2018







0 750' 1500'

**P.O.E. DIVERSION ALTERNATIVE 3**  
COLUMBUS, NM MDP  
8/16/2018



### P.O.E. Diversion Alternative Analysis Table

| Alternatives   | Pros   | Cons  | Cost     |
|--|--|---|----------|
| <b>Alternative 1</b> -100-YR Capacity Berm and Bridge in NM-11 Meeting NMDOT 100-YR Spread Criteria at NM-11                             | Conveys 100-yr peak discharge across NM-11   | Long bridge required with relatively high construction cost   | \$8.34M  |
|  | Provides minor reduction in peak discharge at international border                             | Additional bridge length leads to higher long term maintenance cost                                 |          |
|  | Meets NMDOT 100-yr criteria for spread and 100-yr flow below low chord of bridge               |   |          |
| <b>Alternative 2</b> -100-YR Capacity Berm and Bridge in NM-11 with 100-YR Spread to Crown of NM-11                                      | Conveys 100-yr peak discharge across NM-11 with shallow flooding, road still passable          | Violates NMDOT 100-yr criteria for spread on NM-11 and passing of flow below bottom chord of bridge | \$7.65M  |
|  | Reduced bridge length due to increased storage and ponding depth in DB-23                      |   |          |
|  | Provides 8% reduction in peak discharge at international border                                |   |          |
| <b>Alternative 3</b> -100-YR Capacity Berm and Bridge in NM-11 Meeting NMDOT 100-YR Spread Criteria at NM-11 with Upstream Detention Dam | Conveys 100-yr peak discharge across NM-11   | Substantial additional construction and land cost for upstream detention dam                        | \$11.28M |
|  | Provides 32% reduction in peak discharge at international border due to upstream detention dam | Additional maintenance costs associated with dam  |          |
|  |  |   |          |



# Project Benefits

2007 Project Development Study (PDS) identified 25year storm criterion and \$13.5M in stormwater infrastructure

The Diversion Berms provide 100year flood protection with Alternative No. 2 at \$7.65M in off-site infrastructure

Reduced on-site POE drainage infrastructure needs; reduced construction cost and increased flood protection

Bi-national flood protection with diversion of surface flow around POE and Puerto Palomas; discharge into Laguna south of the border

Reduced Maintenance with Diversion Berms

Protection of NM 11

Removal of floodplain near POE and approximately 300 acres of economically developable real-estate

Thank You.

