

Stream Diversion Construction

- 116th Ave Interchange, I-94 Exit 56
- Duck Creek Box Culvert Installation and Extension
- Prime Contractor:
 - Martin Construction
- Structure Contractor:
 - Wanzek Construction

Special Thanks

- Mitch Unterseher and Robert Monley from Wanzek Construction

Tips from Mitch

Tips from Me

Regulations

Diversion Confusion

- Lack of clear guidelines for diversions
- Contractor was asked to line diversions/provide impermeable dikes
- Work directly associated with erosion control was paid for by change order.

New Regulations

- Regulations for stream diversions for 2015 construction season have been developed:
 - 2015 General Construction Permit
 - Currently in draft form
 - Special Provisions
- Diversions on 116th Ave were built with intent to follow new and developing regulations



Box culvert extension

New box culvert

Diversion Options

- Special Provision Temporary Stream Diversions
 - Open Channel
 - Pipe
 - Suspended Pipe
 - Pumping

Box Culvert Diversion Selection

An open channel was selected for new box culvert diversion



Let the Fun Begin





Do not excavate all the way
to the water level

Manpower Needs





Tips From Mitch:
Use dozer to smooth out
channel before placing fabric

Diversion Channel Elevation is Greater Than Creek Elevation



Liner Placement



2015 General Construction Permit Requirements:

Stream diversions or any temporary or permanent drainage ditch or trench, which will have continuous flow, shall be stabilized with appropriate controls prior to connection with any surface water. The entire area (channel and bank) of the stream diversion or temporary or permanent drainage ditch, or trench, must be appropriately stabilized to bankfull height.



Liner Placement

Place fabric from
downstream up and overlap



Tips From Mitch:
Use reinforced poly wide
enough to cover entire
diversion

Tips From Mitch:
Do not attempt to install
liner when windy

Liner Anchoring



Tips From Mitch:
Try using 2x4 with rebar to
anchor liner

Could also anchor with rip-
rap or sand bags

Diversion Ready for Water



Dike Construction

Construct upstream dike first

Do not allow water to contact soil



Tips From Mitch:
Use R1 fabric wrapped in reinforced poly.





Wrap Dike in Poly





Anchor Poly



Diversion Material Options

Rip-Rap wrapped in fabric

Sandbags

Sheet Piles



Dike Complete – Diversion Begins to Flow



Duck Creek Diverted- Work Area Dry!



Diversion Flowing



SP: Do not store soil stock piles within 200' of diversion

Add fiber rolls to perimeter of diversion

Diversion Outlet



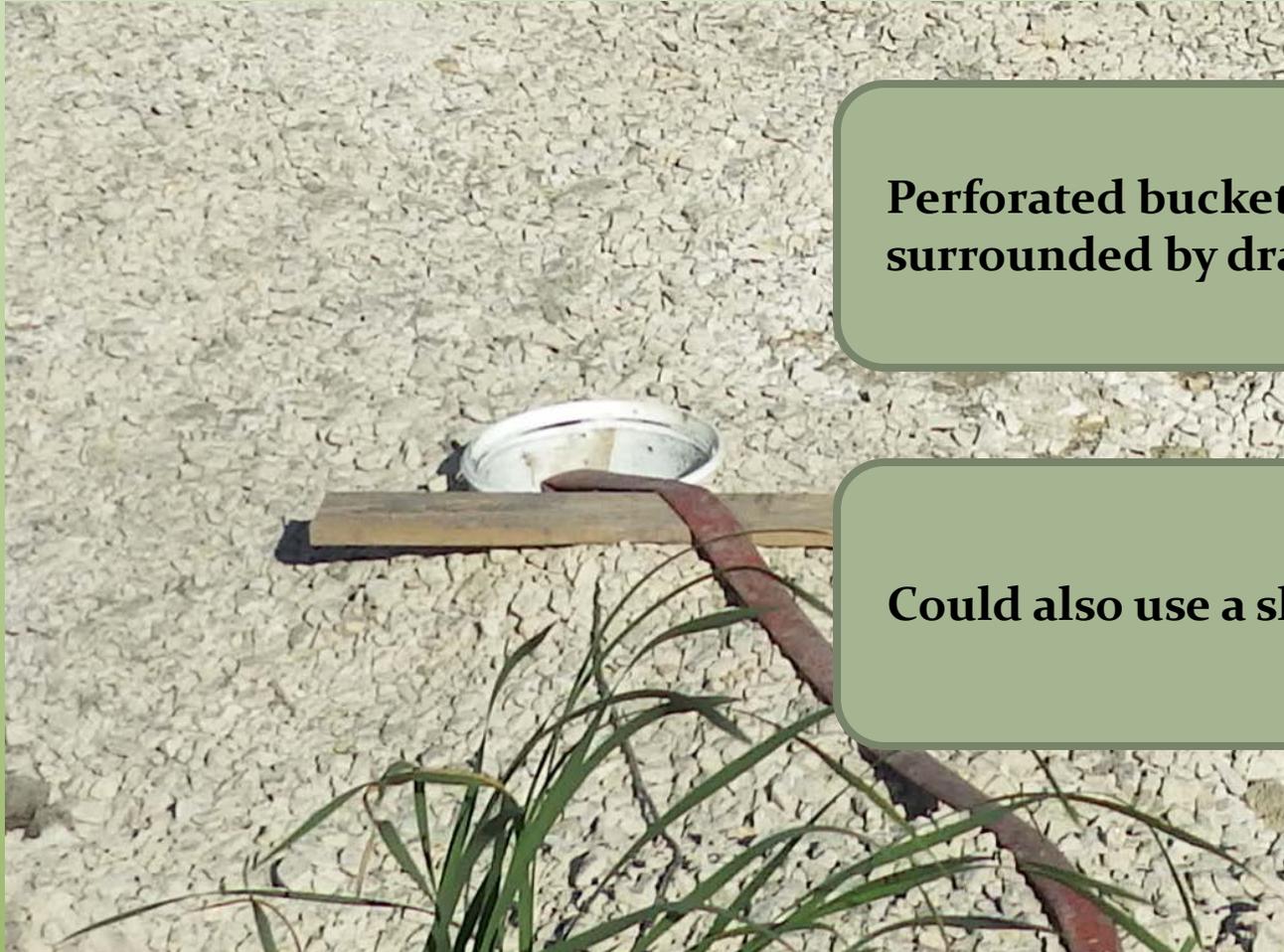


Diversion Dewatering

2015 General Construction Permit:

When dewatering, utilize structures or BMPs which allow for draw down to occur from the surface of the water, unless infeasible. If infeasible, documentation must be provided in the SWPPP. In addition, you must describe what BMP(s) will be used in its place.

Diversion Dewatering



**Perforated bucket or pipe
surrounded by drain rock**

Could also use a skimmer





Do not discharge directly into
the stream or diversion

Discharge Into Vegetative Buffer



Diversion Dewatering

2015 General Construction Permit:

Daily inspections required for dewatering.

Records shall contain at a minimum:

- i. Date and time of the inspection,
- ii. Inspector name,
- iii. Volume of water discharged,
- iv. Findings of the inspection, including recommendations and schedule for corrective actions;
- v. Corrective actions taken (including dates, times, and party completing maintenance activities); and
- vi. Documentation that the SWPPP has been amended when substantial changes are made to the dewatering activity in response to inspections.

Does Size Matter?

**SP will provide minimum
flow requirements**

**Contractor will be
responsible to design and
size diversion**

**Contractor will be
responsible for all damage
from high water events**



How Much Rain Will You Build For?



**Duck Creek drainage
received between 6" and
10" in 24 hours**





**Do not store soil stock
piles within 200' of
diversion**

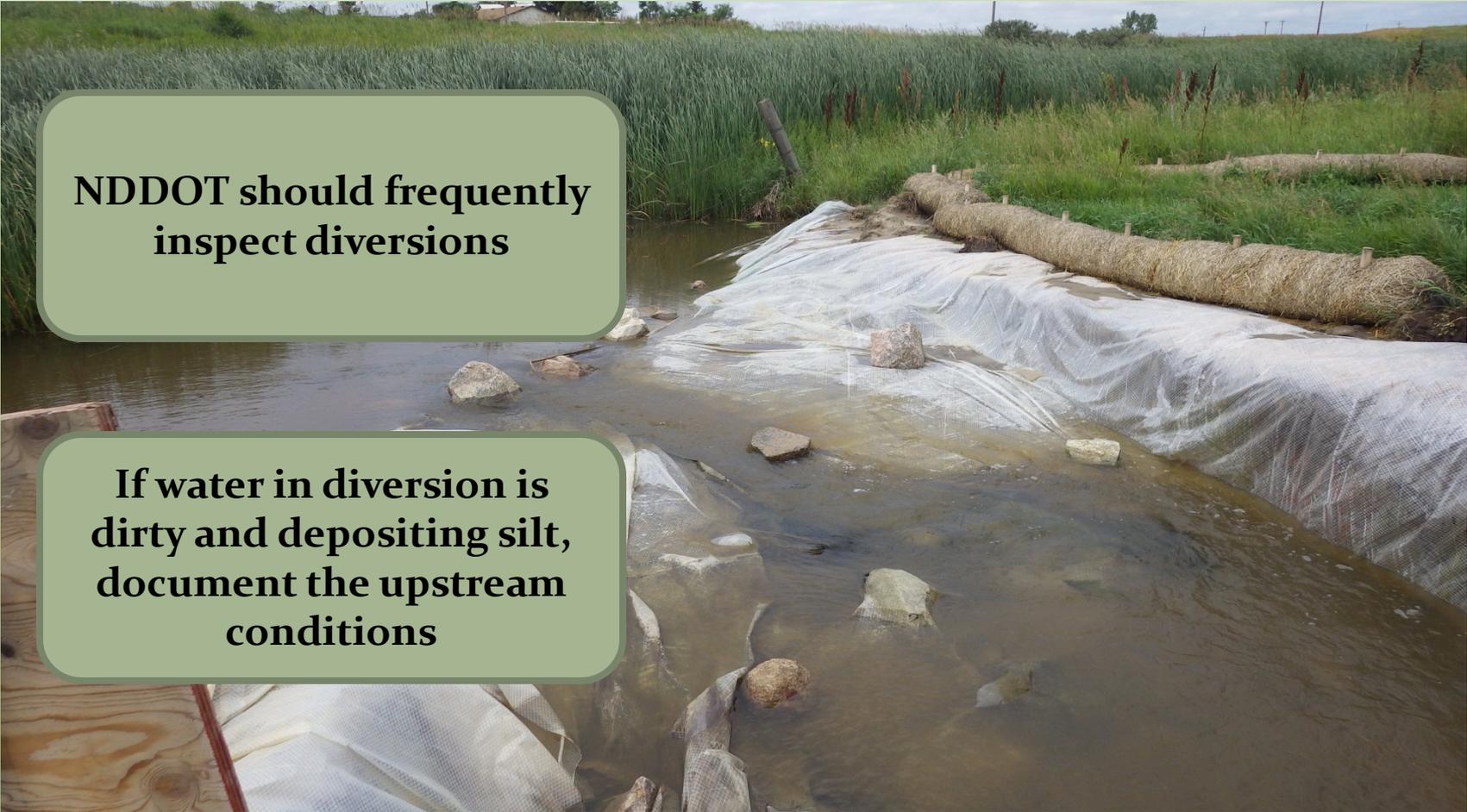


Diversion Inspections



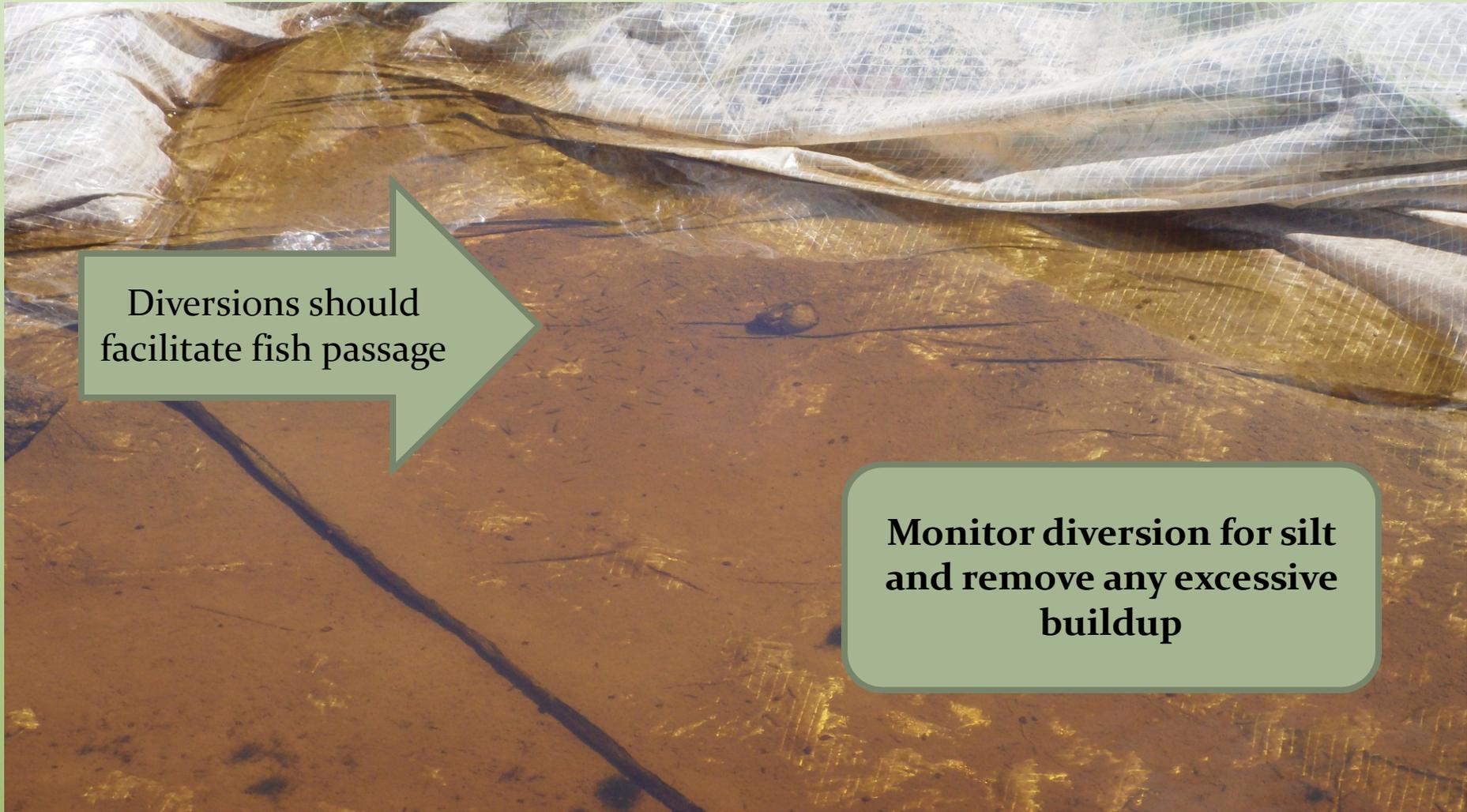
**Contractor will inspect
diversion along with
project inspections**

Diversion Inspections



**NDDOT should frequently
inspect diversions**

**If water in diversion is
dirty and depositing silt,
document the upstream
conditions**



**Diversion should
facilitate fish passage**

**Monitor diversion for silt
and remove any excessive
buildup**

Erosion Control



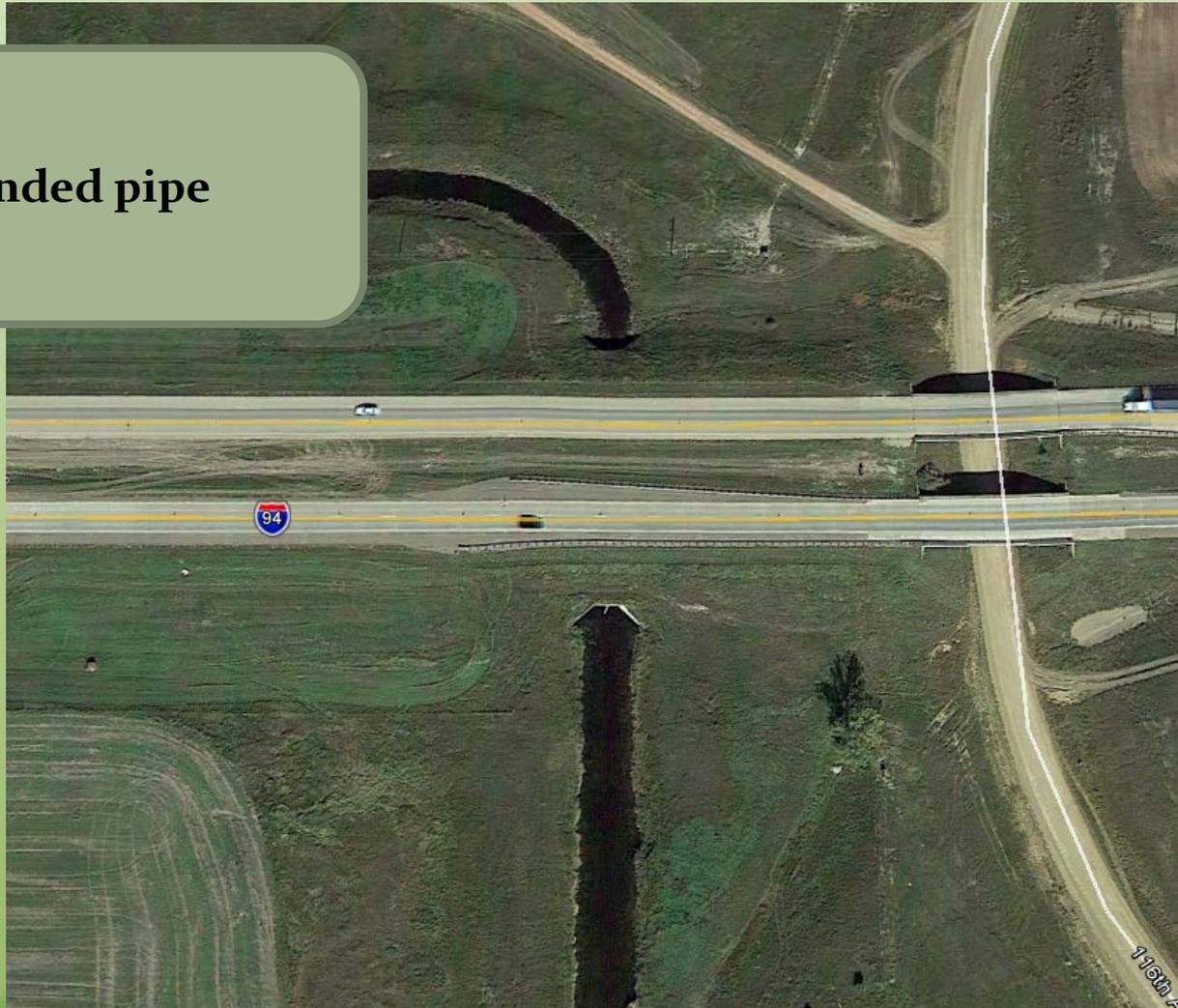
**Place erosion control
measures prior to
restoring flow to channel**

Winter Stabilization



Box Extension Diversion Selection

Suspended pipe

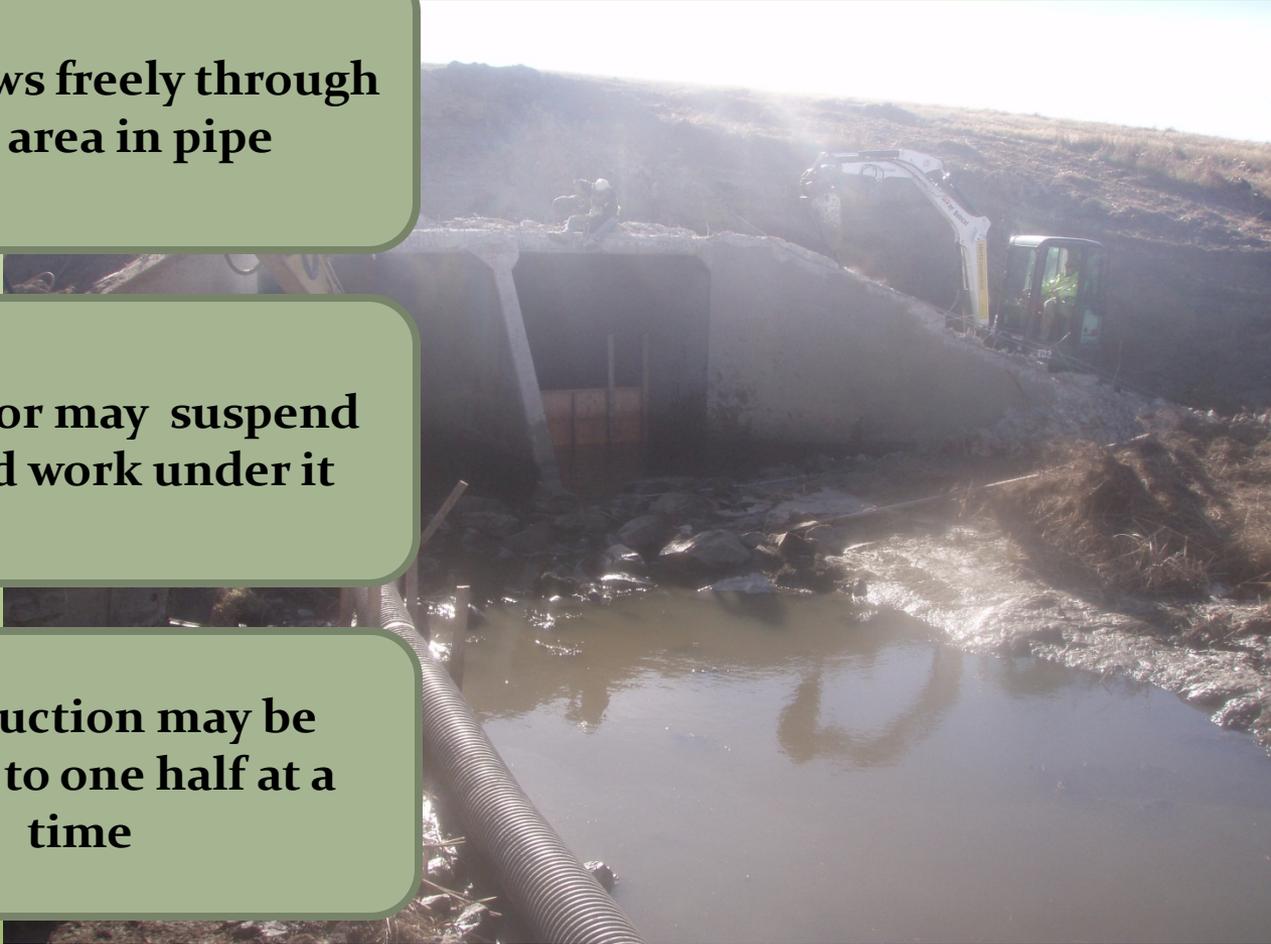


Suspended Pipe Diversion

Water flows freely through work area in pipe

Contractor may suspend pipe and work under it

Construction may be limited to one half at a time



Suspended Pipe Diversion



**Install upstream dike first,
then pipe, then
downstream dike**

Suspended Pipe Diversion



Sheet pile dike may be sealed/reinforced with soil

Suspended Pipe Diversion



**Tips From Mitch:
Install a valve to shut off
pipe to facilitate moving
pipe**

**Any pumping will be
limited to 21 days by SP**

Removal

- All construction materials must be removed
- Remove as soon as possible after permanent erosion control is in place

Questions

- Feel free to direct questions to Matt

Call before you dig!

