



Fontenelle Dam - March 2012

RECLAMATION

River Outlet Works & Powerplant



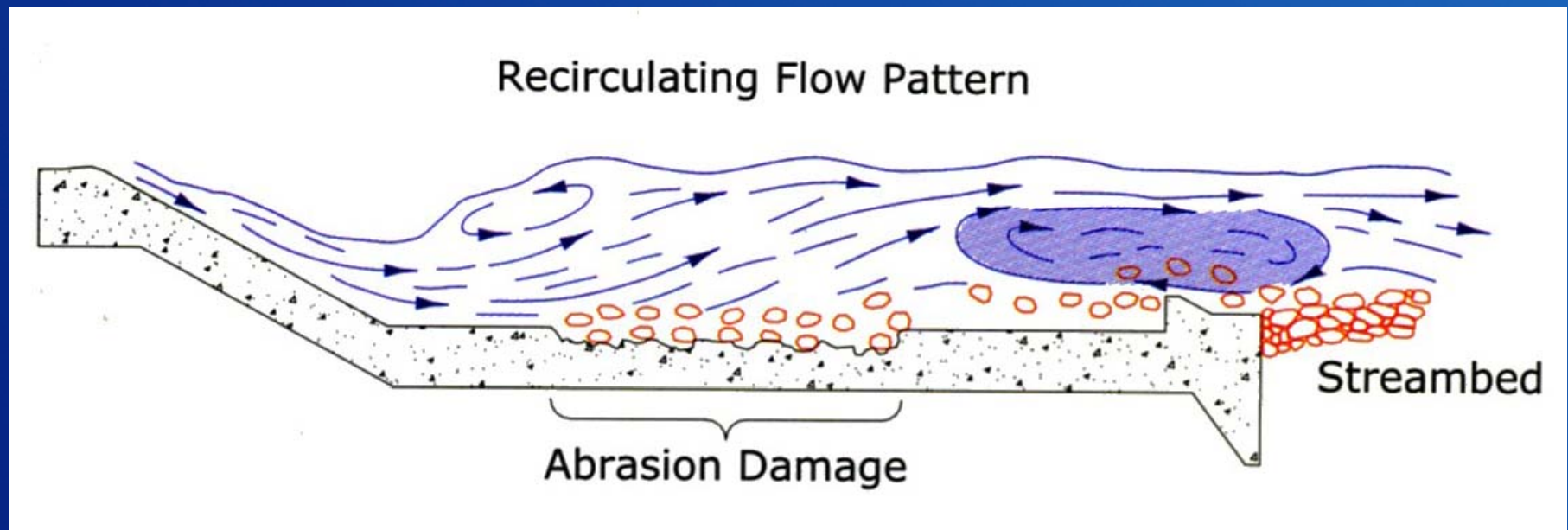
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1986 – 12600 CFS



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Type II stilling basins, such as the Fontenelle ROW stilling basin, have abrasion problems because of a recirculating flow pattern.



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Gravel and cobble are trapped in the basin between the chute blocks and the dentates (2007 dive exam)



RECLAMATION



**And the recirculating flow
pattern with time results
in abrasion damage to the
concrete.
(1967)**

RECLAMATION



The ROW structure was completed in 1965;
extensive ROW repairs were needed in 1967.

Following the 1967 repair, abrasion damage was reported
in 1972 and repairs made in 1981;

Following the 1981 repair, abrasion damaged was reported
as early as 1989.

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2007

Since 1998 the BOR has performed frequent dive exams to monitor the progression of the abrasion damage. No repairs have been made.

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Removed cobble and gravel with dive teams and underwater dredges.



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Performed Scale Model Studies in the Laboratory
at the Denver Technical Service Center

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Completed an Appraisal Cost Estimate of Repair Options.



- **Option 1** Monitoring and Annual removal of Cobbles.- \$ 41,100
- **Option 2** – Basic one time Repair. Install cofferdam and dewater. Repair the damaged concrete in the stilling basin particularly on the dentates and on the west side of the east wall. \$ 1.36 m
- **Option 3** – Downstream Concrete Control Structure. Install cofferdam and dewater. Build a concrete control structure with a large footing and possibly a cutoff wall down to bedrock. The structure would only have a few stop log openings. This structure would be built upstream of the cofferdam and downstream of the 5 to 1 slope.-- \$ 1.42 m
- **Option 5** – Complete Package. Option 2 plus installing deflectors, support structure, working platform, bridge, and stoplogs to allow the future unwatering of the stilling basin. --- \$ 7.1 m

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April 28, 2009



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May 4, 2009



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May 11, 2009



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May 14, 2009



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May 16, 2009

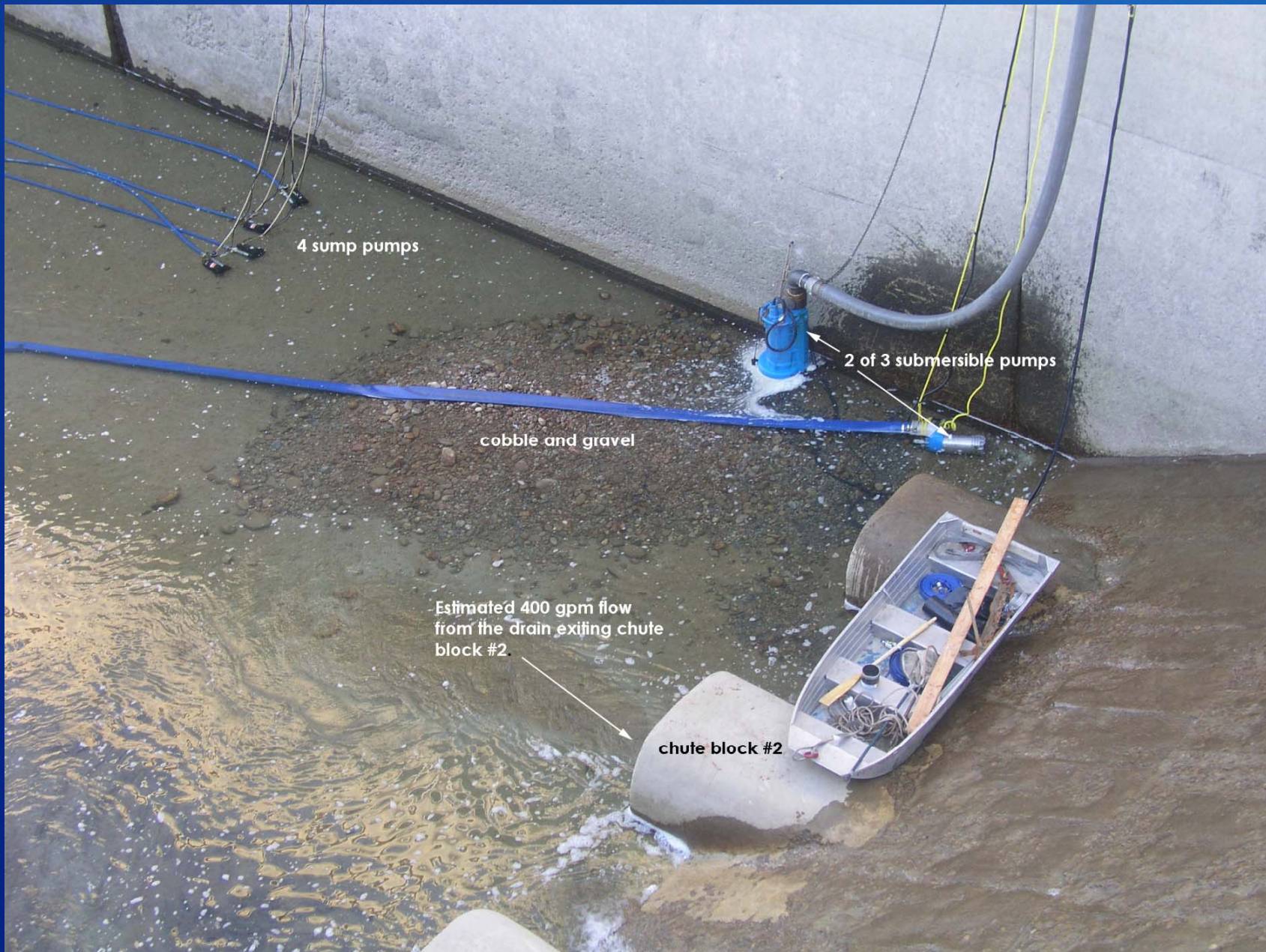


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May 17, 2009



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4 sump pumps

2 of 3 submersible pumps

cobble and gravel

Estimated 400 gpm flow
from the drain exiting chute
block #2

chute block #2

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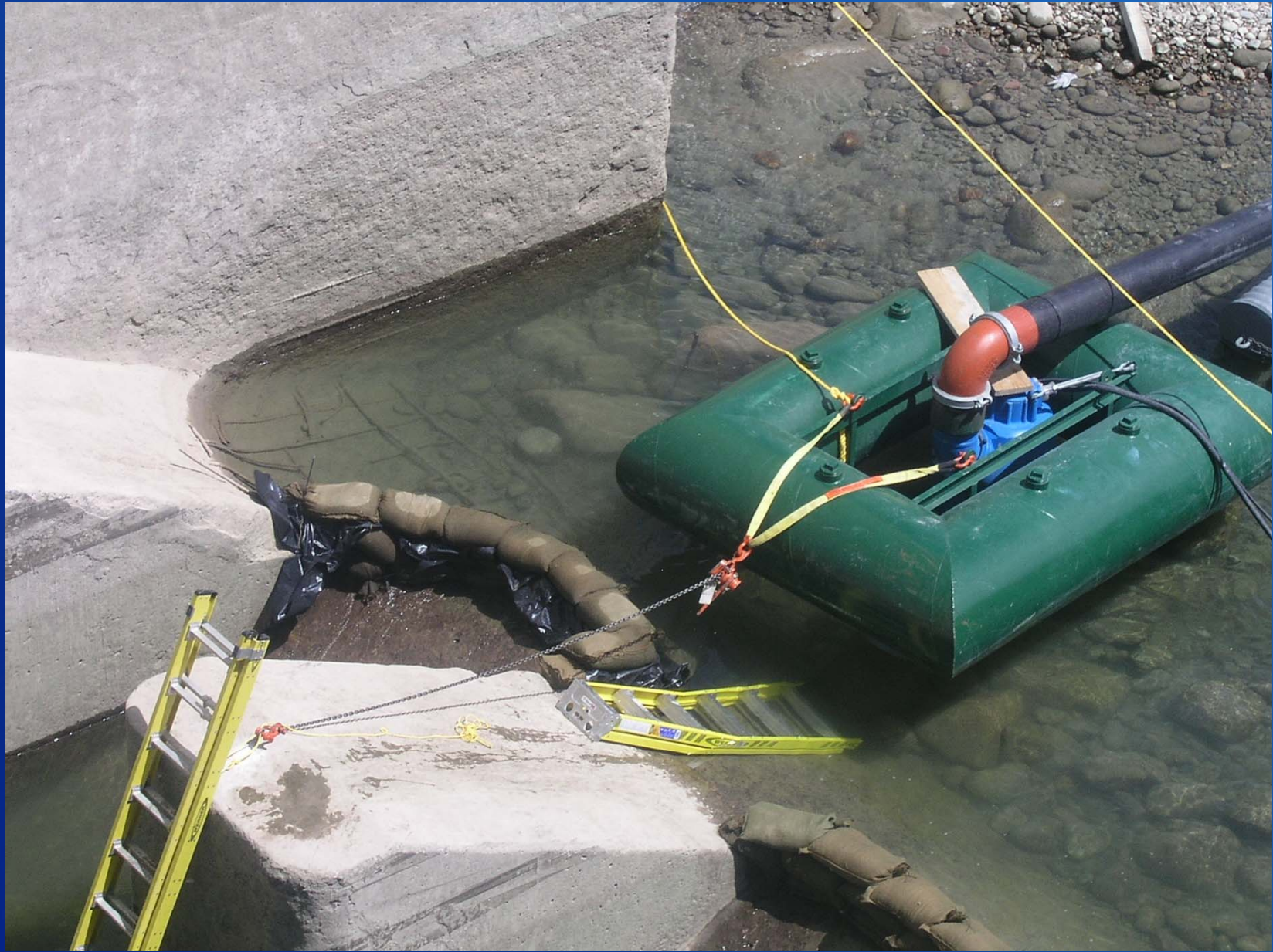
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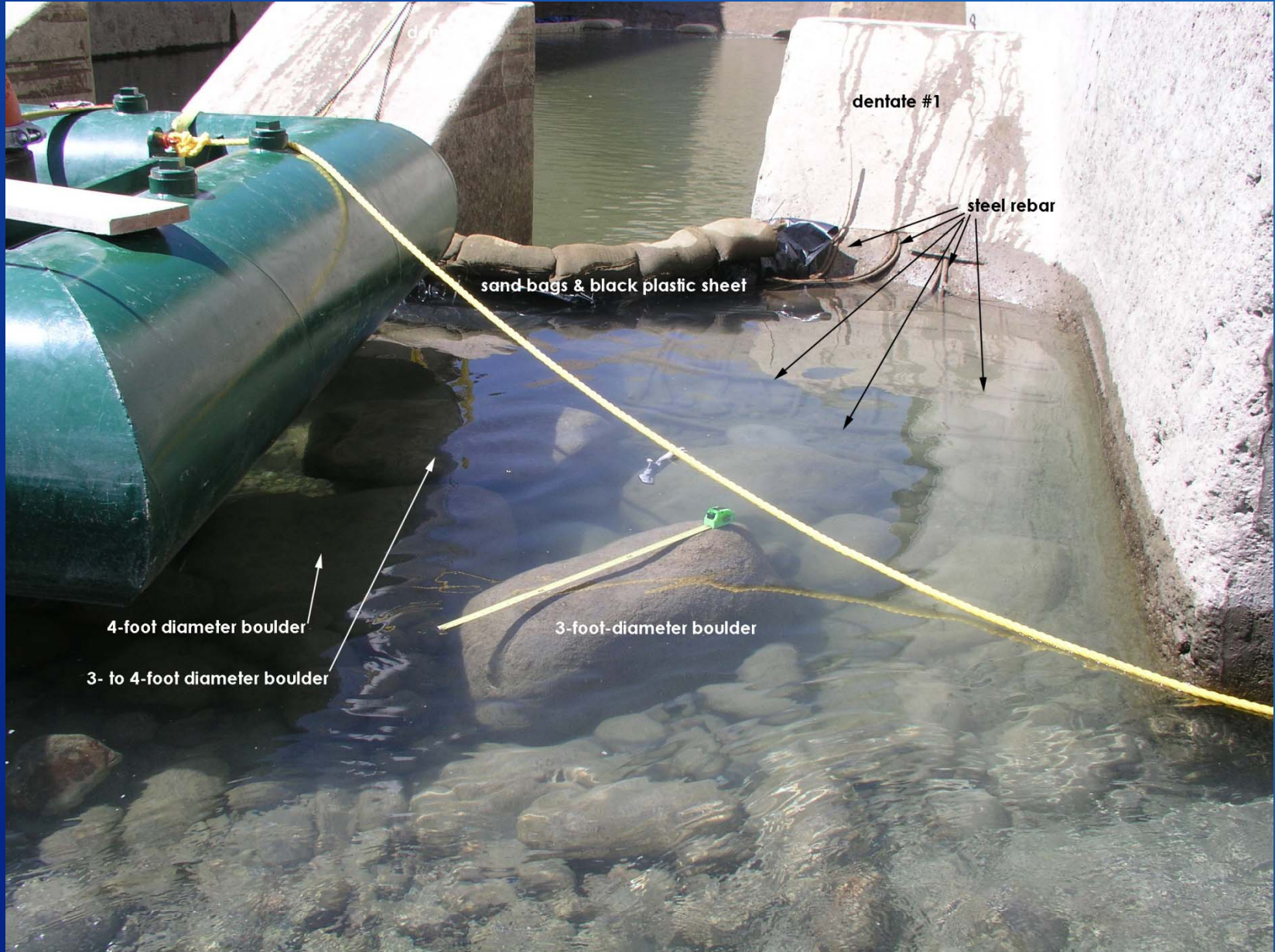
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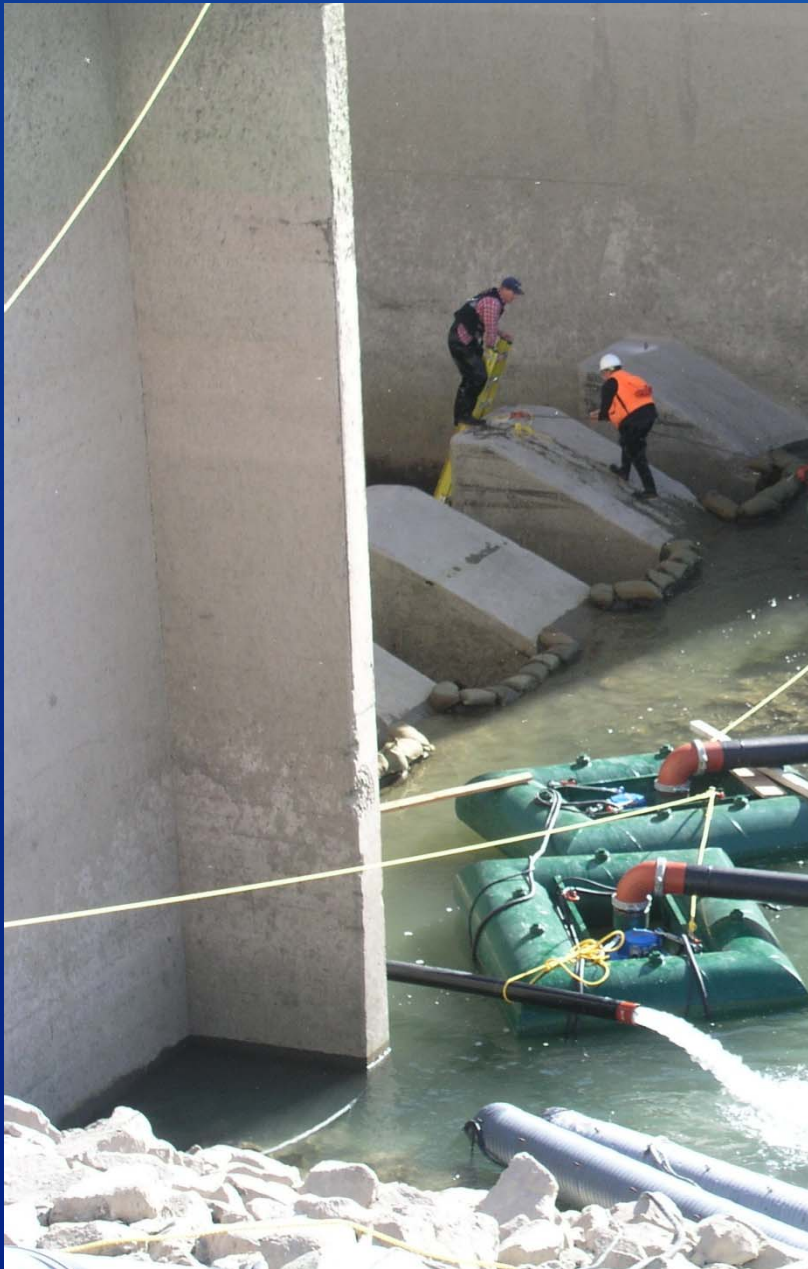
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It has been determined that the concrete abrasion in the ROW is not a dam safety issue but an O&M issue.

In the fall of 2013 it will have been 32 years since any concrete repairs have been made in the ROW stilling basin.

Observations of the ROW concrete following the 2009 dewatering indicate that some repairs should be made and that periodic monitoring should continue.

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BOR is moving toward unwatering the ROW in late April – May 2013 and making repairs to the east most dentate and wall above the dentate.

Work will include:

- unwatering the ROW**
- removing rocks from the end sill**
- excavating a sump near the sill**
- concrete demolition**
- removal of concrete and rock**
- repair concrete**
- survey chute and floor**

Time for unwatering and repair – 6 weeks?

NEPA

404 Permit



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CONCERNS



Maintaining minimum (300 cfs) flows in the Green River should the powerplant go offline.

RECLAMATION

Sept. 1965



2013 Runoff forecast and reservoir elevation. Release schedule.

RECLAMATION

1986



Use of West Canal Outlet Works to provide minimum flows to the Green River.
1000 cfs – June 1986

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QUESTIONS?



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