SMRID's Bow Island Lateral 26 project

Case study – Owner's perspective

72" diameter Weholite pipe installation

June 2nd, 2010
Irrigation Technical Conference

Engineering and project management

Myles Kasun (MPE) design and project manager

Steve Nixon (MPE) resident inspector

David Joachim (SMRID) project coordinator

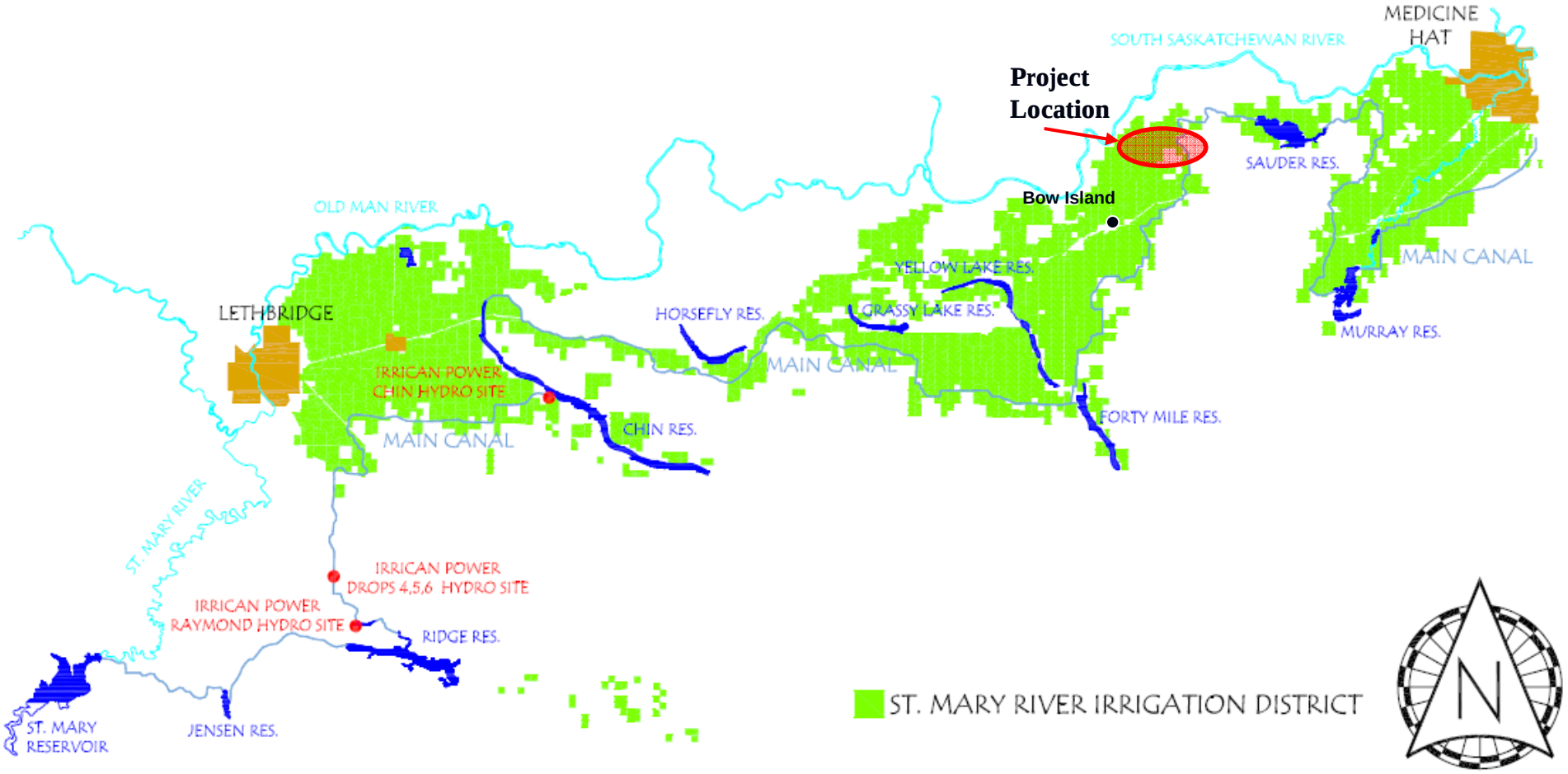
Pipe Supply

- KWH Pipe (manufactured in Saskatoon)

INSTALLATION

- BYZ Construction (Prime contractor)

ST. MARY RIVER IRRIGATION DISTRICT

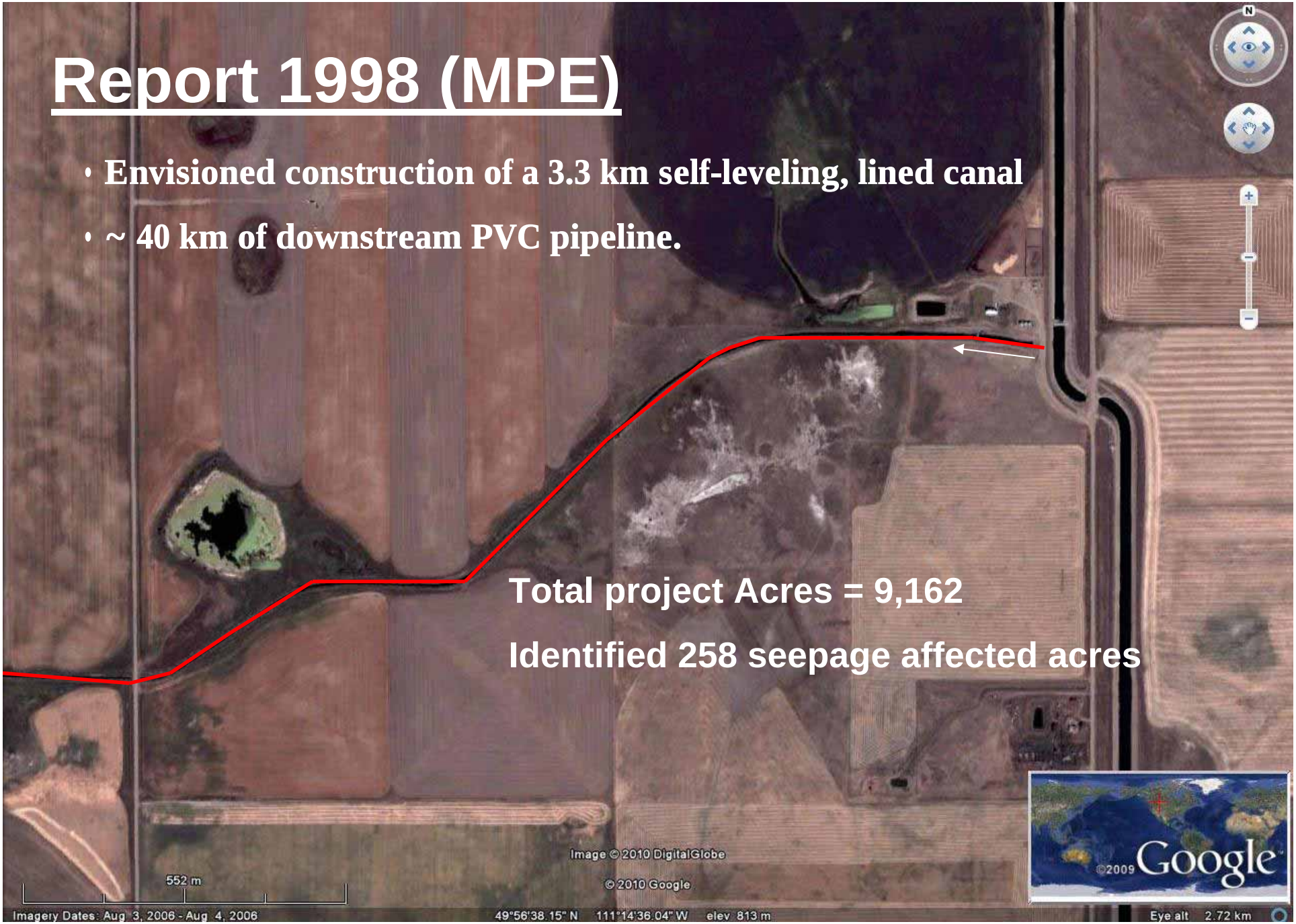


BACKGROUND

1998 report

Report 1998 (MPE)

- Envisioned construction of a 3.3 km self-leveling, lined canal
- ~ 40 km of downstream PVC pipeline.



Issues

- Maintenance of the 3.3 km self leveling canal (algae, aquatic weeds)
- Cost of earthworks for embankment construction and liner

2007 / 2008

- Construction was postponed over 10 years due to other district priorities
- With larger diameter PVC and poly pipe now available, pipe option was re-examined
- Buried pipeline was favored over the canal option; found to be an economic alternative.

Weholite Pipe option

- Flowrate = 117 cfs (3.3 m^3/s) at start
- 72” (1800 mm) diameter had a large enough cross sectional area to allow for single pipe.

Phase 1 Project Components

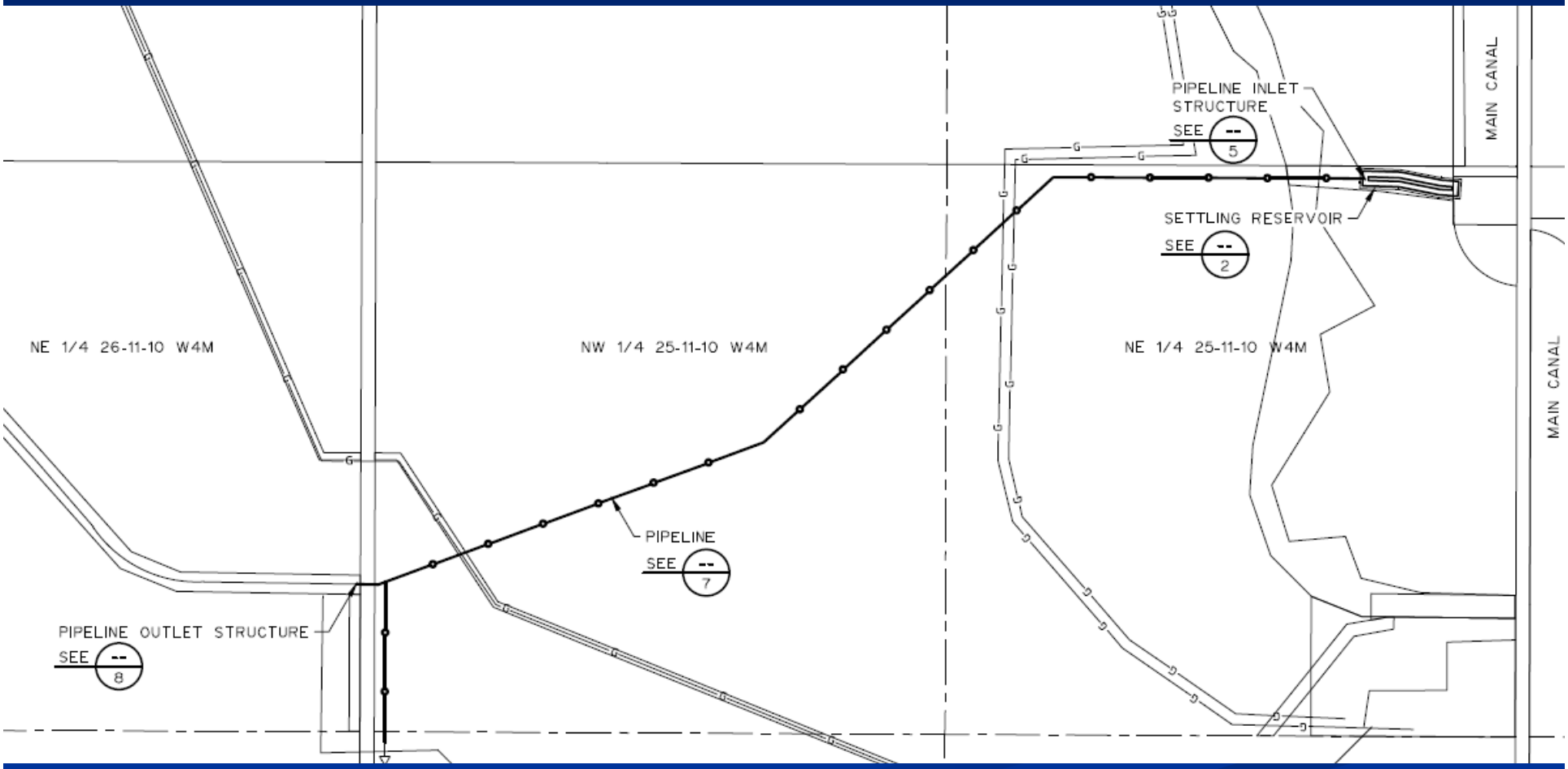
PHASE 1:

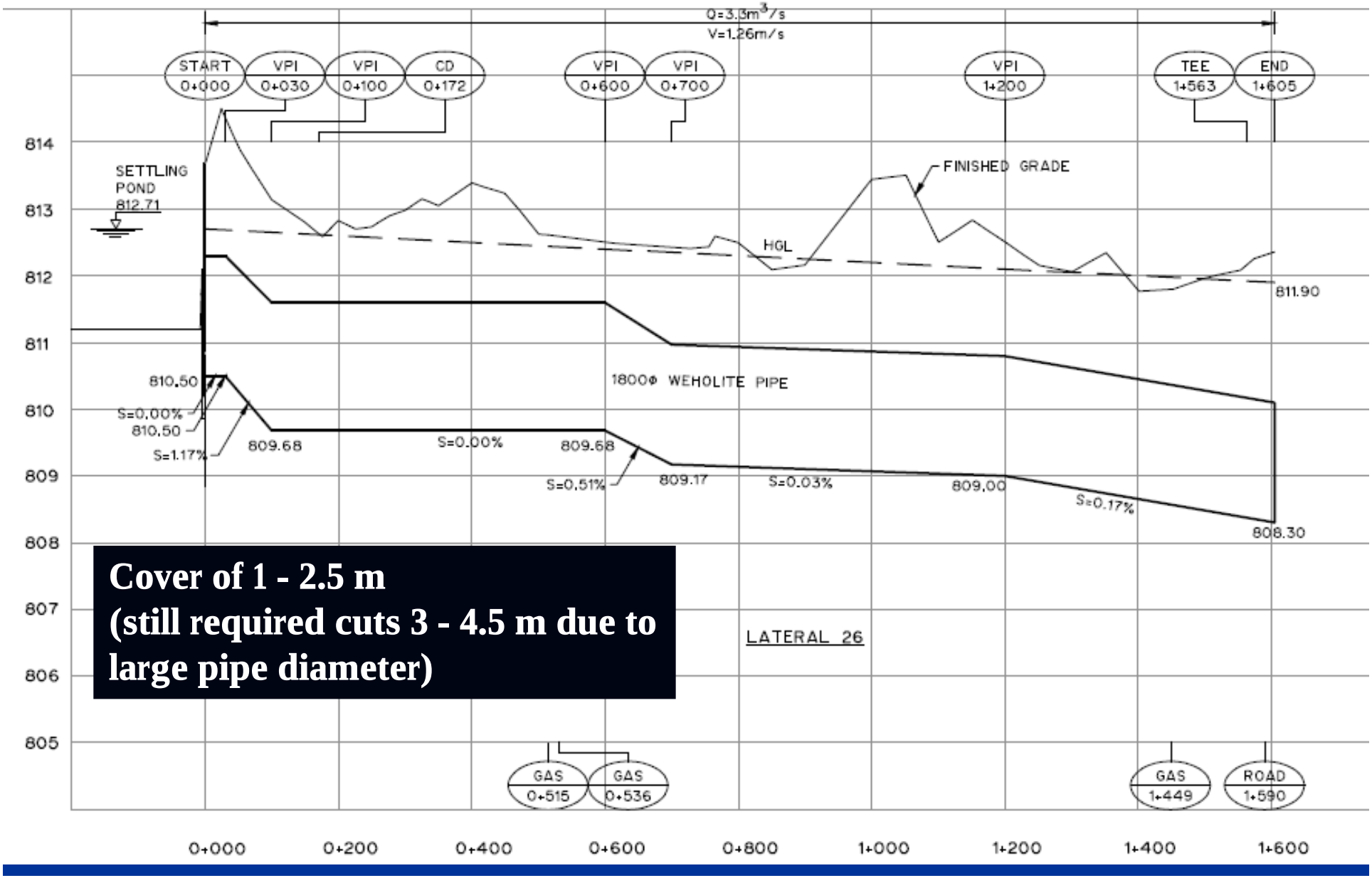
- Lined settling pond (125 m long) + cast in place inlet structure
- 1.6 km of 72” diameter (1800 mm) poly ‘Weholite’ pipe
- Cast-in-place concrete junction box

Subsequent phases

- ~ 40 + km PVC pipe ranging in size from 4” to 48” diameter

Phase 1: Weholite Pipe



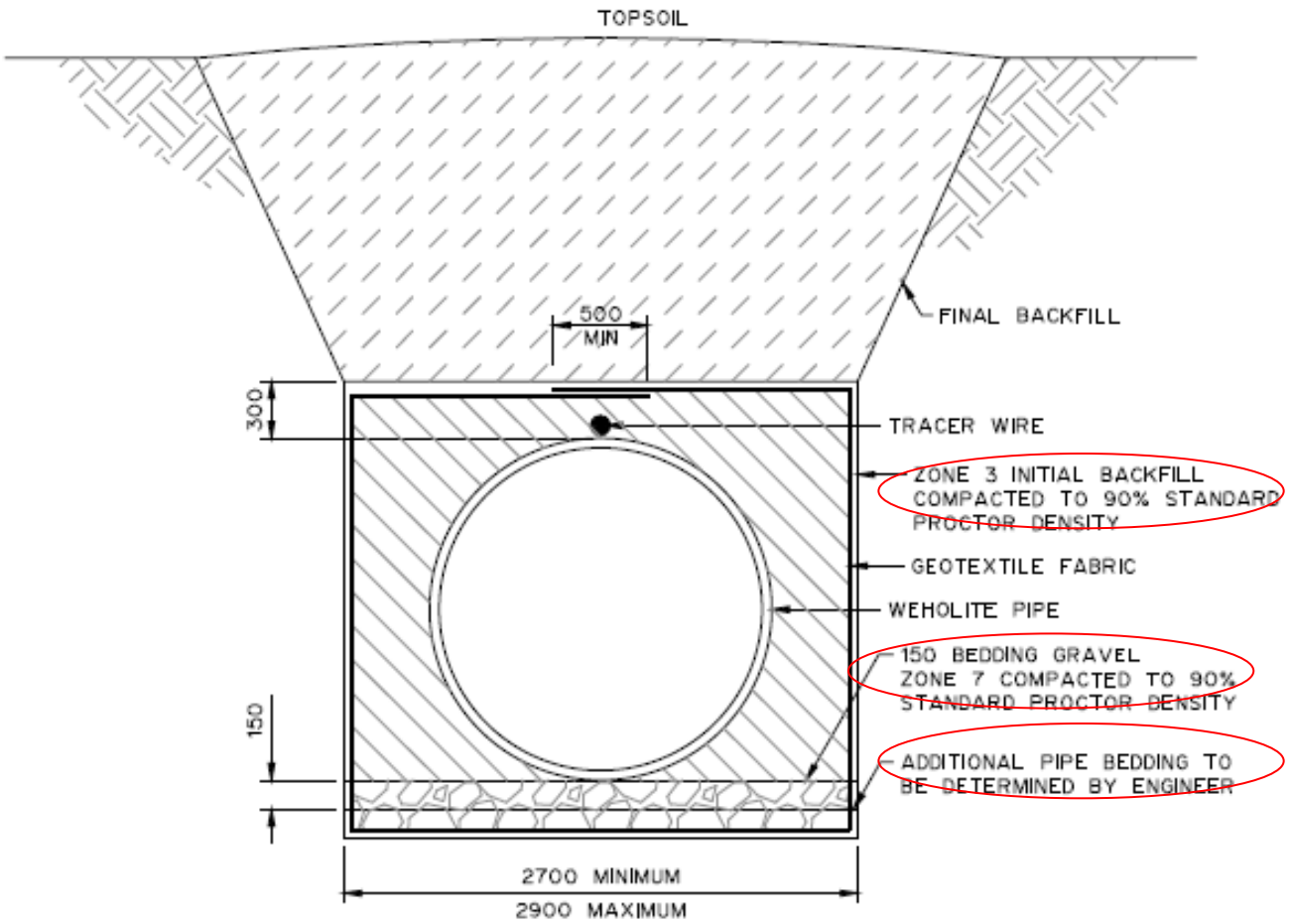


Cover of 1 - 2.5 m
(still required cuts 3 - 4.5 m due to large pipe diameter)

Pipe Characteristics

- Profile walled pipe
- RSC (Ring Stiffness coefficient) 160
- 15 psi rating was used (max 30 psi available for Weholite)
- 50‘ (15 m) lengths

Installation



BACKFILL DETAIL
1:50

Pipe Joining

- Joining done by a mobile extruder inside the pipe by KWH Ltd
- Averaged 2-3 pipe lengths joined per day

Installation photos

- Photos courtesy Steve Nixon, MPE

Lead hoe


Portable extrusion machine

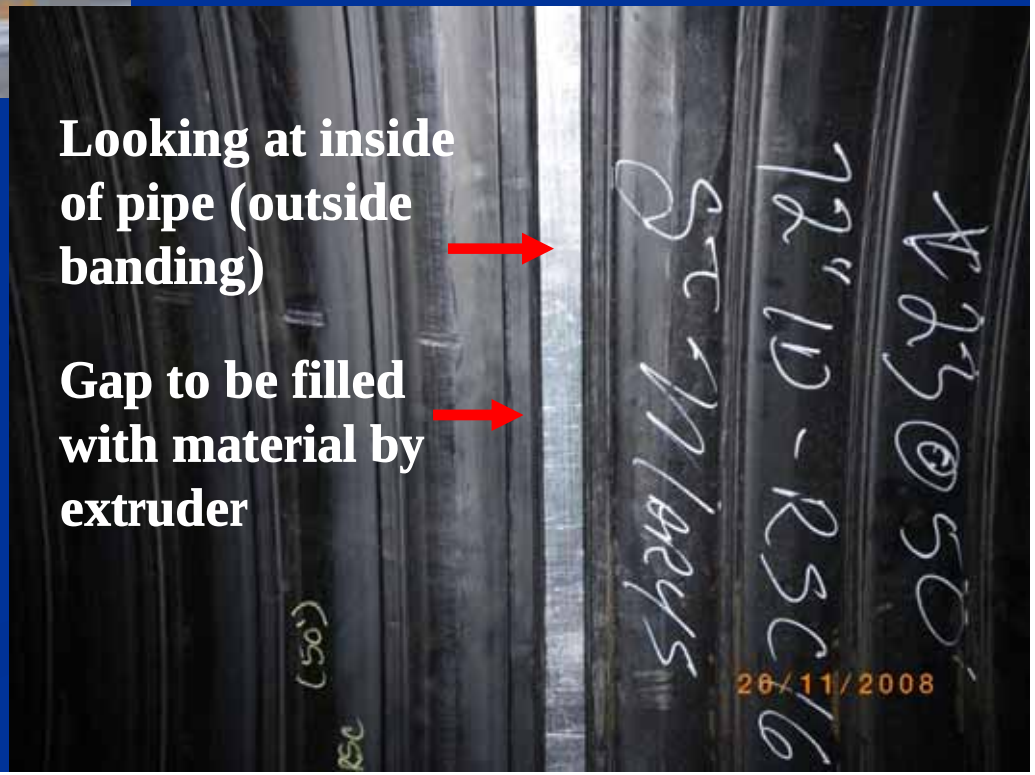

DEERE
EXIT
450C LC
24/11/2008


24/11/2008

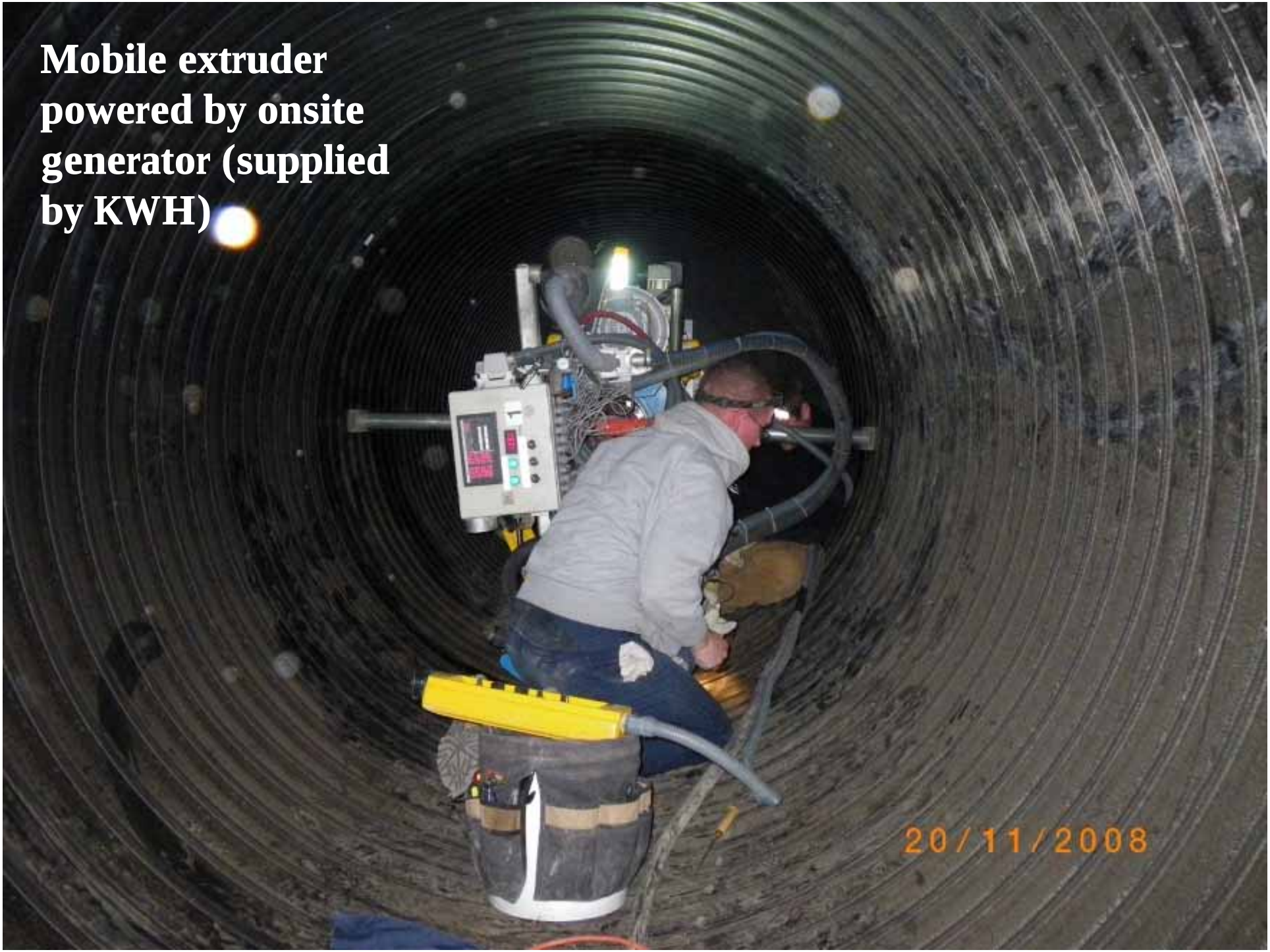
Pipe notched (pipe has to not only be lined up but rotated accordingly)

Looking at inside of pipe (outside banding)

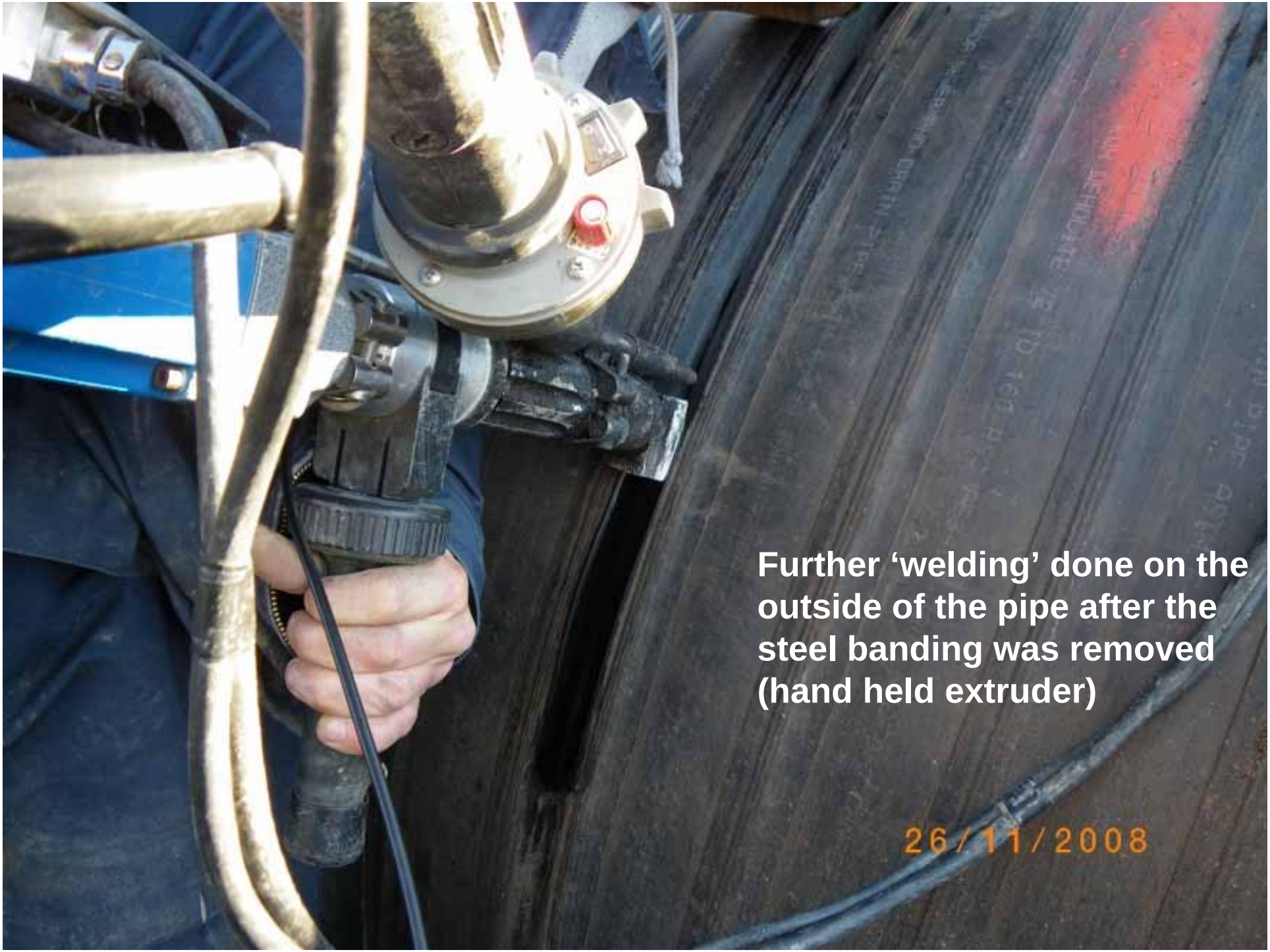
Gap to be filled with material by extruder




20/11/2008


Mobile extruder powered by onsite generator (supplied by KWH)
20/11/2008


Banding
removed
21/11/2008



Further ‘welding’ done on the outside of the pipe after the steel banding was removed (hand held extruder)

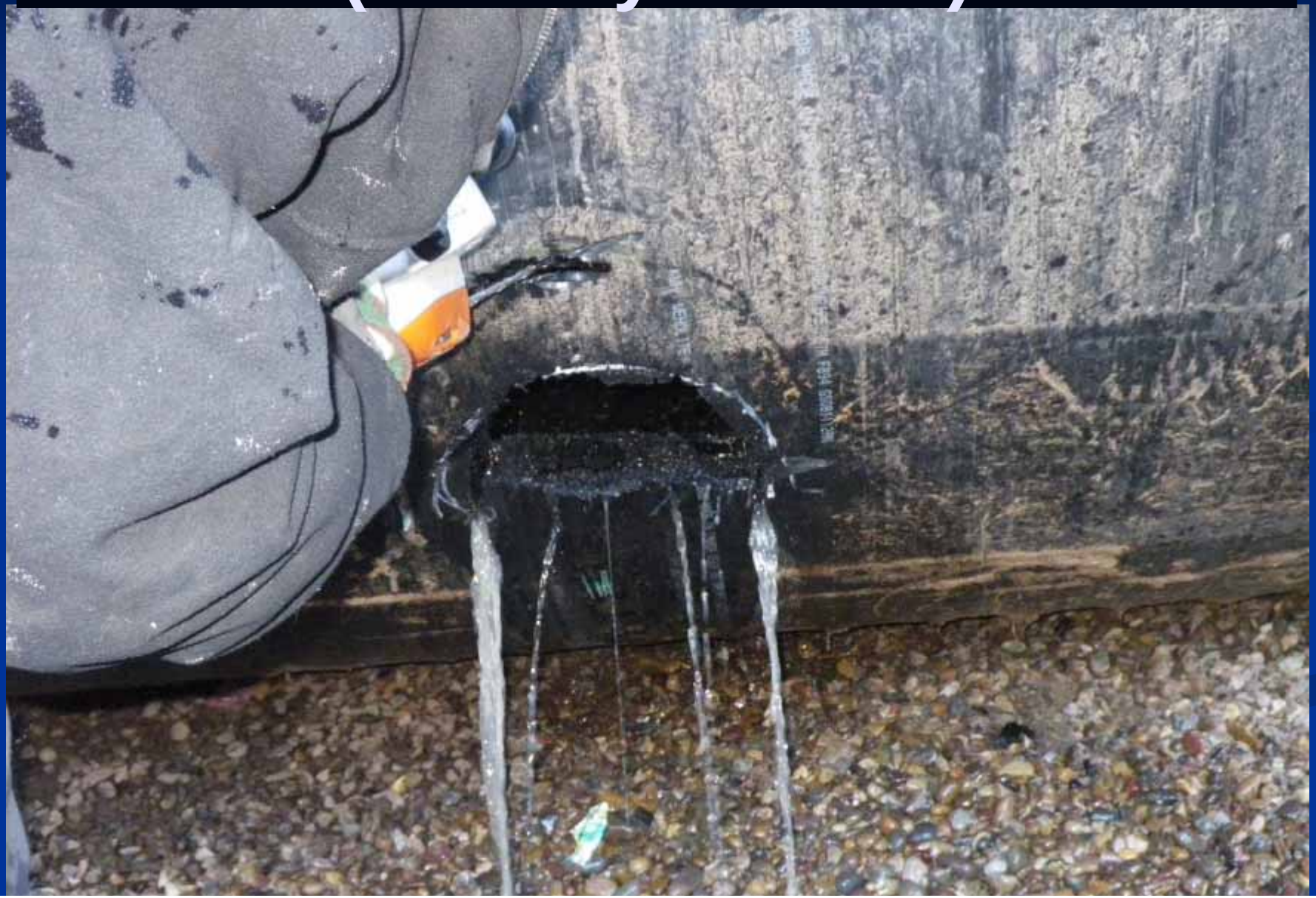

Granular used throughout
24/11/2008

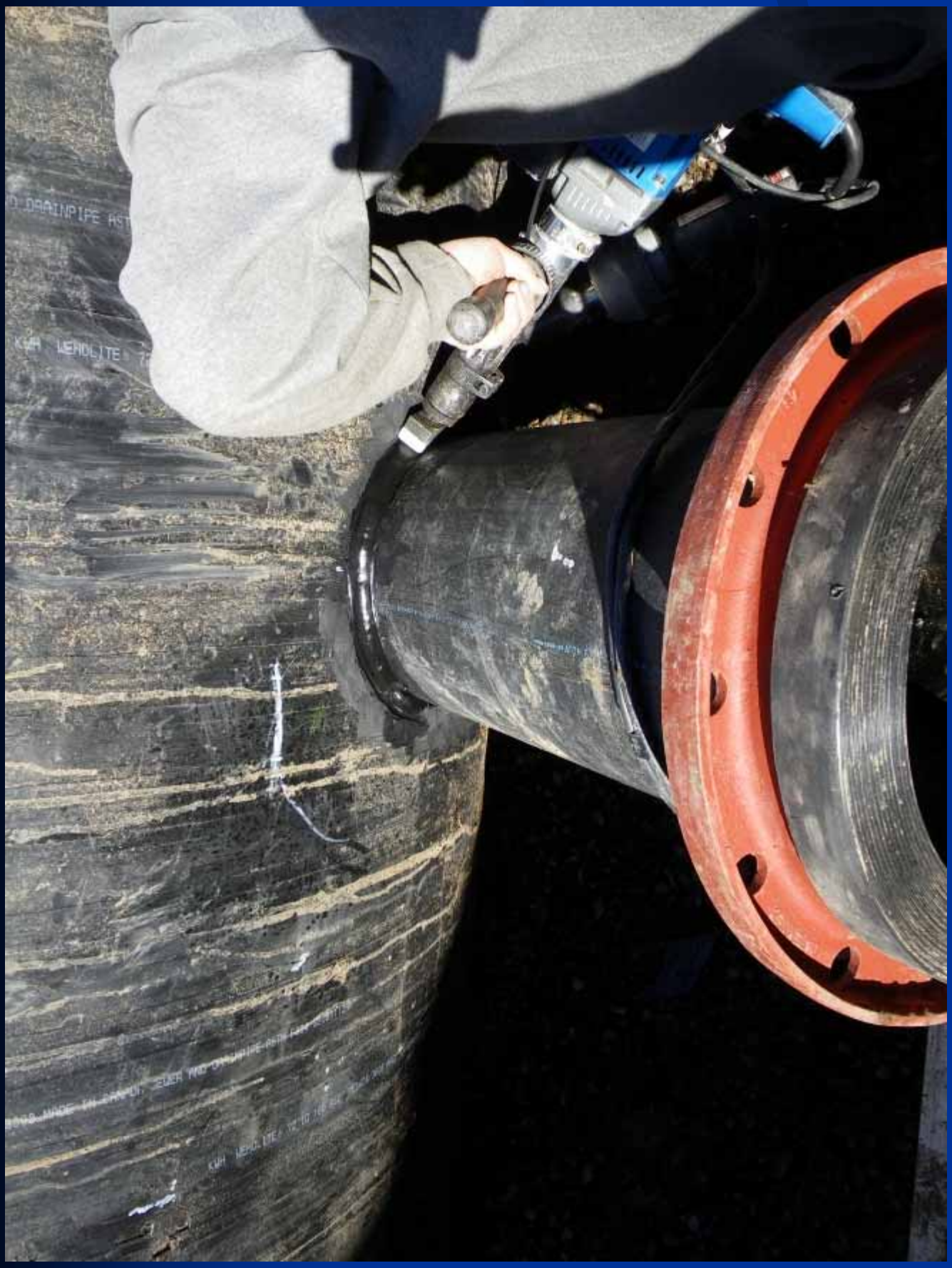

WP 1550
02/12/2008

Granular for haunching/bedding

- 15,864 tonnes of granular
- Cost >$300 grand

Tee constructed onsite (1800 by 300 tee)






19/01/2009


20/01/2009

Elbows

- No thrust blocks were used
- Constructed by KWH’s shop in Saskatoon

Conditions


KOMATSU
EX44


KOMATSU
EX44


CAT
0258

Installation issues

- Wet
- Constant pumping in trench during installation was required
- Pipe installation took longer than foreseen, there were stoppages due to weather (November to early Feb.)
- *Installation took a long time*

Installation issues

- No problems with excess dirt creating a ‘hump’ over pipeline as the land was gently rolling and it was possible to feather out the material

Discussion items

- Cost of pipe supply was competitive
- Installation was slow; expensive
- Cost of future installation bids ???

Before

After


Before
552 m
Image © 2010 DigitalGlobe
© 2010 Google
©2009 Google
Imagery Dates: Aug 3, 2006 - Aug 4, 2006
49°56'38.15" N 111°14'36.04" W elev 813 m
Eye alt 2.72 km


After

Conclusions

- System commisioned in May 2009
- Water supervisor: “Increased capacity”.
- Seepage has been reduced through the section, arable land reclaimed (boon to adjacent landowners).
- SMRID is overall satisfied with final product

Kudos

- **MPE, KWH, BYZ**