9/25/18

Polymet
Don
Christie
Dennis Don

Jeff Udd - PN March 2018
Resp to Comts since then
& cont. case hearing req.

Treatment system
↳ ① Mine H_2O trtmt bef tailings basin
↳ ② Seepage from tailing basin

Iron Solids pretrtm

Greensand filter
↳ Nanofiltrat
↳ RO filtration

Baseflow Dischg ±20% for return flow
to streams → treat only enough
as is req f augmental

FEIS model → Gold Sim mass balance
Design model → Gold freq monitrg
↳
⇒ te would run nanofiltrat most of time
if te cd be RO conctrate waste strm

~~[illegible]~~
⇒ te pilot tested both NF & RO
w/ some ↑ SO_4 watrs fm Pit 5

⇒ GPM ~ 2,000 1-7 yrs (aft 2 yrs constr)
in year 8 flow increases & up to max
of 4000 gpm n yr 9-10
& in yr 8/9 te v to get H_2O out
of ponds bc te l b full
- most water is coming from mine
after first several years
(from Colby Lk @ beginning)

Concentrals
- 600 ug/L cu n yr ~17
600 mg/L sulf n yr 8
↳ first flush fm legacy

100 ug/L cu to 200 mg/L sulf @ closure
when tr s less infiltral
due to cap

Greensand - pilot test results
of ~ 2 yrs w/ spiked samples
Cu 94.19% remv efency

Most r greater tn 85% remvl

As	Fe	Mn
Co	Pb	Ni
		Zn

RO remvl
99% sulf remvl (99.3 - 99.5)
97 - 100% of otr constituents
of metals for before
↳ conservative estimates
NF → c be as low as 70% remvl
of some constituents but usually
in 90% range

n yr 1 - almost all metals
n influent conc r below wqs
n yr 10 - some are higher tn wqs

	influent conc	trtmnt target
Arsenic	24.5	10
Cobalt	24.5	5
→	395	9.3
Copper	31.7	3.2
Lead	344	52
Nickel	58.5	100
hardness		
Sulfate →	337	10

Hg % trtmnt target	< 77%
Hard %	98.8
Sulf	98.4
Hard	59%
Boron	42%
Copper	9.3%

Modular system
if V adsl flow
C use comb o NF + RO

Mercury
- filtrals through taconite tailings
  expected to remv Hg to 1.0 ng/L
- some Bench testing o taconite tailings
- Greensand filtrals
  Some
- Memb Sep
  22-99.9% v b reported

Eagle RO
influent up to 2.5 ng/L
below 0.5 n effluent
Humbolt up to 4.0 ng/L
but conc o efluent ≤ 0.5 ng/L

fine granular
Calcite used @ end
↳ spec f watr trtmt
has low Al conc.

NF f Hg → GE (vendor) does not v data
on Hg remvl

LTV & Polymet tails 2007-2008
Apendix to RS 2019 by NTS

used conc fm modelg as singular value so did not do RP using TSD aprc → instead looked @

for 1st permit → MPCA does not typically put in limits of WQS so long as facility is built to remove to meet to WQS
- Long Prairie example of Hg

Krista - tr s lots o uncertainty n mine Watr quality & trtmt so isnt this difnt

Kyser - memb techn s proven & used all over

Krista - tes plants v RO & limits n t permit

MDEQ includes limits if te r present (Humbolt/Copperwood/Back 40

Jeff Odd → ts s t expected quality & so te struggle to find RP & te l monitor n permit
→ not just Polymet - te need evidence to make initial decs w/o monitoring

Richard
- Yr 10 table he showed
  90.0 trtmt target → 10 mg/L sulf
- & permit req trtmt system be built in accordnc w/ application

Kevin
its s not usually way EPA permits
be we don't tell people how
to build

Scott Kyser
MPCA wants to consistently ~~to include~~ bang
permit

Richard
he did also box into trtmt
be couldn't deviate too far
from EIS

Brad
- he wd v to go back to EIS
if change too much

lawyer also concerned abt anti backsldg
"there wd not be new info mad"

Lawyer - Humboldt in permit did not
consider ROC & beginning so not apples to
apples

-7-

* Eagle was closely ~~[illegible]~~ litigated

- Jeff Udd:

- lawyer
  anti-backsliding is an issue
  tr s only · narrow route
  to loosening limits n t
  future

- Krista → ~~[illegible]~~ is new information from actual mon. data
- Barbara
  ↳ don't believe ta anti-backsliding
  ↳ as big o · concern
  - not a duality

- Brad "yrs o litigat" if permit
  backslid

- Mike Schmidt
  ↳ allowance f backsliding is
  new informat except changes
  to WQS so we are stuck

- Barbara
  did EIS single out 10mg/L Subf
  WQS

Richard
10 mg/L ↳ ask him 1% Rob

Barbara
Reports - included n permit
So what s operable f enforcemt

Jeff
cant anticipate everything so
has ability to b "living document"
- now say l follow permit modfcals
w/ MPCA review & aprvl f
AM - will detrmn whether
major mod consistent w/
State rules
- Richard 7 or 8 parts of permit

Krista
↳ would ts req correctv acls?

Example
Krista 6.10.16-18
no discg to surf H_2O
- what s correctv acls
ta l b taken if not good

Richard
Compreh Oprals Report
we consider any correctv acls
to b adaptive man.

Barbara
AM is proactive
• Corctv acls is aftr tr s problem

- Issue o whether Hg from trench constr wd b- disgd + viol WQS
  ↳ te v ts covered under GP f SW
- Krista
  also do we v difns o GP SW coverage vs indiv permit coverage?
  until operas o WWTS + constr site BMPs v demonstrated
- Old cliffs permit vs New permit covrg

Permt Apre Handout

MPCA said te r adding clarification to prevent aluminum sources aft lime & te r adding iron mining TBELs

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example of limits ta WQBELs r removed if te find ta te v no RP
↳ Im sure we do... Ohio? if way to do that
Barbara - can we cite to permit Mod regs?

changes to permit Wed Sept 26 MPCA Mtg w/

- Clarify no dislg req n permit
  - mine site no direct dislg to surf H_2O
  - plant
    no direct dislg to surf H_2O
- Adibl Mon. locations
  bed rock
  surf H_2O along corridor
  Δ n couple locals
- Limit
  $TU_c = 1$ is included
  extended to quarterly f life o permit: → Cerio & fathead.
  just bef te dislg
- Reinserted Hg min strategy
  ↳ internal processes
- req constr as proposed n Oct 2017 aplcal
  & PE certified ta constr meets design performc
  & OM manual f el control

ts s more perscriptv tn normal
te v disc ts concept
→ submitl of "as built" diagrams

- seep captr system
  - maintain inward gradient
  - v to monitor more/plan to fix & investg cause
  - 7 days to restore inward gradient
    worst case → would not migrate through barrier
  - mo mon freq unless problem

- prohibs f adls o AL
- Reduced notifcals time f reporting o problems
- proposed AM subject to review & aprvl & subject to review as to whetr ts s major modifcals f MN law

- equalization ponds - need to be part o perform planning w/ PE cert.

- HRF
  - asmt has to b done by PE
  - HRF liner plan must discuss adeq o exists & proposed monitoring
  - have not done site investigat yet
  - will slip out concentrate until te build ts

- Monitoring list
  added total/dissolved fracs
  ↳ swater ↳ GW
- Add TBEL f dis mon for
- dissolved Hg mon added for infl & eff + o trtmt system

Not changing
- allowed desig (flow)
- Sewage trtmt
  ↳ dikes & intervening trtmt so not necessary

- sewage → tailings basin → seep captr
trtmt ←

- has standard reopener language
Jeff Smith - cd we beef ts up?
Udd - all data ta comes in
& public
citizens not able to pet'l
to reopen
citizens c sue f violas
o WQS under state law
- Barbara - wouldn't help us
on federal side
bc not included n permit
Jeff - te r thinking abt
strengthening narratr
prohibits to add comfort
Mike Schmidt
- te v broader lang f prohib
WQS exceedences
→ General SW permits
1365 505 g 6 - Mike Schmidt believes ta citizen c enforce [illegible]

Barbara - still v quests abt fed enforceability bc of internal outfall

if tr were a WQBEL we wdn't b having ts discus

but tr s · lit risk & ts s · big issue f us

Linda - c we discuss ts w/ OGC

Barbara - we c do ts

Krista What does Polymet v to do if te decide to change design?

req f permit mod? major - PN minor

does language explain ts?

Richard like AM - wd v to notify MPCA

Richard - may need to clarify ta while building te wd need to do t same as above?

Issue - ↑conc./aplcas says l disg up to WQC/reissu

Mark - est limit w/ lang ta will drop limit based upon real data → Wisconsin

Mark - how do we fit in
timely reissuance pobl

Shannon - fundmtl dif n aprch
do we need to agree or c
good prohibitions fix ts f fed
enfrcblty standpoint

Mark - step toward middle ground
devil n detail
- t vendors footnote performance
to say cannot guarentee

Richard - te looked @ ts closely

Kevin
Hg/As - wd MPCA
consider operating limits
f otr parameters
at least those where conc o infl s gtr tn
Hg - Cardice WQC plus Hg
we need tm to do smtg more

Jeff → te l discuss ts w/ company

Kristie - EIS expects disc'g to
SW fm GW pathway
so how did te prohibit
ts

Richard - deal w/ ta trm oprabl controls

Krista - monitoring array & tn permit
mod/issuance to prevent disc'g

Richard - anl report will document
ts f "early warning"
if tr s plume - tr wd b adaptr
man & if tes r not successful
tr wd need permit coverage

Krista - so is ts disCg prohibitd
Richard - no ts s not prohibited
Krista

Richard GW eval asmt o spabl
extent
EIS talked abt ts
pump out techn r feasible
enhance lining / cover systems
Kevin - suggested to te upgrade
liners but te didnt do to but
tr s techn.

Preprop Permit & ES
up to 45 days
but wd
like it
faster
- will converse
RG466C
KFKREP
plus
15 d rev o
proposed
permit
Jan 8
- new comm
EPA Rev period
not yet public
3rd wk o Oct
DNR decl
but to us by end o October

- Permit issuance
- Hg operatg limit - te feel uncomfort since conc

401 same timeline

Annual avg of flow - no change
Richard
te Red Dog mine
looked @ ↳ v numeric limit of CFX 440
te calculatd
2.4 #

MPCA
95pcntl precip - stat max
comp ag avg evap (50pcntl)
4.0 bill gallons/yr

GS/Gold Sim max flow rate s 1.9
bill gall / yr (3600gpm)
4.0 is 2x max 1.9
if you v actual w/ carryover
it would be less
cum overlif o permit ts wd b lower
tn way we wd do ta
& ta expl wd b added to fact
sheet
Krista - wasn't o clear limit on old permit

Richard 2-7 yr lag fm rainfall to disch @ mine site

1.9 s year 10

Krista - but n no yr shd exceed 4.0 bg/yr.

Richard/Jeff - te l talk abt that internally

Krista
used max be stn te use to calc limits

adding word direct to disch proh fm mine site

BREAK

Kevin
AM - proactive actions
- te modified lang
- But we r worried te ts may complicate prevent violation/enfmt

Richard: te l look @ ts but want it to be clear

- SW - Kevin concern w/ subst'l release o Hg GP - no mon/limits otr tn narrat prohibition
  - what kind o monitoring wd ts b part o 401 monitoring
  - Kevin C te add b sediment basins & mon into SWPPP

Jeff - tr o map o constr SW acreage
Richard - SWPPPs r ve detailed

401 cert → monitor & incl lang of SWPPP/adsl sed ponds

Shannon - te l talk abt ts more & talk more w/ us on ta n followup.

Jeff → te l send us tempo version
↳ will send us cheat sheet to crosswalk 2 verbs (word doc)

Kevin

↳ annual flow - consider adding max

↳ SWPP/mon of constr SW
401 disc w/ Peter

↳ ~~[illegible]~~ addl operty limits

↳ AM lang clarifcas

↳ narratr prohbs of totl fac

3rd wk o Oct s firm