

Popowich, Tracy CSNR:EX

From: Pryce, Conrad FLNR:EX
Sent: Monday, May 7, 2012 10:30 AM
To: Cunningham, Ken FLNR:EX
Subject: As Requested: Chronology of Elinor FSR and Chute Lake Dam Emergency - Conrad Pryce

Friday April 27, 2012 (all times estimated and approximate)

9:45am Steve Rowe advised Ken Cunningham and myself of a potential water overflow issue at a Chute Creek Forest Service Road culvert crossing, located just downstream of the Chute Lake Dam. There was concern about a potential breach of the FSR or the dam and public safety. A request was made to Steve Rowe and Patrick Little to immediately do a site visit and report back.

10:15am Steve Rowe and Patrick Little geared up, and travelled to site to do an assessment. Calls made to Safety Line reporting time input. Activated SPOT.

1:15pm Steve Rowe called from site by cell and reviewed the matter with Ken Cunningham and Conrad Pryce. Steve Rowe advised confirmed concern and that there was a danger to person located downstream. Ken advised of arranging a conf call with PEP/RDOS for 2:00

2:00pm PEP EOC Conf Call – Steve Rowe gave overview of situation based on observations and photos taken earlier in the day. Forwarded photos of site on to EOC and PREOC. 24" height of water in dam spillway weir, with backwater affect from Elinor Forest Service Road on dam impoundment. Steve Rowe estimated 10 acres at 2 foot depth could be released. Conrad Pryce advised that if estimated 200 acre-feet of water were quickly released that this would be a serious situation given the elevation difference between Chute Lake and Okanagan Lake. There is a concern about the risk to persons and property located downstream. Discussion took place with RDOS emergency personnel about alerting /evacuating persons being in the inundation zone as a precautionary measure. 200 acre feet is a large quantity of water which converts to 250,000 m3 in metric (without debris torrent component). PEP personnel indicated it was their intent to immediately evacuate in the Chute Creek inundation zone between Chute Lake (Elinor Forest Service Road culvert) and Okanagan Lake. RDOS used an estimate of 100 metres either side of the creek as the estimated inundation zone to evacuate people was proposed to be used by Mark Woods of RDOS EOC.

4:00 PEP EOC Conf Call – review options. Assemble mapping info. Recommendation made to Ken Cunningham that Brian Symonds, Mike Noseworthy and Steve Rowe to be the 3 persons to do helicopter flyover assessment of Chute Creek downstream of the Elinor Forest Service Road culvert crossing and Chute Lake Dam.

5:15 Brian Symonds and Mike Noseworthy on helicopter to do site assessment.

5:45 PEP EOC Conf Call – All persons in inundation zone have been evacuated reporting in at the Naramata Firehall. 2 zodiacs from Search and Rescue are patrolling the shore

7:15 Leave for Penticton via helicopter.

8:00 Post helicopter site visit meeting with Brian Symonds, Ken Cunningham, Conrad Pryce Mike Noseworthy Des Anderson Shaun Reimer, and Jeff Wiseman to review information and discuss options. Lyle Knight was on speakerphone Persons Equipment and Materials deployed based on plan. Small overflow spillway proposed to be constructed. Mike Noseworthy and Randal Kolhaser to monitor situation overnight. Protocols for regular and emergency call-ins in were specified. Leave building at 10pm.

Saturday April 28, 2012

- 10:00am PEP EOC Conf Call – Review status. Lake dropped 4” overnight. 18 people were staying at hotels and 20 registered staying with friends. Total of 38 registered with RDOS EOC Friday night. RCMP setup security of the site. Discharge in Elinor FSR culverts reduced overnight. A 1’ by 6’ wide spillway channel on Elinor FSR was excavated to control overflow, and flowing over night, reducing level in impoundment above FSR and Chute Lake. Reduced flow during the remainder of the day and would potentially breach road later in day. Height in dam weir 11.5” at 6am. The dam is stable and safe. The concern is more so re: potential breach of the Elinor Forest Service Road, and release of any water from back water affect into Chute Lake. Less active flow in sinkholes. MOTI reported that Argo was monitoring MOTI Chute Creek road crossing downstream of Elinor FSR culverts. MOTI reported that additional staff were on standby ready to respond as needed. Fortis reported 12” diameter high pressure gas main downstream and ready to respond if necessary. Evacuation Order still in place. Next conf call at 4pm to re-assess.
- 4pm Brian Symonds reported that water levels continued to drop in afternoon (dam weir height was currently 6”). FSR culverts were in the process of being breached and it was proposed to remove the Evacuation Order. A decision was made by RDOS to lift the Evacuation Order and to deactivate the EOC. Dan Ashton, Chairman of the RDOS thanked everyone for a great job.

Conrad J. Pryce, P.Eng.
Section Head, Water Allocation
Ministry of Forests, Lands and Natural Resource Operations
Okanagan Shuswap District
102 Industrial Place Penticton BC V2A 7C8
tel: (250) 490-8208 fax : (250) 490-2231
email: Conrad.Pryce@gov.bc.ca
web: www.env.gov.bc.ca/wsd

Popowich, Tracy CSNR:EX

From: Rowe, Steve FLNR:EX
Sent: Tuesday, May 1, 2012 12:00 PM
To: Cunningham, Ken FLNR:EX; Pryce, Conrad FLNR:EX
Subject: Chute Lake - Rowe Timeline
Attachments: Response Timeline To Chute Lake Flooding Report.docx

The attached are my notes for the response.

Steve Rowe
Water Stewardship Officer
Okanagan Shuswap District - Penticton Office
Ministry of Forests, Lands and Natural Resource Operations
Phone 250-490-8219

Response Timeline To Chute Lake Flooding Report – Steve Rowe

Friday April 27, 2012 (all times estimated and approximate)

9:15 : Sinda Carter (C&E) advises Patrick Little & Steve Rowe (Water Stewardship) of a report from Rob Wiens (Highways Area Manager) regarding possible malfunctioning of the road culverts at Chute Lake.

9:20 : Rowe contacts Wiens, who advises that he is in Osoyoos at a different response, and he is passing on report from Jim Martindale (Argo) that sinkholes had formed at the FSR below Chute Lake.

9:25 : Rowe pulls Dam File for Chute Lake and, with assistance of OMS Plan, contacts Mark Anthony Properties – leaves message for Mike Malloy, and gets cell number for Kamaljit Gill (reported to be the vineyard manager). Mr Gill advises that interim manager is now David Elphick. Rowe advises Elphick that the road below the dam has some issues, and that he should attend site, and to call back if there are any problems associated with the dam.

9:45 : Rowe advises Des Anderson (WS) of the report, and discusses potential issue to Ken Cunningham and Conrad Pryce, who dispatch Rowe and Little to site.

10:00 : Carter advise Rowe that Randal Kohlhauser (C&E) is prepping a field trip to the Chute Lake Road to barricade due to the Gillard Road washout. He advised that he would bring road closure materials, and likely meet us at the Chute Lake site.

10:15 : Rowe and Little gear up and leave for site. En route; made phone contact with Elphink to advise of cell phone number if a need for contact, made calls to correct a Safety Line reporting time input, and to re-activate. Activate SPOT.

11:00 : At site, Argo personnel (Daryl Hayter and one other) observing FSR crossing. They were in the area to clear the Chute Creek road crossing 2 km downstream. Advised Argo that this is a FSR and they left shortly after.

In the next ½ hour there were two separate instances where members of the public were 1) preparing to drive through the site in a 4X4 believing the water were “puddles”, until yelled at to stop, and 2) one of two motorcyclists which appeared from the east drove past the warning flagging and into the vortexing sinkhole, and the two riders quickly pulled it out by the back tire.

Elphick arrived on site, the situation was discussed, and the dam was observed with him. He advised that he would be regularly monitoring the conditions.

Observations at 11:30:

At 11:30, the site conditions were; 3 “sinkholes” had developed over the four culverts through the road embankment. The water level was at, and slightly encroaching onto, the road crest. The flow over the concrete weir dam upstream of the road was approx 24 inches above the main sill (20 inches above the sill extension). The area of the reservoir at that elevation (from file info) would be about 40 ha, or 100 acres, so volume retained by road roughly 200 AF. Flow over dam at 2 ft X 50 ft X 3 fps = 300 cfs.

The weather was warm, and patchy snow remained in the surrounding forest and in the road ditches. The preceding days rain was in the range of 40 mm.

The largest of the three sinkholes was mid-road at the western end, at approx 15 feet diameter and 5 feet deep, with steep (undercut) sides. Water level within the hole was discoloured, with minimal turbulence, and 2 to 3 feet below the crest. Small portions of the slopes were noted on two occasions to slough off at the western side of the hole. Stress cracks were evident around the hole, most significantly at the north east side.

A smaller sink area was collapsed on the upstream road crest, approx 6 feet distance and to the north east of the largest sinkhole. This depression was connected to the upstream impoundment, and substantially submerged. There was no noticeable water movement into the depression. As noted, there were stress cracks in the road soils between the two noted sinkholes.

The third sinkhole was located above the furthest culvert to the east. An open area approx 10 feet diameter had eroded, and open from mid road to the upstream crest and connecting with the impoundment. Vortex turbulence was quite strong, indicating significant flow. The slopes of this sinkhole were less steep with less noticeable erosion than the larger sink hole. The water from the impoundment extended beyond this sink hole and several feet further onto the road crest.

12:30 : Kohlhauser on site with barricades which were installed at both ends of the site. Discussion ensued about possible actions, and further contacts to be made. Randal committed to stay at the site and coordinate any activities.

1:15 : After leaving site and finding cell coverage, contact with Cunningham and Pryce. Advised of conditions and possible implications at Indian Rock. Ken advised of arranging a conf call with PEP/RDOS for 2:00

1:30 : Received call from Bill Henrickson (NRO Vernon) and discussed conditions and upcoming conf call. Cell phone batteries depleted.

2:00 : Conf Call - describe conditions. View downloaded photos of site.

4:00 : Conf Call – review options. Assemble mapping info.

5:15 : Join Brian Symonds and Mike Noseworthy on helicopter (Canadian Helicopter-Rod pilot) reconnaissance of Chute Creek from mouth to Chute Lake. Fly over Chute Creek diversion to Elinor reservoir, Elinor dams, and Naramata dam. Minimal discharge through diversion, both reservoirs approx 5 to 10 feet from spilling.

Land at site to review potential actions. The water over the dam (upper sill) was down several inches to approx 18" overflow, and the water level at the road had similarly receded. The largest (mid-road) sinkhole had enlarged slightly, and the vortexing hole had more steepened side slopes. SAR personnel arrived on-site via Eclipse Helicopter. A local resident was on site and reported of large tree in creek, which was investigated and considered not to present a risk. Lyle Knight on site, using the same Canadian Helicopter machine.

7:15 : Leave for Penticton via helicopter. Rowe returned home shortly after arrival.

Monday April 30 11:30

Discuss Chute Lake response and activities with Mike Molloy (Dam Owner).

Future Response Items

- Communications was good for this response, as the area had cell phone coverage nearby, however phone batteries were depleted. **Responders should have car chargers for their cell phones.**
- Although (found to be) not applicable at this site, **there should be ready access to a small supply of sand bags** (perhaps in the warehouse lock-up?). Sand bags can be an adequate tool for initial actions such as to stabilize a small area or to control flows. There were no **shovels, plastic, or other hand tools in our response vehicle which may have proved useful for initial control of site conditions.**

S Rowe May 1 2012

Popowich, Tracy CSNR:EX

From: Little, Patrick FLNR:EX
Sent: Wednesday, May 2, 2012 4:40 PM
To: Cunningham, Ken FLNR:EX
Subject: Chute lake chronology (with attachment)
Attachments: Chute Lake - Response Timeline To Flooding Report LITTLE.docx

Sorry I forgot the attachment!

Hi Ken,

Attached is my chronology of my involvement in the Chute Lake incident.
As I was with Steve the entire time of my involvement I have used his report as a base with some minor modifications.

Patrick

From: Cunningham, Ken FLNR:EX
Sent: Tuesday, May 1, 2012 5:22 PM
To: Kohlhauser, Randal FLNR:EX; Carter, Sinde J FLNR:EX; Rowe, Steve FLNR:EX; Little, Patrick FLNR:EX; Pryce, Conrad FLNR:EX; Anderson, Des FLNR:EX; Reimer, Shaun FLNR:EX; Henriksen, Bill FLNR:EX; Knight, Lyle FLNR:EX; Symonds, Brian FLNR:EX; Noseworthy, Mike FLNR:EX
Cc: Cunningham, Ken FLNR:EX
Subject: RE: Thank you

Hi all. Just a reminder that I need you to put together a bulleted chronology of your involvement in the Chute Lake incident. Thanks to those who have already submitted theirs.

I am also putting a list together on what we need to consider the next time we become involved in this type of event. Please have a look at the attached email and let me know of anything you feel should be added, or as Dave puts it what were the went wells, were trickies or any do differentlies.

As some of us have memories that are really good short term I encourage you to avoid procrastinating on this task ☺.

Thanks.

Also, as noted by Dave I would greatly appreciate
Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

From: Hails, Dave FLNR:EX
Sent: Monday, April 30, 2012 8:36 AM
To: Kohlhauser, Randal FLNR:EX; Carter, Sinde J FLNR:EX; Rowe, Steve FLNR:EX; Little, Patrick FLNR:EX; Pryce, Conrad FLNR:EX; Anderson, Des FLNR:EX; Reimer, Shaun FLNR:EX; Henriksen, Bill FLNR:EX; Knight, Lyle FLNR:EX; Symonds, Brian FLNR:EX; Cunningham, Ken FLNR:EX; Noseworthy, Mike FLNR:EX
Subject: Thank you
Importance: High

Folks – thanks for your efforts over the past few days specific to the events at Chute Lake. Very well handled in a professional manner and awesome team work. We appreciate everyone's efforts and most of all staying safe while managing the situation.

Please ensure Ken C knows of any thoughts you may have on what went well, what was tricky, and what if anything we would do differently as we will be doing a debrief of this event later this week.

Thanks for your great work!

Thanks

Dave Hails
District Manager
Okanagan Shuswap District
Ministry Natural Resource Operations

Response Timeline To Chute Lake Flooding Report – Patrick Little

Friday April 27, 2012 (all times estimated and approximate)

9:15 : Sinda Carter (C&E) advises Patrick Little & Steve Rowe (Water Stewardship) of a report from Rob Wiens (Highways Area Manager) regarding possible malfunctioning of the road culverts at Chute Lake.

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9:25 : Rowe pulls Dam File for Chute Lake and, with assistance of OMS Plan, contacts Mark Anthony Properties – leaves message for Mike Malloy, and gets cell number for Kamaljit Gill (reported to be the vineyard manager). Mr Gill advises that interim manager is now David Elphick. Rowe advises Elphick that the road below the dam has some issues, and that he should attend site, and to call back if there are any problems associated with the dam.

9:45 : Rowe advises Des Anderson (WS) of the report, and discusses potential issue to Ken Cunningham and Conrad Pryce, who dispatch Rowe and Little to site.

10:15 : Rowe and Little gear up and leave for site. En route; Little made phone contact with Elphick to advise of cell phone number if a need for contact, and made calls to correct a Safety Line reporting time input, and to re-activate. Activated SPOT.

11:00 : At site, Argo personnel (Daryl Hayter and one other) observing FSR crossing. They were in the area to clear the Chute Creek road crossing 2 km downstream. Advised Argo that this is a FSR and they left shortly after.

In the next ½ hour there were two separate instances where members of the public were 1) preparing to drive through the site in a 4X4 believing the sink holes were “puddles”, until yelled at to stop, and 2) one of two motorcyclists which appeared from the east (far) side drove past the warning flagging and into the vortexing sinkhole, and the two riders quickly pulled it out by the back tire.

Elphick arrived on site, the situation was discussed, and the dam was observed with him. He advised that he would be regularly monitoring the conditions.

Observations at 11:30:

At 11:30, the site conditions were; 3 “sinkholes” had developed over the four culverts through the road embankment. The water level was at, and slightly encroaching onto,

the road crest. The flow over the concrete weir dam upstream of the road was approx 24 inches above the main sill (20 inches above the sill extension). The area of the reservoir at that elevation (from file info) would be about 40 ha, or 100 acres, so volume retained by road roughly 200 AF. Flow over dam at 2 ft X 50 ft X 3 fps = 300 cfs.

The weather was warm, and patchy snow remained in the surrounding forest and in the road ditches. The preceding days rain was in the range of 40 mm.

Little took several photos of the site and the 3 sinkholes:

The largest of the three sinkholes was mid-road at the western end, at approx 15 feet diameter and estimated to be 5 feet deep, with steep (undercut) sides. Water level within the hole was discoloured, covered in foam, with minimal turbulence, and approximately 2 feet below the crest. Small portions of the slopes were noted on two occasions to slough off at the western side of the hole. Stress cracks were evident around the hole, most significantly at the north east side.

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1:15 : En route to office: After leaving site and finding cell coverage, Rowe contacted Cunningham and Pryce. Advised of conditions and possible implications at Indian Rock. Ken advised of arranging a conf call with PEP/RDOS for 2:00

1:30 : En route to office: Rowe received call from Bill Henrickson (NRO Vernon) and discussed conditions and upcoming conf call. Cell phone batteries depleted.

2:00 : Conf Call - describe conditions. View downloaded photos of site.

4:00 : Conf Call – review options. Assemble mapping info.

Popowich, Tracy CSNR:EX

From: Noseworthy, Mike FLNR:EX
Sent: Friday, May 4, 2012 3:33 PM
To: Cunningham, Ken FLNR:EX
Subject: FW: Chute Lake Chronology of Events

From: Noseworthy, Mike FLNR:EX
Sent: Tuesday, May 1, 2012 1:13 PM
To: Pryce, Conrad FLNR:EX
Subject: Chute Lake Chronology of Events



Chute Lake
Chronology.docx

Here is my account of things.

Michael E. Noseworthy, PGeo, EngL
Senior Regional Dam Safety Officer
Ministry of Forests, Lands and Natural Resource Operations
Okanagan Shuswap District
Ph: 250.490.2291
Fx: 250.490.2231

Chute Lake / Elinor FSR Emergency Response

Chronology of events provided by Michael Noseworthy:

Friday, April 27, 2012

9:09am Received a call from Dale Kronebusch (Emergency Co-ordinator, RDOS). Developing incident at Chute Lake dam. Information was limited at this time. I explained that a similar incident occurred last year. I asked that he contact Lyle Knight as the issue was with the FSR and not the dam. Lyle was familiar with the site.

3:00pm Received a call from Ken Cunningham indicating the situation is more serious than originally reported. He asked if I could come in to aid.

4:15pm Arrived at Penticton office. Discussion in board room with Jeff Wise, Gerry Wells, Ken Cunningham, Conrad Pryce, Steve Rowe, Patrick Little, Shaun Reimer and Brian Symonds on how to proceed. Told that the reservoir level was approximately 24" above the dam and the road was acting as a dam. The road was seriously compromised with 2 large sink holes having been developed. Talk was centered on how to reduce the reservoir flows and shore up the road.

Decided that we should have a helicopter flight to assess both the site conditions and the evacuation zone.

4:45pm Arrive at Canadian Helicopter's hanger and go through safety briefing.

5:02pm Depart Penticton airport. Fly to the confluence of Chute Creek and Okanagan Lake to look for potential avulsion points to determine if the evacuation area should be expanded. Note possible avulsion point at road above Indian Rock community. Other higher road crossing could have avulsions but results would not cause property damages. Minor local over bank flooding noted. One property had a garage and vehicles surrounded by the stream and newly developed side channel.

Flew over Elinor and Naramata Lakes and noted reservoir levels were quite low. Minimal water being diverted into the reservoirs.

5:31pm Land on site to assess the situation. Met with Lyle Knight and Randal Kohlhauser on site. Hitachi Zaxis 75 excavator was being mob on-site. Identified location and size of diversion channel to be constructed.

7:20pm Lifting off from Chute Lake to Penticton airport.

7:42pm Landed at Penticton airport. Drive to office.

- 7:50pm Meet in boardroom with Ken C., Conrad P., Jeff W., Brian S., Shaun R., and Steve R. Discuss strategy. Decide that I would monitor over night with Randal K. Safety check-ins every two hours. Call Kathy to have gear brought down.
- 9:00pm Drive up to Chute Lake in s.22 truck.
- 9:30pm Meet with Randal and Lyle Knight. Assess recent excavator work and road/reservoir conditions. Send Lyle back to Vernon with s.22 truck. Monitor water levels and road conditions.

Saturday, April 28, 2012

- 12:00am Continue to monitor water levels and road condition throughout the night. Measure reservoir levels at dam. Notice gradual lowering of levels.
- 8:00am Call Ken C. to provide an update reservoir levels are retreating.
- 10:00am PEP call update. Describe current situation. Explain to MFLNRO staff following teleconference why I feel that we could rescind the evacuation notice as the reservoir outflow rate is now largely controlled by the dam and not the road.
- 10:45am Drive over to RDOS offices with Brian. Brian gives media an interview. Brian & Mike explain current state at site to RDOS staff and describe the next steps.
- 12:45pm Drive up to quarry to meet with excavator operators. Send one excavator home and the other 200 up to the site.
- 1:30pm Discuss plan on site with Bill Henricksen (MFLNRO), provide further direction to the Zaxis 75 excavator operator and monitor work.
- 3:00pm Larger excavator arrives and operator is instructed on how to removal road section. Monitor work.
- 4:00pm PEP call update. Brian recommends rescinding evacuation order. No threat remains.
- 4:30pm Provide further direction to operators. Request woody debris and damaged culvert to be removed from site and disposed of in landfill.
- 5:15pm Drive to office.
- 6:00pm Short debrief at office then leave for home.

Popowich, Tracy CSNR:EX

From: Cunningham, Ken FLNR:EX
Sent: Wednesday, May 23, 2012 2:11 PM
To: Knight, Lyle FLNR:EX
Subject: Fwd: Chute Lake Incident - Draft Chronology
Attachments: Chute Lake Incidents chronology.docx; ATT00001.htm

Ken Cunningham
Resource Manager
Okanagan Shuswap District

Begin forwarded message:

From: "Cunningham, Ken FLNR:EX" <Ken.Cunningham@gov.bc.ca>
Date: 28 April, 2012 7:01:58 PM PDT
To: "Cunningham, Ken FLNR:EX" <Ken.Cunningham@gov.bc.ca>
Subject: Chute Lake Incident - Draft Chronology

Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

Ken's notes

Chute Lake Incident

April 27th, 2012

- Conrad and Steve called me in to discuss an incident at Chute Lake Road that had been reported by Sinde and Randall. Decision was to send Steve Rowe and Patrick Little to the site to do an assessment.
- Bill has ordered a Hitachi EX75 excavator and a dump truck. After discussions with MOTI we asked him to order some additional machines: 2 size 200 excavators (one up to the Naramata pit and one up to the site), and 6 more dump trucks.

- 17:30 EMBC call:

RDOS:

Evacuation Orders have been issued for the area.

Evacuees will be meeting at the Fire Haul.

Search and Rescue staff are being deployed to notify residents of the evacuation.

2 Zodiaks are in the water to cover the safety plan for the Search and Rescue crews.

FLNRO:

Lyle and Randall both on site.

Brian, Mike and Steve just landed in the helicopter.

Water appear to be receding slowly.

Brian has reviewed the potential flow path for water if the road did give way. Explained where some pinch points/evulsions could occur.

Generally seeing some positive signs in regards to temp, flows, and downstream characteristics if a breach was to occur.

Fortis:

- Bill Henriksen will be going to the site tomorrow morning to replace Randall and Mike. Will aim to be there at 09:00.

- 20:00 EMBC call

Although the overall risk isn't abated, things are looking better.

The temperature is dropping, no new precipitation has occurred, and the water level has dropped over 5 cms.

FLNRO staff, including specialists, have visited the site and have used an excavator to create a ditch that will help draw down the water level a little quicker.

The ditch is constructed in a location and manner designed to minimize the risk of it down cutting further in an uncontrolled manner. Onsite staff have been monitoring the ditch and things are working well.

The RDOS has completed their evacuation.

Search and rescue have helped with the evacuation and checked the surrounding areas for hikers etc.

The RCMP has staff in place to secure the evacuated properties.

MOTI have advised their maintenance crew to be prepared to rebuild roads if the water does release and causes damages to their system.

Dale Kronenbusch is the RDOS media contact. His number is 250-809-2541.

- We have two staff who will be overnighing and monitoring the site. They have the ECC number in the event that road lets go. They are using the RDOS emergency service as their safety check in.
- We have kept an number of machines on standby until tomorrow and will reassess in the morning.
- We will have staff go to the site tomorrow to replace the night crew.
- If the water drops to a safe level we will pull the culvert and breach the road in a controlled manner. We do not think this will occur before noon, but it could take longer.
- Next EMBC call tomorrow morning at 10:00. An update will follow after that (earlier is something happens before then).
- Randall will take the Light Plant up when he returns to the site this evening.
- Discussed components of night time safety plan with Mike. They have 2 people on site, they have check ins set up, they have safety kits with the vehicles. Randall/Mike to call ECC if something significant happens during the night 1-800-663-3456.
- Decision to hold the machines on standby for the evening. The excavator operator at the site will be back tomorrow morning by
- 22:30: Lyle called in. Lights are set up and he will be heading home. He will call me when he gets to pavement.
- 23:15 +/-: Lyle called in from the bottom of the Gillard FSR.
He is with an RCMP officer and heading out to pavement. Will call me tomorrow.
- Randall and Mike will be using the RDOS's Graden Answering Service for their safety check in through the night. Mike to call me at 08:00 tomorrow morning.

April 28th, 2012

- 07:50: Brian Symonds called.
Advised the RDOS had started to divert water into their Eleanor Lake Reservoir.
This won't reduce flows into Chute Lake but will reduce tributary flows into Chute Creek below dam/road to help reduce pressure on culverts and crossings downstream.
RDOS will be returning to Eleanor Lake this morning to finish the job as they had some problems with snow and ice last night.
Brian will be in the office for the 10:00 am EMBC call.
- 08:00: Mike Noseworthy called from Chute Lake.
Height above the dam was 11.5 inches at 06:00.
Flow through the ditch had dropped to a very low flow.
Excavator operator is on site.
Mike has had machine widen the ditch another 3 feet and deepen it another foot.
Although increasing flow through ditch the flow below the road has also dropped (less head pushing water through the culverts)
Mike will call me again at 10:00.
- 08:10: Lyle Knight called. Will be available today if help needed to coordinate actions s.17
- 09:02: Mike called.
Water level is 10.5 inches above the dam. Dropped 1 inch in 3 hours.
Set up other areas to help measure against last night. Site showed 6.5 inch drop to now.
Ponded area below road now showing the top of one culvert out of the water.

Water in sink hole has dropped substantially. No longer swirling around like yesterday but still some sloughing is occurring.

Bill Henriksen has arrived on the site.

- 10:00: EMBC call see EMBC conference call minutes.
- 10:45: Mike Knauff advised me to call Rick Wagner s.17 about another area of concern (Tappin).
- 11:00: Left message about Tappen on Lyle Knight's phones.
- 11:15: Bill Henriksen called in.
The water level continues to drop. Has gone down another inch in the last two hours.
- Brian and Mike mentioned the ability to continue to open up and deepen the ditch is things progress nicely.
- 12:27: Brian and Mike leaving the RDOS on route to the site.
- 12:33: Bill called in.
Water continuing to drop.
Level is at 9 inches over the east side of the weir.
Advised Bill that Brian and Mike are on route and should be there around 1:15 pm.
- 13:00: Brian and Mike at the Naramata Pit.
Talked to excavator who will be heading up. Should be to site by 2:00 pm.
Brian and Mike will be at site and have conducted assessment by the time the excavator arrives.
- 13:54: Brian called from the site.
Have completed their assessment.
Will be proceeding with the breach when the large excavator arrives.
Checked the culverts where Chute Creek passes under Chute Creek Road. Lots of capacity there.
Brian talked to Argo who were at the site. Updated them on our plan.
They are constructing a second ditch on the same side as the first one they build. The first one is stable but not passing enough water for their liking.
Expect to pull the culverts and breach the road around 2:30 pm.
Brian will call RDOS and EMBC to advise them of the plan and will then call me back. I will call MOTI.
Depth of water above the dam/weir was 7.5 inches at 1:25 pm.
- 14:00: Ken left voice messages on Jeff Wiseman's cell and home numbers.
- 14:08: Brian called. He has talked to RDOS (Mark) and EMBC (Mike) and advised them of the plan.
Both are supportive.
- 14:11: Brian called. Excavator has arrived and they will start removing the culvert and breaching the road in a controlled manner in about 15 minutes. They expect it will take about 30 minutes.
- 14:12: Ken called Dale at RDOS and advised work will begin in about 15 minutes. He will advise Mark.
- 14:13: Ken called Mike at the EMBC and advised work will begin in about 15 minutes.
Mike will advise Fortis and will try to raise Jeff through the MOTI radio room.
- 14:41: Brian called. They are starting to do the breach.
They have equalized the differential on either side of the road so no significant pulse should occur.
They will remove the angled culvert first and work backwards.

The dam/weir has a major drop over the weir so it is acting as the major control point of water flow. Brian will call Mark at the RDOS and I will call Mike Knauff at EMBC to advise action is occurring.

- 14:45: I called Mike Knauff and advised him the work was starting. He has advised Fortis and left a message for Jeff on the MOTI radio system.

- 14:52: Lyle Knight called. Advised me that Penticton RCMP have hired someone for security at the Gillard FSR to stop traffic back into Naramata.

Lyle is at the Gillard and will be seeing if he can hire an excavator to do some minor repairs to alleviate the risk of a blow out, and to place material in front of the washout to prevent people from trying to go through the washout and up the Gillard FSR.

- 16:00: EMBC Coordination call (see EMBC Conference call minutes).

- 16:21: Brian Symonds called. Everything has gone very well.

The road has been breached and work continues.

He and Mike will be leaving the site shortly. Bill will remain with the two excavators to finish the job and clean up.

One excavator will bring down the crushed culverts in the dump truck it has with it. The other will bring down the organic material in the dump truck it has with it.

Brian and Mike will bring the light plant and store it in the compound until Westminster Rentals is open.

- 17:55: Brian and Mike arrive at the office.

Summary of what has occurred today. Mostly noted above already.

- 18:30: Called Bill. Just wrapping things up.

Expects to be leaving within 30 minutes.

Culverts and organics being taken down from site.

Road access to creek is barricaded on both sides.

Bill will call me when he hits pavement.

- 18:34: Lyle called. He was able to arrange a large excavator in the vicinity of Gillard FSR to come and do the required work.

The Gillard site is now secured. The creek is back in its banks, erosion isn't occurring and the creek is not damned up at all.

The road has been blocked with rocks and barricades on both sides of the washout.

Dennis Kelly had checked in with Lyle. He has put up barricades on both sides of the Charcoal FSR washout.

Lyle is in Kelowna and heading home.

-

Mike Knauff advised that EMBC gives local governments a standard Task Number and then provide separate Incident Numbers for individual events. The Incident Number for Chute Lake is 120032.

Mike advised at this point FLNRO is not eligible for funding under this event, however, we should document weather and flow conditions to see if we can demonstrate that this weather was a seasonal anomaly high might make the work eligible under a broader DFA. I have asked David Campbell to

summarize the weather information for the last week in support of this request should a DFA be available.

Popowich, Tracy CSNR:EX

From: Cunningham, Ken FLNR:EX
Sent: Friday, April 27, 2012 10:04 PM
To: Hails, Dave FLNR:EX; Dickenson, Kevin FLNR:EX; Manwaring, Richard G FLNR:EX; Thomas, Vivian P GCPE:EX; Townsend, Gary FLNR:EX
Cc: Cunningham, Ken FLNR:EX; Symonds, Brian FLNR:EX; Tobin, Patrick J FLNR:EX
Subject: Chute Lake Incident: Update #1

Hi all. Here is an update to the incident:

- Although the overall risk isn't abated, things are looking better.
- The temperature is dropping, no new precipitation has occurred, and the water level has dropped over 5 cms.
- FLNRO staff, including specialists, have visited the site and have used an excavator to create a ditch that will help draw down the water level a little quicker.
- The ditch is constructed in a location and manner designed to minimize the risk of it down cutting further in an uncontrolled manner. Onsite staff have been monitoring the ditch and things are working well.
- As of the 8:00 pm EMBC call:
 - The RDOS has completed their evacuation (numbers described on the call were not clear but it sounded like 40+ structures and approximately 90 people I will try and get better numbers for tomorrow's update).
 - Search and rescue have helped with the evacuation and checked the surrounding areas for hikers etc.
 - The RCMP has staff in place to secure the evacuated properties.
 - MOTI have advised their maintenance crew to be prepared to rebuild roads if the water does release and causes damages to their system.
 - Dale Kronenbusch is the RDOS media contact. His number is 250-809-2541.
- We have two staff who will be overnighing and monitoring the site. They have the ECC number in the event that road lets go. They are using the RDOS emergency service as their safety check in.
- We have kept an number of machines on standby until tomorrow and will reassess in the morning.
- We will have staff go to the site tomorrow to replace the night crew.
- If the water drops to a safe level we will pull the culvert and breach the road in a controlled manner. We do not think this will occur before noon, but it could take longer.
- Next EMBC call tomorrow morning at 10:00. An update will follow after that (earlier is something happens before then).

Please let me know if you have any questions.

Thanks.

Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

Popowich, Tracy CSNR:EX

From: Cunningham, Ken FLNR:EX
Sent: Saturday, April 28, 2012 11:41 AM
To: Hails, Dave FLNR:EX; Dickenson, Kevin FLNR:EX; Manwaring, Richard G FLNR:EX; Laaksonen-Craig, Susanna FLNR:EX; Townsend, Gary FLNR:EX; Thomas, Vivian P GCPE:EX
Cc: Cunningham, Ken FLNR:EX; Symonds, Brian FLNR:EX; Tobin, Patrick J FLNR:EX; Wiseman, Jeff TRAN:EX
Subject: Chute Lake Incident: Update #2

Hi all. Here is the update following the EMBC conf call:

- Water level dropped nicely overnight.
- Best estimates was there was approximately 20 inches over the top of the dam's upper sill early yesterday.
- At 06:00 this morning the height over the upper sill was approximately 11.5 inches. At 09:02 this morning the height above the upper sill was approximately 10.5 inches. This means the lake appears to have dropped approximately 9.5 inches.
- The ditch that staff cut yesterday had very little flow this morning. Staff cut the ditch down another foot and widened it out another 3 feet.
- Even with this cutting/widening to help increase the flows out of the lake the downstream flows have lessened (less head pushing water through the culverts).
- I don't want to confuse the situation but the water in the lake has now dropped to a point where the original dam/weir is once again acting as the control point for the water flowing downstream. Brian Symonds and Mike Noseworthy are reviewing photos and data and developing a strategy on when we can pull the culverts. The feeling is we should be able to pull the culverts with a small increase in volume noticed only in the immediate vicinity downstream of the culverts.
- The RDOS is diverting some water into their Eleanor Lake reservoir. This doesn't reduce flow into Chute Lake but reduces the water flowing into Chute Creek downstream of the road/dam. This helps take the pressure off the downstream road culverts.
- The sinkholes have expanded a bit but the water level in them has dropped substantially, and the water in them is relatively calm (not swirling like yesterday).
- Today's weather forecast is calling for sunny with cloudy periods and no precipitation. Temperatures in Penticton are forecast to get to 18 which is much cooler than last week.
- We expect that we may be able to pull the culverts before the 4:00 pm EMBC call. If that is the case we will ensure we communicate that plan to EMBC, RDOS, MOTI and others.
- RDOS is maintaining the evacuation alert but we have EMBC call at 4:00 pm where we hope to be in a position to cancel the evacuation alert.
- Brian Symonds and Mike Noseworthy are having a brief meeting with the RDOS and will then head up to the site to make the decision on pulling the culverts.

Please let me know if you have any questions.

Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

Popowich, Tracy CSNR:EX

From: Manwaring, Richard G FLNR:EX
Sent: Saturday, April 28, 2012 7:30 PM
To: Cunningham, Ken FLNR:EX
Cc: Hails, Dave FLNR:EX; Dickenson, Kevin FLNR:EX
Subject: Re: Chute Lake Incident: Update #3

Clutch play Ken. Good work by the team.

I would favor a debrief next week with Dickenson, Hails and I. When you catch up on your sleep, get Corri Ann to set an hour aside please.

It's good to have good people.

Rick Manwaring, RPF
Assistant Deputy Minister
South Area, Regional Operations
Forests, Lands, and Natural Resource Operations
250-828-4449

On 2012-04-28, at 5:15 PM, "Cunningham, Ken FLNR:EX" <Ken.Cunningham@gov.bc.ca> wrote:

Hi all. Here is an update following the EMBC Coordination call:

- Brian, Mike and Bill were on site and completed an assessment of the area. Water was flowing at a level of approximately 6inches over the dam/weir (down from a high of 20 inches yesterday).
- They had deepened the earlier ditch that was constructed and added a second deeper one to release even further flows.
- This work helped equalize the differential pressure on either side of the road, which means the flow rate wouldn't change if they breached the road and removed the culverts.
- They had looked at the culvert crossing downstream and it had capacity to take additional water (although no increase is expected).
- At 14:45 they began the removal/breach. Things are looking good. Some work still to complete and then some clean up to be done.
- They will also use the machine to block access from both sides to ensure nobody accidentally drives into the breach.
- Brian advised the EMBC call that he believed they had addressed the risk associated with backed up water and the road.
- RDOS is going to lift their evacuation order but will allow people to stay out another night if they are already in hotels and prefer not return immediately.
- The RCMP will maintain their security people for another night in case people don't return right away.
- Brian and Mike will help Bill for a little longer but when things are under control they will come back down (and bring the light plant into our compound).
- Bill will stay up on site until things are cleaned up enough to depart. Both machines will be released and we will use the dump trucks they were pulled up in to remove the culverts and an amount of organic material that has been disturbed.
- Nobody will be overnighing at the site tonight.
- There are no further EMBC calls scheduled.
- I will speak to Brian and Mike and determine if we need to send someone up tomorrow. Argo may be going up to the site so they may be able to advise us what things look like.

I will be passing my kudos on to everyone who has been involved and I would also like to thank you for your support. The team included:

- Randall Kohlhauser (C&E)
- Sinde Brown (C&E)
- Steve Rowe (DOS)
- Patrick Little (DOS)
- Conrad Pryce (DOS)
- Des Anderson (DOS)
- Shaun Reimer (DOS)
- Bill Henriksen (DOS)
- Lyle Knight (DOS)
- Dave Hails (DOS)
- Brian Symonds (Provincial Water Stewardship)

Once again it proved extremely valuable to share an office with our MOTI colleagues. Jerry Wells and Jeff Wiseman attended the conference calls in our boardroom and provided technical and operational expertise to us throughout the event. It was greatly appreciated.

This event also showed the benefits of having an integrated district. The issue may have been associated with a FSR but having water staff and forest engineering staff reporting to one manager provided a wonderful amount of flexibility in ensuring we had the right mix of people. I am not saying this couldn't have been accomplished through another organization, however, it was sure nice having line authority over both teams. In addition, this is the third year in a row that C&E has provided exceptional services to the district in identifying and responding to issues of this nature. And last but not least Mr. Symonds is a wonderful resource to share an office with. I am not sure how many years he has been providing this sort of expertise and support, but being able to have staff work with him is an excellent way to help transfer that knowledge and skills to others.

s.22 however, that will have to wait just a little longer as I will continue to monitor communications until everyone is safely back in.

Tanks to all.

Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

Popowich, Tracy CSNR:EX

From: Reimer, Shaun FLNR:EX
Sent: Friday, May 4, 2012 3:56 PM
To: Cunningham, Ken FLNR:EX
Subject: RE: Chute Lake Incident summary

Chute Lake Chronology:

- Called to Penticton FLNRO Office at 1745;
- Brian S, Steve R, and Mike N already on route to site;
- 1800 PEP conference call;
- Des A had just picked up light plant to take to site;
- Informed that Randal K would be coming back to office and would take light plant to site (so that Des A and I didn't have to go to site).

Not Responsive

- 1900 til 2100 discussions with Brian S re: situation and actions channel to drop water level and Randal K and Mike N to go to site to monitor overnight;
- 2100 I went home.

Suggestion: There was discussion with Gerry W re: Worksafe onsite safety plan in case of visit by Worksafe. In this case, we had Mike N write something up at the site. Why don't we have safety committee write up a 'fill in the blank' form for these situation so that we cover all the bases. Forms could be kept in trucks and flood bags.

Shaun Reimer, P.Eng.

Hydrotechnical Engineer
Ministry of Forests, Lands, & Natural Resource Operations
102 Industrial Place
Penticton, BC, V2A 7C8
(250) 490-8229
fax: (250) 490-2231

From: Cunningham, Ken FLNR:EX
Sent: Friday, May 4, 2012 3:22 PM
To: Rowe, Steve FLNR:EX; Pryce, Conrad FLNR:EX; Reimer, Shaun FLNR:EX; Noseworthy, Mike FLNR:EX
Cc: Cunningham, Ken FLNR:EX
Subject: Chute Lake Incident summary
Importance: High

Hi all. Just a reminder that I would like to get your summaries fairly soon. Thanks.

Steve, I thought I received yours but I can't find it. Can you resend if that is the case.

Thanks all.

Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

From: Cunningham, Ken FLNR:EX
Sent: Tuesday, May 1, 2012 5:22 PM
To: Kohlhauser, Randal FLNR:EX; Carter, Sinde J FLNR:EX; Rowe, Steve FLNR:EX; Little, Patrick FLNR:EX; Pryce, Conrad FLNR:EX; Anderson, Des FLNR:EX; Reimer, Shaun FLNR:EX; Henriksen, Bill FLNR:EX; Knight, Lyle FLNR:EX; Symonds, Brian FLNR:EX; Noseworthy, Mike FLNR:EX
Cc: Cunningham, Ken FLNR:EX
Subject: RE: Thank you

Hi all. Just a reminder that I need you to put together a bulleted chronology of your involvement in the Chute Lake incident. Thanks to those who have already submitted theirs.

I am also putting a list together on what we need to consider the next time we become involved in this type of event. Please have a look at the attached email and let me know of anything you feel should be added, or as Dave puts it what were the went wells, were trickies or any do differentlies.

As some of us have memories that are really good short term I encourage you to avoid procrastinating on this task ☺.

Thanks.

Also, as noted by Dave I would greatly appreciate
Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

From: Hails, Dave FLNR:EX
Sent: Monday, April 30, 2012 8:36 AM
To: Kohlhauser, Randal FLNR:EX; Carter, Sinde J FLNR:EX; Rowe, Steve FLNR:EX; Little, Patrick FLNR:EX; Pryce, Conrad FLNR:EX; Anderson, Des FLNR:EX; Reimer, Shaun FLNR:EX; Henriksen, Bill FLNR:EX; Knight, Lyle FLNR:EX; Symonds, Brian FLNR:EX; Cunningham, Ken FLNR:EX; Noseworthy, Mike FLNR:EX
Subject: Thank you
Importance: High

Folks – thanks for your efforts over the past few days specific to the events at Chute Lake. Very well handled in a professional manner and awesome team work. We appreciate everyone's efforts and most of all staying safe while managing the situation.

Please ensure Ken C knows of any thoughts you may have on what went well, what was tricky, and what if anything we would do differently as we will be doing a debrief of this event later this week.

Thanks for your great work!

Thanks

Dave Hails
District Manager
Okanagan Shuswap District

Popowich, Tracy CSNR:EX

From: Cunningham, Ken FLNR:EX
Sent: Thursday, May 24, 2012 4:52 PM
To: Pryce, Conrad FLNR:EX; Knight, Lyle FLNR:EX; Noseworthy, Mike FLNR:EX; Rowe, Steve FLNR:EX; Little, Patrick FLNR:EX; Reimer, Shaun FLNR:EX; Kohlhauser, Randal FLNR:EX; Symonds, Brian FLNR:EX; Henriksen, Bill FLNR:EX
Cc: Cunningham, Ken FLNR:EX
Subject: Learning's from the Chute Lake Incident

Hi all. Here is a summary from yesterday's meeting of things that should be considered the next time we find ourselves in an emergency response situation. Please have a look and see if I missed something or captured it incorrectly.

Emergency response contacts:

- Does EMBC and local government need to be contacted? If so, engage them early.
- Determine who else may be impacted and advise EMBC so they can make contact and have them on the coordination calls (MOTI, utilities, US contacts, IHA, etc.)

Onsite personnel:

- Ensure there is adequate technical and specialist support onsite. Deploy required specialists early in incident.
- Ensure an onsite risk assessment is done early and a safety plan is developed.
- Is a first aid attendant and emergency vehicle required?
- Establish a minimum of two staff for overnight monitoring. Send blankets/sleeping bag if overnighting to keep warm).
- Ensure staff get an appropriate break to keep fresh. Do not let staff work too long of hours.
- Are there staff from other program in the district, region or provincial ops that need to be brought in? Are specialists from other ministries required?
- What check in system will we use? What frequency of check in is required? Who will time and monitor these check ins? Will staff be stationary at one site or mobile to multiple sites.

Onsite equipment/supply needs:

- Do we have adequate fleet vehicles? Do we need a helicopter or boat?
- Don't under estimate equipment requirements and the need to get it hired and to the site quickly. Hire the appropriate sized equipment. Are swampers required?
- Ensure first responders take a flood response kit and other key tools and equipment (such as staff gauges, spade, polaski, sand bags, observer/assessor handbook, good flash light, orange plastic bags, traffic cones/barricades, extra jerry can of gas).
- What field safety gear do staff need (safety vests, hardhats, pfd's, whistles, steel toed boots, gloves, warm clothes, adequate flash lights, Spot Units, caution flagging tape, danger signs, hip waders).
- Do we need barricades to block access points, and if so where do we get them?
- Is a light plant(s) required?
- Do staff have adequate batteries for the various communication devices, including vehicle chargers? Staff need to be aware that if cell coverage isn't good that their phone's roaming feature can drain the battery.
- Staff should take copies of the Hourly Equipment Hire forms.

Office setup

- Set up in a large enough boardroom with laptop with connection to the server, projector, conference call type phone and radio base station.
- Bring in admin support early to help document what is occurring and to capture the chronology of events.

- List of contact info for staff with emergency response specialties.
- List of equipment hire lists and rates.
- List of heli and boat companies with contact/after hour contact info.
- List of MOTI maintenance contractors and contact/after hour contact info.
- List of equipment rental companies and contact/after hour contact info.

Communications:

- Determine what type of communication with the site staff is required (cell phone, FLNRO radio, satellite phone, SPOT Unit). Does there need to be an established onsite radio operator.
- Establish regular information updates from the site.
- Send regular updates to local managers, REDs, ADM, PAB. Send them at the onset and on a regular basis up to when you close off the issue and this communication.

Once we get this list finished we will have to assign some action items to ensure we get our good thoughts implemented.

PS: I am also attaching the Went well/Trickies/Do differently list that we developed. Please take a look and let me know if there are any errors or omission or if you have some additional suggestions. Please use "track changes" if you are going to make edits right in the word document.



Chute Lake

brief NotesMay 2:

Thanks all. I know we are all busy but I would appreciate your feedback in a timely manner.

Ken Cunningham
Resource Manager
Okanagan Shuswap District
Ministry of Forests, Lands and Natural Resource Operations

Chute Lake Debrief Notes

Date: May 23, 2012

In attendance: Ken Cunningham, Conrad Pryce, Mike Noseworthy, Steve Rowe, Patrick Little, Shaun Reimer, Randall Kohlhauser, Brian Symonds, Lyle knight (via phone).

Went Well:

- Situation was successfully defused.
- Good communication right off start (MOTI→C & E→Des Water/Eng Staff) Good communication of risk by first responders.
- Good team work and appropriate resourcing levels.
- Early engagement of EMBC, RDOS. Quick expansion to other agencies that needed to be involved.
- Timely and thorough communication to broad on group, including DM, RED, ADM and PAB.
- Willingness of staff to stay and accept wide variety of duties.
- Good support from upper level management and executive.
- Good availability and use of In house expertise between water and engineering programs.
- Got new staff involved in issue (mentoring opportunity).
- Good support from Compliance and Enforcement.
- Useful having MOTI and Brian Symonds in the office. Good support from both.
- Being able to employ helicopter to access the site quickly, assess site and determine what might occur if failure occurred.

Trickies:

- Having MOTI make recommendations regarding equipment requirements when they were not on site.
- Communication with site was somewhat difficult. Cell coverage was able to be acquired but had to move 200 meters away from the site. Also radio contact was able to occur but we had to step out of the office to hit the repeater.
- Communication with the media. Information media was providing wasn't accurate. Could have met with residences to help clarify what was/could happen.
- Not having an RDOS member on site to better understand the issue and potential ramification.
- Staff from Environment, FLNRO, or MOE not being aware of each other's emergency response models (WFMB vs. Flood response).
- Staff weren't fully aware of full scope of their own or other's roles and responsibilities .

Chute Lake Debrief Notes

Do Differently

- Make sure an onsite incident commander is identified (and transferred as appropriate).
Assignment of the incident commander should be established by the office EOC type director).
- In future years try and ensure flood observer/assessor training occurs before freshet begins
- Establish protocol for transitioning staff into and out of incident (monitor hrs worked to ensure nobody works too long of a shift).
- Should have had a copy of the following documents at the command center as reference material:
 - BC Emergency Response Management Plan,
 - District landslide Response Plan,
 - BC Dam Emergency Response Plan,
- Develop and provide a fact sheet for the media contacts.
- The onsite incident commander needs to develop a written plan that can be transferred when the onsite supervisor changes.
- Provide written instruction to equip operators regarding the expected deliverable if staff will be leaving the site.

Ken Cunningham

Regional Manager

Ministry of Forests, Lands & Natural Resources Operations

Thompson/Okanagan Region

KC/ch