

From: jasonkean@nalcorenergy.com
To: Keith.Dodson
Cc: <JasonKean@nalcorenergy.com>
Subject: Re: Concrete schedule for CH0007
Date: Thursday, May 31, 2012 10:23:54 PM

Keith,

All conventional concrete (CVC) in these totals. RCC is separate from these amounts.

Jason



Jason R. Kean, P. Eng., MBA,
PMP
Deputy Project Manager,
Muskrat Falls & Labrador -
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You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

Keith Dodson ---05/31/2012 10:22:07 PM---Thanks. Good information. I am not clear on the rolled concrete in these totals? On May 31, 2012, at

From: Keith Dodson <k_dodson@westney.com>
 To: "<JasonKean@nalcorenergy.com>" <JasonKean@nalcorenergy.com>
 Date: 05/31/2012 10:22 PM
 Subject: Re: Concrete schedule for CH0007

Thanks. Good information. I am not clear on the rolled concrete in these totals?

On May 31, 2012, at 7:46 PM,
 <JasonKean@nalcorenergy.com<mailto:JasonKean@nalcorenergy.com>> wrote:

Keith,
 I thought I'd share these thoughts with you as prepared by one of our estimators. He speaks to the size and scale of the concrete works at MF in the context of HQ's Eastmain 1A.

Reaffirms the criticality of getting the right contractor, supervision and labor.

Regards,

Jason

<ATT00001.jpg> Jason R. Kean, P. Eng., MBA, PMP
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----- Forwarded by Jason Kean/NLHydro on 05/31/2012 10:14 PM -----

From: "Lemay, Paul" <Paul.Lemay@snclavalin.com<mailto:Paul.Lemay@snclavalin.com>>
To: <JasonKean@nalcorenergy.com<mailto:JasonKean@nalcorenergy.com>>
Cc: <MarkTurpin@nalcorenergy.com<mailto:MarkTurpin@nalcorenergy.com>>, "Tremblay, Jean-Daniel" <Jean-Daniel.Tremblay@snclavalin.com<mailto:Jean-Daniel.Tremblay@snclavalin.com>>
Date: 05/31/2012 02:30 PM
Subject: Concrete schedule for CH0007

Jason,

To answer your request about my comment on the latest concrete schedule received from Tony Scott, here is my preliminary observation:

Part A: CONCRETE QUANTITIES INVOLVED VS BATCH PLANT PRODUCTION CAPACITY

- * The total quantity of concrete is : 438,000 m3
- * The total window to execute these quantities is: 36 months
- * The monthly average quantity to be poured is : 12,200 m3 with some month at 15,000m3 and a peak at 20,800 m3 in august 2014.
- * This brings us to a respective daily average during these months of 405 m3, 500 m3 and 667 m3.

As a bench mark information, at Eastmain-1A, we had 100,000 m3 poured in 23 months, for a monthly average of 4,350 m3 and a daily average of 145 m3 with the support of one concrete batch plant of 125 m3/hr capacity, plus one extra mixer.

Here at Muskrat Falls, we have 4 times more concrete for a period of just 1,6 time longer than Eastmain-1A, that means that we will need at least two, 125 m3 plant and two extra mixer to suffice the demand (500m3/day at M. Falls divided by 145 m3/day at Eastmain = 3.45 mixers, we would have 4).
We also could pour on two shift sequence, if weather condition or breakup equipment situation occurs and we need to catch up!

Part B: VALIDATION OF THE (DAYS / CYCLE) OPERATION, FOR EACH POUR

The numbers of days we have per structure, divided by the numbers of pours, gives us the average number of days per cycle, that normally, should varies between 4 to 5 days for (forming, rebar, pouring, curing and un-forming) and here are my findings:

From the schedule, I counted a total of 771 pours for all the concrete structures, with an average rate of 4.71 days / cycle described as follow:

- * Intake-Powerhouse: 1,034 days / 242 pours for: 4.27 days/cycle
- * Spillway: 122 days / 22 pours for 5.54 days/cycle (total of 5 bays split in two sectors for approximately 238 pours)
- * Rollways: 92 days / 22 pours for 4.18 days/cycle (total of 66 pours for 3 rollways)
- * Center Dam: 608 days / 145 pours for 4.19 days/cycle
- * South & gravity dam: 365 days / 80 pours for 4.56 days/cycle

As a bench mark, at Eastmain-1A we had 162 pours over a period of 700 days for an average of 4.32 days / cycle.

Also as a bench mark information, at Eastmain-1A we had 162 pours on a total of 100,000 m3 for an average of 621 m3/pour, and here at Muskrat Falls, we have 771 pours on a total of 438,000 m3 for an average of 568 m3/pour.

In conclusion,

This is a quite aggressive schedule because of the huge quantities involved in a relatively short period of time and although the day/cycle ratio seems to me reasonable, the fact remain that, running at a pace of some 480 m3 / day, for almost three consecutive years, at every day, will remain quite a challenge!

I suggest we put a time or money provision in our contingency plan, to overcome a

possible failure that may occur.

Regards,

Paul Lemay, p.eng
Lead Estimator.

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