

# Big Eddy Small Hydropower Project Public Update Meeting



Dr. G. Alan Hepburn, P.Eng.  
May 17, 2011



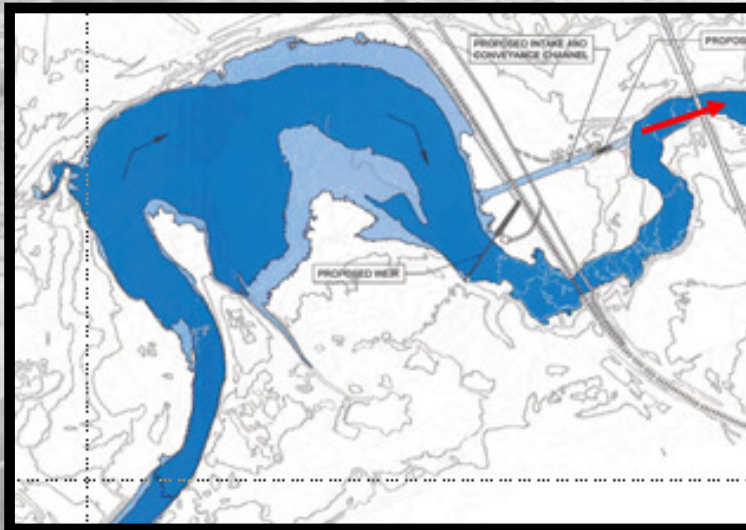
# Agenda

- Recap
  - Xeneca presentation to Professional Engineers
  - “Proposed Operating Flows and Levels” report, Apr. ‘11
  - Xeneca PIC, May 5
  - Other Recent developments
  - How you can help



# Recap

- Xeneca Power Development Inc. is proposing a small hydropower development with a dam just upstream of the railway bridge over the Petawawa
  - Incentive rates introduced by the Green Energy Act makes such projects attractive to private companies
  - 5.3 MW maximum output
  - Xeneca has 18 similar sites across Ontario
  - This is the only urban location for this proponent



# Positive Impacts

- “Millions of dollars will flow into the area”
  - \$17M during construction
  - \$35M to the town over the 40 year life of the facility
- If these numbers seem too good to be true – see later



# Negative Impacts

- Flow for 300 metres downstream of the dam will be severely curtailed
  - Aesthetic impact
- Will destroy one of the prime urban kayaking locations in North America
- Blocks passage for fish migration, including SAR sturgeon
- Public safety issue downstream of the dam (Centennial Park)
- Safety issues around and downstream of the dam/weir:
  - A weir is a “drowning machine”











# Misema – Spring Freshet



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# Xeneca Presentation to Professional Engineers

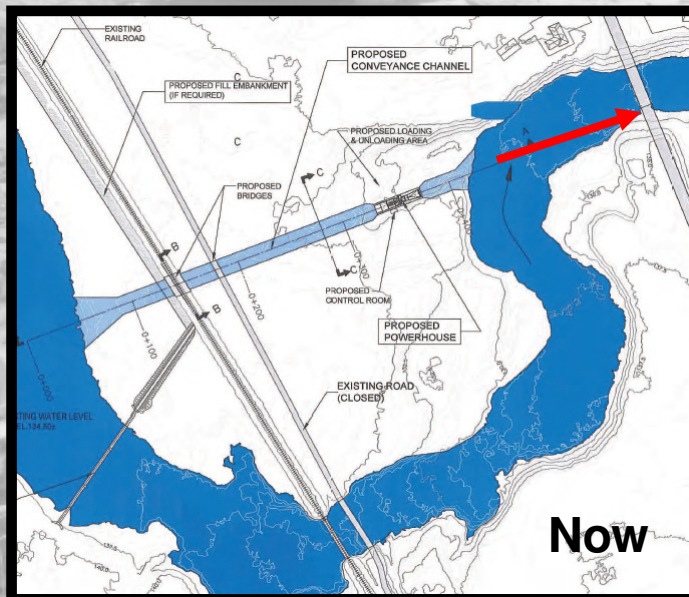
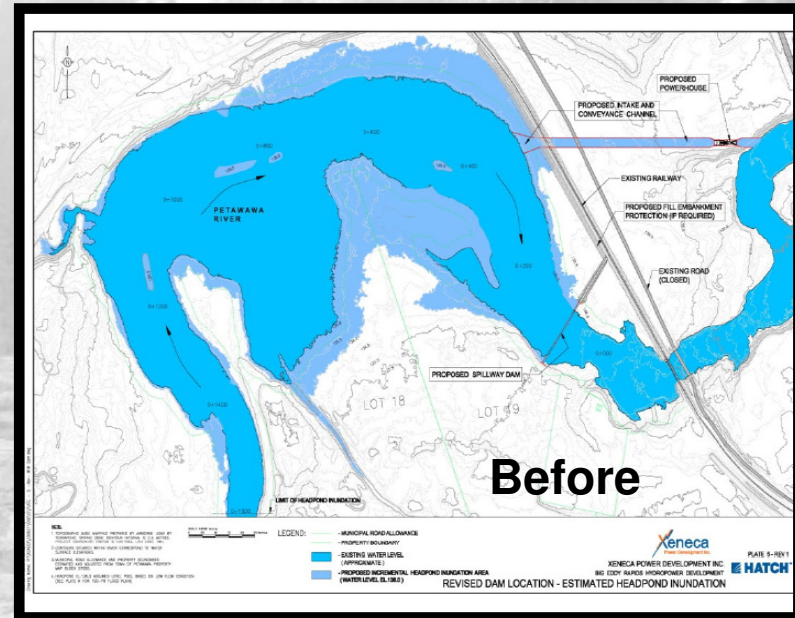
March 15 - Deep River

- The good news: We're making a difference
  - Peaking strategy has been abandoned
  - Tailrace has been re-aligned
- The bad news:
  - No engineered bypass solution for fish
  - Xeneca is a 12 person operation
- It's now a "weir" – not a "dam"
  - Not sure whether this is good or bad news, weirs are "drowning machines"



# Re-aligned Tailrace

- The diagram below shows the alignment presented to the PEO in Deep River
- It still may not be enough to avoid erosion





View from the Powerhouse



# Peaking Abandoned

- No indication of a “level control structure”
- Daily flow variation eliminated
- This does not eliminate the safety issue
- If the turbine control system fails, flow in the area of the Catwalk can vary go from 20 m<sup>3</sup>/sec or less to 69 m<sup>3</sup>/sec “in a matter of minutes”
  - This is more rapidly than we had assumed



# Fish Passage

- No engineered provisions will be made for fish passage
  - If the fish can't make it up the river and over the weir during the spring freshet, they're out of luck



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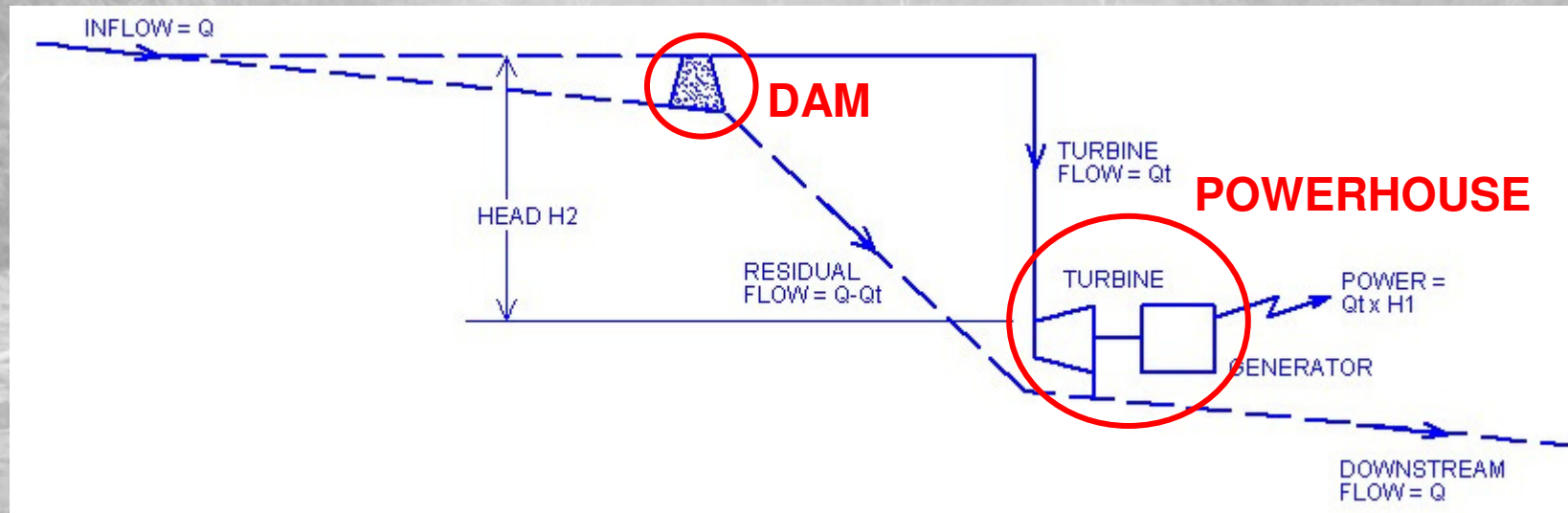


# Operating Flows and Levels Report

- We have obtained a copy of the draft of Xeneca's proposal sent to regulators for review
- Xeneca was not amused
- At last we have numbers on the minimum flows they are proposing for the bypassed section of the river
- While it is clear that the numbers in this report are an opening position, they are much lower than our most pessimistic earlier predictions
- Again, it seems that all reference to varying flows to take advantage of peak rate incentives have been removed
  - Of course, the only supply problem the province has is during the summer peak period



# Run-of-the-River Recap



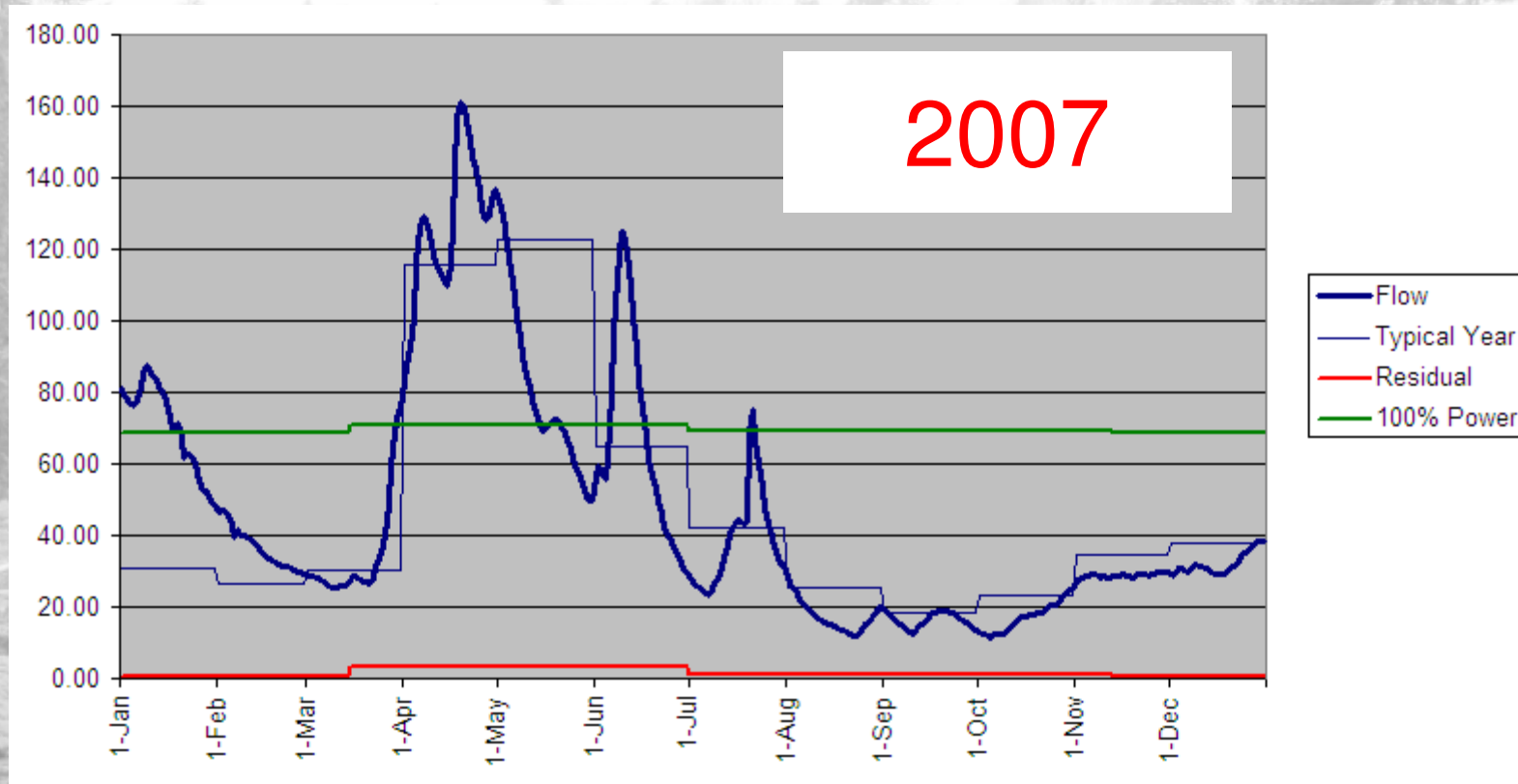
- In normal operation, most of the flow goes through the turbine
- During freshet, there is more flow available than the turbine can use, so the excess spills over the weir



# Flow Report Numbers

- Turbine flow for 100% power  $Q_{TMAX} = 68 \text{ m}^3/\text{sec}$
- Minimum flow for turbine operation  $Q_{TMIN} = 20.4 \text{ m}^3/\text{sec}$
- Residual flows:
  - Freshet (Mar 15 – Jun 30):  $3 \text{ m}^3/\text{sec}$
  - Summer (Jul 1 – Nov 12):  $1 \text{ m}^3/\text{sec}$
  - Winter (Nov 13 – Mar 14):  $0.5 \text{ m}^3/\text{sec}$
- $1 \text{ m}^3/\text{sec}$  is 1/7 of the lowest flow in 2010
  - 1/5 of the lowest flow recorded in the last 100 years
- Misema will look good by comparison



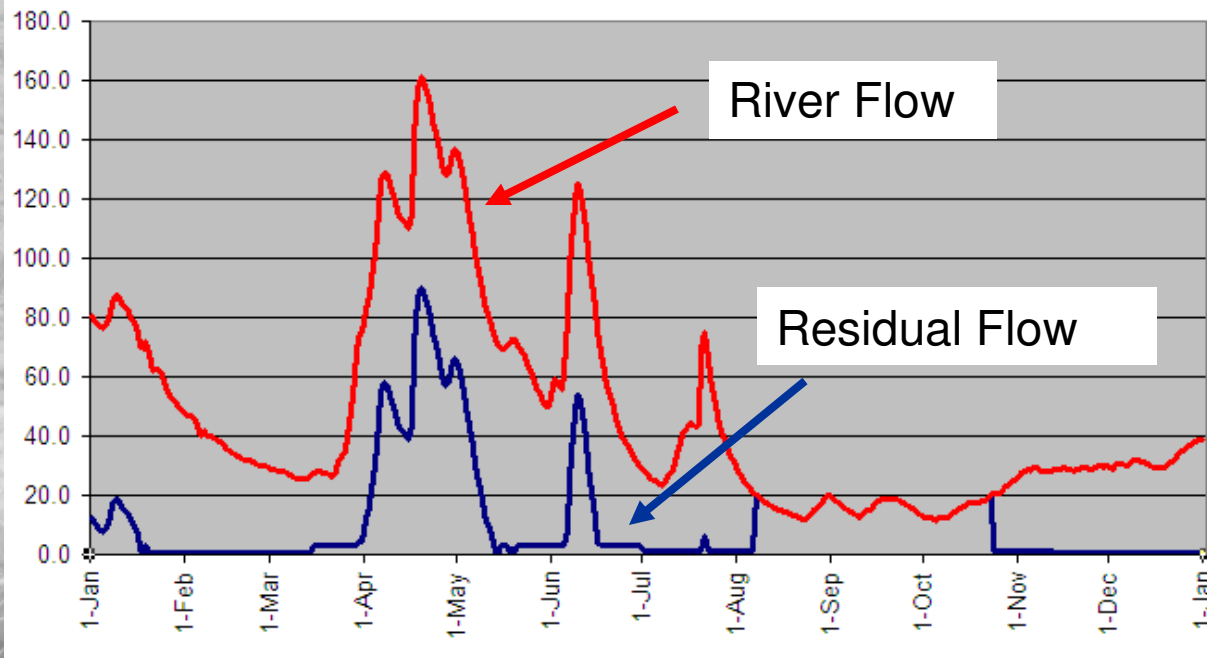
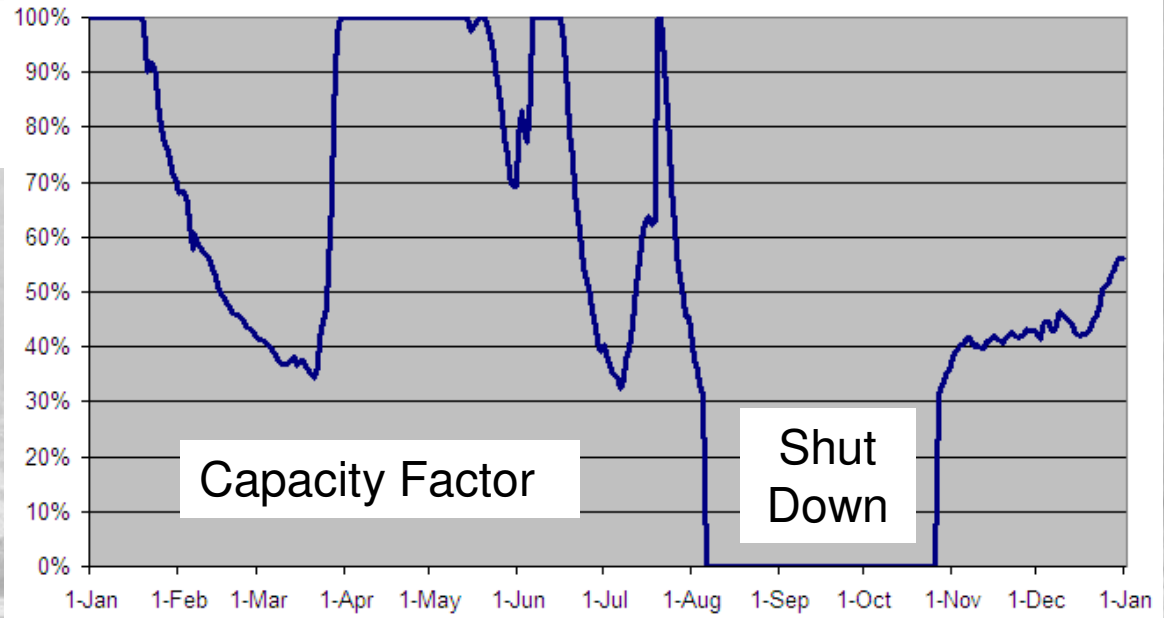


- 2007 was a fairly typical year
  - 2010 was very dry, so we don't want to be accused of using these numbers to distort the story
- They can't use flow above green line
- Shut down below 20.4 (most of summer)



# 2007 Values

- Average Capacity:
  - 52% or 2.7 MW



# Proposal for Kayakers

1. Total Rafting Hours: A total number of hours is agreed to between the facility and recreational users during which the facility is curtailed to allow recreational flows to pass through Railroad Rapids. **[NTD: The proposed number of hours is 100].**
2. Scheduled Hours: Scheduled hours would be set annually in advance based on a protocol agreed to with stakeholders (eg. every Saturday from 9 am to 3 pm in April, May and June when natural flows exceed 100 m<sup>3</sup>/s). During these hours, operation is curtailed to provide high flows in Railroad Rapids.
3. Special Events: Special events would be scheduled as requested by stakeholders and within the total rafting hours.

- That would be one day in 2010
  - Typically, 6 days a year
- The bypass will typically be runnable when flows are very high, even with the turbine running
  - But see “Public Safety”



# Upstream Flooding

- Here's what the report says about inundation during the spring freshet:

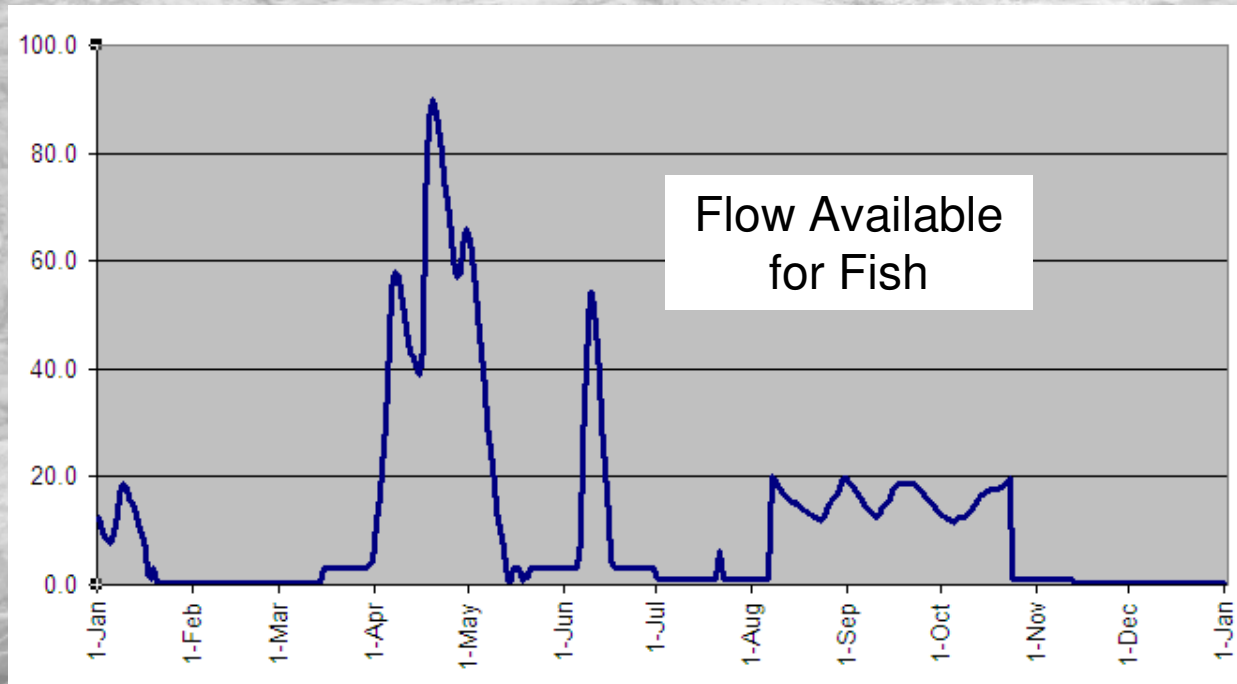
Flood Management: Under flood conditions, the operating objective is to minimize the backwater effect upstream that is created by the weir. To minimize the backwater effect of the weir, the final design is expected to incorporate a section of the weir that can be lowered during floods. This will reduce the hydraulic barrier effect of the weir and mitigate the upstream backwater effects. The operating objective is to minimize backwater effects upstream for flows exceeding 100 m<sup>3</sup>/s. This condition is expected to occur only during spring freshet.

- We have no information about this “section of the weir that can be lowered”
  - It is probably not automatic, like the earlier “Obermeyer Gates”
  - How will it affect kayakers?
- No indication that the effects of ice, debris have been considered



# Proposal for Fish Passage

- Sturgeon not strong swimmers, and don't jump obstacles
- They probably won't even get to the weir, except in August – October, and then they won't jump it
- Bottom line: The project represents an insurmountable barrier for sturgeon except during very brief periods



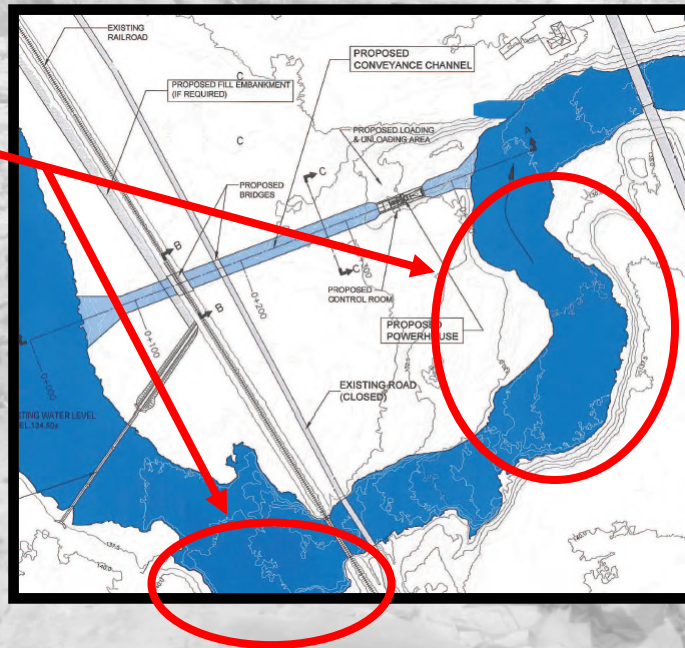


# Fish Spawning Area

- A fish spawning area has been identified in the bypassed reach:

Fish spawning: Fish spawning appears to occur at the base of Railway Rapids in the area where the tailrace outflow from the powerhouse re-joins the river. Special attention will be given in the detailed design to ensure flow characteristics in the spawning area are maintained.

- Most likely areas are here
- What can mitigate 1 m<sup>3</sup>/sec?



# Public Safety

- No daily flow variation, so no daily issue
- Here's what the Report says:

1. One scenario would involve a system malfunction that would cause the plant to rapidly increase production from minimum turbine flow to maximum turbine flow. The results of an unsteady flow hydraulic model (HEC-RAS) were reviewed to provide perspective. It was determined that if such an event were to occur, the flow downstream of the facility would triple over a short period of time (i.e. within minutes) from minimum turbine flow to maximum turbine flow. The range of these flows (17 m<sup>3</sup>/s to 56 m<sup>3</sup>/s) was compared to the maximum range of flows that naturally occur in the river, ranging from 4 m<sup>3</sup>/s to 470 m<sup>3</sup>/s. The range of flows is in the middle of the range of flows experienced in the river. The increase in water depth is small. It is deemed to have limited effect on rafting or kayaking. A concern could exist where swimming occurs downstream.

- Don't have flow pictures yet, but that's a 3.5:1 variation, and 56/68 CMS is about 3 times the normal summer flow
  - The concern seems to be valid



# Public Safety

- Proposed mitigating measures:

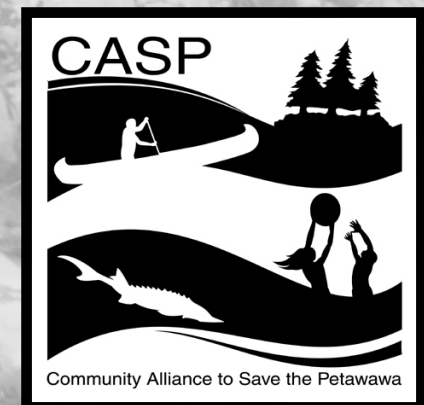
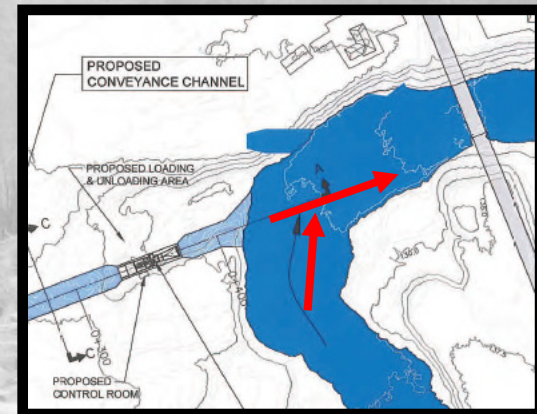
Although the possibility of a facility malfunction was deemed to be highly unlikely, a safety study was commissioned to examine ways to lower the risk of occurrence and to identify mitigation steps to protect the public. Adding redundancy to the safety systems is one possible way to reduce the risk of the above scenarios and is being evaluated. Creating public awareness about the possibility of rapid changes in river flow, be they natural or due to facility error, is also being considered. At the time of writing the safety study was still under way. The final version of this document will include information about this aspect for stakeholder consideration.

- Have no information on these safety systems
  - As usual, our request for information has been ignored
  - Enhancing public awareness using signs, sirens and flashing lights does not seem appropriate in a high-use area
  - Here come the fences!



# Other Public Safety Concerns

- Hazard to kayakers in the area where the tailrace and the bypassed reach flows merge
- The reach will be runnable when river flow > about 150 m<sup>3</sup>/sec, even when the turbine is running at full power
  - Two flows merge, one at 68 m<sup>3</sup>/sec, the other 150-68, or 82 m<sup>3</sup>/sec
- Entrapment against the turbine inlet screens
  - No doubt some safety barriers will be provided to mitigate this



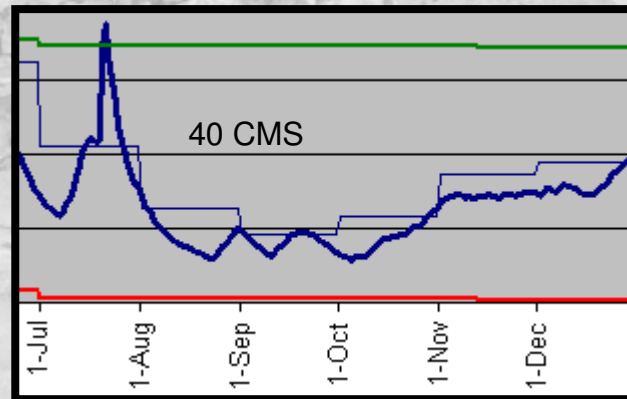
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# Xeneca PIC, May 5

- It's a dam! It's a weir! It's a "Naturalised Passage"!
- Example from Calgary is not a power generation facility
  - Nothing like 2 metres of head
  - Flow shown was 40 m<sup>3</sup>/sec
  - In summer, there isn't that amount of water in the river



# The Weir

- This Calgary weir is currently being modified because it is too dangerous
  - The industry does not refer to these things as “drowning machines” for nothing
- Very little said about kayakers, but they are expected to be able to run the weir
  - No doubt they can - during the freshet
- Fish expected to swim up this passage
  - They can only do so very briefly, unless residual flow is substantially increased



# New Staff Evident

- Several new people noted
  - A biologist
  - A contracting company from Calgary working on the weir design for kayakers/fish
- They evidently had not been well-schooled in what to say, because their words conflicted with Xeneca's established positions (e.g. on residual flow, financial benefits, etc.)
  - Frequently answered "I don't know"
- Window dressing for the PIC?





# Residual Flow

- Everything depends on the residual flow
- If they get away with the 1 m<sup>3</sup>/sec given in the Flows and Levels report, you'll be able to walk across that “naturalized passage” and get nothing more than you feet wet
- We realise that the 1 m<sup>3</sup>/sec is just a negotiating position
- Xeneca's new biologist said that much more would be required for the project to get approved
- How much? 5 m<sup>3</sup>/sec? 25 m<sup>3</sup>/sec?
  - Nobody would even speculate
- Obviously there's a number somewhere at which the project becomes uneconomic
  - At 20 m<sup>3</sup>/sec, capacity drops to 29%



# Residual Flow

- The minimum environmentally acceptable flow will be determined by the needs and abilities of fish to get by the structure . . . if the fish are lucky
- A rough economic analysis shows they need no more than 14 m<sup>3</sup>/sec for the project to break even
  - Perhaps 9 m<sup>3</sup>/sec for the project to be economic
- According to Xeneca's naturalist, this is too low
- Without a firm residual flow number, no design can proceed. No meaningful discussion is possible
- Demand this number by May 31



# Two Turbines?

- Some representatives speculated about this possibility
- It would allow them to operate down to 10 m<sup>3</sup>/sec
  - Break even at 19.5 m<sup>3</sup>/sec minimum residual flow if no increase in capital cost
- Would reduce the safety issue
  - Failure of both turbines simultaneously is unlikely, though they ARE both running the same software
  - Flow variation on failure would be 10 to 34 m<sup>3</sup>/sec
  - Same ratio, but reduced flow less dangerous
- Permits maintenance of one unit while the other is running
- Cost effective?



# Contemptuous Proponent

- While we acknowledge that 1 m<sup>3</sup>/sec is a negotiating position, to even suggest such a number is evidence of contempt on the part of Xeneca:
  - Contempt for the public, because we were not supposed to know about it
  - Contempt for the regulators, because the implication is that they might be stupid enough to approve such a ludicrous number
  - Contempt for the environment, because if the number was approved, there is no doubt that Xeneca would use it



# Xeneca's Performance to Date

- Xeneca claims to be engaged in “open and meaningful consultation”, yet
- Many documents requested
  - Not one released voluntarily
- 200 + questions asked
  - 15 answered
  - 1 answer rated “satisfactory”
- They continue to ignore questions, or at best provide vague answers



# Xeneca's Take on the PIC

- On May 5, 2011 approximately 140 people attended a Public Information meeting to learn about and comment on our Proposed Big Eddy at Railroad Rapids Waterpower on the Petawawa River. Thank you for being part of that very successful exchange of information and ideas!
- Community interest in the Big Eddy project has been greater than all of Xeneca's 18 other projects combined. The outstanding community response has helped make significant changes to the project's design and operation plans as well as enhancing our approach to public safety. In fact, comments from the community have led Xeneca to bring on board a fully qualified, independent, third party engineering firm to assess and help develop a safety program for the projects.
- Your participation in our May 5 meeting will add to the wealth of information we have about the project site and the potential impacts and benefits the project may bring to your community. To complement the environmental studies completed on the project site, we are also developing a knowledge base of the people who use and enjoy the river - including when and how often they are actively pursuing their interests.
- Through this exchange of information we hope to avoid or mitigate any impacts on recreational activities and, where possible, take steps to maintain or even improve the features that are important to the people of Petawawa.



# Hot off the Press (last night)

- Opinion poll being conducted by Angus Reid
- Undisclosed backer
- Lots of questions, like  
“Do you believe that millions of dollars will flow into the community?”
- I wonder who’s behind this?
  - Political party?
  - Xeneca?
- Like any opinion pole, the questions asked will determine the result



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# Come Hell or High Water – May 7

- Very well attended kayaking event
  - 450 registrants
  - Many spectators
  - Collected almost 500 signatures for petition



# CEAA Letter

- In a letter to Xeneca following the Jan 18 Environmental Assessment Coordination meeting, the CEAA ( the federal EA body) wrote (amongst other things):

Please note that federal review times will depend on the quality of the reports, the complexity of project-specific issues, the level of associated public and Aboriginal concern, competing priorities of expert reviewers, and the number of reports submitted concurrently.

- In other words, “you’re in too big a hurry”
- Despite this, we have been told that Xeneca has let a contract to H&H for road construction
- It appears that the PUBLIC consultation component of the Class EA is not the only thing that Xeneca is treating with contempt



# Dollar Benefits to Community

- Three sources:
  - Construction contracts
  - Gross Revenue Charge
  - Commercial property taxes
- Xeneca is now extending project life to 75 years
  - This assumes the FIT contract will be renewed after 40 years under the same favourable terms
  - Making any assumptions about energy costs 40 years from now is totally speculative



# Construction Contracts

- Total construction cost is \$20 million
- This includes engineering, environmental assessment, capital equipment (turbine, generator, etc.)
- Most likely, the only contracts that will be let locally are those for ground clearing, concrete, aggregate, etc.
- \$0.5 million in wages?



# Gross Revenue Charges

- These charges are well documented
- Based on electricity produced
  - Xeneca gets \$0.131 per KW hour
  - GRC = nothing for first ten years
  - After that, Provincial government gets 12% of this
    - ~ \$370,000 per year
  - Local government can go cap-in-hand and beg for a piece of this
  - Rules on how much have not yet been established



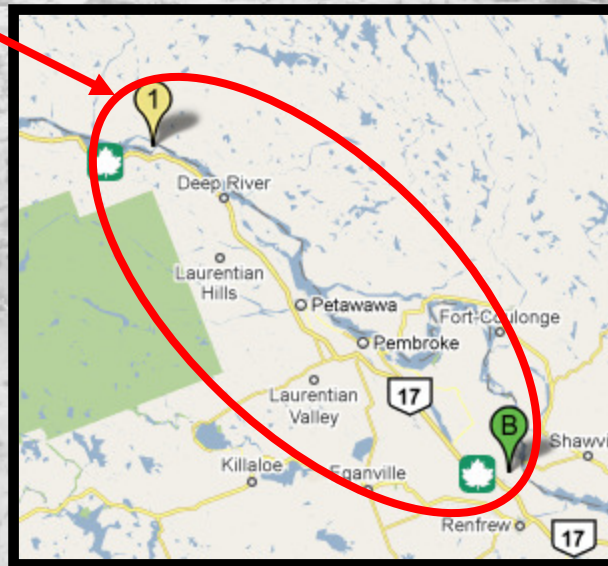
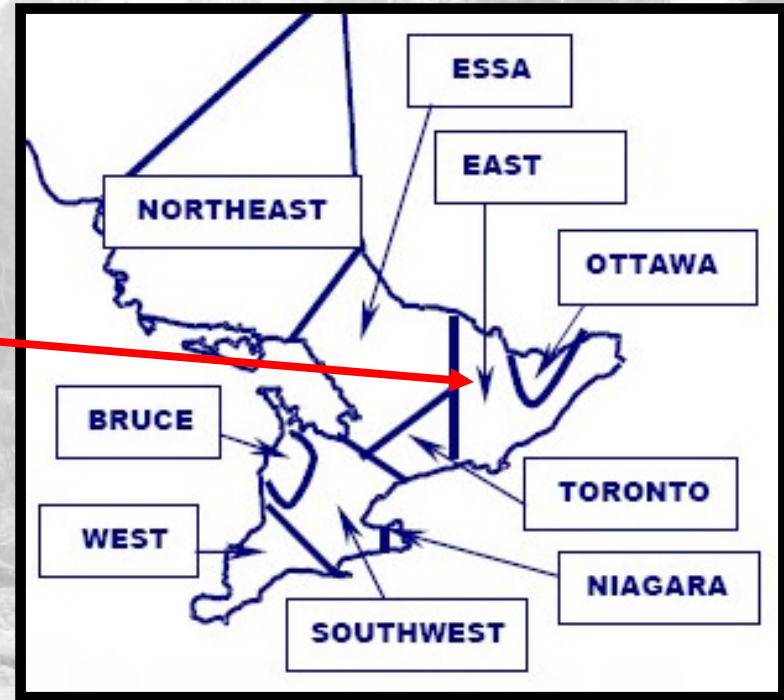
# Commercial Property Taxes

- This is the big unknown
  - If the project were assessed as a commercial operation with a value of \$20 million, proceeds would be significant: 2.9% per annum, or \$580K
  - This decision is with the Ontario Ministry of Finance
  - Petawawa Council doesn't know
  - Xeneca doesn't know
  - People who should know think this number will be zero



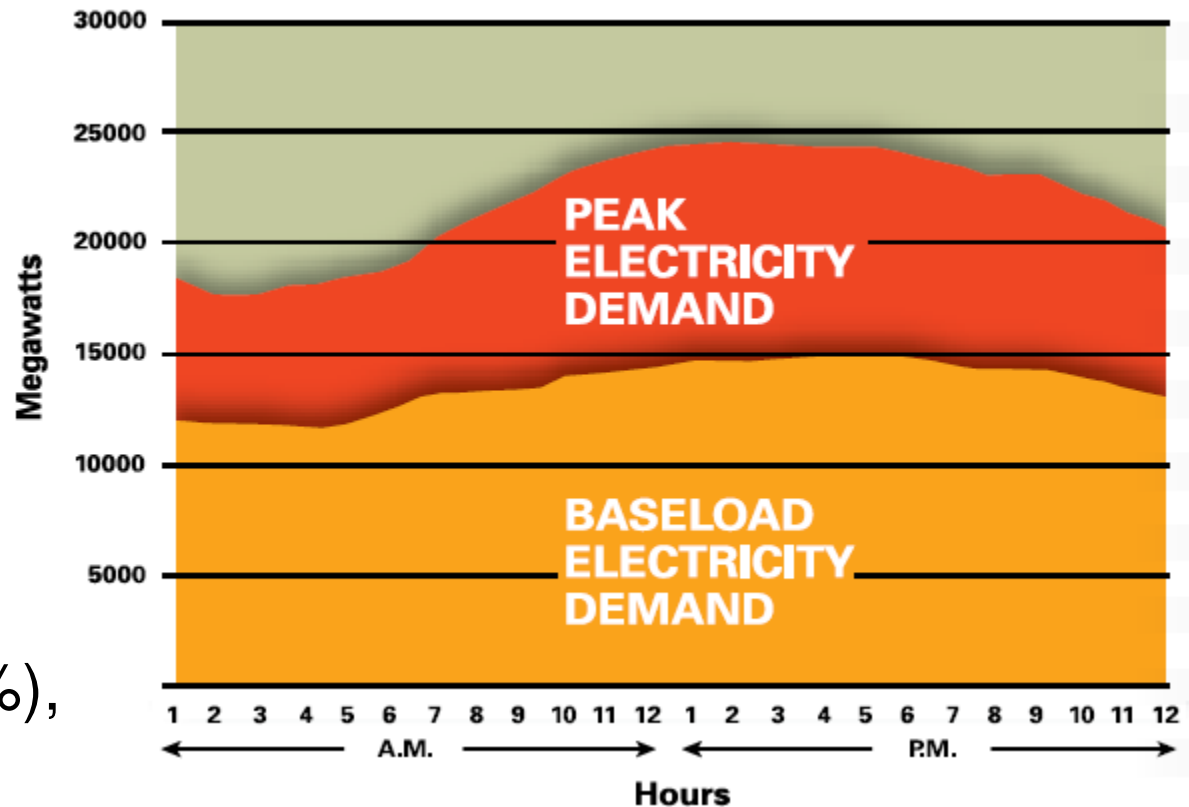
# Need for the Power

- Petawawa is located in the east zone
- Average consumption of this entire zone is 1005 MW
- The Swisha and Chenaux generating stations (Capacity 573 MW) are located within 50 km of Petawawa
- This area does not need another 2.5MW (12% of Petawawa's)



# Need for Power

- Diagram shows a hot summer day
- Baseload met by nuclear (55%), large Hydro
- Peak met by coal, natural gas, small hydro
- You can't even see how much full power (5MW) at Big Eddy would represent (0.2%)
- And Big Eddy would be shut down on hot summer days





# Need for Power

- Local power typically interruptions due to line failures
  - e.g. recent wind storms
- Big Eddy won't help this situation one bit
- Right now, they are spilling water at Chenauax which could produce power virtually free, because they are forced to buy the output of the FIT projects at rates up to \$0.84 per kw hour
  - But, can you blame Xeneca for trying to grab a piece of the action
  - It may not last long!



# A Drop in the Bucket!



# Town's Position

- Council has named the firm who will provide their environmental consultant
  - Met the gentleman at the PIC
  - Seems knowledgeable and sympathetic
  - Bob Sweet was asked to address this meeting
  - He did not respond to this request, despite a telephone follow-up
- He was also asked to provide the terms of reference for the town's environmental consultant, given that our taxes pay his fee
  - No response on that either



# Provincial Conservative Position

- Hudak has said that the FIT program will be discontinued
- Existing contracts will be honoured
- This leaves projects on which construction has not started in a grey area
  - Perhaps those for which strong local opposition is evident might be reconsidered
  - It would be easy to deny them approval on an Environmental Assessment technicality
  - Push Hudak/Yakabuski for clarification
- John will take our petition to the legislature



# Federal Government Position

- Cheryl has said that she would use the federal EA to open, transparent Environmental Assessment if they got a majority
- Well, you got it - Over to you, Cheryl



# First Nations Position

- We have heard that the Algonquin First Nation will oppose the project
  - They apparently have the power to stop it
- We are not aware that they have made this position clear to Xeneca yet



# The Cost of Freedom

- Requested all documents on the Big Eddy file from MNR under the “Freedom of Information” Act
- They want \$940, plus \$10 for the CD!
- Since the project is in its fairly early stages as far as document production is concerned, the eventual bill could run to ten times this figure.
- Must come up with a better way
- Get them to order Xeneca to put us on the distribution list?



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# Ensuring a Responsible EA

- During the Class EA process, the proponent is supposed to negotiate compromises with stakeholders to allow the project to go ahead
- The rules are: You can't say "no" – rather "How about this alternative approach?"
- We need to be seen to be playing the game
  - For each concern, suggest an alternative
- Since Xeneca refuses to become involved in a dialogue, it seems inevitable that there will still be open issues when they publish their Notice of Completion
  - Then your only recourse is to raise a Part II Order request



# Concern: No Fish Passage for SAR

- This is probably our strongest issue
- A study of the literature indicates that nobody can say in advance with any confidence that any structure in the river will not stop the passage of SAR
- If a dam/weir or whatever is built, it cannot be removed
- So any such unproven design is simply taking a gamble on the future of the SAR
- The only acceptable alternative is a separate fishway which can be demonstrated to be effective before the dam/weir is built



# Fishway Implementation

1. Study to establish SAR traffic before project
  2. Design fishway (parallel to inlet channel?)
    - Rest pools every 50 metres
    - Carefully controlled flow
  3. Build fishway, temporarily restrict the river
  4. Another study to confirm SAR traffic unimpeded
  5. If all OK, approve the project
  6. Otherwise, make changes and go back to (4)
- Given low SAR populations, long lifetime of sturgeon, each study might last 3 years
  - Conclusion: The science of fishways is not yet mature. Wait until it is
    - Like offshore windmills



# Concern: Spawning Ground Impacted

- Alternative: Establish hatchery specific to affected species (sturgeon)
  - It is possible, but not easy, to breed sturgeon in captivity and raise them to maturity
  - Again, need to demonstrate the technology before project approval
  - That would require the ability to breed sturgeon in captivity to be demonstrated
  - And it takes a sturgeon 20+ years to reach sexual maturity



# Lake Sturgeon Recovery Strategy

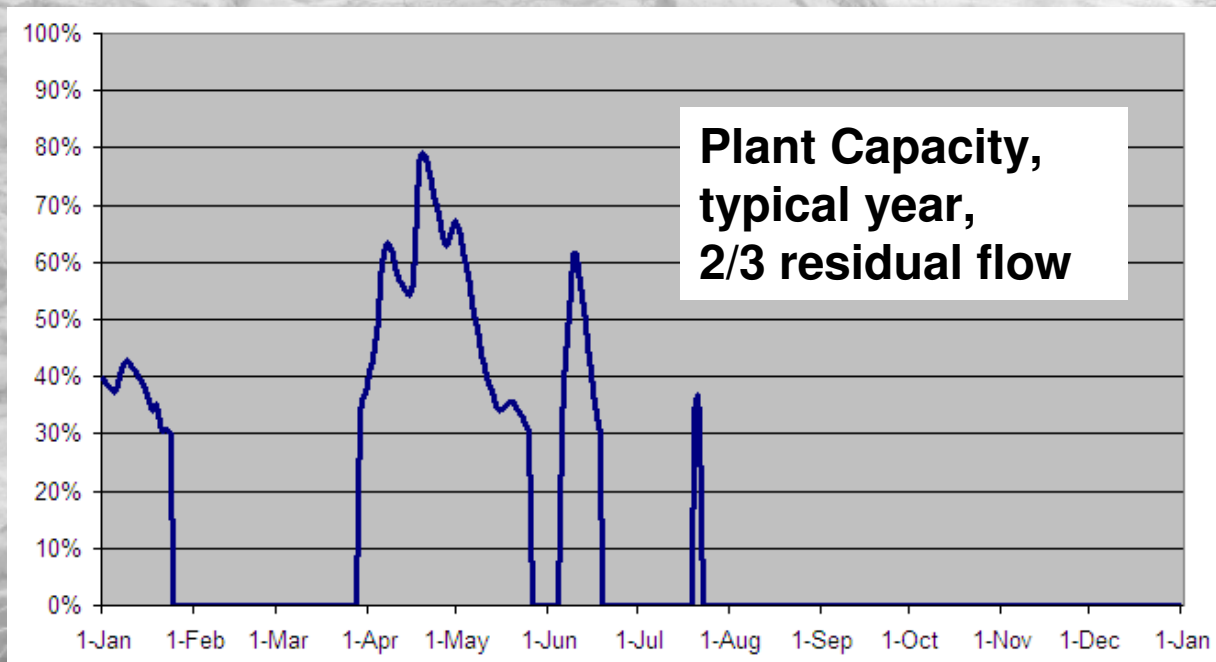
- MNR have such a document in preparation
  - May take two years to complete
- A similar document already exists for American eel
  - Key components of the strategy are to implement dam bypass ladders and reduce mortality due to turbines
- Similar recommendations can be expected for sturgeon
- Does it make sense to build more dams on any river where SAR are known to exist until these measures have been proven to be effective?



# Concern: Aesthetics

- Alternative: Increase residual flow to comply with LRIA guidelines
- Current guidelines:
  - Capacity = 12.8% - that should kill it!

Generally two-thirds of the stream-flow at any time should be maintained downstream, unless conditions warrant otherwise.



# Concern: Public Safety

- Alternative: Do analysis to confirm whether there is a drowning issue
- If so - Fences around headpond, downstream



# Concern: Recreational Use

- Alternative: Increase access time to be similar to status quo, e.g.:
  - 7 days a week
  - Dawn until dusk
  - River flow if it is between 50 and 120 m<sup>3</sup>/sec





# Concern: South Bank Erosion

- Alternative: Flow direction structure in river to align flow with present channel
- Simulation studies to show impact is minimal



# Upcoming PIC, May 31 16:00

- Topics: Environment, Archeology, Operations, Conceptual Design and more
- Format will be posters on the walls of the meeting room in the Quality Inn, like the last one
- One-On-One discussions with Xeneca staff
  - Xeneca personnel short on specifics
  - It seems unlikely that this will change in 4 weeks
- Nobody but Xeneca will record questions
- The format is not useful in enhancing public understanding of the project
  - Protest it to Xeneca



# Questions, Questions

- Xeneca is required to answer all stakeholder questions
- Make questions specific. “I am concerned about the impact of the proposed dam” won’t cut it
- Submit them in writing, either at the meeting or after
- Don’t worry about duplicates. That’s Xeneca’s problem
  - Record responses
  - Forward to [petawawa-river@hotmail.com](mailto:petawawa-river@hotmail.com) attention Jean Ostrom
  - You most probably won’t get an answer from Xeneca
- Provided we have good records, that’s ammunition for a contempt of process case



# Part II Order Requests

- These represent the only mechanism within the Class EA to counter the current irresponsible, contemptuous approach
- These are requests to the Minister of the Environment to switch the project to an individual EA led by the regulators
- The track record is poor:
  - Over the past 10 years, 50 projects have been subject to these requests
  - Not one has been granted
  - But at least one project has been approved with such demanding conditions that it was never constructed
- You have to demonstrate that an impasse was reached
- You have to show that you tried to reach a compromise
- You have to show there's a legitimate environmental concern
- You have to identify your concerns "early in the EA process"



# Letter to Parliament

- Theme is: “The Petawawa River is special. Please protect it, don’t destroy it”
  - Only significant free flowing tributary on Ontario side
  - Migratory route for SAR fish to a huge area of Algonquin Park will be hit hard
  - Unique urban location
  - Will destroy a world class kayaking venue
  - Downstream recreational area heavily used by military and their families
  - Developer treating the established process with contempt

Note: McGuinty’s first degree was in biology



# Accompanying Petition

## Will you sign this?

“I object to this development because

1. The project will have a severe impact on fish migration to Algonquin Park, including some species at risk;
2. The project will destroy one of the premier urban kayaking locations in North America;
3. The project represents a public safety hazard to users of the park area a few hundred metres downstream of the powerhouse;
4. The project will have a major aesthetic impact on a stretch of the river right in the middle of the town of Petawawa;
5. The Petawawa River is the one remaining free-flowing tributary of the Ottawa River in Ontario; and
6. The proponent of this project is not fulfilling his obligation under the Class Environmental Assessment process to ensure open and transparent public communication, and to ensure that public concerns are reflected in the design of the project”.



# Petition Locations

- At this meeting
- At the following locations in Petawawa:
  - Ultramar
  - Gear Heads
  - Runge's Stationery
  - Petawawa Animal Hospital
  - Bell Store
  - Diannes' Barbershop
  - Canadian Legion
  - Remax
- Will collect and send with the letter to the Premier around May 20





*the*

**RAPE**

*of the*

**PETA WAWA**