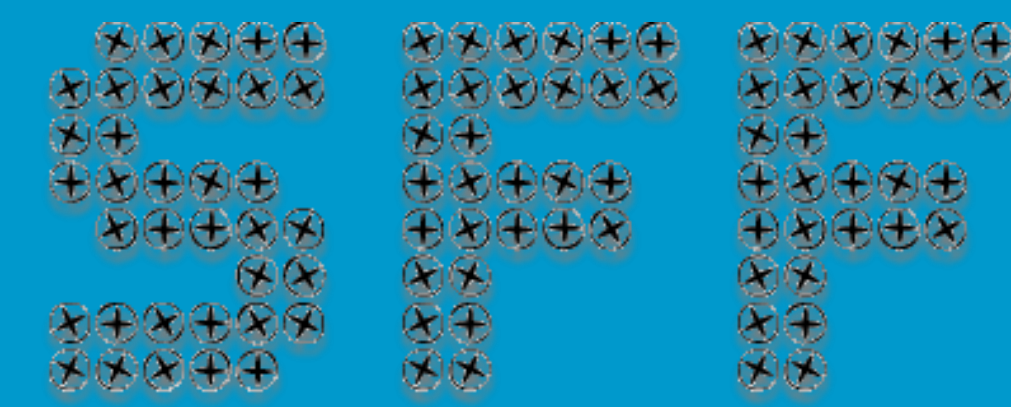


WPI

“Screw” Fossil Fuels

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The Problem

What: The Iron Gate Dam

Where: Northern California

Why: The dam is damaging the environment and creating health issues for locals, but it is a great source of clean energy and beneficial for the local economy.

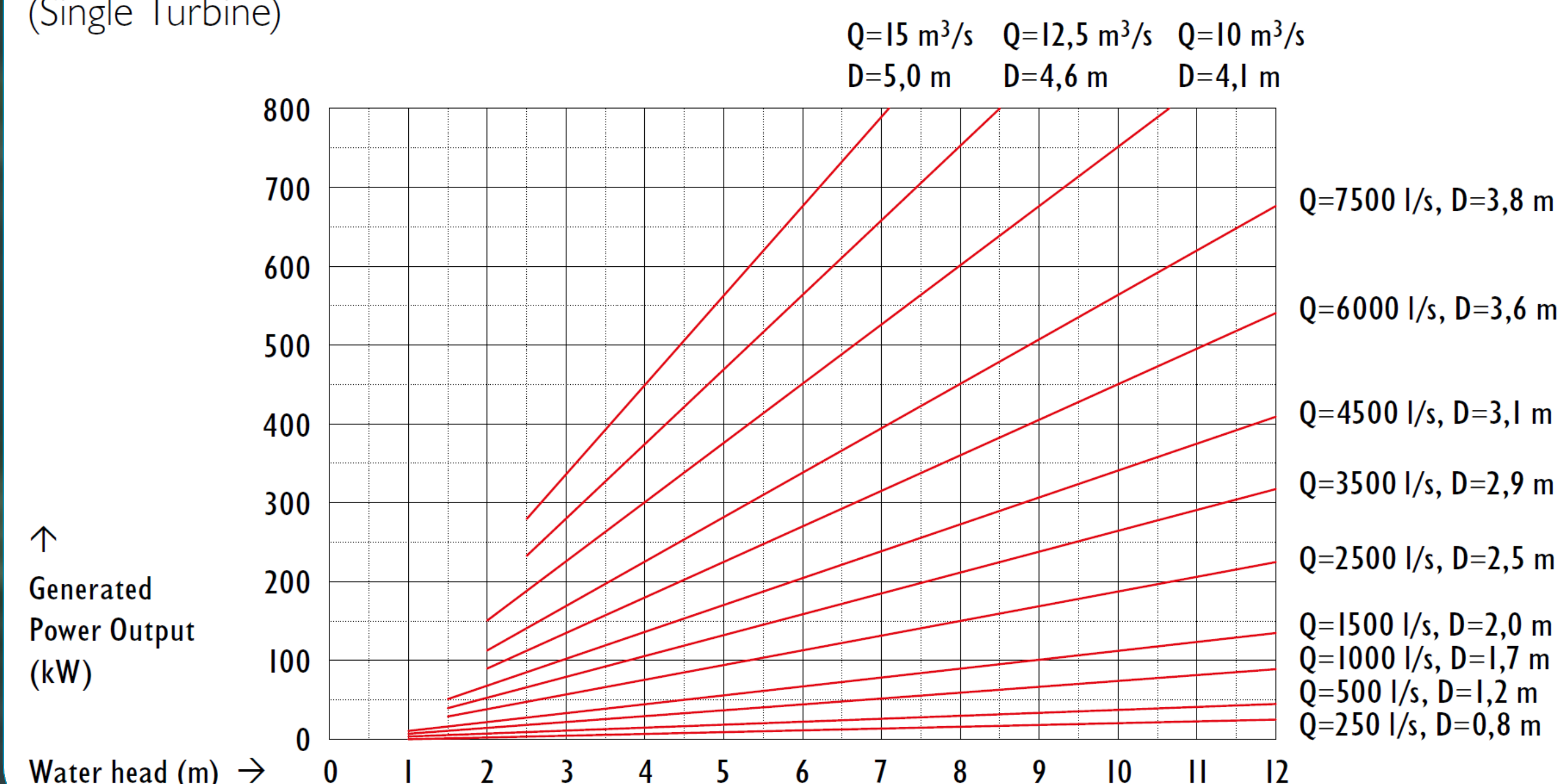
Why an Archimedes Screw?

- Fish can pass through
- No sediment build up
- Little maintenance
- No stagnant water
- Lasts 40 – 60 years
- Relatively cheap



Indicative sizes, flow, head and output

(Single Turbine)



Should the Iron Gate Dam be Removed?

Pros

- Water for irrigators
- Cheap, clean energy
- Increase property value
- Keeps water allocations the same
- Power rate caps
- Tax revenue



Cons

- Thousands of fish will continue to die
- Toxic algae blooms will remain
- Continued health issues
- Continued maintenance costs will increase
- Sediment build up



Who is involved?



Companies

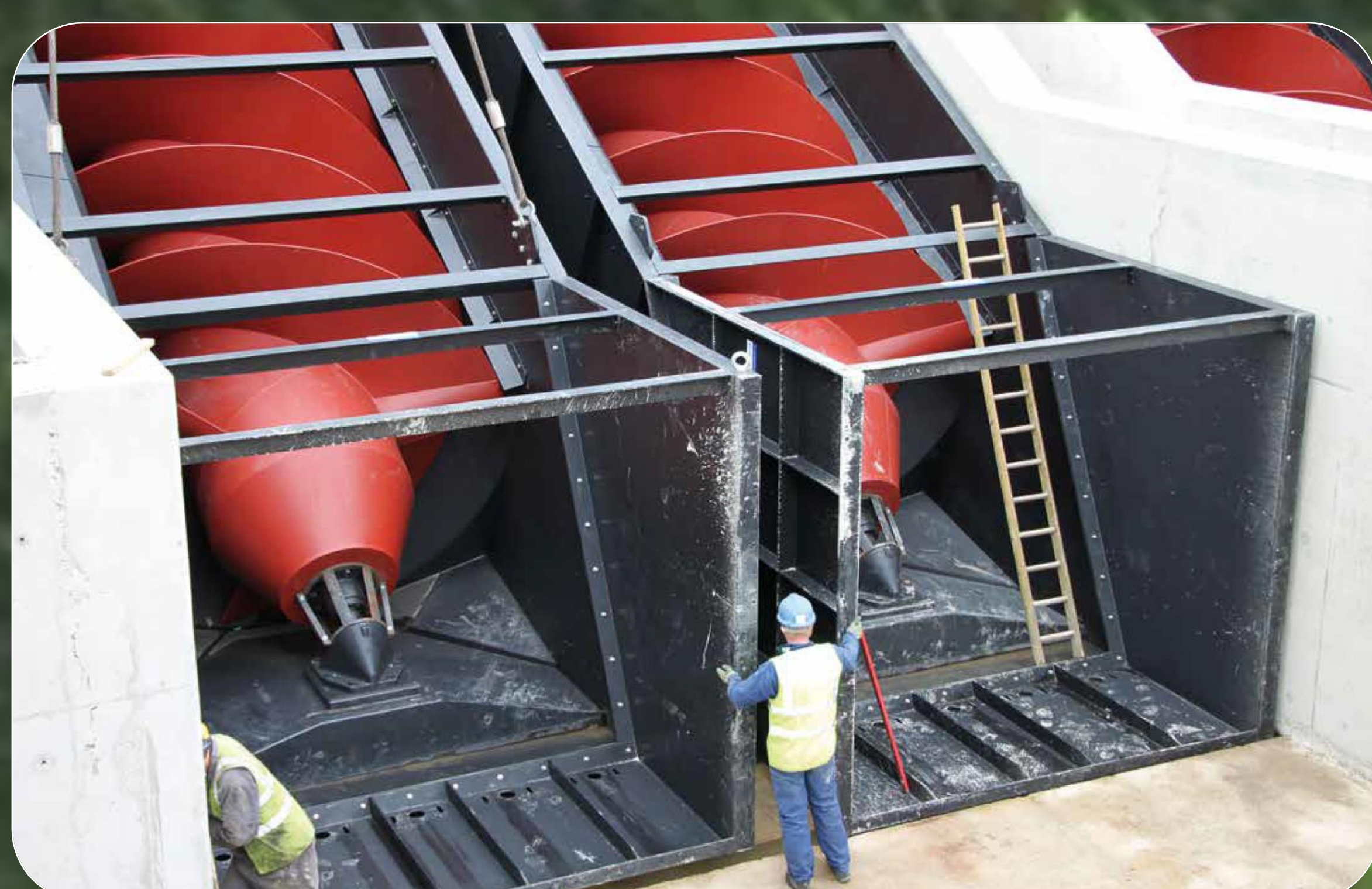
- Fisheries
- PacifiCorp

Environment

- Fish
- Algae
- Sediment

People

- Native Americans
- Farmers
- Homeowners



Watts Generated

$$= [\text{flow}] \times [\text{head}] \times [9.81 \text{ m/s}^2] \times [\text{efficiency}]$$

- Flow = 46.9 m³/s (divided by 3 screws)
- Head = 5 – 7 meters
- Efficiency = 70%+

We could produce somewhere between 0.55 and 0.75 MW per screw.

In total, a set of 3 screws in parallel could produce somewhere between 1.65 and 2.25 MW of power. We would need somewhere between 8 and 11 sets of screws to create 18 MW of power. This would cost somewhere between 19 and 27 million dollars.



We would like to thank Spaans Babcock Inc for providing us with some of the pictures and the technical information featured on this poster. We would also like to thank Kate Olguin for creating our beautiful background.

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