

Western Power Company Ltd.

Ngonye Falls Hydroelectric Project
October 2014



Western Power Company

Western Power Company (WPC) is a Zambian Independent Power Producer which is working for the development of Zambia through electricity generation which is sustainable, clean, efficient and cost effective.

Currently focussed on developing the *Ngonye Falls Hydroelectric Scheme* in the Western province of Zambia, WPC has a strategy to build and operate a portfolio of modern renewable energy plants in Zambia and across the Southern African Region.

Western Power is headquartered in Lusaka and managed by a team of skilled Zambian and international professionals with expertise in engineering, infrastructure development, finance and construction.

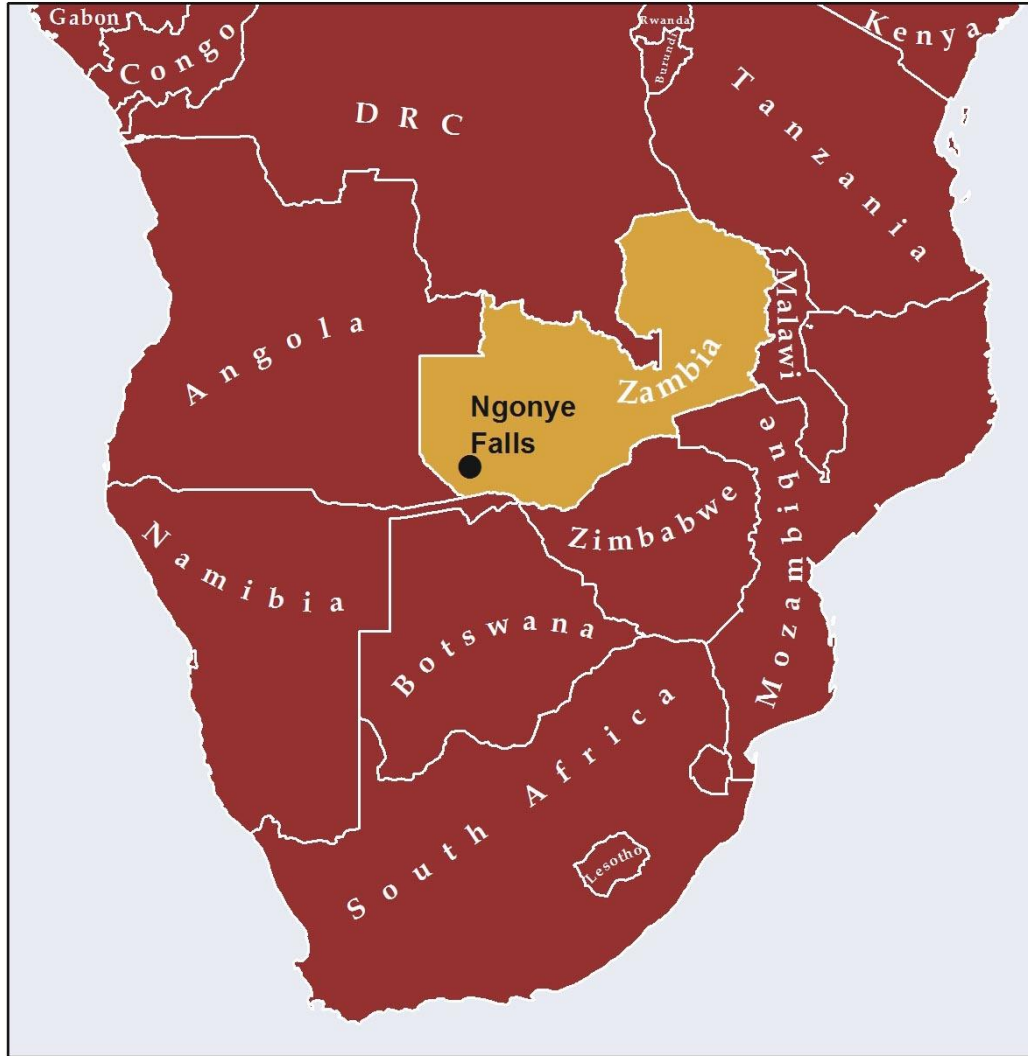
Ngonye Falls Hydroelectric Scheme

The Ngonye Falls on the Zambezi River in western Zambia present an opportunity which is unique for the Western Province for rapidly delivering cost effective and minimal environmental impact hydro-power generation.

The site, which has excellent existing road access, is located close to growing load centres as well as interconnectors to the power grids of Namibia, Botswana and Zimbabwe.

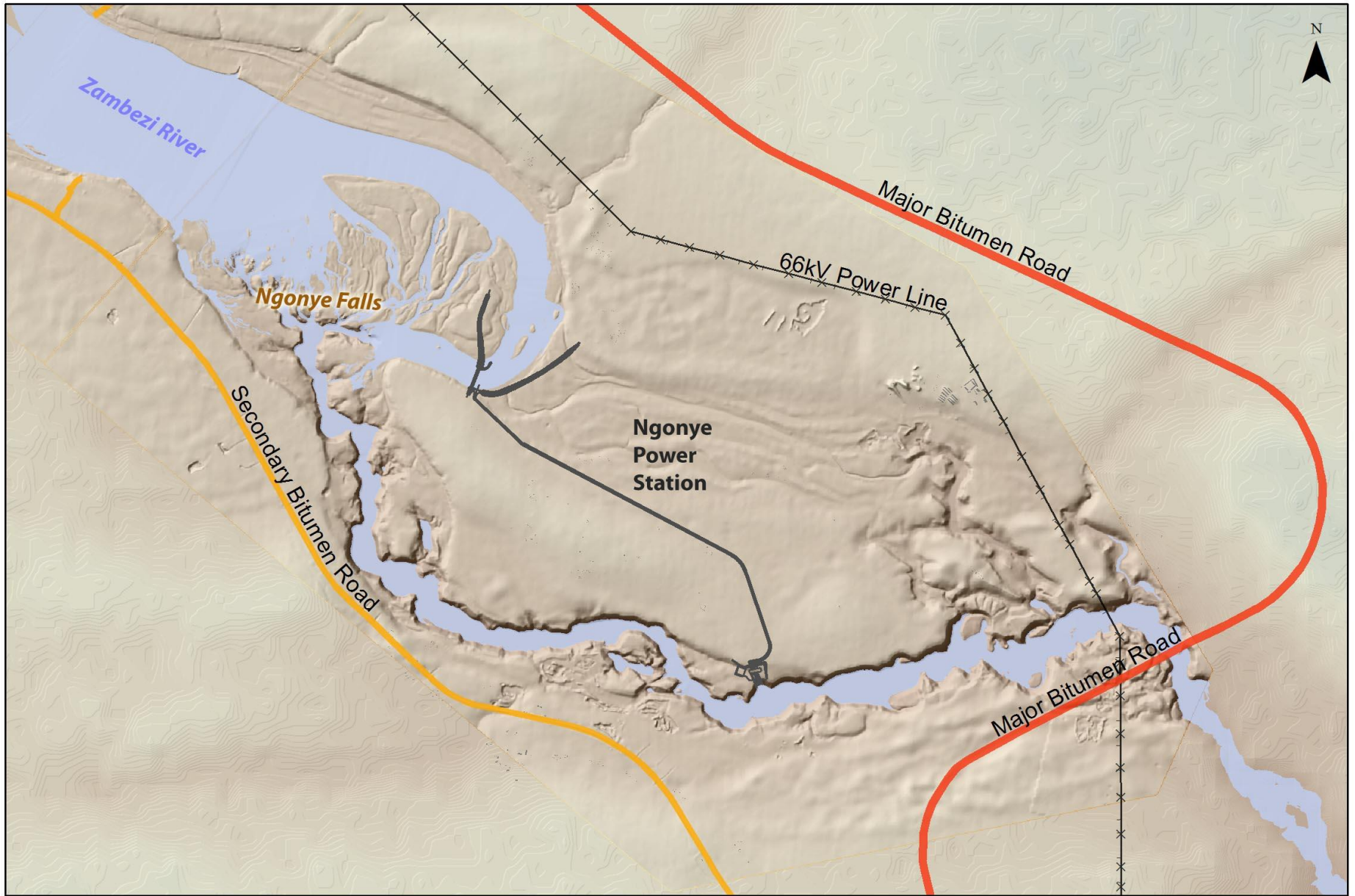
WPC has been undertaking feasibility and design for the Ngonye Falls site since 2009 under an exclusive license from the Zambian Ministry of Mines, Energy and Water Development. The company is now finalising the technical, economic, social and environmental studies required to bring the project to financial close and start of construction during 2016.

Ngonye Falls - Location



Ngonye Falls - Location





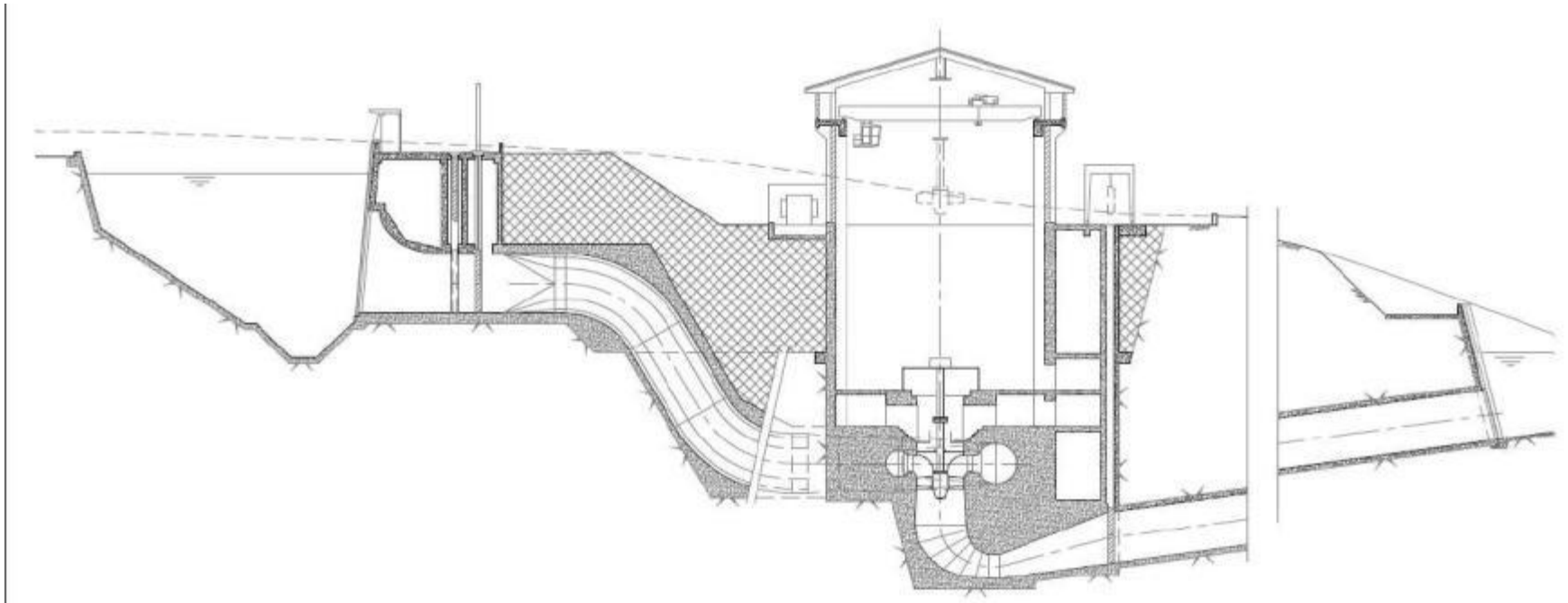


Ngonye – Technical Summary

- 50-80MW installed capacity for 350 - 435GWhr per year of energy
- Barrage across the main east bank river channel with radial gates for sediment scouring, intake control and flood passing
- Embankments for flood control
- Trapezoidal canal 3km in length from intakes to powerhouse
- Pit type powerhouse 50m from the river bank
- Two or three double regulated Kaplan turbine generating units of around 25MW output each
- Surface mounted switchyard and transformers to convert generated power to transmission voltages
- Capital cost estimate for construction: US\$180m

Ngonye - Power House

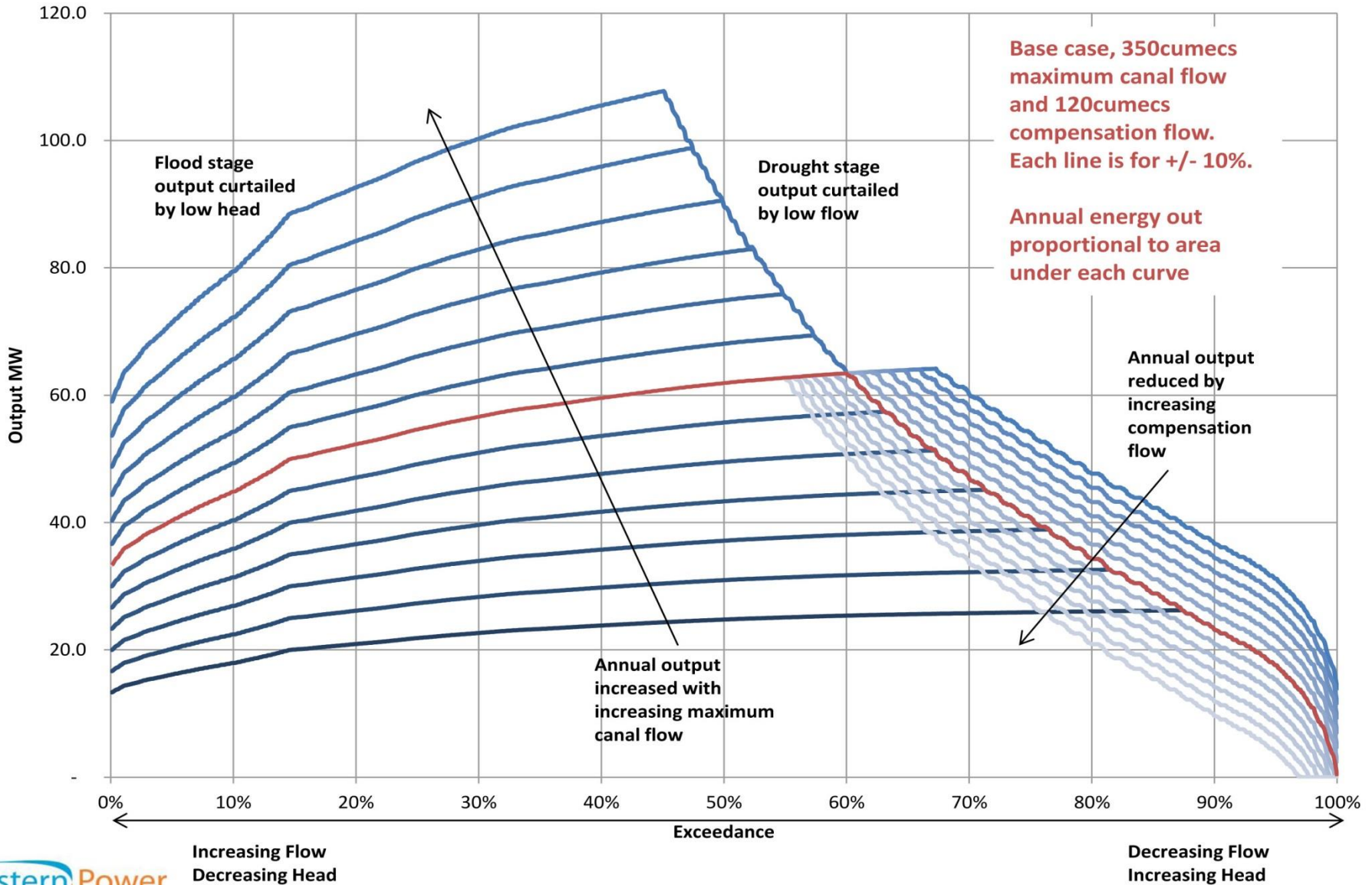
The power house will be mostly buried below the original ground level to reduce the visual impact of this infrastructure.



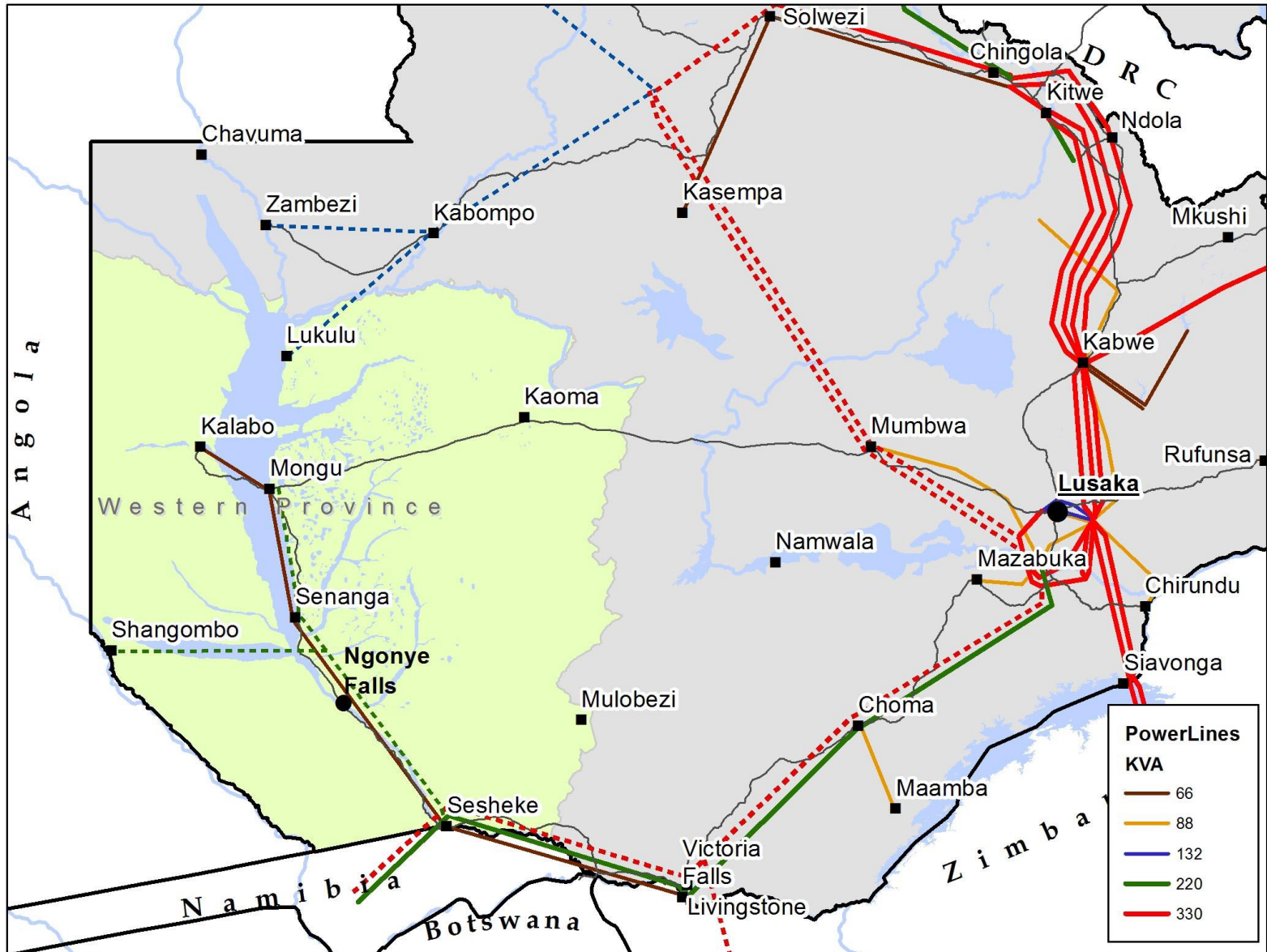
Ngonye - Hydrology

- High flow, lower head during flood stage – peak during March: 12m of head and >4000cumecs of total river flow.
- Low flow, higher head during low stage – lowest in December: 23m of head and 213cumecs of total river flow.
- Need to safeguard the aesthetics of the Ngonye falls and the aquatic environment – minimum environmental base flow through reduced generation and flow intake control.
- Need to maximise economic power generation: From head during low flow periods and from flow during low head periods.

Capacity and Energy



Ngonye – Grid Location



Ngonye – Power Evacuation

- Power Evacuation study completed in 2013 in conjunction with ZESCO Transmission
- Transmission line alignment survey completed in 2014 including social, environmental and technical assessment
- Optimum configuration determined as 110km of new 220kV transmission line from Ngonye to Sesheke substation to utilise an existing spare 220kV substation bay at Sesheke
- New alignment inland of the Zambezi river to bypass settlements and agricultural land
- Approximately US\$ 40m construction cost
- Further studies required include dynamic and transient analysis and contingency analysis

Ngonye Falls – National Benefits

- Early contribution to the national power generation gap
- Generate power equivalent to 7 times the current total consumption of Western Province
- Strengthen and stabilise the Zambian power network and reduce power flows and losses from Southern Zambia to Western Zambia and neighbouring countries
- Ideally placed to export power to the SAPP region
- Demonstration of private sector capability to work with government to deliver new power infrastructure in Zambia
- A foundation stone for economic growth in Western Province

Ngonye – Community

Local communities will see tangible and sustainable benefits from this major infrastructure development.

WPC has committed to long term community improvement through equity participation and a Community Development Fund. The Community Development Fund will be maintained from a percentage of gross energy revenue and administered by a trust with broad local membership and conforming to international governance requirements.

The Development Fund will identify projects which are community led, accountable and matched to the needs of the communities they support.

WPC is working with the Rural Electrification Authority (REA) and the national utility (ZESCO) to facilitate the delivery of electrification to the Sioma District where the project is situated.

Ngonye – Work to Date

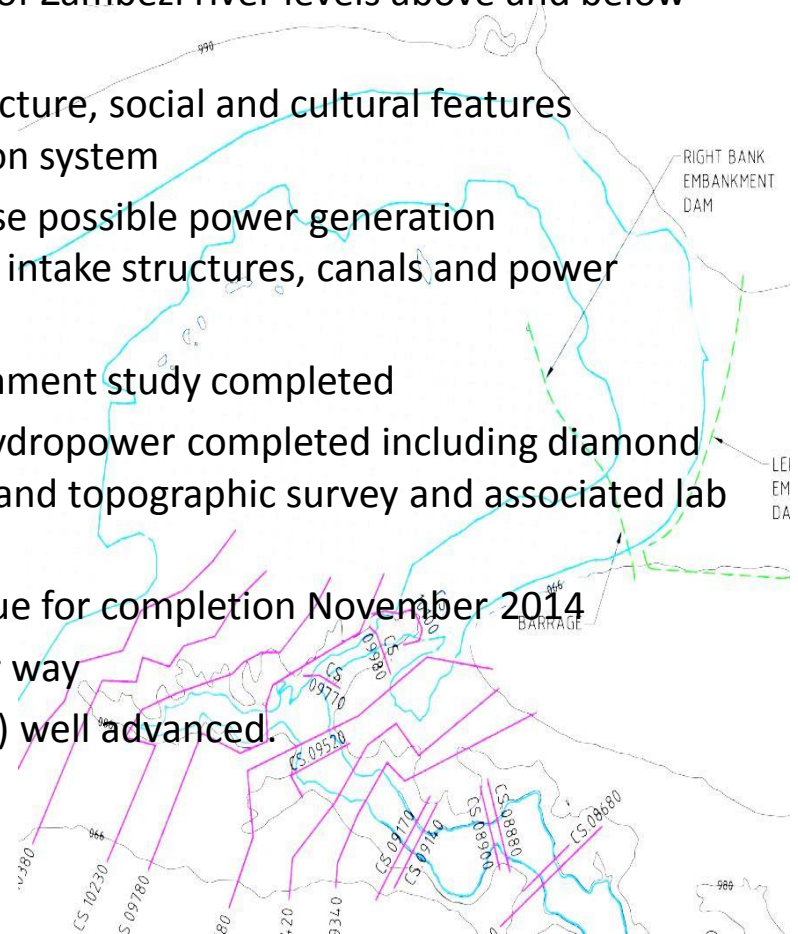
CORPORATE, PERMITTING and COMMUNITY

- ✓ Securing of an exclusive right to undertake feasibility studies for Ngonye from Ministry of Mines, Energy and Water Development through the Office for Promoting Private Power Initiatives (OPPPI).
- ✓ MoU negotiated and completed with the Barotse Royal Establishment, traditional representatives of the community of the Western Province securing long-term cooperation for development of the project.
- ✓ MoU completed with Zesco, Zambia's national power utility covering corporate and technical interactions between WPC and Zesco.
- ✓ Expression of interest from Zesco for power take-off and equity participation.
- ✓ Implementation Agreement drafting in process and pending negotiations with Zambian Government.
- ✓ Discussions with possible power purchasers including Zesco, Nampower (Namibia) and Escom (South Africa).

Ngonye – Work to Date

TECHNICAL

- ✓ Scoping Study to understand the scale and general feasibility of the scheme complete by URS.
- ✓ River gauges installed to take daily measurements of Zambezi river levels above and below the falls.
- ✓ Base mapping of all topographic features, infrastructure, social and cultural features performed to build a project geographic information system
- ✓ Layout Options Study undertaken by URS to analyse possible power generation infrastructure options including first pass design of intake structures, canals and power house.
- ✓ Power evacuation study and transmission line alignment study completed
- ✓ Detailed site investigations specified by Norplan Hydropower completed including diamond core drilling, seismic survey, test pits, bathymetric and topographic survey and associated lab testing
- ✓ Interim Technical and Economic Feasibility study due for completion November 2014
- ✓ Hydrodynamic modelling of the river system under way
- ✓ Full Technical and Economic Feasibility Study (TEFS) well advanced.



Ngonye Falls – Work to Date

SOCIAL AND ENVIRONMENTAL

- ✓ Environmental and Social Impact Assessment (ESIA) commissioned from DH Engineering Consultants and in process.
- ✓ Scoping meetings held with local community to explain the ESIA process and to outline the project, its impacts and benefits.
- ✓ Terms of Reference (ToR) submitted to Zambia Environmental Management Agency (ZEMA) and approved for completion of the EISA.
- ✓ Social baseline studies completed to survey all members of the locally impacted community to determine social and cultural structures and livelihoods.
- ✓ Dry and wet season environmental baseline studies undertaken to comprehensively study the land, water and air environments and flora and fauna they support.

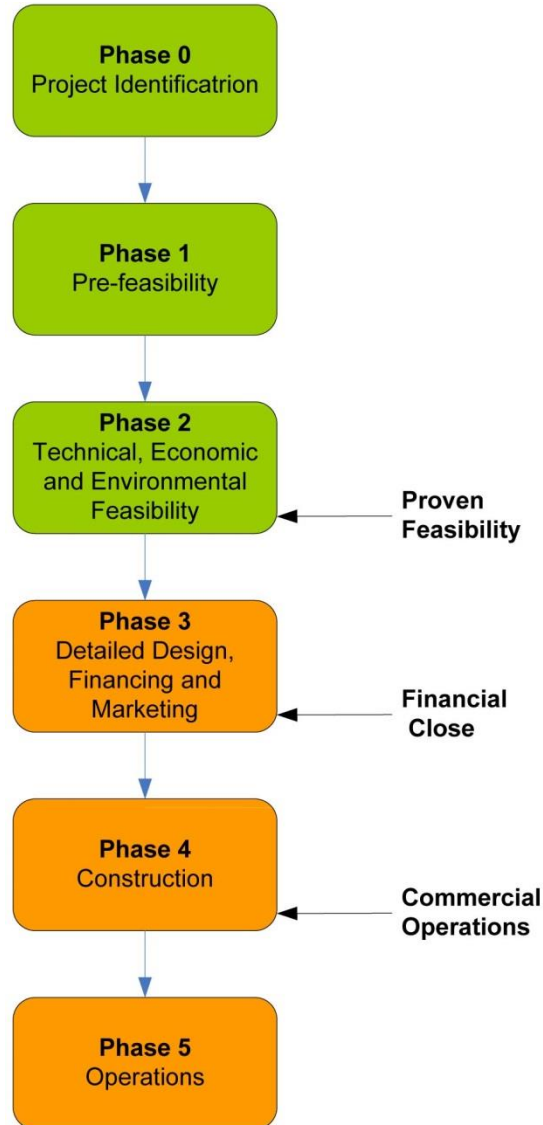


Ngonye – Work To Date

FINANCIAL and FUNDING

- ✓ Market analysis and financial modelling completed to determine the project economic viability, funding requirements and projected financial returns.
- ✓ Scoping stage funding provided by the Zambian project initiators
- ✓ Early project preparation funding secured from Development Bank of Southern Africa (DBSA) .
- ✓ Additional early stage debt and equity funding secured from private investors.
- ✓ DBSA committed to \$1million for pre financial close activities
- ✓ Negotiations ongoing with technical and financial partners for provision of construction equity, debt and O&M services

Ngonye Falls – The Way Forward



Ngonye Falls – The Way Forward

Technical and Environmental

- Completion of Environmental and Social Impact Assessment and additional work required for upgrading to meet IFC standards – Q1 2015
- Completion of Technical and Economic Feasibility Study – Q1 2015
- Completion of transmission line studies and design – Q1 2015

Agreements and Permitting

- Implementation Agreement with the Zambian Government - GRZ / OPPPI
- Water and land rights issuance with community collaboration as enshrined in the Community MoU.
- Power Purchase Agreement negotiation and completion with ZESCO
- Connection Agreement including financial and technical aspects of ZESCO participation in transmission line
- Endorsement Agreement and Generation License

Ngonye Falls – The Way Forward

Financial

- Completion of debt and equity funding negotiations for construction finance
- Financial Close expected Q4 2015

Design and Construction

- EPC selection and contracting
- Detailed design with EPC contractor
- O&M selection and contracting
- Construction 24-30 months from 2016

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Legal Advisors (Zambia): *Chibesakunda and Company*