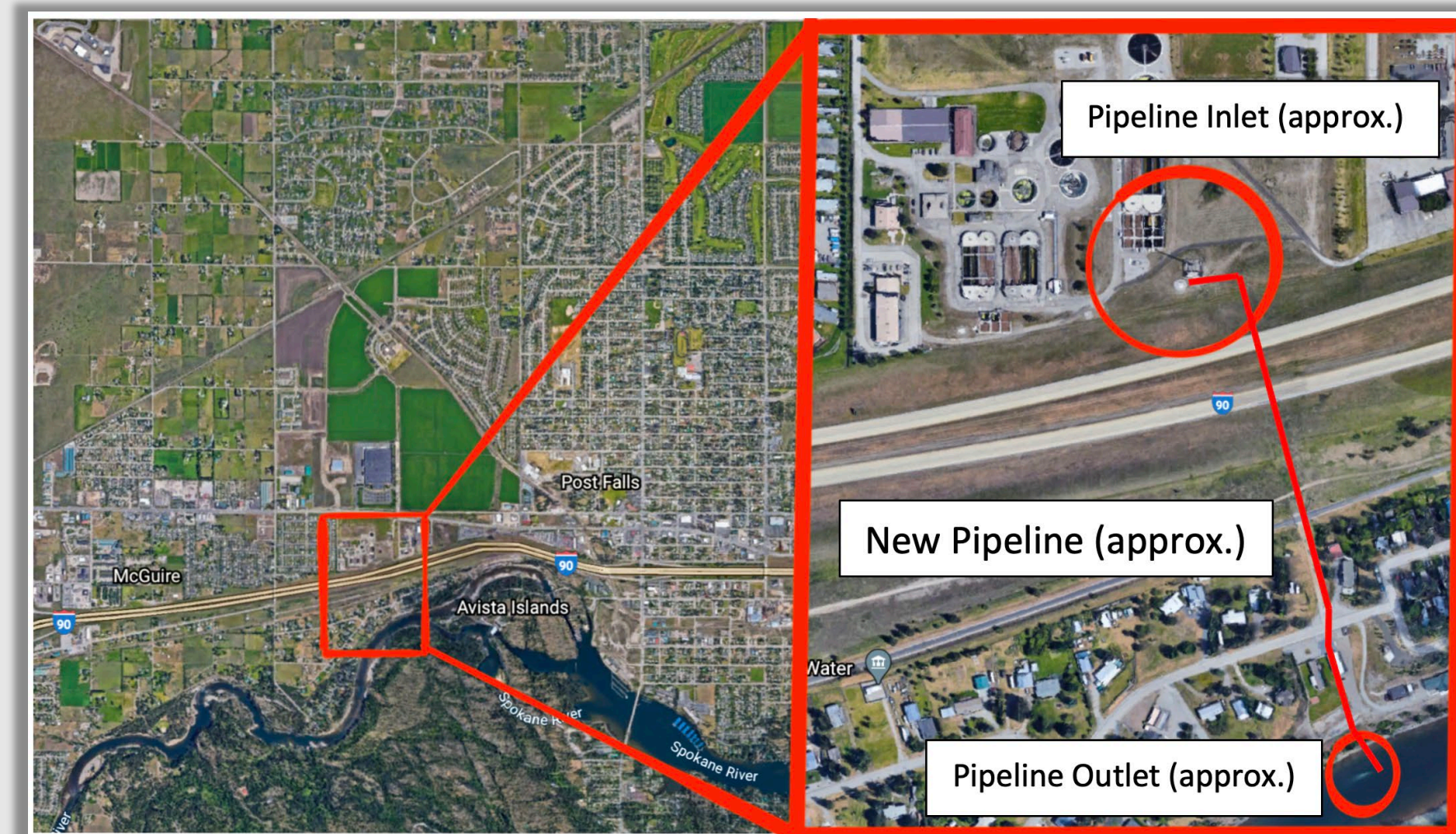
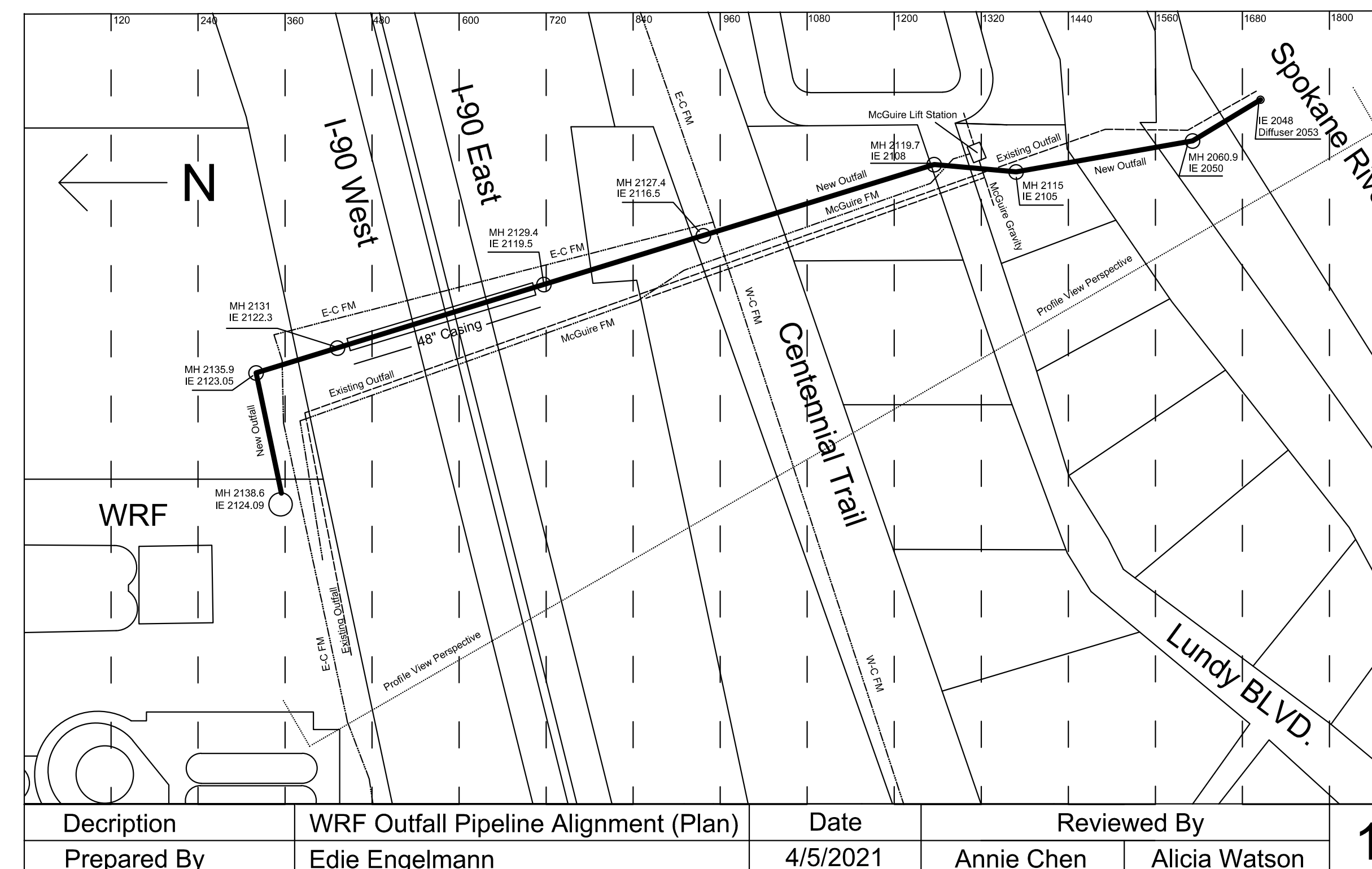


INTRODUCTION



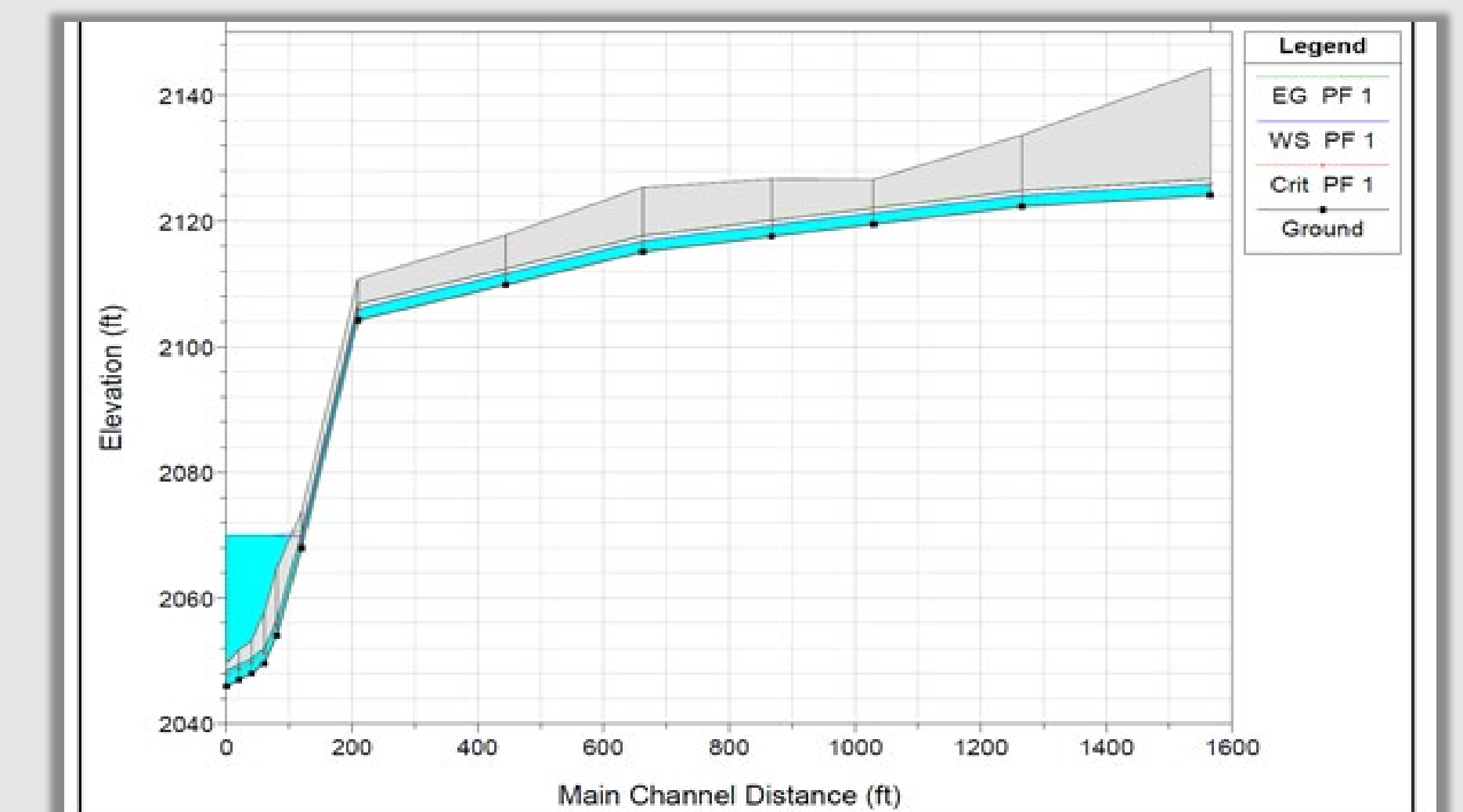
- Water reclamation facility (WRF) discharges to Spokane river via existing outfall pipeline
- Operating at capacity
- Varies in material and size

PLAN VIEW ALIGNMENT



The plan view alignment represents the top-down location of the new pipeline and the surrounding utilities

HYDRAULIC ANALYSIS



- Water surface profile for newly designed pipeline (HEC-RAS)
- Sized to convey at least 17.8 MGD at peak flow from WRF

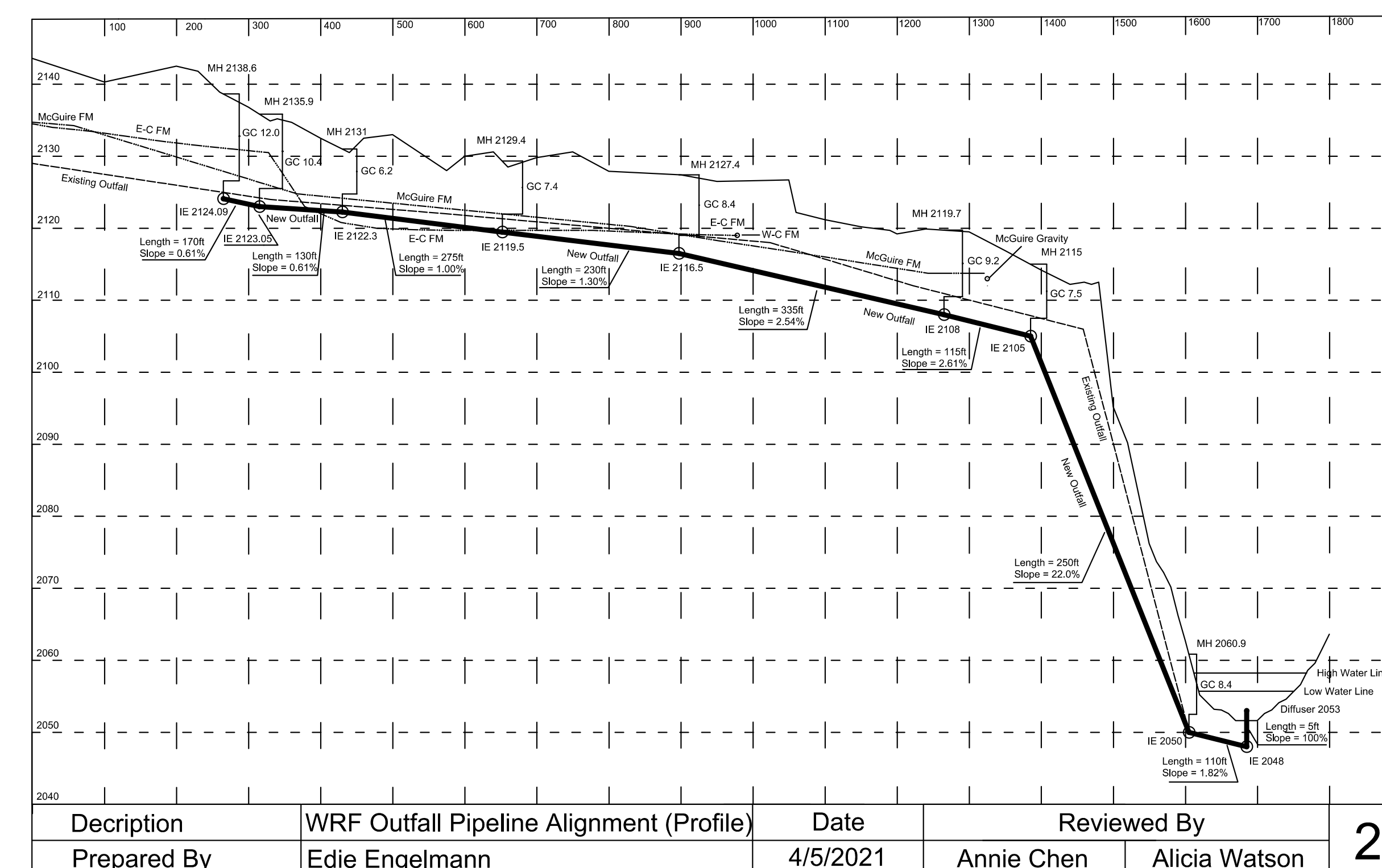
OBJECTIVES

- Design a single diameter pipeline from WRF to Spokane River
- Sized to convey current and future flows
- Existing utilities must stay operational during construction

CHARACTERISTICS

Material	Ductile Iron: ANSI/AWWA C 151/A 21.51
Size	30-inch diameter
Length	1620 linear feet

PROFILE VIEW ALIGNMENT



The profile view alignment represents the side view location of the new pipeline and the surrounding utilities

COST ANALYSIS

Pipe Material Cost			
Pipe Material	Unit Price	Quantity	Subtotal
30-inch Ductile Iron	\$91.14	1620	\$147,700.00
Equipment and Labor Cost			
Pipe Material	Unit Price	Quantity	Subtotal
30-inch Ductile Iron	\$25.20	1620	\$40,850.00
Backfill Cost	By section depth		181,000.00
Pipe Fittings Cost	20% of construction costs		\$74,000.00
Manhole Cost	Unit Price	Quantity	Subtotal
	\$2,015.00	7	\$14,100.00
Grand Total			\$458,100.00

ACKNOWLEDGEMENTS

Sponsor Contacts:
Chris Horgan, P.E.
Jon Baune, P.E.

Faculty Advisor:
Dr. Fritz Fiedler, P.E.