

**EROSION AND GEOLOGIC HAZARDS AT PROJECT FACILITIES  
AND TRANSMISSION LINE RIGHT-OF-WAY STUDY  
INTERIM REPORT**

**ATTACHMENT E**

**SUMMARY TABLE AND MAPBOOK**

Table E-1. Sites grouped into Special Concern Zones based on proximity of City Light facilities to mapped mass wasting features.

Special Interest Zones	Site ID	City Light Facilities	Nearest Mass Wasting Feature to Project Site and Facilities	Distance to Feature (Feet)	Inventory Feature ID	Mapbook Page	Most Recent Reported Slope Failure	Descriptions of Reported Slope Failures and/or Mass Wasting Features Mapped Near Project Site and Facilities
Ross Dam	MW-1	Ross Dam Right Abutment	Rockfall	0	900	1, 1a	Unknown age of movement	Less than 100 ft from multiple rockfall features with fresh surfaces
	MW-2	Ross Dam Powerhouse	Rockfall	300	887	1, 1a	2014?	Periodic rockfall in vicinity of Ross Powerhouse, noted in Golder Associates (2014), near rockfall 887
	MW-3	Ross Dam Haul Rd, Towers B90/48N B91/8N	Rockfall	0	887	1, 1a	2010	Rockfall reported in Landslide Tech FAR 06-19-13 and Landslide Tech (2011); within rockfall 887
	MW-4	Ross Dam Powerhouse	Debris flow fan	300	3203	1, 1a	Unknown age of movement	Two debris flow fans mapped within 300 ft W of powerhouse; although opposite side of river could be sources of large boulders and rock blocks
Thunder Arm Bridge	MW-5	SR 20 Bridge over Thunder Arm	Landslide-rock flow	350	3403	1a	Unknown age of movement	N approach of bridge within 350 ft of 3403 rock flow with freshened surfaces
	MW-6	SR 20 and Colonial Cr. Rec Area/Campground, S end of Thunder Arm bridge	Debris Flow	0	3201	1a	2017	WSDOT USMS reported 2017 debris flow, rubble on road; 3201 debris flow fan extends SE across recreation area
Diablo Dam, Upstream and Downstream	MW-7	Diablo Dam Rd, North Cascades Learning Ctr, docks, tourist facilities	Rockfall, debris flow/flood fans	0	3207	1, 2a	Unknown age of movement	Multiple facilities within footprints of 3212, 3210, 3207 debris flow/flood fans and 879 rockfall; mapped features show fresh surfaces
	MW-8	Diablo Dam Rd, North Cascades Learning Ctr, docks, tourist facilities	Rockfall, debris flow fans	0	879	1, 2a	Unknown age of movement	Multiple facilities within or near footprints of 3212, 3210, 3207 debris flow fans and 879 and 880 rockfall; mapped features show fresh surfaces
	MW-9	Diablo Dam Rd, North Cascades Learning Ctr, docks, tourist facilities	Rockfall, debris flow fans	0	879	1, 2a	Unknown age of movement	Multiple facilities within 879 rockfall; mapped features show fresh surfaces
	MW-10	SR 20 and Left abutment of Diablo Dam	Rockfall	0	944	1, 2a	1992?	WSDOT USMS note recent rockfall, wedge and planar failures, mitigated by scaling
	MW-11	Diablo Dam right abutment, tower B87/46N	Rockfall	0	878	1a, 2, 2a	1996?	Mapped rockfall area reported in Raytheon Constructors Inc. (1996), mapped talus deposits (878) have freshened surfaces
	MW-12	Diablo Intake, Diablo dam right abutment	Rockfall	0	1002	1a, 2, 2a	Unknown age of movement	facilities within footprints of rockfall 1002 and 878 with freshened surfaces
	MW-13	Diablo Powerhouse	Rockfall	250	873	1a, 2, 2a	2021	Rockfall reported 10/2021 (City Light) and 2007 (Landslide Tech, 2007); near rockfall 873 and 870, freshened surfaces
	MW-14	Diablo Powerhouse, tower B87/23N	Rockfall	200	873	1a, 2, 2a	1999?	Rockfall reported in Shannon & Wilson Inc. (1999), near rockfall 873



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Diablo Dam, Upstream and Downstream	MW-15	Town of Diablo facilities, Diablo Road	Rockfall	100	874	1a, 2, 2a	2021? or earlier	City Light reported slope 'between tennis court and Davis powerhouse' has periodic rockfall, near rockfall 874
	MW-16	Town of Diablo (including homes), Diablo and Stetattle Cr. Rd	Debris flow	0	3218	1a, 2, 2a	Unknown age of movement	Town footprint within debris flow 3218 and 3215; town downstream of multiple debris chutes in Stetattle Cr. channel
	MW-17	Tower D86/32N, SR 20 Bridge over Skagit R downstream of Diablo Dam	Debris Flow, rockfall	0	3195	1a, 2, 2a	Unknown age of movement	Tower below 820 rockfall; east approach of Gorge Lake bridge crosses 3195 debris flow fan
	MW-18	Diablo Road	Debris flow, rockfall	0	3219	1a, 2, 2a	Unknown age of movement	Approx. 4000 ft section of Diablo R, crosses rockfall 998, 999, 866 and debris flow fans 3220, 3221, 3219
	MW-19	Tower B86/12N, Diablo Rd	Rockfall	0	998	1a, 2, 2a	1992	WSDOT USMS reported chronic rockfall area, mitigated with rock debris retaining mesh; below rockfall 998
	MW-20	Towers D86/13N D86/25N, access road	Debris flow, rockfall	0	3194	1a, 2, 2a	Unknown age of movement	Towers located on small ridges adjacent to and above debris flow fan 3194 and rockfall 819
	MW-21	Towers B85/44N D85/39N	Rockfall	0	864	2	Recent	Towers located near rockfall 865 and 864, WSDOT (USMS) reported rockfall along SR20 directly downslope
Gorge Dam, Upstream and Downstream	MW-22	City Light access roads and SR 20	Debris Flow, rockfall	0	3223	2	Recent	WSDOT (USMS) reported rockfall and debris flow activity near debris flow 3223; rockfall 1000, 859, 858
	MW-23	City Light access roads and SR 21	Debris Flow, rockfall	0	3224	2, 3a, 3	Recent	WSDOT (USMS) reported rockfall near rockfall 863 and debris flow near fan 3224
	MW-24	Gorge Dam left abutment, Gorge Dam Rd, Towers B83/44N D83/38N	Landslide, debris flow, rockfall	0	3218	2, 3a, 3	Unknown age of movement	Facilities near rock avalanche 3218, debris flow 3175, rockfall 805
	MW-25	Gorge Dam right abutment	Closest mapped rockfall 1000ft upslope (847)		NA	2, 3a, 3	2001?	Golder Associates (2001) reported periodic rockfall near right abutment
	MW-26	Gorge Dam Rd, SR 20	Debris flow, rockfall, rock avalanche	0	845	2, 3a, 3	debris flow activity recent	Facilities cross debris flow 3227 (activity reported by WSDOT [USMS]) and rockfall 845, all downslope of rock flow 3354; rock avalanche 3220 located across (SE) Skagit R.
	MW-26a	Towers B83/3N, B83/11N, City Light access roads	Rockfall	100-300	842	2, 3a, 3	Unknown age of movement	Towers cross below mapped rockfall 842 and 843

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Gorge Dam to Newhalem Area	MW-27	SR 20, City Light access roads and SR 20	Debris flow, rock avalanche, rockfall	0	3404	2, 3a, 3	Rock avalanche (2003), debris flow recent activity	Site downslope of 2003 Afternoon Cr. rock avalanche that crossed SR 20 (Strouth, 2006) (Inventory landslide 3456); Strouth (2006) noted history of rockfall and debris flows; WSDOT (USMS) reported rockfall and debris flows; Inventory debris flows 3373, 3230, 3232 and rockfall 841
	MW-28	SR 20 N side of town of Newhalem	Debris flow, rockfall	0	Multiple	2, 3a, 3	Recent	Site located within approx. 1-mile-long segment of SR20 that crosses multiple debris flow fans, and rockfall with recently reported periodic activity (City Light, WSDOT [USMS])
	MW-29	SR 20 N side of town of Newhalem	Debris flow, rockfall	0	Multiple	2, 3a, 3, 3b	Recent	Site located within approx. 1-mile-long segment of SR20 that crosses multiple debris flow fans, and rockfall with recently reported periodic activity (City Light, WSDOT [USMS])
	MW-30	SR 20 N side of town of Newhalem	Debris flow, rockfall	0	Multiple	2, 3a, 3, 3b	Recent	Site located within approx. 1-mile-long segment of SR20 that crosses multiple debris flow fans, and rockfall with recently reported periodic activity (City Light, WSDOT [USMS])
	MW-31	Gorge powerhouse, suspension bridges	Debris flow, rockfall	0	3158	2, 3a, 3, 3b	Unknown age of movement	South end of Gorge powerhouse located near debris flow fan 3158 and rockfall 792 and 793
	MW-32	Tower B81/24N, Newhalem Townsite facilities N of SR 20	Rockfall	0	797	2, 3a, 3, 3b, 5	Unknown age of movement	facilities below ~2000-ft-long rockfall scarps and talus (797)
	MW-33	Tower B81/24N, Newhalem Townsite facilities N of SR 20	Rockflow / Rockfall	0	3200	3, 3b, 5	Unknown age of movement	Tower and Newhalem located at toe of rockflow with rockfall (3200) with some refreshed surfaces
Thornton Cr.	MW-34	D78/33N	Landslide, rockfall	NA	No mapped features	4, 5	Recent	WSDOT reported recent landslide and rockfall near tower and City Light access roads., no mapped features in Inventory; slope failures could be small events along river terrace with small incised channel N side of SR20
	MW-35	Tower D77/45N, City Light access road (unnamed)	Debris flow	0	3267	4, 5	Unknown age of movement	Tower alignment crosses debris flow fan 3267
Damnation Cr. to Bacon Cr., Right Bank of Skagit R.	MW-36	Towers D75/28N, D75/37N, City Light access road (unnamed)	Debris flow	0	3274	5, 6, 7a	Unknown age of movement	Tower alignment crosses debris flow fan 3274
	MW-37	Tower D75/5N, City Light access roads	Rockfall	0	730	5, 6, 7a	Unknown age of movement	Tower alignment crosses small rockfall zones upslope of SR 20

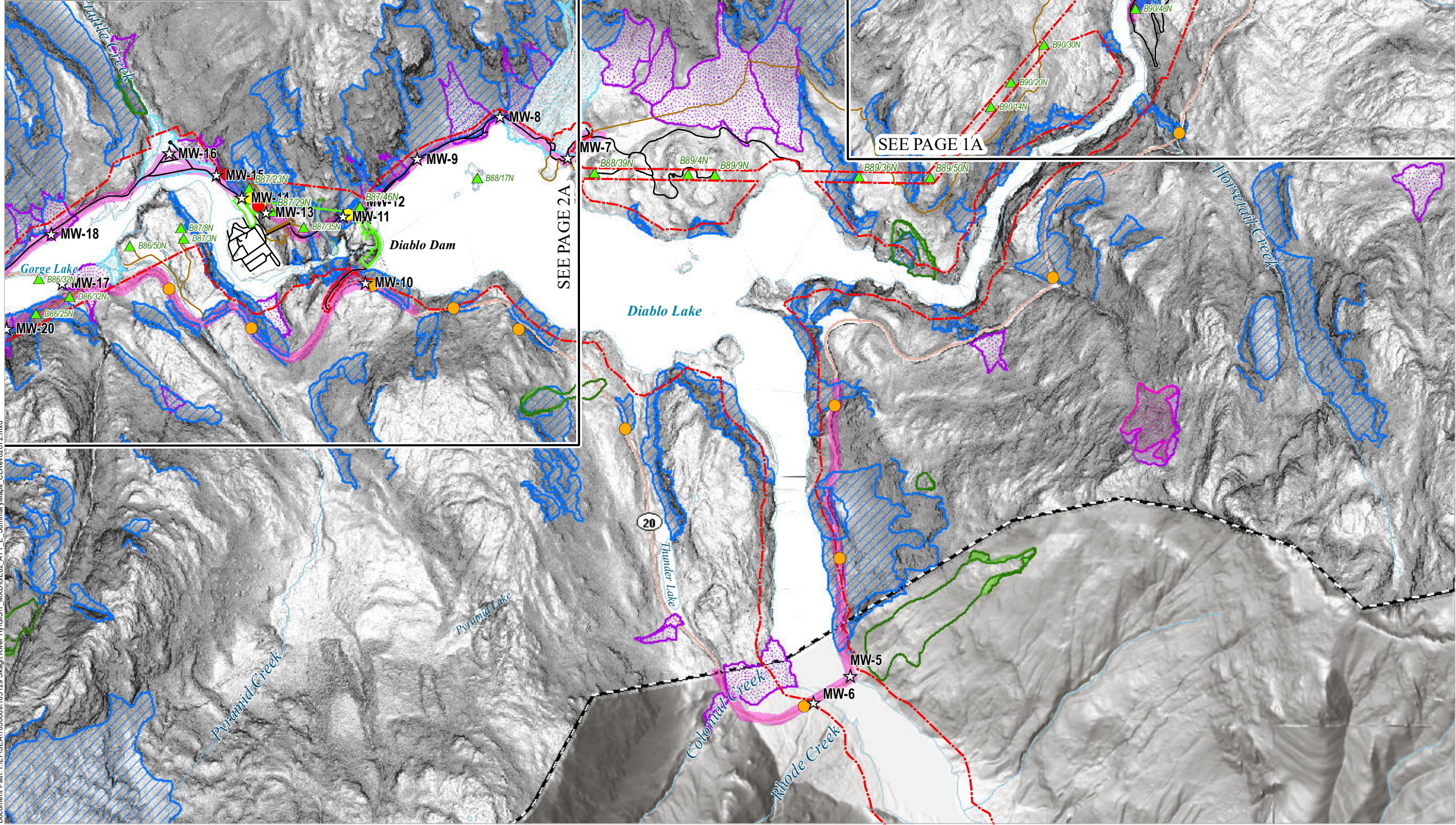
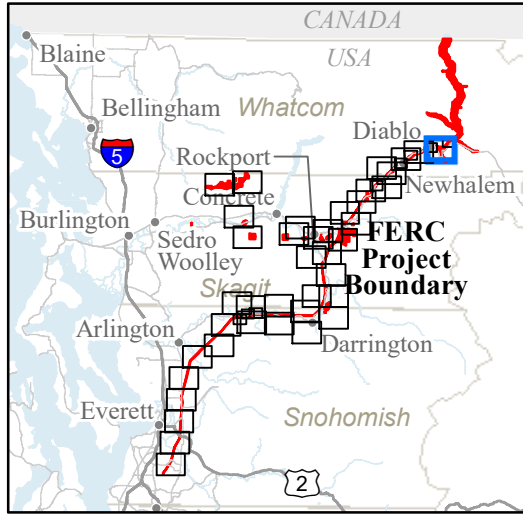
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Damnation Cr. to Bacon Cr., Right Bank of Skagit R.	MW-38	Tower D74/45N, City Light access road (unnamed)	Debris flow	0	3375	6, 7, 7a	Recent	Tower alignment crosses debris flow 3375; near site WSDOT (USMS) report debris flow material on SR 20
	MW-39	Tower B74/42N, City Light access road (unnamed)	Landslide, rockfall	0	3405	6, 7, 7a	Historic	Tower located below toe of mapped landslide 3405; tower alignment crosses ~4000-ft-wide landslide/rockfall/debris flow complex; nested slides are likely historic (3193, 3192)
	MW-40	Towers D74/31N, City Light access roads	Landslide, rockfall, debris flow	0	3227	6, 7, 7a	Unknown age of movement	Tower alignment crosses debris flow 3136, rock avalanche 3227, and below rockfall 742
	MW-41	Tower D73/47N, City Light access roads	Landslide	0	3179	6, 7, 7a	Unknown age of movement	Tower alignment crosses large landslide complex including nested landslides with refreshed surfaces; tower located within 3179
	MW-42	Towers B73/36N and D73/38N, City Light access roads	Landslide	0	3179	6, 7, 7a	Unknown age of movement	Tower alignment crosses large landslide complex including nested landslides with refreshed surfaces; tower located within 3179
	MW-43	Tower D78/9N, City Light access roads	Landslide	100	3174	7, 8	Unknown age of movement	Tower alignment crosses large landslide complex (3174) with refreshed surfaces; tower located downslope and adjacent to landslides within complex
	MW-44	Towers D72/32N, B72/34N, City Light access roads	Rockfall	0	724	7, 8	Unknown age of movement	Tower alignment crosses mapped rockfall 724 on N side of SR20
Bacon Cr. to Olsen Cr.	MW-45	Towers B71/11N, D71/11N, City Light access roads	Rockfall	150	688	7, 8	Unknown age of movement	Rockfall 688 mapped upslope or tower alignment
	MW-46	Towers B70/47N, D70/47N City Light access roads	Rockfall	100	692	7, 8	Unknown age of movement	Rockfall 692 mapped upslope or tower alignment
	MW-47	TowersB67/48N, D67/48N, B67/35N, D67/35N, City Light access roads	Debris flow	0	3301	9, 10	Unknown age of movement	Tower alignment crosses large debris flow 3301at distal end of Olsen Cr.

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Mitigation Parcel P-553	MW-48	Mitigation parcel P-553	Landslide	0	3378	13	Unknown age of movement	Site located within the eastern and southern portions of the mitigation parcel P-553; parcel includes large complex of landslides (e.g., 3378); some of the nested landslides within the complex show freshened surfaces
Hilt Lake, above Left Bank of Skagit R.	MW-49	Towers B58/4N and D58/4N, City Light access roads (unnamed)	Rockfall	0	529	16, 17	Unknown age of movement	Towers located on top of rockfall scarp 529
	MW-50	Towers B57/44N and D57/42N, City Light access roads (unnamed)	Rockfall	0	528	16, 17	Unknown age of movement	Towers located on top of rockfall scarp 528
Vicinity of Sauk - Suiattle R. Confluence	MW-51	Towers B50/24N, D50/24N, B50/13N, D50/13N, City Light access roads (unnamed)	Debris flow	0	3076	19, 20	Unknown age of movement	Tower alignment crosses a complex of debris flows (e.g., 3076) located directly downslope from multiple landslides.
French Cr, NF Stilliguamish R.	MW-52	Towers B39/29N D39/30N	Landslide	100	11517	23, 26	Recent	Towers located on top of scarp/landslide 11517; City Light reported failure along French Cr. bank and a lost tower

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NF Stillquamish R., South Bank between Boulder R. and Fry Cr.	MW-53	Towers B37/16N D37/16N, City Light access roads	Landslide	0	11498	24, 24a, 27	Unknown age of movement	Tower alignment crosses ~5 mi-long zone of landslides and debris flows; towers located with mapped landslide 11498
	MW-54	Towers D36/34N B36/34N D36/29N B36/29N	Landslide	0	11478	24, 24a, 27	Recent	Towers located on top of landslide 11478 with freshened surface and that is undercutting access road; City Light reports site is monitored with inclinometers
	MW-55	Towers D36/17N, B36/18N, City Light access roads	Landslide	0	11500	24, 24a, 27	Unknown age of movement	Towers located within landslide 11500 with possible shallow sloughing along E and W flanks
	MW-56	Towers D36/9N, B36/10N, City Light access roads	Landslide	0	11497	24, 24a, 27	Unknown age of movement	Towers located within a complex of landslides and above headscarp for landslide 11477
	MW-57	Tower B35/47N, City Light access roads	Landslide	0	11474	24, 24a, 27	Unknown age of movement	Tower located within a complex of landslides and above headscarp for landslide 11474
	MW-58	Towers D35/33N B35/33N, City Light access roads	Landslide, debris flow	0	11531	24, 24a, 27	Recent	Towers located at distal end of 2104 Oso landslide to north and at base of multiple debris flows and landslide 12038 upslope
	MW-59	Towers D35/22N, B35/22N, City Light access roads	Landslide	0	12035	24, 24a, 27	Unknown age of movement	Towers located at distal end of 2104 Oso landslide to north and within distal end of landslide 12035, tower B35/22N located where toe of 12035 appears steepened and subject to shallow sloughing

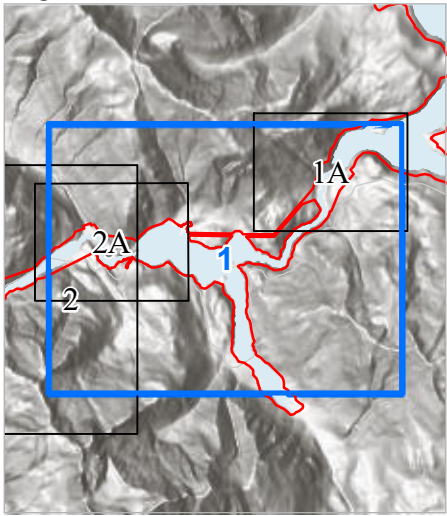
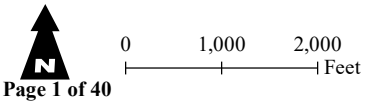
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NF Stillaguamish R., South Bank between Boulder R. and Fry Cr.	MW-60	Towers D35/7N, B35/7N, City Light access roads	Landslide	0	12031	24, 24a, 24b, 27	Unknown age of movement	Towers located within landslide 12031
	MW-61	Towers B34/48N D34/48N	Landslide	0	12025	24, 24a, 24b, 27	2004	Towers located above landslide with recent movement reported by WSDOT (2004), emergency repairs and soldier pile wall installed
	MW-62	Towers B34/34N D34/38N	Landslide	0	12026	24, 24a, 24b, 27	Unknown age of movement	Towers located within landslide 12026
	MW-63	TowersD34/11N, B34/11N, B34/4N	Landslide	100	3426	24, 24a, 24b, 24c, 27	Unknown age of movement	Tower alignment crosses large landslide complex 12024, also crosses headscarps of multiple shallow landslides along Montague Cr.
	MW-64	Towers D33/35N, B34/11N, B33/34N	Landslide, debris flow	0	4687	24, 24c, 27	Recent?	Tower alignment crosses multiple debris flows and the toe of large landslide complex 11415; City Light report notes WSDOT monitoring slope
	MW-65	Tower D33/15N	Landslide	0	11415	24, 24c, 27	Recent?	Tower alignment crosses toe of large landslide complex 11415 and smaller nested landslides; City Light report notes WSDOT monitoring slope
NF Stillaguamish R., South Bank Near Riley Lk	MW-66	Tower B31/22N	Landslide	0	12428	29	Unknown age of movement	Tower located on headscarp of shallow landslide 12428
	MW-67	Towers D30/51N B30/51N	Landslide	0	12434	29	Unknown age of movement	Towers located above small landslide 12434: City Light reports shallow sloughing below towers





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- Study Routes
  - Road
  - Trail
- Mass Wasting Study Boundary
- Sites of Special Concern
- Zones of Special Concern
- SCL Reported Slope Failure Location
- Slope Failure Locations from Other Sources
- WSDOT Reported Slope Failure Locations
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
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- Rockfall Talus Deposits
- Debris Flow Head Scarps and Flanks
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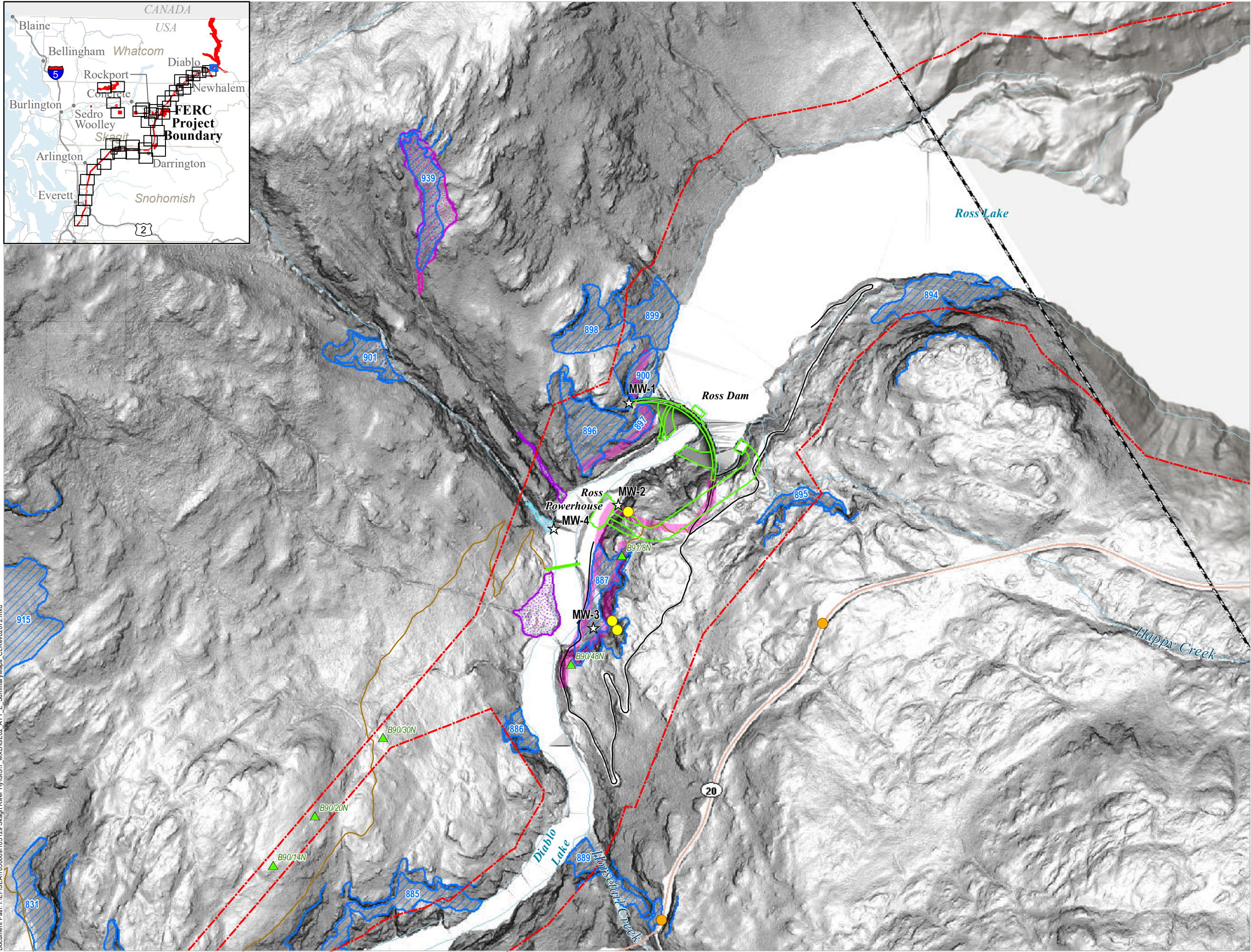
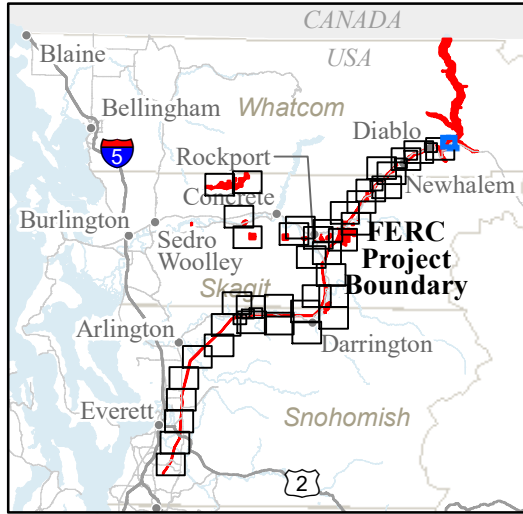


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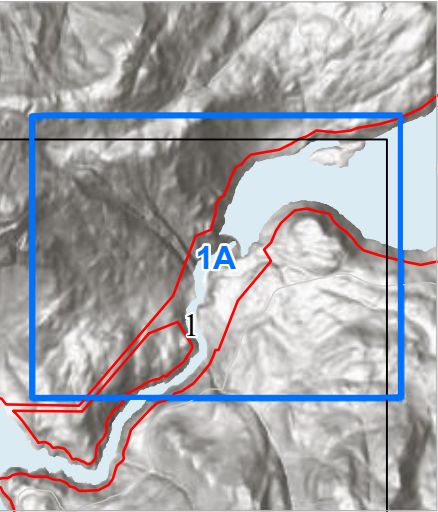
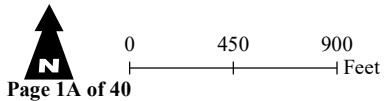
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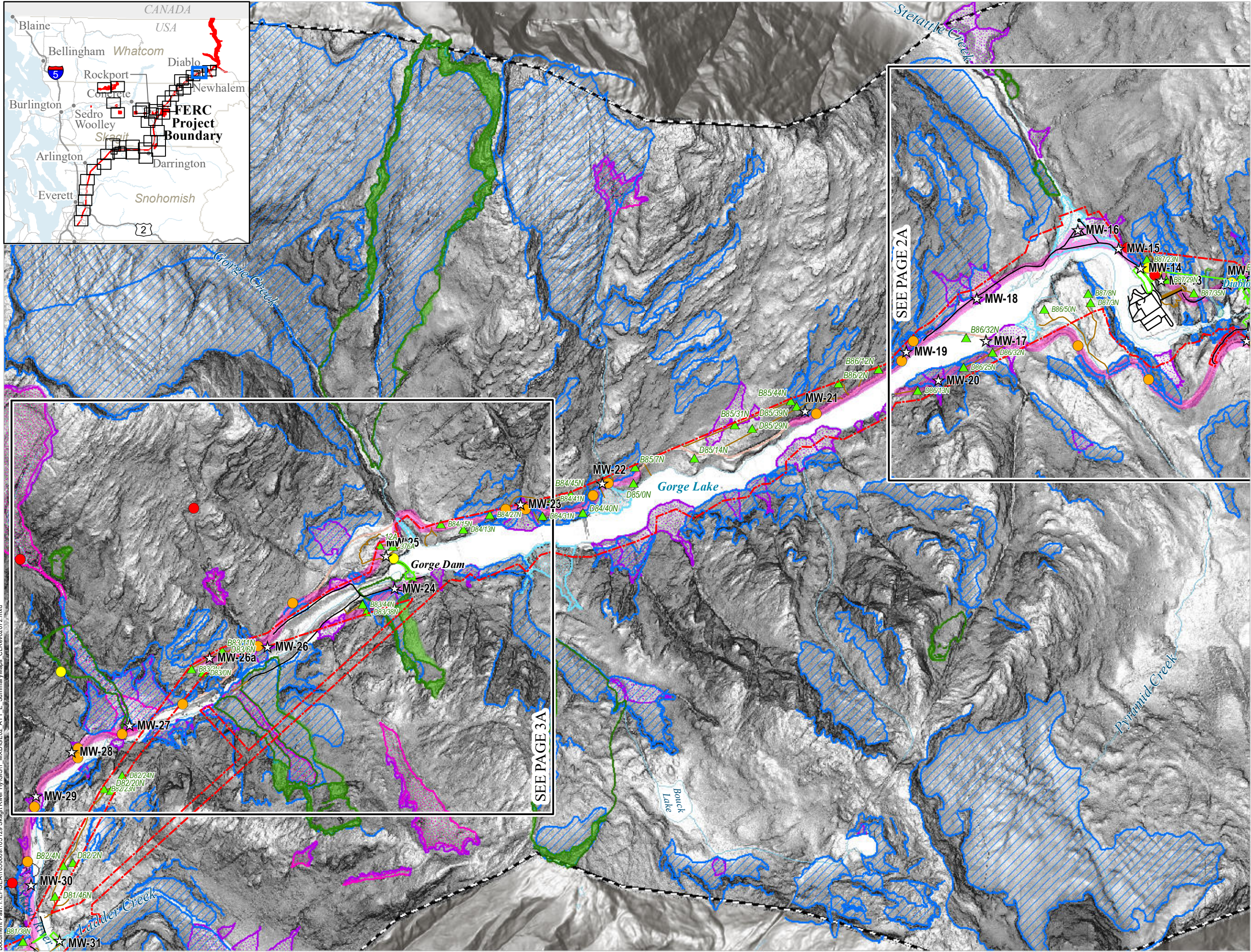


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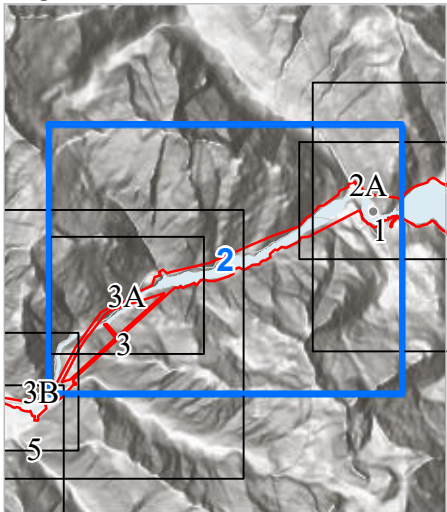
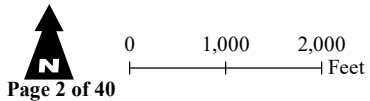
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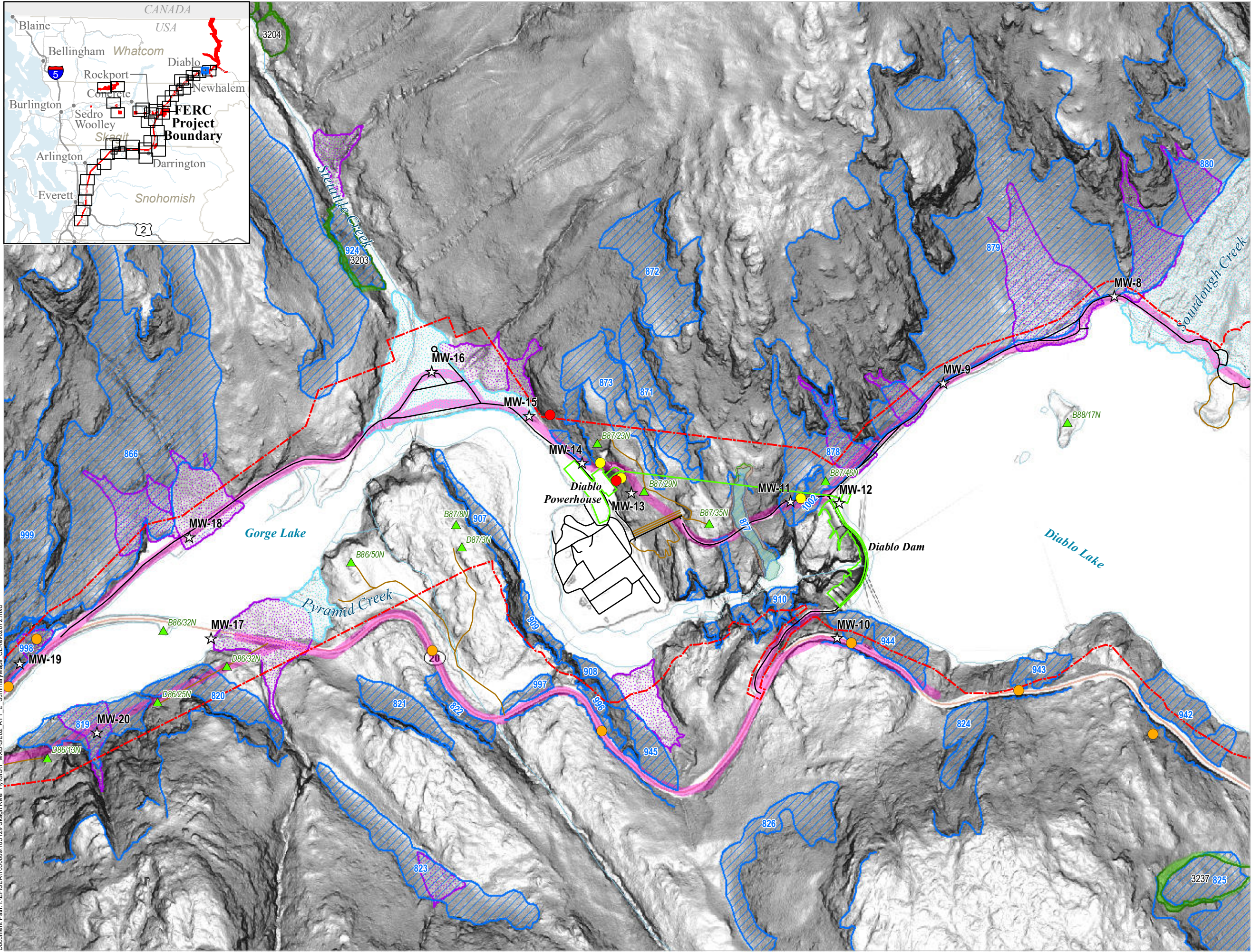


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Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Rockfall Scarps

Rockfall Talus Deposits

Fan Deposits

Debris Flood

Debris Flow

0

450

900

Feet

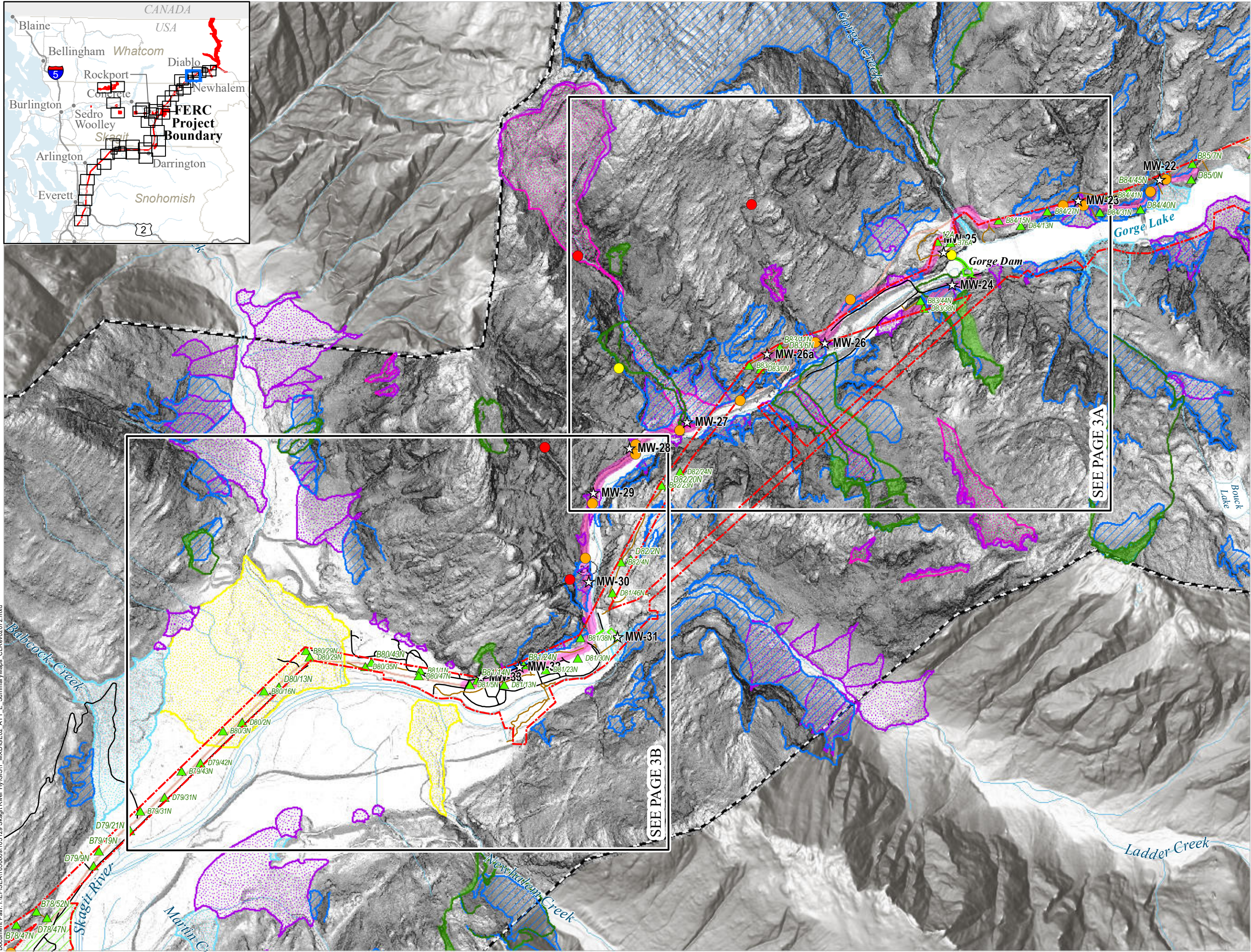
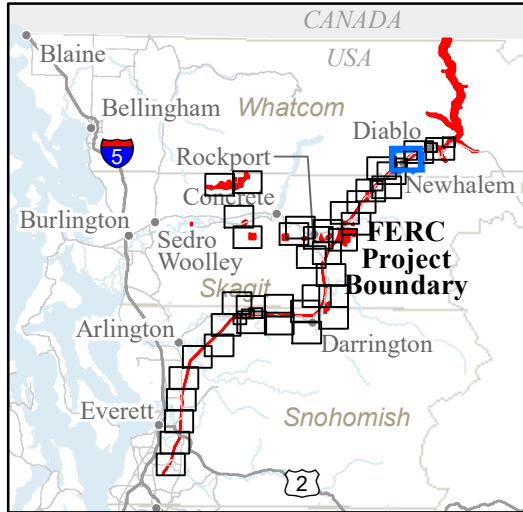
Page 2A of 40

Seattle City Light

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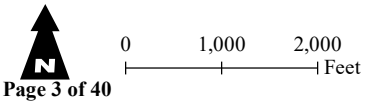
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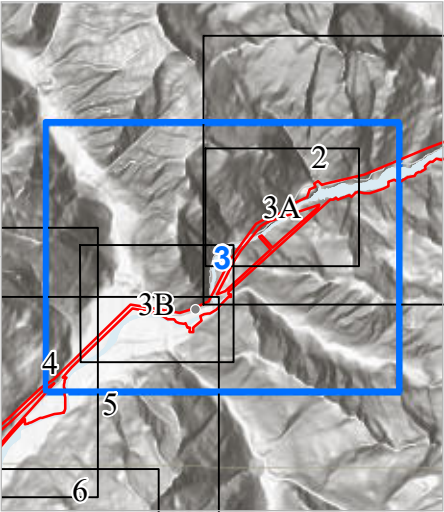


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- Deep Landslide Scarp
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarp
- Rockfall Talus Deposits
- Debris Flow Head Scarps and Flanks
- Debris Flow Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow



Page 3 of 40

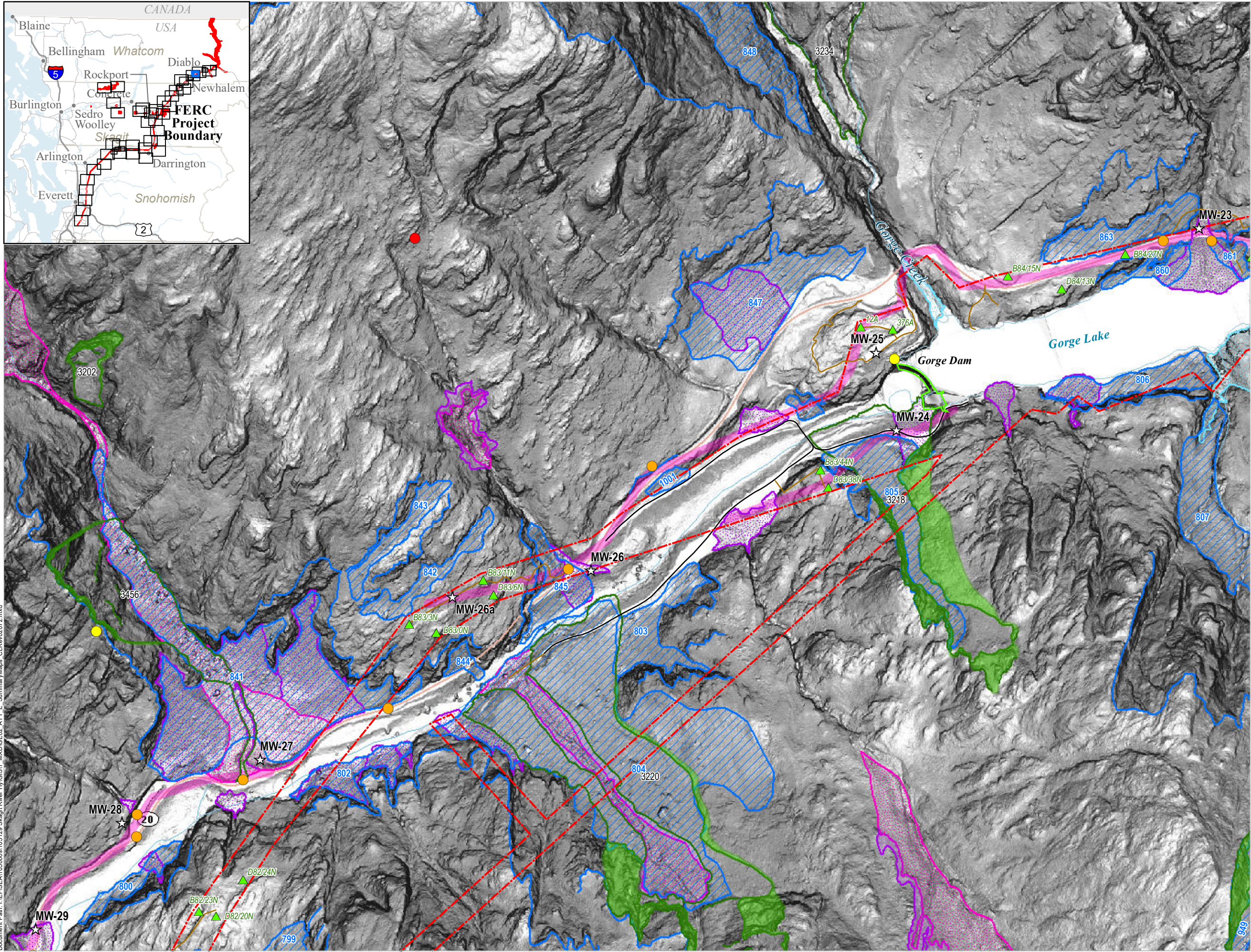
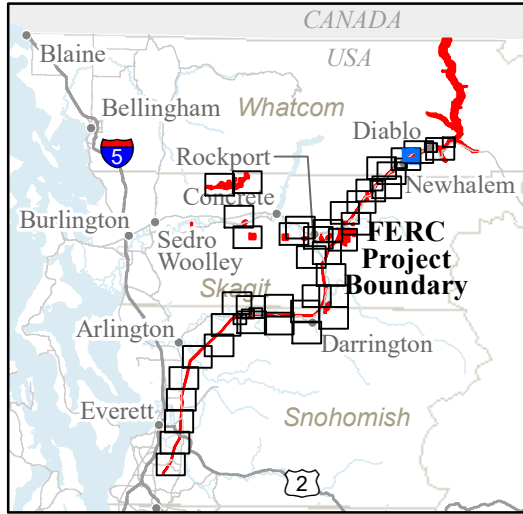


Seattle City Light

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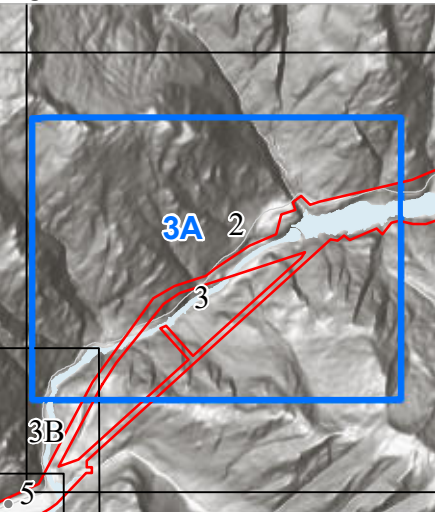
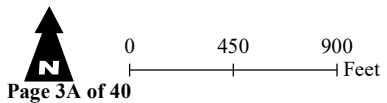
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## GE-02: SUMMARY

- FERC Project Boundary
- City Light Major Facilities
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Trail
- Mass Wasting Study Boundary
- Sites of Special Concern
- Zones of Special Concern
- SCL Reported Slope Failure Locations
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- Rockfall Talus Deposits
- Debris Flow Head Scarps and Flanks
- Debris Flow Deposits
- Fan Deposits
  - Debris Flood
  - Debris Flow

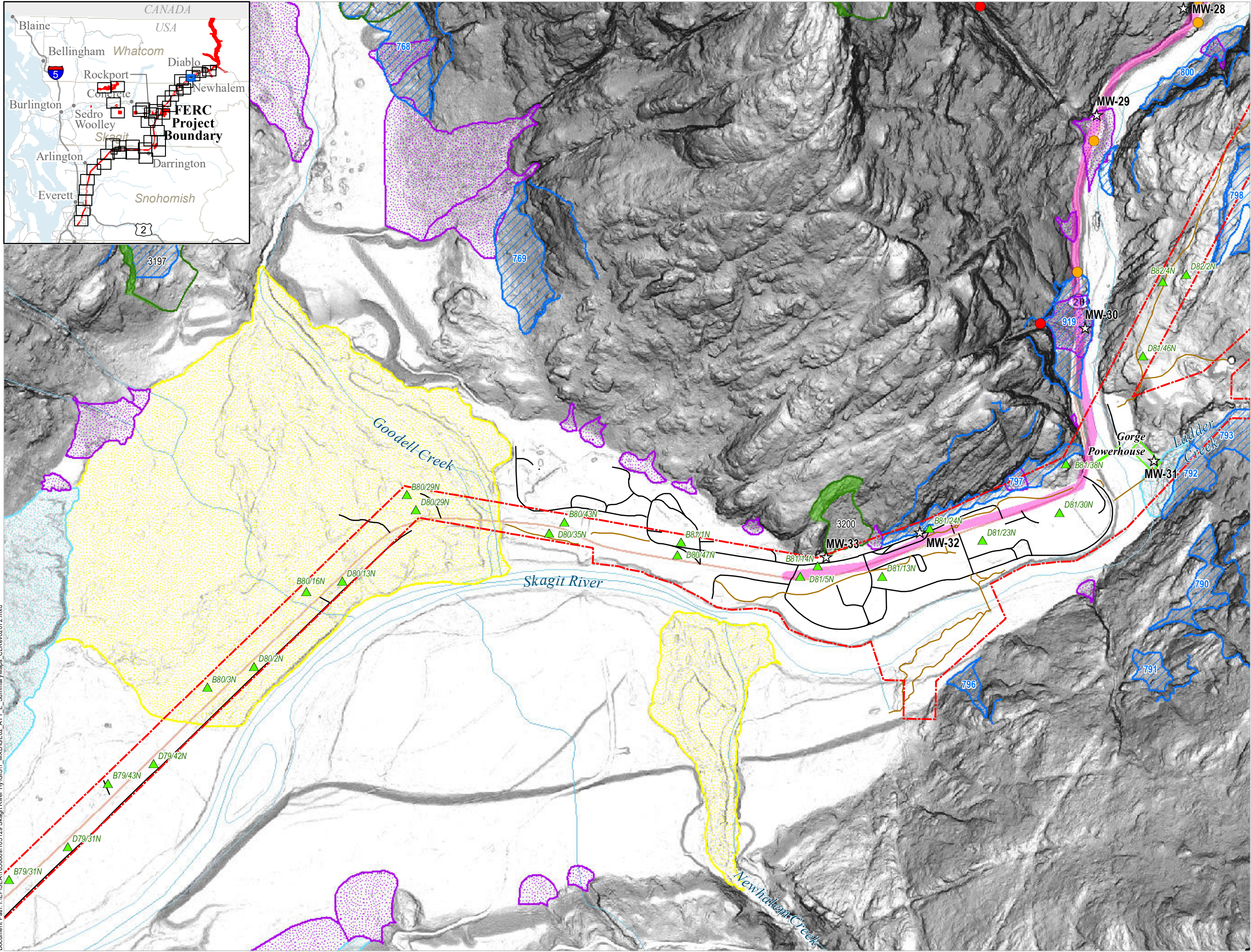
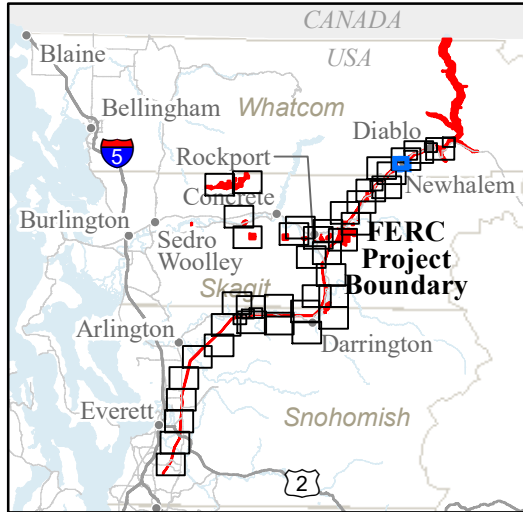


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### GE-02: SUMMARY

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- Rockfall Talus Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

0 450 900 Feet

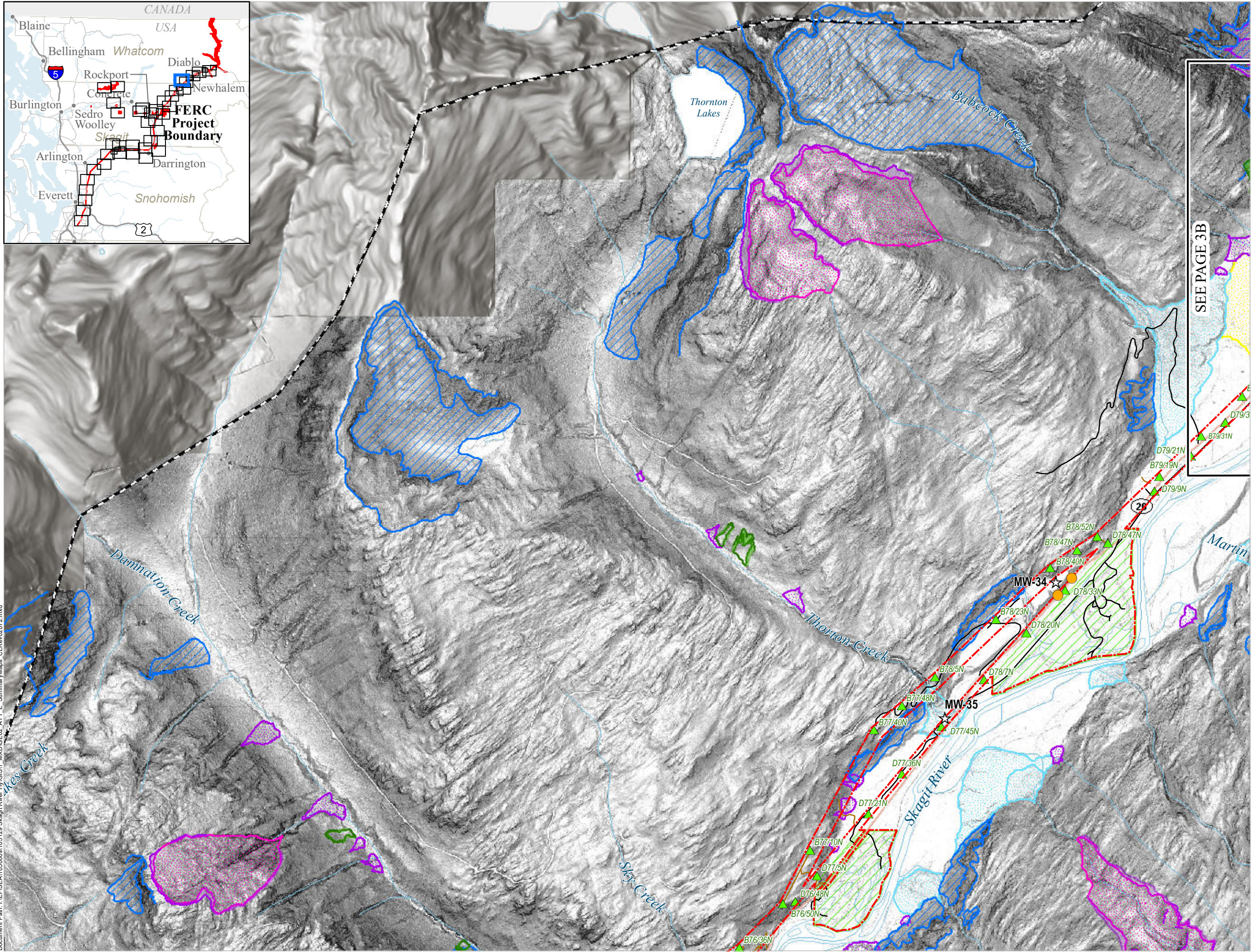
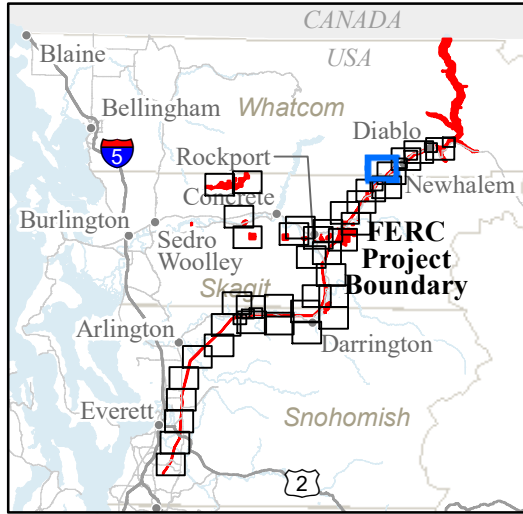
Page 3B of 40

Seattle City Light

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### GE-02: SUMMARY

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- Debris Flow Head Scarps and Flanks
- Debris Flow Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

SEE PAGE 3B

0 1,000 2,000 Feet

Page 4 of 40

Seattle City Light

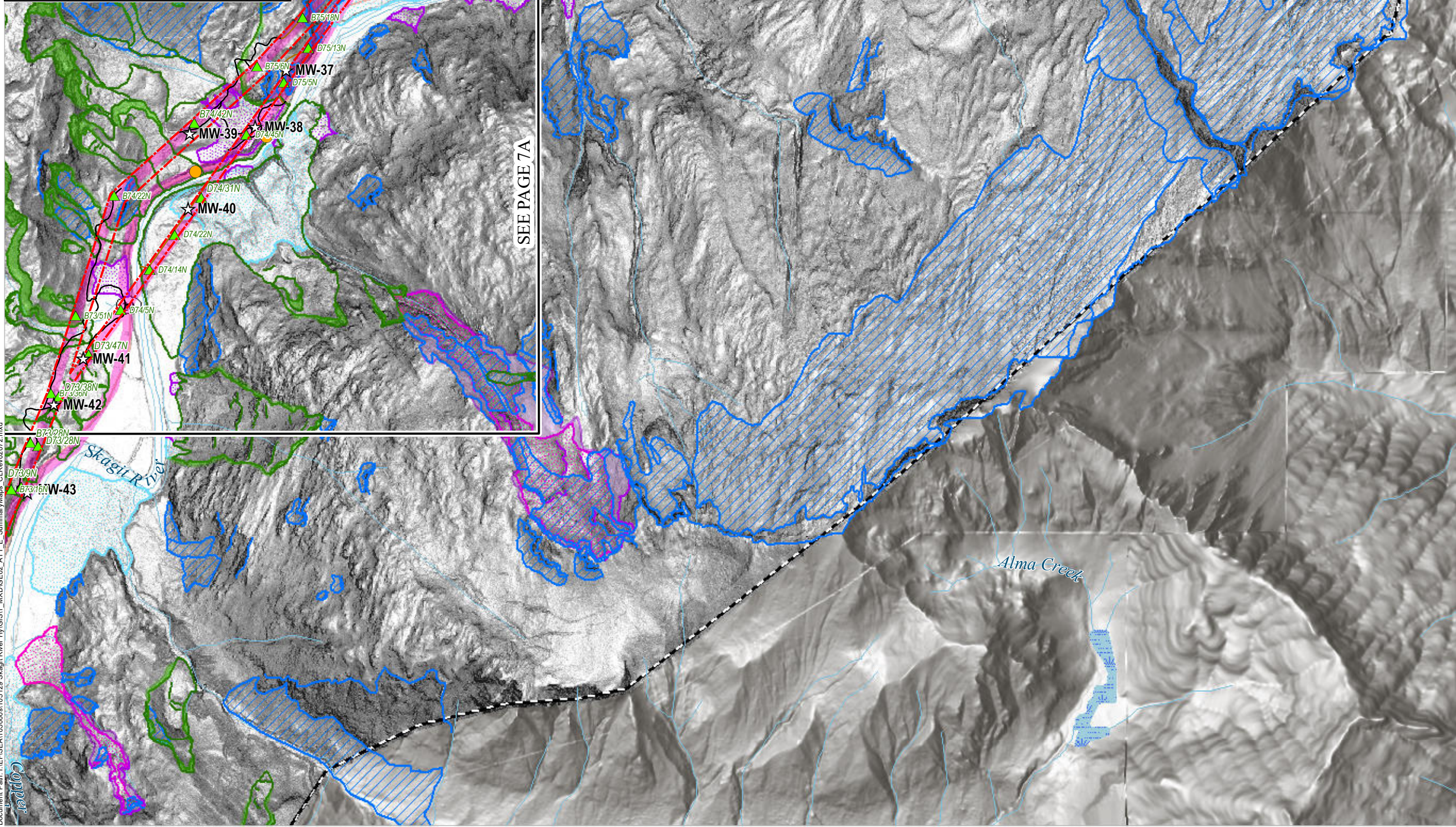
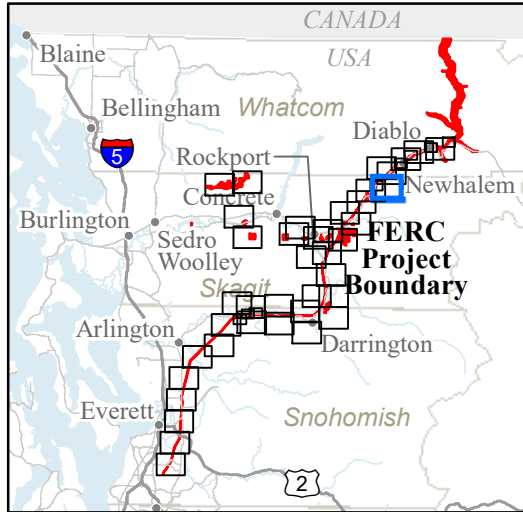
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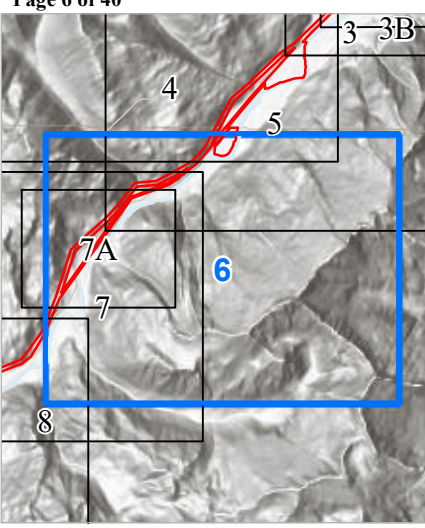
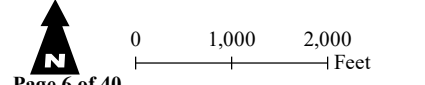






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- Debris Flow Deposits
- Fan Deposits
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  - Debris Flow



Seattle City Light

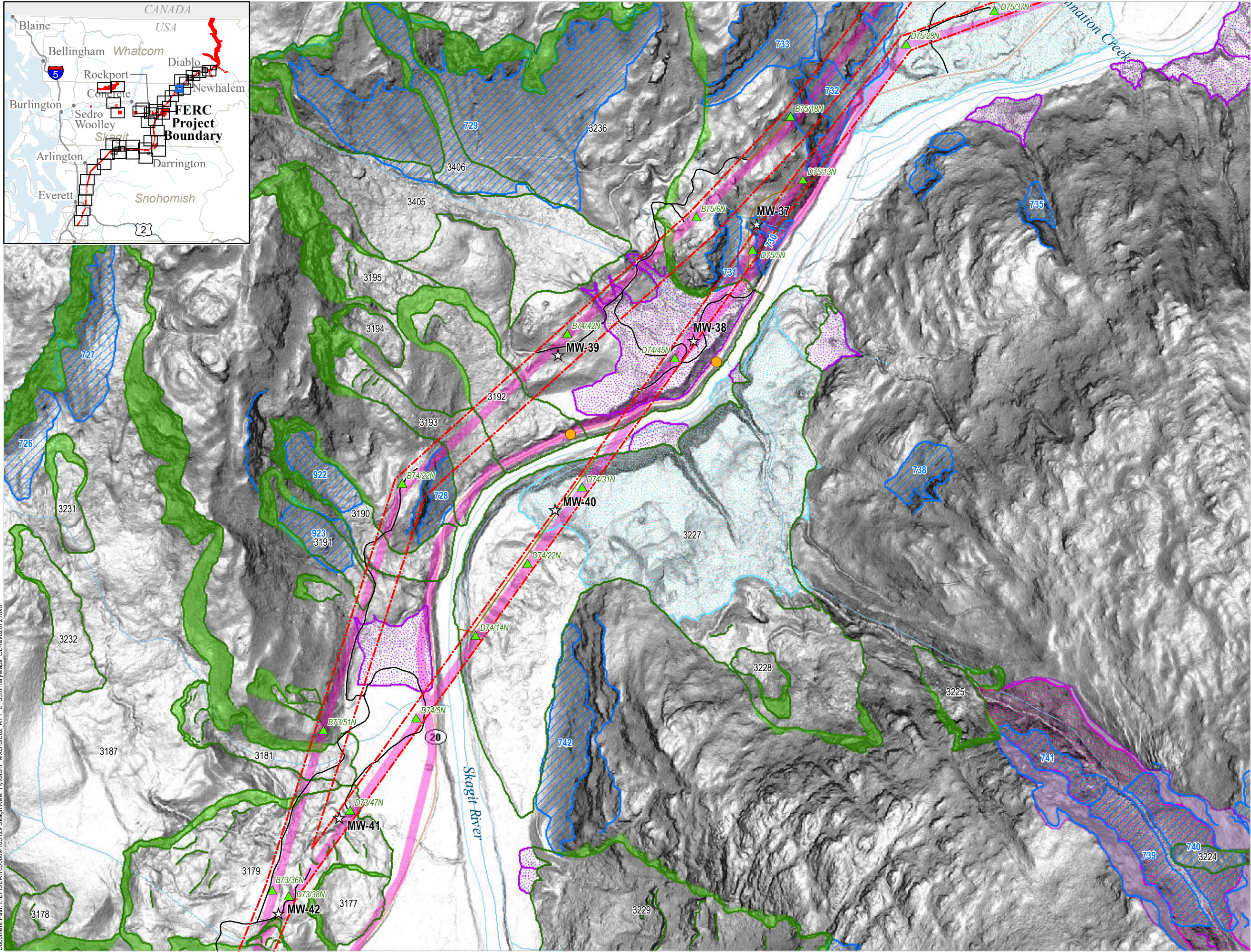
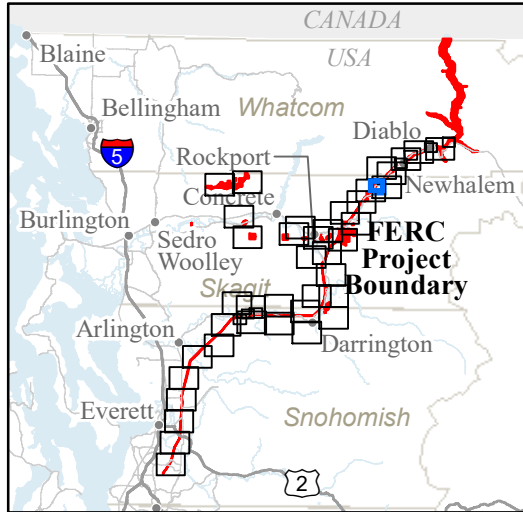
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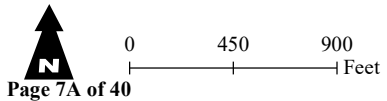




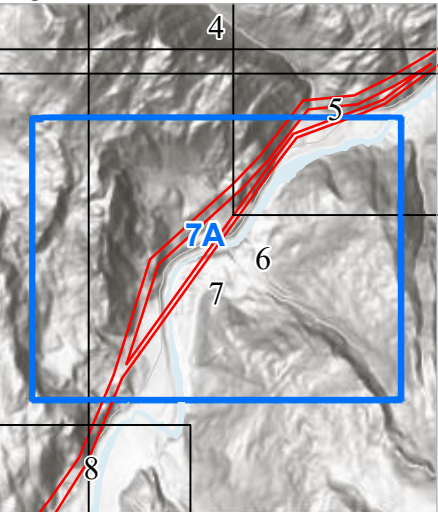


## GE-02: SUMMARY

- FERC Project Boundary
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- Debris Flow Deposits
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  - Debris Flood
  - Debris Flow



Page 7A of 40

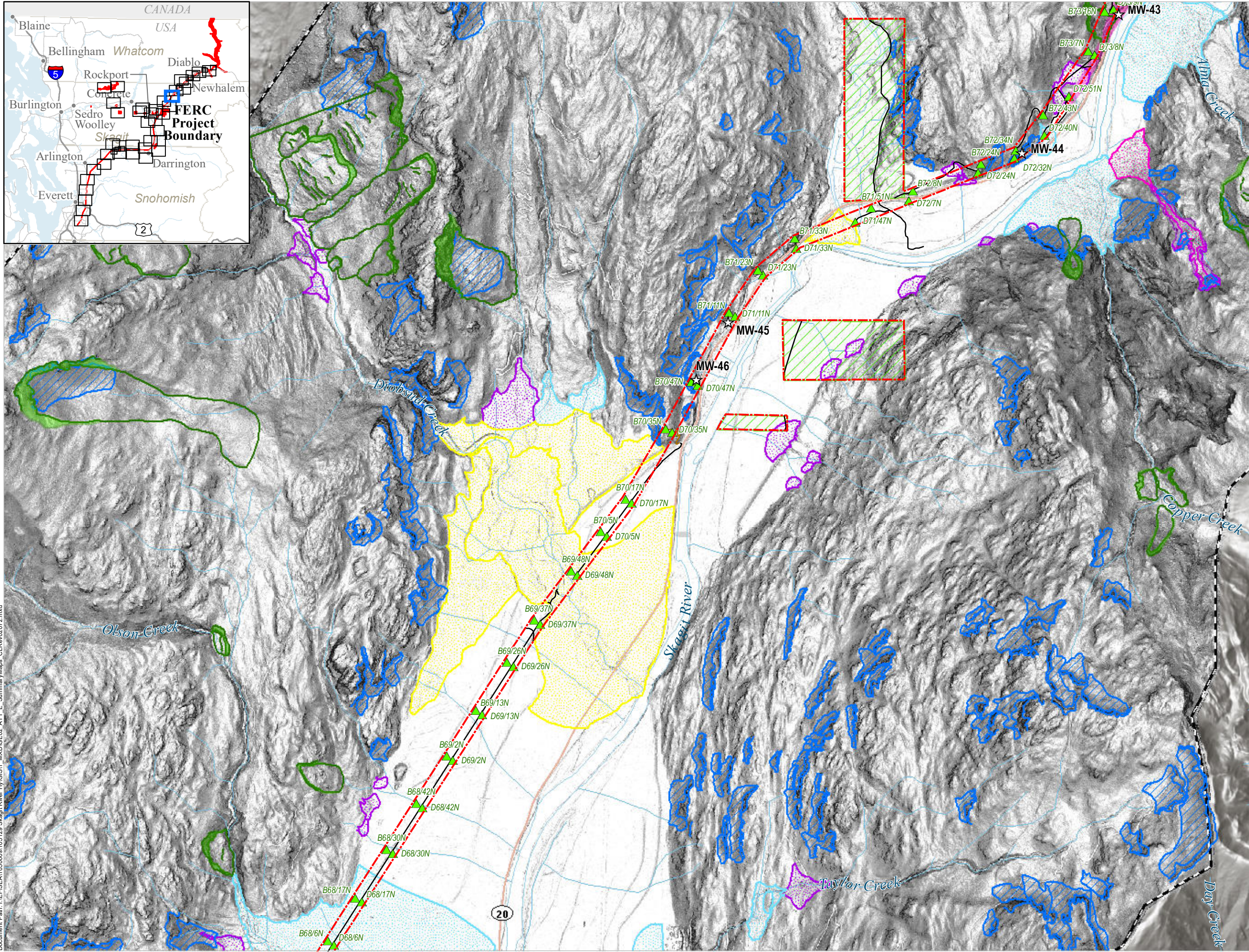
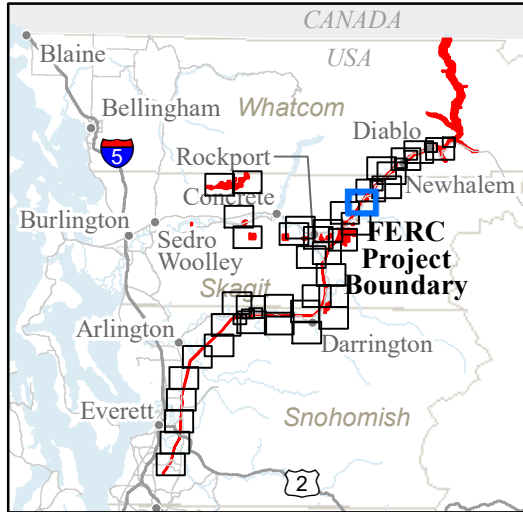


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### GE-02: SUMMARY

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  - Road
  - Trail
- Mass Wasting Study Boundary
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- Zones of Special Concern
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  - Deep Landslide Head Scars and Flanks
  - Deep Landslide Deposits
  - Rockfall Scars
  - Rockfall Talus Deposits
  - Debris Flow Head Scars and Flanks
  - Debris Flow Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

0 1,000 2,000 Feet

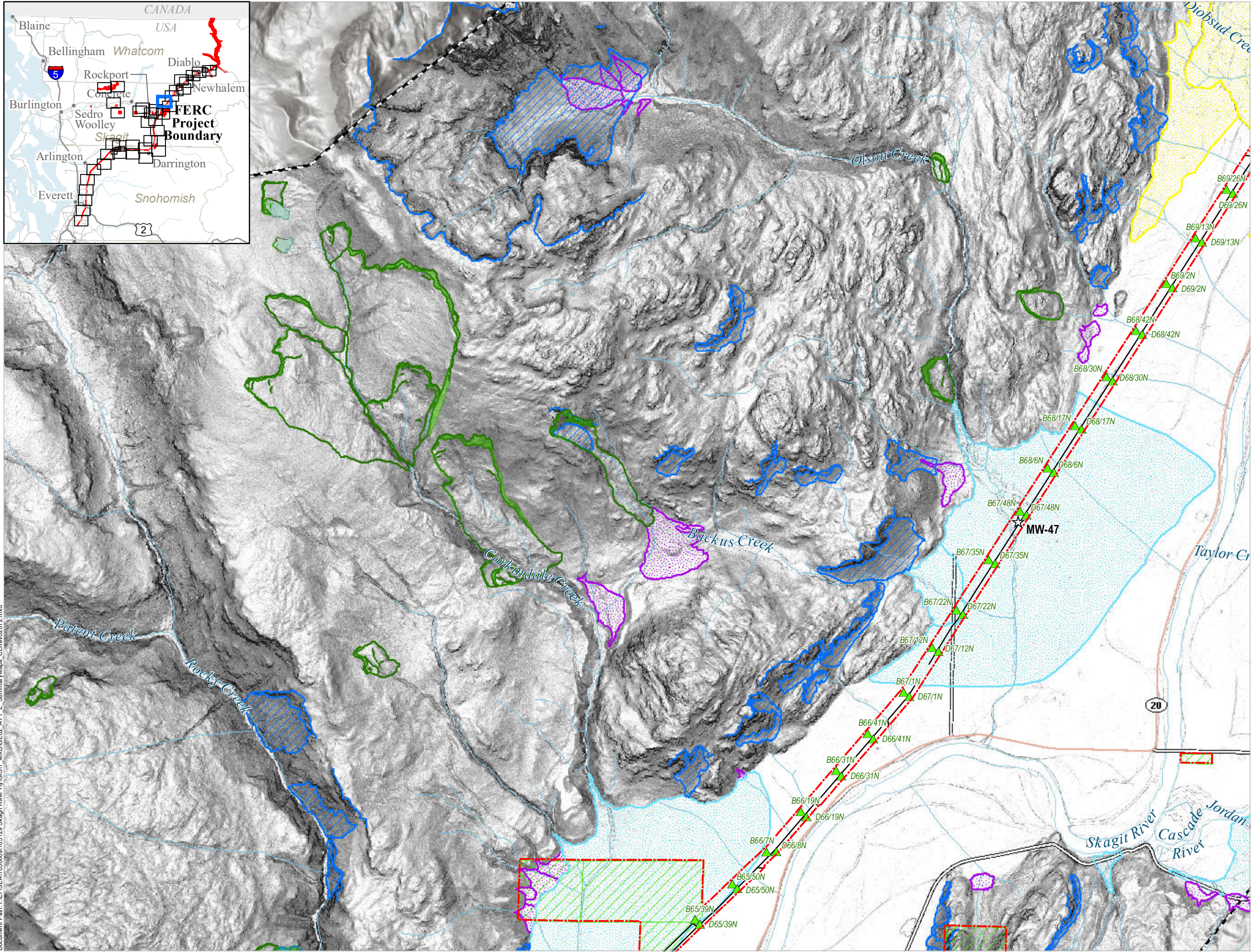
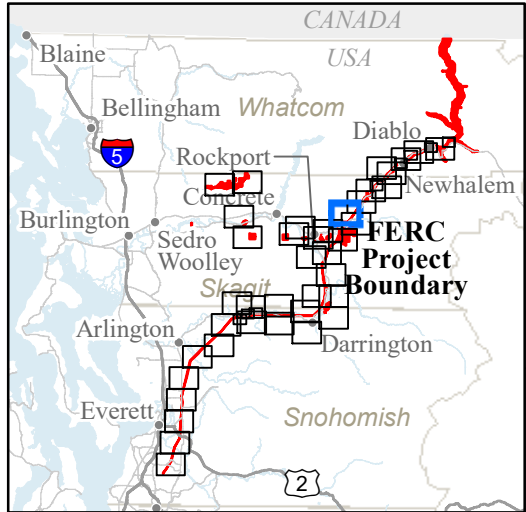
Page 8 of 40

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### GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- City Light Mitigation Parcels
- Study Routes
- Road
- Mass Wasting Study Boundary
- Sites of Special Concern
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

0 1,000 2,000 Feet

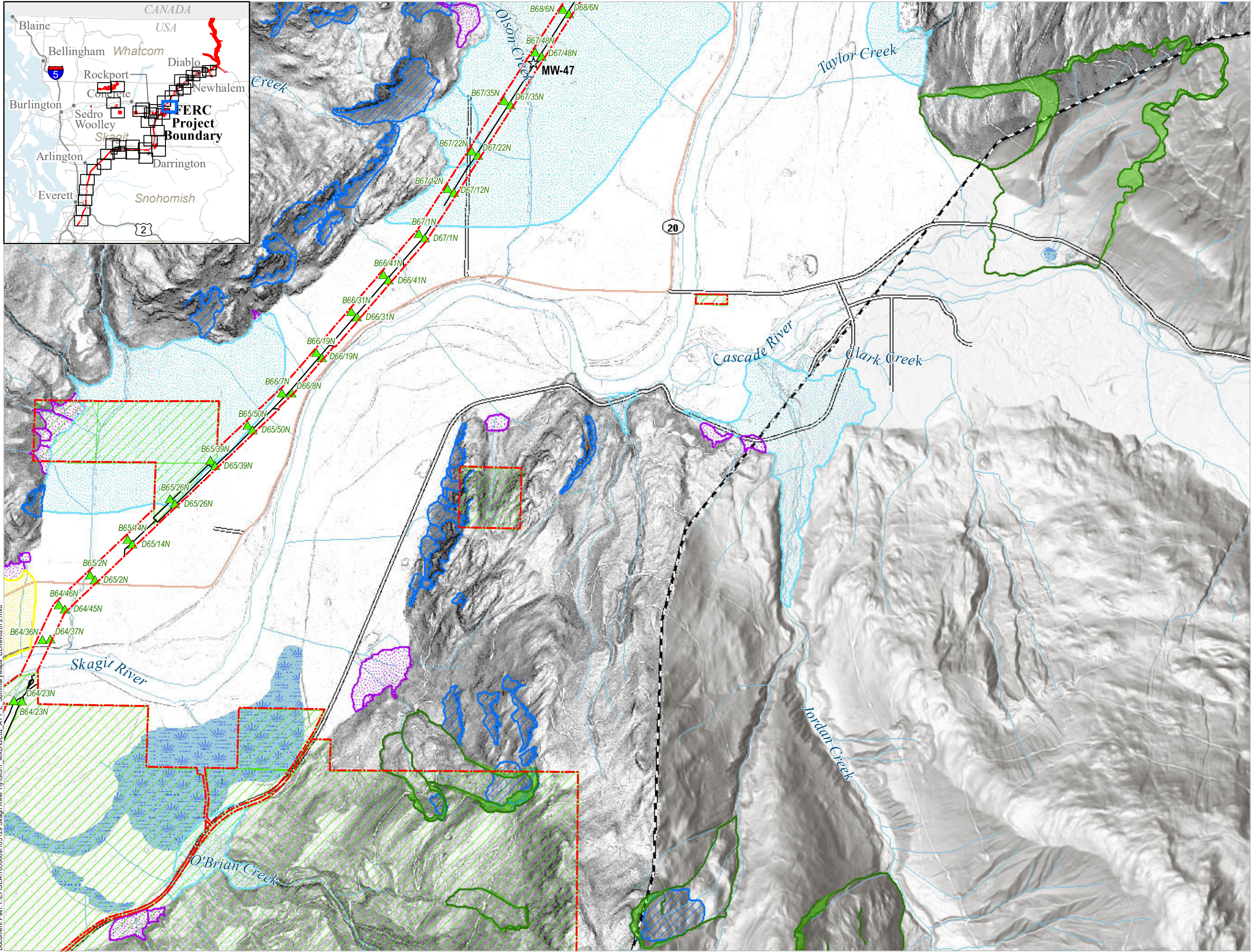
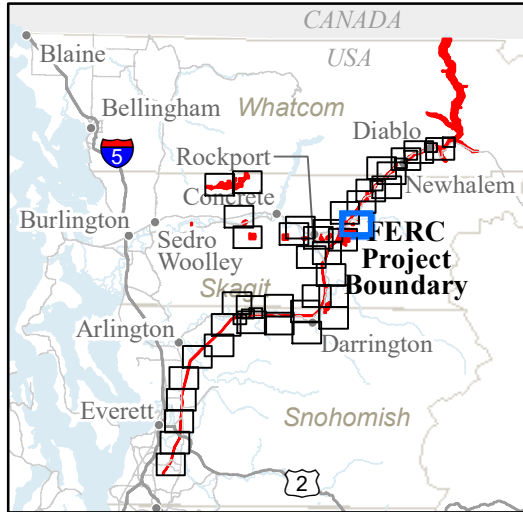
Page 9 of 40

Seattle City Light

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### GE-02: SUMMARY

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- City Light Transmission Line Tower Locations
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- Sites of Special Concern
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- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

0 1,000 2,000 Feet

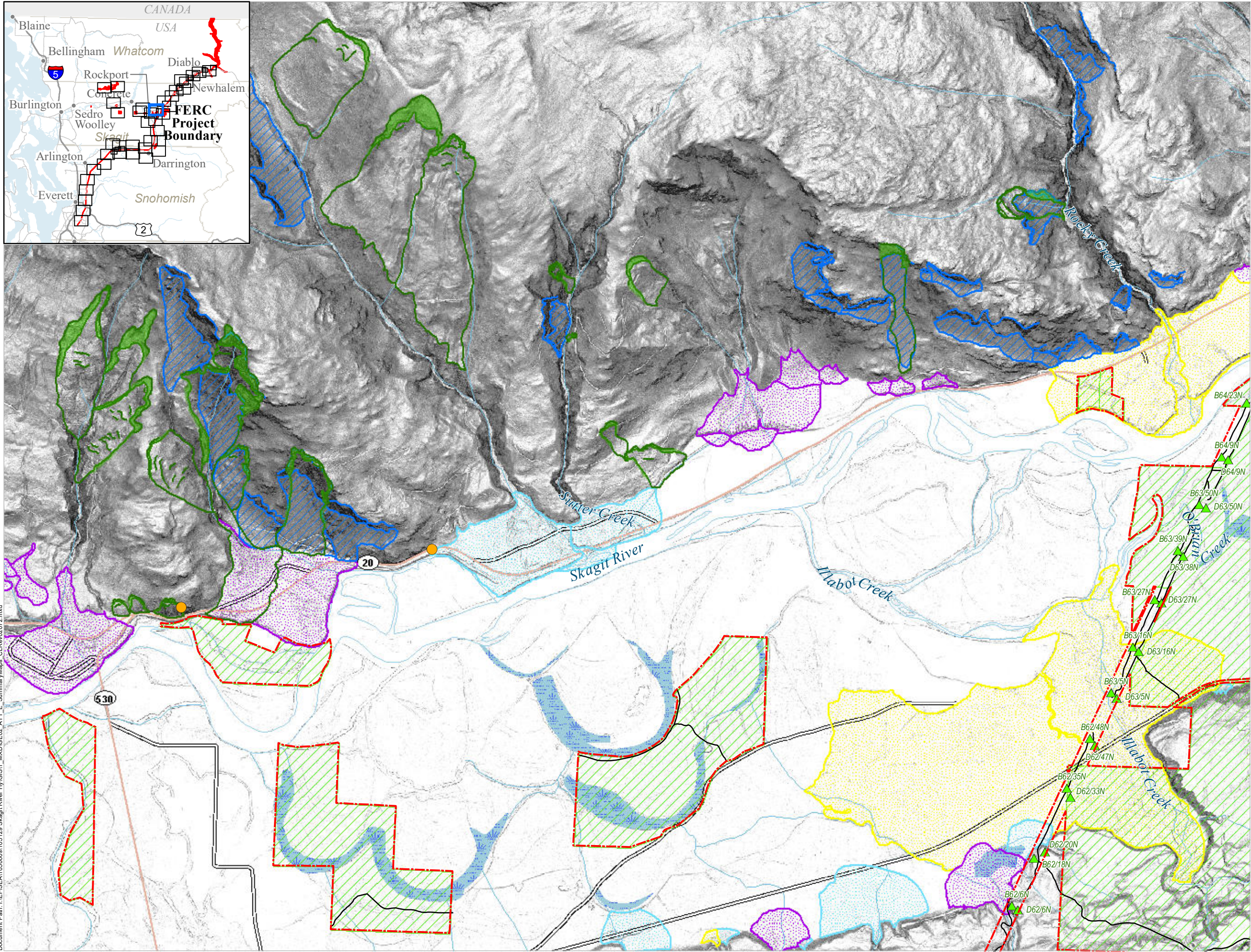
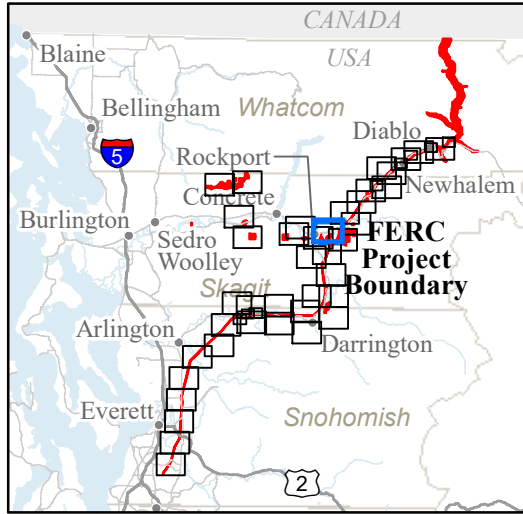
Page 10 of 40

Seattle City Light

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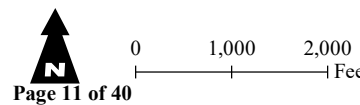
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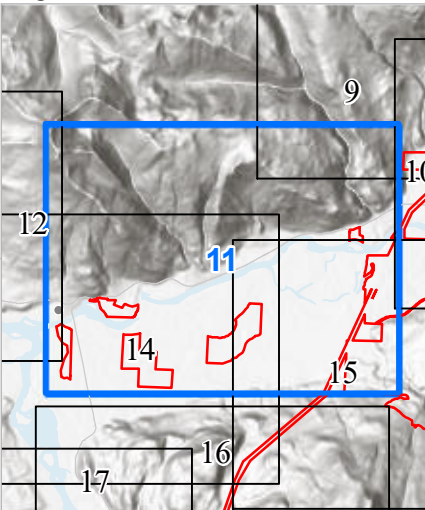


## GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- City Light Mitigation Parcels
- Study Routes
- Road
- Mass Wasting Study Boundary
- WSDOT Reported Slope Failure Locations
- Deep Landslide Scarp
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- Deep Landslide Deposits
- Rockfall Scarp
- Rockfall Talus Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow



Page 11 of 40

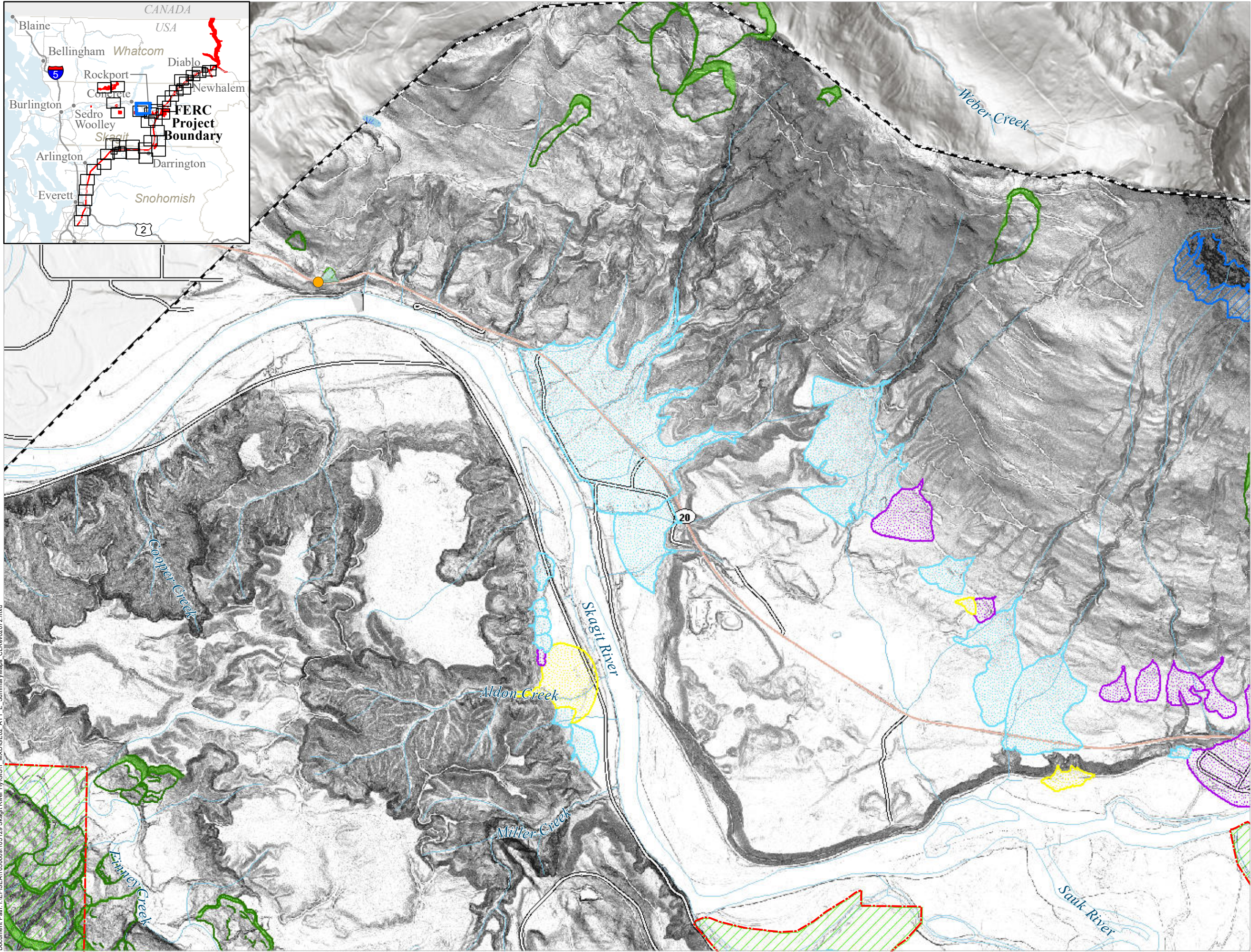


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### GE-02: SUMMARY

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- Sites of Special Concern
- WSDOT Reported Slope Failure Locations
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
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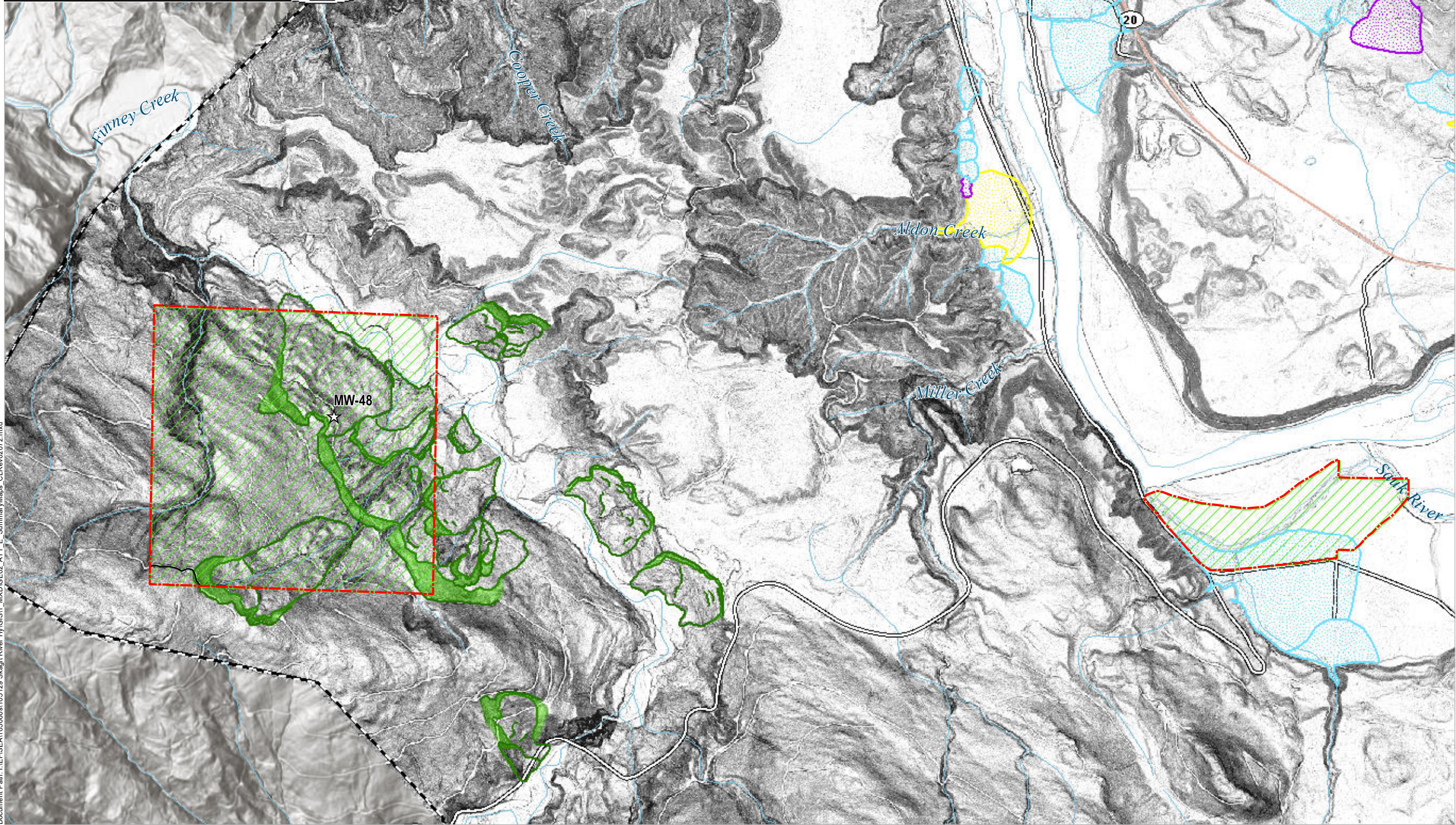
Page 12 of 40

Seattle City Light

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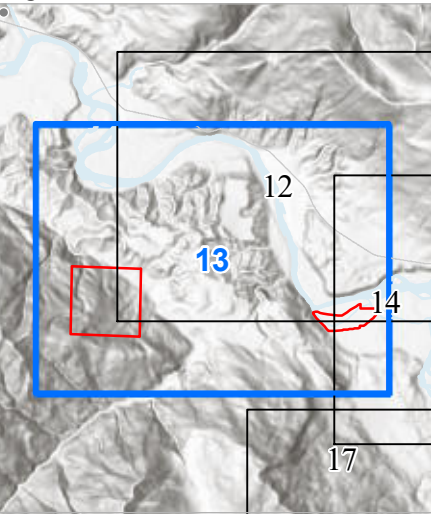
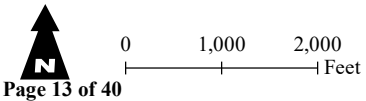
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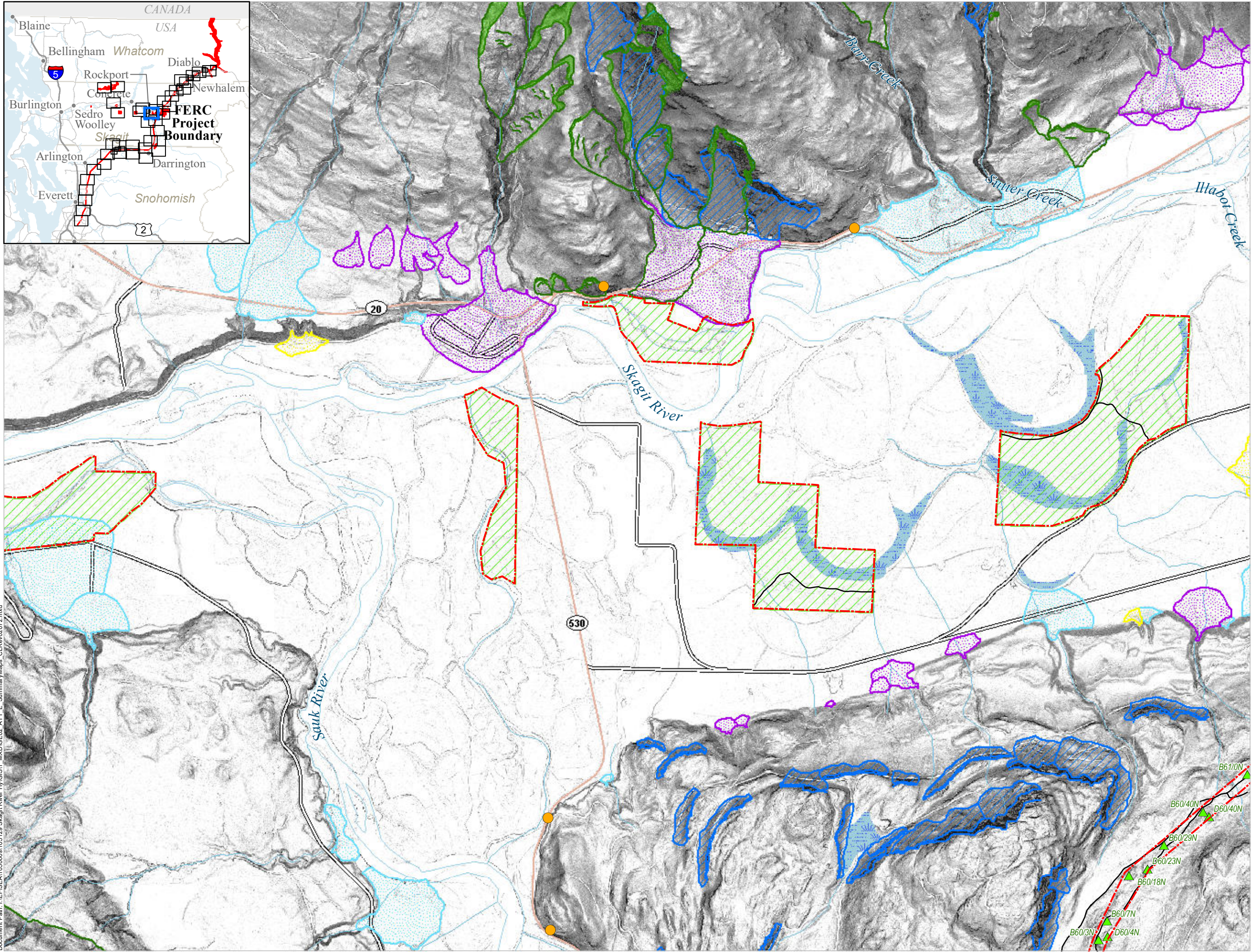
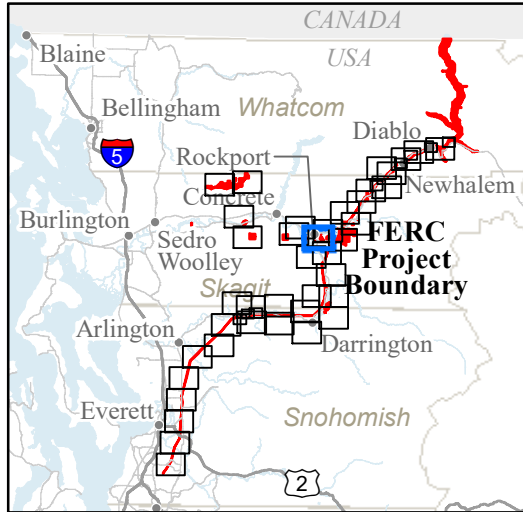


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- Fan Deposits
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- Debris Flow

0 1,000 2,000 Feet

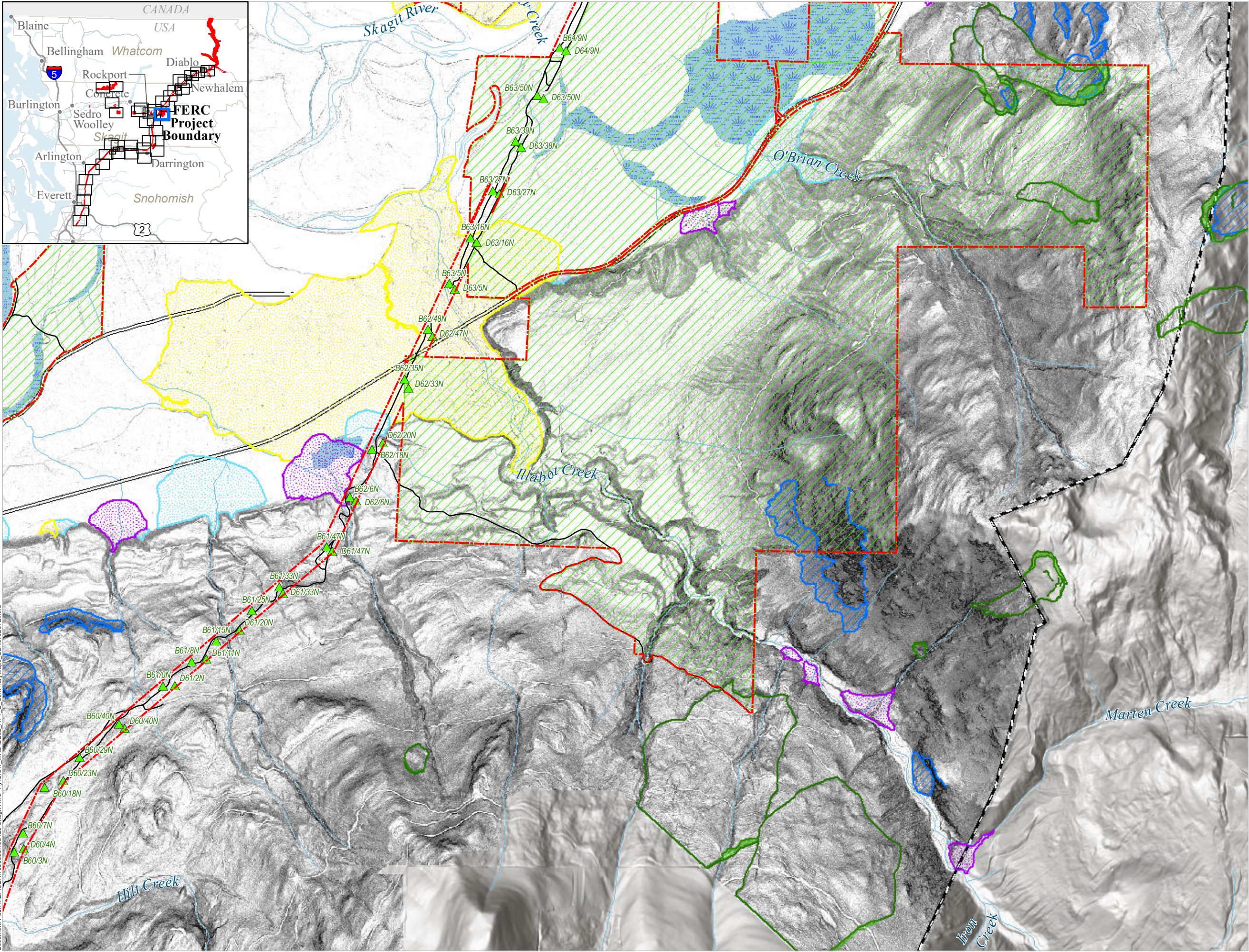
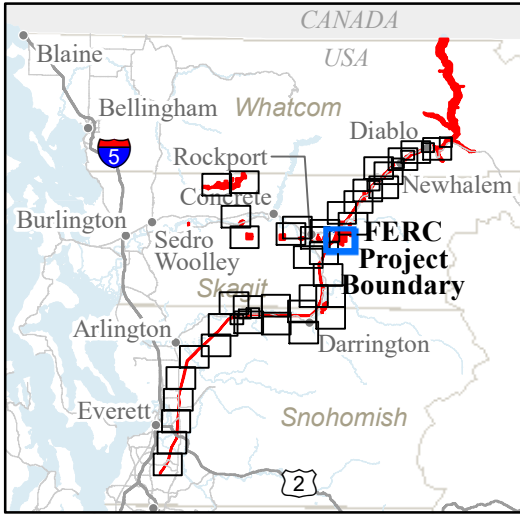
Page 14 of 40

Seattle City Light

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### GE-02: SUMMARY

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0 1,000 2,000 Feet

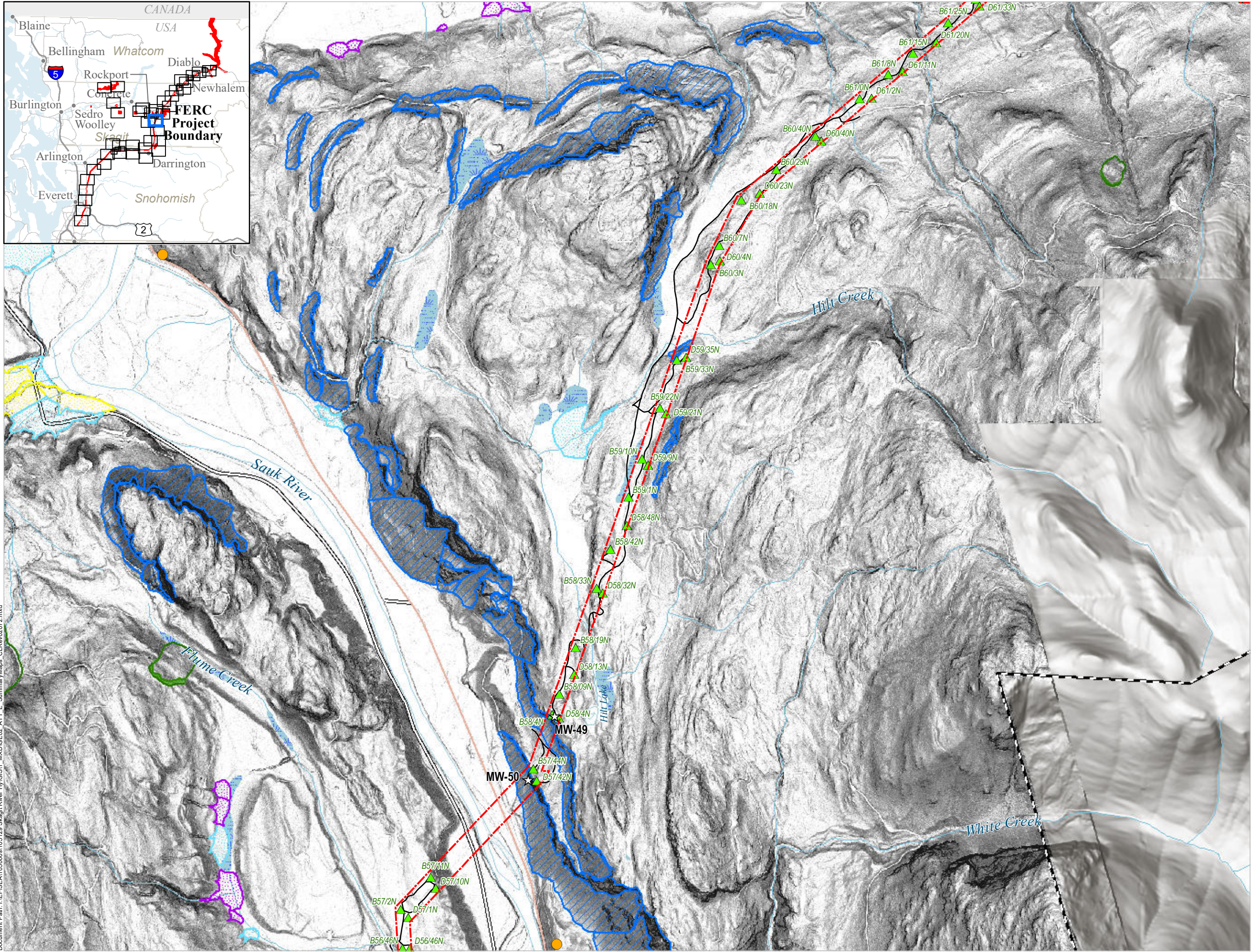
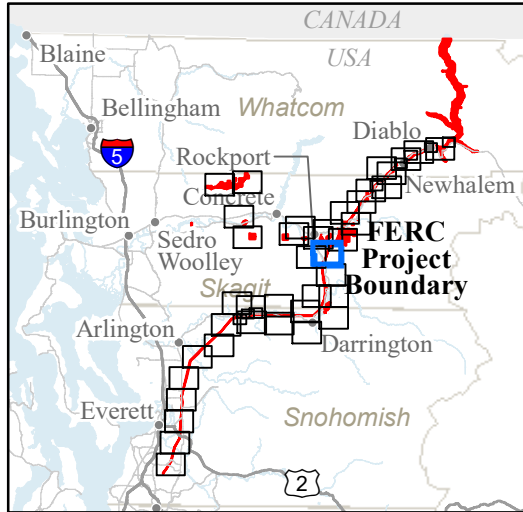
Page 15 of 40

Seattle City Light

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0 1,000 2,000 Feet

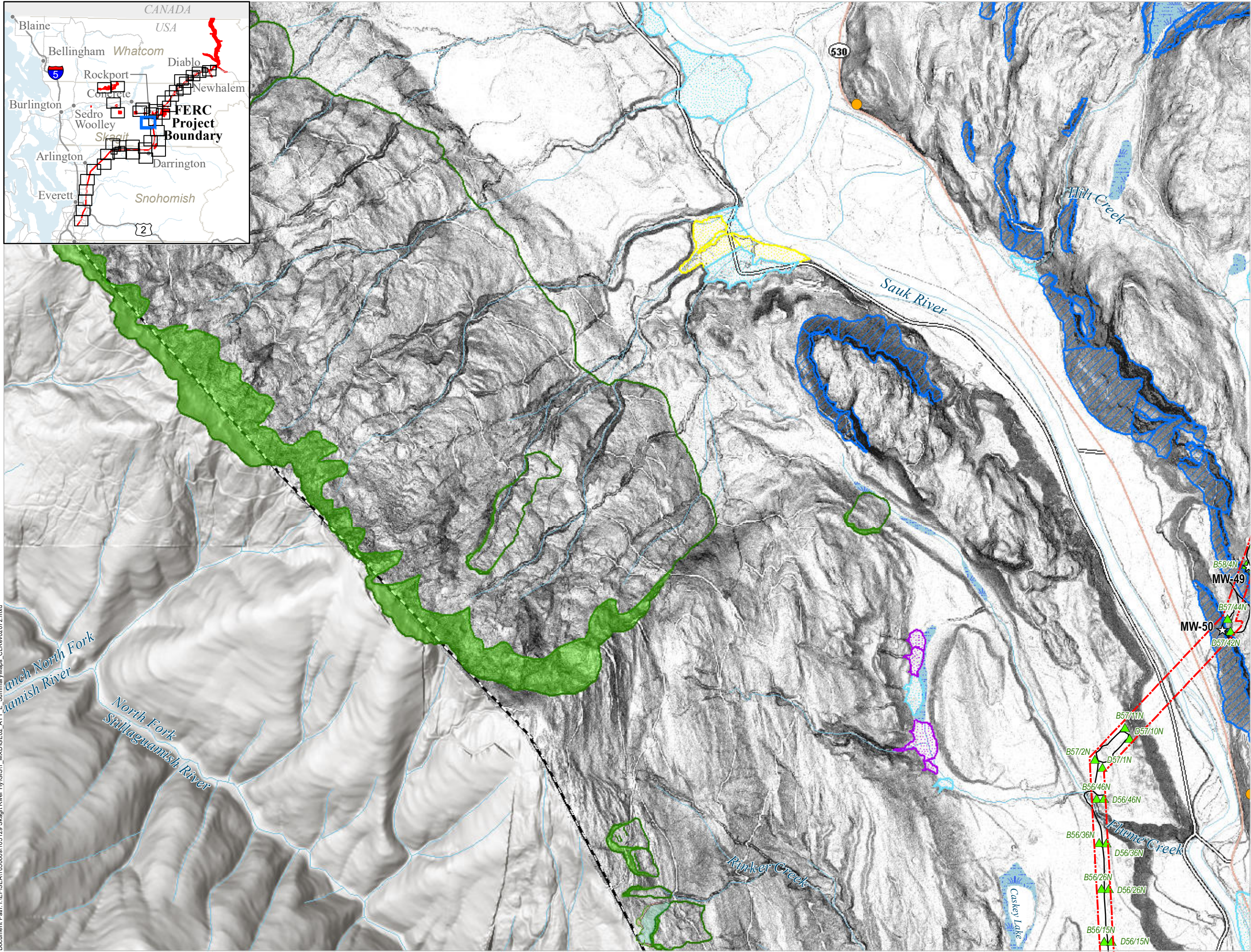
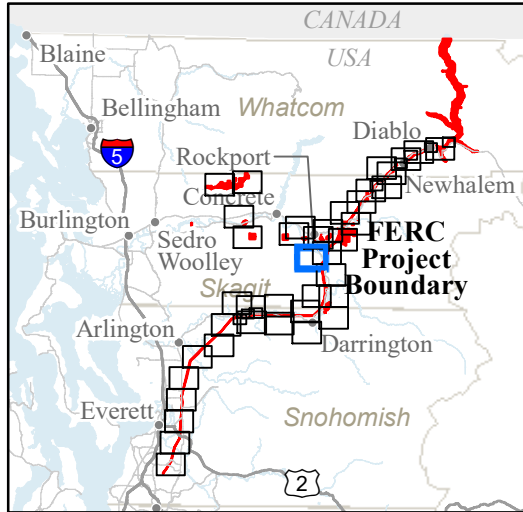
Page 16 of 40

Seattle City Light

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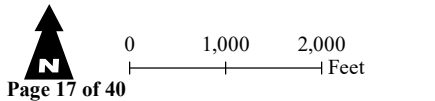
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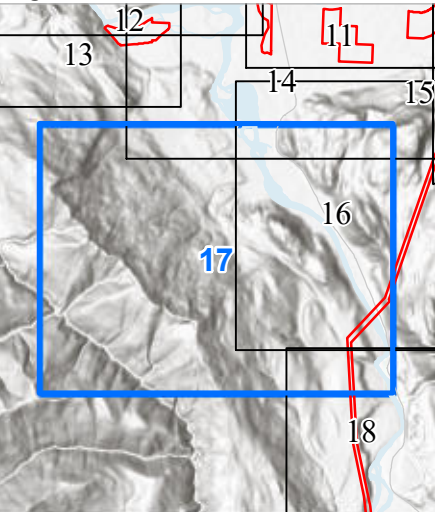


GE-02: SUMMARY

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Page 17 of 40

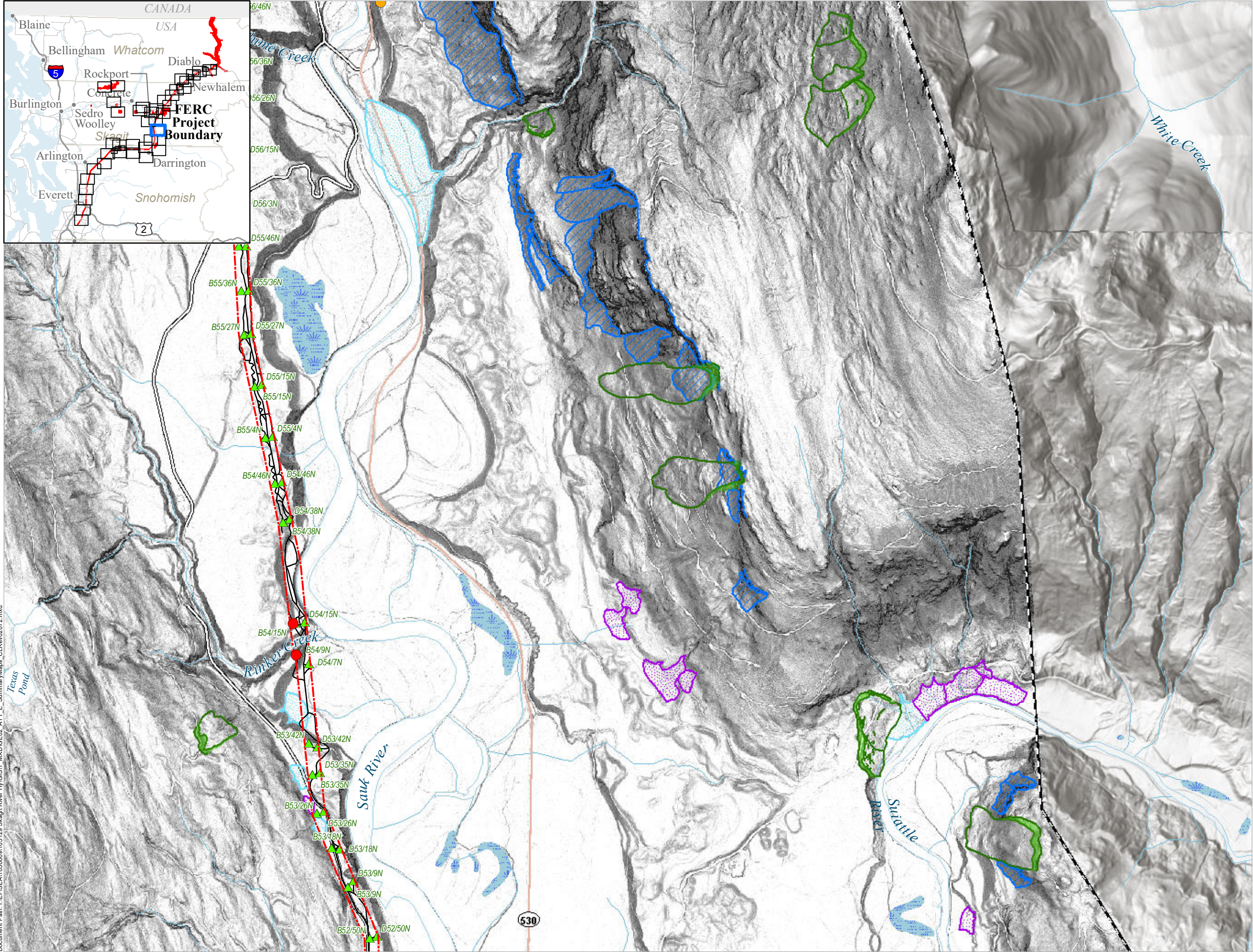
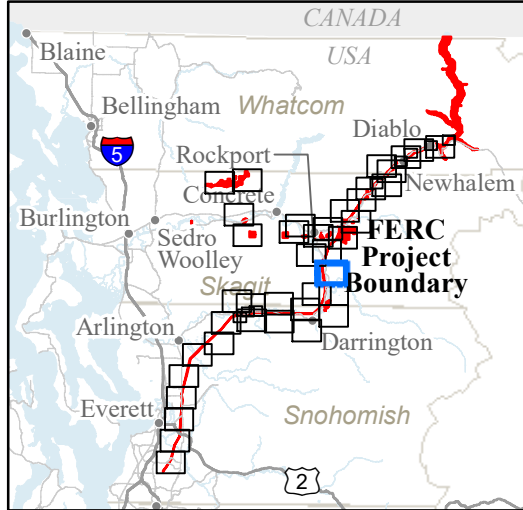


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### GE-02: SUMMARY

FERC Project Boundary

City Light Transmission Line Tower Locations

Study Routes

Road

Mass Wasting Study Boundary

SCL Reported Slope Failure Location

WSDOT Reported Slope Failure Locations

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Rockfall Scarps

Rockfall Talus Deposits

Fan Deposits

Debris Flood

Debris Flow

0

1,000

2,000

Feet

Page 18 of 40

17

16

18

19

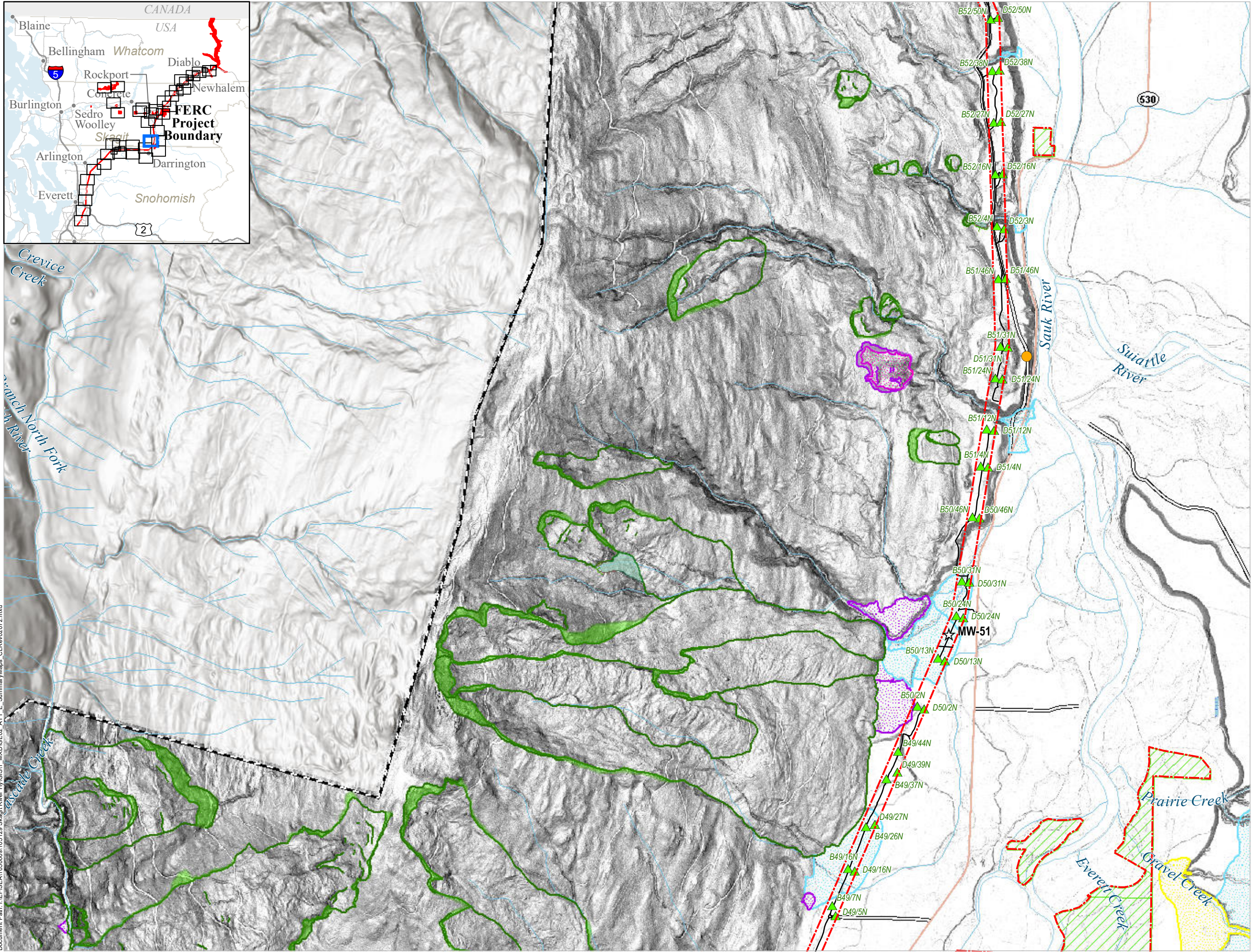
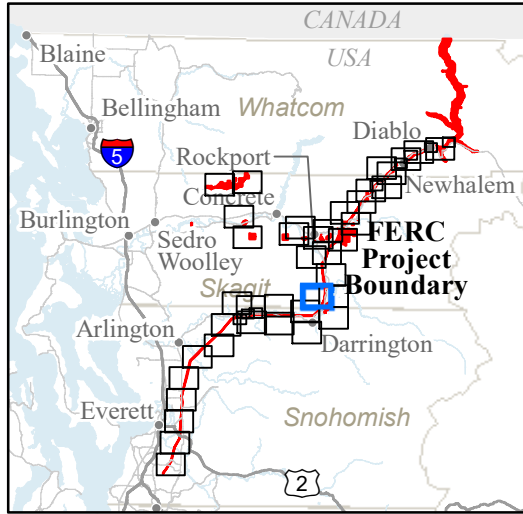
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### GE-02: SUMMARY

FERC Project Boundary

City Light Transmission Line Tower Locations

City Light Mitigation Parcels

Study Routes

Road

Mass Wasting Study Boundary

Sites of Special Concern

WSDOT Reported Slope Failure Locations

Shallow Landslide Head Scarps and Flanks

Shallow Landslide Deposits

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Debris Flow Head Scarps and Flanks

Debris Flow Deposits

Fan Deposits

Alluvial

Debris Flood

Debris Flow

0 1,000 2,000 Feet

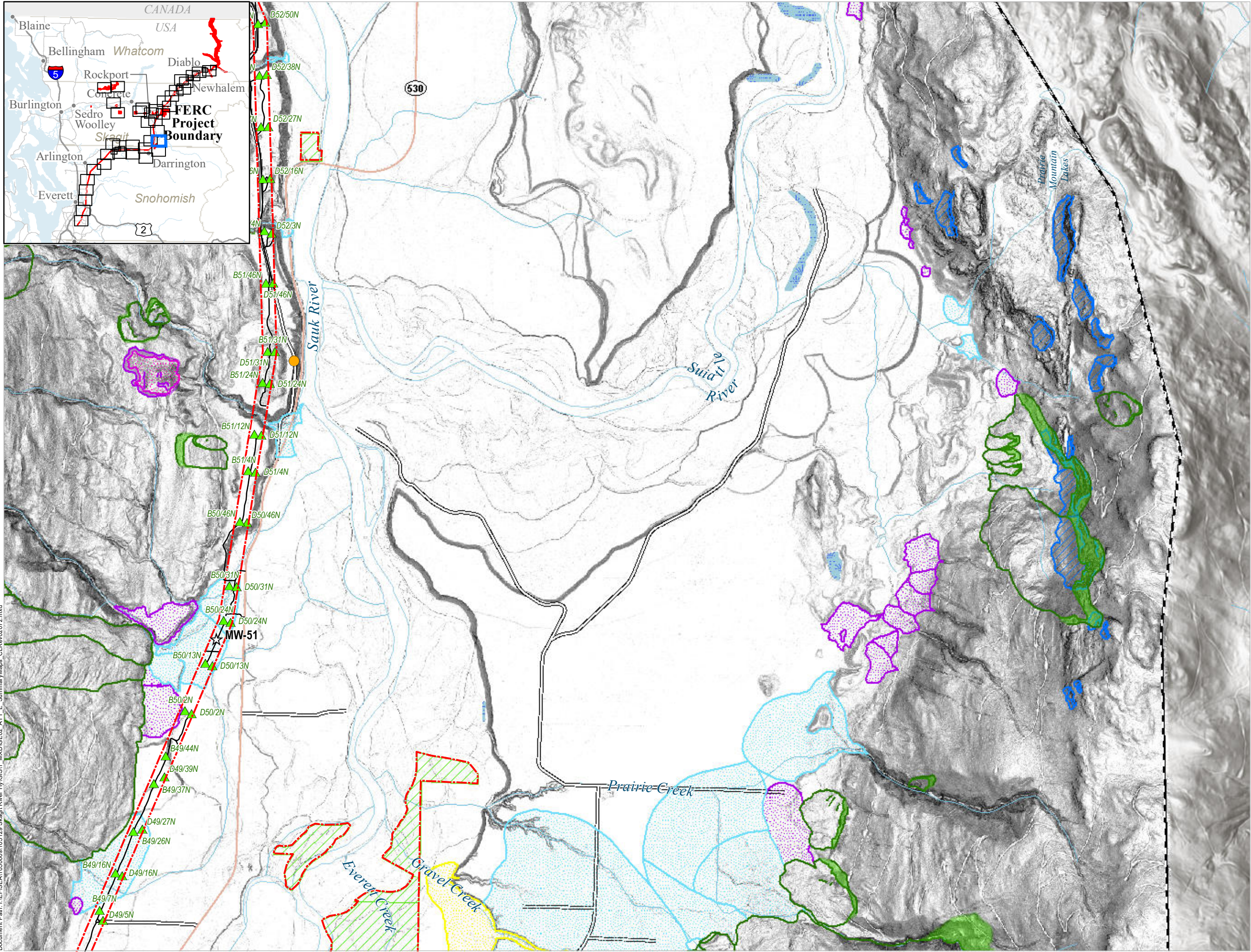
Page 19 of 40

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### GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- City Light Mitigation Parcels
- Study Routes
- Road
- Mass Wasting Study Boundary
- Sites of Special Concern
- WSDOT Reported Slope Failure Locations
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Debris Flow Head Scarps and Flanks
- Debris Flow Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

0 1,000 2,000 Feet

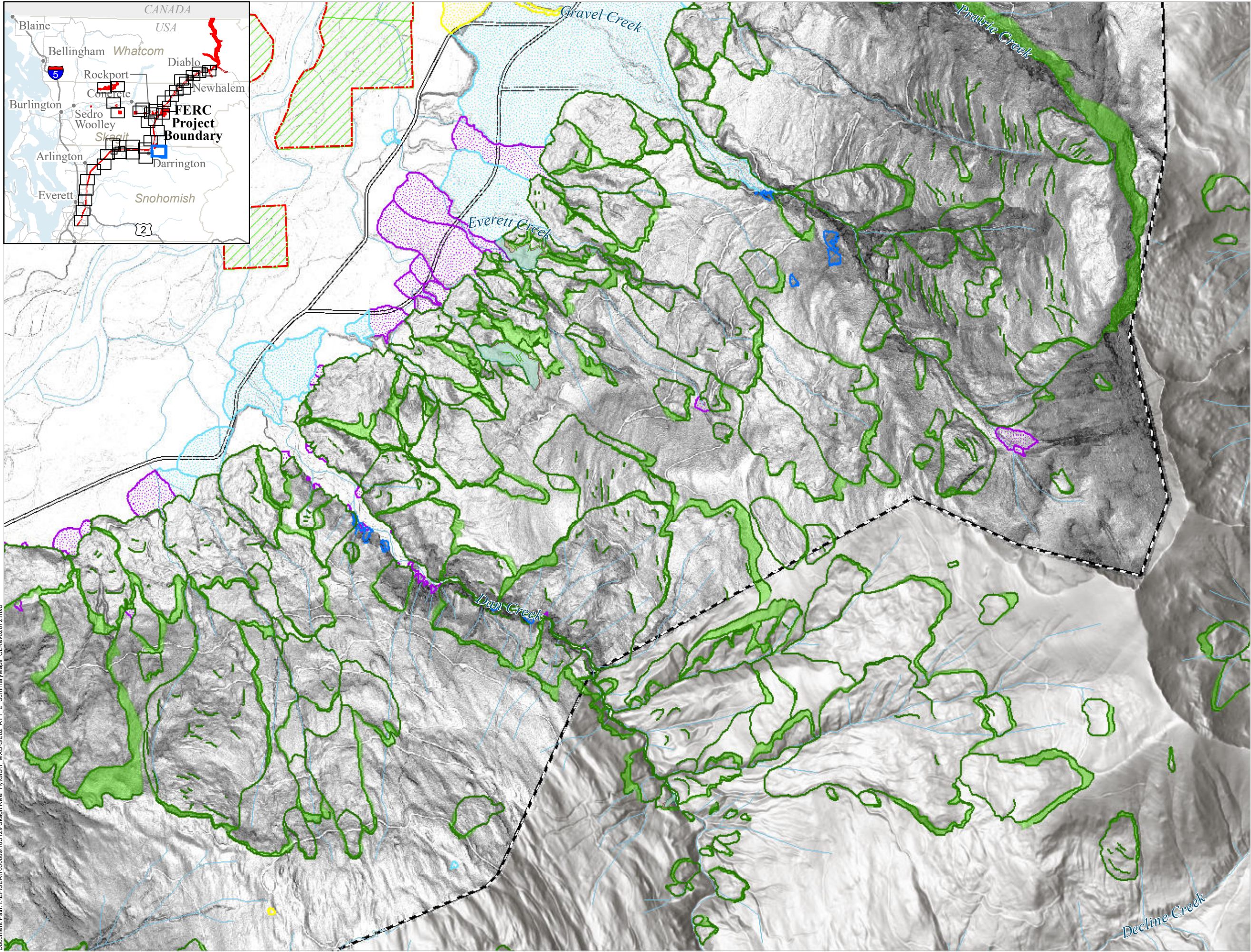
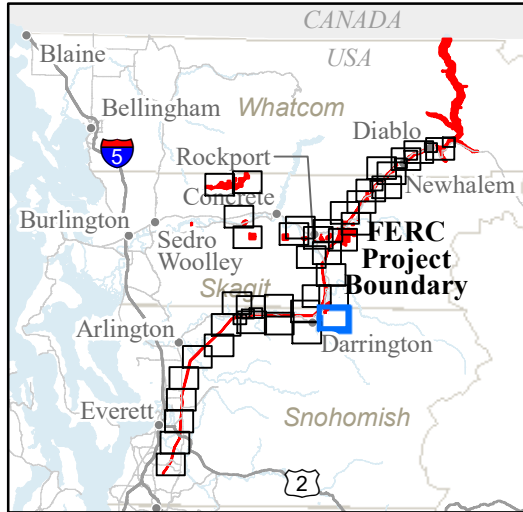
Page 20 of 40

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### GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- City Light Mitigation Parcels
- Study Routes
  - Road
- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

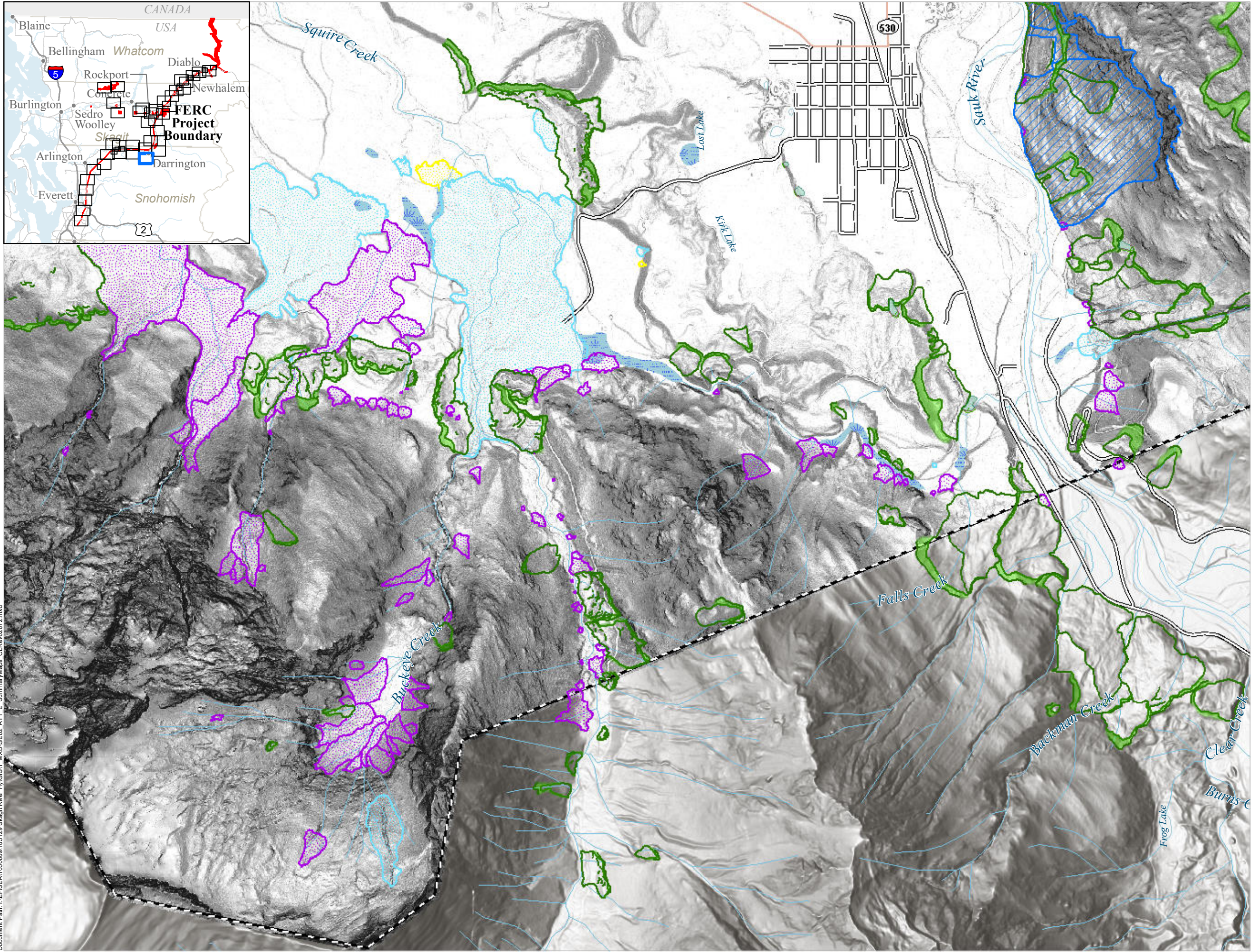
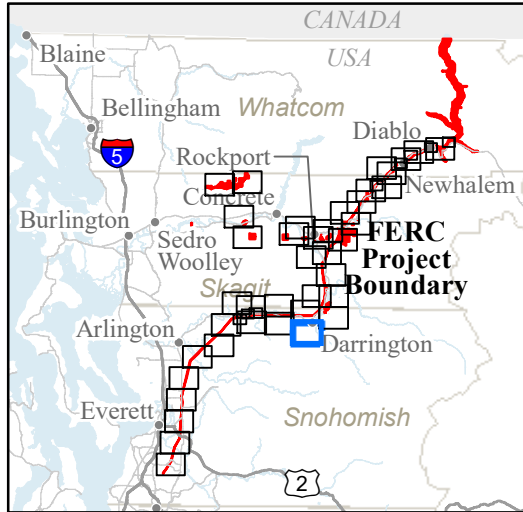
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Seattle City Light

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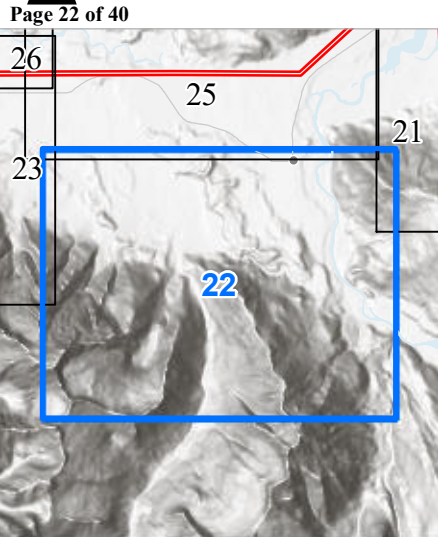
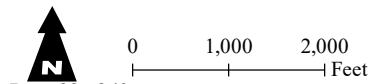
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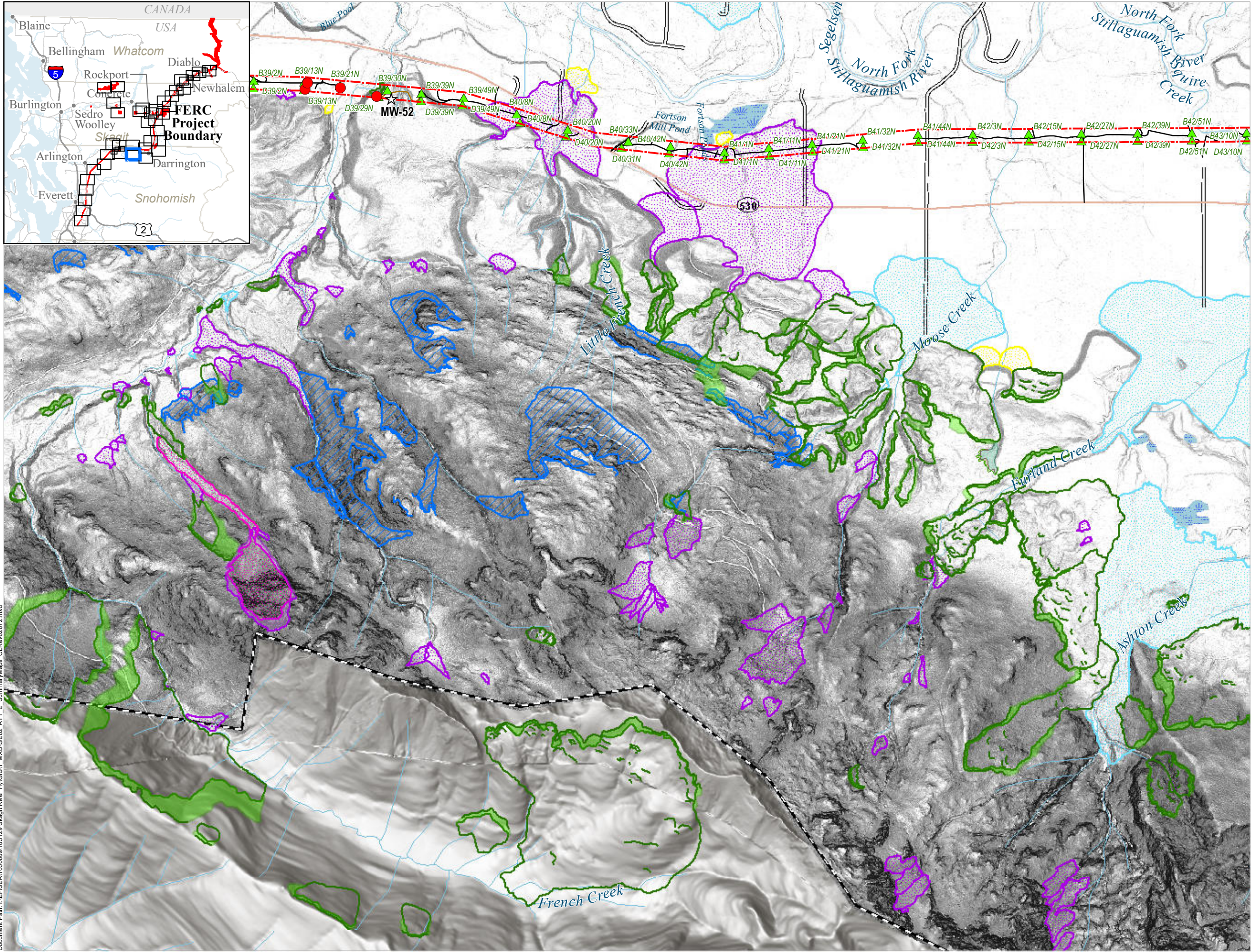
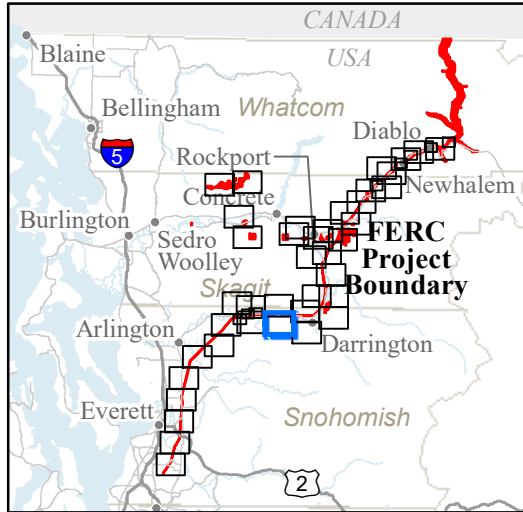


GE-02: SUMMARY

- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
- Alluvial
- Debris Flood
- Debris Flow







### GE-02: SUMMARY

FERC Project Boundary

City Light Transmission Line Tower Locations

Study Routes

Road

Trail

Mass Wasting Study Boundary

Sites of Special Concern

SCL Reported Slope Failure Location

Shallow Landslide Head Scarps and Flanks

Shallow Landslide Deposits

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Rockfall Scarps

Rockfall Talus Deposits

Debris Flow Head Scarps and Flanks

Debris Flow Deposits

Fan Deposits

Alluvial

Debris Flood

Debris Flow

0

1,000

2,000

Feet

Page 23 of 40

27

26

25

24

23

22

24A

24

23

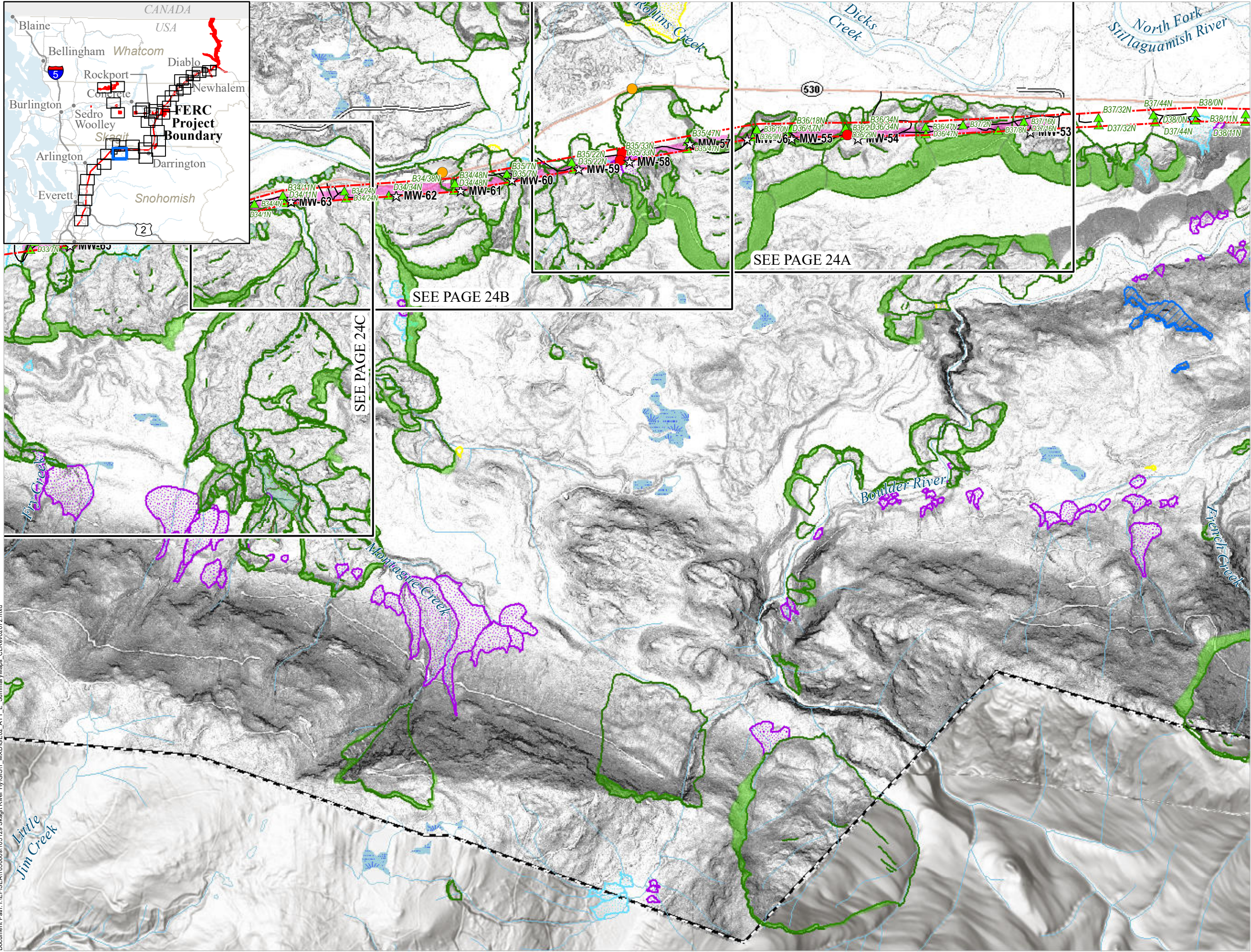
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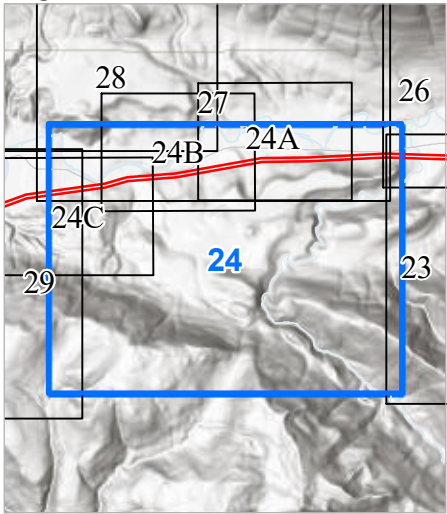
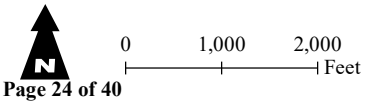
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**GE-02: SUMMARY**

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
- Road
- Mass Wasting Study Boundary
- Sites of Special Concern
- Zones of Special Concern
- SCL Reported Slope Failure Location
- WSDOT Reported Slope Failure Locations
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

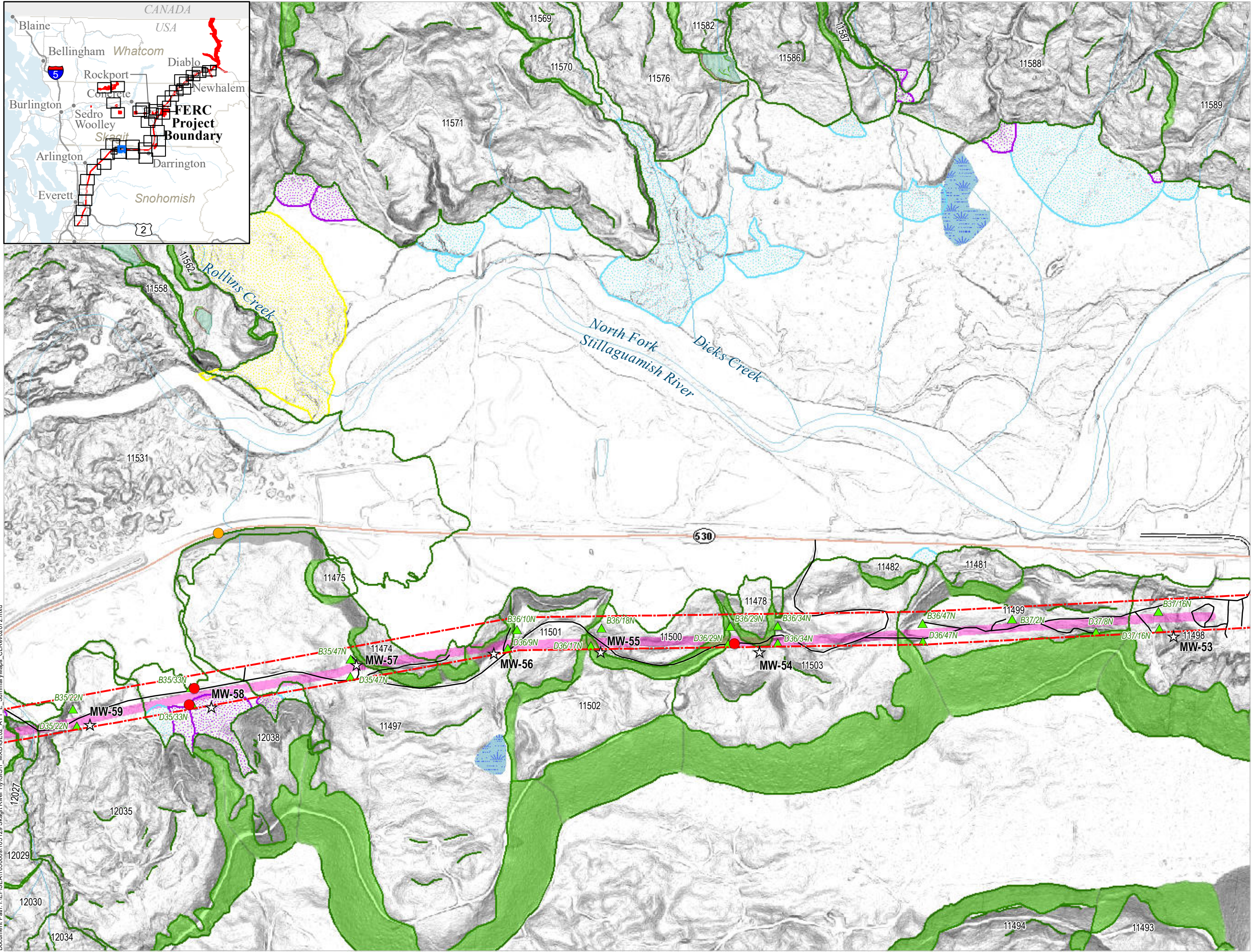
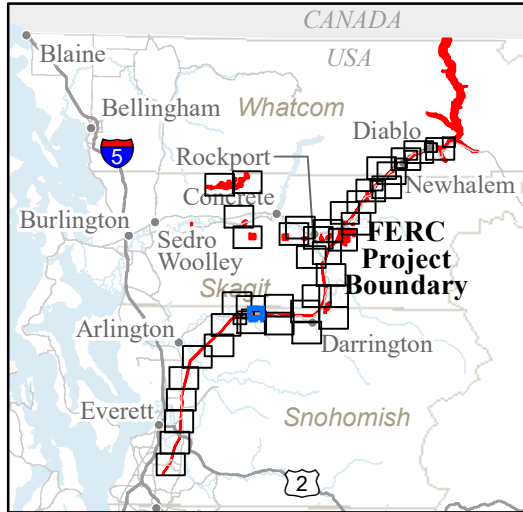


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### GE-02: SUMMARY

FERC Project Boundary

City Light Transmission Line Tower Locations

Study Routes

Road

Mass Wasting Study Boundary

Sites of Special Concern

Zones of Special Concern

SCL Reported Slope Failure Location

WSDOT Reported Slope Failure Locations

Shallow Landslide Head Scarps and Flanks

Shallow Landslide Deposits

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Fan Deposits

Alluvial

Debris Flood

Debris Flow

0

450

900

Feet

Page 24A of 40

28

27

24B

24A

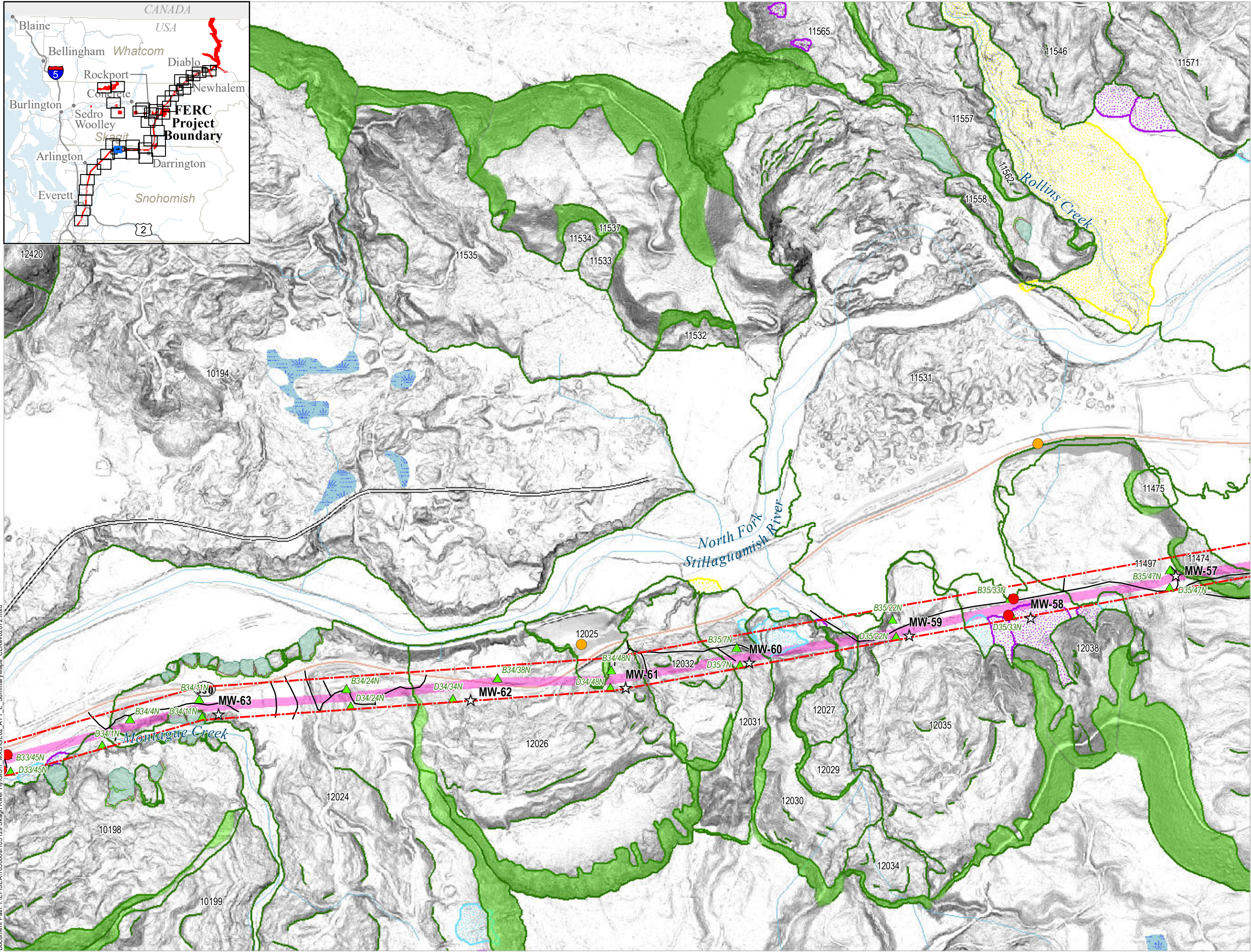
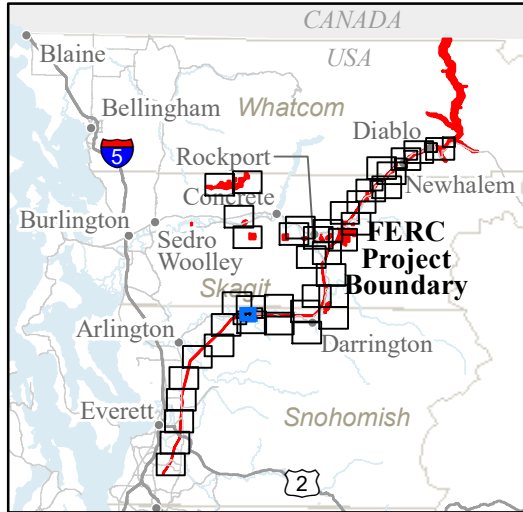
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### GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Mass Wasting Study Boundary
  - Sites of Special Concern
  - Zones of Special Concern
  - SCL Reported Slope Failure Location
  - WSDOT Reported Slope Failure Locations
  - Shallow Landslide Head Scarps and Flanks
  - Shallow Landslide Deposits
  - Deep Landslide Scarps
  - Deep Landslide Head Scarps and Flanks
  - Deep Landslide Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

0 450 900 Feet

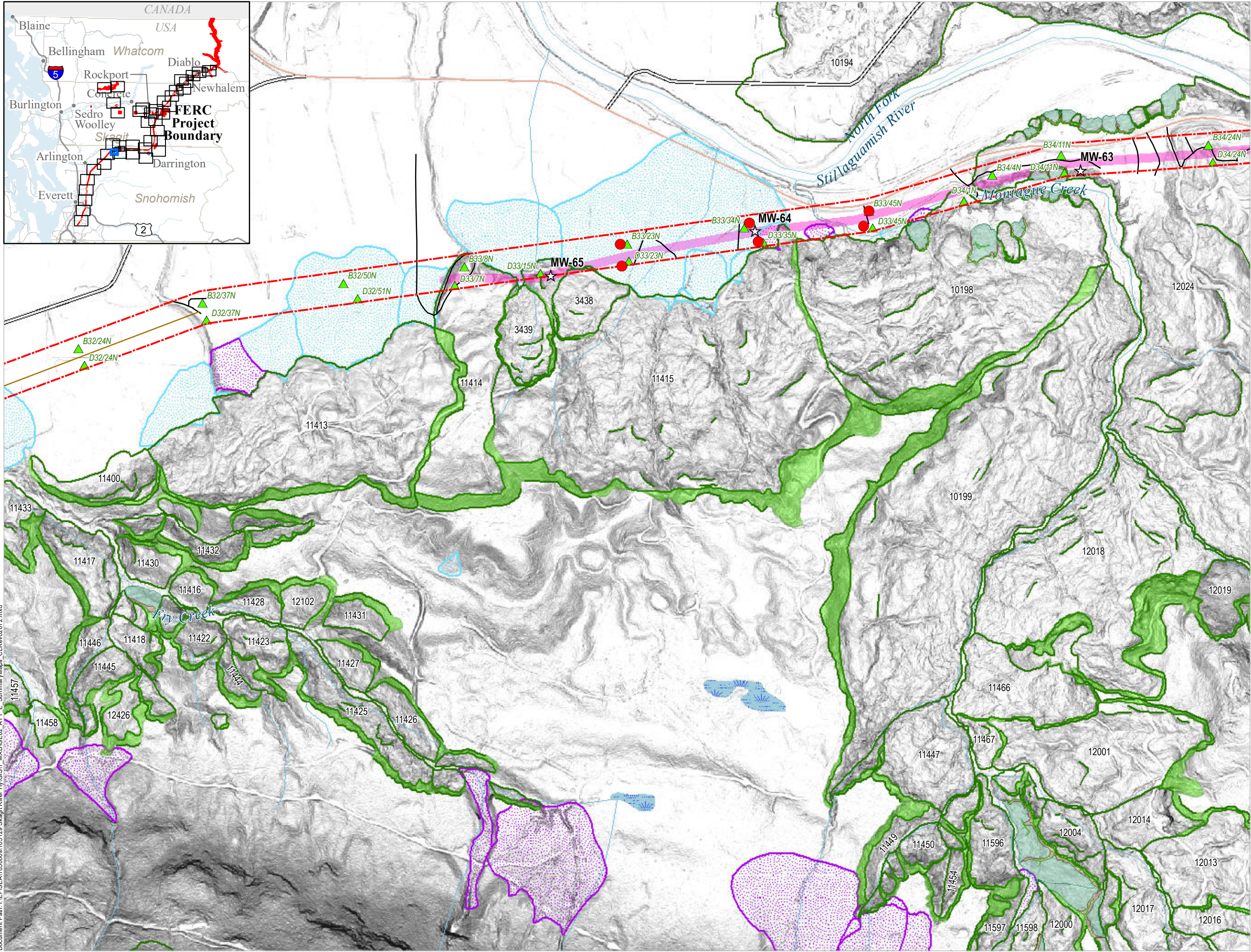
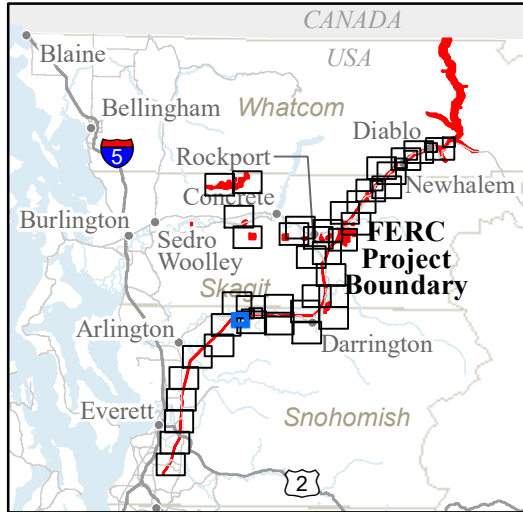
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Seattle City Light

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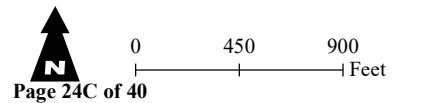
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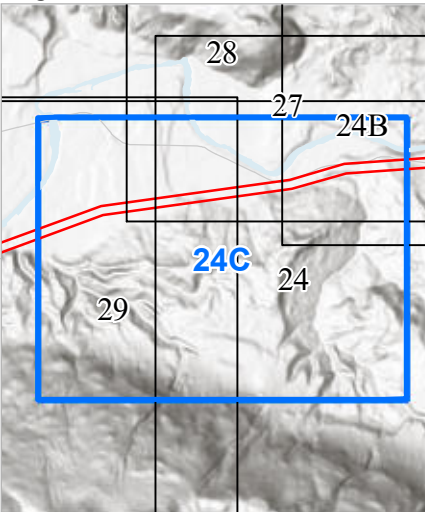


## GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Trail
- Mass Wasting Study Boundary
- Sites of Special Concern
- Zones of Special Concern
- SCL Reported Slope Failure Location
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Fan Deposits
  - Debris Flood
  - Debris Flow



Page 24C of 40

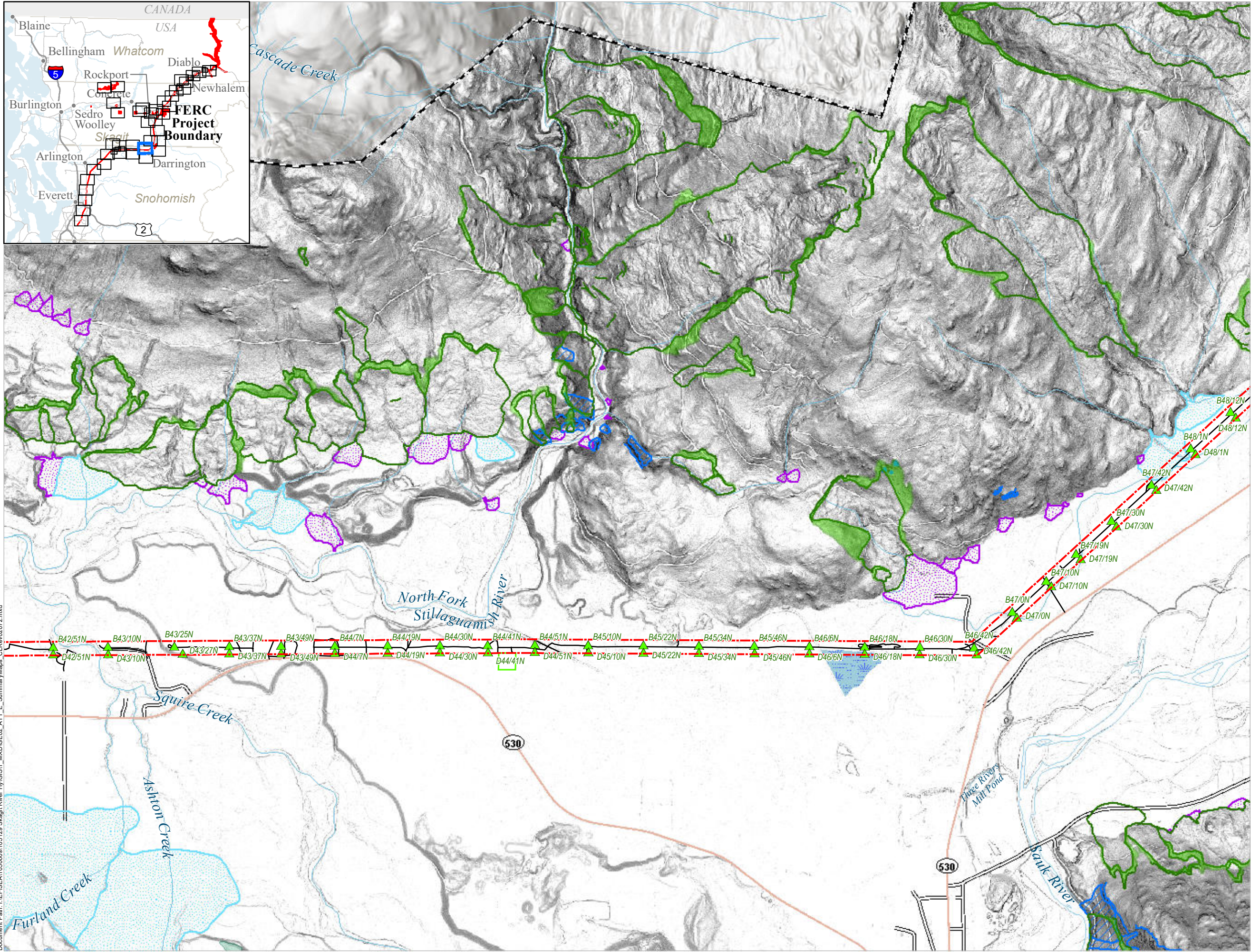
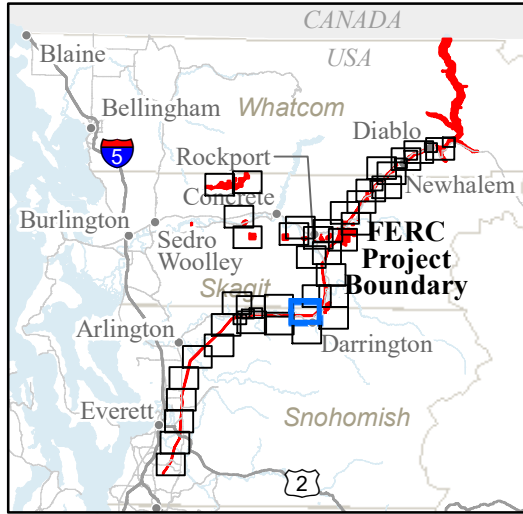


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### GE-02: SUMMARY

- FERC Project Boundary
- City Light Major Facilities
- City Light Transmission Line Tower Locations

Study Routes

- Road
- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits

Fan Deposits

- Debris Flood
- Debris Flow

0 1,000 2,000 Feet

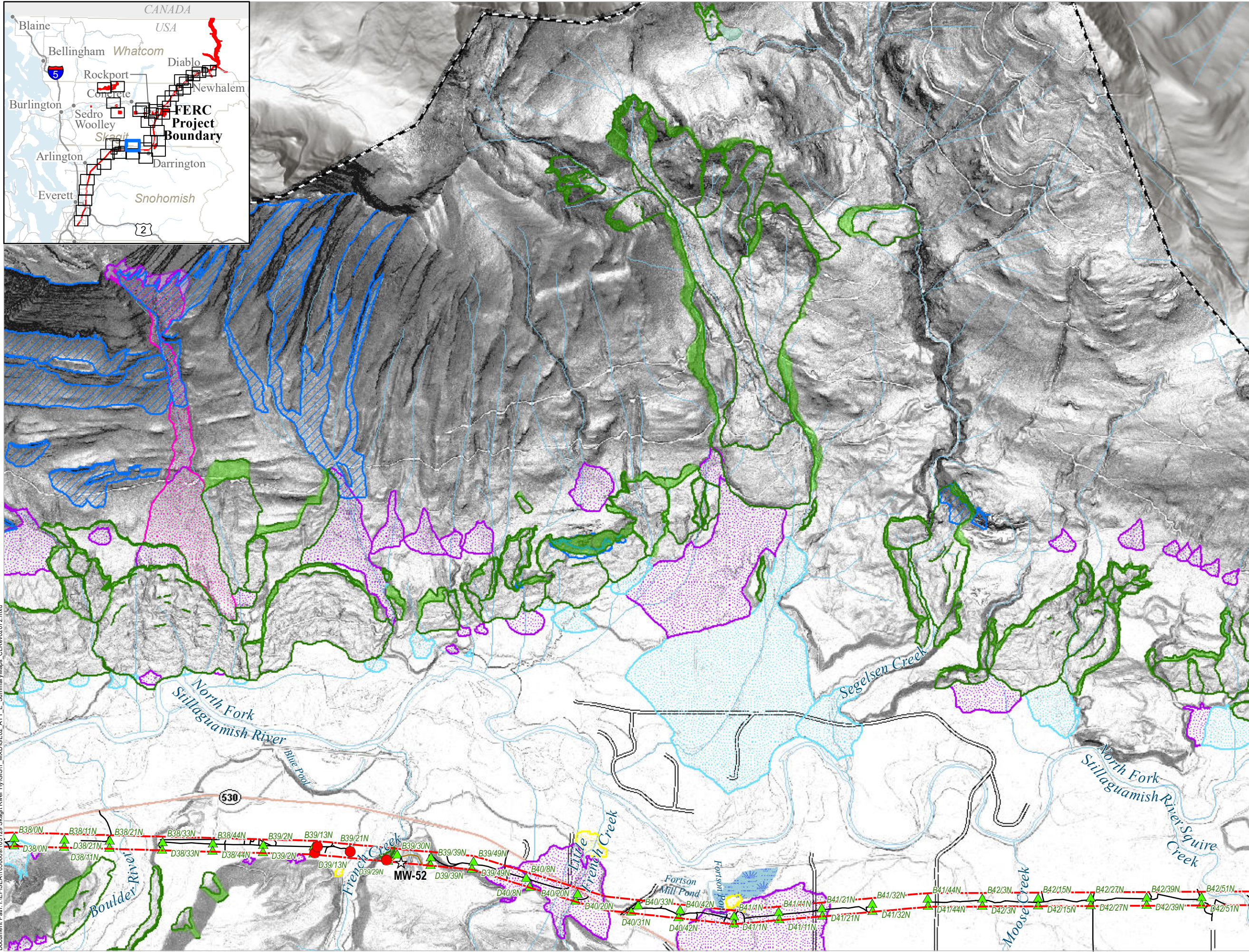
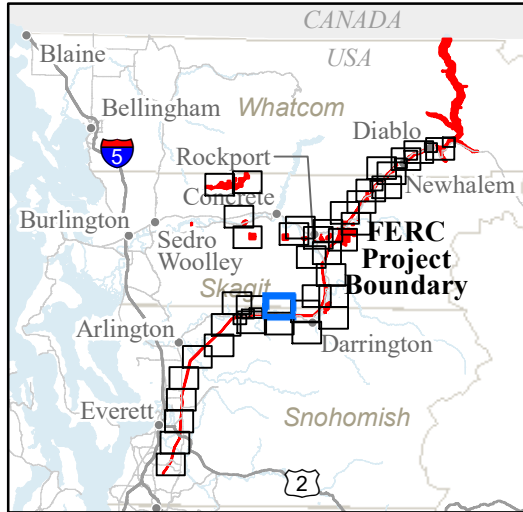
Page 25 of 40

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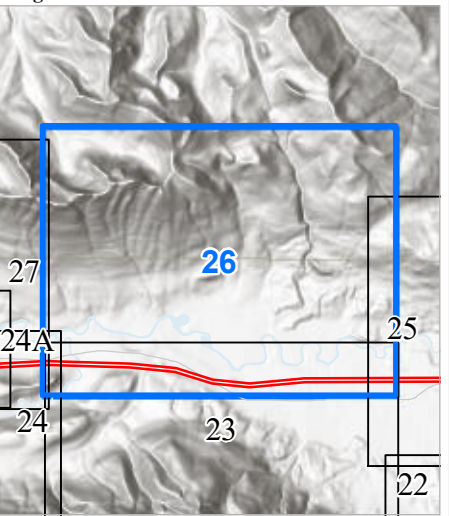
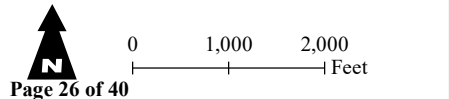
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## GE-02: SUMMARY

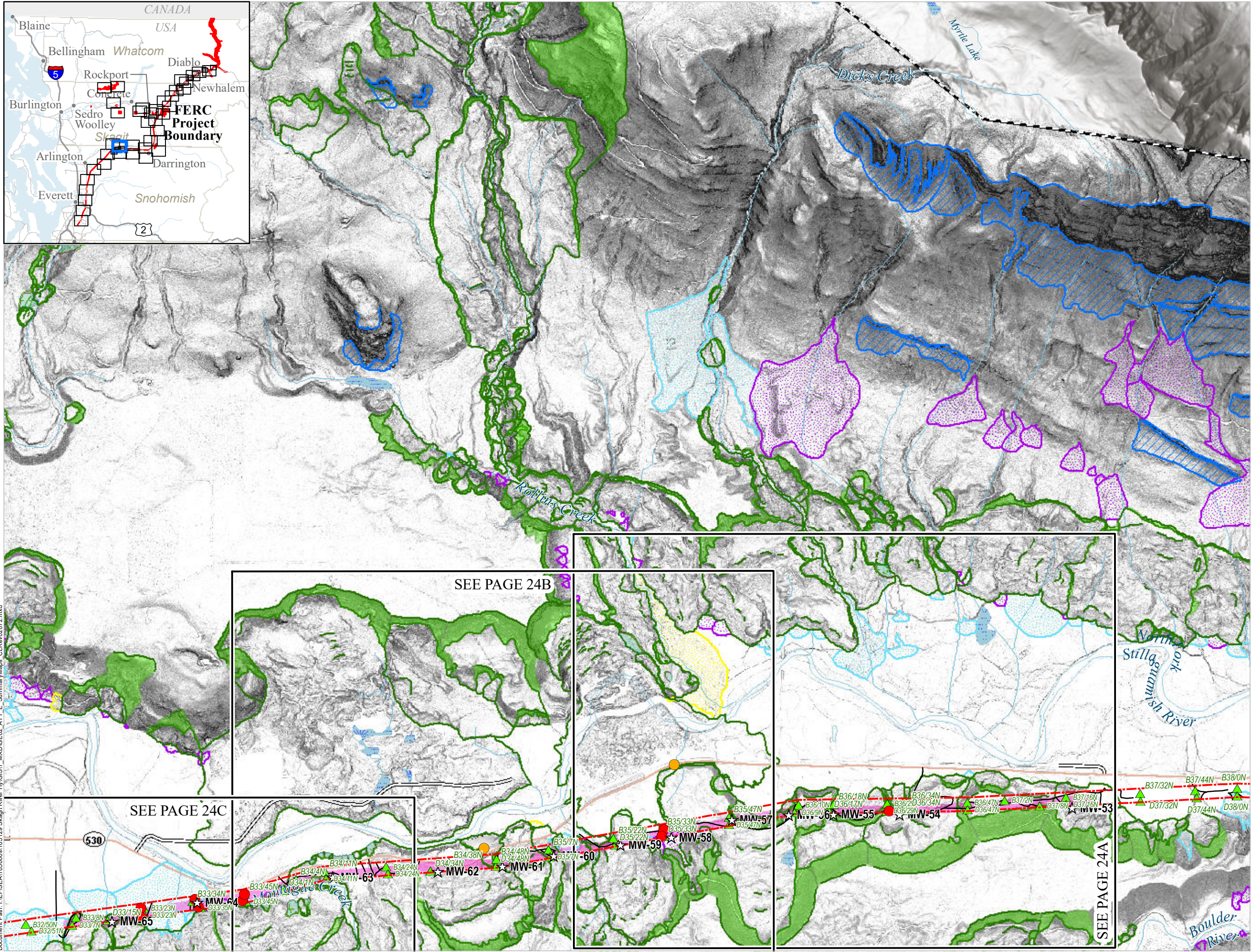
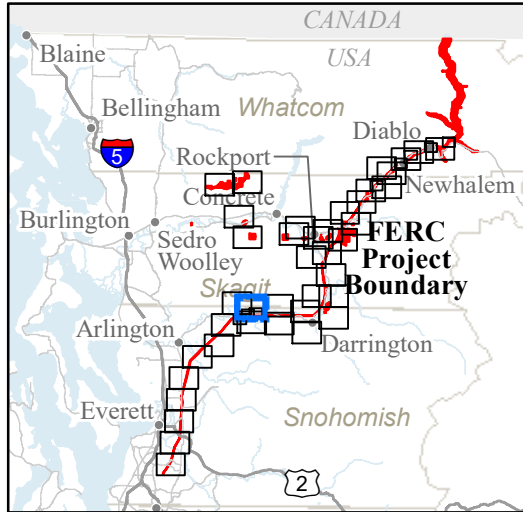
- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Trail
- Mass Wasting Study Boundary
- Sites of Special Concern
- SCL Reported Slope Failure Location
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Debris Flow Head Scarps and Flanks
- Debris Flow Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow



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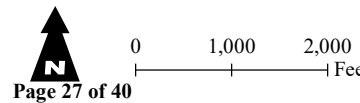
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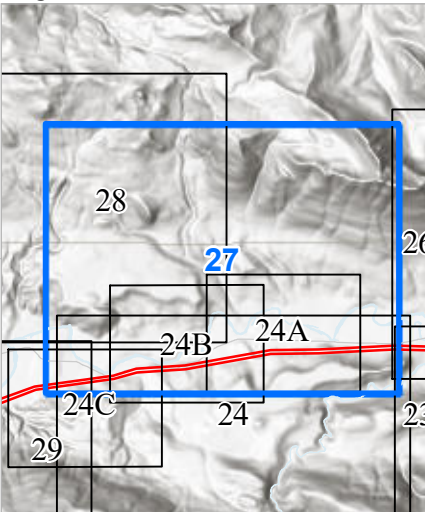


## GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
- Road
- Mass Wasting Study Boundary
- Sites of Special Concern
- Zones of Special Concern
- SCL Reported Slope Failure Location
- WSDOT Reported Slope Failure Locations
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
- Alluvial
- Debris Flood
- Debris Flow



Page 27 of 40

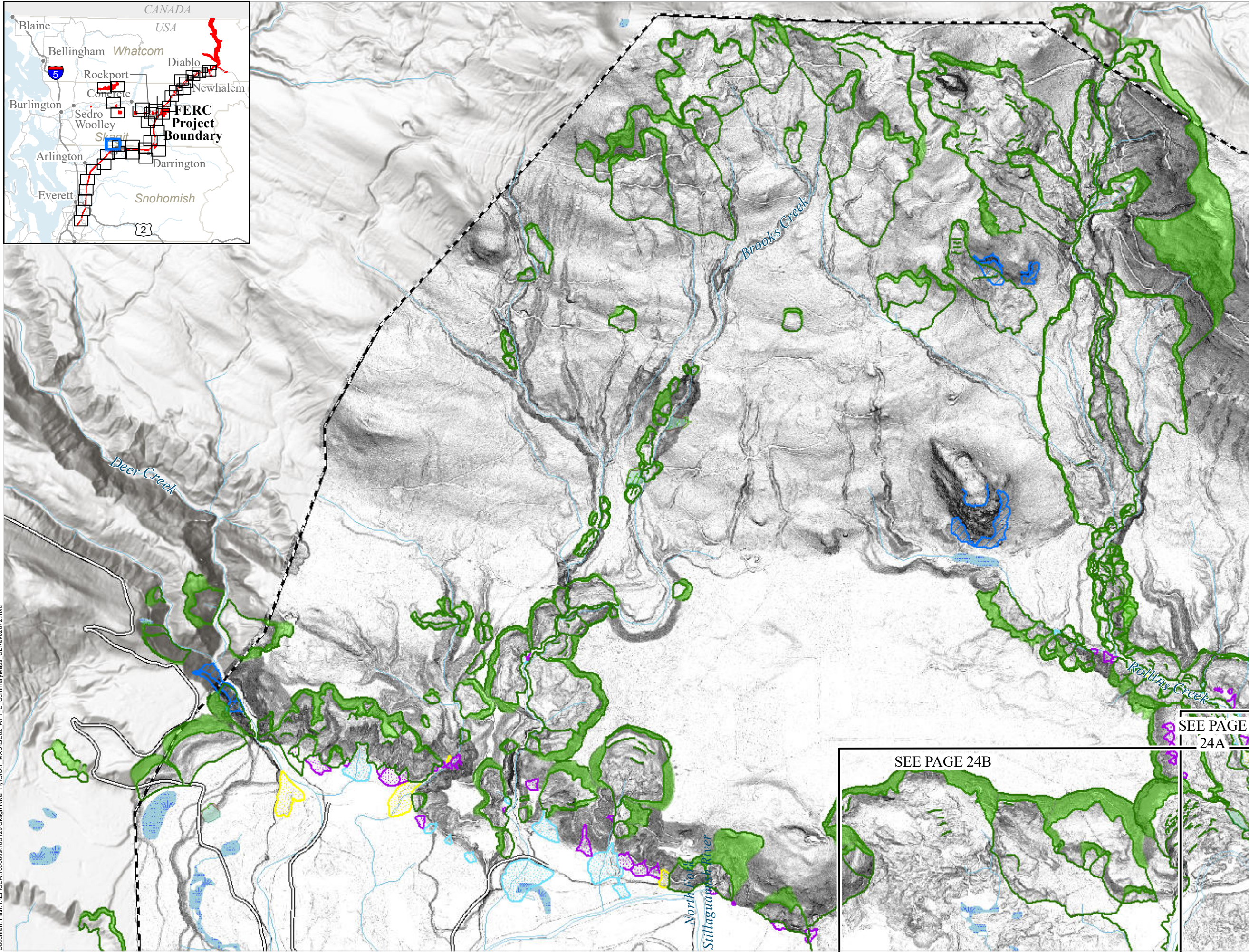
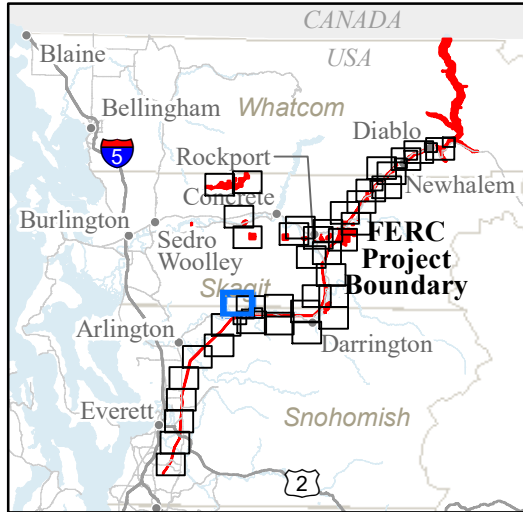


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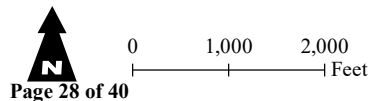
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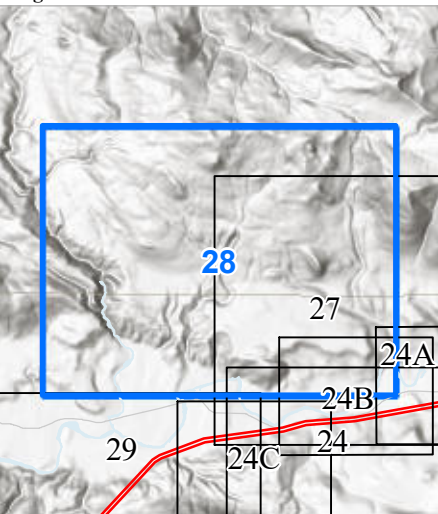


## GE-02: SUMMARY

- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Rockfall Scarps
- Rockfall Talus Deposits
- Fan Deposits
- Alluvial
- Debris Flood
- Debris Flow



Page 28 of 40



Seattle City Light

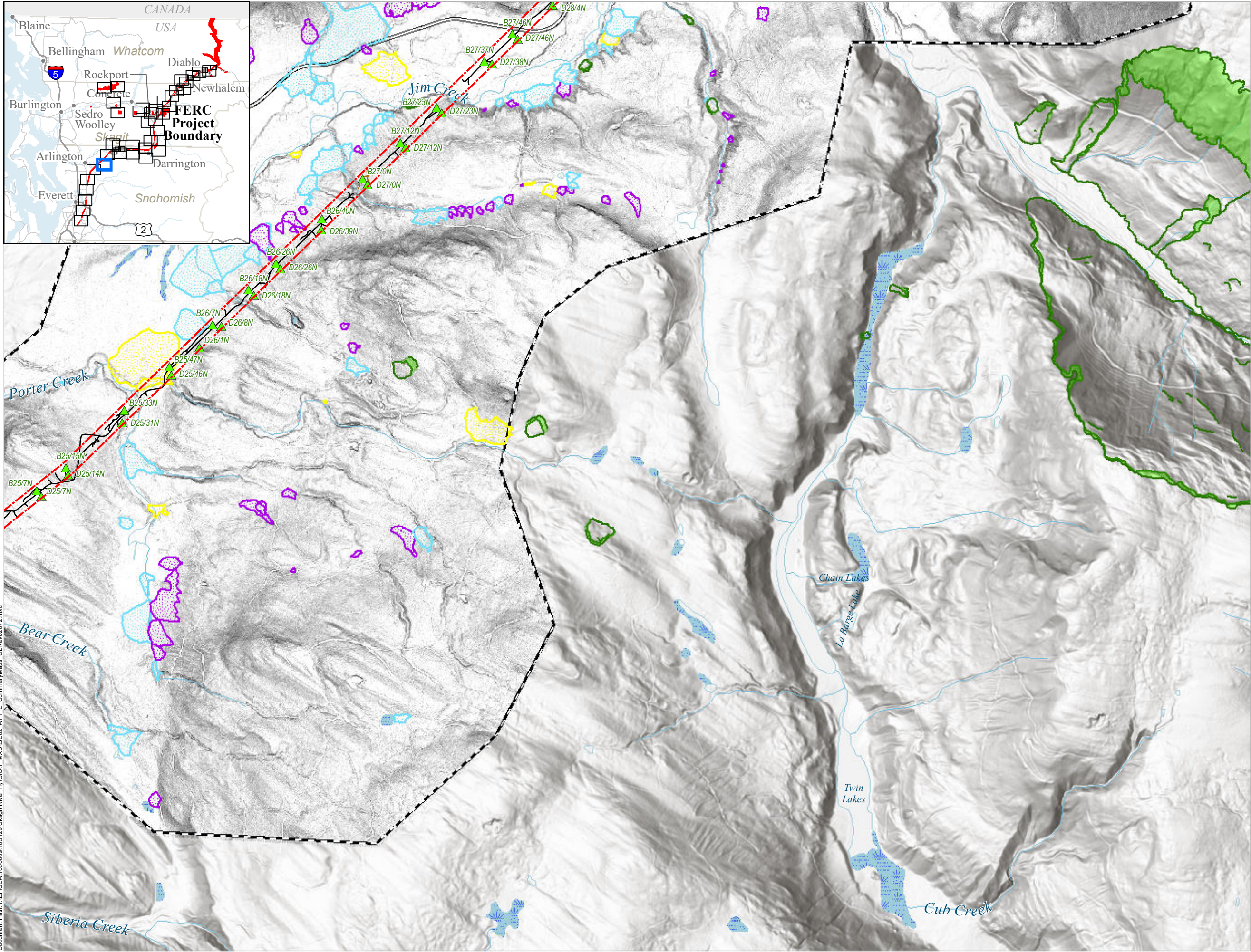
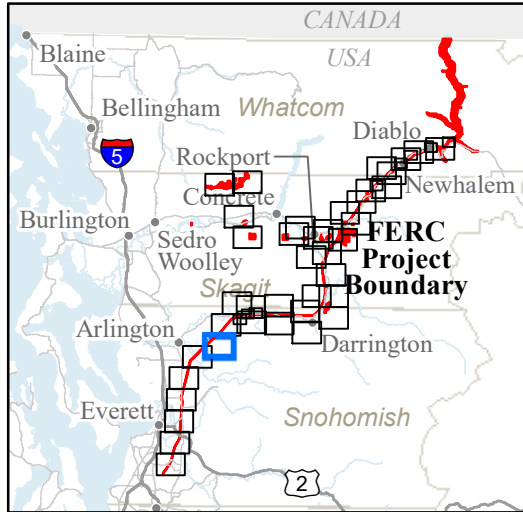
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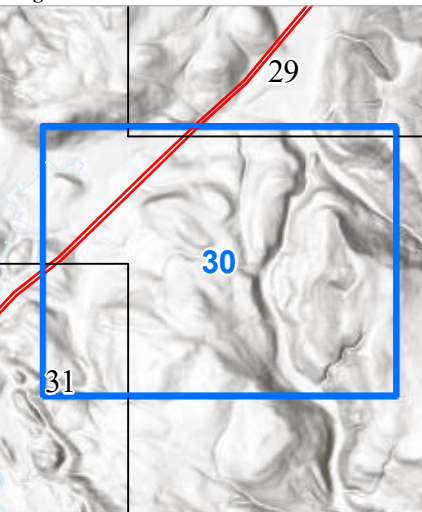


## GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Trail
- Mass Wasting Study Boundary
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow



Page 30 of 40

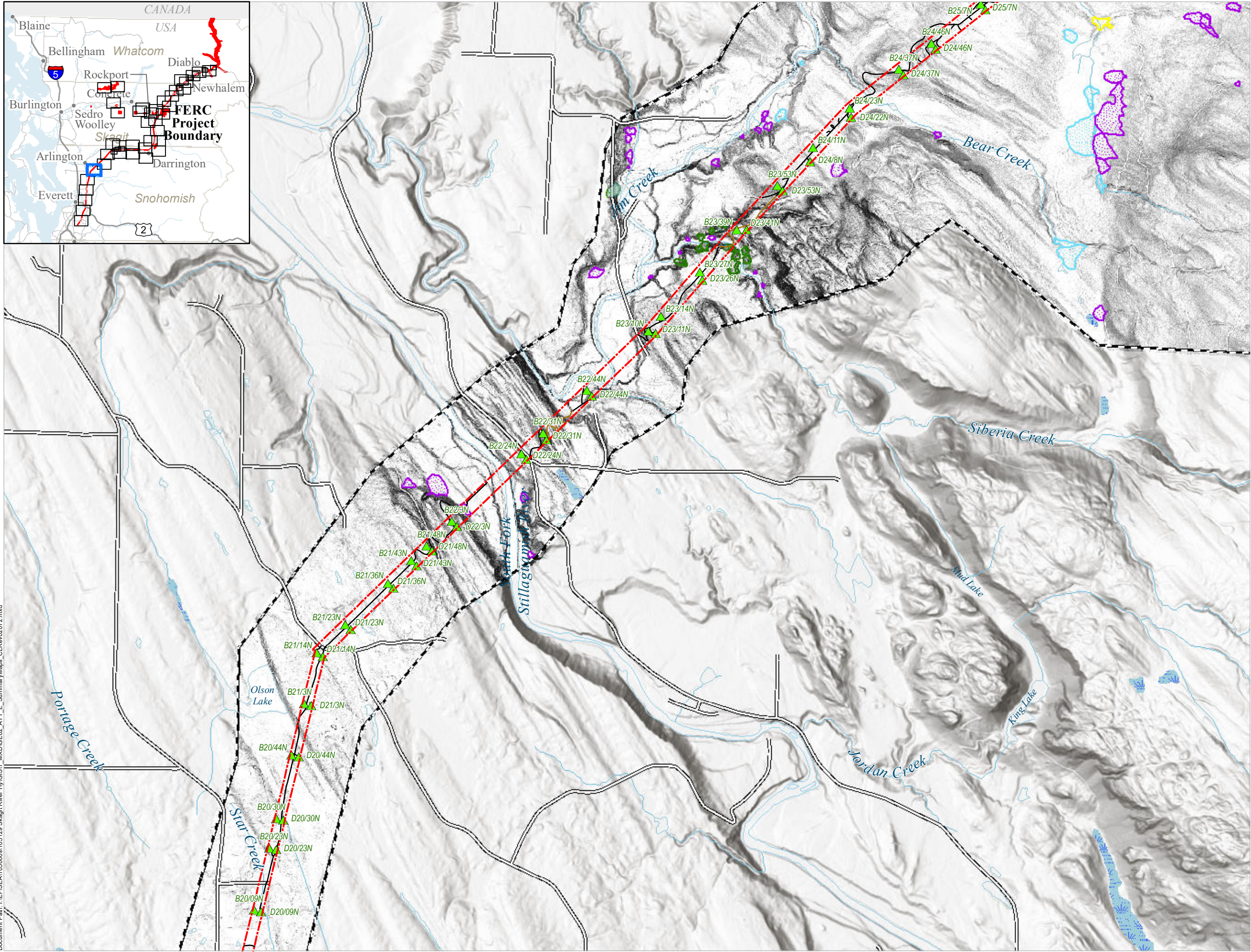
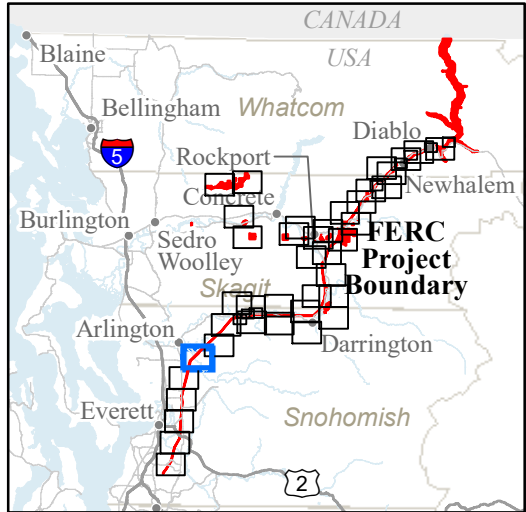


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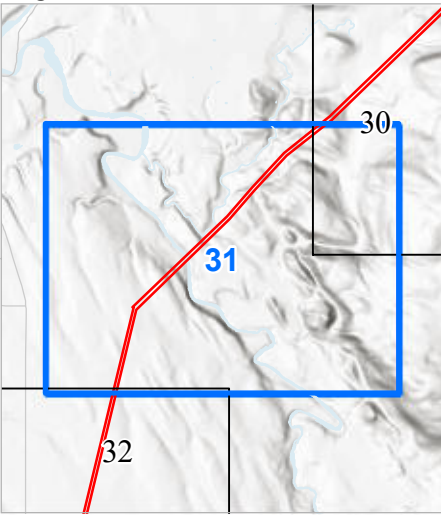
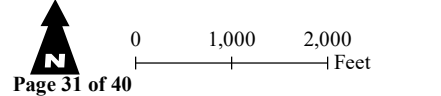
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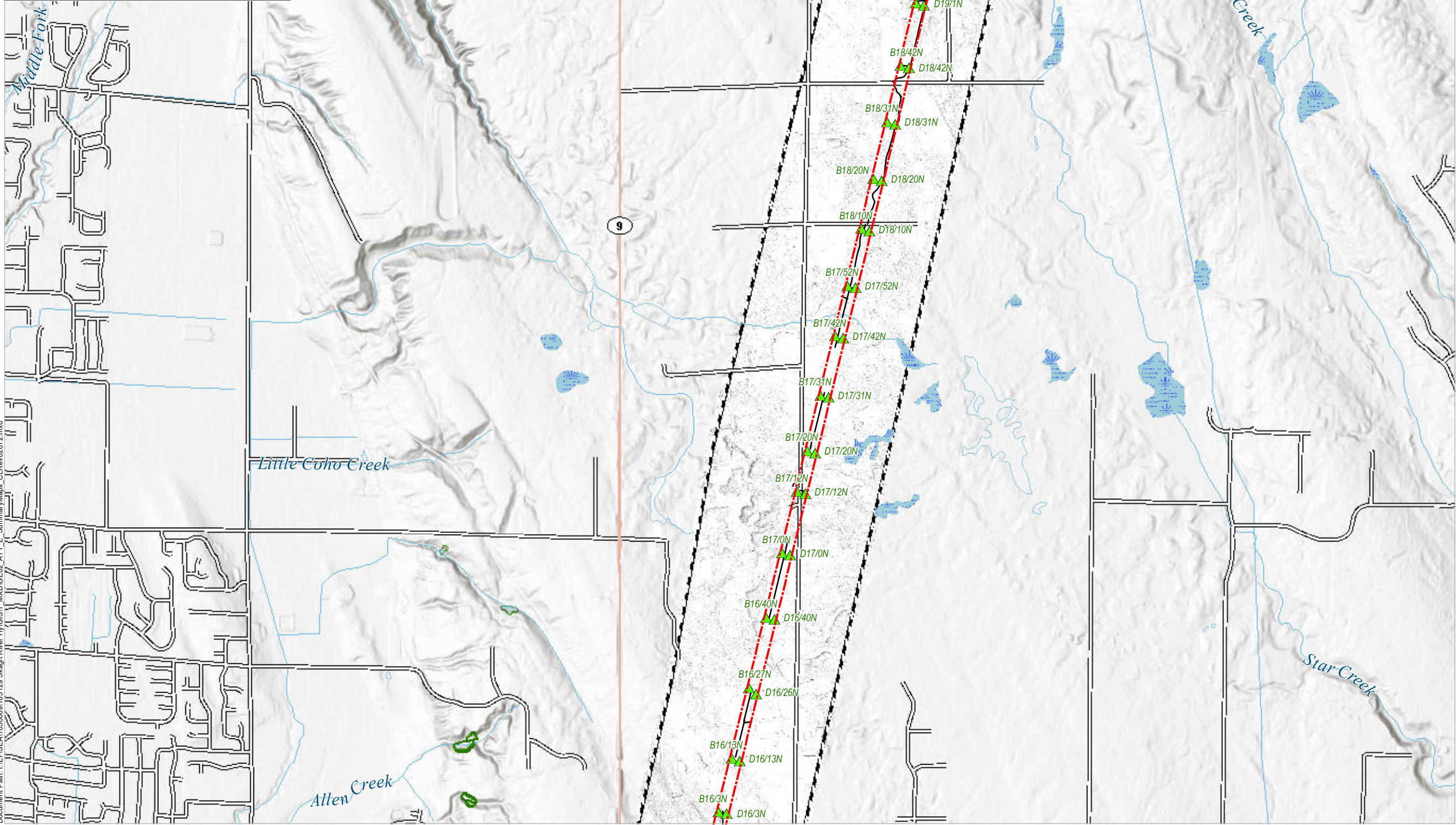
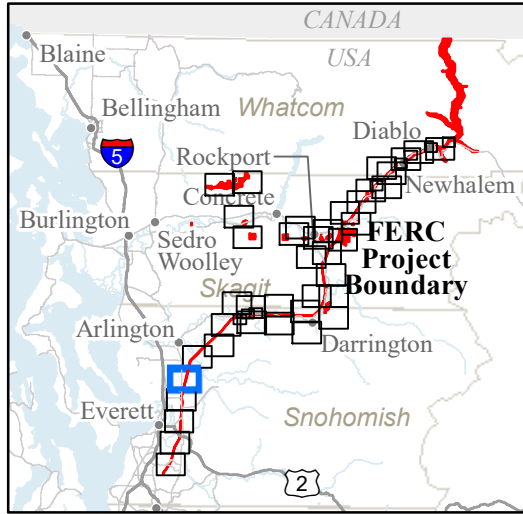


### GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Trail
- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Fan Deposits
  - Alluvial
  - Debris Flood
  - Debris Flow

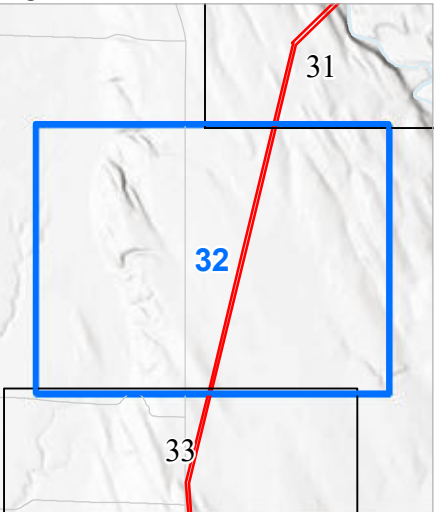
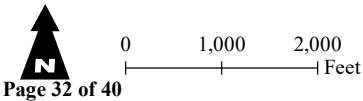






## GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
  - Road
  - Mass Wasting Study Boundary
  - Shallow Landslide Head Scarps and Flanks
  - Shallow Landslide Deposits
  - Deep Landslide Scarps
  - Deep Landslide Head Scarps and Flanks
  - Deep Landslide Deposits

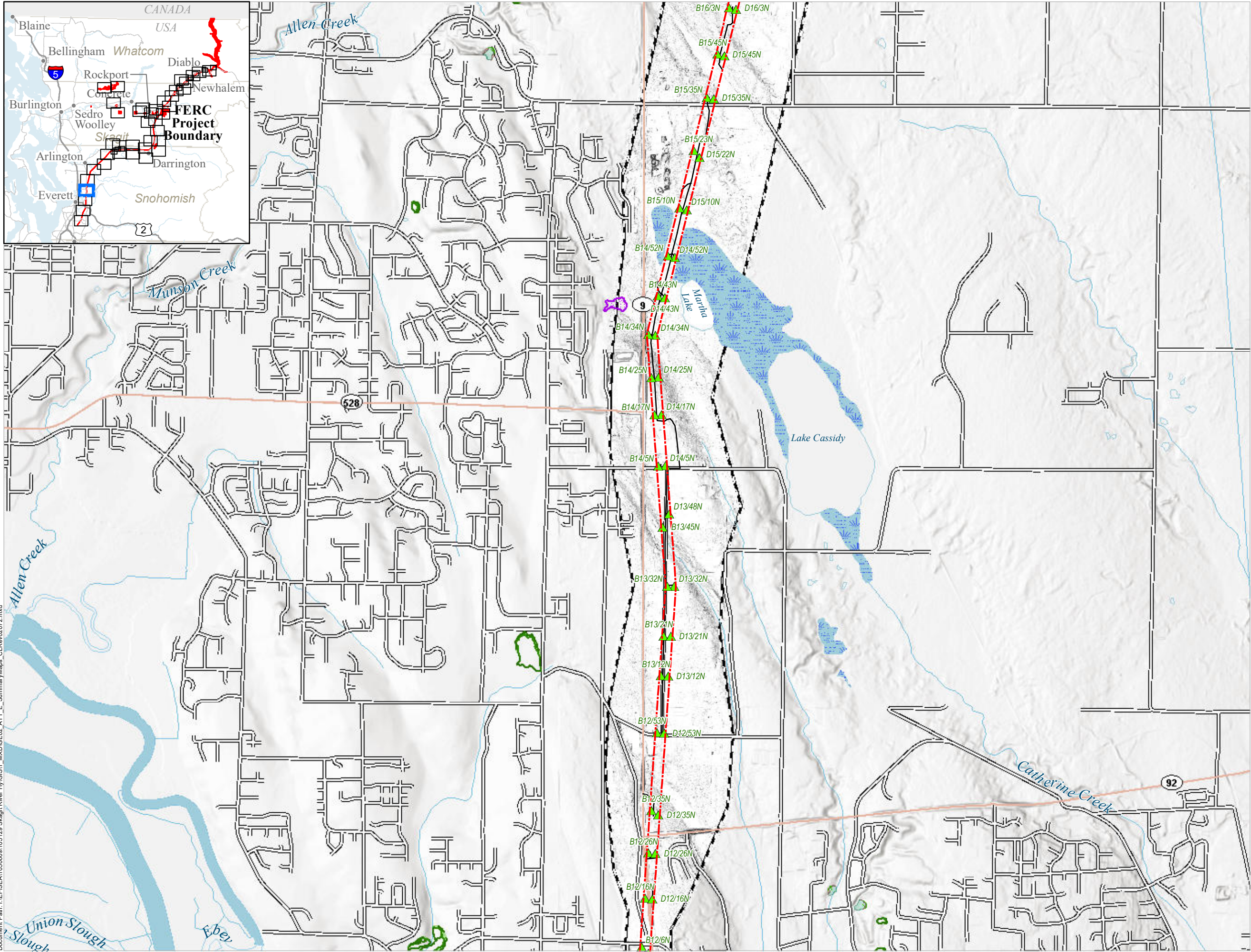


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### GE-02: SUMMARY

FERC Project Boundary

City Light Transmission Line Tower Locations

Study Routes

Road

Mass Wasting Study Boundary

Shallow Landslide Head Scarps and Flanks

Shallow Landslide Deposits

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Fan Deposits

Debris Flow

0

1,000

2,000

Feet

Page 33 of 40

32

33

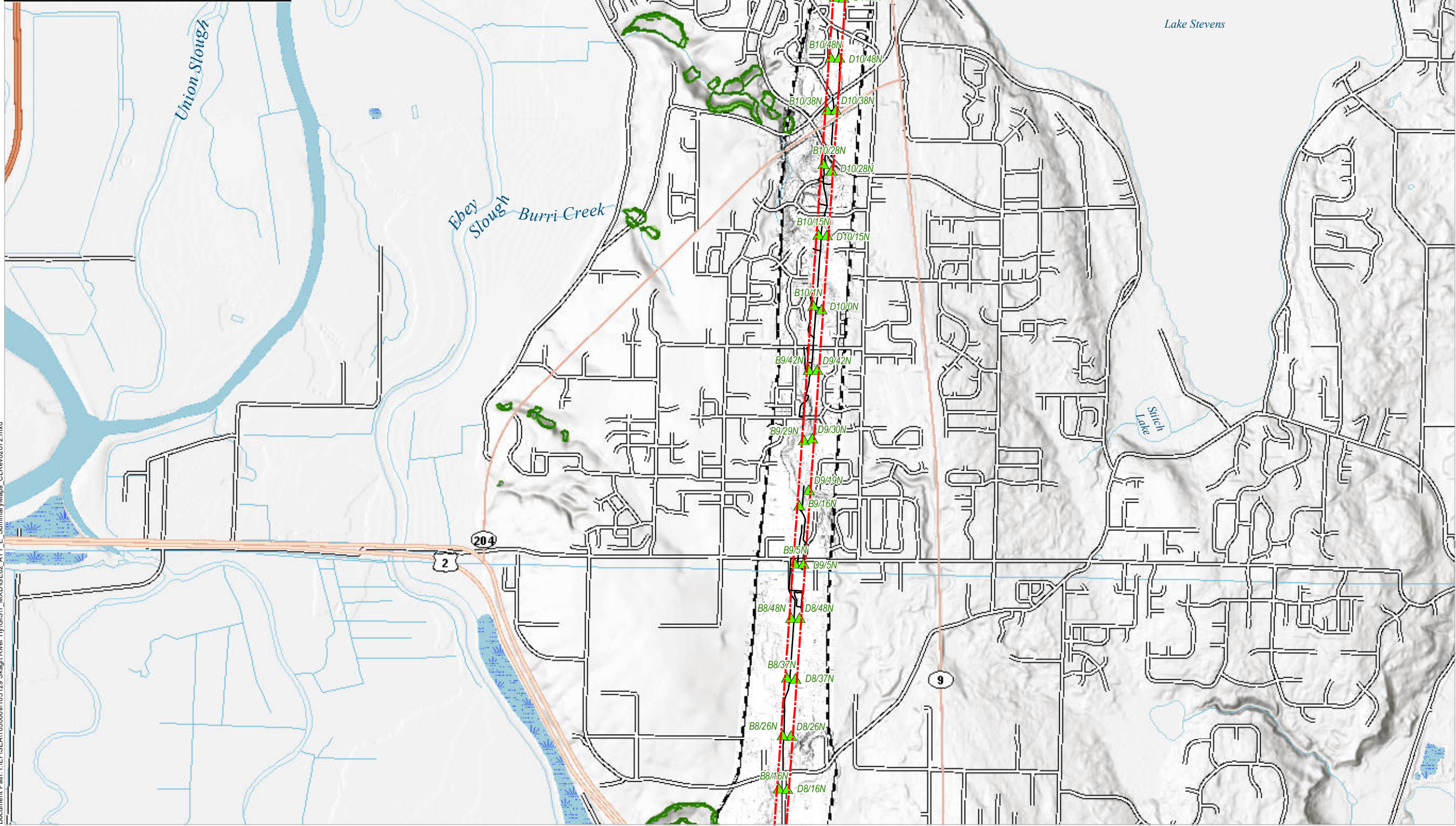
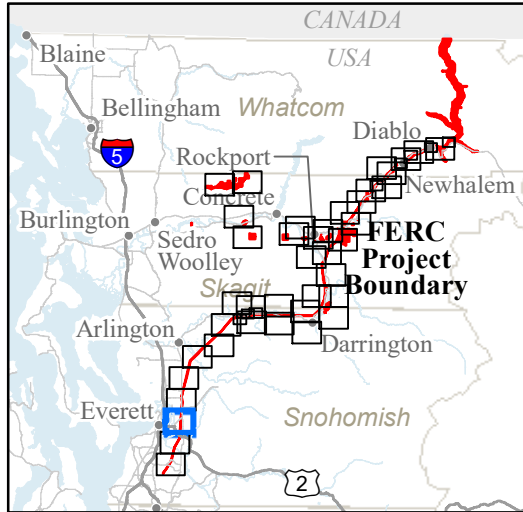
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### GE-02: SUMMARY

FERC Project Boundary

City Light Transmission Line Tower Locations

Study Routes

Road

Trail

Mass Wasting Study Boundary

Shallow Landslide Head Scarps and Flanks

Shallow Landslide Deposits

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Fan Deposits

Debris Flow

0

1,000

2,000

Feet

Page 34 of 40

33

34

35

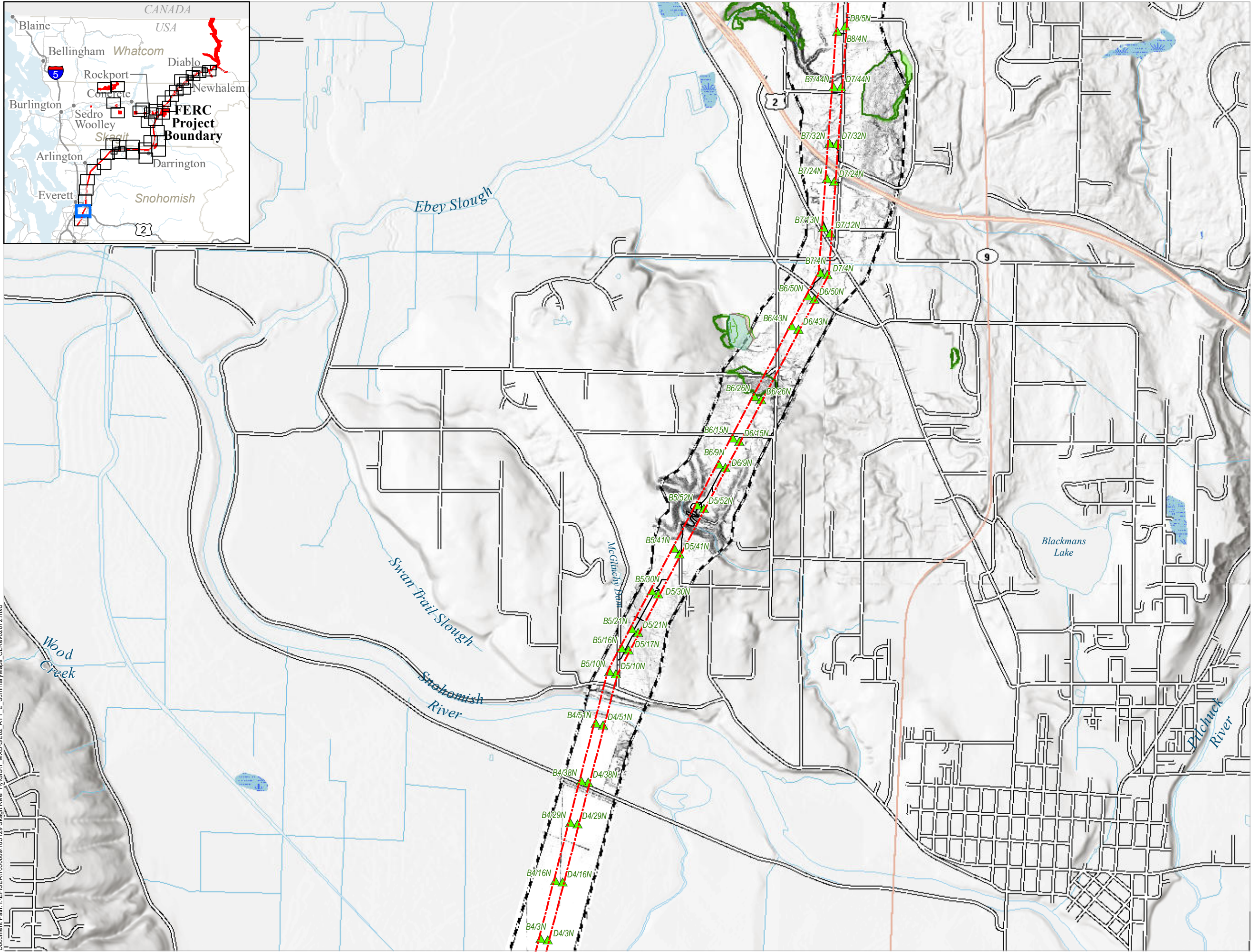
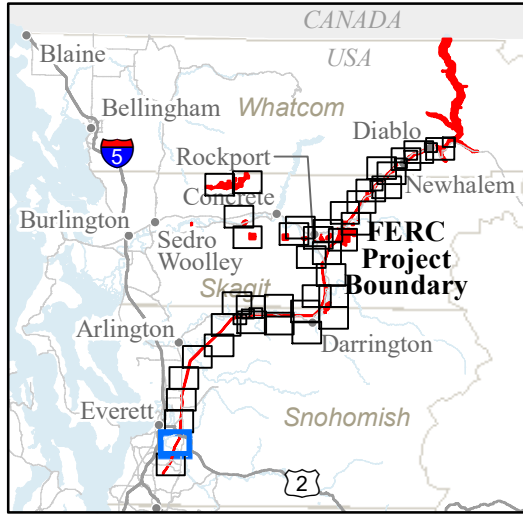
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### GE-02: SUMMARY

- FERC Project Boundary
- City Light Transmission Line Tower Locations
- Study Routes
- Road
- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits

0 1,000 2,000 Feet

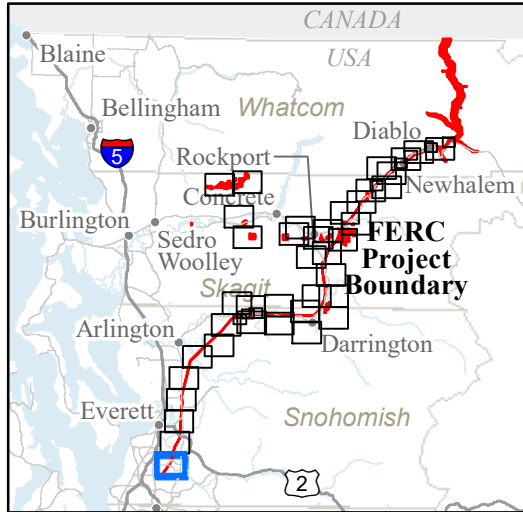
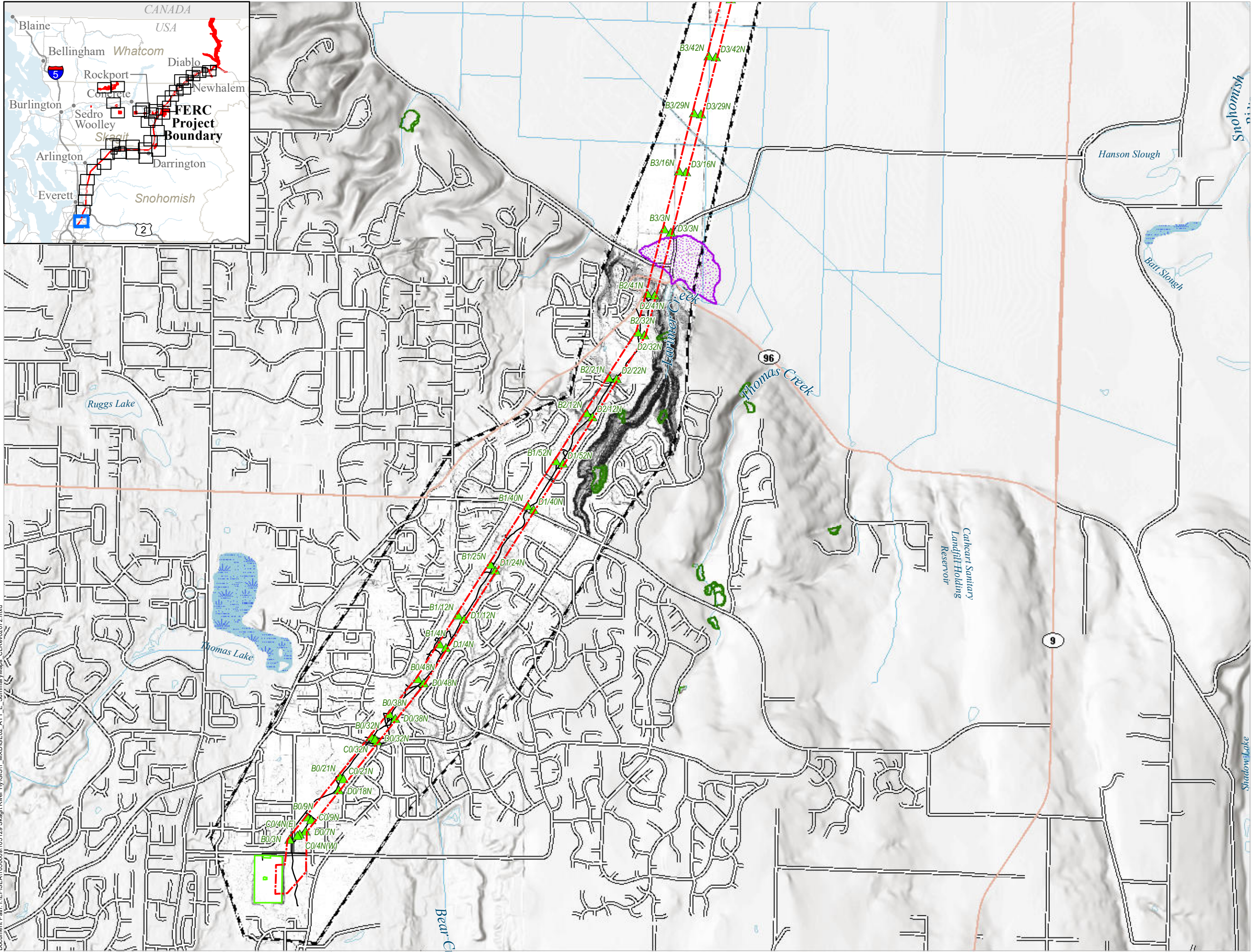
Page 35 of 40

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### GE-02: SUMMARY

FERC Project Boundary

City Light Major Facilities

City Light Transmission Line Tower Locations

Study Routes

Road

Mass Wasting Study Boundary

Shallow Landslide Head Scarps and Flanks

Shallow Landslide Deposits

Deep Landslide Scarps

Deep Landslide Head Scarps and Flanks

Deep Landslide Deposits

Fan Deposits

Debris Flow

010002000  
Feet

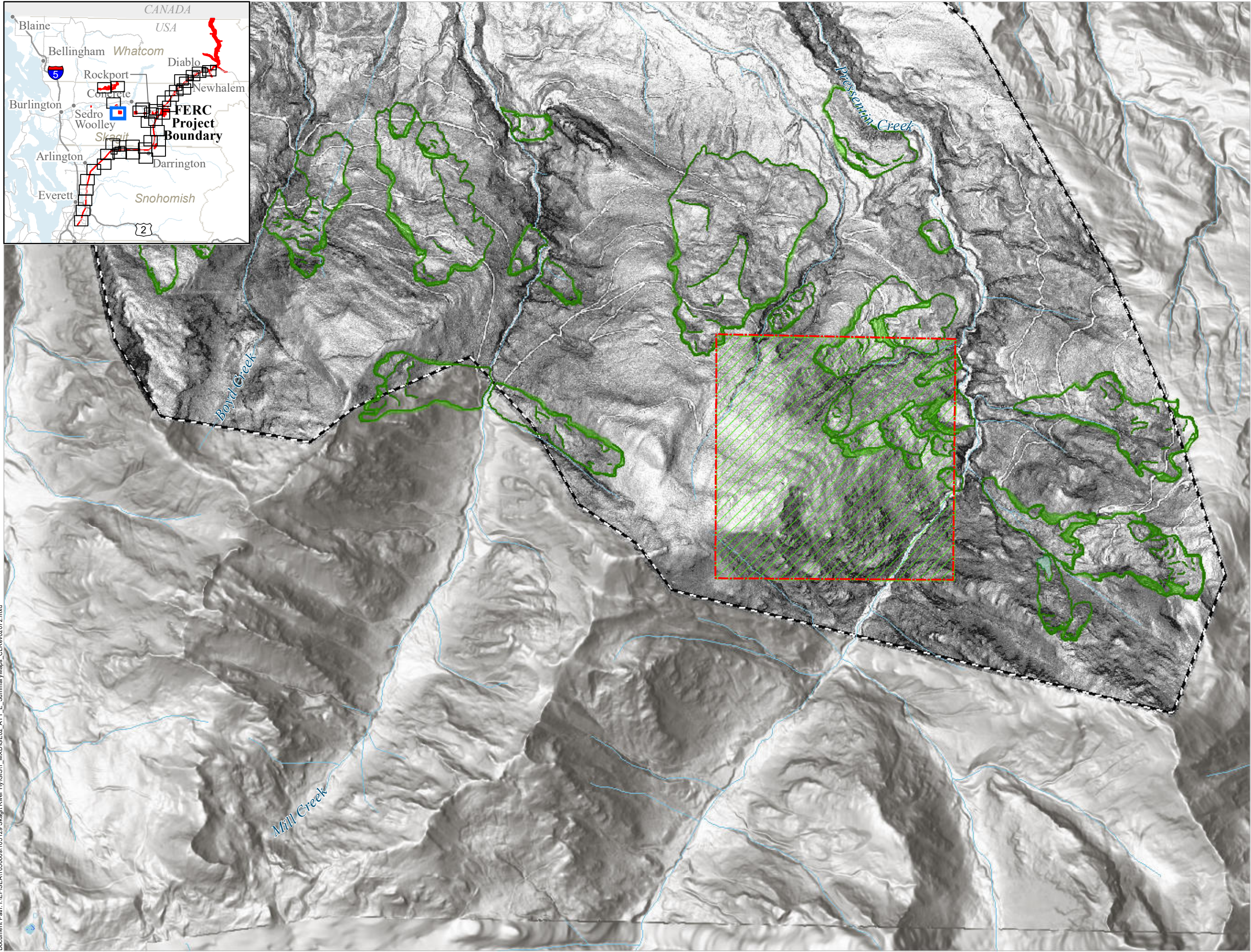
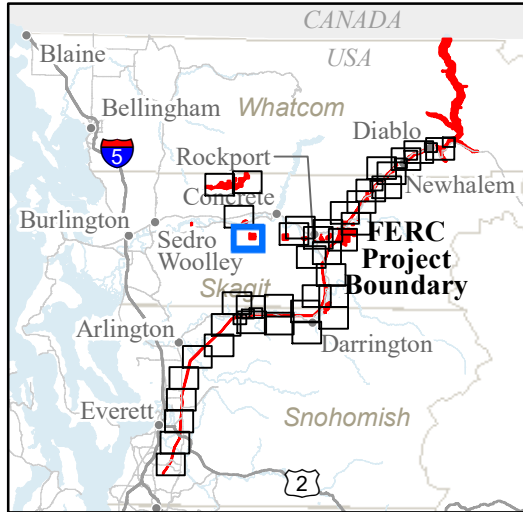
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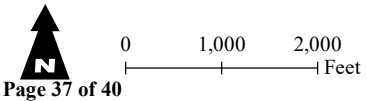
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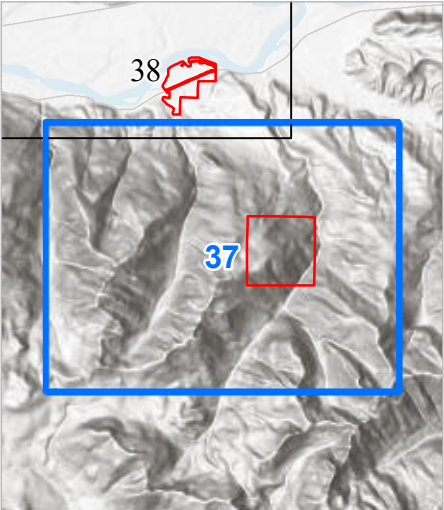


GE-02: SUMMARY

- FERC Project Boundary
- City Light Mitigation Parcels
- Mass Wasting Study Boundary
- Shallow Landslide Head Scarps and Flanks
- Shallow Landslide Deposits
- Deep Landslide Scarps
- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits



Page 37 of 40

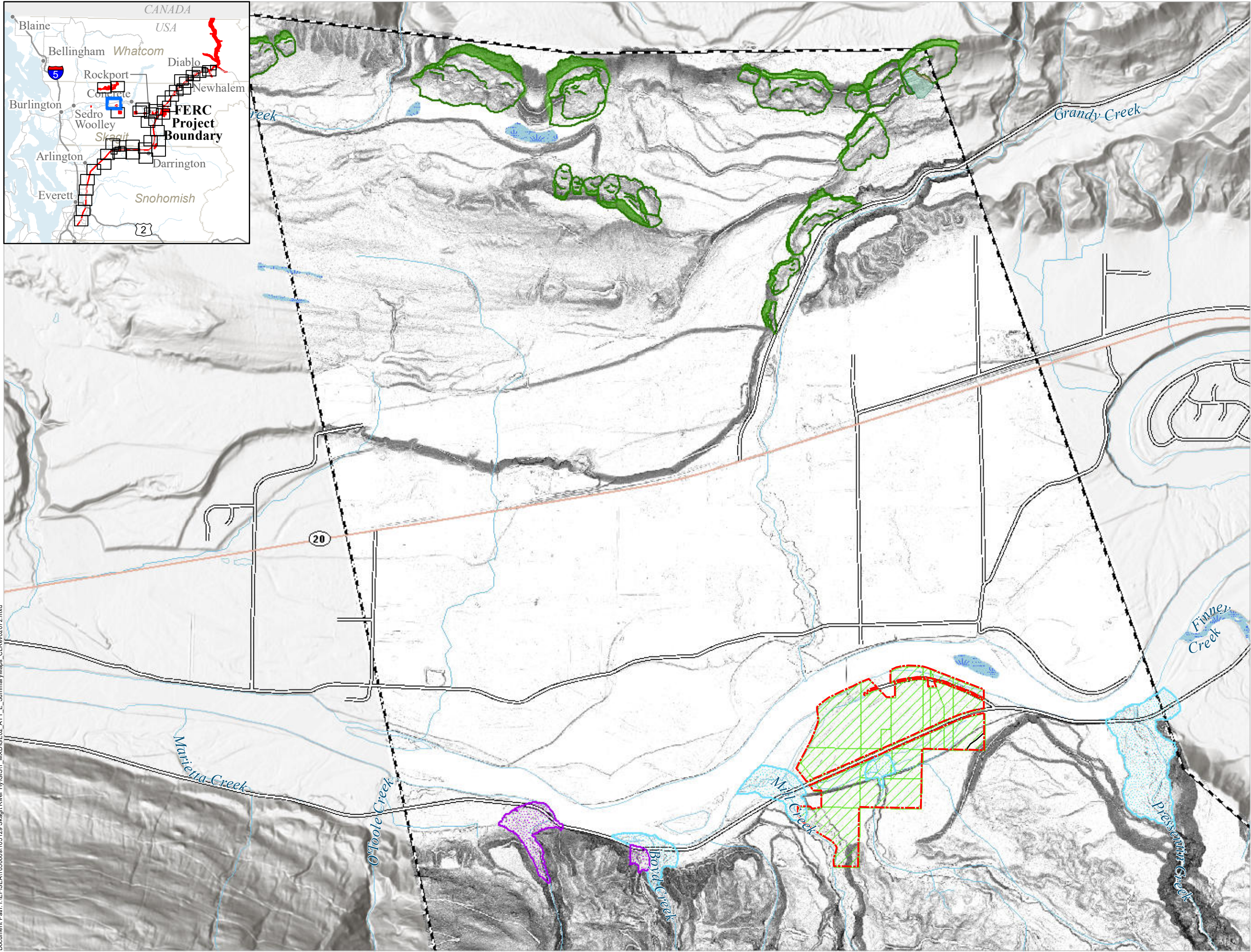
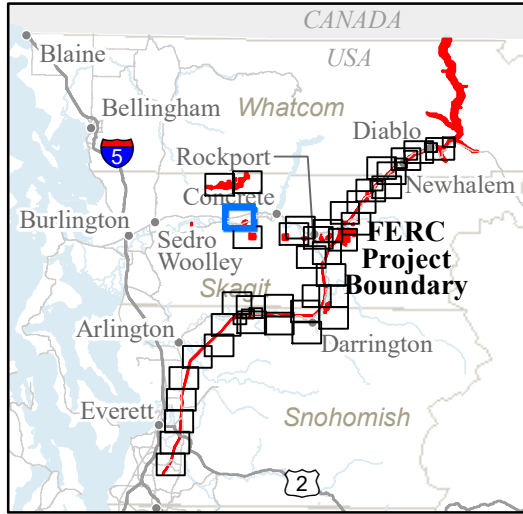


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### GE-02: SUMMARY

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  - Road
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- Deep Landslide Head Scarps and Flanks
- Deep Landslide Deposits
- Fan Deposits
  - Debris Flood
  - Debris Flow

0 1,000 2,000 Feet

Page 38 of 40

38

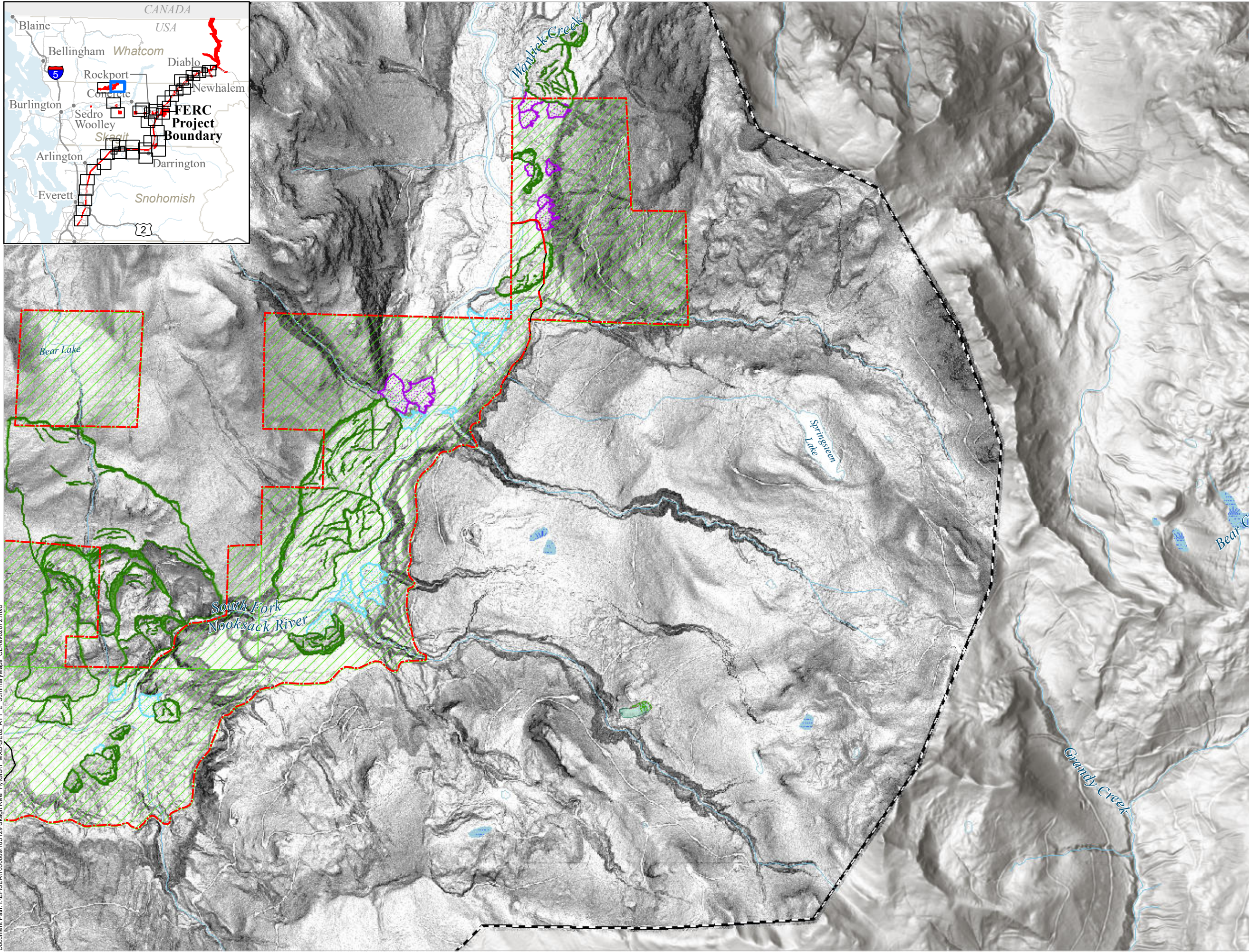
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**SKAGIT RIVER HYDROELECTRIC PROJECT (FERC NO. 553)**

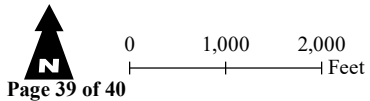
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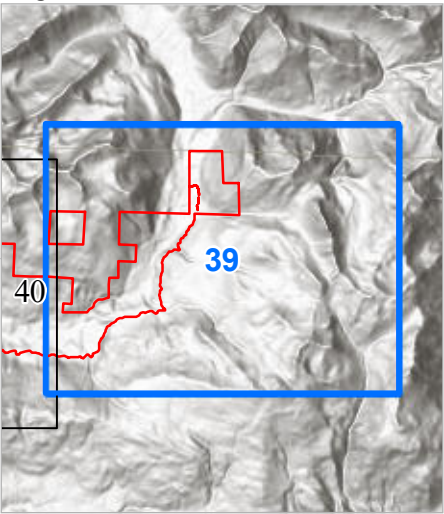


GE-02: SUMMARY

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- Fan Deposits
  - Debris Flood
  - Debris Flow



Page 39 of 40

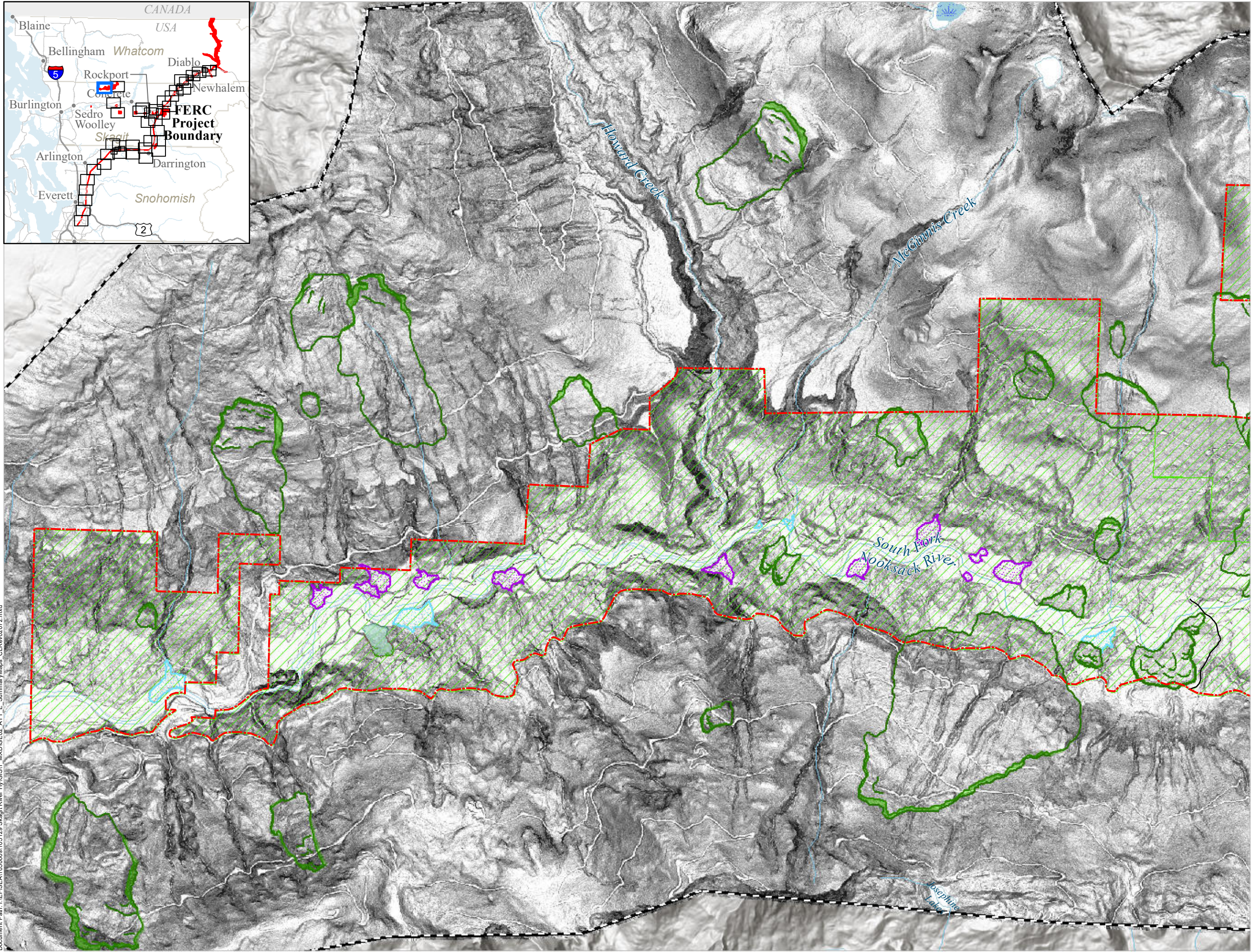
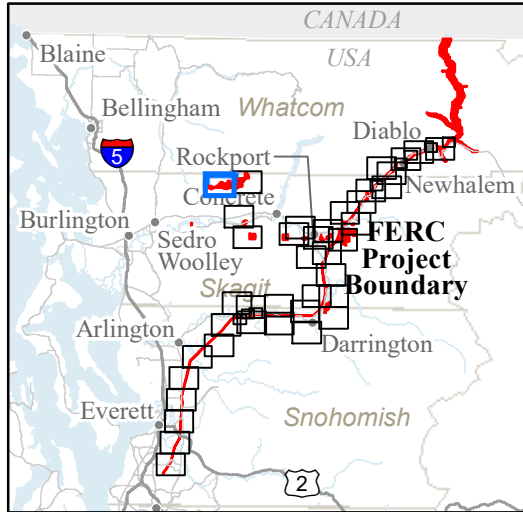


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0 1,000 2,000 Feet

Page 40 of 40

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